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An American National Standard

Standard Specification and Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples[1]

This standard is issued under the fixed designation E230/E230M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification contains reference tables (Tables 8 to 25) that give temperature-electromotive force (emf) relationships for Types B, E, J, K, N, R, S, T, and C thermocouples.[2] These are the thermocouple types most commonly used in industry. The tables contain all of the temperature-emf data currently available for the thermocouple types covered by this standard and may include data outside of the recommended upper temperature limit of an included thermocouple type.

1.2 In addition, the specification includes standard and special tolerances on initial values of emf versus temperature for thermocouples (Table 1), thermocouple extension wires (Table 2), and compensating extension wires for thermocouples (Table 3). Users should note that the stated tolerances apply only to the temperature ranges specified for the thermocouple types as given in Tables 1, 2, and 3, and do not apply to the temperature ranges covered in Tables 8 to 25.

1.3 Tables 4 and 5 provide insulation color coding for thermocouple and thermocouple extension wires as customarily used in the United States.

1.4 Recommendations regarding upper temperature limits for the thermocouple types referred to in 1.1 are provided in Table 6.

1.5 Tables 26 to 45 give temperature-emf data for single-leg thermoelements referenced to platinum (NIST Pt-67). The tables include values for Types BP, BN, JP, JN, KP (same as EP), KN, NP, NN, TP, and TN (same as EN).

1.6 Tables for Types RP, RN, SP, and SN thermoelements are not included since, nominally, Tables 18 to 21 represent the thermoelectric properties of Type RP and SP thermoelements referenced to pure platinum. Tables for the individual thermoelements of Type C are not included because materials for Type C thermocouples are normally supplied as matched pairs only.

1.7 Polynomial coefficients which may be used for computation of thermocouple emf as a function of temperature are given in Table 7. Coefficients for the emf of each thermocouple pair as well as for the emf of most individual thermoelements versus platinum are included. Coefficients for type RP and SP thermoelements are not included since they are nominally the same as for types R and S thermocouples, and coefficients for type RN or SN relative to the nominally similar Pt-67 would be insignificant. Coefficients for the individual thermoelements of Type C thermocouples have not been established.

1.8 Coefficients for sets of inverse polynomials are given in Table 46. These may be used for computing a close approximation of temperature (°C) as a function of thermocouple emf. Inverse functions are provided only for thermocouple pairs and are valid only over the emf ranges specified.

1.9 This specification is intended to define the thermoelectric properties of materials that conform to the relationships presented in the tables of this standard and bear the letter designations contained herein. Topics such as ordering information, physical and mechanical properties, workmanship, testing, and marking are not addressed in this specification. The user is referred to specific standards such as Specifications E235, E574, E585/E585M, E608/E608M, E1159, or E2181/E2181M for guidance in these areas.

1.10 The temperature-emf data in this specification are intended for industrial and laboratory use.

1.11 Thermocouple color codes per IEC 584–3 are given in Appendix X1.

1.12 The values stated in either SI units or inch-pound units are to be regarded separately as standard.

1.12.1 The values stated in brackets are not conversions to the values they succeed and therefore shall be used independently of the preceding values.

1.12.2 The values given in parentheses are conversions of the values they succeed.

1.12.3 Combining values from the two systems may result in non-conformance with the standard.

1.13 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

[1] These tables are under the jurisdiction of ASTM Committee E20 on Temperature Measurement and are the direct responsibility of Subcommittee E20.04 on Thermocouples.

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[2] These temperature-emf relationships have been revised as required by the international adoption in 1989 of a revised International Temperature Scale (ITS-90).

responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

E235 Specification for Thermocouples, Sheathed, Type K and Type N, for Nuclear or for Other High-Reliability Applications

E574 Specification for Duplex, Base Metal Thermocouple Wire With Glass Fiber or Silica Fiber Insulation

E585/E585M Specification for Compacted Mineral-Insulated, Metal-Sheathed, Base Metal Thermocouple Cable

E608/E608M Specification for Mineral-Insulated, Metal-Sheathed Base Metal Thermocouples

E1159 Specification for Thermocouple Materials, Platinum-Rhodium Alloys, and Platinum

E2181/E2181M Specification for Compacted Mineral-Insulated, Metal-Sheathed, Noble Metal Thermocouples and Thermocouple Cable

2.2 *NIST Monograph:*

NIST Monograph 175 Temperature-Electromotive Force Reference Functions and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90[4]

2.3 *IEC Standard:*

IEC 584–3 Thermocouples – Part 3: Extension and Compensating Cables Tolerances and Identification System, 1989

3. Source of Data

3.1 The data in these tables are based upon the SI volt[5] and the International Temperature Scale of 1990 (ITS-90).

3.2 The temperature-emf data in Tables 8 to 23 and 26 to 45, together with the corresponding equations in Tables 7 and 46 for all thermocouple types except Type C, have been extracted from NIST Monograph 175. Temperature-emf data in Tables 24 and 25 and the coefficients for Type C in Tables 7 and 46 have been developed from curves fitted to wire manufacturers' data.

NOTE 1—It is beyond the scope of this standard to discuss the origin of these tables. If further information is required, the reader should consult NIST Monograph 175.

3.3 These tables give emf values to three decimal places (1 μV) at temperature intervals of one degree. The tables are satisfactory for most industrial uses but may not be adequate for computer and similar applications. If greater precision is required, the reader should refer to NIST Monograph 175 which includes tables giving emf values to four decimal places (0.1 μV) for each type except Type C. Equations which permit easy and unique generation of the temperature-emf relationships can be found in Table 7. For convenience, coefficients of inverse polynomials that may be used to calculate approximate temperature (°C) as a function of thermocouple emf are given in Table 46.

4. Thermocouple Types and Letter Designations

4.1 The letter symbols identifying each reference table are those which are in common use throughout industry and identify the following thermocouple calibrations:

4.1.1 *Type B*—Platinum-30 % rhodium (+) versus platinum-6 % rhodium (−).

4.1.2 *Type E*—Nickel-10 % chromium (+) versus copper-45 % nickel (constantan) (−).

4.1.3 *Type J*—Iron (+) versus copper-45 % nickel (constantan) (−).

4.1.4 *Type K*—Nickel-10 % chromium (+) versus nickel-5 % (aluminum, silicon) (−).

NOTE 2—Silicon, or aluminum and silicon, may be present in combination with other elements.

4.1.5 *Type N*—Nickel-14 % chromium, 1.5 % silicon (+) versus nickel-4.5 % silicon-0.1 % magnesium (−).

4.1.6 *Type R*—Platinum-13 % rhodium (+) versus platinum (−).

4.1.7 *Type S*—Platinum-10 % rhodium (+) versus platinum (−).

4.1.8 *Type T*—Copper (+) versus copper-45 % nickel (constantan) (−).

4.1.9 *Type C*—Tungsten-5 % Rhenium (+) versus Tungsten-26 % Rhenium (−).

4.2 Each letter designation in 4.1 identifies a specific temperature-emf relationship (Tables 8 to 25) and may be applied to any thermocouple conforming thereto within stated tolerances on initial values of emf versus temperature, regardless of its composition.

4.3 The thermoelement identifying symbols in Tables 26 to 45 use the suffix letters P and N to denote, respectively, the positive and negative thermoelement of a given thermocouple type.

4.4 Tables 26 to 45 identify specific temperature-emf relationships of individual thermoelements with respect to platinum (NIST Pt-67). The appropriate letter designation may be applied to any thermoelement which, when combined with its mating thermoelement, will form a thermocouple conforming to the corresponding table within the stated tolerances.

4.5 An overall suffix letter "X" (for example KX, TX, EPX, JNX) denotes an "extension grade" material whose thermoelectric properties will match those of the corresponding thermocouple type within the stated extension grade tolerances over a limited temperature range. Most base metal extension wires have the same nominal composition as the thermocouple wires with which they are intended to be used, whereas the *compensating* extension wires for noble metal or refractory metal thermocouple types (S, R, B, or C) are usually of a different, more economical composition whose relative thermoelectric properties as a pair nonetheless closely approximate

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[4] Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899.

[5] Discussed in NIST Technical Note 1263, Guidelines for Implementing the New Representations of the Volt and Ohm Effective January 1, 1990.

those of the noble metal or refractory metal thermocouples with which they are to be used over a limited temperature range.

5. Tolerances on Initial Values of Emf versus Temperature

5.1 In the United States, thermocouples and matched thermocouple wire pairs are normally supplied conforming to the tolerances on initial values of emf versus temperature provided in Table 1.

5.1.1 Tolerances on initial values of emf versus temperature for single-leg thermoelements referenced to platinum have been established only for Types KP and KN. These are supplied, by common practice, to a tolerance equivalent to one half the millivolt tolerance of the Type K thermocouple.

5.1.2 For all other thermocouple types, tolerances on initial values of emf versus temperature for single thermoelements should be established by agreement between the purchaser and the supplier.

5.1.3 In Tables 34, 35, 44, and 45, the thermoelements are identified by two thermoelement symbols indicating their applicability to two thermocouple types. This indicates that the temperature-electromotive force relationship of the table is typical of the referenced thermoelements over the temperature range given in Table 1 for the corresponding thermocouple type. It should not be assumed, however, that thermoelements used with one thermocouple type are interchangeable with those of the other, or that they have the same millivolt tolerances for the initial values of emf versus temperature.

5.2 Thermocouple extension wires and compensating extension wires are supplied to conform to the tolerances on initial values of emf versus temperature shown in Tables 2 and 3, respectively.

5.2.1 Initial tolerances of extension grade materials and compensating extension materials apply over a more limited range of temperature than the corresponding thermocouple grade materials. Applicable temperature ranges, consistent with typical usage, are given in Tables 2 and 3.

6. Color Coding

6.1 Color codes for insulation on thermocouple grade materials, along with corresponding thermocouple and thermoelement letter designations, are given in Table 4.

6.2 Extension wires for thermocouples are distinguished by having an identifying color in the outer jacket as shown in Table 5, where letter designations for the extension thermoelements and pairs are also presented.

6.3 Information presented in Tables 4 and 5 is based on customary practice in the United States.

NOTE 3—Other insulation color coding conventions may be found in use elsewhere in the world. Refer to Appendix X1 for information.

7. List of Tables

7.1 Following is a list of the tables included in this standard:

7.1.1 *General Tables:*

Table Number	Title
1	Tolerances on Initial Values of Emf versus Temperature for Thermocouples
2	Tolerances on Initial Values of Emf versus Temperature for Extension Wires
3	Tolerances on Initial Values of Emf versus Temperature for Compensating Extension Wires
4	United States Color Codes for Single and Duplex Insulated Thermocouple Wire
5	United States Color Codes for Single and Duplex Insulated Extension Wire
6	Suggested Upper Temperature Limits for Protected Thermocouples
7	Polynomial Coefficients for Generating Thermocouple Emf as a Function of Temperature

7.1.2 *Emf versus Temperature Tables for Thermocouples:*

Table Number	Thermocouple Type	Temperature Range[A]
8	B	0 to 1820°C
9	B	32 to 3308°F
10	E	–270 to 1000°C
11	E	–454 to 1832°F
12	J	–210 to 1200°C
13	J	–346 to 2192°F
14	K	–270 to 1372°C
15	K	–454 to 2500°F
16	N	–270 to 1300°C
17	N	–454 to 2372°F
18	R	–50 to 1768°C
19	R	–58 to 3214°F
20	S	–50 to 1768°C
21	S	–58 to 3214°F
22	T	–270 to 400°C
23	T	–454 to 752°F
24	C	0 to 2315°C
25	C	32 to 4200°F

7.1.3 *Emf versus Temperature Tables for Thermoelements:*

Table Number	Thermocouple Type	Thermoelement Type	Temperature Range[A]
26	B	BP	0 to 1768°C
27	B	BP	32 to 3214°F
28	B	BN	0 to 1768°C
29	B	BN	32 to 3214°F
30	J	JP	–210 to 760°C
31	J	JP	–346 to 1400°F
32	J	JN	–210 to 760°C
33	J	JN	–346 to 1400°F
34	K or E	KP or EP	–270 to 1372°C
35	K or E	KP or EP	–454 to 2500°F
36	K	KN	–270 to 1372°C
37	K	KN	–454 to 2500°F
38	N	NP	–200 to 1300°C
39	N	NP	–328 to 2372°F
40	N	NN	–200 to 1300°C
41	N	NN	–328 to 2372°F
42	T	TP	–270 to 400°C
43	T	TP	–454 to 752°F
44	T or E	TN or EN	–270 to 1000°C
45	T or E	TN or EN	–454 to 1832°F

[A] These temperature ranges represent the published temperature versus emf data for the thermocouple and thermoelement types listed. Refer to Table 6 for the recommended upper temperature limits for a specific thermocouple wire size and type.

7.1.4 *Supplementary Table:*

Table Number	Title
46	Coefficients of Inverse Polynomials for Computation of Approximate Temperature as a Function of Thermocouple Emf

8. Keywords

8.1 emf computation; compensating extension wire; inverse polynomial; polynomial coefficient; reference tables; thermocouple; thermocouple extension wire; thermoelement; upper temperature limit

TABLE 1 Tolerances on Initial Values of Emf vs. Temperature for Thermocouples

NOTE 1—Tolerances in this table apply to new essentially homogeneous thermocouple wire, normally in the size range 0.25 to 3 mm in diameter (No. 30 to No. 8 AWG) and used at temperatures not exceeding the recommended limits of Table 6. If used at higher temperatures these tolerances may not apply.

NOTE 2—At a given temperature that is expressed in °C, the tolerance expressed in °F is 1.8 times larger than the tolerance expressed in °C. Where tolerances are given in percent, the percentage applies to the temperature being measured when expressed in degrees Celsius. To determine the tolerance in degrees Fahrenheit, multiply the tolerance in degrees Celsius by 9/5.

NOTE 3—**Caution:** Users should be aware that certain characteristics of thermocouple materials, including the emf-versus-temperature relationship may change with usage; consequently, test results and performance obtained at the time of manufacture may not necessarily apply throughout an extended period of use. Tolerances given in this table apply only to new wire as delivered to the user *and do not allow for changes in characteristics with use*. The magnitude of such changes will depend on such factors as wire size, temperature, time of exposure, and environment. It should be further noted that due to possible changes in homogeneity, attempting to recalibrate *used* thermocouples is likely to yield irrelevant results, and is not recommended. However, it may be appropriate to compare used thermocouples *in-situ* with new or known good ones to ascertain their suitability for further service under the conditions of the comparison.

Thermocouple Type	Temperature Range		Tolerances with Reference Junction 0°C [32°F]			
			Standard Tolerances		Special Tolerances	
	°C	°F	°C	°F	°C	°F
T	0 to 370	32 to 700	The greater of ±1.0°C or ±0.75 %	Note 2	The greater of ±0.5°C or ±0.4 %	Note 2
J	0 to 760	32 to 1400	The greater of ±2.2°C or ±0.75 %		The greater of ±1.1°C or ±0.4 %	
*E	0 to 870	32 to 1600	The greater of ±1.7°C or ±0.5 %		The greater of ±1.0°C or ±0.4 %	
K or N	0 to 1260	32 to 2300	The greater of ±2.2°C or ±0.75 %		The greater of ±1.1°C or ±0.4 %	
R or S	0 to 1480	32 to 2700	The greater of ±1.5°C or ±0.25 %		The greater of ±0.6°C or ±0.1 %	
B	870 to 1700	1600 to 3100	±0.5 %		±0.25 %	
C	0 to 2315	32 to 4200	The greater of ±4.4°C or 1 %	Note 2	Not applicable	
T[A]	–200 to 0	–328 to 32	The greater of ±1.0°C or ±1.5 %		[B]	
*E[A]	–200 to 0	–328 to 32	The greater of ±1.7°C or ±1 %		[B]	
K[A]	–200 to 0	–328 to 32	The greater of ±2.2°C or ±2 %		[B]	

*The standard tolerances shown do not apply to Type E mineral-insulated, metal-sheathed (MIMS) thermocouples and thermocouple cables as described in Specifications E608/E608M and E585/E585M. The standard tolerances for MIMS Type E constructions are the greater of ±2.2°C or ±0.75 % from 0 to 870°C and the greater of ±2.2°C or ±2 % from -200 to 0°C.

[A] Thermocouples and thermocouple materials are normally supplied to meet the tolerances specified in the table for temperatures above 0°C. The same materials, however, may not fall within the tolerances for temperatures below 0°C in the second section of the table. If materials are required to meet the tolerances stated for temperatures below 0°C the purchase order shall so state. Selection of materials usually will be required.

[B] Special tolerances for temperatures below 0°C are difficult to justify due to limited available information. However, the following values for Types E and T thermocouples are suggested as a guide for discussion between the purchaser and supplier:

Type E, – 200 to 0°C, ±1.0°C or ±0.5 % (whichever is greater)

Type T, – 200 to 0°C, ±0.5°C or ±0.8 % (whichever is greater)

Initial values of tolerance for Type J thermocouples at temperatures below 0°C and special tolerances for Type K thermocouples below 0°C are not given due to the characteristics of the materials. Data for type N thermocouples below 0°C are not currently available.

TABLE 2 Tolerances on Initial Values of Emf vs. Temperature for Extension Wires

NOTE 1—Tolerances in this table represent the maximum error contribution allowable from new and essentially homogeneous thermocouple extension wire when exposed to the full temperature range given in the table below. Extension grade materials are not intended for use outside the temperature range shown.

NOTE 2—Thermocouple extension wire makes a contribution to the total thermoelectric signal that is dependent upon the temperature difference between the extreme ends of the extension wire length. The actual magnitude of any error introduced into a measuring circuit by homogeneous and correctly connected extension wires is equal to the algebraic difference of the deviations at its two end temperatures, as determined for that extension wire pair.

Thermocouple Type	Temperature Range		Tolerances—Reference Junction 0°C [32°F]			
			Standard Tolerances		Special Tolerances	
	°C	[°F]	°C	[°F]	°C	[°F]
TX	–60 to 100	–75 to 200	±1.0	±1.8	±0.5	±0.9
JX	0 to 200	32 to 400	±2.2	±4.0	±1.1	±2.0
EX	0 to 200	32 to 400	±1.7	±3.0	±1.0	±1.8
KX	0 to 200	32 to 400	±2.2	±4.0	±1.1	±2.0
NX	0 to 200	32 to 400	±2.2	±4.0	±1.1	±2.0

TABLE 3 Tolerances on Initial Values of Emf vs. Temperature for Compensating Extension Wires

NOTE 1—Tolerances in this table apply to new and essentially homogeneous thermocouple compensating extension wire when used at temperatures within the range given in the table below.

NOTE 2—Thermocouple compensating extension wire makes a contribution to the total thermoelectric signal that is dependent upon the temperature difference between the extreme ends of the compensating extension wire length.

Thermocouple Type	Temperature Range		Tolerances—Reference Junction 0°C [32°F]		
			Standard Tolerances		Special Tolerances
	°C	[°F]	°C	[°F]	
SX	0 to 200	32 to 400	±5	±9	[A]
RX	0 to 200	32 to 400	±5	±9	[A]
BX[B]	0 to 200	32 to 400	±4.2	±7.6	[A]
B[C]	0 to 100	32 to 200	±3.7	±6.7	...
CX	0 to 200	32 to 400		Initial Calibration Tolerance ±0.110 mV	

[A] Special tolerance grade compensating extension wires are not available.
[B] Proprietary alloy compensating extension wire is available for use over a wide temperature range.
[C] Special compensating extension wires are not necessary with Type B over the limited temperature range 0 to 50°C [32 to 122°F], where the use of non-compensated (copper/copper) conductors introduces no significant error. For a somewhat larger temperature gradient of 0 to 100°C [32 to 212°F] across the extension portion of the circuit, the use of non-compensated (copper/copper) extension wires may result in small errors, the magnitude of which will not exceed the tolerances given for measurements above 1000°C [1800°F].

TABLE 4 United States Color Codes for Single and Duplex Insulated Thermocouple Wire

NOTE 1—Data in this table represents customary practice in the United States of America. Different color code conventions may be in use in other parts of the world.

NOTE 2—For some types of insulations, colors may appear as a stripe or trace strand. High temperature braided insulations are normally supplied without color coding.

NOTE 3—The noble metal thermocouples are not normally supplied with colored insulations. However, if they were so furnished, the color codes for the corresponding single wire extensions would apply, with a brown overall jacket, where applicable.

Thermocouple Type	Thermoelement Designation	Individual Conductor Color	Overall Jacket Color
T			Brown
	TP (+)	Blue	
	TN (–)	Red	
J			Brown
	JP (+)	White	
	JN (–)	Red	
E			Brown
	EP (+)	Purple	
	EN (–)	Red	
K			Brown
	KP (+)	Yellow	
	KN (–)	Red	
N			Brown
	NP (+)	Orange	
	NN (–)	Red	

TABLE 5 United States Color Codes for Single and Duplex Insulated Extension Wire

NOTE 1—Data in this table represents customary practice in the United States of America. Different color code conventions may be in use in other parts of the world.

NOTE 2—For some types of insulations, colors may appear as a stripe or trace strand. High temperature braided insulations are normally supplied without color coding.

Thermocouple Type	Thermoelement Designation	Individual Conductor Color	Overall Jacket Color
TX			Blue
	TPX (+)	Blue	
	TNX (–)	Red, or Red/Blue Trace	
JX			Black
	JPX (+)	White	
	JNX (–)	Red, or Red/Black Trace	
EX			Purple
	EPX (+)	Purple	
	ENX (–)	Red, or Red/Purple Trace	
KX			Yellow
	KPX (+)	Yellow	
	KNX (–)	Red, or Red/Yellow Trace	
NX			Orange
	NPX (+)	Orange	
	NNX (–)	Red, or Red/Orange Trace	
RX or SX[A]			Green
	RPX/SPX (+)	Black	
	RNX/SNX (–)	Red, or Red/Black Trace	
BX[B]			Gray
	BPX (+)	Gray	
	BNX (–)	Red, or Red/Gray Trace	
CX			Red
	CPX (+)	Green	
	CNX (–)	Red	

[A] Type R and S thermocouples utilize the same extension alloys.

[B] Color code shown is applicable to constructions incorporating proprietary Type B compensating extension alloy wires. When uncompensated (copper/copper) extension materials are used with Type B thermocouples, the extension wire insulation is not normally color coded.

TABLE 6 Suggested Upper Temperature Limits for Protected Thermocouples

NOTE 1—This table provides the recommended upper temperature limits for the various thermocouple types and wire sizes. These limits apply to protected thermocouples, that is, thermocouples in conventional closed-end protecting tubes. They do not apply to compacted, mineral-insulated, metal-sheathed thermocouples.

NOTE 2—The temperature limits given here are intended only as a guide to the user and they should not be taken as absolute values nor as guarantees of satisfactory service life or performance. These types and sizes may be used at temperatures above the stated limits, but usually at the expense of stability or service life or both. In some instances, it may be necessary to reduce the temperature limits in order to achieve satisfactory performance in service. ASTM MNL-12[A] and other literature sources should be consulted for additional applications information.

	Upper Temperature limit for Various Wire Sizes, °C [°F]					
Thermo-couple Type	No. 8 AWG (3.25 mm [0.128 in.])	No. 14 AWG (1.63 mm [0.064 in.])	No. 20 AWG (0.81 mm [0.032 in.])	No. 24 AWG (0.51 mm [0.020 in.])	No. 28 AWG (0.33 mm [0.013 in.])	No. 30 AWG (0.25 mm [0.010 in.])
T		370 [700]	260 [500]	200 [400]	200 [400]	150 [300]
J	760 [1400]	590 [1100]	480 [900]	370 [700]	370 [700]	320 [600]
E	870 [1600]	650 [1200]	540 [1000]	430 [800]	430 [800]	370 [700]
K and N	1260 [2300]	1090 [2000]	980 [1800]	870 [1600]	870 [1600]	760 [1400]
R and S				1480 [2700]		
B				1700 [3100]		
C[B]				2315 [4200][C]		

[A] *Manual on the Use of Thermocouples in Temperature Measurement*, ASTM MNL-12, 1993.

[B] Type C thermoelements are not suitable for use in the presence of oxygen; therefore, protection for these thermocouples must provide an inert or non-oxidizing environment.

[C] No. 24 AWG thermoelements are common for this thermocouple type, but other sizes are available and, with adequate protection, are generally useable over the same temperature range.

TABLE 7 Polynomial Coefficients for Generating Thermocouple Emf as a Function of Temperature

NOTE 1—The following table contains sets of polynomial coefficients used to compute emfs for the various types of thermocouples and for their individual thermoelements paired with Pt–67, when reference junctions are at 0°C.

NOTE 2—The coefficients given are for an expression of the form: $E = c_0 + c_1t + c_2t^2 + c_3t^3 ... + c_nt^n$. In this expression, E is in millivolts, t is in °C, and c_0, c_1, c_2... c_n are the coefficients given in the following table. For the Type K thermocouple and the Type KN thermoelement, coefficients b_0 and b_1 for an exponential term containing *e*, the natural logarithm base, also appear in the table. This term is of the form: $b_0e^{b_1(t-126.9686)^2}$ and, where given, it is to be evaluated and added to the polynomial result.

NOTE 3—If emf values on another temperature scale are desired, first convert the desired temperature to its equivalent in °C, then evaluate the appropriate polynomial from the table below using the °C equivalent temperature.

TYPE B Thermocouple				
Temperature Range			0 °C to 630.615 °C	630.615 °C to 1820 °C
	c_0	=	0.0	–3.893 816 862 1 ....
	c_1	=	–2.465 081 834 6 × 10 $^{-4}$	2.857 174 747 0 × 10 $^{-2}$
	c_2	=	5.904 042 117 1 × 10 $^{-6}$	–8.488 510 478 5 × 10 $^{-5}$
	c_3	=	–1.325 793 163 6 × 10 $^{-9}$	1.578 528 016 4 × 10 $^{-7}$
	c_4	=	1.566 829 190 1 × 10^{-12}	–1.683 534 486 4 × 10^{-10}
	c_5	=	–1.694 452 924 0 × 10^{-15}	1.110 979 401 3 × 10^{-13}
	c_6	=	6.299 034 709 4 × 10^{-19}	–4.451 543 103 3 × 10^{-17}
	c_7	=		9.897 564 082 1 × 10^{-21}
	c_8	=		–9.379 133 028 9 × 10^{-25}
TYPE E Thermocouple				
Temperature Range			–270 °C to 0 °C	0 °C to 1000 °C
	c_0	=	0.0	0.0
	c_1	=	5.866 550 870 8 × 10 $^{-2}$	5.866 550 871 0 × 10 $^{-2}$
	c_2	=	4.541 097 712 4 × 10 $^{-5}$	4.503 227 558 2 × 10 $^{-5}$
	c_3	=	–7.799 804 868 6 × 10 $^{-7}$	2.890 840 721 2 × 10 $^{-8}$
	c_4	=	–2.580 016 084 3 × 10 $^{-8}$	–3.305 689 665 2 × 10^{-10}
	c_5	=	–5.945 258 305 7 × 10^{-10}	6.502 440 327 0 × 10^{-13}
	c_6	=	–9.321 405 866 7 × 10^{-12}	–1.919 749 550 4 × 10^{-16}
	c_7	=	–1.028 760 553 4 × 10^{-13}	–1.253 660 049 7 × 10^{-18}
	c_8	=	–8.037 012 362 1 × 10^{-16}	2.148 921 756 9 × 10^{-21}
	c_9	=	–4.397 949 739 1 × 10^{-18}	–1.438 804 178 2 × 10^{-24}
	c_{10}	=	–1.641 477 635 5 × 10^{-20}	3.596 089 948 1 × 10^{-28}
	c_{11}	=	–3.967 361 951 6 × 10^{-23}	
	c_{12}	=	–5.582 732 872 1 × 10^{-26}	
	c_{13}	=	–3.465 784 201 3 × 10^{-29}	
TYPE J Thermocouple				
Temperature Range			–210 °C to 760 °C	760 °C to 1200 °C
	c_0	=	0.0	2.964 562 568 1 × 10 ^{2}
	c_1	=	5.038 118 781 5 × 10 $^{-2}$	–1.497 612 778 6 .
	c_2	=	3.047 583 693 0 × 10 $^{-5}$	3.178 710 392 4 × 10 $^{-3}$
	c_3	=	–8.568 106 572 0 × 10 $^{-8}$	–3.184 768 670 1 × 10 $^{-6}$
	c_4	=	1.322 819 529 5 × 10^{-10}	1.572 081 900 4 × 10 $^{-9}$
	c_5	=	–1.705 295 833 7 × 10^{-13}	–3.069 136 905 6 × 10^{-13}
	c_6	=	2.094 809 069 7 × 10^{-16}	
	c_7	=	–1.253 839 533 6 × 10^{-19}	
	c_8	=	1.563 172 569 7 × 10^{-23}	
TYPE K Thermocouple				
Temperature Range			–270 °C to 0 °C	0 °C to 1372 °C
	c_0	=	0.0	–1.760 041 368 6 × 10 $^{-2}$
	c_1	=	3.945 012 802 5 × 10 $^{-2}$	3.892 120 497 5 × 10 $^{-2}$
	c_2	=	2.362 237 359 8 × 10 $^{-5}$	1.855 877 003 2 × 10 $^{-5}$
	c_3	=	–3.285 890 678 4 × 10 $^{-7}$	–9.945 759 287 4 × 10 $^{-8}$
	c_4	=	–4.990 482 877 7 × 10 $^{-9}$	3.184 094 571 9 × 10^{-10}
	c_5	=	–6.750 905 917 3 × 10^{-11}	–5.607 284 488 9 × 10^{-13}
	c_6	=	–5.741 032 742 8 × 10^{-13}	5.607 505 905 9 × 10^{-16}
	c_7	=	–3.108 887 289 4 × 10^{-15}	–3.202 072 000 3 × 10^{-19}
	c_8	=	–1.045 160 936 5 × 10^{-17}	9.715 114 715 2 × 10^{-23}
	c_9	=	–1.988 926 687 8 × 10^{-20}	–1.210 472 127 5 × 10^{-26}
	c_{10}	=	–1.632 269 748 6 × 10^{-23}	
Exponential Coefficients See Note 2	b_0	=		1.185 976 × 10 $^{-1}$
	b_1	=		–1.183 432 × 10 $^{-4}$
TYPE N Thermocouple				
Temperature Range			–270 °C to 0 °C	0 °C to 1300 °C
	c_0	=	0.0	0.0

TABLE 7 *Continued*

c_1	=	2.615 910 596 2 × 10^{-2}	2.592 939 460 1 × 10^{-2}
c_2	=	1.095 748 422 8 × 10^{-5}	1.571 014 188 0 × 10^{-5}
c_3	=	–9.384 111 155 4 × 10^{-8}	4.382 562 723 7 × 10^{-8}
c_4	=	–4.641 203 975 9 × 10^{-11}	–2.526 116 979 4 × 10^{-10}
c_5	=	–2.630 335 771 6 × 10^{-12}	6.431 181 933 9 × 10^{-13}
c_6	=	–2.265 343 800 3 × 10^{-14}	–1.006 347 151 9 × 10^{-15}
c_7	=	–7.608 930 079 1 × 10^{-17}	9.974 533 899 2 × 10^{-19}
c_8	=	–9.341 966 783 5 × 10^{-20}	–6.086 324 560 7 × 10^{-22}
c_9	=		2.084 922 933 9 × 10^{-25}
c_{10}	=		–3.068 219 615 1 × 10^{-29}

TYPE R Thermocouple

Temperature Range		–50 °C to 1064.18 °C	1064.18 °C to 1664.5 °C	1664.5 °C to 1768.1 °C
c_0	=	0.0	2.951 579 253 16 .	1.522 321 182 09 × 10^{2}
c_1	=	5.289 617 297 65 × 10^{-3}	–2.520 612 513 32 × 10^{-3}	–2.688 198 885 45 × 10^{-1}
c_2	=	1.391 665 897 82 × 10^{-5}	1.595 645 018 65 × 10^{-5}	1.712 802 804 71 × 10^{-4}
c_3	=	–2.388 556 930 17 × 10^{-8}	–7.640 859 475 76 × 10^{-9}	–3.458 957 064 53 × 10^{-8}
c_4	=	3.569 160 010 63 × 10^{-11}	2.053 052 910 24 × 10^{-12}	–9.346 339 710 46 × 10^{-15}
c_5	=	–4.623 476 662 98 × 10^{-14}	–2.933 596 681 73 × 10^{-16}	
c_6	=	5.007 774 410 34 × 10^{-17}		
c_7	=	–3.731 058 861 91 × 10^{-20}		
c_8	=	1.577 164 823 67 × 10^{-23}		
c_9	=	–2.810 386 252 51 × 10^{-27}		

TYPE S Thermocouple

Temperature Range		–50 °C to 1064.18 °C	1064.18 °C to 1664.5 °C	1664.5 °C to 1768.1 °C
c_0	=	0.0	1.329 004 440 85 .	1.466 282 326 36 × 10^{2}
c_1	=	5.403 133 086 31 × 10^{-3}	3.345 093 113 44 × 10^{-3}	–2.584 305 167 52 × 10^{-1}
c_2	=	1.259 342 897 40 × 10^{-5}	6.548 051 928 18 × 10^{-6}	1.636 935 746 41 × 10^{-4}
c_3	=	–2.324 779 686 89 × 10^{-8}	–1.648 562 592 09 × 10^{-9}	–3.304 390 469 87 × 10^{-8}
c_4	=	3.220 288 230 36 × 10^{-11}	1.299 896 051 74 × 10^{-14}	–9.432 236 906 12 × 10^{-15}
c_5	=	–3.314 651 963 89 × 10^{-14}		
c_6	=	2.557 442 517 86 × 10^{-17}		
c_7	=	–1.250 688 713 93 × 10^{-20}		
c_8	=	2.714 431 761 45 × 10^{-24}		

TYPE T Thermocouple

Temperature Range		–270 °C to 0 °C	0 °C to 400 °C
c_0	=	0.0	0.0
c_1	=	3.874 810 636 4 × 10^{-2}	3.874 810 636 4 × 10^{-2}
c_2	=	4.419 443 434 7 × 10^{-5}	3.329 222 788 0 × 10^{-5}
c_3	=	1.184 432 310 5 × 10^{-7}	2.061 824 340 4 × 10^{-7}
c_4	=	2.003 297 355 4 × 10^{-8}	–2.188 225 684 6 × 10^{-9}
c_5	=	9.013 801 955 9 × 10^{-10}	1.099 688 092 8 × 10^{-11}
c_6	=	2.265 115 659 3 × 10^{-11}	–3.081 575 877 2 × 10^{-14}
c_7	=	3.607 115 420 5 × 10^{-13}	4.547 913 529 0 × 10^{-17}
c_8	=	3.849 393 988 3 × 10^{-15}	–2.751 290 167 3 × 10^{-20}
c_9	=	2.821 352 192 5 × 10^{-17}	
c_{10}	=	1.425 159 477 9 × 10^{-19}	
c_{11}	=	4.876 866 228 6 × 10^{-22}	
c_{12}	=	1.079 553 927 0 × 10^{-24}	
c_{13}	=	1.394 502 706 2 × 10^{-27}	
c_{14}	=	7.979 515 392 7 × 10^{-31}	

TYPE C Coefficients

t = 0 °C to 2315 °C

		0 °C to 630.615 °C	630.615 °C to 2315 °C
c_0	=	0.0000000	4.0528823 × 10^{-1}
c_1	=	1.3406032 × 10^{-2}	1.1509355 × 10^{-2}
c_2	=	1.1924992 × 10^{-5}	1.5696453 × 10^{-5}
c_3	=	-7.9806354 × 10^{-9}	–1.3704412 × 10^{-8}
c_4	=	-5.0787515 × 10^{-12}	5.2290873 × 10^{-12}
c_5	=	1.3164197 × 10^{-14}	–9.2082758 × 10^{-16}
c_6	=	-7.9197332 × 10^{-18}	4.5245112 × 10^{-20}

TYPE BP Thermoelement vs. Platinum (NIST Pt–67)

Temperature Range	0 °C to 630.615 °C	630.615 °C to 1768.1 °C

TABLE 7 *Continued*

c_0	=	0.0	−7.968 043 228 2 .
c_1	=	4.822 787 568 7 × 10^{-3}	6.394 111 021 3 × 10^{-2}
c_2	=	1.565 116 570 9 × 10^{-5}	−1.710 242 141 0 × 10^{-4}
c_3	=	−2.223 379 788 2 × 10^{-8}	3.055 578 252 7 × 10^{-7}
c_4	=	2.833 324 407 4 × 10^{-11}	−3.210 574 449 2 × 10^{-10}
c_5	=	−2.025 894 044 7 × 10^{-14}	2.090 910 279 4 × 10^{-13}
c_6	=	6.148 870 509 6 × 10^{-18}	−8.233 582 542 6 × 10^{-17}
c_7	=		1.782 284 151 5 × 10^{-20}
c_8	=		−1.618 707 418 7 × 10^{-24}
TYPE BN Thermoelement vs. Platinum (NIST Pt–67)			
Temperature Range		0 °C to 630.615 °C	630.615 °C to 1768.1 °C
c_0	=	0.0	−4.074 226 366 2 .
c_1	=	5.069 295 752 2 × 10^{-3}	3.536 936 274 3 × 10^{-2}
c_2	=	9.747 123 592 0 × 10^{-6}	−8.613 910 931 5 × 10^{-5}
c_3	=	−2.090 800 471 8 × 10^{-8}	1.477 050 236 2 × 10^{-7}
c_4	=	2.676 641 488 3 × 10^{-11}	−1.527 039 962 9 × 10^{-10}
c_5	=	−1.856 448 752 3 × 10^{-14}	9.799 308 780 5 × 10^{-14}
c_6	=	5.518 967 038 6 × 10^{-18}	−3.782 039 439 3 × 10^{-17}
c_7	=		7.925 277 432 8 × 10^{-21}
c_8	=		−6.807 941 157 8 × 10^{-25}
TYPE JP Thermoelement vs. Platinum (NIST Pt–67)			
Temperature Range		−210 °C to 760 °C	
c_0	=	0.0	
c_1	=	1.791 354 855 9 × 10^{-2}	
c_2	=	4.677 466 335 8 × 10^{-6}	
c_3	=	−7.122 599 299 1 × 10^{-8}	
c_4	=	1.335 212 501 6 × 10^{-10}	
c_5	=	−1.500 896 263 9 × 10^{-13}	
c_6	=	1.551 431 962 5 × 10^{-16}	
c_7	=	−7.950 357 212 5 × 10^{-20}	
c_8	=	2.429 790 391 0 × 10^{-24}	
Platinum (NIST Pt–67) vs. **TYPE JN** Thermoelement			
Temperature Range		−210 °C to 760 °C	
c_0	=	0.0	
c_1	=	3.246 763 925 6 × 10^{-2}	
c_2	=	2.579 837 059 4 × 10^{-5}	
c_3	=	−1.445 507 273 0 × 10^{-8}	
c_4	=	−1.239 297 209 3 × 10^{-12}	
c_5	=	−2.043 995 698 0 × 10^{-14}	
c_6	=	5.433 771 071 8 × 10^{-17}	
c_7	=	−4.588 038 123 5 × 10^{-20}	
c_8	=	1.320 193 530 6 × 10^{-23}	
TYPE KP or EP Thermoelement vs. Platinum (NIST Pt–67)			
Temperature Range		−270 °C to 0 °C	0 °C to 1372 °C
c_0	=	0.0	0.0
c_1	=	2.581 195 057 4 × 10^{-2}	2.581 195 057 3 × 10^{-2}
c_2	=	2.299 008 894 3 × 10^{-5}	2.683 139 535 5 × 10^{-5}
c_3	=	−6.157 475 446 0 × 10^{-7}	−3.867 519 441 2 × 10^{-8}
c_4	=	−2.327 184 376 5 × 10^{-8}	3.030 555 323 4 × 10^{-11}
c_5	=	−5.457 033 359 6 × 10^{-10}	−1.028 040 353 3 × 10^{-14}
c_6	=	−7.845 394 226 4 × 10^{-12}	−3.448 171 733 0 × 10^{-17}
c_7	=	−7.251 284 060 8 × 10^{-14}	8.251 289 448 0 × 10^{-20}
c_8	=	−4.356 917 479 1 × 10^{-16}	−7.889 338 217 7 × 10^{-23}
c_9	=	−1.664 752 760 6 × 10^{-18}	3.569 925 312 6 × 10^{-26}
c_{10}	=	−3.737 720 750 1 × 10^{-21}	−6.331 536 065 9 × 10^{-30}
c_{11}	=	−3.774 144 269 5 × 10^{-24}	
c_{12}	=	1.002 535 559 0 × 10^{-27}	
c_{13}	=	3.893 531 072 5 × 10^{-30}	
Platinum (NIST Pt–67) vs. **TYPE KN** Thermoelement			
Temperature Range		−270 °C to 0 °C	0 °C to 1372 °C
c_0	=	0.0	−1.760 041 368 6 × 10^{-2}
c_1	=	1.363 817 745 2 × 10^{-2}	1.310 925 440 3 × 10^{-2}
c_2	=	6.322 846 542 6 × 10^{-7}	−8.272 625 323 0 × 10^{-6}
c_3	=	2.871 584 767 6 × 10^{-7}	−6.078 239 846 2 × 10^{-8}
c_4	=	1.828 136 088 7 × 10^{-8}	2.881 039 039 6 × 10^{-10}
c_5	=	4.781 942 767 9 × 10^{-10}	−5.504 480 453 6 × 10^{-13}
c_6	=	7.271 290 952 1 × 10^{-12}	5.952 323 079 2 × 10^{-16}

TABLE 7 *Continued*

	c_7	=	6.940 395 331 9 × 10^{-14}	−4.027 200 945 1 × 10^{-19}
	c_8	=	4.252 401 385 5 × 10^{-16}	1.760 445 293 3 × 10^{-22}
	c_9	=	1.644 863 493 8 × 10^{-18}	−4.780 397 440 1 × 10^{-26}
	c_{10}	=	3.721 398 052 6 × 10^{-21}	6.331 536 065 9 × 10^{-30}
	c_{11}	=	3.774 144 269 5 × 10^{-24}	
	c_{12}	=	−1.002 535 559 0 × 10^{-27}	
	c_{13}	=	−3.893 531 072 5 × 10^{-30}	
Exponential Coefficients	b_0	=		1.185 976 × 10^{-1}
See Note 2	b_1	=		−1.183 432 × 10^{-4}
TYPE NP Thermoelement vs. Platinum (NIST Pt–67)				
Temperature Range			−200 °C to 0 °C	0 °C to 1300 °C
	c_0	=	0.0	0.0
	c_1	=	1.541 798 843 0 × 10^{-2}	1.544 538 594 7 × 10^{-2}
	c_2	=	2.570 738 245 7 × 10^{-5}	2.672 234 128 9 × 10^{-5}
	c_3	=	−9.018 782 577 1 × 10^{-8}	−2.559 531 305 2 × 10^{-8}
	c_4	=	−5.365 479 300 5 × 10^{-10}	−3.302 809 741 4 × 10^{-11}
	c_5	=	−3.352 621 597 6 × 10^{-12}	2.007 532 297 1 × 10^{-13}
	c_6	=	−7.272 344 767 0 × 10^{-15}	−4.270 815 423 0 × 10^{-16}
	c_7	=		5.181 347 352 2 × 10^{-19}
	c_8	=		−3.688 712 493 1 × 10^{-22}
	c_9	=		1.426 873 470 8 × 10^{-25}
	c_{10}	=		−2.312 130 215 4 × 10^{-29}
Platinum (NIST Pt–67) vs. **TYPE NN** Thermoelement				
Temperature Range			−200 °C to 0 °C	0 °C to 1300 °C
	c_0	=	0.0	0.0
	c_1	=	1.074 111 753 2 × 10^{-2}	1.048 400 865 5 × 10^{-2}
	c_2	=	−1.474 989 822 9 × 10^{-5}	−1.101 219 940 9 × 10^{-5}
	c_3	=	−3.653 285 783 2 × 10^{-9}	6.942 094 028 9 × 10^{-8}
	c_4	=	4.901 358 902 9 × 10^{-10}	−2.195 836 005 3 × 10^{-10}
	c_5	=	7.222 858 260 4 × 10^{-13}	4.423 649 636 8 × 10^{-13}
	c_6	=	−1.538 109 323 6 × 10^{-14}	−5.792 656 096 4 × 10^{-16}
	c_7	=	−7.608 930 079 1 × 10^{-17}	4.793 186 547 0 × 10^{-19}
	c_8	=	−9.341 966 783 5 × 10^{-20}	−2.397 612 067 6 × 10^{-22}
	c_9	=		6.580 494 631 8 × 10^{-26}
	c_{10}	=		−7.560 893 996 5 × 10^{-30}
TYPE TP Thermoelement vs. Platinum (NIST Pt–67)				
Temperature Range			−270 °C to 0 °C	0 °C to 400 °C
	c_0	=	0.0	0.0
	c_1	=	5.894 548 229 7 × 10^{-3}	5.894 548 226 5 × 10^{-3}
	c_2	=	2.177 354 616 7 × 10^{-5}	1.509 134 765 2 × 10^{-5}
	c_3	=	2.826 761 733 1 × 10^{-7}	1.385 988 324 2 × 10^{-7}
	c_4	=	2.256 129 063 2 × 10^{-8}	−1.827 351 164 9 × 10^{-9}
	c_5	=	9.502 026 902 0 × 10^{-10}	1.033 635 649 1 × 10^{-11}
	c_6	=	2.412 716 823 3 × 10^{-11}	−3.065 826 553 4 × 10^{-14}
	c_7	=	3.910 747 567 8 × 10^{-13}	4.681 530 823 5 × 10^{-17}
	c_8	=	4.217 403 476 6 × 10^{-15}	−2.974 071 681 2 × 10^{-20}
	c_9	=	3.094 671 890 4 × 10^{-17}	1.474 503 431 3 × 10^{-24}
	c_{10}	=	1.551 930 033 9 × 10^{-19}	−3.659 405 308 7 × 10^{-28}
	c_{11}	=	5.235 860 981 1 × 10^{-22}	
	c_{12}	=	1.136 383 791 3 × 10^{-24}	
	c_{13}	=	1.433 054 079 2 × 10^{-27}	
	c_{14}	=	7.979 515 392 7 × 10^{-31}	
Platinum (NIST Pt–67) vs. **TYPE TN or EN** Thermoelement				
Temperature Range			−270 °C to 0 °C	0 °C to 1000 °C
	c_0	=	0.0	0.0
	c_1	=	3.285 355 813 4 × 10^{-2}	3.285 355 813 8 × 10^{-2}
	c_2	=	2.242 088 818 1 × 10^{-5}	1.820 088 022 7 × 10^{-5}
	c_3	=	−1.642 329 422 6 × 10^{-7}	6.758 360 162 4 × 10^{-8}
	c_4	=	−2.528 317 078 0 × 10^{-9}	−3.608 745 197 5 × 10^{-10}
	c_5	=	−4.882 249 460 9 × 10^{-11}	6.605 244 362 3 × 10^{-13}
	c_6	=	−1.476 011 640 4 × 10^{-12}	−1.574 932 377 1 × 10^{-16}
	c_7	=	−3.036 321 473 1 × 10^{-14}	−1.336 172 944 2 × 10^{-18}
	c_8	=	−3.680 094 883 0 × 10^{-16}	2.227 815 139 1 × 10^{-21}
	c_9	=	−2.733 196 978 5 × 10^{-18}	−1.474 503 431 3 × 10^{-24}
	c_{10}	=	−1.267 705 560 5 × 10^{-20}	3.659 405 308 7 × 10^{-28}
	c_{11}	=	−3.589 947 524 7 × 10^{-23}	
	c_{12}	=	−5.682 986 428 0 × 10^{-26}	
	c_{13}	=	−3.855 137 308 5 × 10^{-29}	

TABLE 8 Type B Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
0	0.000	–0.000	–0.000	–0.001	–0.001	–0.001	–0.001	–0.001	–0.002	–0.002	–0.002
10	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.003	–0.003	–0.003
20	–0.003	–0.003	–0.003	–0.003	–0.003	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002
30	–0.002	–0.002	–0.002	–0.002	–0.002	–0.001	–0.001	–0.001	0.001	–0.001	–0.000
40	–0.000	–0.000	–0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.002
50	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.005	0.005	0.006	0.006
60	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.011
70	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.015	0.016	0.017	0.017
80	0.017	0.018	0.019	0.020	0.020	0.021	0.022	0.022	0.023	0.024	0.025
90	0.025	0.026	0.026	0.027	0.028	0.029	0.030	0.031	0.031	0.032	0.033
100	0.033	0.034	0.035	0.036	0.037	0.038	0.039	0.040	0.041	0.042	0.043
110	0.043	0.044	0.045	0.046	0.047	0.048	0.049	0.050	0.051	0.052	0.053
120	0.053	0.055	0.056	0.057	0.058	0.059	0.060	0.062	0.063	0.064	0.065
130	0.065	0.066	0.068	0.069	0.070	0.072	0.073	0.074	0.075	0.077	0.078
140	0.078	0.079	0.081	0.082	0.084	0.085	0.086	0.088	0.089	0.091	0.092
150	0.092	0.094	0.095	0.096	0.098	0.099	0.101	0.102	0.104	0.106	0.107
160	0.107	0.109	0.110	0.112	0.113	0.115	0.117	0.118	0.120	0.122	0.123
170	0.123	0.125	0.127	0.128	0.130	0.132	0.134	0.135	0.137	0.139	0.141
180	0.141	0.142	0.144	0.146	0.148	0.150	0.151	0.153	0.155	0.157	0.159
190	0.159	0.161	0.163	0.165	0.166	0.168	0.170	0.172	0.174	0.176	0.178
200	0.178	0.180	0.182	0.184	0.186	0.188	0.190	0.192	0.195	0.197	0.199
210	0.199	0.201	0.203	0.205	0.207	0.209	0.212	0.214	0.216	0.218	0.220
220	0.220	0.222	0.225	0.227	0.229	0.231	0.234	0.236	0.238	0.241	0.243
230	0.243	0.245	0.248	0.250	0.252	0.255	0.257	0.259	0.262	0.264	0.267
240	0.267	0.269	0.271	0.274	0.276	0.279	0.281	0.284	0.286	0.289	0.291
250	0.291	0.294	0.296	0.299	0.301	0.304	0.307	0.309	0.312	0.314	0.317
260	0.317	0.320	0.322	0.325	0.328	0.330	0.333	0.336	0.338	0.341	0.344
270	0.344	0.347	0.349	0.352	0.355	0.358	0.360	0.363	0.366	0.369	0.372
280	0.372	0.375	0.377	0.380	0.383	0.386	0.389	0.392	0.395	0.398	0.401
290	0.401	0.404	0.407	0.410	0.413	0.416	0.419	0.422	0.425	0.428	0.431
300	0.431	0.434	0.437	0.440	0.443	0.446	0.449	0.452	0.455	0.458	0.462
310	0.462	0.465	0.468	0.471	0.474	0.478	0.481	0.484	0.487	0.490	0.494
320	0.494	0.497	0.500	0.503	0.507	0.510	0.513	0.517	0.520	0.523	0.527
330	0.527	0.530	0.533	0.537	0.540	0.544	0.547	0.550	0.554	0.557	0.561
340	0.561	0.564	0.568	0.571	0.575	0.578	0.582	0.585	0.589	0.592	0.596
350	0.596	0.599	0.603	0.607	0.610	0.614	0.617	0.621	0.625	0.628	0.632
360	0.632	0.636	0.639	0.643	0.647	0.650	0.654	0.658	0.662	0.665	0.669
370	0.669	0.673	0.677	0.680	0.684	0.688	0.692	0.696	0.700	0.703	0.707
380	0.707	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.738	0.742	0.746
390	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	0.782	0.787
400	0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.815	0.819	0.824	0.828
410	0.828	0.832	0.836	0.840	0.844	0.849	0.853	0.857	0.861	0.866	0.870
420	0.870	0.874	0.878	0.883	0.887	0.891	0.896	0.900	0.904	0.909	0.913
430	0.913	0.917	0.922	0.926	0.930	0.935	0.939	0.944	0.948	0.953	0.957
440	0.957	0.961	0.966	0.970	0.975	0.979	0.984	0.988	0.993	0.997	1.002
450	1.002	1.007	1.011	1.016	1.020	1.025	1.030	1.034	1.039	1.043	1.048
460	1.048	1.053	1.057	1.062	1.067	1.071	1.076	1.081	1.086	1.090	1.095
470	1.095	1.100	1.105	1.109	1.114	1.119	1.124	1.129	1.133	1.138	1.143
480	1.143	1.148	1.153	1.158	1.163	1.167	1.172	1.177	1.182	1.187	1.192
490	1.192	1.197	1.202	1.207	1.212	1.217	1.222	1.227	1.232	1.237	1.242
500	1.242	1.247	1.252	1.257	1.262	1.267	1.272	1.277	1.282	1.288	1.293
510	1.293	1.298	1.303	1.308	1.313	1.318	1.324	1.329	1.334	1.339	1.344
520	1.344	1.350	1.355	1.360	1.365	1.371	1.376	1.381	1.387	1.392	1.397
530	1.397	1.402	1.408	1.413	1.418	1.424	1.429	1.435	1.440	1.445	1.451
540	1.451	1.456	1.462	1.467	1.472	1.478	1.483	1.489	1.494	1.500	1.505
550	1.505	1.511	1.516	1.522	1.527	1.533	1.539	1.544	1.550	1.555	1.561
560	1.561	1.566	1.572	1.578	1.583	1.589	1.595	1.600	1.506	1.612	1.617
570	1.617	1.623	1.629	1.634	1.640	1.646	1.652	1.657	1.663	1.669	1.675
580	1.675	1.680	1.686	1.692	1.698	1.704	1.709	1.715	1.721	1.727	1.733
590	1.733	1.739	1.745	1.750	1.756	1.762	1.768	1.774	1.780	1.786	1.792

TABLE 8 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
600	1.792	1.798	1.804	1.810	1.816	1.822	1.828	1.834	1.840	1.846	1.852
610	1.852	1.858	1.864	1.870	1.876	1.882	1.888	1.894	1.901	1.907	1.913
620	1.913	1.919	1.925	1.931	1.937	1.944	1.950	1.956	1.962	1.968	1.975
630	1.975	1.981	1.987	1.993	1.999	2.006	2.012	2.018	2.025	2.031	2.037
640	2.037	2.043	2.050	2.056	2.062	2.069	2.075	2.082	2.088	2.094	2.101
650	2.101	2.107	2.113	2.120	2.126	2.133	2.139	2.146	2.152	2.158	2.165
660	2.165	2.171	2.178	2.184	2.191	2.197	2.204	2.210	2.217	2.224	2.230
670	2.230	2.237	2.243	2.250	2.256	2.263	2.270	2.276	2.283	2.289	2.296
680	2.296	2.303	2.309	2.316	2.323	2.329	2.336	2.343	2.350	2.356	2.363
690	2.363	2.370	2.376	2.383	2.390	2.397	2.403	2.410	2.417	2.424	2.431
700	2.431	2.437	2.444	2.451	2.458	2.465	2.472	2.479	2.485	2.492	2.499
710	2.499	2.506	2.513	2.520	2.527	2.534	2.541	2.548	2.555	2.562	2.569
720	2.569	2.576	2.583	2.590	2.597	2.604	2.611	2.618	2.625	2.632	2.639
730	2.639	2.646	2.653	2.660	2.667	2.674	2.681	2.688	2.696	2.703	2.710
740	2.710	2.717	2.724	2.731	2.738	2.746	2.753	2.760	2.767	2.775	2.782
750	2.782	2.789	2.796	2.803	2.811	2.818	2.825	2.833	2.840	2.847	2.854
760	2.854	2.862	2.869	2.876	2.884	2.891	2.898	2.906	2.913	2.921	2.928
770	2.928	2.935	2.943	2.950	2.958	2.965	2.973	2.980	2.987	2.995	3.002
780	3.002	3.010	3.017	3.025	3.032	3.040	3.047	3.055	3.062	3.070	3.078
790	3.078	3.085	3.093	3.100	3.108	3.116	3.123	3.131	3.138	3.146	3.154
800	3.154	3.161	3.169	3.177	3.184	3.192	3.200	3.207	3.215	3.223	3.230
810	3.230	3.238	3.246	3.254	3.261	3.269	3.277	3.285	3.292	3.300	3.308
820	3.308	3.316	3.324	3.331	3.339	3.347	3.355	3.363	3.371	3.379	3.386
830	3.386	3.394	3.402	3.410	3.418	3.426	3.434	3.442	3.450	3.458	3.466
840	3.466	3.474	3.482	3.490	3.498	3.506	3.514	3.522	3.530	3.538	3.546
850	3.546	3.554	3.562	3.570	3.578	3.586	3.594	3.602	3.610	3.618	3.626
860	3.626	3.634	3.643	3.651	3.659	3.667	3.675	3.683	3.692	3.700	3.708
870	3.708	3.716	3.724	3.732	3.741	3.749	3.757	3.765	3.774	3.782	3.790
880	3.790	3.798	3.807	3.815	3.823	3.832	3.840	3.848	3.857	3.865	3.873
890	3.873	3.882	3.890	3.898	3.907	3.915	3.923	3.932	3.940	3.949	3.957
900	3.957	3.965	3.974	3.982	3.991	3.999	4.008	4.016	4.024	4.033	4.041
910	4.041	4.050	4.058	4.067	4.075	4.084	4.093	4.101	4.110	4.118	4.127
920	4.127	4.135	4.144	4.152	4.161	4.170	4.178	4.187	4.195	4.204	4.213
930	4.213	4.221	4.230	4.239	4.247	4.256	4.265	4.273	4.282	4.291	4.299
940	4.299	4.308	4.317	4.326	4.334	4.343	4.352	4.360	4.369	4.378	4.387
950	4.387	4.396	4.404	4.413	4.422	4.431	4.440	4.448	4.457	4.466	4.475
960	4.475	4.484	4.493	4.501	4.510	4.519	4.528	4.537	4.546	4.555	4.564
970	4.564	4.573	4.582	4.591	4.599	4.608	4.617	4.626	4.635	4.644	4.653
980	4.653	4.662	4.671	4.680	4.689	4.698	4.707	4.716	4.725	4.734	4.743
990	4.743	4.753	4.762	4.771	4.780	4.789	4.798	4.807	4.816	4.825	4.834
1000	4.834	4.843	4.853	4.862	4.871	4.880	4.889	4.898	4.908	4.917	4.926
1010	4.926	4.935	4.944	4.954	4.963	4.972	4.981	4.990	5.000	5.009	5.018
1020	5.018	5.027	5.037	5.046	5.055	5.065	5.074	5.083	5.092	5.102	5.111
1030	5.111	5.120	5.130	5.139	5.148	5.158	5.167	5.176	5.186	5.195	5.205
1040	5.205	5.214	5.223	5.233	5.242	5.252	5.261	5.270	5.280	5.289	5.299
1050	5.299	5.308	5.318	5.327	5.337	5.346	5.356	5.365	5.375	5.384	5.394
1060	5.394	5.403	5.413	5.422	5.432	5.441	5.451	5.460	5.470	5.480	5.489
1070	5.489	5.499	5.508	5.518	5.528	5.537	5.547	5.555	5.566	5.576	5.585
1080	5.585	5.595	5.605	5.614	5.624	5.634	5.643	5.653	5.663	5.672	5.682
1090	5.682	5.692	5.702	5.711	5.721	5.731	5.740	5.750	5.760	5.770	5.780
1100	5.780	5.789	5.799	5.809	5.819	5.828	5.838	5.848	5.858	5.868	5.878
1110	5.878	5.887	5.897	5.907	5.917	5.927	5.937	5.947	5.956	5.966	5.976
1120	5.976	5.986	5.996	6.006	6.016	6.026	6.036	6.046	6.055	6.065	6.075
1130	6.075	6.085	6.095	6.105	6.115	6.125	6.135	6.145	6.155	6.165	6.175
1140	6.175	6.185	6.195	6.205	5.215	6.225	6.235	6.245	6.256	6.266	6.276
1150	6.276	6.286	6.296	6.306	6.316	6.326	6.336	6.346	6.356	6.367	6.377
1160	6.377	6.387	6.397	6.407	5.417	6.427	6.438	6.448	6.458	6.468	6.478
1170	6.478	6.488	6.499	6.509	6.519	6.529	6.539	6.550	6.560	6.570	6.580
1180	6.580	6.591	6.601	6.611	6.621	6.632	6.642	6.652	6.663	6.673	6.683

TABLE 8 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1190	6.683	6.693	6.704	6.714	6.724	6.735	6.745	6.755	6.766	6.776	6.786
1200	6.786	6.797	6.807	6.818	6.828	6.838	6.849	6.859	6.869	5.880	6.890
1210	6.890	6.901	6.911	6.922	6.932	6.942	6.953	6.963	6.974	6.984	6.995
1220	6.995	7.005	7.016	7.026	7.037	7.047	7.058	7.068	7.079	7.089	7.100
1230	7.100	7.110	7.121	7.131	7.142	7.152	7.163	7.173	7.184	7.194	7.205
1240	7.205	7.216	7.226	7.237	7.247	7.258	7.269	7.279	7.290	7.300	7.311
1250	7.311	7.322	7.332	7.343	7.353	7.364	7.375	7.385	7.396	7.407	7.417
1260	7.417	7.428	7.439	7.449	7.460	7.471	7.482	7.492	7.503	7.514	7.524
1270	7.524	7.535	7.546	7.557	7.567	7.578	7.589	7.600	7.610	7.621	7.632
1280	7.632	7.643	7.653	7.664	7.675	7.686	7.697	7.707	7.718	7.729	7.740
1290	7.740	7.751	7.761	7.772	7.783	7.794	7.805	7.816	7.827	7.837	7.848
1300	7.848	7.859	7.870	7.881	7.892	7.903	7.914	7.924	7.935	7.946	7.957
1310	7.957	7.968	7.979	7.990	8.001	8.012	8.023	8.034	8.045	8.056	8.066
1320	8.066	8.077	8.088	8.099	8.110	8.121	8.132	8.143	8.154	8.165	8.176
1330	8.176	8.187	8.198	8.209	8.220	8.231	8.242	8.253	8.264	8.275	8.286
1340	8.286	8.298	8.309	8.320	8.331	8.342	8.353	8.364	8.375	8.386	8.397
1350	8.397	8.408	8.419	8.430	8.441	8.453	8.464	8.475	8.486	8.497	8.508
1360	8.508	8.519	8.530	8.542	8.553	8.564	8.575	8.586	8.597	8.508	8.620
1370	8.620	8.631	8.642	8.653	8.664	8.675	8.687	8.698	8.709	8.720	8.731
1380	8.731	8.743	8.754	8.765	8.776	8.787	8.799	8.810	8.821	8.832	8.844
1390	8.844	8.855	8.866	8.877	8.889	8.900	8.911	8.922	8.934	8.945	8.956
1400	8.956	8.967	8.979	8.990	9.001	9.013	9.024	9.035	9.047	9.058	9.069
1410	9.069	9.080	9.092	9.103	9.114	9.126	9.137	9.148	9.160	9.171	9.182
1420	9.182	9.194	9.205	9.216	9.228	9.239	9.251	9.262	9.273	9.285	9.296
1430	9.296	9.307	9.319	9.330	9.342	9.353	9.364	9.376	9.387	9.398	9.410
1440	9.410	9.421	9.433	9.444	9.456	9.467	9.478	9.490	9.501	9.513	9.524
1450	9.524	9.536	9.547	9.558	9.570	9.581	9.593	9.604	9.616	9.627	9.639
1460	9.639	9.650	9.662	9.673	9.684	9.696	9.707	9.719	9.730	9.742	9.753
1470	9.753	9.765	9.776	9.788	9.799	9.811	9.822	9.834	9.845	9.857	9.868
1480	9.868	9.880	9.891	9.903	9.914	9.926	9.937	9.949	9.961	9.972	9.984
1490	9.984	9.995	10.007	10.018	10.030	10.041	10.053	10.064	10.076	10.088	10.099
1500	10.099	10.111	10.122	10.134	10.145	10.157	10.168	10.180	10.192	10.203	10.215
1510	10.215	10.226	10.238	10.249	10.261	10.273	10.284	10.296	10.307	10.319	10.331
1520	10.331	10.342	10.354	10.365	10.377	10.389	10.400	10.412	10.423	10.435	10.447
1530	10.447	10.458	10.470	10.482	10.493	10.505	10.516	10.528	10.540	10.551	10.563
1540	10.563	10.575	10.586	10.598	10.609	10.621	10.633	10.644	10.656	10.668	10.679
1550	10.679	10.691	10.703	10.714	10.726	10.738	10.749	10.761	10.773	10.784	10.796
1560	10.796	10.808	10.819	10.831	10.843	10.854	10.866	10.877	10.889	10.901	10.913
1570	10.913	10.924	10.936	10.948	10.959	10.971	10.983	10.994	11.006	11.018	11.029
1580	11.029	11.041	11.053	11.064	11.076	11.088	11.099	11.111	11.123	11.134	11.146
1590	11.146	11.158	11.169	11.181	11.193	11.205	11.216	11.228	11.240	11.251	11.263
1600	11.263	11.275	11.286	11.298	11.310	11.321	11.333	11.345	11.357	11.368	11.380
1610	11.380	11.392	11.403	11.415	11.427	11.438	11.450	11.462	11.474	11.485	11.497
1620	11.497	11.509	11.520	11.532	11.544	11.555	11.567	11.579	11.591	11.602	11.614
1630	11.614	11.626	11.637	11.649	11.661	11.673	11.684	11.696	11.708	11.719	11.731
1640	11.731	11.743	11.754	11.766	11.778	11.790	11.801	11.813	11.825	11.836	11.848
1650	11.848	11.860	11.871	11.883	11.895	11.907	11.918	11.930	11.942	11.953	11.965
1660	11.965	11.977	11.988	12.000	12.012	12.024	12.035	12.047	12.059	12.070	12.082
1670	12.082	12.094	12.105	12.117	12.129	12.141	12.152	12.164	12.176	12.187	12.199
1680	12.199	12.211	12.222	12.234	12.246	12.257	12.269	12.281	12.292	12.304	12.316
1690	12.316	12.327	12.339	12.351	12.363	12.374	12.386	12.398	12.409	12.421	12.433
1700	12.433	12.444	12.456	12.468	12.479	12.491	12.503	12.514	12.526	12.538	12.549
1710	12.549	12.561	12.572	12.584	12.596	12.607	12.619	12.631	12.642	12.554	12.666
1720	12.666	12.677	12.689	12.701	12.712	12.724	12.736	12.747	12.759	12.770	12.782
1730	12.782	12.794	12.805	12.817	12.829	12.840	12.852	12.863	12.875	12.887	12.898
1740	12.898	12.910	12.921	12.933	12.945	12.956	12.968	12.980	12.991	13.003	13.014
1750	13.014	13.026	13.037	13.049	13.061	13.072	13.084	13.095	13.107	13.119	13.130
1760	13.130	13.142	13.153	13.165	13.176	13.188	13.200	13.211	13.223	13.234	13.246
1770	13.246	13.257	13.269	13.280	13.292	13.304	13.315	13.327	13.338	13.350	13.361

TABLE 8 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1780	13.361	13.373	13.384	13.396	13.407	13.419	13.430	13.442	13.453	13.465	13.476
1790	13.476	13.488	13.499	13.511	13.522	13.534	13.545	13.557	13.568	13.580	13.591
1800	13.591	13.603	13.614	13.626	13.637	13.649	13.660	13.672	13.683	13.694	13.706
1810	13.706	13.717	13.729	13.740	13.752	13.763	13.775	13.786	13.797	13.809	13.820
1820	13.820										

TABLE 9 Type B Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
30			0.000	–0.000	–0.000	–0.000	–0.001	–0.001	–0.001	–0.001	–0.001
40	–0.001	–0.001	–0.001	–0.001	–0.001	–0.001	–0.002	–0.002	–0.002	–0.002	–0.002
50	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002
60	–0.002	–0.002	–0.002	–0.003	–0.003	–0.003	–0.003	–0.003	–0.003	–0.003	–0.003
70	–0.003	–0.003	–0.003	–0.003	–0.003	–0.003	–0.003	–0.002	–0.002	–0.002	–0.002
80	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002	–0.002
90	–0.002	–0.002	–0.002	–0.002	–0.002	0.001	–0.001	–0.001	–0.001	–0.001	–0.001
100	–0.001	–0.001	–0.001	–0.001	–0.000	–0.000	–0.000	–0.000	0.000	0.000	0.000
110	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
120	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004
130	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006
140	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.009	0.009
150	0.009	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.012
160	0.012	0.012	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015	0.015
170	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.019	0.019
180	0.019	0.019	0.020	0.020	0.021	0.021	0.021	0.022	0.022	0.023	0.023
190	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.026	0.027	0.027	0.027
200	0.027	0.028	0.028	0.029	0.029	0.030	0.030	0.031	0.031	0.032	0.032
210	0.032	0.033	0.033	0.034	0.034	0.035	0.035	0.036	0.036	0.037	0.037
220	0.037	0.038	0.038	0.039	0.039	0.040	0.041	0.041	0.042	0.042	0.043
230	0.043	0.043	0.044	0.044	0.045	0.046	0.046	0.047	0.047	0.048	0.049
240	0.049	0.049	0.050	0.050	0.051	0.052	0.052	0.053	0.053	0.054	0.055
250	0.055	0.055	0.056	0.057	0.057	0.058	0.059	0.059	0.060	0.060	0.061
260	0.061	0.062	0.062	0.063	0.064	0.065	0.065	0.066	0.067	0.067	0.068
270	0.068	0.069	0.069	0.070	0.071	0.072	0.072	0.073	0.074	0.074	0.075
280	0.075	0.076	0.077	0.077	0.078	0.079	0.080	0.080	0.081	0.082	0.083
290	0.083	0.083	0.084	0.085	0.086	0.086	0.087	0.088	0.089	0.090	0.090
300	0.090	0.091	0.092	0.093	0.094	0.094	0.095	0.096	0.097	0.098	0.099
310	0.099	0.099	0.100	0.101	0.102	0.103	0.104	0.105	0.105	0.106	0.107
320	0.107	0.108	0.109	0.110	0.111	0.112	0.112	0.113	0.114	0.115	0.116
330	0.116	0.117	0.118	0.119	0.120	0.121	0.121	0.122	0.123	0.124	0.125
340	0.125	0.126	0.127	0.128	0.129	0.130	0.131	0.132	0.133	0.134	0.135
350	0.135	0.136	0.137	0.138	0.139	0.140	0.141	0.142	0.143	0.144	0.145
360	0.145	0.146	0.147	0.148	0.149	0.150	0.151	0.152	0.153	0.154	0.155
370	0.155	0.156	0.157	0.158	0.159	0.160	0.151	0.162	0.163	0.164	0.165
380	0.165	0.166	0.167	0.168	0.170	0.171	0.172	0.173	0.174	0.175	0.176
390	0.176	0.177	0.178	0.179	0.180	0.182	0.183	0.184	0.185	0.186	0.187
400	0.187	0.188	0.190	0.191	0.192	0.193	0.194	0.195	0.196	0.198	0.199
410	0.199	0.200	0.201	0.202	0.203	0.205	0.206	0.207	0.208	0.209	0.211
420	0.211	0.212	0.213	0.214	0.215	0.217	0.218	0.219	0.220	0.222	0.223
430	0.223	0.224	0.225	0.226	0.228	0.229	0.230	0.231	0.233	0.234	0.235
440	0.235	0.236	0.238	0.239	0.240	0.242.	0.243	0.244	0.245	0.247	0.248
450	0.248	0.249	0.251	0.252	0.253	0.255	0.256	0.257	0.259	0.260	0.261
460	0.261	0.263	0.264	0.265	0.267	0.268	0.269	0.271	0.272	0.273	0.275
470	0.275	0.276	0.277	0.279	0.280	0.282	0.283	0.284	0.286	0.287	0.288
480	0.288	0.290	0.291	0.293	0.294	0.296	0.297	0.298	0.300	0.301	0.303
490	0.303	0.304	0.305	0.307	0.308	0.310	0.311	0.313	0.314	0.316	0.317
500	0.317	0.319	0.320	0.321	0.323	0.324	0.326	0.327	0.329	0.330	0.332
510	0.332	0.333	0.335	0.336	0.338	0.339	0.341	0.342	0.344	0.345	0.347
520	0.347	0.348	0.350	0.352	0.353	0.355	0.356	0.358	0.359	0.361	0.362
530	0.362	0.364	0.365	0.367	0.369	0.370	0.372	0.373	0.375	0.377	0.378
540	0.378	0.380	0.381	0.383	0.384	0.386	0.388	0.389	0.391	0.393	0.394
550	0.394	0.396	0.397	0.399	0.401	0.402	0.404	0.406	0.407	0.409	0.411
560	0.411	0.412	0.414	0.416	0.417	0.419	0.421	0.422	0.424	0.426	0.427
570	0.427	0.429	0.431	0.432	0.434	0.436	0.437	0.439	0.441	0.443	0.444
580	0.444	0.446	0.448	0.449	0.451	0.453	0.455	0.456	0.458	0.460	0.462
590	0.462	0.463	0.465	0.467	0.469	0.470	0.472	0.474	0.476	0.478	0.479
600	0.479	0.481	0.483	0.485	0.486	0.488	0.490	0.492	0.494	0.495	0.497
610	0.497	0.499	0.501	0.503	0.505	0.506	0.508	0.510	0.512	0.514	0.516

TABLE 9 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
620	0.516	0.517	0.519	0.521	0.523	0.525	0.527	0.529	0.530	0.532	0.534
630	0.534	0.536	0.538	0.540	0.542	0.544	0.546	0.547	0.549	0.551	0.553
640	0.553	0.555	0.557	0.559	0.561	0.563	0.565	0.567	0.569	0.570	0.572
650	0.572	0.574	0.576	0.578	0.580	0.582	0.584	0.586	0.588	0.590	0.592
660	0.592	0.594	0.596	0.598	0.600	0.602	0.604	0.606	0.608	0.610	0.612
670	0.612	0.614	0.616	0.618	0.620	0.622	0.624	0.626	0.628	0.630	0.632
680	0.632	0.634	0.636	0.638	0.640	0.642	0.644	0.646	0.648	0.650	0.653
690	0.653	0.655	0.657	0.659	0.661	0.663	0.665	0.667	0.669	0.671	0.673
700	0.673	0.675	0.678	0.680	0.682	0.684	0.686	0.688	0.690	0.692	0.694
710	0.694	0.697	0.699	0.701	0.703	0.705	0.707	0.709	0.712	0.714	0.716
720	0.716	0.718	0.720	0.722	0.725	0.727	0.729	0.731	0.733	0.735	0.738
730	0.738	0.740	0.742	0.744	0.746	0.749	0.751	0.753	0.755	0.757	0.760
740	0.760	0.762	0.764	0.766	0.769	0.771	0.773	0.775	0.778	0.780	0.782
750	0.782	0.784	0.787	0.789	0.791	0.793	0.796	0.798	0.800	0.802	0.805
760	0.805	0.807	0.809	0.812	0.814	0.816	0.818	0.821	0.823	0.825	0.828
770	0.828	0.830	0.832	0.835	0.837	0.839	0.842	0.844	0.846	0.849	0.851
780	0.851	0.853	0.856	0.858	0.860	0.853	0.865	0.867	0.870	0.872	0.875
790	0.875	0.877	0.879	0.882	0.884	0.886	0.889	0.891	0.894	0.896	0.898
800	0.898	0.901	0.903	0.905	0.908	0.910	0.913	0.915	0.918	0.920	0.923
810	0.923	0.925	0.927	0.930	0.932	0.935	0.937	0.940	0.942	0.945	0.947
820	0.947	0.950	0.952	0.955	0.957	0.959	0.962	0.964	0.967	0.969	0.972
830	0.972	0.974	0.977	0.979	0.982	0.984	0.987	0.989	0.992	0.994	0.997
840	0.997	1.000	1.002	1.005	1.007	1.010	1.012	1.015	1.017	1.020	1.022
850	1.022	1.025	1.027	1.030	1.033	1.035	1.038	1.040	1.043	1.045	1.048
860	1.048	1.051	1.053	1.056	1.058	1.061	1.064	1.066	1.069	1.071	1.074
870	1.074	1.077	1.079	1.082	1.085	1.087	1.090	1.092	1.095	1.098	1.100
880	1.100	1.103	1.106	1.108	1.111	1.114	1.116	1.119	1.122	1.124	1.127
890	1.127	1.130	1.132	1.135	1.138	1.140	1.143	1.146	1.148	1.151	1.154
900	1.154	1.157	1.159	1.162	1.165	1.167	1.170	1.173	1.176	1.178	1.181
910	1.181	1.184	1.186	1.189	1.192	1.195	1.197	1.200	1.203	1.206	1.208
920	1.208	1.211	1.214	1.217	1.220	1.222	1.225	1.228	1.231	1.233	1.236
930	1.236	1.239	1.242	1.245	1.247	1.250	1.253	1.256	1.259	1.262	1.264
940	1.264	1.267	1.270	1.273	1.276	1.278	1.281	1.284	1.287	1.290	1.293
950	1.293	1.296	1.298	1.301	1.304	1.307	1.310	1.313	1.316	1.318	1.321
960	1.321	1.324	1.327	1.330	1.333	1.336	1.339	1.342	1.344	1.347	1.350
970	1.350	1.353	1.356	1.359	1.362	1.365	1.368	1.371	1.374	1.377	1.379
980	1.379	1.382	1.385	1.388	1.391	1.394	1.397	1.400	1.403	1.406	1.409
990	1.409	1.412	1.415	1.418	1.421	1.424	1.427	1.430	1.433	1.436	1.439
1000	1.439	1.442	1.445	1.448	1.451	1.454	1.457	1.460	1.463	1.466	1.469
1010	1.469	1.472	1.475	1.478	1.481	1.484	1.487	1.490	1.493	1.496	1.499
1020	1.499	1.502	1.505	1.508	1.511	1.515	1.518	1.521	1.524	1.527	1.530
1030	1.530	1.533	1.536	1.539	1.542	1.545	1.548	1.552	1.555	1.558	1.561
1040	1.561	1.564	1.567	1.570	1.573	1.576	1.580	1.583	1.586	1.589	1.592
1050	1.592	1.595	1.598	1.601	1.605	1.608	1.611	1.614	1.617	1.620	1.624
1060	1.624	1.627	1.630	1.633	1.636	1.639	1.643	1.646	1.649	1.652	1.655
1070	1.655	1.659	1.662	1.665	1.668	1.671	1.675	1.678	1.681	1.684	1.687
1080	1.587	1.691	1.694	1.697	1.700	1.704	1.707	1.710	1.713	1.716	1.720
1090	1.720	1.723	1.726	1.729	1.733	1.736	1.739	1.743	1.746	1.749	1.752
1100	1.752	1.756	1.759	1.762	1.765	1.769	1.772	1.775	1.779	1.782	1.785
1110	1.785	1.789	1.792	1.795	1.798	1.802	1.805	1.808	1.812	1.815	1.818
1120	1.818	1.822	1.825	1.828	1.832	1.835	1.838	1.842	1.845	1.849	1.852
1130	1.852	1.855	1.859	1.862	1.865	1.869	1.872	1.875	1.879	1.882	1.886
1140	1.886	1.889	1.892	1.896	1.899	1.903	1.906	1.909	1.913	1.916	1.920
1150	1.920	1.923	1.926	1.930	1.933	1.937	1.940	1.944	1.947	1.950	1.954
1160	1.954	1.957	1.961	1.964	1.968	1.971	1.975	1.978	1.981	1.985	1.988
1170	1.988	1.992	1.995	1.999	2.002	2.006	2.009	2.013	2.016	2.020	2.023
1180	2.023	2.027	2.030	2.034	2.037	2.041	2.044	2.048	2.051	2.055	2.058
1190	2.058	2.062	2.065	2.069	2.072	2.076	2.079	2.083	2.086	2.090	2.094
1200	2.094	2.097	2.101	2.104	2.108	2.111	2.115	2.118	2.122	2.126	2.129

TABLE 9 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1210	2.129	2.133	2.136	2.140	2.143	2.147	2.151	2.154	2.158	2.161	2.165
1220	2.165	2.169	2.172	2.176	2.179	2.183	2.187	2.190	2.194	2.197	2.201
1230	2.201	2.205	2.208	2.212	2.216	2.219	2.223	2.226	2.230	2.234	2.237
1240	2.237	2.241	2.245	2.248	2.252	2.256	2.259	2.263	2.267	2.270	2.274
1250	2.274	2.278	2.281	2.285	2.289	2.292	2.296	2.300	2.303	2.307	2.311
1260	2.311	2.315	2.318	2.322	2.326	2.329	2.333	2.337	2.341	2.344	2.348
1270	2.348	2.352	2.355	2.359	2.363	2.367	2.370	2.374	2.378	2.382	2.385
1280	2.385	2.389	2.393	2.397	2.400	2.404	2.408	2.412	2.416	2.419	2.423
1290	2.423	2.427	2.431	2.434	2.438	2.442	2.446	2.450	2.453	2.457	2.461
1300	2.461	2.465	2.469	2.472	2.476	2.480	2.484	2.488	2.492	2.495	2.499
1310	2.499	2.503	2.507	2.511	2.515	2.518	2.522	2.526	2.530	2.534	2.538
1320	2.538	2.541	2.545	2.549	2.553	2.557	2.561	2.565	2.569	2.572	2.576
1330	2.576	2.580	2.584	2.588	2.592	2.596	2.600	2.604	2.607	2.611	2.615
1340	2.615	2.619	2.623	2.627	2.631	2.635	2.639	2.643	2.647	2.651	2.654
1350	2.654	2.658	2.662	2.666	2.670	2.674	2.678	2.682	2.686	2.690	2.694
1360	2.694	2.698	2.702	2.706	2.710	2.714	2.718	2.722	2.726	2.730	2.734
1370	2.734	2.738	2.742	2.746	2.750	2.754	2.758	2.762	2.766	2.770	2.774
1380	2.774	2.778	2.782	2.786	2.790	2.794	2.798	2.802	2.806	2.810	2.814
1390	2.814	2.818	2.822	2.826	2.830	2.834	2.838	2.842	2.846	2.850	2.854
1400	2.854	2.859	2.863	2.867	2.871	2.875	2.879	2.883	2.887	2.891	2.895
1410	2.895	2.899	2.903	2.908	2.912	2.916	2.920	2.924	2.928	2.932	2.936
1420	2.936	2.940	2.944	2.949	2.953	2.957	2.961	2.965	2.969	2.973	2.978
1430	2.978	2.982	2.986	2.990	2.994	2.998	3.002	3.007	3.011	3.015	3.019
1440	3.019	3.023	3.027	3.032	3.036	3.040	3.044	3.048	3.052	3.057	3.061
1450	3.061	3.065	3.069	3.073	3.078	3.082	3.086	3.090	3.094	3.099	3.103
1460	3.103	3.107	3.111	3.116	3.120	3.124	3.128	3.132	3.137	3.141	3.145
1470	3.145	3.149	3.154	3.158	3.162	3.166	3.171	3.175	3.179	3.183	3.188
1480	3.188	3.192	3.196	3.200	3.205	3.209	3.213	3.218	3.222	3.225	3.230
1490	3.230	3.235	3.239	3.243	3.248	3.252	3.256	3.261	3.265	3.269	3.273
1500	3.273	3.278	3.282	3.286	3.291	3.295	3.299	3.304	3.308	3.312	3.317
1510	3.317	3.321	3.325	3.330	3.334	3.338	3.343	3.347	3.352	3.356	3.360
1520	3.360	3.365	3.369	3.373	3.378	3.382	3.386	3.391	3.395	3.400	3.404
1530	3.404	3.408	3.413	3.417	3.422	3.426	3.430	3.435	3.439	3.444	3.448
1540	3.448	3.452	3.457	3.461	3.466	3.470	3.474	3.479	3.483	3.488	3.492
1550	3.492	3.497	3.501	3.506	3.510	3.514	3.519	3.523	3.528	3.532	3.537
1560	3.537	3.541	3.546	3.550	3.555	3.559	3.563	3.568	3.572	3.577	3.581
1570	3.581	3.586	3.590	3.595	3.599	3.604	3.608	3.613	3.617	3.622	3.626
1580	3.626	3.631	3.635	3.640	3.644	3.649	3.653	3.658	3.662	3.667	3.672
1590	3.672	3.676	3.681	3.685	3.690	3.694	3.699	3.703	3.708	3.712	3.717
1600	3.717	3.722	3.726	3.731	3.735	3.740	3.744	3.749	3.753	3.758	3.763
1610	3.763	3.767	3.772	3.776	3.781	3.786	3.790	3.795	3.799	3.804	3.809
1620	3.809	3.813	3.818	3.822	3.827	3.832	3.836	3.841	3.845	3.850	3.855
1630	3.855	3.859	3.864	3.869	3.873	3.878	3.882	3.887	3.892	3.896	3.901
1640	3.901	3.906	3.910	3.915	3.920	3.924	3.929	3.934	3.938	3.943	3.948
1650	3.948	3.952	3.957	3.962	3.966	3.971	3.976	3.980	3.985	3.990	3.994
1660	3.994	3.999	4.004	4.009	4.013	4.018	4.023	4.027	4.032	4.037	4.041
1670	4.041	4.046	4.051	4.056	4.060	4.065	4.070	4.075	4.079	4.084	4.089
1680	4.089	4.093	4.098	4.103	4.108	4.112	4.117	4.122	4.127	4.131	4.136
1690	4.136	4.141	4.146	4.151	4.155	4.160	4.165	4.170	4.174	4.179	4.184
1700	4.184	4.189	4.194	4.198	4.203	4.208	4.213	4.217	4.222	4.227	4.232
1710	4.232	4.237	4.242	4.246	4.251	4.256	4.261	4.266	4.270	4.275	4.280
1720	4.280	4.285	4.290	4.295	4.299	4.304	4.309	4.314	4.319	4.324	4.328
1730	4.328	4.333	4.338	4.343	4.348	4.353	4.358	4.362	4.367	4.372	4.377
1740	4.377	4.382	4.387	4.392	4.397	4.401	4.406	4.411	4.416	4.421	4.426
1750	4.426	4.431	4.436	4.441	4.445	4.450	4.455	4.460	4.465	4.470	4.475
1760	4.475	4.480	4.485	4.490	4.495	4.500	4.504	4.509	4.514	4.519	4.524
1770	4.524	4.529	4.534	4.539	4.544	4.549	4.554	4.559	4.564	4.569	4.574
1780	4.574	4.579	4.584	4.589	4.593	4.598	4.603	4.608	4.613	4.618	4.623
1790	4.623	4.628	4.633	4.638	4.643	4.648	4.653	4.658	4.663	4.668	4.673

TABLE 9 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1800	4.673	4.678	4.683	4.688	4.693	4.698	4.703	4.708	4.713	4.718	4.723
1810	4.723	4.728	4.733	4.738	4.743	4.748	4.754	4.759	4.764	4.769	4.774
1820	4.774	4.779	4.784	4.789	4.794	4.799	4.804	4.809	4.814	4.819	4.824
1830	4.824	4.829	4.834	4.839	4.844	4.850	4.855	4.860	4.865	4.870	4.875
1840	4.875	4.880	4.885	4.890	4.895	4.900	4.905	4.911	4.916	4.921	4.925
1850	4.926	4.931	4.936	4.941	4.946	4.951	4.957	4.962	4.967	4.972	4.977
1860	4.977	4.982	4.987	4.992	4.998	5.003	5.008	5.013	5.018	5.023	5.028
1870	5.028	5.034	5.039	5.044	5.049	5.054	5.059	5.065	5.070	5.075	5.080
1880	5.080	5.085	5.090	5.096	5.101	5.106	5.111	5.116	5.121	5.127	5.132
1890	5.132	5.137	5.142	5.147	5.153	5.158	5.163	5.158	5.173	5.179	5.184
1900	5.184	5.189	5.194	5.199	5.205	5.210	5.215	5.220	5.225	5.231	5.236
1910	5.236	5.241	5.246	5.252	5.257	5.262	5.267	5.273	5.278	5.283	5.288
1920	5.288	5.294	5.299	5.304	5.309	5.315	5.320	5.325	5.330	5.336	5.341
1930	5.341	5.346	5.351	5.357	5.362	5.367	5.373	5.378	5.383	5.388	5.394
1940	5.394	5.399	5.404	5.410	5.415	5.420	5.425	5.431	5.436	5.441	5.447
1950	5.447	5.452	5.457	5.463	5.468	5.473	5.479	5.484	5.489	5.495	5.500
1960	5.500	5.505	5.511	5.516	5.521	5.527	5.532	5.537	5.543	5.548	5.553
1970	5.553	5.559	5.564	5.569	5.575	5.580	5.585	5.591	5.596	5.601	5.507
1980	5.607	5.612	5.618	5.623	5.628	5.634	5.639	5.644	5.650	5.655	5.561
1990	5.661	5.666	5.671	5.677	5.682	5.688	5.693	5.698	5.704	5.709	5.715
2000	5.715	5.720	5.725	5.731	5.736	5.742	5.747	5.752	5.758	5.763	5.769
2010	5.769	5.774	5.780	5.785	5.790	5.796	5.801	5.807	5.812	5.818	5.823
2020	5.823	5.828	5.834	5.839	5.845	5.850	5.856	5.861	5.867	5.872	5.878
2030	5.878	5.883	5.888	5.894	5.899	5.905	5.910	5.916	5.921	5.927	5.932
2040	5.932	5.938	5.943	5.949	5.954	5.960	5.965	5.971	5.976	5.982	5.987
2050	5.987	5.993	5.998	6.004	6.009	6.015	6.020	6.026	6.031	6.037	6.042
2060	6.042	6.048	6.053	6.059	6.064	6.070	6.075	6.081	6.086	6.092	6.098
2070	6.098	6.103	6.109	6.114	6.120	6.125	6.131	6.136	6.142	6.147	6.153
2080	6.153	6.159	6.164	6.170	6.175	6.181	6.186	6.192	6.197	6.203	6.209
2090	6.209	6.214	6.220	6.225	6.231	6.237	6.242	6.248	6.253	6.259	6.264
2100	6.264	6.270	6.276	6.281	6.287	6.292	6.298	6.304	6.309	6.315	6.320
2110	6.320	6.326	6.332	6.337	6.343	6.349	6.354	6.360	6.365	6.371	6.377
2120	6.377	6.382	6.388	6.394	6.399	6.405	6.410	6.416	6.422	6.427	6.433
2130	6.433	6.439	6.444	6.450	6.456	6.461	6.467	6.473	6.478	6.484	6.490
2140	6.490	6.495	6.501	6.507	6.512	6.518	6.524	6.529	6.535	6.541	6.546
2150	6.546	6.552	6.558	6.563	6.569	6.575	6.580	6.586	6.592	6.597	6.603
2160	6.603	6.609	6.615	6.620	6.626	6.632	6.637	6.643	6.649	6.655	6.660
2170	6.660	6.666	6.672	6.677	6.683	6.689	6.695	6.700	6.706	6.712	6.718
2180	6.718	6.723	6.729	6.735	6.740	6.746	6.752	6.758	6.753	6.769	6.775
2190	6.775	6.781	6.786	6.792	6.798	6.804	6.809	6.815	6.821	6.827	6.833
2200	6.833	6.838	6.844	6.850	6.856	6.861	6.867	6.873	6.879	5.884	6.890
2210	6.890	6.896	6.902	6.908	6.913	6.919	6.925	6.931	6.937	6.942	6.948
2220	6.948	6.954	6.960	6.966	6.971	6.977	6.983	6.989	6.995	7.000	7.006
2230	7.006	7.012	7.018	7.024	7.030	7.035	7.041	7.047	7.053	7.059	7.065
2240	7.065	7.070	7.076	7.082	7.088	7.094	7.100	7.105	7.111	7.117	7.123
2250	7.123	7.129	7.135	7.141	7.146	7.152	7.158	7.164	7.170	7.176	7.182
2260	7.182	7.187	7.193	7.199	7.205	7.211	7.217	7.223	7.229	7.234	7.240
2270	7.240	7.246	7.252	7.258	7.264	7.270	7.276	7.281	7.287	7.293	7.299
2280	7.299	7.305	7.311	7.317	7.323	7.329	7.335	7.340	7.346	7.352	7.358
2290	7.358	7.364	7.370	7.376	7.382	7.388	7.394	7.400	7.406	7.412	7.417
2300	7.417	7.423	7.429	7.435	7.441	7.447	7.453	7.459	7.465	7.471	7.477
2310	7.477	7.483	7.489	7.495	7.501	7.507	7.512	7.518	7.524	7.530	7.536
2320	7.536	7.542	7.548	7.554	7.550	7.566	7.572	7.578	7.584	7.590	7.596
2330	7.596	7.602	7.608	7.614	7.620	7.626	7.632	7.638	7.644	7.650	7.556
2340	7.656	7.662	7.668	7.674	7.580	7.686	7.692	7.698	7.704	7.710	7.716
2350	7.716	7.722	7.728	7.734	7.740	7.746	7.752	7.758	7.764	7.770	7.776
2360	7.776	7.782	7.788	7.794	7.800	7.806	7.812	7.818	7.824	7.830	7.836
2370	7.836	7.842	7.848	7.854	7.860	7.856	7.872	7.878	7.884	7.891	7.897
2380	7.897	7.903	7.909	7.915	7.921	7.927	7.933	7.939	7.945	7.951	7.957
2390	7.957	7.963	7.969	7.975	7.981	7.987	7.994	8.000	8.006	8.012	8.018

TABLE 9 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
										Reference Junctions at 32°F	
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2400	8.018	8.024	8.030	8.036	8.042	8.048	8.054	8.060	8.066	8.073	8.079
2410	8.079	8.085	8.091	8.097	8.103	8.109	8.115	8.121	8.127	8.134	8.140
2420	8.140	8.146	8.152	8.158	8.164	8.170	8.176	8.182	8.188	8.195	8.201
2430	8.201	8.207	8.213	8.219	8.225	8.231	8.237	8.244	8.250	8.256	8.262
2440	8.262	8.268	8.274	8.280	8.286	8.293	8.299	8.305	8.311	8.317	8.323
2450	8.323	8.329	8.336	8.342	8.348	8.354	8.360	8.366	8.372	8.379	8.385
2460	8.385	8.391	8.397	8.403	8.409	8.416	8.422	8.428	8.434	8.440	8.446
2470	8.446	8.453	8.459	8.465	8.471	8.477	8.483	8.490	8.496	8.502	8.508
2480	8.508	8.514	8.521	8.527	8.533	8.539	8.545	8.551	8.558	8.564	8.570
2490	8.570	8.576	8.582	8.589	8.595	8.601	8.607	8.613	8.520	8.526	8.632
2500	8.632	8.638	8.644	8.651	8.657	8.563	8.669	8.675	8.682	8.688	8.694
2510	8.694	8.700	8.707	8.713	8.719	8.725	8.731	8.738	8.744	8.750	8.756
2520	8.756	8.763	8.769	8.775	8.781	8.787	8.794	8.800	8.806	8.812	8.819
2530	8.819	8.825	8.831	8.837	8.844	8.850	8.856	8.862	8.869	8.875	8.881
2540	8.881	8.887	8.894	8.900	8.906	8.912	8.919	8.925	8.931	8.937	8.944
2550	8.944	8.950	8.956	8.962	8.969	8.975	8.981	8.988	8.994	9.000	9.006
2560	9.006	9.013	9.019	9.025	9.031	9.038	9.044	9.050	9.057	9.063	9.069
2570	9.069	9.075	9.082	9.088	9.094	9.101	9.107	9.113	9.119	9.126	9.132
2580	9.132	9.138	9.145	9.151	9.157	9.164	9.170	9.176	9.182	9.189	9.195
2590	9.195	9.201	9.208	9.214	9.220	9.227	9.233	9.239	9.245	9.252	9.258
2600	9.258	9.264	9.271	9.277	9.283	9.290	9.296	9.302	9.309	9.315	9.321
2610	9.321	9.328	9.334	9.340	9.347	9.353	9.359	9.366	9.372	9.378	9.385
2620	9.385	9.391	9.397	9.404	9.410	9.416	9.423	9.429	9.435	9.442	9.448
2630	9.448	9.454	9.461	9.467	9.473	9.480	9.486	9.492	9.499	9.505	9.511
2640	9.511	9.518	9.524	9.530	9.537	9.543	9.550	9.556	9.562	9.569	9.575
2650	9.575	9.581	9.588	9.594	9.600	9.607	9.613	9.619	9.626	9.632	9.639
2660	9.639	9.645	9.651	9.658	9.664	9.670	9.677	9.683	9.690	9.696	9.702
2670	9.702	9.709	9.715	9.721	9.728	9.734	9.741	9.747	9.753	9.760	9.766
2680	9.766	9.772	9.779	9.785	9.792	9.798	9.804	9.811	9.817	9.824	9.830
2690	9.8.30	9.836	9.843	9.849	9.856	9.862	9.868	9.875	9.881	9.888	9.894
2700	9.894	9.900	9.907	9.913	9.920	9.926	9.932	9.939	9.945	9.952	9.958
2710	9.958	9.964	9.971	9.977	9.984	9.990	9.996	10.003	10.009	10.016	10.022
2720	10.022	10.028	10.035	10.041	10.048	10.054	10.061	10.067	10.073	10.080	10.086
2730	10.086	10.093	10.099	10.105	10.112	10.118	10.125	10.131	10.138	10.144	10.150
2740	10.150	10.157	10.163	10.170	10.176	10.183	10.189	10.195	10.202	10.208	10.215
2750	10.215	10.221	10.228	10.234	10.240	10.247	10.253	10.260	10.266	10.273	10.279
2760	10.279	10.286	10.292	10.298	10.305	10.311	10.318	10.324	10.331	10.337	10.344
2770	10.344	10.350	10.356	10.363	10.369	10.376	10.382	10.389	10.395	10.402	10.408
2780	10.408	10.414	10.421	10.427	10.434	10.440	10.447	10.453	10.460	10.466	10.473
2790	10.473	10.479	10.485	10.492	10.498	10.505	10.511	10.518	10.524	10.531	10.537
2800	10.537	10.544	10.550	10.556	10.563	10.569	10.576	10.582	10.589	10.595	10.602
2810	10.602	10.608	10.615	10.621	10.628	10.634	10.641	10.647	10.653	10.660	10.666
2820	10.666	10.673	10.679	10.686	10.692	10.699	10.705	10.712	10.718	10.725	10.731
2830	10.731	10.738	10.744	10.751	10.757	10.763	10.770	10.776	10.783	10.789	10.796
2840	10.796	10.802	10.809	10.815	10.822	10.828	10.835	10.841	10.848	10.854	10.861
2850	10.861	10.867	10.874	10.880	10.887	10.893	10.900	10.906	10.913	10.919	10.925
2850	10.925	10.932	10.938	10.945	10.951	10.958	10.964	10.971	10.977	10.984	10.990
2870	10.990	10.997	11.003	11.010	11.016	11.023	11.029	11.036	11.042	11.049	11.055
2880	11.055	11.062	11.068	11.075	11.081	11.088	11.094	11.101	11.107	11.114	11.120
2890	11.120	11.127	11.133	11.140	11.146	11.153	11.159	11.166	11.172	11.179	11.185
2900	11.185	11.192	11.198	11.205	11.211	11.218	11.224	11.231	11.237	11.244	11.250
2910	11.250	11.257	11.263	11.270	11.276	11.282	11.289	11.295	11.302	11.308	11.315
2920	11.315	11.321	11.328	11.334	11.341	11.347	11.354	11.360	11.367	11.373	11.380
2930	11.380	11.386	11.393	11.399	11.406	11.412	11.419	11.425	11.432	11.438	11.445
2940	11.445	11.451	11.458	11.464	11.471	11.477	11.484	11.490	11.497	11.503	11.510
2950	11.510	11.516	11.523	11.529	11.536	11.542	11.549	11.555	11.562	11.568	11.575
2960	11.575	11.582	11.588	11.595	11.601	11.608	11.614	11.621	11.627	11.634	11.640
2970	11.640	11.647	11.653	11.660	11.665	11.673	11.679	11.686	11.692	11.699	11.705
2980	11.705	11.712	11.718	11.725	11.731	11.738	11.744	11.751	11.757	11.764	11.770

TABLE 9 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
										Reference Junctions at 32°F	
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2990	11.770	11.777	11.783	11.790	11.796	11.803	11.809	11.816	11.822	11.829	11.835
3000	11.835	11.842	11.848	11.855	11.861	11.868	11.874	11.881	11.887	11.894	11.900
3010	11.900	11.907	11.913	11.920	11.926	11.933	11.939	11.946	11.952	11.959	11.965
3020	11.965	11.972	11.978	11.985	11.991	11.998	12.004	12.011	12.017	12.024	12.030
3030	12.030	12.037	12.043	12.050	12.056	12.063	12.069	12.076	12.082	12.089	12.095
3040	12.095	12.102	12.108	12.115	12.121	12.128	12.134	12.141	12.147	12.154	12.160
3050	12.160	12.166	12.173	12.179	12.186	12.192	12.199	12.205	12.212	12.218	12.225
3060	12.225	12.231	12.238	12.244	12.251	12.257	12.264	12.270	12.277	12.283	12.290
3070	12.290	12.296	12.303	12.309	12.316	12.322	12.329	12.335	12.342	12.348	12.355
3080	12.355	12.361	12.368	12.374	12.381	12.387	12.394	12.400	12.407	12.413	12.420
3090	12.420	12.426	12.433	12.439	12.446	12.452	12.458	12.465	12.471	12.478	12.484
3100	12.484	12.491	12.497	12.504	12.510	12.517	12.523	12.530	12.536	12.543	12.549
3110	12.549	12.556	12.562	12.569	12.575	12.582	12.588	12.595	12.601	12.607	12.614
3120	12.614	12.620	12.627	12.633	12.640	12.646	12.653	12.659	12.666	12.672	12.679
3130	12.679	12.685	12.692	12.698	12.704	12.711	12.717	12.724	12.730	12.737	12.743
3140	12.743	12.750	12.756	12.763	12.769	12.776	12.782	12.789	12.795	12.801	12.808
3150	12.808	12.814	12.821	12.827	12.834	12.840	12.847	12.853	12.860	12.866	12.872
3160	12.872	12.879	12.885	12.892	12.898	12.905	12.911	12.918	12.924	12.931	12.937
3170	12.937	12.943	12.950	12.956	12.963	12.969	12.976	12.982	12.989	12.995	13.001
3180	13.001	13.008	13.014	13.021	13.027	13.034	13.040	13.047	13.053	13.059	13.066
3190	13.066	13.072	13.079	13.085	13.092	13.098	13.104	13.111	13.117	13.124	13.130
3200	13.130	13.137	13.143	13.149	13.156	13.162	13.169	13.175	13.182	13.188	13.194
3210	13.194	13.201	13.207	13.214	13.220	13.227	13.233	13.239	13.246	13.252	13.259
3220	13.259	13.265	13.271	13.278	13.284	13.291	13.297	13.304	13.310	13.316	13.323
3230	13.323	13.329	13.336	13.342	13.348	13.355	13.361	13.368	13.374	13.380	13.387
3240	13.387	13.393	13.400	13.406	13.412	13.419	13.425	13.432	13.438	13.444	13.451
3250	13.451	13.457	13.464	13.470	13.476	13.483	13.489	13.496	13.502	13.508	13.515
3260	13.515	13.521	13.527	13.534	13.540	13.547	13.553	13.559	13.566	13.572	13.579
3270	13.579	13.585	13.591	13.598	13.604	13.610	13.617	13.623	13.630	13.636	13.642
3280	13.642	13.649	13.655	13.661	13.668	13.674	13.680	13.687	13.693	13.700	13.706
3290	13.706	13.712	13.719	13.725	13.731	13.738	13.744	13.750	13.757	13.763	13.769
3300	13.769	13.776	13.782	13.789	13.795	13.801	13.808	13.814	13.820		

TABLE 10 Type E Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–9.835										
–260	–9.797	–9.802	–9.808	–9.813	–9.817	–9.821	–9.825	–9.828	–9.831	–9.833	–9.835
–250	–9.718	–9.728	–9.737	–9.746	–9.754	–9.762	–9.770	–9.777	–9.784	–9.790	–9.797
–240	–9.604	–9.617	–9.630	–9.642	–9.654	–9.666	–9.677	–9.688	–9.698	–9.709	–9.718
–230	–9.455	–9.471	–9.487	–9.503	–9.519	–9.534	–9.548	–9.563	–9.577	–9.591	–9.604
–220	–9.274	–9.293	–9.313	–9.331	–9.350	–9.368	–9.386	–9.404	–9.421	–9.438	–9.455
–210	–9.063	–9.085	–9.107	–9.129	–9.151	–9.172	–9.193	–9.214	–9.234	–9.254	–9.274
–200	–8.825	–8.850	–8.874	–8.899	–8.923	–8.947	–8.971	–8.994	–9.017	–9.040	–9.063
–190	–8.561	–8.588	–8.616	–8.643	–8.669	–8.696	–8.722	–8.748	–8.774	–8.799	–8.825
–180	–8.273	–8.303	–8.333	–8.362	–8.391	–8.420	–8.449	–8.477	–8.505	–8.533	–8.561
–170	–7.963	–7.995	–8.027	–8.059	–8.090	–8.121	–8.152	–8.183	–8.213	–8.243	–8.273
–160	–7.632	–7.666	–7.700	–7.733	–7.767	–7.800	–7.833	–7.866	–7.899	–7.931	–7.963
–150	–7.279	–7.315	–7.351	–7.387	–7.423	–7.458	–7.493	–7.528	–7.563	–7.597	–7.632
–140	–6.907	–6.945	–6.983	–7.021	–7.058	–7.096	–7.133	–7.170	–7.206	–7.243	–7.279
–130	–5.516	–6.556	–6.596	–6.636	–6.675	–6.714	–6.753	–6.792	–6.831	–6.869	–6.907
–120	–6.107	–6.149	–6.191	–6.232	–6.273	–6.314	–6.355	–6.396	–6.436	–6.476	–6.516
–110	–5.681	–5.724	–5.767	–5.810	–5.853	–5.896	–5.939	–5.981	–6.023	–6.065	–6.107
–100	–5.237	–5.282	–5.327	–5.372	–5.417	–5.461	–5.505	–5.549	–5.593	–5.637	–5.681
–90	–4.777	–4.824	–4.871	–4.917	–4.963	–5.009	–5.055	–5.101	–5.147	–5.192	–5.237
–80	–4.302	–4.350	–4.398	–4.446	–4.494	–4.542	–4.589	–4.636	–4.684	–4.731	–4.777
–70	–3.811	–3.861	–3.911	–3.960	–4.009	–4.058	–4.107	–4.156	–4.205	–4.254	–4.302
–60	–3.306	–3.357	–3.408	–3.459	–3.510	–3.561	–3.611	–3.661	–3.711	–3.761	–3.811
–50	–2.787	–2.840	–2.892	–2.944	–2.996	–3.048	–3.100	–3.152	–3.204	–3.255	–3.306
–40	–2.255	–2.309	–2.362	–2.416	–2.469	–2.523	–2.576	–2.629	–2.682	–2.735	–2.787
–30	–1.709	–1.765	–1.820	–1.874	–1.929	–1.984	–2.038	–2.093	–2.147	–2.201	–2.255
–20	–1.152	–1.208	–1.264	–1.320	–1.376	–1.432	–1.488	–1.543	–1.599	–1.654	–1.709
–10	–0.582	–0.639	–0.697	–0.754	–0.811	–0.868	–0.925	–0.982	–1.039	–1.095	–1.152
0	0.000	–0.059	–0.117	–0.176	–0.234	–0.292	–0.350	–0.408	–0.466	–0.524	–0.582
0	0.000	0.059	0.118	0.176	0.235	0.294	0.354	0.413	0.472	0.532	0.591
10	0.591	0.651	0.711	0.770	0.830	0.890	0.950	1.010	1.071	1.131	1.192
20	1.192	1.252	1.313	1.373	1.434	1.495	1.556	1.617	1.678	1.740	1.801
30	1.801	1.862	1.924	1.986	2.047	2.109	2.171	2.233	2.295	2.357	2.420
40	2.420	2.482	2.545	2.607	2.670	2.733	2.795	2.858	2.921	2.984	3.048
50	3.048	3.111	3.174	3.236	3.301	3.365	3.429	3.492	3.556	3.620	3.685
60	3.685	3.749	3.813	3.877	3.942	4.006	4.071	4.136	4.200	4.265	4.330
70	4.330	4.395	4.460	4.526	4.591	4.656	4.722	4.788	4.853	4.919	4.985
80	4.985	5.051	5.117	5.183	5.249	5.315	5.382	5.448	5.514	5.581	5.648
90	5.648	5.714	5.781	5.848	5.915	5.982	6.049	6.117	6.184	6.251	6.319
100	6.319	6.386	6.454	6.522	6.590	6.658	6.725	6.794	6.862	6.930	6.998
110	6.998	7.066	7.135	7.203	7.272	7.341	7.409	7.478	7.547	7.616	7.685
120	7.685	7.754	7.823	7.892	7.962	8.031	8.101	8.170	8.240	8.309	8.379
130	8.379	8.449	8.519	8.589	8.659	8.729	8.799	8.869	8.940	9.010	9.081
140	9.081	9.151	9.222	9.292	9.363	9.434	9.505	9.576	9.647	9.718	9.789
150	9.789	9.860	9.931	10.003	10.074	10.145	10.217	10.288	10.360	10.432	10.503
160	10.503	10.575	10.647	10.719	10.791	10.863	10.935	11.007	11.080	11.152	11.224
170	11.224	11.297	11.369	11.442	11.514	11.587	11.660	11.733	11.805	11.878	11.951
180	11.951	12.024	12.097	12.170	12.243	12.317	12.390	12.463	12.537	12.610	12.684
190	12.684	12.757	12.831	12.904	12.978	13.052	13.126	13.199	13.273	13.347	13.421
200	13.421	13.495	13.569	13.644	13.718	13.792	13.866	13.941	14.015	14.090	14.164
210	14.164	14.239	14.313	14.388	14.463	14.537	14.612	14.687	14.762	14.837	14.912
220	14.912	14.987	15.062	15.137	15.212	15.287	15.362	15.438	15.513	15.588	15.664
230	15.664	15.739	15.815	15.890	15.966	15.041	16.117	16.193	16.269	16.344	16.420
240	16.420	16.496	16.572	16.648	16.724	16.800	16.876	16.952	17.028	17.104	17.181
250	17.181	17.257	17.333	17.409	17.486	17.562	17.639	17.715	17.792	17.868	17.945
260	17.945	18.021	18.098	18.175	18.252	18.328	18.405	18.482	18.559	18.636	18.713
270	18.713	18.790	18.867	18.944	19.021	19.098	19.175	19.252	19.330	19.407	19.484
280	19.484	19.561	19.639	19.716	19.794	19.871	19.948	20.026	20.103	20.181	20.259
290	20.259	20.336	20.414	20.492	20.569	20.647	20.725	20.803	20.880	20.958	21.036
300	21.035	21.114	21.192	21.270	21.348	21.426	21.504	21.582	21.660	21.739	21.817

TABLE 10 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	21.817	21.895	21.973	22.051	22.130	22.208	22.286	22.365	22.443	22.522	22.600
320	22.600	22.678	22.757	22.835	22.914	22.993	23.071	23.150	23.228	23.307	23.386
330	23.386	23.464	23.543	23.622	23.701	23.780	23.858	23.937	24.016	24.095	24.174
340	24.174	24.253	24.332	24.411	24.490	24.569	24.648	24.727	24.806	24.885	24.964
350	24.964	25.044	25.123	25.202	25.281	25.360	25.440	25.519	25.598	25.678	25.757
360	25.757	25.836	25.916	25.995	26.075	26.154	26.233	25.313	26.392	26.472	26.552
370	26.552	26.631	26.711	26.790	26.870	26.950	27.029	27.109	27.189	27.268	27.348
380	27.348	27.428	27.507	27.587	27.667	27.747	27.827	27.907	27.986	28.066	28.146
390	28.146	28.226	28.306	28.386	28.466	28.546	28.626	28.706	28.786	28.866	28.946
400	28.946	29.026	29.106	29.186	29.266	29.346	29.427	29.507	29.587	29.667	29.747
410	29.747	29.827	29.908	29.988	30.068	30.148	30.229	30.309	30.389	30.470	30.550
420	30.550	30.630	30.711	30.791	30.871	30.952	31.032	31.112	31.193	31.273	31.354
430	31.354	31.434	31.515	31.595	31.676	31.756	31.837	31.917	31.998	32.078	32.159
440	32.159	32.239	32.320	32.400	32.481	32.562	32.642	32.723	32.803	32.884	32.965
450	32.965	33.045	33.126	33.207	33.287	33.368	33.449	33.529	33.610	33.691	33.772
460	33.772	33.852	33.933	34.014	34.095	34.175	34.256	34.337	34.418	34.498	34.579
470	34.579	34.660	34.741	34.822	34.902	34.983	35.064	35.145	35.226	35.307	35.387
480	35.387	35.468	35.549	35.630	35.711	35.792	35.873	35.954	36.034	36.115	35.196
490	36.196	36.277	36.358	36.439	36.520	36.601	35.682	36.763	36.843	36.924	37.005
500	37.005	37.086	37.167	37.248	37.329	37.410	37.491	37.572	37.653	37.734	37.815
510	37.815	37.896	37.977	38.058	38.139	38.220	38.300	38.381	38.462	38.543	38.624
520	38.624	38.705	38.786	38.867	38.948	39.029	39.110	39.191	39.272	39.353	39.434
530	39.434	39.515	39.596	39.677	39.758	39.839	39.920	40.001	40.082	40.163	40.243
540	40.243	40.324	40.405	40.486	40.567	40.648	40.729	40.810	40.891	40.972	41.053
550	41.053	41.134	41.215	41.296	41.377	41.457	41.538	41.619	41.700	41.781	41.862
560	41.862	41.943	42.024	42.105	42.185	42.266	42.347	42.428	42.509	42.590	42.671
570	42.671	42.751	42.832	42.913	42.994	43.075	43.156	43.236	43.317	43.398	43.479
580	43.479	43.560	43.640	43.721	43.802	43.883	43.963	44.044	44.125	44.206	44.286
590	44.286	44.367	44.448	44.529	44.609	44.690	44.771	44.851	44.932	45.013	45.093
600	45.093	45.174	45.255	45.335	45.416	45.497	45.577	45.658	45.738	45.819	45.900
610	45.900	45.980	46.061	46.141	46.222	46.302	46.383	46.463	46.544	46.624	46.705
620	46.705	46.785	46.866	46.946	47.027	47.107	47.188	47.268	47.349	47.429	47.509
630	47.509	47.590	47.670	47.751	47.831	47.911	47.992	48.072	48.152	48.233	48.313
640	48.313	48.393	48.474	48.554	48.634	48.715	48.795	48.875	48.955	49.035	49.116
650	49.116	49.196	49.276	49.356	49.436	49.517	49.597	49.677	49.757	49.837	49.917
660	49.917	49.997	50.077	50.157	50.238	50.318	50.398	50.478	50.558	50.638	50.718
670	50.718	50.798	50.878	50.958	51.038	51.118	51.197	51.277	51.357	51.437	51.517
680	51.517	51.597	51.677	51.757	51.837	51.915	51.996	52.076	52.156	52.236	52.315
690	52.315	52.395	52.475	52.555	52.634	52.714	52.794	52.873	52.953	53.033	53.112
700	53.112	53.192	53.272	53.351	53.431	53.510	53.590	53.670	53.749	53.829	53.908
710	53.908	53.988	54.067	54.147	54.226	54.306	54.385	54.465	54.544	54.624	54.703
720	54.703	54.782	54.862	54.941	55.021	55.100	55.179	55.259	55.338	55.417	55.497
730	55.497	55.576	55.655	55.734	55.814	55.893	55.972	56.051	56.131	56.210	56.289
740	56.289	56.368	56.447	56.526	56.60$	56.685	56.764	56.843	56.922	57.001	57.080
750	57.080	57.159	57.238	57.317	57.396	57.475	57.554	57.633	57.712	57.791	57.870
760	57.870	57.949	58.028	58.107	58.186	58.265	58.343	58.422	58.501	58.580	58.659
770	58.659	58.738	58.816	58.895	58.974	59.053	59.131	59.210	59.289	59.367	59.446
780	59.446	59.525	59.604	59.682	59.761	59.839	59.918	59.997	60.075	60.154	60.232
790	60.232	60.311	60.390	60.468	60.547	60.625	60.704	60.782	60.860	60.939	61.017
800	61.017	61.096	61.174	61.253	61.331	61.409	61.488	61.566	61.644	61.723	61.801
810	61.801	61.879	61.958	62.036	62.114	62.192	62.271	62.349	62.427	62.505	62.583
820	62.583	62.662	62.740	62.818	62.896	62.974	63.052	63.130	63.208	63.286	63.364
830	63.364	63.442	63.520	63.598	63.676	63.754	63.832	63.910	63.988	64.066	64.144
840	64.144	64.222	64.300	64.377	64.455	64.533	64.611	64.689	64.766	64.844	64.922
850	64.922	65.000	65.077	65.155	65.233	65.310	65.388	65.465	65.543	65.621	65.698
860	65.698	65.776	65.853	65.931	66.008	66.086	66.163	66.241	66.318	66.396	66.473
870	66.473	66.550	66.628	66.705	66.782	66.860	66.937	67.014	67.092	67.169	67.246
880	67.246	67.323	67.400	67.478	67.555	67.632	67.709	67.786	67.863	67.940	68.017
890	68.017	68.094	68.171	68.248	68.325	68.402	68.479	68.556	68.633	68.710	68.787

TABLE 10 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
900	68.787	68.863	66.940	69.017	69.094	69.171	69.247	69.324	69.401	69.477	69.554
910	69.554	69.631	69.707	69.784	69.860	69.937	70.013	70.090	70.166	70.243	70.319
920	70.319	70.396	70.472	70.548	70.625	70.701	70.777	70.854	70.930	71.006	71.082
930	71.082	71.159	71.235	71.311	71.387	71.463	71.539	71.615	71.692	71.768	71.844
940	71.844	71.920	71.996	72.072	72.147	72.223	72.299	72.375	72.451	72.527	72.603
950	72.603	72.678	72.754	72.830	72.906	72.981	73.057	73.133	73.208	73.284	73.360
960	73.360	73.435	73.511	73.586	73.662	73.738	73.813	73.889	73.964	74.040	74.115
970	74.115	74.190	74.266	74.341	74.417	74.492	74.567	74.643	74.718	74.793	74.869
980	74.869	74.944	75.019	75.095	75.170	75.245	75.320	75.395	75.471	75.546	75.621
990	75.621	75.696	75.771	75.847	75.922	75.997	76.072	76.147	76.223	76.298	76.373
1000	76.373										

TABLE 11 Type E Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–9.830	–9.832	–9.833	–9.834	–9.835						
–440	–9.809	–9.812	–9.814	–9.817	–9.819	–9.821	–9.823	–9.825	–9.827	–9.829	–9.830
–430	–9.775	–9.779	–9.782	–9.786	–9.790	–9.793	–9.797	–9.800	–9.803	–9.806	–9.809
–420	–9.729	–9.734	–9.739	–9.744	–9.749	–9.753	–9.758	–9.762	–9.766	–9.771	–9.775
–410	–9.672	–9.678	–9.684	–9.690	–9.696	–9.702	–9.707	–9.713	–9.718	–9.724	–9.729
–400	–9.604	–9.611	–9.618	–9.625	–9.632	–9.639	–9.646	–9.653	–9.659	–9.666	–9.672
–390	–9.525	–9.534	–9.542	–9.550	–9.558	–9.566	–9.574	–9.581	–9.589	–9.597	–9.604
–380	–9.436	–9.446	–9.455	–9.464	–9.473	–9.482	–9.491	–9.500	–9.508	–9.517	–9.525
–370	–9.338	–9.348	–9.358	–9.368	–9.378	–9.388	–9.398	–9.408	–9.417	–9.427	–9.436
–360	–9.229	–9.241	–9.252	–9.263	–9.274	–9.285	–9.295	–9.306	–9.317	–9.327	–9.338
–350	–9.112	–9.124	–9.136	–9.148	–9.160	–9.172	–9.184	–9.195	–9.207	–9.218	–9.229
–340	–8.986	–8.999	–9.012	–9.025	–9.038	–9.050	–9.063	–9.075	–9.088	–9.100	–9.112
–330	–8.852	–8.866	–8.880	–8.893	–8.907	–8.920	–8.934	–8.947	–8.960	–8.973	–8.986
–320	–8.710	–8.725	–8.739	–8.754	–8.768	–8.782	–8.797	–8.811	–8.825	–8.839	–8.852
–310	–8.561	–8.576	–8.591	–8.607	–8.622	–8.637	–8.652	–8.666	–8.681	–8.696	–8.710
–300	–8.404	–8.420	–8.436	–8.452	–8.468	–8.483	–8.499	–8.515	–8.530	–8.546	–8.561
–290	–8.240	–8.257	–8.273	–8.290	–8.307	–8.323	–8.339	–8.355	–8.372	–8.388	–8.404
–280	–8.069	–8.087	–8.104	–8.121	–8.138	–8.155	–8.173	–8.189	–8.206	–8.223	–8.240
–270	–7.891	–7.910	–7.928	–7.945	–7.963	–7.981	–7.999	–8.017	–8.034	–8.052	–8.069
–260	–7.707	–7.726	–7.745	–7.763	–7.782	–7.800	–7.819	–7.837	–7.855	–7.873	–7.891
–250	–7.516	–7.536	–7.555	–7.574	–7.593	–7.613	–7.632	–7.651	–7.670	–7.688	–7.707
–240	–7.319	–7.339	–7.359	–7.379	–7.399	–7.419	–7.438	–7.458	–7.478	–7.497	–7.516
–230	–7.116	–7.137	–7.157	–7.178	–7.198	–7.219	–7.239	–7.259	–7.279	–7.299	–7.319
–220	–6.907	–6.928	–6.950	–6.971	–6.992	–7.013	–7.033	–7.054	–7.075	–7.096	–7.116
–210	–6.692	–6.714	–6.736	–6.757	–6.779	–6.801	–6.822	–6.843	–6.865	–6.886	–6.907
–200	–6.472	–6.494	–6.516	–6.539	–6.561	–6.583	–6.605	–6.627	–6.649	–6.671	–6.692
–190	–6.246	–6.269	–6.291	–6.314	–6.337	–6.359	–6.382	–6.405	–6.427	–6.449	–6.472
–180	–6.014	–6.037	–6.061	–6.084	–6.107	–6.130	–6.154	–6.177	–6.200	–6.223	–6.246
–170	–5.777	–5.801	–5.825	–5.849	–5.872	–5.896	–5.920	–5.943	–5.967	–5.991	–6.014
–160	–5.535	–5.559	–5.584	–5.608	–5.632	–5.656	–5.681	–5.705	–5.729	–5.753	–5.777
–150	–5.287	–5.312	–5.337	–5.362	–5.387	–5.412	–5.436	–5.461	–5.486	–5.510	–5.535
–140	–5.035	–5.060	–5.086	–5.111	–5.136	–5.162	–5.187	–5.212	–5.237	–5.262	–5.287
–130	–4.777	–4.803	–4.829	–4.855	–4.881	–4.907	–4.932	–4.958	–4.984	–5.009	–5.035
–120	–4.515	–4.542	–4.568	–4.594	–4.621	–4.647	–4.673	–4.699	–4.725	–4.751	–4.777
–110	–4.248	–4.275	–4.302	–4.329	–4.355	–4.382	–4.409	–4.436	–4.462	–4.489	–4.515
–100	–3.976	–4.004	–4.031	–4.058	–4.086	–4.113	–4.140	–4.167	–4.194	–4.221	–4.248
–90	–3.700	–3.728	–3.756	–3.784	–3.811	–3.839	–3.867	–3.894	–3.922	–3.949	–3.976
–80	–3.420	–3.448	–3.476	–3.504	–3.532	–3.561	–3.589	–3.617	–3.645	–3.672	–3.700
–70	–3.135	–3.163	–3.192	–3.221	–3.249	–3.278	–3.306	–3.335	–3.363	–3.391	–3.420
–60	–2.846	–2.875	–2.904	–2.933	–2.962	–2.991	–3.020	–3.048	–3.077	–3.106	–3.135
–50	–2.552	–2.582	–2.611	–2.641	–2.670	–2.699	–2.729	–2.758	–2.787	–2.816	–2.846
–40	–2.255	–2.285	–2.315	–2.344	–2.374	–2.404	–2.434	–2.463	–2.493	–2.523	–2.552
–30	–1.953	–1.984	–2.014	–2.044	–2.074	–2.105	–2.135	–2.165	–2.195	–2.225	–2.255
–20	–1.648	–1.679	–1.709	–1.740	–1.771	–1.801	–1.832	–1.862	–1.893	–1.923	–1.953
–10	–1.339	–1.370	–1.401	–1.432	–1.463	–1.494	–1.525	–1.556	–1.587	–1.617	–1.648
0	–1.026	–1.057	–1.089	–1.120	–1.152	–1.183	–1.214	–1.245	–1.277	–1.308	–1.339
0	–1.026	–0.994	–0.963	–0.931	–0.900	–0.868	–0.836	–0.805	–0.773	–0.741	–0.709
10	–0.709	–0.677	–0.645	–0.614	–0.582	–0.550	–0.517	–0.485	–0.453	–0.421	–0.389
20	–0.389	–0.357	–0.324	–0.292	–0.260	–0.227	–0.195	–0.163	–0.130	–0.098	–0.065
30	–0.065	–0.033	0.000	0.033	0.065	0.098	0.131	0.163	0.196	0.229	0.262
40	0.262	0.294	0.327	0.360	0.393	0.426	0.459	0.492	0.525	0.558	0.591
50	0.591	0.624	0.657	0.691	0.724	0.757	0.790	0.824	0.857	0.890	0.924
60	0.924	0.957	0.990	1.024	1.057	1.091	1.124	1.158	1.192	1.225	1.259
70	1.259	1.292	1.326	1.360	1.394	1.427	1.451	1.495	1.529	1.563	1.597
80	1.597	1.631	1.665	1.699	1.733	1.767	1.801	1.835	1.869	1.904	1.938
90	1.938	1.972	2.006	2.041	2.075	2.109	2.144	2.178	2.212	2.247	2.281
100	2.281	2.316	2.351	2.385	2.420	2.454	2.489	2.524	2.558	2.593	2.628
110	2.628	2.663	2.698	2.733	2.767	2.802	2.837	2.872	2.907	2.942	2.977
120	2.977	3.012	3.048	3.083	3.118	3.153	3.188	3.224	3.259	3.294	3.330

TABLE 11 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	3.330	3.365	3.400	3.436	3.471	3.507	3.542	3.578	3.613	3.649	3.685
140	3.685	3.720	3.756	3.792	3.827	3.863	3.899	3.935	3.970	4.006	4.042
150	4.042	4.078	4.114	4.150	4.186	4.222	4.258	4.294	4.330	4.366	4.403
160	4.403	4.439	4.475	4.511	4.547	4.584	4.620	4.656	4.693	4.729	4.766
170	4.766	4.802	4.839	4.875	4.912	4.948	4.985	5.021	5.058	5.095	5.131
180	5.131	5.168	5.205	5.242	5.278	5.315	5.352	5.389	5.426	5.463	5.500
190	5.500	5.537	5.574	5.611	5.648	5.685	5.722	5.759	5.796	5.833	5.871
200	5.871	5.908	5.945	5.982	6.020	6.057	6.094	6.132	6.169	6.207	6.244
210	6.244	6.281	6.319	6.356	6.394	6.432	6.469	6.507	6.544	6.582	6.620
220	6.620	6.658	6.695	6.733	6.771	6.809	6.847	6.884	6.922	6.960	6.998
230	6.998	7.036	7.074	7.112	7.150	7.188	7.226	7.264	7.302	7.341	7.379
240	7.379	7.417	7.455	7.493	7.532	7.570	7.608	7.647	7.685	7.723	7.762
250	7.762	7.800	7.839	7.877	7.916	7.954	7.993	8.031	8.070	8.108	8.147
260	8.147	8.186	8.224	8.263	8.302	8.340	8.379	8.418	8.457	8.496	8.535
270	8.535	8.573	8.612	8.651	8.690	8.729	8.768	8.807	8.846	8.885	8.924
280	8.924	8.963	9.002	9.041	9.081	9.120	9.159	9.198	9.237	9.277	9.316
290	9.316	9.355	9.395	9.434	9.473	9.513	9.552	9.591	9.631	9.670	9.710
300	9.710	9.749	9.789	9.828	9.868	9.907	9.947	9.987	10.026	10.066	10.106
310	10.106	10.145	10.185	10.225	10.265	10.304	10.344	10.384	10.424	10.464	10.504
320	10.504	10.543	10.583	10.623	10.663	10.703	10.743	10.783	10.823	10.863	10.903
330	10.903	10.943	10.983	11.024	11.064	11.104	11.144	11.184	11.224	11.265	11.305
340	11.305	11.345	11.385	11.426	11.466	11.506	11.547	11.587	11.627	11.668	11.708
350	11.708	11.749	11.789	11.830	11.870	11.911	11.951	11.992	12.032	12.073	12.113
360	12.113	12.154	12.195	12.235	12.276	12.317	12.357	12.398	12.439	12.480	12.520
370	12.520	12.561	12.602	12.643	12.684	12.724	12.765	12.806	12.847	12.888	12.929
380	12.929	12.970	13.011	13.052	13.093	13.134	13.175	13.216	13.257	13.298	13.339
390	13.339	13.380	13.421	13.462	13.504	13.545	13.586	13.627	13.668	13.710	13.751
400	13.751	13.792	13.833	13.875	13.916	13.957	13.999	14.040	14.081	14.123	14.164
410	14.164	14.205	14.247	14.288	14.330	14.371	14.413	14.454	14.496	14.537	14.579
420	14.579	14.620	14.662	14.704	14.745	14.787	14.828	14.870	14.912	14.953	14.995
430	14.995	15.037	15.078	15.120	15.162	15.204	15.245	15.287	15.329	15.371	15.413
440	15.413	15.454	15.496	15.538	15.580	15.622	15.664	15.706	15.748	15.790	15.831
450	15.831	15.873	15.915	15.957	15.999	16.041	16.083	16.125	16.168	16.210	16.252
460	16.252	16.294	16.336	16.378	16.420	16.462	16.504	16.547	16.589	16.631	16.673
470	16.673	16.715	16.758	16.800	16.842	16.884	16.927	16.969	17.011	17.054	17.096
480	17.096	17.138	17.181	17.223	17.265	17.308	17.350	17.392	17.435	17.477	17.520
490	17.520	17.562	17.605	17.647	17.690	17.732	17.775	17.817	17.860	17.902	17.945
500	17.945	17.987	18.030	18.073	18.115	18.158	18.200	18.243	18.286	18.328	18.371
510	18.371	18.414	18.456	18.499	18.542	18.585	18.627	18.670	18.713	18.756	18.798
520	18.798	18.841	18.884	18.927	18.969	19.012	19.055	19.098	19.141	19.184	19.227
530	19.227	19.269	19.312	19.355	19.398	19.441	19.484	19.527	19.570	19.613	19.656
540	19.656	19.699	19.742	19.785	19.828	19.871	19.914	19.957	20.000	20.043	20.086
550	20.086	20.129	20.172	20.216	20.259	20.302	20.345	20.388	20.431	20.474	20.517
560	20.517	20.561	20.604	20.647	20.690	20.733	20.777	20.820	20.863	20.906	20.950
570	20.950	20.993	21.036	21.080	21.123	21.166	21.209	21.253	21.296	21.339	21.383
580	21.383	21.426	21.470	21.513	21.556	21.600	21.643	21.686	21.730	21.773	21.817
590	21.817	21.860	21.904	21.947	21.991	22.034	22.078	22.121	22.165	22.208	22.252
600	22.252	22.295	22.339	22.382	22.426	22.469	22.513	22.556	22.600	22.644	22.687
610	22.687	22.731	22.774	22.818	22.862	22.905	22.949	22.993	23.036	23.080	23.124
620	23.124	23.167	23.211	23.255	23.298	23.342	23.386	23.429	23.473	23.517	23.561
630	23.561	23.604	23.648	23.692	23.736	23.780	23.823	23.867	23.911	23.955	23.999
640	23.999	24.042	24.086	24.130	24.174	24.218	24.262	24.305	24.349	24.393	24.437
650	24.437	24.481	24.525	24.569	24.613	24.657	24.701	24.745	24.789	24.832	24.876
650	24.876	24.920	24.964	25.008	25.052	25.096	25.140	25.184	25.228	25.272	25.316
670	25.316	25.360	25.404	25.448	25.493	25.537	25.581	25.625	25.669	25.713	25.757
680	25.757	25.801	25.845	25.889	25.933	25.977	26.022	26.066	26.110	26.154	26.198
690	26.198	26.242	26.286	26.331	26.375	26.419	26.463	26.507	26.552	26.596	26.640
700	26.640	26.684	26.728	26.773	26.817	26.861	26.905	26.950	26.994	27.038	27.082
710	27.082	27.127	27.171	27.215	27.259	27.304	27.348	27.392	27.437	27.481	27.525

TABLE 11 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	27.525	27.570	27.614	27.658	27.703	27.747	27.791	27.836	27.880	27.924	27.969
730	27.969	28.013	28.057	28.102	28.146	28.191	28.235	28.279	28.324	28.368	28.413
740	28.413	28.457	28.501	28.546	28.590	28.635	28.679	28.724	28.768	28.813	28.857
750	28.857	28.901	28.946	28.990	29.035	29.079	29.124	29.168	29.213	29.257	29.302
760	29.302	29.346	29.391	29.435	29.480	29.525	29.569	29.614	29.658	29.703	29.747
770	29.747	29.792	29.836	29.881	29.925	29.970	30.015	30.059	30.104	30.148	30.193
780	30.193	30.238	30.282	30.327	30.371	30.416	30.461	30.505	30.550	30.595	30.639
790	30.639	30.684	30.728	30.773	30.818	30.862	30.907	30.952	30.996	31.041	31.086
800	31.086	31.130	31.175	31.220	31.264	31.309	31.354	31.398	31.443	31.488	31.533
810	31.533	31.577	31.622	31.667	31.711	31.756	31.801	31.846	31.890	31.935	31.980
820	31.980	32.025	32.069	32.114	32.159	32.204	32.248	32.293	32.338	32.383	32.427
830	32.427	32.472	32.517	32.562	32.606	32.651	32.696	32.741	32.786	32.830	32.875
840	32.875	32.920	32.965	33.010	33.054	33.099	33.144	33.189	33.234	33.278	33.323
850	33.323	33.368	33.413	33.458	33.503	33.547	33.592	33.637	33.682	33.727	33.772
860	33.772	33.816	33.861	33.906	33.951	33.996	34.041	34.086	34.130	34.175	34.220
870	34.220	34.265	34.310	34.355	34.400	34.445	34.489	34.534	34.579	34.624	34.669
880	34.669	34.714	34.759	34.804	34.849	34.893	34.938	34.983	35.028	35.073	35.118
890	35.118	35.163	35.208	35.253	35.298	35.343	35.387	35.432	35.477	35.522	35.567
900	35.567	35.612	35.657	35.702	35.747	35.792	35.837	35.882	35.927	35.972	36.016
910	36.016	36.061	36.106	36.151	36.196	36.241	36.286	36.331	36.376	36.421	36.466
920	36.466	36.511	36.556	36.601	36.646	36.691	36.736	36.781	36.826	36.870	36.915
930	36.915	36.960	37.005	37.050	37.095	37.140	37.185	37.230	37.275	37.320	37.365
940	37.365	37.410	37.455	37.500	37.545	37.590	37.635	37.680	37.725	37.770	37.815
950	37.815	37.860	37.905	37.950	37.995	38.040	38.085	38.130	38.175	38.220	38.265
960	38.265	38.309	38.354	38.399	38.444	38.489	38.534	38.579	38.624	38.669	38.714
970	38.714	38.759	38.804	38.849	38.894	38.939	38.984	39.029	39.074	39.119	39.164
980	39.164	39.209	39.254	39.299	39.344	39.389	39.434	39.479	39.524	39.569	39.614
990	39.614	39.659	39.704	39.749	39.794	39.839	39.884	39.929	39.974	40.019	40.064
1000	40.064	40.109	40.154	40.199	40.243	40.288	40.333	40.378	40.423	40.468	40.513
1010	40.513	40.558	40.603	40.648	40.693	40.738	40.783	40.828	40.873	40.918	40.963
1020	40.963	41.008	41.053	41.098	41.143	41.188	41.233	41.278	41.323	41.368	41.412
1030	41.412	41.457	41.502	41.547	41.592	41.637	41.682	41.727	41.772	41.817	41.862
1040	41.862	41.907	41.952	41.997	42.042	42.087	42.132	42.176	42.221	42.266	42.311
1050	42.311	42.356	42.401	42.446	42.491	42.536	42.581	42.626	42.671	42.715	42.760
1060	42.750	42.805	42.850	42.895	42.940	42.985	43.030	43.075	43.120	43.165	43.209
1070	43.209	43.254	43.299	43.344	43.389	43.434	43.479	43.524	43.569	43.613	43.658
1080	43.658	43.703	43.748	43.793	43.838	43.883	43.928	43.972	44.017	44.062	44.107
1090	44.107	44.152	44.197	44.242	44.286	44.331	44.376	44.421	44.466	44.511	44.555
1100	44.555	44.600	44.645	44.690	44.735	44.780	44.824	44.869	44.914	44.959	45.004
1110	45.004	45.049	45.093	45.138	45.183	45.228	45.273	45.317	45.362	45.407	45.452
1120	45.452	45.497	45.541	45.586	45.631	45.676	45.720	45.765	45.810	45.855	45.900
1130	45.900	45.944	45.989	46.034	46.079	46.123	46.168	46.213	46.258	46.302	46.347
1140	46.347	46.392	46.437	46.481	46.526	46.571	46.616	46.660	46.705	46.750	46.794
1150	46.794	46.839	46.884	46.929	46.973	47.018	47.063	47.107	47.152	47.197	47.241
1160	47.241	47.286	47.331	47.375	47.420	47.465	47.509	47.554	47.599	47.643	47.588
1170	47.688	47.733	47.777	47.822	47.867	47.911	47.956	48.001	48.045	48.090	48.135
1180	48.135	48.179	48.224	48.268	48.313	48.358	48.402	48.447	48.492	48.536	48.581
1190	48.581	48.625	48.670	48.715	48.759	48.804	48.848	48.893	48.937	48.982	49.027
1200	49.027	49.071	49.116	49.160	49.205	49.249	49.294	49.338	49.383	49.428	49.472
1210	49.472	49.517	49.561	49.606	49.650	49.695	49.739	49.784	49.828	49.873	49.917
1220	49.917	49.962	50.006	50.051	50.095	50.140	50.184	50.229	50.273	50.318	50.362
1230	50.362	50.407	50.451	50.495	50.540	50.584	50.629	50.673	50.718	50.762	50.807
1240	50.807	50.851	50.895	50.940	50.984	51.029	51.073	51.118	51.162	51.206	51.251
1250	51.251	51.295	51.340	51.384	51.428	51.473	51.517	51.561	51.606	51.650	51.695
1260	51.695	51.739	51.783	51.828	51.872	51.916	51.961	52.005	52.049	52.094	52.138
1270	52.138	52.182	52.227	52.271	52.315	52.360	52.404	52.448	52.493	52.537	52.581
1280	52.581	52.625	52.670	52.714	52.758	52.803	52.847	52.891	52.935	52.980	53.024
1290	53.024	53.068	53.112	53.157	53.201	53.245	53.289	53.334	53.378	53.422	53.466
1300	53.466	53.510	53.555	53.599	53.643	53.687	53.732	53.776	53.820	53.864	53.908

TABLE 11 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1310	53.908	53.952	53.997	54.041	54.085	54.129	54.173	54.218	54.262	54.306	54.350
1320	54.350	54.394	54.438	54.482	54.527	54.571	54.615	54.659	54.703	54.747	54.791
1330	54.791	54.835	54.879	54.924	54.968	55.012	55.056	55.100	55.144	55.188	55.232
1340	55.232	55.276	55.320	55.364	55.408	55.453	55.497	55.541	55.585	55.629	55.673
1350	55.673	55.717	55.761	55.805	55.849	55.893	55.937	55.981	56.025	56.069	56.113
1360	56.113	56.157	56.201	56.245	56.289	56.333	56.377	56.421	56.465	56.509	56.553
1370	56.553	56.597	56.641	56.685	56.729	56.773	56.816	56.860	56.904	56.948	56.992
1380	56.992	57.036	57.080	57.124	57.168	57.212	57.256	57.300	57.344	57.387	57.431
1390	57.431	57.475	57.519	57.563	57.607	57.651	57.695	57.738	57.782	57.826	57.870
1400	57.870	57.914	57.958	58.002	58.045	58.089	58.133	58.177	58.221	58.265	58.308
1410	58.308	58.352	58.396	58.440	58.484	58.527	58.571	58.615	58.659	58.702	58.746
1420	58.745	58.790	58.834	58.878	58.921	58.965	59.009	59.053	59.096	59.140	59.184
1430	59.184	59.228	59.271	59.315	59.359	59.402	59.446	59.490	59.534	59.577	59.621
1440	59.621	59.665	59.708	59.752	59.796	59.839	59.883	59.927	59.970	60.014	60.058
1450	60.058	60.101	60.145	60.189	60.232	60.276	60.320	60.363	60.407	60.451	60.494
1460	60.494	60.538	60.581	60.625	60.669	60.712	60.756	60.799	60.843	60.887	60.930
1470	60.930	60.974	61.017	61.061	61.105	61.148	61.192	61.235	61.279	61.322	61.366
1480	61.366	61.409	61.453	61.496	61.540	61.583	61.627	61.671	61.714	61.758	61.801
1490	61.801	61.845	61.888	61.932	61.975	62.018	62.062	62.105	62.149	62.192	62.236
1500	62.236	62.279	62.323	62.366	62.410	62.453	62.496	62.540	62.583	62.627	62.670
1510	62.670	62.714	62.757	62.800	62.844	62.887	62.931	62.974	63.017	63.061	63.104
1520	63.104	63.148	63.191	63.234	63.278	63.321	63.364	63.408	63.451	63.494	63.538
1530	63.538	63.581	63.624	63.668	63.711	63.754	63.798	63.841	63.884	63.927	63.971
1540	63.971	64.014	64.057	64.101	64.144	64.187	64.230	64.274	64.317	64.360	64.403
1550	64.403	64.447	64.490	64.533	64.576	64.619	64.663	64.706	64.749	64.792	64.835
1560	64.835	64.879	64.922	64.965	65.008	65.051	65.094	65.138	65.181	65.224	65.267
1570	65.267	65.310	65.353	65.396	65.440	65.483	65.526	65.569	65.612	65.655	65.698
1580	65.698	65.741	65.784	65.827	65.871	65.914	65.957	66.000	66.043	66.086	66.129
1590	66.129	66.172	66.215	66.258	66.301	66.344	66.387	66.430	66.473	66.516	66.559
1600	66.559	66.602	66.645	66.688	66.731	66.774	66.817	66.860	66.903	66.946	66.989
1610	66.989	67.031	67.074	67.117	67.160	67.203	67.246	67.289	67.332	67.375	67.418
1620	67.418	67.460	67.503	67.546	67.589	67.632	67.675	67.718	67.760	67.803	67.846
1630	67.846	67.889	67.932	67.974	68.017	68.060	68.103	68.146	68.188	68.231	68.274
1640	68.274	68.317	68.359	68.402	68.445	68.488	68.530	68.573	68.616	68.659	68.701
1650	68.701	68.744	68.787	68.829	68.872	68.915	68.957	63.000	69.043	69.085	69.128
1660	69.128	69.171	69.213	69.256	69.298	69.341	69.384	69.426	69.469	69.511	69.554
1670	69.554	69.597	69.639	69.682	69.724	69.767	69.809	69.852	69.894	69.937	69.979
1680	69.979	70.022	70.064	70.107	70.149	70.192	70.234	70.277	70.319	70.362	70.404
1690	70.404	70.447	70.489	70.531	70.574	70.616	70.659	70.701	70.744	70.786	70.828
1700	70.828	70.871	70.913	70.955	70.998	71.040	71.082	71.125	71.167	71.209	71.252
1710	71.252	71.294	71.336	71.379	71.421	71.463	71.506	71.548	71.590	71.632	71.675
1720	71.675	71.717	71.759	71.801	71.844	71.886	71.928	71.970	72.012	72.055	72.097
1730	72.097	72.139	72.181	72.223	72.266	72.308	72.350	72.392	72.434	72.476	72.518
1740	72.518	72.561	72.603	72.645	72.687	72.729	72.771	72.813	72.855	72.897	72.939
1750	72.939	72.981	73.023	73.066	73.108	73.150	73.192	73.234	73.276	73.318	73.360
1760	73.360	73.402	73.444	73.486	73.528	73.570	73.612	73.654	73.696	73.738	73.780
1770	73.780	73.821	73.863	73.905	73.947	73.989	74.031	74.073	74.115	74.157	74.199
1780	74.199	74.241	74.283	74.324	74.366	74.408	74.450	74.492	74.534	74.576	74.618
1790	74.618	74.659	74.701	74.743	74.785	74.827	74.869	74.910	74.952	74.994	75.036
1800	75.036	75.078	75.120	75.161	75.203	75.245	75.287	75.329	75.370	75.412	75.454
1810	75.454	75.496	75.538	75.579	75.621	75.663	75.705	75.746	75.788	75.830	75.872
1820	75.872	75.913	75.955	75.997	76.039	76.081	76.122	76.164	76.206	76.248	76.289
1830	76.289	76.331	76.373								

TABLE 12 Type J Thermocouple

NOTE 1—The maximum recommended temperature limit tor Type J thermocouples is 760°C [1400°F] as specified in Table 6. Extension of the Type J tables beyond 760°C [1400°F] gives temperature–electromotive force data to 1200°C [2192°F]. This extension is a mathematical extrapolation based on limited calibration data and caution should be exercised in its use. The basis for the extended curve is discussed in *NBS Monograph 125*. It should be noted that initial calibration tolerances for Type J thermocouples (see Table 1) do not apply above 760°C [1400°F].

Temperature in Degrees Celsius (ITS–90)

										Reference Junctions at 0°C	
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–210	–8.095										
–200	–7.890	–7.912	–7.934	–7.955	–7.976	–7.996	–8.017	–8.037	–8.057	–8.076	–8.095
–190	–7.659	–7.683	–7.707	–7.731	–7.755	–7.778	–7.801	–7.824	–7.846	–7.868	–7.890
–180	–7.403	–7.429	–7.456	–7.482	–7.508	–7.534	–7.559	–7.585	–7.610	–7.634	–7.659
–170	–7.123	–7.152	–7.181	–7.209	–7.237	–7.265	–7.293	–7.321	–7.348	–7.376	–7.403
–160	–6.821	–6.853	–6.883	–6.914	–6.944	–6.975	–7.005	–7.035	–7.064	–7.094	–7.123
–150	–6.500	–6.533	–6.566	–6.598	–6.631	–6.663	–6.695	–6.727	–6.759	–6.790	–6.821
–140	–6.159	–6.194	–6.229	–6.263	–6.298	–6.332	–6.366	–6.400	–6.433	–6.467	–6.500
–130	–5.801	–5.838	–5.874	–5.910	–5.946	–5.982	–6.018	–6.054	–6.089	–6.124	–6.159
–120	–5.426	–5.465	–5.503	–5.541	–5.578	–5.616	–5.653	–5.690	–5.727	–5.764	–5.801
–110	–5.037	–5.076	–5.115	–5.155	–5.194	–5.233	–5.272	–5.311	–5.350	–5.388	–5.426
–100	–4.633	–4.674	–4.714	–4.755	–4.796	–4.836	–4.877	–4.917	–4.957	–4.997	–5.037
–90	–4.215	–4.257	–4.300	–4.342	–4.384	–4.425	–4.467	–4.509	–4.550	–4.591	–4.633
–80	–3.786	–3.829	–3.872	–3.916	–3.959	–4.002	–4.045	–4.088	–4.130	–4.173	–4.215
70	–3.344	–3.389	–3.434	–3.478	–3.522	–3.566	–3.610	–3.654	–3.698	–3.742	–3.786
–60	–2.893	–2.938	–2.984	–3.029	–3.075	–3.120	–3.165	–3.210	–3.255	–3.300	–3.344
–50	–2.431	–2.478	–2.524	–2.571	–2.617	–2.663	–2.709	–2.755	–2.801	–2.847	–2.893
–40	–1.961	–2.008	–2.055	–2.103	–2.150	–2.197	–2.244	–2.291	–2.338	–2.385	–2.431
–30	–1.482	–1.530	–1.578	–1.626	–1.674	–1.722	–1.770	1.818	–1.865	–1.913	–1.961
–20	–0.995	–1.044	–1.093	–1.142	–1.190	–1.239	–1.288	–1.336	–1.385	–1.433	–1.482
–10	–0.501	–0.550	–0.600	–0.650	–0.699	–0.749	–0.798	–0.847	–0.896	–0.946	–0.995
0	0.000	–0.050	–0.101	–0.151	–0.201	–0.251	–0.301	–0.351	–0.401	–0.451	–0.501
0	0.000	0.050	0.101	0.151	0.202	0.253	0.303	0.354	0.405	0.456	0.507
10	0.507	0.558	0.609	0.660	0.711	0.762	0.814	0.865	0.916	0.968	1.019
20	1.019	1.071	1.122	1.174	1.226	1.277	1.329	1.381	1.433	1.485	1.537
30	1.537	1.589	1.641	1.693	1.745	1.797	1.849	1.902	1.954	2.006	2.059
40	2.059	2.111	2.164	2.216	2.269	2.322	2.374	2.427	2.480	2.532	2.585
50	2.585	2.638	2.691	2.744	2.797	2.850	2.903	2.956	3.009	3.062	3.116
60	3.116	3.169	3.222	3.275	3.329	3.382	3.436	3.489	3.543	3.596	3.650
70	3.650	3.703	3.757	3.810	3.864	3.918	3.971	4.025	4.079	4.133	4.187
80	4.187	4.240	4.294	4.348	4.402	4.456	4.510	4.564	4.618	4.672	4.726
90	4.726	4.781	4.835	4.889	4.943	4.997	5.052	5.106	5.160	5.215	5.269
100	5.269	5.323	5.378	5.432	5.487	5.541	5.595	5.650	5.705	5.759	5.814
110	5.814	5.868	5.923	5.977	6.032	6.087	6.141	6.196	6.251	6.306	6.360
120	6.360	6.415	6.470	6.525	6.579	6.634	6.689	6.744	6.799	6.854	6.909
130	6.909	6.964	7.019	7.074	7.129	7.184	7.239	7.294	7.349	7.404	7.459
140	7.459	7.514	7.569	7.624	7.679	7.734	7.789	7.844	7.900	7.955	8.010
150	8.010	8.065	8.120	8.175	8.231	8.286	8.341	8.396	8.452	8.507	8.562
160	8.562	8.618	8.673	8.728	8.783	8.839	8.894	8.949	9.005	9.060	9.115
170	9.115	9.171	9.226	9.282	9.337	9.392	9.448	9.503	9.559	9.614	9.669
180	9.669	9.725	9.780	9.836	9.891	9.947	10.002	10.057	10.113	10.168	10.224
190	10.224	10.279	10.335	10.390	10.446	10.501	10.557	10.612	10.668	10.723	10.779
200	10.779	10.834	10.890	10.945	11.001	11.056	11.112	11.167	11.223	11.278	11.334
210	11.334	11.389	11.445	11.501	11.556	11.612	11.667	11.723	11.778	11.834	11.889
220	11.889	11.945	12.000	12.056	12.111	12.167	12.222	12.278	12.334	12.389	12.445
230	12.445	12.500	12.556	12.611	12.667	12.722	12.778	12.833	12.889	12.944	13.000
240	13.000	13.056	13.111	13.167	13.222	13.278	13.333	13.389	13.444	13.500	13.555
250	13.555	13.611	13.666	13.722	13.777	13.833	13.888	13.944	13.999	14.055	14.110
260	14.110	14.166	14.221	14.277	14.332	14.388	14.443	14.499	14.554	14.609	14.665
270	14.665	14.720	14.776	14.831	14.887	14.942	14.998	15.053	15.109	15.164	15.219
280	15.219	15.275	15.330	15.386	15.441	15.496	15.552	15.607	15.663	15.718	15.773
290	15.773	15.829	15.884	15.940	15.995	16.050	16.106	16.161	16.216	16.272	16.327
300	16.327	16.383	16.438	16.493	16.549	16.604	16.659	16.715	16.770	16.825	16.881
310	16.881	16.936	16.991	17.046	17.102	17.157	17.212	17.268	17.323	17.378	17.434
320	17.434	17.489	17.544	17.599	17.655	17.710	17.765	17.820	17.876	17.931	17.986

TABLE 12 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
330	17.986	18.041	18.097	18.152	18.207	18.262	18.318	18.373	18.428	18.483	18.538
340	18.538	18.594	18.649	18.704	18.759	18.814	18.870	18.925	18.980	19.035	19.090
350	19.090	19.146	19.201	19.256	19.311	19.366	19.422	19.477	19.532	19.587	19.642
360	19.642	19.697	19.753	19.808	19.863	19.918	19.973	20.028	20.083	20.139	20.194
370	20.194	20.249	20.304	20.359	20.414	20.469	20.525	20.580	20.635	20.690	20.745
380	20.745	20.800	20.855	20.911	20.966	21.021	21.076	21.131	21.186	21.241	21.297
390	21.297	21.352	21.407	21.462	21.517	21.572	21.627	21.683	21.738	21.793	21.848
400	21.848	21.903	21.958	22.014	22.069	22.124	22.179	22.234	22.289	22.345	22.400
410	22.400	22.455	22.510	22.565	22.620	22.676	22.731	22.786	22.841	22.896	22.952
420	22.952	23.007	23.062	23.117	23.172	23.228	23.283	23.338	23.393	23.449	23.504
430	23.504	23.559	23.614	23.670	23.725	23.780	23.835	23.891	23.946	24.001	24.057
440	24.057	24.112	24.167	24.223	24.278	24.333	24.389	24.444	24.499	24.555	24.610
450	24.610	24.665	24.721	24.776	24.832	24.887	24.943	24.998	25.053	25.109	25.164
460	25.164	25.220	25.275	25.331	25.386	25.442	25.497	25.553	25.608	25.664	25.720
470	25.720	25.775	25.831	25.886	25.942	25.998	26.053	26.109	26.165	26.220	26.276
480	26.276	26.332	26.387	26.443	26.499	26.555	26.610	26.666	26.722	26.778	26.834
490	26.834	26.889	26.945	27.001	27.057	27.113	27.169	27.225	27.281	27.337	27.393
500	27.393	27.449	27.505	27.561	27.617	27.673	27.729	27.785	27.841	27.897	27.953
510	27.953	28.010	28.066	28.122	28.178	28.234	28.291	28.347	28.403	28.460	28.516
520	28.516	28.572	28.629	28.685	28.741	28.798	28.854	28.911	28.957	29.024	29.080
530	29.080	29.137	29.194	29.250	29.307	29.363	29.420	29.477	29.534	29.590	29.647
540	29.647	29.704	29.761	29.818	29.874	29.931	29.988	30.045	30.102	30.159	30.216
550	30.216	30.273	30.330	30.387	30.444	30.502	30.559	30.616	30.673	30.730	30.788
560	30.788	30.845	30.902	30.960	31.017	31.074	31.132	31.189	31.247	31.304	31.362
570	31.362	31.419	31.477	31.535	31.592	31.650	31.708	31.766	31.823	31.881	31.939
580	31.939	31.997	32.055	32.113	32.171	32.229	32.287	32.345	32.403	32.461	32.519
590	32.519	32.577	32.636	32.694	32.752	32.810	32.869	32.927	32.985	33.044	33.102
600	33.102	33.161	33.219	33.278	33.337	33.395	33.454	33.513	33.571	33.630	33.689
610	33.689	33.748	33.807	33.866	33.925	33.984	34.043	34.102	34.161	34.220	34.279
620	34.279	34.338	34.397	34.457	34.516	34.575	34.635	34.694	34.754	34.813	34.873
630	34.873	34.932	34.992	35.051	35.111	35.171	35.230	35.290	35.350	35.410	35.470
640	35.470	35.530	35.590	35.650	35.710	35.770	35.830	35.890	35.950	36.010	36.071
650	36.071	36.131	36.191	36.252	36.312	36.373	36.433	36.494	36.554	36.615	36.675
660	36.675	36.736	36.797	36.858	36.918	36.979	37.040	37.101	37.162	37.223	37.284
670	37.284	37.345	37.406	37.467	37.528	37.590	37.651	37.712	37.773	37.835	37.896
680	37.896	37.958	38.019	38.081	38.142	38.204	38.265	38.327	38.389	38.450	38.512
690	38.512	38.574	38.636	38.698	38.760	38.822	38.884	38.946	39.008	39.070	39.132
700	39.132	39.194	39.256	39.318	39.381	39.443	39.505	39.568	39.630	39.693	39.755
710	39.755	39.818	39.880	39.943	40.005	40.068	40.131	40.193	40.256	40.319	40.382
720	40.382	40.445	40.508	40.570	40.633	40.696	40.759	40.822	40.886	40.949	41.012
730	41.012	41.075	41.138	41.201	41.265	41.328	41.391	41.455	41.518	41.581	41.645
740	41.645	41.708	41.772	41.835	41.899	41.962	42.026	42.090	42.153	42.217	42.281
750	42.281	42.344	42.408	42.472	42.536	42.599	42.663	42.727	42.791	42.855	42.919
760	42.919	42.983	43.047	43.111	43.175	43.239	43.303	43.367	43.431	43.495	43.559
770	43.559	43.624	43.688	43.752	43.817	43.881	43.945	44.010	44.074	44.139	44.203
780	44.203	44.267	44.332	44.396	44.461	44.525	44.590	44.655	44.719	44.784	44.848
790	44.848	44.913	44.977	45.042	45.107	45.171	45.236	45.301	45.365	45.430	45.494
800	45.494	45.559	45.624	45.688	45.753	45.818	45.882	45.947	46.011	46.076	46.141
810	46.141	46.205	46.270	46.334	46.399	46.464	46.528	46.593	46.657	46.722	46.786
820	46.786	46.851	46.915	46.980	47.044	47.109	47.173	47.238	47.302	47.367	47.431
830	47.431	47.495	47.560	47.624	47.688	47.753	47.817	47.881	47.946	48.010	48.074
840	48.074	48.138	48.202	48.267	48.331	48.395	48.459	48.523	48.587	48.651	48.715
850	48.715	48.779	48.843	48.907	48.971	49.034	49.098	49.162	49.226	49.290	49.353
860	49.353	49.417	49.481	49.544	49.608	49.672	49.735	49.799	49.862	49.926	49.989
870	49.989	50.052	50.116	50.179	50.243	50.306	50.369	50.432	50.495	50.559	50.622
880	50.622	50.685	50.748	50.811	50.874	50.937	51.000	51.063	51.126	51.188	51.251
890	51.251	51.314	51.377	51.439	51.502	51.565	51.627	51.690	51.752	51.815	51.877
900	51.877	51.940	52.002	52.064	52.127	52.189	52.251	52.314	52.376	52.438	52.500
910	52.500	52.562	52.624	52.686	52.748	52.810	52.872	52.934	52.996	53.057	53.119

TABLE 12 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
920	53.119	53.181	53.243	53.304	53.366	53.427	53.489	53.550	53.612	53.673	53.735
930	53.735	53.796	53.857	53.919	53.980	54.041	54.102	54.164	54.225	54.286	54.347
940	54.347	54.408	54.469	54.530	54.591	54.652	54.713	54.773	54.834	54.895	54.956
950	54.956	55.016	55.077	55.138	55.198	55.259	55.319	55.380	55.440	55.501	55.561
960	55.561	55.622	55.682	55.742	55.803	55.863	55.923	55.983	56.043	56.104	56.164
970	56.164	56.224	56.284	56.344	56.404	56.464	56.524	56.584	56.643	56.703	56.763
980	56.763	56.823	56.883	56.942	57.002	57.062	57.121	57.181	57.240	57.300	57.360
990	57.360	57.419	57.479	57.538	57.597	57.657	57.716	57.776	57.835	57.894	57.953
1000	57.953	58.013	58.072	58.131	58.190	58.249	58.309	58.368	58.427	58.486	58.545
1010	58.545	58.604	58.663	58.722	58.781	58.840	58.899	58.957	59.016	59.075	59.134
1020	59.134	59.193	59.252	59.310	59.369	59.428	59.487	59.545	59.604	59.663	59.721
1030	59.721	59.780	59.838	59.897	59.956	60.014	60.073	60.131	60.190	60.248	60.307
1040	60.307	60.365	60.423	60.482	60.540	60.599	60.657	60.715	60.774	60.832	60.890
1050	60.890	60.949	61.007	61.065	61.123	61.182	61.240	61.298	61.356	61.415	61.473
1060	61.473	61.531	61.589	61.647	61.705	61.763	61.822	61.880	61.938	61.996	62.054
1070	62.054	62.112	62.170	62.228	62.286	62.344	62.402	62.460	62.518	62.576	62.634
1080	62.634	62.692	62.750	62.808	62.866	62.924	62.982	63.040	63.098	63.156	63.214
1090	63.214	63.271	63.329	63.387	63.445	63.503	63.561	63.619	63.677	63.734	63.792
1100	63.792	63.850	63.908	63.966	64.024	64.081	64.139	64.197	64.255	64.313	64.370
1110	64.370	64.428	64.486	64.544	64.602	64.659	64.717	64.775	64.833	64.890	64.948
1120	64.948	65.006	65.064	65.121	65.179	65.237	65.295	65.352	65.410	65.468	65.525
1130	65.525	65.583	65.641	65.699	65.756	65.814	65.872	65.929	65.987	66.045	66.102
1140	66.102	66.160	66.218	66.275	66.333	66.391	66.448	66.506	66.564	66.621	66.679
1150	66.679	66.737	66.794	66.852	66.910	66.967	67.025	67.082	67.140	67.198	67.255
1160	67.255	67.313	67.370	67.428	67.486	67.543	67.601	67.658	67.716	67.773	67.831
1170	67.831	67.888	67.946	68.003	68.061	68.119	68.176	68.234	68.291	68.348	68.406
1180	68.406	68.463	68.521	68.578	68.636	68.693	68.751	68.808	68.865	68.923	68.980
1190	68.980	69.037	69.095	69.152	69.209	69.267	69.324	69.381	69.439	69.496	69.553
1200	69.553										

TABLE 13 Type J Thermocouple

NOTE 1—The maximum recommended temperature limit for Type J thermocouples is 760°C [1400°F] as specified in Table 6. Extension of the Type J tables beyond 760°C [1400°F] gives temperature-electromotive force data to 1200°C [2192°F]. This extension is a mathematical extrapolation based on limited calibration data and caution should be exercised in its use. The basis for the extended curve is discussed in *NBS Monograph 125*. It should be noted that initial calibration tolerances for Type J thermocouples (see Table 1) do not apply above 760°C [1400°F].

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

										Reference Junctions at 32°F	
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–340	–8.030	–8.041	–8.052	–8.063	–8.074	–8.085	–8.095				
–330	–7.915	–7.927	–7.938	–7.950	–7.962	–7.973	–7.985	–7.996	–8.008	–8.019	–8.030
–320	–7.791	–7.804	–7.816	–7.829	–7.841	–7.854	–7.866	–7.878	–7.890	–7.903	–7.915
–310	–7.659	–7.672	–7.686	–7.699	–7.713	–7.726	–7.739	–7.752	–7.765	–7.778	–7.791
–300	–7.519	–7.534	7.548	–7.562	–7.576	–7.590	–7.604	–7.618	–7.632	–7.645	–7.559
–290	–7.373	–7.388	–7.403	–7.417	–7.432	–7.447	–7.462	–7.475	–7.491	–7.505	–7.519
–280	–7.219	–7.234	–7.250	–7.265	–7.281	–7.296	–7.312	7.327	–7.342	–7.357	–7.373
–270	–7.058	–7.074	–7.090	–7.107	–7.123	–7.139	–7.155	–7.171	–7.187	–7.203	–7.219
–260	–6.890	–6.907	–6.924	–6.941	–6.958	–6.975	–6.991	–7.008	–7.025	–7.041	–7.058
–250	–6.716	–6.734	–6.752	–6.769	–6.787	–6.804	–6.821	–6.839	–6.856	–6.873	–6.890
–240	–6.536	–6.555	–6.573	–6.591	–6.609	–6.627	–6.545	–5.663	–5.681	5.699	–6.716
–210	–6.351	–6.370	–6.388	–6.407	–6.426	–6.444	–6.463	–6.481	–6.500	–6.518	–6.536
–220	–6.159	–6.179	–6.198	–6.217	–6.236	–6.256	–6.275	–5.294	–6.313	–6.332	–6.351
–210	–5.962	–5.982	–6.002	6.022	–5.042	–6.061	–6.081	–6.101	–6.120	–6.140	–6.159
–200	–5.750	–5.781	–5.801	5.821	5.842	–5.862	–5.882	–5.902	–5.922	–5.942	–5.962
–190	–5.553	–5.574	–5.595	–5.616	–5.637	–5.657	–5.678	–5.699	–5.719	–5.740	–5.750
–180	–5.341	–5.363	–5.384	–5.405	–5.426	–5.448	–5.469	–5.490	–5.511	–5.532	–5.553
–170	–5.125	–5.146	–5.168	–5.190	–5.212	–5.233	–5.255	–5.277	–5.298	–5.320	–5.341
–160	–4.903	–4.926	–4.948	–4.970	–4.992	–5.015	–5.037	–5.059	–5.081	–5.103	–5.125
–150	–4.678	–4.701	–4.724	–4.746	–4.769	–4.791	–4.814	–4.836	–4.859	–4.881	–4.903
–140	–4.449	–4.472	–4.495	–4.518	–4.541	–4.564	–4.587	–4.610	–4.633	–4.655	–4.678
–130	–4.215	–4.239	–4.252	–4.286	–4.309	–4.332	–4.356	–4.379	–4.402	–4.425	–4.449
–120	–3.978	–4.002	–4.026	–4.050	–4.073	–4.097	–4.121	–4.144	–4.168	–4.192	–4.215
–110	–3.737	–3.761	–3.786	–3.810	–3.834	–3.858	–3.882	–3.906	–3.930	–3.954	–3.978
–100	–3.493	–3.517	–3.542	–3.566	–3.591	–3.615	–3.540	–3.664	–3.688	–3.713	–3.737
–90	–3.245	–3.270	–3.295	–3.320	–3.344	–3.369	–3.394	–3.419	–3.443	–3.468	–3.493
–80	–2.994	–3.019	–3.044	–3.070	–3.095	–3.120	–3.145	–3.170	–3.195	–3.220	–3.245
–70	–2.740	–2.766	–2.791	2.817	–2.842	–2.867	–2.893	–2.918	–2.943	–2.969	–2.994
–60	–2.483	–2.509	–2.535	–2.560	–2.586	2.512	–2.638	–2.663	–2.689	–2.714	–2.740
–50	–2.223	–2.249	–2.275	–2.301	–2.327	–2.353	–2.379	–2.405	–2.431	–2.457	–2.483
–40	1.961	1.987	–2.013	–2.040	–2.065	–2.092	–2.118	–2.145	–2.171	–2.197	–2.223
–30	–1.695	–1.722	–1.749	–1.775	–1.802	–1.828	–1.855	–1.881	–1.908	–1.934	–1.961
–20	–1.428	–1.455	–1.482	–1.508	–1.535	–1.562	–1.589	–1.615	–1.642	–1.569	–1.695
–10	–1.158	–1.185	–1.212	–1.239	–1.266	–1.293	–1.320	–1.347	–1.374	–1.401	–1.428
0	–0.886	–0.913	–0.940	–0.967	–0.995	–1.022	–1.049	–1.076	–1.104	–1.131	–1.158
0	–0.886	–0.858	–0.831	–0.803	–0.776	–0.749	–0.721	–0.694	–0.666	–0.639	–0.611
10	–0.611	–0.583	–0.556	–0.528	–0.501	–0.473	–0.445	–0.418	–0.390	–0.362	–0.334
20	–0.334	–0.307	–0.279	–0.251	–0.223	–0.195	–0.168	–0.140	–0.112	–0.084	–0.056
30	–0.056	–0.028	0.000	0.028	0.056	0.084	0.112	0.140	0.168	0.196	0.225
40	0.225	0.253	0.281	0.309	0.337	0.365	0.394	0.422	0.450	0.478	0.507
50	0.507	0.535	0.563	0.592	0.620	0.649	0.677	0.705	0.734	0.762	0.791
60	0.791	0.819	0.848	0.875	0.905	0.933	0.962	0.991	1.019	1.048	1.076
70	1.076	1.105	1.134	1.162	1.191	1.220	1.249	1.277	1.306	1.335	1.364
80	1.364	1.392	1.421	1.450	1.479	1.508	1.537	1.555	1.594	1.623	1.652
90	1.652	1.681	1.710	1.739	1.768	1.797	1.826	1.855	1.884	1.913	1.942
100	1.942	1.972	2.001	2.030	2.059	2.088	2.117	2.146	2.175	2.205	2.234
110	2.234	2.263	2.292	2.322	2.351	2.380	2.409	2.439	2.468	2.497	2.527
120	2.527	2.556	2.585	2.615	2.644	2.673	2.703	2.732	2.762	2.791	2.821
130	2.821	2.850	2.880	2.909	2.938	2.968	2.997	3.027	3.057	3.086	3.116
140	3.116	3.145	3.175	3.204	3.234	3.264	3.293	3.323	3.353	3.382	3.412
150	3.412	3.442	3.471	3.501	3.531	3.560	3.590	3.620	3.650	3.679	3.709
160	3.709	3.739	3.769	3.798	3.828	3.858	3.888	3.918	3.948	3.977	4.007
170	4.007	4.037	4.057	4.097	4.127	4.157	4.187	4.217	4.246	4.276	4.306
180	4.305	4.336	4.366	4.396	4.426	4.456	4.486	4.516	4.546	4.575	4.606
190	4.606	4.636	4.666	4.696	4.726	4.757	4.787	4.817	4.847	4.877	4.907

TABLE 13 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
200	4.907	4.937	4.967	4.997	5.028	5.058	5.088	5.118	5.148	5.178	5.209
210	5.209	5.239	5.269	5.299	5.329	5.360	5.390	5.420	5.450	5.480	5.511
220	5.511	5.541	5.571	5.602	5.632	5.662	5.692	5.723	5.753	5.783	5.814
230	5.814	5.844	5.874	5.905	5.935	5.965	5.996	6.026	6.056	6.087	6.117
240	6.117	6.147	6.178	6.208	6.239	6.269	6.299	6.330	6.360	6.391	6.421
250	6.421	6.452	6.482	6.512	6.543	6.573	6.604	5.634	6.655	6.695	6.726
260	6.726	6.756	6.787	6.817	6.848	6.878	6.909	6.939	6.970	7.000	7.031
270	7.031	7.061	7.092	7.122	7.153	7.184	7.214	7.245	7.275	7.306	7.336
280	7.336	7.367	7.398	7.428	7.459	7.489	7.520	7.550	7.581	7.612	7.642
290	7.642	7.673	7.704	7.734	7.765	7.795	7.826	7.857	7.887	7.918	7.949
300	7.949	7.979	8.010	8.041	8.071	8.102	8.133	8.163	8.194	8.225	8.255
310	8.255	8.286	8.317	8.347	8.378	8.409	8.439	8.470	8.501	8.532	8.562
320	8.562	8.593	8.624	8.654	8.685	8.716	8.747	8.777	8.808	8.839	8.869
330	8.869	8.900	8.931	8.962	8.992	9.023	9.054	9.085	9.115	9.146	9.177
340	9.177	9.208	9.238	9.269	9.300	9.331	9.362	9.392	9.423	9.454	9.485
350	9.485	9.515	9.546	9.577	9.608	9.639	9.669	9.700	9.731	9.762	9.793
360	9.793	9.823	9.854	9.885	9.916	9.947	9.977	10.008	10.039	10.070	10.101
370	10.101	10.131	10.162	10.193	10.224	10.255	10.285	10.315	10.347	10.378	10.409
380	10.409	10.440	10.470	10.501	10.532	10.563	10.594	10.625	10.655	10.686	10.717
390	10.717	10.748	10.779	10.810	10.840	10.871	10.902	10.933	10.964	10.995	11.025
400	11.025	11.056	11.087	11.118	11.149	11.180	11.211	11.241	11.272	11.303	11.334
410	11.334	11.365	11.396	11.426	11.457	11.488	11.519	11.550	11.581	11.612	11.642
420	11.642	11.673	11.704	11.735	11.766	11.797	11.828	11.858	11.889	11.920	11.951
430	11.951	11.982	12.013	12.044	12.074	12.105	12.136	12.167	12.198	12.229	12.260
440	12.260	12.290	12.321	12.352	12.383	12.414	12.445	12.476	12.506	12.537	12.568
450	12.568	12.599	12.630	12.661	12.691	12.722	12.753	12.784	12.815	12.846	12.877
460	12.877	12.907	12.938	12.969	13.000	13.031	13.062	13.093	13.123	13.154	13.185
470	13.185	13.216	13.247	13.278	13.308	13.339	13.370	13.401	13.432	13.463	13.494
480	13.494	13.524	13.555	13.586	13.617	13.648	13.679	13.709	13.740	13.771	13.802
490	13.802	13.833	13.864	13.894	13.925	13.956	13.987	14.018	14.049	14.079	14.110
500	14.110	14.141	14.172	14.203	14.233	14.264	14.295	14.326	14.357	14.388	14.418
510	14.418	14.449	14.480	14.511	14.542	14.573	14.603	14.634	14.665	14.696	14.727
520	14.727	14.757	14.788	14.819	14.850	14.881	14.911	14.942	14.973	15.004	15.035
530	15.035	15.065	15.096	15.127	15.158	15.189	15.219	15.250	15.281	15.312	15.343
540	15.343	15.373	15.404	15.435	15.466	15.496	15.527	15.558	15.589	15.620	15.650
550	15.650	15.681	15.712	15.743	15.773	15.804	15.835	15.866	15.897	15.927	15.958
560	15.958	15.989	16.020	16.050	16.081	16.112	16.143	16.173	16.204	16.235	16.266
570	16.266	16.296	16.327	16.358	16.389	16.419	16.450	16.481	16.512	16.542	16.573
580	16.573	16.604	16.635	16.665	16.696	16.727	15.758	15.788	16.819	16.850	16.881
590	16.881	16.911	16.942	16.973	17.003	17.034	17.065	17.096	17.126	17.157	17.188
600	17.188	17.219	17.249	17.280	17.311	17.341	17.372	17.403	17.434	17.464	17.495
610	17.495	17.526	17.556	17.587	17.618	17.649	17.679	17.710	17.741	17.771	17.802
620	17.802	17.833	17.863	17.894	17.925	17.955	17.986	18.017	18.048	18.078	18.109
630	18.109	18.140	18.170	18.201	18.232	18.262	18.293	18.324	18.354	18.385	18.416
640	18.416	18.446	18.477	18.508	18.538	18.569	18.600	18.630	18.661	18.692	18.722
650	18.722	18.753	18.784	18.815	18.845	18.876	18.906	18.937	18.968	18.998	19.029
660	19.029	19.060	19.090	19.121	19.152	19.182	19.213	19.244	19.274	19.305	19.336
670	19.336	19.366	19.397	19.428	19.458	19.489	19.520	19.550	19.581	19.612	19.642
680	19.642	19.673	19.704	19.734	19.765	19.795	19.826	19.857	19.887	19.918	19.949
690	19.949	19.979	20.010	20.041	20.071	20.102	20.132	20.163	20.194	20.224	20.255
700	20.255	20.286	20.316	20.347	20.378	20.408	20.439	20.469	20.500	20.531	20.561
710	20.561	20.592	20.623	20.653	20.684	20.715	20.745	20.776	20.806	20.837	20.868
720	20.858	20.898	20.929	20.960	20.990	21.021	21.052	21.082	21.113	21.143	21.174
730	21.174	21.205	21.235	21.266	21.297	21.327	21.358	21.389	21.419	21.450	21.480
740	21.480	21.511	21.542	21.572	21.603	21.634	21.664	21.695	21.726	21.756	21.787
750	21.787	21.817	21.848	21.879	21.909	21.940	21.971	22.001	22.032	22.063	22.093
760	22.093	22.124	22.154	22.185	22.216	22.246	22.277	22.308	22.338	22.369	22.400
770	22.400	22.430	22.461	22.492	22.522	22.553	22.584	22.614	22.645	22.676	22.706
780	22.706	22.737	22.768	22.798	22.829	22.860	22.890	22.921	22.952	22.982	23.013
790	23.013	23.044	23.074	23.105	23.136	23.166	23.197	23.228	23.258	23.289	23.320

TABLE 13 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
800	23.320	23.350	23.381	23.412	23.442	23.473	23.504	23.535	23.565	23.596	23.627
810	23.627	23.657	23.688	23.719	23.749	23.780	23.811	23.842	23.872	23.903	23.934
820	23.934	23.964	23.995	24.026	24.057	24.087	24.118	24.149	24.180	24.210	24.241
830	24.241	24.272	24.303	24.333	24.364	24.395	24.426	24.456	24.487	24.518	24.549
840	24.549	24.579	24.610	24.641	24.672	24.702	24.733	24.764	24.795	24.826	24.856
850	24.856	24.887	24.918	24.949	24.979	25.010	25.041	25.072	25.103	25.134	25.164
850	25.164	25.195	25.226	25.257	25.288	25.318	25.349	25.380	25.411	25.442	25.473
870	25.473	25.504	25.534	25.565	25.596	25.627	25.658	25.689	25.720	25.750	25.781
880	25.781	25.812	25.843	25.874	25.905	25.936	25.967	25.998	26.029	26.059	26.090
890	26.090	26.121	26.152	26.183	26.214	26.245	26.276	26.307	26.338	26.359	26.400
900	26.400	26.431	26.462	26.493	26.524	26.555	26.586	26.617	26.648	26.679	26.710
910	26.710	26.741	26.772	26.803	26.834	26.865	26.896	26.927	26.958	26.989	27.020
920	27.020	27.051	27.082	27.113	27.144	27.175	27.206	27.237	27.268	27.299	27.330
930	27.330	27.362	27.393	27.424	27.455	27.486	27.517	27.548	27.579	27.610	27.642
940	27.642	27.673	27.704	27.735	27.766	27.797	27.829	27.860	27.891	27.922	27.953
950	27.953	27.985	28.016	28.047	28.078	28.109	28.141	28.172	28.203	28.234	28.266
950	28.266	28.297	28.328	28.359	28.391	28.422	28.453	28.485	28.516	28.547	28.579
970	28.579	28.610	28.641	28.672	28.704	28.735	28.767	28.798	28.829	28.861	28.892
980	28.892	28.923	28.955	28.986	29.018	29.049	29.080	29.112	29.143	29.175	29.206
990	29.206	29.238	29.269	29.301	29.332	29.363	29.395	29.426	29.458	29.489	29.521
1000	29.521	29.552	29.584	29.616	29.647	29.679	29.710	29.742	29.773	29.805	29.836
1010	29.836	29.868	29.900	29.931	29.963	29.995	30.026	30.058	30.089	30.121	30.153
1020	30.153	30.184	30.216	30.248	30.279	30.311	30.343	30.375	30.406	30.438	30.470
1030	30.470	30.502	30.533	30.565	30.597	30.629	30.660	30.592	30.724	30.756	30.788
1040	30.788	30.819	30.851	30.883	30.915	30.947	30.979	31.011	31.043	31.074	31.106
1050	31.106	31.138	31.170	31.202	31.234	31.266	31.298	31.330	31.362	31.394	31.426
1060	31.426	31.458	31.490	31.522	31.554	31.586	31.618	31.650	31.682	31.714	31.746
1070	31.746	31.778	31.811	31.843	31.875	31.907	31.939	31.971	32.003	32.035	32.068
1080	32.068	32.100	32.132	32.164	32.196	32.229	32.261	32.293	32.325	32.358	32.390
1090	32.390	32.422	32.455	32.487	32.519	32.551	32.584	32.616	32.648	32.681	32.713
1100	32.713	32.746	32.778	32.810	32.843	32.875	32.908	32.940	32.973	33.005	33.037
1110	33.037	33.070	33.102	33.135	33.167	33.200	33.232	33.265	33.298	33.330	33.363
1120	33.363	33.395	33.428	33.460	33.493	33.526	33.558	33.591	33.624	33.656	33.689
1130	33.689	33.722	33.754	33.787	33.820	33.853	33.885	33.918	33.951	33.984	34.016
1140	34.016	34.049	34.082	34.115	34.148	34.180.	34.213	34.246	34.279	34.312	34.345
1150	34.345	34.378	34.411	34.444	34.476	34.509	34..542	34.575	34.608	34.641	34.674
1160	34.674	34.707	34.740	34.773	34.806	34.840	34.873	34.906	34.939	34.972	35.005
1170	35.005	35.038	35.071	35.104	35.138	35.171	35.204	35.237	35.270	35.304	35.337
1180	35.337	35.370	35.403	35.437	35.470	35.503	35.536	35.570	35.603	35.636	35.670
1190	35.670	35.703	35.736	35.770	35.803	35.837	35.870	35.903	35.937	35.970	36.004
1200	36.004	36.037	36.071	36.104	36.138	36.171	36.205	36.238	36.272	36.305	35.339
1210	36.339	36.373	36.406	36.440	36.473	35.507	36.541	36.574	36.608	36.642	36.675
1220	36.675	36.709	36.743	36.777	36.810	36.844	36.878	36.912	36.945	36.979	37.013
1230	37.013	37.047	37.081	37.114	37.148	37.182	37.216	37.250	37.284	37.318	37.352
1240	37.352	37.386	37.420	37.454	37.488	37.522	37.556	37.590	37.624	37.658	37.692
1250	37.692	37.726	37.760	37.794	37.828	37.862	37.896	37.930	37.964	37.999	38.033
1260	38.033	38.067	38.101	38.135	38.169	38.204	38.238	38.272	38.306	38.341	38.375
1270	38.375	38.409	38.444	38.478	38.512	38.546	38.581	38.615	38.650	38.684	38.718
1280	38.718	38.753	38.787	38.822	38.856	38.890	38.925	38.959	38.994	39.028	39.063
1290	39.063	39.097	39.132	39.166	39.201	39.235	39.270	39.305	39.339	39.374	39.408
1300	39.408	39.443	39.478	39.512	39.547	39.582	39.616	39.651	39.686	39.720	39.755
1310	39.755	39.790	39.825	39.859	39.894	39.929	39.964	39.998	40.033	40.068	40.103
1320	40.103	40.138	40.173	40.207	40.242	40.277	40.312	40.347	40.382	40.417	40.452
1330	40.452	40.487	40.522	40.556	40.591	40.626	40.661	40.695	40.731	40.766	40.801
1340	40.801	40.836	40.872	40.907	40.942	40.977	41.012	41.047	41.082	41.117	41.152
1350	41.152	41.187	41.222	41.258	41.293	41.328	41.363	41.398	41.433	41.469	41.504
1360	41.504	41.539	41.574	41.610	41.645	41.680	41.715	41.751	41.786	41.821	41.856
1370	41.856	41.892	41.927	41.962	41.998	42.033	42.068	42.104	42.139	42.174	42.210
1380	42.210	42.245	42.281	42.316	42.351	42.387	42.422	42.458	42.493	42.528	42.564

TABLE 13 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1390	42.564	42.599	42.635	42.670	42.706	42.741	42.777	42.812	42.848	42.883	42.919
1400	42.919	42.954	42.990	43.025	43.061	43.096	43.132	43.167	43.203	43.239	43.274
1410	43.274	43.310	43.346	43.381	43.417	43.452	43.488	43.524	43.559	43.595	43.631
1420	43.631	43.667	43.702	43.738	43.774	43.809	43.845	43.881	43.917	43.953	43.988
1430	43.988	44.024	44.060	44.096	44.131	44.167	44.203	44.239	44.275	44.310	44.346
1440	44.346	44.382	44.418	44.454	44.490	44.525	44.561	44.597	44.633	44.669	44.705
1450	44.705	44.741	44.777	44.812	44.848	44.884	44.920	44.956	44.992	45.028	45.064
1460	45.064	45.099	45.135	45.171	45.207	45.243	45.279	45.315	45.351	45.387	45.423
1470	45.423	45.458	45.494	45.530	45.566	45.602	45.638	45.674	45.710	45.746	45.782
1480	45.782	45.818	45.853	45.889	45.925	45.961	45.997	46.033	46.069	46.105	46.141
1490	46.141	46.177	46.212	46.248	46.284	46.320	46.356	46.392	46.428	46.464	46.500
1500	46.500	46.535	46.571	46.607	46.643	46.679	46.715	46.751	46.786	46.822	46.858
1510	46.858	46.894	46.930	46.966	47.001	47.037	47.073	47.109	47.145	47.181	47.216
1520	47.216	47.252	47.288	47.324	47.359	47.395	47.431	47.467	47.503	47.538	47.574
1530	47.574	47.610	47.646	47.681	47.717	47.753	47.788	47.824	47.860	47.896	47.931
1540	47.931	47.967	48.003	48.038	48.074	48.110	48.145	48.181	48.217	48.252	48.288
1550	48.288	48.324	48.359	48.395	48.430	48.466	48.502	48.537	48.573	48.608	48.644
1560	48.644	48.679	48.715	48.750	48.786	48.822	48.857	48.893	48.928	48.964	48.999
1570	48.999	49.034	49.070	49.105	49.141	49.176	49.212	49.247	49.283	49.318	49.353
1580	49.353	49.389	49.424	49.460	49.495	49.530	49.566	49.601	49.636	49.672	49.707
1590	49.707	49.742	49.778	49.813	49.848	49.883	49.919	49.954	49.989	50.024	50.060
1600	50.060	50.095	50.130	50.165	50.200	50.235	50.271	50.306	50.341	50.376	50.411
1510	50.411	50.446	50.481	50.517	50.552	50.587	50.622	50.657	50.692	50.727	50.762
1620	50.762	50.797	50.832	50.867	50.902	50.937	50.972	51.007	51.042	51.077	51.112
1630	51.112	51.147	51.181	51.216	51.251	51.286	51.321	51.356	51.391	51.425	51.460
1640	51.460	51.495	51.530	51.565	51.599	51.634	51.669	51.704	51.738	51.773	51.808
1650	51.808	51.843	51.877	51.912	51.947	51.981	52.016	52.051	52.085	52.120	52.154
1660	52.154	52.189	52.224	52.258	52.293	52.327	52.362	52.396	52.431	52.465	52.500
1670	52.500	52.534	52.569	52.603	52.638	52.672	52.707	52.741	52.776	52.810	52.844
1680	52.844	52.879	52.913	52.947	52.982	53.016	53.050	53.085	53.119	53.153	53.188
1690	53.188	53.222	53.256	53.290	53.325	53.359	53.393	53.427	53.462	53.496	53.530
1700	53.530	53.564	53.598	53.632	53.667	53.701	53.735	53.769	53.803	53.837	53.871
1710	53.871	53.905	53.939	53.973	54.007	54.041	54.075	54.109	54.143	54.177	54.211
1720	54.211	54.245	54.279	54.313	54.347	54.381	54.415	54.449	54.483	54.516	54.550
1730	54.550	54.584	54.618	54.652	54.686	54.719	54.753	54.787	54.821	54.855	54.888
1740	54.888	54.922	54.956	54.990	55.023	55.057	55.091	55.124	55.158	55.192	55.225
1750	55.225	55.259	55.293	55.326	55.360	55.393	55.427	55.461	55.494	55.528	55.561
1760	55.561	55.595	55.628	55.662	55.695	55.729	55.762	55.796	55.829	55.863	55.896
1770	55.896	55.930	55.963	55.997	56.030	56.063	56.097	56.130	56.164	56.197	56.230
1780	56.230	56.264	56.297	56.330	56.364	56.397	56.430	56.464	56.497	56.530	56.564
1790	56.564	56.597	56.630	56.663	56.697	56.730	56.763	56.796	56.829	56.863	56.896
1800	56.896	56.929	56.962	56.995	57.028	57.062	57.095	57.128	57.161	57.194	57.227
1810	57.227	57.260	57.293	57.326	57.350	57.393	57.426	57.459	57.492	57.525	57.558
1820	57.558	57.591	57.624	57.657	57.690	57.723	57.756	57.789	57.822	57.855	57.888
1830	57.888	57.920	57.953	57.986	58.019	58.052	58.085	58.118	58.151	58.184	58.217
1840	58.217	58.249	58.282	58.315	58.348	58.381	58.414	58.446	58.479	58.512	58.545
1850	58.545	58.578	58.610	58.643	58.676	58.709	58.741	58.774	58.807	58.840	58.872
1860	58.872	58.905	58.938	58.971	59.003	59.036	59.069	59.101	59.134	59.167	59.199
1870	59.199	59.232	59.265	59.297	59.330	59.363	59.395	59.428	59.460	59.493	59.526
1880	59.526	59.558	59.591	59.623	59.656	59.689	59.721	59.754	59.786	59.819	59.851
1890	59.851	59.884	59.916	59.949	59.982	60.014	60.047	60.079	60.112	60.144	60.177
1900	60.177	60.209	60.242	60.274	60.307	60.339	60.371	60.404	60.436	60.469	60.501
1910	60.501	60.534	60.566	60.599	60.631	60.663	60.696	60.728	60.761	60.793	60.826
1920	60.826	60.858	60.890	60.923	60.955	60.987	61.020	61.052	61.085	61.117	61.149
1930	61.149	61.182	61.214	61.246	61.279	61.311	61.343	61.376	61.408	61.440	61.473
1940	61.473	61.505	61.537	61.570	61.602	61.634	61.667	61.699	61.731	61.763	61.796
1950	61.796	61.828	61.860	61.893	61.925	61.957	61.989	62.022	62.054	62.086	62.118
1960	62.118	62.151	62.183	62.215	62.247	62.280	62.312	62.344	62.376	62.409	62.441
1970	62.441	62.473	62.505	62.537	62.570	62.602	62.634	62.666	62.699	62.731	62.763

TABLE 13 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1980	62.763	62.795	62.827	62.860	62.892	62.924	62.956	62.988	63.020	63.053	63.085
1990	63.085	63.117	63.149	63.181	63.214	63.246	63.278	63.310	63.342	63.374	63.406
2000	63.406	63.439	63.471	63.503	63.535	63.567	63.599	63.632	63.664	63.696	63.728
2010	63.728	63.760	63.792	63.824	63.856	63.889	63.921	63.953	63.985	64.017	64.049
2020	64.049	64.081	64.113	64.146	64.178	64.210	64.242	64.274	64.306	64.338	64.370
2030	64.370	64.402	64.435	64.467	64.499	64.531	64.563	64.595	64.627	64.659	64.691
2040	64.691	64.723	64.756	64.788	64.820	64.852	64.884	64.916	64.948	64.980	65.012
2050	65.012	65.044	65.076	65.109	65.141	65.173	65.205	65.237	65.269	65.301	65.333
2060	65.333	65.365	65.397	65.429	65.461	65.493	65.525	65.557	65.590	55.622	65.654
2070	65.654	65.686	65.718	65.750	65.782	65.814	65.846	65.878	65.910	65.942	65.974
2080	65.974	66.006	66.038	66.070	66.102	66.134	66.166	66.199	66.231	66.263	66.295
2090	66.295	66.327	66.359	66.391	66.423	66.455	66.487	66.519	66.551	66.583	66.615
2100	66.615	66.647	66.679	66.711	66.743	66.775	66.807	66.839	66.871	66.903	66.935
2110	66.935	66.967	66.999	67.031	67.063	67.095	67.127	67.159	67.191	67.223	67.255
2120	67.255	67.287	67.319	67.351	67.383	67.415	67.447	67.479	67.511	67.543	67.575
2130	67.575	67.607	67.639	67.671	67.703	67.735	67.767	67.799	67.831	67.863	67.895
2140	67.895	67.927	67.959	67.991	68.023	68.055	68.087	68.119	68.150	68.182	68.214
2150	68.214	68.246	68.278	68.310	68.342	68.374	68.406	68.438	68.470	68.502	68.534
2160	68.534	68.566	68.597	68.629	68.661	68.693	68.725	68.757	68.789	68.821	68.853
2170	68.853	68.884	68.916	68.948	68.980	69.012	69.044	69.076	69.108	69.139	69.171
2180	69.171	69.203	69.235	69.267	69.299	69.330	69.362	69.394	69.426	69.458	69.490
2190	69.490	69.521	69.553								

TABLE 14 Type K Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–6.458										
–260	–6.441	–6.444	–6.446	–6.448	–6.450	–6.452	–6.453	–6.455	–6.456	–6.457	–6.458
–250	–6.404	–6.408	–6.413	–6.417	–6.421	–6.425	–6.429	–6.432	–6.435	–6.438	–6.441
–240	–6.344	–6.351	–6.358	–6.364	–6.370	–6.377	–6.382	–6.388	–6.393	–6.399	–6.404
–230	–6.262	–6.271	–6.280	–6.289	–6.297	–6.306	–6.314	–6.322	–6.329	–6.337	–6.344
–220	–6.158	–6.170	–6.181	–6.192	–6.202	–6.213	–6.223	–6.233	–6.243	–6.252	–6.262
–210	–6.035	–6.048	–6.061	–6.074	–6.087	–6.099	–6.111	–6.123	–6.135	–6.147	–6.158
–200	–5.891	–5.907	–5.922	–5.936	–5.951	–5.965	–5.980	–5.994	–6.007	–6.021	–6.035
–190	–5.730	–5.747	–5.763	–5.780	–5.797	–5.813	–5.829	–5.845	–5.861	–5.876	–5.891
–180	–5.550	–5.569	–5.588	–5.606	–5.624	–5.642	–5.660	–5.678	–5.695	–5.713	–5.730
–170	–5.354	–5.374	–5.395	–5.415	–5.435	–5.454	–5.474	–5.493	–5.512	–5.531	–5.550
–160	–5.141	–5.163	–5.185	–5.207	–5.228	–5.250	–5.271	–5.292	–5.313	–5.333	–5.354
–150	–4.913	–4.936	–4.960	–4.983	–5.006	–5.029	–5.052	–5.074	–5.097	–5.119	–5.141
–140	–4.669	–4.694	–4.719	–4.744	–4.768	–4.793	–4.817	–4.841	–4.865	–4.889	–4.913
–130	–4.411	–4.437	–4.463	–4.490	–4.516	–4.542	–4.567	–4.593	–4.618	–4.644	–4.569
–120	–4.138	–4.166	–4.194	–4.221	–4.249	–4.276	–4.303	–4.330	–4.357	–4.384	–4.411
–110	–3.852	–3.882	–3.911	–3.939	–3.968	–3.997	–4.025	–4.054	–4.082	–4.110	–4.138
–100	–3.554	–3.584	–3.614	–3.645	–3.675	–3.705	–3.734	–3.764	–3.794	–3.823	–3.852
–90	–3.243	–3.274	–3.306	–3.337	–3.368	–3.400	–3.431	–3.462	–3.492	–3.523	–3.554
–80	–2.920	–2.953	–2.986	–3.018	–3.050	–3.083	–3.115	–3.147	–3.179	–3.211	–3.243
–70	–2.587	–2.620	–2.654	–2.688	–2.721	–2.755	–2.788	–2.821	–2.854	–2.887	–2.920
–60	–2.243	–2.278	–2.312	–2.347	–2.382	–2.416	–2.450	–2.485	–2.519	–2.553	–2.587
–50	–1.889	–1.925	–1.961	–1.996	–2.032	–2.067	–2.103	–2.138	–2.173	–2.208	–2.243
–40	–1.527	–1.564	–1.600	–1.637	–1.673	–1.709	–1.745	–1.782	–1.818	–1.854	–1.889
–30	–1.156	–1.194	–1.231	–1.268	–1.305	–1.343	–1.380	–1.417	–1.453	–1.490	–1.527
–20	–0.778	–0.816	–0.854	–0.892	–0.930	–0.968	–1.006	–1.043	–1.081	–1.119	–1.156
–10	–0.392	–0.431	–0.470	–0.508	–0.547	–0.586	–0.624	–0.663	–0.701	–0.739	–0.778
0	0.000	–0.039	–0.079	–0.118	–0.157	–0.197	–0.236	–0.275	–0.314	–0.353	–0.392
0	0.000	0.039	0.079	0.119	0.158	0.198	0.238	0.277	0.317	0.357	0.397
10	0.397	0.437	0.477	0.517	0.557	0.597	0.637	0.677	0.718	0.758	0.798
20	0.798	0.838	0.879	0.919	0.960	1.000	1.041	1.081	1.122	1.163	1.203
30	1.203	1.244	1.285	1.326	1.366	1.407	1.448	1.489	1.530	1.571	1.612
40	1.612	1.653	1.694	1.735	1.776	1.817	1.858	1.899	1.941	1.982	2.023
50	2.023	2.064	2.106	2.147	2.188	2.230	2.271	2.312	2.354	2.395	2.436
60	2.436	2.478	2.519	2.561	2.602	2.644	2.685	2.727	2.768	2.810	2.851
70	2.851	2.893	2.934	2.976	3.017	3.059	3.100	3.142	3.184	3.225	3.267
80	3.267	3.308	3.350	3.391	3.433	3.474	3.516	3.557	3.599	3.640	3.682
90	3.682	3.723	3.765	3.806	3.848	3.889	3.931	3.972	4.013	4.055	4.096
100	4.096	4.138	4.179	4.220	4.262	4.303	4.344	4.385	4.427	4.468	4.509
110	4.509	4.550	4.591	4.633	4.674	4.715	4.756	4.797	4.838	4.879	4.920
120	4.920	4.961	5.002	5.043	5.084	5.124	5.165	5.206	5.247	5.288	5.328
130	5.328	5.369	5.410	5.450	5.491	5.532	5.572	5.613	5.653	5.694	5.735
140	5.735	5.775	5.815	5.856	5.896	5.937	5.977	6.017	6.058	6.098	6.138
150	6.138	6.179	6.219	6.259	6.299	6.339	6.380	6.420	6.460	6.500	6.540
160	6.540	6.580	6.620	6.660	6.701	6.741	6.781	6.821	6.861	6.901	6.941
170	6.941	6.981	7.021	7.060	7.100	7.140	7.180	7.220	7.260	7.300	7.340
180	7.340	7.380	7.420	7.460	7.500	7.540	7.579	7.619	7.659	7.699	7.739
190	7.739	7.779	7.819	7.859	7.899	7.939	7.979	8.019	8.059	8.099	8.138
200	8.138	8.178	8.218	8.258	8.298	8.338	8.378	8.418	8.458	8.499	8.539
210	8.539	8.579	8.619	8.659	8.699	8.739	8.779	8.819	8.860	8.900	8.940
220	8.940	8.980	9.020	9.061	9.101	9.141	9.181	9.222	9.252	9.302	9.343
230	9.343	9.383	9.423	9.464	9.504	9.545	9.585	9.626	9.666	9.707	9.747
240	9.747	9.788	9.828	9.869	9.909	9.950	9.991	10.031	10.072	10.113	10.153
250	10.153	10.194	10.235	10.276	10.316	10.357	10.398	10.439	10.480	10.520	10.561
260	10.561	10.602	10.643	10.684	10.725	10.766	10.807	10.848	10.889	10.930	10.971
270	10.971	11.012	11.053	11.094	11.135	11.176	11.217	11.259	11.300	11.341	11.382
280	11.382	11.423	11.465	11.506	11.547	11.588	11.630	11.671	11.712	11.753	11.795
290	11.795	11.836	11.877	11.919	11.960	12.001	12.043	12.084	12.126	12.167	12.209
300	12.209	12.250	12.291	12.333	12.374	12.416	12.457	12.499	12.540	12.582	12.624

TABLE 14 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	12.624	12.665	12.707	12.748	12.790	12.831	12.873	12.915	12.956	12.998	13.040
320	13.040	13.081	13.123	13.165	13.206	13.248	13.290	13.331	13.373	13.415	13.457
330	13.457	13.498	13.540	13.582	13.624	13.665	13.707	13.749	13.791	13.833	13.874
340	13.874	13.916	13.958	14.000	14.042	14.084	14.126	14.167	14.209	14.251	14.293
350	14.293	14.335	14.377	14.419	14.461	14.503	14.545	14.587	14.629	14.671	14.713
360	14.713	14.755	14.797	14.839	14.881	14.923	14.965	15.007	15.049	15.091	15.133
370	15.133	15.175	15.217	15.259	15.301	15.343	15.385	15.427	15.469	15.511	15.554
380	15.554	15.596	15.638	15.680	15.722	15.764	15.806	15.849	15.891	15.933	15.975
390	15.975	16.017	16.059	16.102	16.144	16.186	15.228	16.270	16.313	16.355	16.397
400	16.397	16.439	16.482	16.524	16.566	16.608	16.651	16.693	16.735	16.778	16.820
410	16.820	16.862	16.904	16.947	16.989	17.031	17.074	17.116	17.158	17.201	17.243
420	17.243	17.285	17.328	17.370	17.413	17.455	17.497	17.540	17.582	17.624	17.667
430	17.667	17.709	17.752	17.794	17.837	17.879	17.921	17.964	18.006	18.049	18.091
440	18.091	18.134	18.176	18.218	18.261	18.303	18.345	18.388	18.431	18.473	18.516
450	18.516	18.558	18.601	18.643	18.686	18.728	18.771	18.813	18.856	18.898	18.941
460	18.941	18.983	19.026	19.068	19.111	19.154	19.196	19.239	19.281	19.324	19.366
470	19.366	19.409	19.451	19.494	19.537	19.579	19.622	19.664	19.707	19.750	19.792
480	19.792	19.835	19.877	19.920	19.962	20.005	20.048	20.090	20.133	20.175	20.218
490	20.218	20.261	20.303	20.346	20.389	20.431	20.474	20.516	20.559	20.602	20.644
500	20.644	20.687	20.730	20.772	20.815	20.857	20.900	20.943	20.985	21.028	21.071
510	21.071	21.113	21.156	21.199	21.241	21.284	21.326	21.369	21.412	21.454	21.497
520	21.497	21.540	21.582	21.625	21.668	21.710	21.753	21.796	21.838	21.881	21.924
530	21.924	21.966	22.009	22.052	22.094	22.137	22.179	22.222	22.265	22.307	22.350
540	22.350	22.393	22.435	22.478	22.521	22.563	22.605	22.649	22.691	22.734	22.776
550	22.776	22.819	22.862	22.904	22.947	22.990	23.032	23.075	23.117	23.160	23.203
560	23.203	23.245	23.288	23.331	23.373	23.416	23.458	23.501	23.544	23.586	23.629
570	23.629	23.671	23.714	23.757	23.799	23.842	23.884	23.927	23.970	24.012	24.055
580	24.055	24.097	24.140	24.182	24.225	24.267	24.310	24.353	24.395	24.438	24.480
590	24.480	24.523	24.565	24.608	24.650	24.693	24.735	24.778	24.820	24.863	24.905
600	24.905	24.948	24.990	25.033	25.075	25.118	25.160	25.203	25.245	25.288	25.330
610	25.330	25.373	25.415	25.458	25.500	25.543	25.585	25.627	25.670	25.712	25.755
620	25.755	25.797	25.840	25.882	25.924	25.967	26.009	26.052	26.094	26.136	26.179
630	26.179	26.221	26.263	26.306	26.348	26.390	26.433	26.475	26.517	26.560	26.602
640	26.602	26.644	26.687	26.729	26.771	26.814	26.856	26.898	26.940	26.983	27.025
650	27.025	27.067	27.109	27.152	27.194	27.236	27.278	27.320	27.363	27.405	27.447
660	27.447	27.489	27.531	27.574	27.616	27.658	27.700	27.742	27.784	27.826	27.869
670	27.869	27.911	27.953	27.995	28.037	28.079	28.121	28.163	28.205	28.247	28.289
680	28.289	28.332	28.374	28.416	28.458	28.500	28.542	28.584	28.626	28.668	28.710
690	28.710	28.752	28.794	28.835	28.877	28.919	28.961	29.003	29.045	29.087	29.129
700	29.129	29.171	29.213	29.255	29.297	29.338	29.380	29.422	29.464	29.506	29.548
710	29.548	29.589	29.631	29.673	29.715	29.757	29.798	29.840	29.882	29.924	29.965
720	29.965	30.007	30.049	30.090	30.132	30.174	30.216	30.257	30.299	30.341	30.382
730	30.382	30.424	30.466	30.507	30.549	30.590	30.632	30.674	30.715	30.757	30.798
740	30.798	30.840	30.881	30.923	30.964	31.006	31.047	31.089	31.130	31.172	31.213
750	31.213	31.255	31.296	31.338	31.379	31.421	31.462	31.504	31.545	31.586	31.628
760	31.628	31.669	31.710	31.752	31.793	31.834	31.876	31.917	31.958	32.000	32.041
770	32.041	32.082	32.124	32.165	32.206	32.247	32.289	32.330	32.371	32.412	32.453
780	32.453	32.495	32.536	32.577	32.618	32.659	32.700	32.742	32.783	32.824	32.865
790	32.865	32.906	32.947	32.988	33.029	33.070	33.111	33.152	33.193	33.234	33.275
800	33.275	33.316	33.357	33.398	33.439	33.480	33.521	33.562	33.603	33.644	33.685
810	33.685	33.726	33.767	33.808	33.848	33.889	33.930	33.971	34.012	34.053	34.093
820	34.093	34.134	34.175	34.216	34.257	34.297	34.338	34.379	34.420	34.460	34.501
830	34.501	34.542	34.582	34.623	34.664	34.704	34.745	34.786	34.826	34.867	34.908
840	34.908	34.948	34.989	35.029	35.070	35.110	35.151	35.192	35.232	35.273	35.313
850	35.313	35.354	35.394	35.435	35.475	35.516	35.556	35.596	35.637	35.677	35.718
860	35.718	35.758	35.798	35.839	35.879	35.920	35.960	36.000	36.041	36.081	36.121
870	36.121	36.162	36.202	36.242	36.282	36.323	36.363	36.403	36.443	36.484	36.524
880	36.524	36.564	36.604	36.644	36.685	36.725	36.765	36.805	36.845	36.885	36.925
890	36.925	36.965	37.006	37.046	37.086	37.126	37.166	37.206	37.246	37.286	37.326

TABLE 14 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
900	37.326	37.366	37.406	37.446	37.486	37.526	37.566	37.606	37.646	37.686	37.725
910	37.725	37.765	37.805	37.845	37.885	37.925	37.965	38.005	38.044	38.084	38.124
920	38.124	38.164	38.204	38.243	38.283	38.323	38.363	38.402	38.442	38.482	38.522
930	38.522	38.561	38.601	38.641	38.680	38.720	38.760	38.799	38.839	38.878	38.918
940	38.918	38.958	38.997	39.037	39.076	39.116	39.155	39.195	39.235	39.274	39.314
950	39.314	39.353	39.393	39.432	39.471	39.511	39.550	39.590	39.629	39.669	39.708
960	39.708	39.747	39.787	39.826	39.866	39.905	39.944	39.984	40.023	40.062	40.101
970	40.101	40.141	40.180	40.219	40.259	40.298	40.337	40.376	40.415	40.455	40.494
980	40.494	40.533	40.572	40.611	40.651	40.690	40.729	40.768	40.807	40.846	40.885
990	40.885	40.924	40.963	41.002	41.042	41.081	41.120	41.159	41.198	41.237	41.276
1000	41.276	41.315	41.354	41.393	41.431	41.470	41.509	41.548	41.587	41.626	41.665
1010	41.665	41.704	41.743	41.781	41.820	41.859	41.898	41.937	41.976	42.014	42.053
1020	42.053	42.092	42.131	42.169	42.208	42.247	42.286	42.324	42.363	42.402	42.440
1030	42.440	42.479	42.518	42.556	42.595	42.633	42.672	42.711	42.749	42.788	42.826
1040	42.826	42.865	42.903	42.942	42.980	43.019	43.057	43.096	43.134	43.173	43.211
1050	43.211	43.250	43.288	43.327	43.365	43.403	43.442	43.480	43.518	43.557	43.595
1060	43.595	43.633	43.672	43.710	43.748	43.787	43.825	43.863	43.901	43.940	43.978
1070	43.978	44.016	44.054	44.092	44.130	44.169	44.207	44.245	44.283	44.321	44.359
1080	44.359	44.397	44.435	44.473	44.512	44.550	44.588	44.626	44.664	44.702	44.740
1090	44.740	44.778	44.816	44.853	44.891	44.929	44.967	45.005	45.043	45.081	45.119
1100	45.119	45.157	45.194	45.232	45.270	45.308	45.346	45.383	45.421	45.459	45.497
1110	45.497	45.534	45.572	45.610	45.647	45.685	45.723	45.760	45.798	45.836	45.873
1120	45.873	45.911	45.948	45.986	46.024	46.061	46.099	46.136	46.174	46.211	46.249
1130	46.249	46.286	46.324	46.361	46.398	46.436	46.473	46.511	46.548	46.585	46.623
1140	46.623	46.660	46.697	46.735	46.772	46.809	46.847	46.884	46.921	46.958	46.995
1150	46.995	47.033	47.070	47.107	47.144	47.181	47.218	47.256	47.293	47.330	47.367
1160	47.367	47.404	47.441	47.478	47.515	47.552	47.589	47.626	47.663	47.700	47.737
1170	47.737	47.774	47.811	47.848	47.884	47.921	47.958	47.995	48.032	48.069	48.105
1180	48.105	48.142	48.179	48.216	48.252	48.289	48.326	48.363	48.399	48.436	48.473
1190	48.473	48.509	48.546	48.582	48.619	48.656	48.692	48.729	48.765	48.802	48.838
1200	48.838	48.875	48.911	48.948	48.984	49.021	49.057	49.093	49.130	49.166	49.202
1210	49.202	49.239	49.275	49.311	49.348	49.384	49.420	49.456	49.493	49.529	49.565
1220	49.565	49.601	49.637	49.674	49.710	49.746	49.782	49.818	49.854	49.890	49.926
1230	49.926	49.962	49.998	50.034	50.070	50.106	50.142	50.178	50.214	50.250	50.286
1240	50.286	50.322	50.358	50.393	50.429	50.465	50.501	50.537	50.572	50.608	50.644
1250	50.644	50.680	50.715	50.751	50.787	50.822	50.858	50.894	50.929	50.965	51.000
1260	51.000	51.036	51.071	51.107	51.142	51.178	51.213	51.249	51.284	51.320	51.355
1270	51.355	51.391	51.426	51.461	51.497	51.532	51.567	51.603	51.638	51.673	51.708
1280	51.708	51.744	51.779	51.814	51.849	51.885	51.920	51.955	51.990	52.025	52.060
1290	52.060	52.095	52.130	52.165	52.200	52.235	52.270	52.305	52.340	52.375	52.410
1300	52.410	52.445	52.480	52.515	52.550	52.585	52.620	52.654	52.689	52.724	52.759
1310	52.759	52.794	52.828	52.863	52.898	52.932	52.967	53.002	53.037	53.071	53.106
1320	53.106	53.140	53.175	53.210	53.244	53.279	53.313	53.348	53.382	53.417	53.451
1330	53.451	53.486	53.520	53.555	53.589	53.623	53.658	53.692	53.727	53.761	53.795
1340	53.795	53.830	53.864	53.898	53.932	53.967	54.001	54.035	54.069	54.104	54.138
1350	54.138	54.172	54.206	54.240	54.274	54.308	54.343	54.377	54.411	54.445	54.479
1360	54.479	54.513	54.547	54.581	54.615	54.649	54.683	54.717	54.751	54.785	54.819
1370	54.819	54.852	54.886								

TABLE 15 Type K Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–6.456	–6.456	–6.457	–6.457	–6.458						
–440	–6.446	–6.448	–6.449	–6.450	–6.451	–6.452	–6.453	–6.454	–6.454	–6.455	–6.456
–430	–6.431	–6.433	–6.435	–6.436	–6.438	–6.440	–6.441	–6.443	–6.444	–6.445	–6.446
–420	–6.409	–6.411	–6.414	–6.416	–6.419	–6.421	–6.423	–6.425	–6.427	–6.429	–6.431
–410	–6.380	–6.383	–6.386	–6.389	–6.392	–6.395	–6.398	–6.401	–6.404	–6.406	–6.409
–400	–6.344	–6.348	–6.352	–6.355	–6.359	–6.363	–6.366	–6.370	–6.373	–6.377	–6.380
–390	–6.301	–6.306	–6.310	–6.315	–6.319	–6.323	–6.328	–6.332	–6.336	–6.340	–6.344
–380	–6.251	–6.257	–6.262	–6.267	–6.272	–6.277	–6.282	–6.287	–6.292	–6.296	–6.301
–370	–6.195	–6.201	–6.207	–6.213	–6.218	–6.224	–6.230	–6.235	–6.241	–6.246	–6.251
–360	–6.133	–6.139	–6.146	–6.152	–6.158	–6.165	–6.171	–6.177	–6.183	–6.189	–6.195
–350	–6.064	–6.071	–6.078	–6.085	–6.092	–6.099	–6.106	–6.113	–6.119	–6.126	–6.133
–340	–5.989	–5.997	–6.004	–6.012	–6.020	–6.027	–6.035	–6.042	–6.049	–6.057	–6.064
–330	–5.908	–5.917	–5.925	–5.933	–5.941	–5.949	–5.957	–5.965	–5.973	–5.981	–5.989
–320	–5.822	–5.831	–5.840	–5.848	–5.857	–5.866	–5.874	–5.883	–5.891	–5.900	–5.908
–310	–5.730	–5.739	–5.749	–5.758	–5.767	–5.776	–5.786	–5.795	–5.804	–5.813	–5.822
–300	–5.632	–5.642	–5.652	–5.662	–5.672	–5.682	–5.691	–5.701	–5.711	–5.720	–5.730
–290	–5.529	–5.540	–5.550	–5.561	–5.571	–5.581	–5.592	–5.602	–5.612	–5.622	–5.632
–280	–5.421	–5.432	–5.443	–5.454	–5.465	–5.476	–5.487	–5.497	–5.508	–5.519	–5.529
–270	–5.308	–5.320	–5.331	–5.343	–5.354	–5.365	–5.377	–5.388	–5.399	–5.410	–5.421
–260	–5.190	–5.202	–5.214	–5.226	–5.238	–5.250	–5.261	–5.273	–5.285	–5.296	–5.308
–250	–5.067	–5.079	–5.092	–5.104	–5.117	–5.129	–5.141	–5.153	–5.166	–5.178	–5.190
–240	–4.939	–4.952	–4.965	–4.978	–4.991	–5.003	–5.016	–5.029	–5.042	–5.054	–5.067
–230	–4.806	–4.820	–4.833	–4.847	–4.860	–4.873	–4.886	–4.900	–4.913	–4.926	–4.939
–220	–4.669	–4.683	–4.697	–4.711	–4.724	–4.738	–4.752	–4.766	–4.779	–4.793	–4.806
–210	–4.527	–4.542	–4.556	–4.570	–4.584	–4.599	–4.613	–4.627	–4.641	–4.655	–4.669
–200	–4.381	–4.396	–4.411	–4.425	–4.440	–4.455	–4.469	–4.484	–4.498	–4.513	–4.527
–190	–4.231	–4.246	–4.261	–4.276	–4.291	–4.306	–4.321	–4.336	–4.351	–4.366	–4.381
–180	–4.076	–4.091	–4.107	–4.123	–4.138	–4.154	–4.169	–4.185	–4.200	–4.215	–4.231
–170	–3.917	–3.933	–3.949	–3.965	–3.981	–3.997	–4.013	–4.029	–4.044	–4.060	–4.076
–160	–3.754	–3.771	–3.787	–3.803	–3.820	–3.836	–3.852	–3.869	–3.885	–3.901	–3.917
–150	–3.587	–3.604	–3.621	–3.638	–3.655	–3.671	–3.688	–3.705	–3.721	–3.738	–3.754
–140	–3.417	–3.434	–3.451	–3.468	–3.486	–3.503	–3.520	–3.537	–3.554	–3.571	–3.587
–130	–3.243	–3.260	–3.278	–3.295	–3.313	–3.330	–3.348	–3.365	–3.382	–3.400	–3.417
–120	–3.065	–3.083	–3.101	–3.119	–3.136	–3.154	–3.172	–3.190	–3.207	–3.225	–3.243
–110	–2.884	–2.902	–2.920	–2.938	–2.957	–2.975	–2.993	–3.011	–3.029	–3.047	–3.065
–100	–2.699	–2.718	–2.736	–2.755	–2.773	–2.792	–2.810	–2.829	–2.847	–2.865	–2.884
–90	–2.511	–2.530	–2.549	–2.568	–2.587	–2.605	–2.624	–2.643	–2.662	–2.680	–2.699
–80	–2.320	–2.339	–2.359	–2.378	–2.397	–2.416	–2.435	–2.454	–2.473	–2.492	–2.511
–70	–2.126	–2.146	–2.165	–2.185	–2.204	–2.223	–2.243	–2.262	–2.282	–2.301	–2.320
–60	–1.929	–1.949	–1.969	–1.988	–2.008	–2.028	–2.048	–2.067	–2.087	–2.106	–2.126
–50	–1.729	–1.749	–1.770	–1.790	–1.810	–1.830	–1.850	–1.869	–1.889	–1.909	–1.929
–40	–1.527	–1.547	–1.568	–1.588	–1.608	–1.628	–1.649	–1.659	–1.689	–1.709	–1.729
–30	–1.322	–1.343	–1.363	–1.384	–1.404	–1.425	–1.445	–1.466	–1.486	–1.507	–1.527
–20	–1.114	–1.135	–1.156	–1.177	–1.198	–1.218	–1.239	–1.260	–1.281	–1.301	–1.322
–10	–0.905	–0.926	–0.947	–0.968	–0.989	–1.010	–1.031	–1.052	–1.073	–1.094	–1.114
0	–0.692	–0.714	–0.735	–0.756	–0.778	–0.799	–0.820	–0.841	–0.862	–0.883	–0.905
0	–0.692	–0.671	–0.650	–0.628	–0.607	–0.586	–0.564	–0.543	–0.521	–0.500	–0.478
10	–0.478	–0.457	–0.435	–0.413	–0.392	–0.370	–0.349	–0.327	–0.305	–0.284	–0.262
20	–0.262	–0.240	–0.218	–0.197	–0.175	–0.153	–0.131	–0.109	–0.088	–0.066	–0.044
30	–0.044	–0.022	0.000	0.022	0.044	0.066	0.088	0.110	0.132	0.154	0.176
40	0.176	0.198	0.220	0.242	0.264	0.286	0.308	0.330	0.353	0.375	0.397
50	0.397	0.419	0.441	0.463	0.486	0.508	0.530	0.552	0.575	0.597	0.519
60	0.619	0.642	0.664	0.686	0.709	0.731	0.753	0.776	0.798	0.821	0.843
70	0.843	0.865	0.888	0.910	0.933	0.955	0.978	1.000	1.023	1.045	1.068
80	1.068	1.090	1.113	1.136	1.158	1.181	1.203	1.226	1.249	1.271	1.294
90	1.294	1.316	1.339	1.362	1.384	1.407	1.430	1.453	1.475	1.498	1.521
100	1.521	1.543	1.566	1.589	1.612	1.635	1.657	1.680	1.703	1.726	1.749
110	1.749	1.771	1.794	1.817	1.840	1.863	1.886	1.909	1.931	1.954	1.977
120	1.977	2.000	2.023	2.046	2.069	2.092	2.115	2.138	2.161	2.184	2.207

TABLE 15 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	2.207	2.230	2.253	2.276	2.298	2.321	2.344	2.367	2.390	2.413	2.436
140	2.436	2.459	2.483	2.506	2.529	2.552	2.575	2.598	2.621	2.644	2.667
150	2.667	2.690	2.713	2.736	2.759	2.782	2.805	2.828	2.851	2.874	2.897
160	2.897	2.920	2.944	2.967	2.990	3.013	3.036	3.059	3.082	3.105	3.128
170	3.128	3.151	3.174	3.197	3.220	3.244	3.267	3.290	3.313	3.336	3.359
180	3.359	3.382	3.405	3.428	3.451	3.474	3.497	3.520	3.544	3.567	3.590
190	3.590	3.613	3.636	3.659	3.682	3.705	3.728	3.751	3.774	3.797	3.820
200	3.820	3.843	3.866	3.889	3.912	3.935	3.958	3.981	4.004	4.027	4.050
210	4.050	4.073	4.096	4.119	4.142	4.165	4.188	4.211	4.234	4.257	4.280
220	4.280	4.303	4.326	4.349	4.372	4.395	4.417	4.440	4.463	4.486	4.509
230	4.509	4.532	4.555	4.578	4.601	4.623	4.646	4.669	4.692	4.715	4.738
240	4.738	4.760	4.783	4.806	4.829	4.852	4.874	4.897	4.920	4.943	4.965
250	4.965	4.988	5.011	5.034	5.056	5.079	5.102	5.124	5.147	5.170	5.192
260	5.192	5.215	5.238	5.260	5.283	5.306	5.328	5.351	5.374	5.396	5.419
270	5.419	5.441	5.464	5.487	5.509	5.532	5.554	5.577	5.599	5.622	5.644
280	5.644	5.667	5.690	5.712	5.735	5.757	5.779	5.802	5.824	5.847	5.869
290	5.869	5.892	5.914	5.937	5.959	5.982	6.004	6.026	6.049	6.071	6.094
300	6.094	6.116	6.138	6.161	6.183	6.205	6.228	6.250	6.272	6.295	6.317
310	6.317	6.339	6.362	6.384	5.406	6.429	6.451	6.473	6.496	6.518	6.540
320	6.540	6.562	6.585	6.607	5.629	6.652	6.674	6.696	6.718	6.741	6.763
330	6.763	6.785	6.807	6.829	6.852	6.874	6.896	6.918	6.941	6.963	6.985
340	6.985	7.007	7.029	7.052	7.074	7.096	7.118	7.140	7.163	7.185	7.207
350	7.207	7.229	7.251	7.273	7.296	7.318	7.340	7.362	7.384	7.407	7.429
360	7.429	7.451	7.473	7.495	7.517	7.540	7.562	7.584	7.605	7.628	7.650
370	7.650	7.673	7.695	7.717	7.739	7.761	7.783	7.806	7.828	7.850	7.872
380	7.872	7.894	7.917	7.939	7.961	7.983	8.005	8.027	8.050	8.072	8.094
390	8.094	8.116	8.138	8.161	8.183	8.205	8.227	8.250	8.272	8.294	8.316
400	8.316	8.338	8.361	8.383	8.405	8.427	8.450	8.472	8.494	8.516	8.539
410	8.539	8.561	8.583	8.605	8.628	8.650	8.672	8.694	8.717	8.739	8.761
420	8.761	8.784	8.806	8.828	8.851	8.873	8.895	8.918	8.940	8.962	8.985
430	8.985	9.007	9.029	9.052	9.074	9.096	9.119	9.141	9.163	9.186	9.208
440	9.208	9.231	9.253	9.275	9.298	9.320	9.343	9.365	9.388	9.410	9.432
450	9.432	9.455	9.477	9.500	9.522	9.545	9.567	9.590	9.612	9.635	9.657
460	9.657	9.680	9.702	9.725	9.747	9.770	9.792	9.815	9.837	9.860	9.882
470	9.882	9.905	9.927	9.950	9.973	9.995	10.018	10.040	10.063	10.086	10.108
480	10.108	10.131	10.153	10.176	10.199	10.221	10.244	10.267	10.289	10.312	10.334
490	10.334	10.357	10.380	10.402	10.425	10.448	10.471	10.493	10.516	10.539	10.561
500	10.561	10.584	10.607	10.629	10.652	10.675	10.698	10.720	10.743	10.766	10.789
510	10.789	10.811	10.834	10.857	10.880	10.903	10.925	10.948	10.971	10.994	11.017
520	11.017	11.039	11.062	11.085	11.108	11.131	11.154	11.176	11.199	11.222	11.245
530	11.245	11.268	11.291	11.313	11.336	11.359	11.382	11.405	11.428	11.451	11.474
540	11.474	11.497	11.519	11.542	11.565	11.588	11.611	11.634	11.657	11.680	11.703
550	11.703	11.726	11.749	11.772	11.795	11.818	11.841	11.864	11.887	11.910	11.933
560	11.933	11.956	11.978	12.001	12.024	12.047	12.070	12.093	12.116	12.140	12.163
570	12.163	12.186	12.209	12.232	12.255	12.278	12.301	12.324	12.347	12.370	12.393
580	12.393	12.416	12.439	12.462	12.485	12.508	12.531	12.554	12.577	12.600	12.624
590	12.624	12.647	12.670	12.693	12.716	12.739	12.762	12.785	12.808	12.831	12.855
600	12.855	12.878	12.901	12.924	12.947	12.970	12.993	13.016	13.040	13.063	13.086
610	13.086	13.109	13.132	13.155	13.179	13.202	13.225	13.248	13.271	13.294	13.318
620	13.318	13.341	13.364	13.387	13.410	13.433	13.457	13.480	13.503	13.526	13.549
630	13.549	13.573	13.596	13.619	13.642	13.665	13.689	13.712	13.735	13.758	13.782
640	13.782	13.805	13.828	13.851	13.874	13.898	13.921	13.944	13.967	13.991	14.014
650	14.014	14.037	14.060	14.084	14.107	14.130	14.154	14.177	14.200	14.223	14.247
660	14.247	14.270	14.293	14.316	14.340	14.363	14.386	14.410	14.433	14.456	14.479
670	14.479	14.503	14.526	14.549	14.573	14.596	14.619	14.643	14.666	14.689	14.713
680	14.713	14.736	14.759	14.783	14.806	14.829	14.853	14.876	14.899	14.923	14.946
690	14.946	14.969	14.993	15.016	15.039	15.063	15.086	15.109	15.133	15.156	15.179
700	15.179	15.203	15.226	15.250	15.273	15.296	15.320	15.343	15.366	15.390	15.413
710	15.413	15.437	15.460	15.483	15.507	15.530	15.554	15.577	15.600	15.624	15.647

TABLE 15 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
720	15.547	15.671	15.694	15.717	15.741	15.764	15.788	15.811	15.834	15.858	15.881
730	15.881	15.905	15.928	15.952	15.975	15.998	16.022	16.045	16.069	16.092	16.116
740	16.116	16.139	16.163	16.186	16.209	16.233	16.256	16.280	16.303	16.327	16.350
750	16.350	16.374	16.397	16.421	16.444	16.468	16.491	16.514	16.538	16.561	16.585
760	16.585	16.608	16.632	16.655	16.679	16.702	16.726	16.749	16.773	16.796	16.820
770	16.820	16.843	16.867	16.890	16.914	16.937	16.961	16.984	17.008	17.031	17.055
780	17.055	17.078	17.102	17.125	17.149	17.173	17.196	17.220	17.243	17.267	17.290
790	17.290	17.314	17.337	17.351	17.384	17.408	17.431	17.455	17.478	17.502	17.526
800	17.526	17.549	17.573	17.596	17.620	17.643	17.667	17.690	17.714	17.738	17.761
810	17.761	17.785	17.808	17.832	17.855	17.879	17.902	17.926	17.950	17.973	17.997
820	17.997	18.020	18.044	18.068	18.091	18.115	18.138	18.162	18.185	18.209	18.233
830	18.233	18.256	18.280	18.303	18.327	18.351	18.374	18.398	18.421	18.445	18.469
840	18.469	18.492	18.516	18.539	18.563	18.587	18.610	18.634	18.657	18.681	18.705
850	18.705	18.728	18.752	18.776	18.799	18.823	18.846	18.870	18.894	18.917	18.941
860	18.941	18.965	18.988	19.012	19.035	19.059	19.083	19.106	19.130	19.154	19.177
870	19.177	19.201	19.224	19.248	19.272	19.295	19.319	19.343	19.366	19.390	19.414
880	19.414	19.437	19.461	19.485	19.508	19.532	19.556	19.579	19.603	19.626	19.650
890	19.650	19.674	19.697	19.721	19.745	19.768	19.792	19.816	19.839	19.863	19.887
900	19.887	19.910	19.934	19.958	19.981	20.005	20.029	20.052	20.076	20.100	20.123
910	20.123	20.147	20.171	20.194	20.218	20.242	20.265	20.289	20.313	20.336	20.360
920	20.360	20.384	20.407	20.431	20.455	20.479	20.502	20.526	20.550	20.573	20.597
930	20.597	20.621	20.644	20.668	20.692	20.715	20.739	20.763	20.786	20.810	20.834
940	20.834	20.857	20.881	20.905	20.929	20.952	20.976	21.000	21.023	21.047	21.071
950	21.071	21.094	21.118	21.142	21.165	21.189	21.213	21.236	21.260	21.284	21.308
950	21.308	21.331	21.355	21.379	21.402	21.426	21.450	21.473	21.497	21.521	21.544
970	21.544	21.568	21.592	21.616	21.639	21.663	21.687	21.710	21.734	21.758	21.781
980	21.781	21.805	21.829	21.852	21.876	21.900	21.924	21.947	21.971	21.995	22.018
990	22.018	22.042	22.066	22.089	22.113	22.137	22.150	22.184	22.208	22.232	22.255
1000	22.255	22.279	22.303	22.326	22.350	22.374	22.397	22.421	22.445	22.468	22.492
1010	22.492	22.516	22.540	22.563	22.587	22.611	22.634	22.658	22.682	22.705	22.729
1020	22.729	22.753	22.776	22.800	22.824	22.847	22.871	22.895	22.919	22.942	22.966
1030	22.966	22.990	23.013	23.037	23.061	23.084	23.108	23.132	23.155	23.179	23.203
1040	23.203	23.226	23.250	23.274	23.297	23.321	23.345	23.368	23.392	23.416	23.439
1050	23.439	23.463	23.487	23.510	23.534	23.558	23.581	23.605	23.629	23.652	23.676
1060	23.676	23.700	23.723	23.747	23.771	23.794	23.818	23.842	23.865	23.889	23.913
1070	23.913	23.936	23.960	23.984	24.007	24.031	24.055	24.078	24.102	24.126	24.149
1080	24.149	24.173	24.197	24.220	24.244	24.267	24.291	24.315	24.338	24.362	24.386
1090	24.386	24.409	24.433	24.457	24.480	24.504	24.527	24.551	24.575	24.598	24.622
1100	24.622	24.646	24.669	24.693	24.717	24.740	24.764	24.787	24.811	24.835	24.858
1110	24.858	24.882	24.905	24.929	24.953	24.976	25.000	25.024	25.047	25.071	25.094
1120	25.094	25.118	25.142	25.165	25.189	25.212	25.236	25.260	25.283	25.307	25.330
1130	25.330	25.354	25.377	25.401	25.425	25.448	25.472	25.495	25.519	25.543	25.566
1140	25.566	25.590	25.613	25.637	25.660	25.684	25.708	25.731	25.755	25.778	25.802
1150	25.802	25.825	25.849	25.873	25.896	25.920	25.943	25.967	25.990	26.014	26.037
1160	26.037	26.061	26.084	26.108	26.132	26.155	26.179	26.202	26.226	26.249	26.273
1170	26.273	26.296	26.320	26.343	26.367	26.390	26.414	26.437	26.461	26.484	26.508
1180	26.508	26.532	26.555	26.579	26.602	26.626	26.649	26.673	26.696	26.720	26.743
1190	26.743	26.767	26.790	26.814	26.837	26.861	26.884	26.907	26.931	26.954	26.978
1200	26.978	27.001	27.025	27.048	27.072	27.095	27.119	27.142	27.166	27.189	27.213
1210	27.213	27.236	27.260	27.283	27.306	27.330	27.353	27.377	27.400	27.424	27.447
1220	27.447	27.471	27.494	27.517	27.541	27.564	27.588	27.611	27.635	27.658	27.681
1230	27.681	27.705	27.728	27.752	27.775	27.798	27.822	27.845	27.869	27.892	27.915
1240	27.915	27.939	27.962	27.986	28.009	28.032	28.056	28.079	28.103	28.126	28.149
1250	28.149	28.173	28.196	28.219	28.243	28.266	28.289	28.313	28.336	28.360	28.383
1260	28.383	28.406	28.430	28.453	28.476	28.500	28.523	28.546	28.570	28.593	28.616
1270	28.616	28.640	28.663	28.686	28.710	28.733	28.756	28.780	28.803	28.826	28.849
1280	28.849	28.873	28.896	28.919	28.943	28.966	28.989	29.013	29.036	29.059	29.082
1290	29.082	29.106	29.129	29.152	29.176	29.199	29.222	29.245	29.269	29.292	29.315
1300	29.315	29.338	29.362	29.385	29.408	29.431	29.455	29.478	29.501	29.524	29.548

TABLE 15 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1310	29.548	29.571	29.594	29.617	29.640	29.664	29.687	29.710	29.733	29.757	29.780
1320	29.780	29.803	29.826	29.849	29.873	29.896	29.919	29.942	29.965	29.989	30.012
1330	30.012	30.035	30.058	30.081	30.104	30.128	30.151	30.174	30.197	30.220	30.243
1340	30.243	30.267	30.290	30.313	30.336	30.359	30.382	30.405	30.429	30.452	30.475
1350	30.475	30.498	30.521	30.544	30.567	30.590	30.613	30.637	30.660	30.683	30.706
1360	30.706	30.729	30.752	30.775	30.798	30.821	30.844	30.868	30.891	30.914	30.937
1370	30.937	30.960	30.983	31.006	31.029	31.052	31.075	31.098	31.121	31.144	31.167
1380	31.167	31.190	31.213	31.236	31.260	31.283	31.306	31.329	31.352	31.375	31.398
1390	31.398	31.421	31.444	31.467	31.490	31.513	31.536	31.559	31.582	31.605	31.628
1400	31.628	31.651	31.674	31.697	31.720	31.743	31.766	31.789	31.812	31.834	31.857
1410	31.857	31.880	31.903	31.926	31.949	31.972	31.995	32.018	32.041	32.064	32.087
1420	32.087	32.110	32.133	32.156	32.179	32.202	32.224	32.247	32.270	32.293	32.316
1430	32.316	32.339	32.362	32.385	32.408	32.431	32.453	32.476	32.499	32.522	32.545
1440	32.545	32.568	32.591	32.614	32.636	32.659	32.682	32.705	32.728	32.751	32.774
1450	32.774	32.796	32.819	32.842	32.865	32.888	32.911	32.933	32.956	32.979	33.002
1460	33.002	33.025	33.047	33.070	33.093	33.116	33.139	33.161	33.184	33.207	33.230
1470	33.230	33.253	33.275	33.298	33.321	33.344	33.366	33.389	33.412	33.435	33.458
1480	33.458	33.480	33.503	33.526	33.548	33.571	33.594	33.617	33.639	33.662	33.685
1490	33.685	33.708	33.730	33.753	33.776	33.798	33.821	33.844	33.867	33.889	33.912
1500	33.912	33.935	33.957	33.980	34.003	34.025	34.048	34.071	34.093	34.116	34.139
1510	34.139	34.161	34.184	34.207	34.229	34.252	34.275	34.297	34.320	34.343	34.365
1520	34.365	34.388	34.411	34.433	34.456	34.478	34.501	34.524	34.546	34.569	34.591
1530	34.591	34.614	34.637	34.659	34.682	34.704	34.727	34.750	34.772	34.795	34.817
1540	34.817	34.840	34.862	34.885	34.908	34.930	34.953	34.975	34.998	35.020	35.043
1550	35.043	35.065	35.088	35.110	35.133	35.156	35.178	35.201	35.223	35.246	35.268
1560	35.268	35.291	35.313	35.336	35.358	35.381	35.403	35.426	35.448	35.471	35.493
1570	35.493	35.516	35.538	35.560	35.583	35.605	35.628	35.650	35.673	35.695	35.718
1580	35.718	35.740	35.763	35.785	35.807	35.830	35.852	35.875	35.897	35.920	35.942
1590	35.942	35.964	35.987	36.009	36.032	36.054	36.076	36.099	36.121	36.144	36.166
1600	36.166	36.188	36.211	36.233	36.256	36.278	36.300	36.323	36.345	36.367	36.390
1610	36.390	36.412	36.434	36.457	36.479	36.501	35.524	36.546	36.568	36.591	36.613
1620	36.613	36.635	36.558	36.680	36.702	36.725	36.747	36.769	36.792	36.814	36.836
1630	36.836	36.859	36.881	36.903	36.925	36.948	36.970	36.992	37.014	37.037	37.059
1640	37.059	37.081	37.104	37.126	37.148	37.170	37.193	37.215	37.237	37.259	37.281
1650	37.281	37.304	37.326	37.348	37.370	37.393	37.415	37.437	37.459	37.481	37.504
1660	37.504	37.526	37.548	37.570	37.592	37.615	37.637	37.659	37.681	37.703	37.725
1670	37.725	37.748	37.770	37.792	37.814	37.836	37.858	37.881	37.903	37.925	37.947
1680	37.947	37.969	37.991	38.013	38.036	38.058	38.080	38.102	38.124	38.146	38.168
1690	38.168	38.190	38.212	38.235	38.257	38.279	38.301	38.323	38.345	38.367	38.389
1700	38.389	38.411	38.433	38.455	38.477	38.499	38.522	38.544	38.566	38.588	38.610
1710	38.610	38.632	38.654	38.676	38.698	38.720	38.742	38.764	38.786	38.808	38.830
1720	38.830	38.852	38.874	38.896	38.918	38.940	38.962	38.984	39.006	39.028	39.050
1730	39.050	39.072	39.094	39.116	39.138	39.160	39.182	39.204	39.226	39.248	39.270
1740	39.270	39.292	39.314	39.335	39.357	39.379	39.401	39.423	39.445	39.467	39.489
1750	39.489	39.511	39.533	39.555	39.577	39.599	39.620	39.642	39.664	39.686	39.708
1760	39.708	39.730	39.752	39.774	39.796	39.817	39.839	39.861	39.883	39.905	39.927
1770	39.927	39.949	39.970	39.992	40.014	40.036	40.058	40.080	40.101	40.123	40.145
1780	40.145	40.167	40.189	40.211	40.232	40.254	40.276	40.298	40.320	40.341	40.363
1790	40.363	40.385	40.407	40.429	40.450	40.472	40.494	40.516	40.537	40.559	40.581
1800	40.581	40.603	40.624	40.646	40.668	40.690	40.711	40.733	40.755	40.777	40.798
1810	40.798	40.820	40.842	40.864	40.885	40.907	40.929	40.950	40.972	40.994	41.015
1820	41.015	41.037	41.059	41.081	41.102	41.124	41.146	41.167	41.189	41.211	41.232
1830	41.232	41.254	41.276	41.297	41.319	41.341	41.362	41.384	41.405	41.427	41.449
1840	41.449	41.470	41.492	41.514	41.535	41.557	41.578	41.600	41.622	41.643	41.665
1850	41.665	41.686	41.708	41.730	41.751	41.773	41.794	41.816	41.838	41.859	41.881
1860	41.881	41.902	41.924	41.945	41.967	41.988	42.010	42.032	42.053	42.075	42.096
1870	42.096	42.118	42.139	42.161	42.182	42.204	42.225	42.247	42.268	42.290	42.311
1880	42.311	42.333	42.354	42.376	42.397	42.419	42.440	42.462	42.483	42.505	42.526
1890	42.526	42.548	42.569	42.591	42.612	42.633	42.655	42.676	42.698	42.719	42.741

TABLE 15 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1900	42.741	42.762	42.783	42.805	42.826	42.848	42.869	42.891	42.912	42.933	42.955
1910	42.955	42.976	42.998	43.019	43.040	43.062	43.083	43.104	43.126	43.147	43.169
1920	43.169	43.190	43.211	43.233	43.254	43.275	43.297	43.318	43.339	43.361	43.382
1930	43.382	43.403	43.425	43.446	43.467	43.489	43.510	43.531	43.552	43.574	43.595
1940	43.595	43.616	43.638	43.659	43.680	43.701	43.723	43.744	43.765	43.787	43.808
1950	43.808	43.829	43.850	43.872	43.893	43.914	43.935	43.957	43.978	43.999	44.020
1960	44.020	44.041	44.063	44.084	44.105	44.126	44.147	44.169	44.190	44.211	44.232
1970	44.232	44.253	44.275	44.296	44.317	44.338	44.359	44.380	44.402	44.423	44.444
1980	44.444	44.465	44.486	44.507	44.528	44.550	44.571	44.592	44.613	44.634	44.655
1990	44.655	44.676	44.697	44.719	44.740	44.761	44.782	44.803	44.824	44.845	44.866
2000	44.866	44.887	44.908	44.929	44.950	44.971	44.992	45.014	45.035	45.056	45.077
2010	45.077	45.098	45.119	45.140	45.161	45.182	45.203	45.224	45.245	45.266	45.287
2020	45.287	45.308	45.329	45.350	45.371	45.392	45.413	45.434	45.455	45.476	45.497
2030	45.497	45.518	45.539	45.560	45.580	45.601	45.622	45.643	45.664	45.685	45.706
2040	45.706	45.727	45.748	45.769	45.790	45.811	45.832	45.852	45.873	45.894	45.915
2050	45.915	45.936	45.957	45.978	45.999	46.019	46.040	46.061	46.082	46.103	46.124
2060	46.124	46.145	46.165	46.186	46.207	46.228	46.249	46.269	46.290	46.311	46.332
2070	46.332	46.353	46.373	46.394	46.415	46.436	46.457	46.477	46.498	46.519	46.540
2080	46.540	46.560	46.581	46.602	46.623	46.643	46.664	46.685	46.706	46.726	46.747
2090	46.747	46.768	46.789	46.809	46.830	46.851	46.871	46.892	46.913	46.933	46.954
2100	46.954	46.975	46.995	47.016	47.037	47.057	47.078	47.099	47.119	47.140	47.161
2110	47.161	47.181	47.202	47.223	47.243	47.264	47.284	47.305	47.326	47.346	47.367
2120	47.367	47.387	47.408	47.429	47.449	47.470	47.490	47.511	47.531	47.552	47.573
2130	47.573	47.593	47.614	47.634	47.655	47.675	47.696	47.716	47.737	47.757	47.778
2140	47.778	47.798	47.819	47.839	47.860	47.880	47.901	47.921	47.942	47.962	47.983
2150	47.983	48.003	48.024	48.044	48.065	48.085	48.105	48.126	48.146	48.167	48.187
2160	48.187	48.208	48.228	48.248	48.269	48.289	48.310	48.330	48.350	48.371	48.391
2170	48.391	48.411	48.432	48.452	48.473	48.493	48.513	48.534	48.554	48.574	48.595
2180	48.595	48.615	48.635	48.656	48.676	48.696	48.717	48.737	48.757	48.777	48.798
2190	48.798	48.818	48.838	48.859	48.879	48.899	48.919	48.940	48.960	48.980	49.000
2200	49.000	49.021	49.041	49.061	49.081	49.101	49.122	49.142	49.162	49.182	49.202
2210	49.202	49.223	49.243	49.263	49.283	49.303	49.323	49.344	49.364	49.384	49.404
2220	49.404	49.424	49.444	49.465	49.485	49.505	49.525	49.545	49.565	49.585	49.605
2230	49.605	49.625	49.645	49.666	49.686	49.706	49.726	49.746	49.766	49.786	49.806
2240	49.806	49.826	49.846	49.866	49.886	49.906	49.926	49.946	49.966	49.986	50.006
2250	50.006	50.026	50.046	50.066	50.086	50.106	50.126	50.146	50.166	50.186	50.206
2260	50.206	50.226	50.246	50.266	50.286	50.306	50.326	50.346	50.366	50.385	50.405
2270	50.405	50.425	50.445	50.465	50.485	50.505	50.525	50.545	50.564	50.584	50.604
2280	50.604	50.624	50.644	50.664	50.684	50.703	50.723	50.743	50.763	50.783	50.802
2290	50.802	50.822	50.842	50.862	50.882	50.901	50.921	50.941	50.961	50.981	51.000
2300	51.000	51.020	51.040	51.060	51.079	51.099	51.119	51.139	51.158	51.178	51.198
2310	51.198	51.217	51.237	51.257	51.276	51.296	51.316	51.336	51.355	51.375	51.395
2320	51.395	51.414	51.434	51.453	51.473	51.493	51.512	51.532	51.552	51.571	51.591
2330	51.591	51.611	51.630	51.650	51.669	51.689	51.708	51.728	51.748	51.767	51.787
2340	51.787	51.806	51.826	51.845	51.865	51.885	51.904	51.924	51.943	51.963	51.982
2350	51.982	52.002	52.021	52.041	52.060	52.080	52.099	52.119	52.138	52.158	52.177
2360	52.177	52.197	52.216	52.235	52.255	52.274	52.294	52.313	52.333	52.352	52.371
2370	52.371	52.391	52.410	52.430	52.449	52.468	52.488	52.507	52.527	52.546	52.565
2380	52.565	52.585	52.604	52.623	52.643	52.662	52.681	52.701	52.720	52.739	52.759
2390	52.759	52.778	52.797	52.817	52.836	52.855	52.875	52.894	52.913	52.932	52.952
2400	52.952	52.971	52.990	53.010	53.029	53.048	53.067	53.087	53.106	53.125	53.144
2410	53.144	53.163	53.183	53.202	53.221	53.240	53.260	53.279	53.298	53.317	53.336
2420	53.336	53.355	53.375	53.394	53.413	53.432	53.451	53.470	53.490	53.509	53.528
2430	53.528	53.547	53.566	53.585	53.604	53.623	53.643	53.662	53.681	53.700	53.719
2440	53.719	53.738	53.757	53.776	53.795	53.814	53.833	53.852	53.871	53.890	53.910
2450	53.910	53.929	53.948	53.967	53.986	54.005	54.024	54.043	54.062	54.081	54.100
2460	54.100	54.119	54.138	54.157	54.176	54.195	54.214	54.233	54.252	54.271	54.289
2470	54.289	54.308	54.327	54.346	54.365	54.384	54.403	54.422	54.441	54.460	54.479
2480	54.479	54.498	54.517	54.536	54.554	54.573	54.592	54.611	54.630	54.649	54.668
2490	54.668	54.687	54.705	54.724	54.743	54.762	54.781	54.800	54.819	54.837	54.856

TABLE 15 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2500	54.856	54.875									

TABLE 16 Type N Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–4.345										
–260	–4.336	–4.337	–4.339	–4.340	–4.341	–4.342	–4.343	–4.344	–4.344	–4.345	–4.345
–250	–4.313	–4.316	–4.319	–4.321	–4.324	–4.326	–4.328	–4.330	–4.332	–4.334	–4.336
–240	–4.277	–4.281	–4.285	–4.289	–4.293	–4.297	–4.300	–4.304	–4.307	–4.310	–4.313
–230	–4.226	–4.232	–4.238	–4.243	–4.248	–4.254	–4.258	–4.263	–4.268	–4.273	–4.277
–220	–4.162	–4.169	–4.176	–4.183	–4.189	–4.196	–4.202	–4.209	–4.215	–4.221	–4.225
–210	–4.083	–4.091	–4.100	–4.108	–4.116	–4.124	–4.132	–4.140	–4.147	–4.154	–4.162
–200	–3.990	–4.000	–4.010	–4.020	–4.029	–4.038	–4.048	–4.057	–4.066	–4.074	–4.083
–190	–3.884	–3.896	–3.907	–3.918	–3.928	–3.939	–3.950	–3.960	–3.970	–3.980	–3.990
–180	–3.766	–3.778	–3.790	–3.803	–3.815	–3.827	–3.838	–3.850	–3.862	–3.873	–3.884
–170	–3.634	–3.648	–3.662	–3.675	–3.688	–3.702	–3.715	–3.728	–3.740	–3.753	–3.766
–160	–3.491	–3.506	–3.521	–3.535	–3.550	–3.564	–3.578	–3.593	–3.607	–3.621	–3.634
–150	–3.336	–3.352	–3.368	–3.384	–3.400	–3.415	–3.431	–3.446	–3.461	–3.476	–3.491
–140	–3.171	–3.188	–3.205	–3.221	–3.238	–3.255	–3.271	–3.288	–3.304	–3.320	–3.336
–130	–2.994	–3.012	–3.030	–3.048	–3.066	–3.084	–3.101	–3.119	–3.136	–3.153	–3.171
–120	–2.808	–2.827	–2.846	–2.865	–2.883	–2.902	–2.921	–2.939	–2.958	–2.976	–2.994
–110	–2.612	–2.632	–2.652	–2.672	–2.691	–2.711	–2.730	–2.750	–2.769	–2.789	–2.808
–100	–2.407	–2.428	–2.448	–2.469	–2.490	–2.510	–2.531	–2.551	–2.571	–2.592	–2.612
–90	–2.193	–2.215	–2.237	–2.258	–2.280	–2.301	–2.322	–2.344	–2.365	–2.386	–2.407
–80	–1.972	–1.995	–2.017	–2.039	–2.062	–2.084	–2.106	–2.128	–2.150	–2.172	–2.193
–70	–1.744	–1.767	–1.790	–1.813	–1.836	–1.859	–1.882	–1.905	–1.927	–1.950	–1.972
–60	–1.509	–1.533	–1.557	–1.580	–1.604	–1.627	–1.651	–1.674	–1.698	–1.721	–1.744
–50	–1.269	–1.293	–1.317	–1.341	–1.366	–1.390	–1.414	–1.438	–1.462	–1.485	–1.509
–40	–1.023	–1.048	–1.072	–1.097	–1.122	–1.146	–1.171	–1.195	–1.220	–1.244	–1.269
–30	–0.772	–0.798	–0.823	–0.848	–0.873	–0.898	–0.923	–0.948	–0.973	–0.998	–1.023
–20	–0.518	–0.544	–0.569	–0.595	–0.620	–0.646	–0.671	–0.696	–0.722	–0.747	–0.772
–10	–0.250	–0.286	–0.312	–0.338	–0.364	–0.390	–0.415	–0.441	–0.467	–0.492	–0.518
0	0.000	–0.026	–0.052	–0.078	–0.104	–0.131	–0.157	–0.183	–0.209	–0.234	–0.260
0	0.000	0.026	0.052	0.078	0.104	0.130	0.156	0.182	0.208	0.235	0.261
10	0.261	0.287	0.313	0.340	0.366	0.393	0.419	0.446	0.472	0.499	0.525
20	0.525	0.552	0.578	0.605	0.632	0.659	0.685	0.712	0.739	0.766	0.793
30	0.793	0.820	0.847	0.874	0.901	0.928	0.955	0.983	1.010	1.037	1.065
40	1.065	1.092	1.119	1.147	1.174	1.202	1.229	1.257	1.284	1.312	1.340
50	1.340	1.368	1.395	1.423	1.451	1.479	1.507	1.535	1.563	1.591	1.619
60	1.619	1.647	1.675	1.703	1.732	1.760	1.788	1.817	1.845	1.873	1.902
70	1.902	1.930	1.959	1.988	2.016	2.045	2.074	2.102	2.131	2.160	2.189
80	2.189	2.218	2.247	2.276	2.305	2.334	2.363	2.392	2.421	2.450	2.480
90	2.480	2.509	2.538	2.568	2.597	2.626	2.656	2.685	2.715	2.744	2.774
100	2.774	2.804	2.833	2.863	2.893	2.923	2.953	2.983	3.012	3.042	3.072
110	3.072	3.102	3.133	3.163	3.193	3.223	3.253	3.283	3.314	3.344	3.374
120	3.374	3.405	3.435	3.466	3.496	3.527	3.557	3.588	3.619	3.649	3.680
130	3.680	3.711	3.742	3.772	3.803	3.834	3.865	3.896	3.927	3.958	3.989
140	3.989	4.020	4.051	4.083	4.114	4.145	4.176	4.208	4.239	4.270	4.302
150	4.302	4.333	4.365	4.396	4.428	4.459	4.491	4.523	4.554	4.586	4.618
160	4.618	4.650	4.681	4.713	4.745	4.777	4.809	4.841	4.873	4.905	4.937
170	4.937	4.969	5.001	5.033	5.066	5.098	5.130	5.162	5.195	5.227	5.259
180	5.259	5.292	5.324	5.357	5.389	5.422	5.454	5.487	5.520	5.552	5.585
190	5.585	5.618	5.650	5.683	5.716	5.749	5.782	5.815	5.847	5.880	5.913
200	5.913	5.946	5.979	6.013	6.046	6.079	6.112	6.145	6.178	6.211	6.245
210	6.245	6.278	6.311	6.345	6.378	6.411	6.445	6.478	6.512	6.545	6.579
220	6.579	6.612	6.646	6.680	6.713	6.747	6.781	6.814	6.848	6.882	6.915
230	6.916	6.949	6.983	7.017	7.051	7.085	7.119	7.153	7.187	7.221	7.255
240	7.255	7.289	7.323	7.357	7.392	7.426	7.460	7.494	7.528	7.563	7.597
250	7.597	7.631	7.666	7.700	7.734	7.769	7.803	7.838	7.872	7.907	7.941
260	7.941	7.976	8.010	8.045	8.080	8.114	8.149	8.184	8.218	8.253	8.288
270	8.288	8.323	8.358	8.392	8.427	8.462	8.497	8.532	8.567	8.602	8.637
280	8.637	8.672	8.707	8.742	8.777	8.812	8.847	8.882	8.918	8.953	8.988
290	8.988	9.023	9.058	9.094	9.129	9.154	9.200	9.235	9.270	9.306	9.341
300	9.341	9.377	9.412	9.448	9.483	9.519	9.554	9.590	9.625	9.661	9.695

TABLE 16 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	9.696	9.732	9.768	9.803	9.839	9.875	9.910	9.946	9.982	10.018	10.054
320	10.054	10.089	10.125	10.161	10.197	10.233	10.269	10.305	10.341	10.377	10.413
330	10.413	10.449	10.485	10.521	10.557	10.593	10.629	10.665	10.701	10.737	10.774
340	10.774	10.810	10.846	10.882	10.918	10.955	10.991	11.027	11.064	11.100	11.135
350	11.136	11.173	11.209	11.245	11.282	11.318	11.355	11.391	11.428	11.464	11.501
360	11.501	11.537	11.574	11.610	11.647	11.583	11.720	11.757	11.793	11.830	11.867
370	11.867	11.903	11.940	11.977	12.013	12.050	12.087	12.124	12.160	12.197	12.234
380	12.234	12.271	12.308	12.345	12.382	12.418	12.455	12.492	12.529	12.566	12.603
390	12.603	12.640	12.677	12.714	12.751	12.788	12.825	12.862	12.899	12.937	12.974
400	12.974	13.011	13.048	13.085	13.122	13.159	13.197	13.234	13.271	13.308	13.346
410	13.346	13.383	13.420	13.457	13.495	13.532	13.569	13.607	13.644	13.682	13.719
420	13.719	13.756	13.794	13.831	13.869	13.906	13.944	13.981	14.019	14.056	14.094
430	14.094	14.131	14.169	14.206	14.244	14.281	14.319	14.356	14.394	14.432	14.469
440	14.469	14.507	14.545	14.582	14.520	14.658	14.695	14.733	14.771	14.809	14.845
450	14.846	14.884	14.922	14.960	14.998	15.035	15.073	15.111	15.149	15.187	15.225
460	15.225	15.262	15.300	15.338	15.376	15.414	15.452	15.490	15.528	15.566	15.604
470	15.604	15.642	15.680	15.718	15.756	15.794	15.832	15.870	15.908	15.946	15.984
480	15.984	16.022	16.060	16.099	15.137	16.175	16.213	16.251	16.289	16.327	16.365
490	16.366	16.404	16.442	16.480	16.518	16.557	16.595	16.633	16.571	16.710	16.748
500	16.748	16.786	16.824	16.863	16.901	16.939	16.978	17.016	17.054	17.093	17.131
510	17.131	17.169	17.208	17.246	17.285	17.323	17.361	17.400	17.438	17.477	17.515
520	17.515	17.554	17.592	17.630	17.569	17.707	17.746	17.784	17.823	17.861	17.900
530	17.900	17.938	17.977	18.016	18.054	18.093	18.131	18.170	18.208	18.247	18.286
540	18.286	18.324	18.363	18.401	18.440	18.479	18.517	18.556	18.595	18.633	18.672
550	18.672	18.711	18.749	18.788	18.827	18.865	18.904	18.943	18.982	19.020	19.059
560	19.059	19.098	19.136	19.175	19.214	19.253	19.292	19.330	19.369	19.408	19.447
570	19.447	19.485	19.524	19.563	19.602	19.641	19.680	19.718	19.757	19.796	19.835
580	19.835	19.874	19.913	19.952	19.990	20.029	20.068	20.107	20.146	20.185	20.224
590	20.224	20.263	20.302	20.341	20.379	20.418	20.457	20.496	20.535	20.574	20.613
600	20.613	20.652	20.691	20.730	20.769	20.808	20.847	20.886	20.925	20.964	21.003
610	21.003	21.042	21.081	21.120	21.159	21.198	21.237	21.276	21.315	21.354	21.393
620	21.393	21.432	21.471	21.510	21.549	21.588	21.628	21.667	21.705	21.745	21.784
630	21.784	21.823	21.862	21.901	21.940	21.979	22.018	22.058	22.097	22.136	22.175
640	22.175	22.214	22.253	22.292	22.331	22.370	22.410	22.449	22.488	22.527	22.566
650	22.566	22.605	22.644	22.684	22.723	22.762	22.801	22.840	22.879	22.919	22.958
660	22.958	22.997	23.036	23.075	23.115	23.154	23.193	23.232	23.271	23.311	23.350
670	23.350	23.389	23.428	23.457	23.507	23.546	23.585	23.524	23.663	23.703	23.742
680	23.742	23.781	23.820	23.860	23.899	23.938	23.977	24.016	24.056	24.095	24.134
690	24.134	24.173	24.213	24.252	24.291	24.330	24.370	24.409	24.448	24.487	24.527
700	24.527	24.566	24.605	24.644	24.684	24.723	24.762	24.801	24.841	24.880	24.919
710	24.919	24.959	24.998	25.037	25.076	25.116	25.155	25.194	25.233	25.273	25.312
720	25.312	25.351	25.391	25.430	25.469	25.508	25.548	25.587	25.626	25.666	25.705
730	25.705	25.744	25.783	25.823	25.862	25.901	25.941	25.980	26.019	26.058	26.098
740	26.098	26.137	26.176	26.216	26.255	26.294	25.333	26.373	26.412	26.451	26.491
750	26.491	26.530	26.569	26.608	26.648	26.687	26.726	26.766	26.805	26.844	26.883
760	26.883	26.923	26.962	27.001	27.041	27.080	27.119	27.158	27.198	27.237	27.276
770	27.275	27.316	27.355	27.394	27.433	27.473	27.512	27.551	27.591	27.630	27.669
780	27.669	27.708	27.748	27.787	27.826	27.866	27.905	27.944	27.983	28.023	28.062
790	28.062	28.101	28.140	28.180	28.219	28.258	28.297	28.337	28.376	28.415	28.455
800	28.455	28.494	28.533	28.572	28.612	28.651	28.690	28.729	28.769	28.808	28.847
810	28.847	28.886	28.926	28.965	29.004	29.043	29.083	29.122	29.161	29.200	29.239
820	29.239	29.279	29.318	29.357	29.396	29.436	29.475	29.514	29.553	29.592	29.632
830	29.632	29.671	29.710	29.749	29.789	29.828	29.867	29.906	29.945	29.985	30.024
840	30.024	30.063	30.102	30.141	30.181	30.220	30.259	30.298	30.337	30.376	30.416
850	30.416	30.455	30.494	30.533	30.572	30.611	30.651	30.690	30.729	30.768	30.807
860	30.807	30.846	30.886	30.925	30.964	31.003	31.042	31.081	31.120	31.150	31.199
870	31.199	31.238	31.277	31.316	31.355	31.394	31.433	31.473	31.512	31.551	31.590
880	31.590	31.629	31.668	31.707	31.746	31.785	31.824	31.863	31.903	31.942	31.981
890	31.981	32.020	32.059	32.098	32.137	32.176	32.215	32.254	32.293	32.332	32.371

TABLE 16 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
900	32.371	32.410	32.449	32.488	32.527	32.566	32.605	32.644	32.683	32.722	32.761
910	32.761	32.800	32.839	32.878	32.917	32.956	32.995	33.034	33.073	33.112	33.151
920	33.151	33.190	33.229	33.268	33.307	33.346	33.385	33.424	33.463	33.502	33.541
930	33.541	33.580	33.619	33.658	33.697	33.736	33.774	33.813	33.852	33.891	33.930
940	33.930	33.969	34.008	34.047	34.085	34.124	34.163	34.202	34.241	34.280	34.319
950	34.319	34.358	34.396	34.435	34.474	34.513	34.552	34.591	34.629	34.668	34.707
960	34.707	34.746	34.785	34.823	34.862	34.901	34.940	34.979	35.017	35.056	35.095
970	35.095	35.134	35.172	35.211	35.250	35.289	35.327	35.366	35.405	35.444	35.482
980	35.482	35.521	35.560	35.598	35.637	35.676	35.714	35.753	35.792	35.831	35.869
990	35.869	35.908	35.946	35.985	36.024	36.062	36.101	36.140	36.178	36.217	36.256
1000	36.256	36.294	36.333	36.371	36.410	36.449	36.487	36.526	36.564	36.603	36.641
1010	36.641	36.680	36.718	36.757	35.796	36.834	36.873	36.911	36.950	36.988	37.027
1020	37.027	37.065	37.104	37.142	37.181	37.219	37.258	37.296	37.334	37.373	37.411
1030	37.411	37.450	37.488	37.527	37.565	37.603	37.642	37.680	37.719	37.757	37.795
1040	37.795	37.834	37.872	37.911	37.949	37.987	38.026	38.064	38.102	38.141	38.179
1050	38.179	38.217	38.256	38.294	38.332	38.370	38.409	38.447	38.485	38.524	38.562
1060	38.562	38.600	38.638	38.677	38.715	38.753	38.791	38.829	38.868	38.906	38.944
1070	38.944	38.982	39.020	39.059	39.097	39.135	39.173	39.211	39.249	39.287	39.326
1080	39.326	39.364	39.402	39.440	39.478	39.516	39.554	39.592	39.630	39.668	39.706
1090	39.706	39.744	39.783	39.821	39.859	39.897	39.935	39.973	40.011	40.049	40.087
1100	40.087	40.125	40.163	40.201	40.238	40.276	40.314	40.352	40.390	40.428	40.466
1110	40.466	40.504	40.542	40.580	40.618	40.655	40.693	40.731	40.759	40.807	40.845
1120	40.845	40.883	40.920	40.958	40.996	41.034	41.072	41.109	41.147	41.185	41.223
1130	41.223	41.260	41.298	41.336	41.374	41.411	41.449	41.487	41.525	41.562	41.600
1140	41.600	41.638	41.675	41.713	41.751	41.788	41.826	41.864	41.901	41.939	41.976
1150	41.976	42.014	42.052	42.089	42.127	42.164	42.202	42.239	42.277	42.314	42.352
1160	42.352	42.390	42.427	42.465	42.502	42.540	42.577	42.614	42.652	42.689	42.727
1170	42.727	42.764	42.802	42.839	42.877	42.914	42.951	42.989	43.026	43.064	43.101
1180	43.101	43.138	43.176	43.213	43.250	43.288	43.325	43.362	43.399	43.437	43.474
1190	43.474	43.511	43.549	43.586	43.623	43.660	43.698	43.735	43.772	43.809	43.846
1200	43.846	43.884	43.921	43.958	43.995	44.032	44.069	44.106	44.144	44.181	44.218
1210	44.218	44.255	44.292	44.329	44.366	44.403	44.440	44.477	44.514	44.551	44.588
1220	44.588	44.625	44.662	44.699	44.736	44.773	44.810	44.847	44.884	44.921	44.958
1230	44.958	44.995	45.032	45.069	45.105	45.142	45.179	45.216	45.253	45.290	45.326
1240	45.326	45.363	45.400	45.437	45.474	45.510	45.547	45.584	45.621	45.657	45.694
1250	45.694	45.731	45.767	45.804	45.841	45.877	45.914	45.951	45.987	46.024	46.060
1260	46.060	46.097	46.133	46.170	46.207	46.243	46.280	46.316	46.353	46.389	46.425
1270	46.425	46.462	46.498	46.535	46.571	46.608	46.644	46.680	46.717	46.753	46.789
1280	46.789	46.826	46.862	46.898	46.935	46.971	47.007	47.043	47.079	47.116	47.152
1290	47.152	47.188	47.224	47.260	47.296	47.333	47.369	47.405	47.441	47.477	47.513
1300	47.5131										

TABLE 17 Type N Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–4.344	–4.344	–4.345	–4.345	–4.345						
–440	–4.339	–4.340	–4.340	–4.341	–4.341	–4.342	–4.342	–4.343	–4.343	–4.344	–4.344
–430	–4.330	–4.331	–4.332	–4.333	–4.334	–4.335	–4.336	–4.337	–4.337	–4.338	–4.339
–420	–4.316	–4.318	–4.319	–4.321	–4.322	–4.324	–4.325	–4.326	–4.327	–4.329	–4.330
–410	–4.299	–4.301	–4.303	–4.305	–4.306	–4.308	–4.310	–4.312	–4.313	–4.315	–4.316
–400	–4.277	–4.279	–4.282	–4.284	–4.286	–4.288	–4.291	–4.293	–4.295	–4.297	–4.299
–390	–4.251	–4.254	–4.256	–4.259	–4.262	–4.264	–4.267	–4.270	–4.272	–4.275	–4.277
–380	–4.220	–4.223	–4.226	–4.230	–4.233	–4.236	–4.239	–4.242	–4.245	–4.248	–4.251
–370	–4.185	–4.189	–4.192	–4.196	–4.199	–4.203	–4.206	–4.210	–4.213	–4.217	–4.220
–360	–4.145	–4.150	–4.154	–4.158	–4.162	–4.166	–4.170	–4.174	–4.177	–4.181	–4.185
–350	–4.102	–4.106	–4.111	–4.115	–4.120	–4.124	–4.128	–4.133	–4.137	–4.141	–4.145
–340	–4.054	–4.059	–4.064	–4.068	–4.073	–4.078	–4.083	–4.088	–4.092	–4.097	–4.102
–330	–4.001	–4.007	–4.012	–4.017	–4.023	–4.028	–4.033	–4.038	–4.043	–4.049	–4.054
–320	–3.945	–3.951	–3.957	–3.962	–3.968	–3.974	–3.979	–3.985	–3.990	–3.996	–4.001
–310	–3.884	–3.891	–3.897	–3.903	–3.909	–3.915	–3.921	–3.927	–3.933	–3.939	–3.945
–300	–3.820	–3.827	–3.833	–3.840	–3.846	–3.853	–3.859	–3.866	–3.872	–3.878	–3.884
–290	–3.752	–3.759	–3.766	–3.773	–3.779	–3.786	–3.793	–3.800	–3.807	–3.813	–3.820
–280	–3.679	–3.687	–3.694	–3.702	–3.709	–3.716	–3.723	–3.730	–3.738	–3.745	–3.752
–270	–3.604	–3.611	–3.619	–3.627	–3.634	–3.642	–3.650	–3.657	–3.665	–3.672	–3.679
–260	–3.524	–3.532	–3.540	–3.548	–3.556	–3.564	–3.572	–3.580	–3.588	–3.596	–3.604
–250	–3.441	–3.449	–3.458	–3.466	–3.474	–3.483	–3.491	–3.499	–3.508	–3.516	–3.524
–240	–3.354	–3.363	–3.372	–3.380	–3.389	–3.398	–3.407	–3.415	–3.424	–3.432	–3.441
–230	–3.264	–3.273	–3.282	–3.291	–3.300	–3.309	–3.318	–3.327	–3.336	–3.345	–3.354
–220	–3.171	–3.180	–3.189	–3.199	–3.208	–3.218	–3.227	–3.235	–3.246	–3.255	–3.264
–210	–3.074	–3.084	–3.093	–3.103	–3.113	–3.123	–3.132	–3.142	–3.151	–3.161	–3.171
–200	–2.974	–2.984	–2.994	–3.004	–3.014	–3.024	–3.034	–3.044	–3.054	–3.064	–3.074
–190	–2.871	–2.881	–2.892	–2.902	–2.912	–2.923	–2.933	–2.943	–2.954	–2.964	–2.974
–180	–2.765	–2.776	–2.786	–2.797	–2.808	–2.818	–2.829	–2.839	–2.850	–2.860	–2.871
–170	–2.656	–2.667	–2.678	–2.689	–2.700	–2.711	–2.722	–2.733	–2.743	–2.754	–2.765
–160	–2.544	–2.556	–2.567	–2.578	–2.589	–2.601	–2.612	–2.623	–2.634	–2.645	–2.656
–150	–2.430	–2.442	–2.453	–2.465	–2.476	–2.488	–2.499	–2.510	–2.522	–2.533	–2.544
–140	–2.313	–2.325	–2.337	–2.348	–2.360	–2.372	–2.384	–2.395	–2.407	–2.418	–2.430
–130	–2.193	–2.206	–2.218	–2.230	–2.242	–2.254	–2.265	–2.277	–2.289	–2.301	–2.313
–120	–2.072	–2.084	–2.096	–2.108	–2.121	–2.133	–2.145	–2.157	–2.169	–2.181	–2.193
–110	–1.947	–1.960	–1.972	–1.985	–1.997	–2.010	–2.022	–2.035	–2.047	–2.059	–2.072
–100	–1.821	–1.834	–1.846	–1.859	–1.872	–1.884	–1.897	–1.910	–1.922	–1.935	–1.947
–90	–1.692	–1.705	–1.718	–1.731	–1.744	–1.757	–1.770	–1.783	–1.795	–1.808	–1.821
–80	–1.562	–1.575	–1.588	–1.601	–1.614	–1.627	–1.640	–1.653	–1.666	–1.679	–1.692
–70	–1.430	–1.443	–1.456	–1.470	–1.483	–1.496	–1.509	–1.522	–1.536	–1.549	–1.562
–60	–1.296	–1.309	–1.323	–1.336	–1.349	–1.363	–1.376	–1.390	–1.403	–1.416	–1.430
–50	–1.160	–1.174	–1.187	–1.201	–1.214	–1.228	–1.242	–1.255	–1.269	–1.282	–1.296
–40	–1.023	–1.037	–1.050	–1.064	–1.078	–1.092	–1.105	–1.119	–1.133	–1.146	–1.160
–30	–0.884	–0.898	–0.912	–0.926	–0.940	–0.954	–0.967	–0.981	–0.995	–1.009	–1.023
–20	–0.744	–0.758	–0.772	–0.786	–0.800	–0.814	–0.828	–0.842	–0.856	–0.870	–0.884
–10	–0.603	–0.617	–0.632	–0.646	–0.660	–0.674	–0.688	–0.702	–0.716	–0.730	–0.744
0	–0.461	–0.475	–0.490	–0.504	–0.518	–0.532	–0.546	–0.561	–0.575	–0.589	–0.603
0	–0.461	–0.447	–0.433	–0.418	–0.404	–0.390	–0.375	–0.361	–0.347	–0.332	–0.318
10	–0.318	–0.304	–0.289	–0.275	–0.260	–0.246	–0.232	–0.217	–0.203	–0.188	–0.174
20	–0.174	–0.159	–0.145	–0.131	–0.116	–0.102	–0.087	–0.073	–0.058	–0.044	–0.029
30	–0.029	–0.015	0.000	0.014	0.029	0.043	0.058	0.072	0.087	0.101	0.116
40	0.116	0.130	0.145	0.159	0.174	0.188	0.203	0.217	0.232	0.246	0.261
50	0.261	0.275	0.290	0.305	0.319	0.334	0.349	0.363	0.378	0.393	0.407
60	0.407	0.422	0.437	0.451	0.466	0.481	0.496	0.510	0.525	0.540	0.555
70	0.555	0.570	0.584	0.599	0.614	0.629	0.644	0.659	0.674	0.688	0.703
80	0.703	0.718	0.733	0.748	0.763	0.778	0.793	0.808	0.823	0.838	0.853
90	0.853	0.868	0.883	0.898	0.913	0.928	0.943	0.958	0.974	0.989	1.004
100	1.004	1.019	1.034	1.049	1.065	1.080	1.095	1.110	1.125	1.141	1.156
110	1.156	1.171	1.186	1.202	1.217	1.232	1.248	1.263	1.278	1.294	1.309
120	1.309	1.324	1.340	1.355	1.371	1.386	1.402	1.417	1.432	1.448	1.463

TABLE 17 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	1.463	1.479	1.494	1.510	1.525	1.541	1.557	1.572	1.588	1.603	1.619
140	1.619	1.635	1.650	1.666	1.682	1.697	1.713	1.729	1.744	1.760	1.776
150	1.776	1.791	1.807	1.823	1.839	1.855	1.870	1.886	1.902	1.918	1.934
160	1.934	1.950	1.965	1.981	1.997	2.013	2.029	2.045	2.061	2.077	2.093
170	2.093	2.109	2.125	2.141	2.157	2.173	2.189	2.205	2.221	2.237	2.253
180	2.253	2.269	2.285	2.301	2.318	2.334	2.350	2.366	2.382	2.398	2.415
190	2.415	2.431	2.447	2.463	2.480	2.496	2.512	2.528	2.545	2.561	2.577
200	2.577	2.594	2.610	2.626	2.643	2.659	2.676	2.692	2.708	2.725	2.741
210	2.741	2.758	2.774	2.791	2.807	2.824	2.840	2.857	2.873	2.890	2.906
220	2.906	2.923	2.939	2.956	2.973	2.989	3.006	3.022	3.039	3.056	3.072
230	3.072	3.089	3.106	3.123	3.139	3.156	3.173	3.189	3.206	3.223	3.240
240	3.240	3.257	3.273	3.290	3.307	3.324	3.341	3.358	3.374	3.391	3.408
250	3.408	3.425	3.442	3.459	3.476	3.493	3.510	3.527	3.544	3.561	3.578
260	3.578	3.595	3.612	3.629	3.646	3.663	3.680	3.697	3.714	3.731	3.748
270	3.748	3.766	3.783	3.800	3.817	3.834	3.851	3.869	3.886	3.903	3.920
280	3.920	3.937	3.955	3.972	3.989	4.007	4.024	4.041	4.058	4.076	4.093
290	4.093	4.110	4.128	4.145	4.162	4.180	4.197	4.215	4.232	4.250	4.267
300	4.267	4.284	4.302	4.319	4.337	4.354	4.372	4.389	4.407	4.424	4.442
310	4.442	4.459	4.477	4.495	4.512	4.530	4.547	4.565	4.583	4.600	4.618
320	4.618	4.635	4.653	4.671	4.688	4.706	4.724	4.742	4.759	4.777	4.795
330	4.795	4.813	4.830	4.848	4.866	4.884	4.901	4.919	4.937	4.955	4.973
340	4.973	4.991	5.008	5.026	5.044	5.062	5.080	5.098	5.116	5.134	5.152
350	5.152	5.170	5.188	5.206	5.224	5.241	5.259	5.277	5.295	5.314	5.332
360	5.332	5.350	5.368	5.386	5.404	5.422	5.440	5.458	5.476	5.494	5.512
370	5.512	5.531	5.549	5.567	5.585	5.603	5.621	5.639	5.658	5.676	5.694
380	5.694	5.712	5.731	5.749	5.767	5.785	5.804	5.822	5.840	5.858	5.877
390	5.877	5.895	5.913	5.932	5.950	5.968	5.987	6.005	6.024	6.042	6.060
400	6.060	6.079	6.097	6.116	6.134	6.152	6.171	6.189	6.208	6.226	6.245
410	6.245	6.263	6.282	6.300	6.319	6.337	6.356	6.374	6.393	6.411	6.430
420	6.430	6.449	6.467	6.486	6.504	6.523	6.542	6.560	6.579	6.598	6.616
430	6.616	6.635	6.653	6.672	6.691	6.710	6.728	6.747	6.756	6.784	6.803
440	6.803	6.822	6.841	6.859	6.878	6.897	6.916	6.934	6.953	6.972	6.991
450	6.991	7.010	7.029	7.047	7.066	7.085	7.104	7.123	7.142	7.161	7.179
460	7.179	7.198	7.217	7.236	7.255	7.274	7.293	7.312	7.331	7.350	7.369
470	7.369	7.388	7.407	7.426	7.445	7.464	7.483	7.502	7.521	7.540	7.559
480	7.559	7.578	7.597	7.616	7.635	7.654	7.673	7.692	7.711	7.731	7.750
490	7.750	7.769	7.788	7.807	7.826	7.845	7.865	7.884	7.903	7.922	7.941
500	7.941	7.960	7.980	7.999	8.018	8.037	8.057	8.076	8.095	8.114	8.134
510	8.134	8.153	8.172	8.191	8.211	8.230	8.249	8.269	8.288	8.307	8.327
520	8.327	8.346	8.365	8.385	8.404	8.423	8.443	8.462	8.482	8.501	8.520
530	8.520	8.540	8.559	8.579	8.598	8.517	8.637	8.656	8.676	8.695	8.715
540	8.715	8.734	8.754	8.773	8.793	8.812	8.832	8.851	8.871	8.890	8.910
550	8.910	8.929	8.949	8.968	8.988	9.008	9.027	9.047	9.066	9.086	9.105
560	9.105	9.125	9.145	9.164	9.184	9.204	9.223	9.243	9.262	9.282	9.302
570	9.302	9.321	9.341	9.361	9.381	9.400	9.420	9.440	9.459	9.479	9.499
580	9.499	9.519	9.538	9.558	9.578	9.598	9.617	9.637	9.657	9.677	9.696
590	9.696	9.716	9.736	9.756	9.776	9.795	9.815	9.835	9.855	9.875	9.895
600	9.895	9.914	9.934	9.954	9.974	9.994	10.014	10.034	10.054	10.073	10.093
610	10.093	10.113	10.133	10.153	10.173	10.193	10.213	10.233	10.253	10.273	10.293
620	10.293	10.313	10.333	10.353	10.373	10.393	10.413	10.433	10.453	10.473	10.493
630	10.493	10.513	10.533	10.553	10.573	10.593	10.613	10.633	10.653	10.673	10.693
640	10.693	10.713	10.733	10.753	10.774	10.794	10.814	10.834	10.854	10.874	10.894
650	10.894	10.914	10.934	10.955	10.975	10.995	11.015	11.035	11.055	11.076	11.096
660	11.096	11.116	11.136	11.156	11.177	11.197	11.217	11.237	11.257	11.278	11.298
670	11.298	11.318	11.338	11.359	11.379	11.399	11.419	11.440	11.460	11.480	11.501
680	11.501	11.521	11.541	11.561	11.582	11.602	11.622	11.643	11.663	11.683	11.704
690	11.704	11.724	11.744	11.765	11.785	11.805	11.826	11.846	11.867	11.887	11.907
700	11.907	11.928	11.948	11.968	11.989	12.009	12.030	12.050	12.071	12.091	12.111
710	12.111	12.132	12.152	12.173	12.193	12.214	12.234	12.255	12.275	12.295	12.316

TABLE 17 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	12.316	12.336	12.357	12.377	12.398	12.418	12.439	12.459	12.480	12.500	12.521
730	12.521	12.542	12.562	12.583	12.603	12.624	12.644	12.665	12.685	12.706	12.726
740	12.726	12.747	12.768	12.788	12.809	12.829	12.850	12.871	12.891	12.912	12.932
750	12.932	12.953	12.974	12.994	13.015	13.036	13.056	13.077	13.098	13.118	13.139
760	13.139	13.159	13.180	13.201	13.221	13.242	13.263	13.284	13.304	13.325	13.346
770	13.346	13.366	13.387	13.408	13.428	13.449	13.470	13.491	13.511	13.532	13.553
780	13.553	13.574	13.594	13.615	13.636	13.657	13.677	13.698	13.719	13.740	13.760
790	13.760	13.781	13.802	13.823	13.844	13.864	13.885	13.906	13.927	13.948	13.969
800	13.969	13.989	14.010	14.031	14.052	14.073	14.094	14.114	14.135	14.156	14.177
810	14.177	14.198	14.219	14.240	14.260	14.281	14.302	14.323	14.344	14.365	14.386
820	14.386	14.407	14.428	14.448	14.469	14.490	14.511	14.532	14.553	14.574	14.595
830	14.595	14.616	14.637	14.658	14.679	14.700	14.721	14.742	14.763	14.784	14.804
840	14.804	14.825	14.846	14.867	14.888	14.909	14.930	14.951	14.972	14.993	15.014
850	15.014	15.035	15.056	15.077	15.098	15.119	15.140	15.162	15.183	15.204	15.225
860	15.225	15.246	15.267	15.288	15.309	15.330	15.351	15.372	15.393	15.414	15.435
870	15.435	15.456	15.477	15.498	15.520	15.541	15.562	15.583	15.604	15.625	15.646
880	15.646	15.667	15.688	15.709	15.731	15.752	15.773	15.794	15.815	15.836	15.857
890	15.857	15.878	15.900	15.921	15.942	15.963	15.984	16.005	16.027	16.048	16.069
900	16.069	16.090	16.111	16.132	16.154	16.175	15.196	16.217	16.238	16.260	16.281
910	16.281	16.302	16.323	16.344	16.366	16.387	15.408	15.429	16.450	15.472	16.493
920	16.493	16.514	16.535	16.557	16.578	16.599	16.620	16.642	16.663	16.684	16.705
930	16.705	16.727	16.748	16.769	16.790	16.812	16.833	16.854	16.875	16.897	16.918
940	16.918	16.939	16.961	16.982	17.003	17.025	17.046	17.067	17.088	17.110	17.131
950	17.131	17.152	17.174	17.195	17.216	17.238	17.259	17.280	17.302	17.323	17.344
960	17.344	17.366	17.387	17.408	17.430	17.451	17.472	17.494	17.515	17.536	17.558
970	17.558	17.579	17.601	17.622	17.643	17.665	17.686	17.707	17.729	17.750	17.772
980	17.772	17.793	17.814	17.836	17.857	17.879	17.900	17.921	17.943	17.964	17.986
990	17.986	18.007	18.028	18.050	18.071	18.093	18.114	18.136	18.157	18.178	18.200
1000	18.200	18.221	18.243	18.264	18.286	18.307	18.328	18.350	18.371	18.393	18.414
1010	18.414	18.436	18.457	18.479	18.500	18.522	18.543	18.565	18.586	18.608	18.629
1020	18.629	18.650	18.672	18.693	18.715	18.736	18.758	18.779	18.801	18.822	18.844
1030	18.844	18.865	18.887	18.908	18.930	18.951	18.973	18.994	19.016	19.037	19.059
1040	19.059	19.081	19.102	19.124	19.145	19.167	19.188	19.210	19.231	19.253	19.274
1050	19.274	19.296	19.317	19.339	19.360	19.382	19.404	19.425	19.447	19.468	19.490
1060	19.490	19.511	19.533	19.554	19.576	19.598	19.619	19.641	19.662	19.684	19.705
1070	19.705	19.727	19.749	19.770	19.792	19.813	19.835	19.857	19.878	19.900	19.921
1080	19.921	19.943	19.964	19.986	20.008	20.029	20.051	20.072	20.094	20.116	20.137
1090	20.137	20.159	20.181	20.202	20.224	20.245	20.267	20.289	20.310	20.332	20.353
1100	20.353	20.375	20.397	20.418	20.440	20.462	20.483	20.505	20.527	20.548	20.570
1110	20.570	20.591	20.613	20.635	20.656	20.578	20.700	20.721	20.743	20.765	20.786
1120	20.786	20.808	20.830	20.851	20.873	20.895	20.916	20.938	20.960	20.981	21.003
1130	21.003	21.025	21.046	21.068	21.090	21.111	21.133	21.155	21.176	21.198	21.220
1140	21.220	21.241	21.263	21.285	21.306	21.328	21.350	21.371	21.393	21.415	21.437
1150	21.437	21.458	21.480	21.502	21.523	21.545	21.567	21.588	21.610	21.632	21.654
1160	21.654	21.675	21.697	21.719	21.740	21.762	21.784	21.806	21.827	21.849	21.871
1170	21.871	21.892	21.914	21.936	21.958	21.979	22.001	22.023	22.044	22.066	22.088
1180	22.088	22.110	22.131	22.153	22.175	22.197	22.218	22.240	22.262	22.284	22.305
1190	22.305	22.327	22.349	22.370	22.392	22.414	22.436	22.457	22.479	22.501	22.523
1200	22.523	22.544	22.566	22.588	22.610	22.631	22.653	22.675	22.697	22.718	22.740
1210	22.740	22.762	22.784	22.805	22.827	22.849	22.871	22.893	22.914	22.936	22.958
1220	22.958	22.980	23.001	23.023	23.045	23.067	23.088	23.110	23.132	23.154	23.176
1230	23.176	23.197	23.219	23.241	23.263	23.284	23.306	23.328	23.350	23.372	23.393
1240	23.393	23.415	23.437	23.459	23.480	23.502	23.524	23.546	23.568	23.589	23.611
1250	23.611	23.633	23.655	23.676	23.698	23.720	23.742	23.764	23.785	23.807	23.829
1260	23.829	23.851	23.873	23.894	23.916	23.938	23.960	23.982	24.003	24.025	24.047
1270	24.047	24.069	24.091	24.112	24.134	24.156	24.178	24.200	24.221	24.243	24.265
1280	24.265	24.287	24.309	24.330	24.352	24.374	24.396	24.418	24.439	24.461	24.483
1290	24.483	24.505	24.527	24.548	24.570	24.592	24.614	24.636	24.658	24.679	24.701
1300	24.701	24.723	24.745	24.767	24.788	24.810	24.832	24.854	24.876	24.897	24.919

TABLE 17 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1310	24.919	24.941	24.963	24.985	25.007	25.028	25.050	25.072	25.094	25.116	25.137
1320	25.137	25.159	25.181	25.203	25.225	25.247	25.268	25.290	25.312	25.334	25.356
1330	25.356	25.377	25.399	25.421	25.443	25.465	25.487	25.508	25.530	25.552	25.574
1340	25.574	25.596	25.618	25.639	25.661	25.683	25.705	25.727	25.748	25.770	25.792
1350	25.792	25.814	25.836	25.858	25.879	25.901	25.923	25.945	25.967	25.989	26.010
1360	26.010	26.032	26.054	26.076	26.098	26.119	26.141	26.163	26.185	26.207	26.229
1370	26.229	26.250	26.272	26.294	26.316	26.338	26.360	26.381	26.403	26.425	26.447
1380	26.447	26.469	26.491	26.512	26.534	26.556	26.578	26.600	26.622	26.643	26.665
1390	26.665	26.687	26.709	26.731	26.752	26.774	26.796	26.818	26.840	26.862	26.883
1400	26.883	26.905	26.927	26.949	26.971	26.993	27.014	27.036	27.058	27.080	27.102
1410	27.102	27.124	27.145	27.167	27.189	27.211	27.233	27.254	27.276	27.298	27.320
1420	27.320	27.342	27.364	27.385	27.407	27.429	27.451	27.473	27.495	27.516	27.538
1430	27.538	27.560	27.582	27.604	27.625	27.647	27.669	27.691	27.713	27.735	27.756
1440	27.756	27.778	27.800	27.822	27.844	27.866	27.887	27.909	27.931	27.953	27.975
1450	27.975	27.996	28.018	28.040	28.062	28.084	28.105	28.127	28.149	28.171	28.193
1460	28.193	28.215	28.236	28.258	28.280	28.302	28.324	28.345	28.367	28.389	28.411
1470	28.411	28.433	28.455	28.476	28.498	28.520	28.542	28.564	28.585	28.607	28.629
1480	28.629	28.651	28.673	28.694	28.716	28.738	28.760	28.782	28.803	28.825	28.847
1490	28.847	28.869	28.891	28.912	28.934	28.956	28.978	29.000	29.021	29.043	29.065
1500	29.065	29.087	29.109	29.130	29.152	29.174	29.196	29.218	29.239	29.261	29.283
1510	29.283	29.305	29.327	29.348	29.370	29.392	29.414	29.436	29.457	29.479	29.501
1520	29.501	29.523	29.545	29.566	29.588	29.610	29.632	29.653	29.675	29.697	29.719
1530	29.719	29.741	29.762	29.784	29.806	29.828	29.850	29.871	29.893	29.915	29.937
1540	29.937	29.958	29.980	30.002	30.024	30.046	30.067	30.089	30.111	30.133	30.154
1550	30.154	30.176	30.198	30.220	30.242	30.263	30.285	30.307	30.329	30.350	30.372
1560	30.372	30.394	30.416	30.437	30.459	30.481	30.503	30.524	30.546	30.568	30.590
1570	30.590	30.611	30.633	30.655	30.677	30.699	30.720	30.742	30.764	30.786	30.807
1580	30.807	30.829	30.851	30.873	30.894	30.916	30.938	30.960	30.981	31.003	31.025
1590	31.025	31.047	31.068	31.090	31.112	31.133	31.155	31.177	31.199	31.220	31.242
1600	31.242	31.264	31.286	31.307	31.329	31.351	31.373	31.394	31.416	31.438	31.459
1610	31.459	31.481	31.503	31.525	31.546	31.568	31.590	31.612	31.633	31.655	31.677
1620	31.677	31.698	31.720	31.742	31.764	31.785	31.807	31.829	31.850	31.872	31.894
1630	31.894	31.916	31.937	31.959	31.981	32.002	32.024	32.046	32.068	32.089	32.111
1640	32.111	32.133	32.154	32.176	32.198	32.219	32.241	32.263	32.284	32.306	32.328
1650	32.328	32.350	32.371	32.393	32.415	32.436	32.458	32.480	32.501	32.523	32.545
1660	32.545	32.566	32.588	32.610	32.631	32.653	32.675	32.696	32.718	32.740	32.761
1670	32.761	32.783	32.805	32.826	32.848	32.870	32.891	32.913	32.935	32.956	32.978
1680	32.978	33.000	33.021	33.043	33.065	33.086	33.108	33.130	33.151	33.173	33.195
1690	33.195	33.216	33.238	33.260	33.281	33.303	33.325	33.346	33.368	33.389	33.411
1700	33.411	33.433	33.454	33.476	33.498	33.519	33.541	33.563	33.584	33.606	33.627
1710	33.627	33.649	33.671	33.692	33.714	33.736	33.757	33.779	33.800	33.822	33.844
1720	33.844	33.865	33.887	33.908	33.930	33.952	33.973	33.995	34.016	34.038	34.060
1730	34.060	34.081	34.103	34.124	34.146	34.168	34.189	34.211	34.232	34.254	34.276
1740	34.276	34.297	34.319	34.340	34.362	34.384	34.405	34.427	34.448	34.470	34.491
1750	34.491	34.513	34.535	34.556	34.578	34.599	34.621	34.642	34.664	34.686	34.707
1760	34.707	34.729	34.750	34.772	34.793	34.815	34.836	34.858	34.879	34.901	34.923
1770	34.923	34.944	34.966	34.987	35.009	35.030	35.052	35.073	35.095	35.116	35.138
1780	35.138	35.160	35.181	35.203	35.224	35.246	35.267	35.289	35.310	35.332	35.353
1790	35.353	35.375	35.396	35.418	35.439	35.461	35.482	35.504	35.525	35.547	35.568
1800	35.568	35.590	35.611	35.633	35.654	35.676	35.697	35.719	35.740	35.762	35.783
1810	35.783	35.805	35.826	35.848	35.869	35.891	35.912	35.934	35.955	35.977	35.998
1820	35.998	36.019	36.041	36.062	36.084	36.105	36.127	36.148	36.170	36.191	36.213
1830	36.213	36.234	36.256	36.277	36.298	36.320	36.341	36.363	36.384	36.406	36.427
1840	36.427	36.449	36.470	36.491	36.513	36.534	36.556	36.577	36.599	36.620	36.641
1850	36.641	36.663	36.684	36.706	36.727	36.748	36.770	36.791	36.813	36.834	36.855
1860	36.855	36.877	36.898	36.920	36.941	36.962	36.984	37.005	37.027	37.048	37.069
1870	37.069	37.091	37.112	37.134	37.155	37.176	37.198	37.219	37.240	37.262	37.283
1880	37.283	37.305	37.326	37.347	37.369	37.390	37.411	37.433	37.454	37.475	37.497
1890	37.497	37.518	37.539	37.561	37.582	37.603	37.625	37.646	37.668	37.689	37.710

TABLE 17 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1900	37.710	37.731	37.753	37.774	37.795	37.817	37.838	37.859	37.881	37.902	37.923
1910	37.923	37.945	37.966	37.987	38.009	38.030	38.051	38.073	38.094	38.115	38.136
1920	38.136	38.158	38.179	38.200	38.222	38.243	38.264	38.285	38.307	38.328	38.349
1930	38.349	38.370	38.392	38.413	38.434	38.456	38.477	38.498	38.519	38.541	38.562
1940	38.562	38.583	38.604	38.626	38.647	38.668	38.689	38.711	38.732	38.753	38.774
1950	38.774	38.795	38.817	38.838	38.859	38.880	38.902	38.923	38.944	38.965	38.986
1960	38.986	39.008	39.029	39.050	39.071	39.093	39.114	39.135	39.156	39.177	39.198
1970	39.198	39.220	39.241	39.262	39.283	39.304	39.326	39.347	39.368	39.389	39.410
1980	39.410	39.431	39.453	39.474	39.495	39.516	39.537	39.558	39.580	39.601	39.622
1990	39.622	39.643	39.664	39.685	39.706	39.728	39.749	39.770	39.791	39.812	39.833
2000	39.833	39.854	39.875	39.897	39.918	39.939	39.960	39.981	40.002	40.023	40.044
2010	40.044	40.066	40.087	40.108	40.129	40.150	40.171	40.192	40.213	40.234	40.255
2020	40.255	40.276	40.297	40.319	40.340	40.361	40.382	40.403	40.424	40.445	40.466
2030	40.466	40.487	40.508	40.529	40.550	40.571	40.592	40.613	40.634	40.655	40.677
2040	40.677	40.698	40.719	40.740	40.761	40.782	40.803	40.824	40.845	40.866	40.887
2050	40.887	40.908	40.929	40.950	40.971	40.992	41.013	41.034	41.055	41.076	41.097
2060	41.097	41.118	41.139	41.160	41.181	41.202	41.223	41.244	41.265	41.286	41.307
2070	41.307	41.328	41.349	41.370	41.390	41.411	41.432	41.453	41.474	41.495	41.516
2080	41.516	41.537	41.558	41.579	41.600	41.621	41.642	41.663	41.684	41.705	41.725
2090	41.725	41.746	41.767	41.788	41.809	41.830	41.851	41.872	41.893	41.914	41.935
2100	41.935	41.955	41.976	41.997	42.018	42.039	42.060	42.081	42.102	42.123	42.143
2110	42.143	42.164	42.185	42.206	42.227	42.248	42.269	42.289	42.310	42.331	42.352
2120	42.352	42.373	42.394	42.415	42.435	42.456	42.477	42.498	42.519	42.540	42.560
2130	42.560	42.581	42.602	42.623	42.644	42.664	42.685	42.706	42.727	42.748	42.768
2140	42.768	42.789	42.810	42.831	42.852	42.872	42.893	42.914	42.935	42.956	42.976
2150	42.976	42.997	43.018	43.039	43.059	43.080	43.101	43.122	43.142	43.163	43.184
2160	43.184	43.205	43.225	43.246	43.267	43.288	43.308	43.329	43.350	43.370	43.391
2170	43.391	43.412	43.433	43.453	43.474	43.495	43.515	43.536	43.557	43.578	43.598
2180	43.598	43.619	43.640	43.660	43.681	43.702	43.722	43.743	43.764	43.784	43.805
2190	43.805	43.826	43.846	43.867	43.888	43.908	43.929	43.950	43.970	43.991	44.012
2200	44.012	44.032	44.053	44.073	44.094	44.115	44.135	44.156	44.177	44.197	44.218
2210	44.218	44.238	44.259	44.280	44.300	44.321	44.341	44.362	44.383	44.403	44.424
2220	44.424	44.444	44.465	44.485	44.506	44.527	44.547	44.568	44.588	44.609	44.629
2230	44.629	44.650	44.671	44.691	44.712	44.732	44.753	44.773	44.794	44.814	44.835
2240	44.835	44.855	44.876	44.896	44.917	44.937	44.958	44.978	44.999	45.019	45.040
2250	45.040	45.060	45.081	45.101	45.122	45.142	45.163	45.183	45.204	45.224	45.245
2260	45.245	45.265	45.286	45.306	45.326	45.347	45.367	45.388	45.408	45.429	45.449
2270	45.449	45.469	45.490	45.510	45.531	45.551	45.572	45.592	45.612	45.633	45.653
2280	45.653	45.674	45.694	45.714	45.735	45.755	45.775	45.796	45.816	45.837	45.857
2290	45.857	45.877	45.898	45.918	45.938	45.959	45.979	45.999	46.020	46.040	46.060
2300	46.060	46.081	46.101	46.121	46.142	46.162	46.182	46.202	46.223	46.243	46.263
2310	46.263	46.284	46.304	46.324	46.344	46.365	46.385	46.405	46.425	46.446	46.466
2320	46.466	46.486	46.506	46.527	46.547	46.567	46.587	46.608	46.628	46.648	46.668
2330	46.668	46.688	46.709	46.729	46.749	46.769	46.789	46.810	46.830	46.850	46.870
2340	46.870	46.890	46.910	46.931	46.951	46.971	46.991	47.011	47.031	47.051	47.071
2350	47.071	47.092	47.112	47.132	47.152	47.172	47.192	47.212	47.232	47.252	47.272
2360	47.272	47.292	47.312	47.333	47.353	47.373	47.393	47.413	47.433	47.453	47.473
2370	47.473	47.493	47.513								

TABLE 18 Type R Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–50	–0.226										
–40	–0.188	–0.192	–0.196	–0.200	–0.204	–0.208	–0.211	–0.215	–0.219	–0.223	–0.226
–30	–0.145	–0.150	–0.154	–0.158	–0.163	–0.167	–0.171	–0.175	–0.180	–0.184	–0.188
–20	–0.100	–0.105	–0.109	–0.114	–0.119	–0.123	–0.128	–0.132	–0.137	–0.141	–0.145
–10	–0.051	–0.056	–0.061	–0.066	–0.071	–0.076	–0.081	–0.086	–0.091	–0.095	–0.100
0	0.000	–0.005	–0.011	–0.016	–0.021	–0.026	–0.031	–0.036	–0.041	–0.046	–0.051
0	0.000	0.005	0.011	0.016	0.021	0.027	0.032	0.038	0.043	0.049	0.054
10	0.054	0.060	0.065	0.071	0.077	0.082	0.088	0.094	0.100	0.105	0.111
20	0.111	0.117	0.123	0.129	0.135	0.141	0.147	0.153	0.159	0.165	0.171
30	0.171	0.177	0.183	0.189	0.195	0.201	0.207	0.214	0.220	0.226	0.232
40	0.232	0.239	0.245	0.251	0.258	0.264	0.271	0.277	0.284	0.290	0.296
50	0.296	0.303	0.310	0.315	0.323	0.329	0.336	0.343	0.349	0.356	0.363
60	0.363	0.369	0.376	0.383	0.390	0.397	0.403	0.410	0.417	0.424	0.431
70	0.431	0.438	0.445	0.452	0.459	0.466	0.473	0.480	0.487	0.494	0.501
80	0.501	0.508	0.516	0.523	0.530	0.537	0.544	0.552	0.559	0.566	0.573
90	0.573	0.581	0.588	0.595	0.603	0.610	0.618	0.625	0.632	0.640	0.647
100	0.647	0.655	0.662	0.670	0.677	0.685	0.693	0.700	0.708	0.715	0.723
110	0.723	0.731	0.738	0.746	0.754	0.761	0.769	0.777	0.785	0.792	0.800
120	0.800	0.808	0.816	0.824	0.832	0.839	0.847	0.855	0.863	0.871	0.879
130	0.879	0.887	0.895	0.903	0.911	0.919	0.927	0.935	0.943	0.951	0.959
140	0.959	0.967	0.976	0.984	0.992	1.000	1.008	1.016	1.025	1.033	1.041
150	1.041	1.049	1.058	1.066	1.074	1.082	1.091	1.099	1.107	1.116	1.124
160	1.124	1.132	1.141	1.149	1.158	1.166	1.175	1.183	1.191	1.200	1.208
170	1.208	1.217	1.225	1.234	1.242	1.251	1.260	1.268	1.277	1.285	1.294
180	1.294	1.303	1.311	1.320	1.329	1.337	1.346	1.355	1.363	1.372	1.381
190	1.381	1.389	1.398	1.407	1.416	1.425	1.433	1.442	1.451	1.460	1.469
200	1.469	1.477	1.486	1.495	1.504	1.513	1.522	1.531	1.540	1.549	1.558
210	1.558	1.567	1.575	1.584	1.593	1.602	1.611	1.620	1.629	1.639	1.648
220	1.648	1.657	1.666	1.675	1.684	1.693	1.702	1.711	1.720	1.729	1.739
230	1.739	1.748	1.757	1.766	1.775	1.784	1.794	1.803	1.812	1.821	1.831
240	1.831	1.840	1.849	1.858	1.868	1.877	1.885	1.895	1.905	1.914	1.923
250	1.923	1.933	1.942	1.951	1.961	1.970	1.980	1.989	1.998	2.008	2.017
260	2.017	2.027	2.036	2.046	2.055	2.064	2.074	2.083	2.093	2.102	2.112
270	2.112	2.121	2.131	2.140	2.150	2.159	2.159	2.179	2.188	2.198	2.207
280	2.207	2.217	2.226	2.236	2.246	2.255	2.265	2.275	2.284	2.294	2.304
290	2.304	2.313	2.323	2.333	2.342	2.352	2.362	2.371	2.381	2.391	2.401
300	2.401	2.410	2.420	2.430	2.440	2.449	2.459	2.469	2.479	2.488	2.498
310	2.498	2.508	2.518	2.528	2.538	2.547	2.557	2.567	2.577	2.587	2.597
320	2.597	2.607	2.617	2.626	2.636	2.646	2.656	2.666	2.676	2.686	2.696
330	2.696	2.706	2.716	2.726	2.736	2.746	2.756	2.766	2.776	2.786	2.796
340	2.796	2.806	2.816	2.826	2.836	2.846	2.856	2.866	2.876	2.886	2.896
350	2.896	2.906	2.916	2.926	2.937	2.947	2.957	2.967	2.977	2.987	2.997
360	2.997	3.007	3.018	3.028	3.038	3.048	3.058	3.068	3.079	3.089	3.099
370	3.099	3.109	3.119	3.130	3.140	3.150	3..160	3.171	3.181	3.191	3.201
380	3.201	3.212	3.222	3.232	3.242	3.253	3.263	3.273	3.284	3.294	3.304
390	3.304	3.315	3.325	3.335	3.346	3.356	3.366	3.377	3.387	3.397	3.408
400	3.408	3.418	3.428	3.439	3.449	3.460	3.470	3.480	3.491	3.501	3.512
410	3.512	3.522	3.533	3.543	3.553	3.564	3.574	3.585	3.595	3.606	3.616
420	3.616	3.627	3.637	3.648	3.658	3.669	3.679	3.690	3.700	3.711	3.721
430	3.721	3.732	3.742	3.753	3.764	3.774	3.785	3.795	3.806	3.816	3.827
440	3.827	3.838	3.848	3.859	3.869	3.880	3.891	3.901	3.912	3.922	3.933
450	3.933	3.944	3.954	3.965	3.976	3.986	3.997	4.008	4.018	4.029	4.040
460	4.040	4.050	4.061	4.072	4.083	4.093	4.104	4.115	4.125	4.136	4.147
470	4.147	4.158	4.168	4.179	4.190	4.201	4.211	4.222	4.233	4.244	4.255
480	4.255	4.265	4.276	4.287	4.298	4.309	4.319	4.330	4.341	4.352	4.363
490	4.363	4.373	4.384	4.395	4.406	4.417	4.428	4.439	4.449	4.460	4.471
500	4.471	4.482	4.493	4.504	4.515	4.526	4.537	4.548	4.558	4.569	4.580
510	4.580	4.591	4.602	4.613	4.624	4.635	4.646	4.657	4.668	4.679	4.690
520	4.690	4.701	4.712	4.723	4.734	4.745	4.756	4.767	4.778	4.789	4.800

TABLE 18 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
530	4.800	4.811	4.822	4.833	4.844	4.855	4.866	4.877	4.888	4.899	4.910
540	4.910	4.922	4.933	4.944	4.955	4.966	4.977	4.988	4.999	5.010	5.021
550	5.021	5.033	5.044	5.055	5.066	5.077	5.088	5.099	5.111	5.122	5.133
560	5.133	5.144	5.155	5.166	5.178	5.189	5.200	5.211	5.222	5.234	5.245
570	5.245	5.256	5.267	5.279	5.290	5.301	5.312	5.323	5.335	5.346	5.357
580	5.357	5.369	5.380	5.391	5.402	5.414	5.425	5.436	5.448	5.459	5.470
590	5.470	5.481	5.493	5.504	5.515	5.527	5.538	5.549	5.561	5.572	5.583
600	5.583	5.595	5.606	5.618	5.629	5.640	5.652	5.663	5.674	5.686	5.697
610	5.697	5.709	5.720	5.731	5.743	5.754	5.766	5.777	5.789	5.800	5.812
620	5.812	5.823	5.834	5.846	5.857	5.869	5.880	5.892	5.903	5.915	5.926
630	5.926	5.938	5.949	5.951	5.972	5.984	5.995	6.007	6.018	6.030	6.041
640	6.041	6.053	6.065	6.076	6.088	6.099	6.111	6.122	6.134	6.146	6.157
650	6.157	6.169	6.180	6.192	6.204	6.215	6.227	6.238	6.250	6.262	6.273
660	6.273	6.285	6.297	5.308	6.320	6.332	6.343	6.355	6.367	6.378	6.390
670	6.390	6.402	6.413	6.425	6.437	6.448	6.460	6.472	6.484	6.495	6.507
580	6.507	6.519	6.531	6.542	6.554	6.566	6.578	6.589	6.601	6.613	6.625
690	6.625	6.636	6.648	6.660	6.672	6.684	6.695	6.707	6.719	6.731	6.743
700	6.743	6.755	6.766	6.778	6.790	6.802	6.814	6.826	6.838	6.849	6.861
710	6.861	6.873	6.885	6.897	6.909	6.921	6.933	6.945	6.956	6.968	6.980
720	6.980	6.992	7.004	7.015	7.028	7.040	7.052	7.064	7.076	7.088	7.100
730	7.100	7.112	7.124	7.136	7.148	7.160	7.172	7.184	7.196	7.208	7.220
740	7.220	7.232	7.244	7.256	7.268	7.280	7.292	7.304	7.316	7.328	7.340
750	7.340	7.352	7.364	7.376	7.389	7.401	7.413	7.425	7.437	7.449	7.461
760	7.461	7.473	7.485	7.498	7.510	7.522	7.534	7.546	7.558	7.570	7.583
770	7.583	7.595	7.607	7.619	7.631	7.644	7.656	7.668	7.680	7.692	7.705
780	7.705	7.717	7.729	7.741	7.753	7.766	7.778	7.790	7.802	7.815	7.827
790	7.827	7.839	7.851	7.864	7.876	7.888	7.901	7.913	7.925	7.938	7.950
800	7.950	7.962	7.974	7.987	7.999	8.011	8.024	8.036	8.048	8.061	8.073
810	8.073	8.086	8.098	8.110	8.123	8.135	8.147	8.160	8.172	8.185	8.197
820	8.197	8.209	8.222	8.234	8.247	8.259	8.272	8.284	8.296	8.309	8.321
830	8.321	8.334	8.346	8.359	8.371	8.384	8.396	8.409	8.421	8.434	8.446
840	8.446	8.459	8.471	8.484	8.496	8.509	8.521	8.534	8.546	8.559	8.571
850	8.571	8.584	8.597	8.609	8.622	8.634	8.647	8.659	8.672	8.685	8.697
860	8.697	8.710	8.722	8.735	8.748	8.760	8.773	8.785	8.798	8.811	8.823
870	8.823	8.836	8.849	8.861	8.874	8.887	8.899	8.912	8.925	8.937	8.950
880	8.950	8.963	8.975	8.988	9.001	9.014	9.026	9.039	9.052	9.065	9.077
890	9.077	9.090	9.103	9.115	9.128	9.141	9.154	9.167	9.179	9.192	9.205
900	9.205	9.218	9.230	9.243	9.256	9.269	9.282	9.294	9.307	9.320	9.333
910	9.333	9.346	9.359	9.371	9.384	9.397	9.410	9.423	9.436	9.449	9.461
920	9.461	9.474	9.487	9.500	9.513	9.526	9.539	9.552	9.565	9.578	9.590
930	9.590	9.603	9.616	9.629	9.642	9.655	9.658	9.681	9.694	9.707	9.720
940	9.720	9.733	9.746	9.759	9.772	9.785	9.798	9.811	9.824	9.837	9.850
950	9.850	9.863	9.876	9.889	9.902	9.915	9.928	9.941	9.954	9.967	9.980
960	9.980	9.993	10.006	10.019	10.032	10.046	10.059	10.072	10.085	10.098	10.111
970	10.111	10.124	10.137	10.150	10.163	10.177	10.190	10.203	10.216	10.229	10.242
980	10.242	10.255	10.268	10.282	10.295	10.308	10.321	10.334	10.347	10.361	10.374
990	10.374	10.387	10.400	10.413	10.427	10.440	10.453	10.466	10.480	10.493	10.506
1000	10.506	10.519	10.532	10.546	10.559	10.572	10.585	10.599	10.612	10.625	10.638
1010	10.638	10.652	10.665	10.678	10.692	10.705	10.718	10.731	10.745	10.758	10.771
1020	10.771	10.785	10.798	10.811	10.825	10.838	10.851	10.865	10.878	10.891	10.905
1030	10.905	10.918	10.932	10.945	10.958	10.972	10.985	10.998	11.012	11.025	11.039
1040	11.039	11.052	11.065	11.079	11.092	11.106	11.119	11.132	11.146	11.159	11.173
1050	11.173	11.186	11.200	11.213	11.227	11.240	11.253	11.267	11.280	11.294	11.307
1060	11.307	11.321	11.334	11.348	11.361	11.375	11.388	11.402	11.415	11.429	11.442
1070	11.442	11.456	11.469	11.483	11.496	11.510	11.524	11.537	11.551	11.564	11.578
1080	11.578	11.591	11.605	11.618	11.632	11.646	11.659	11.673	11.686	11.700	11.714
1090	11.714	11.727	11.741	11.754	11.768	11.782	11.795	11.809	11.822	11.836	11.850
1100	11.850	11.863	11.877	11.891	11.904	11.918	11.931	11.945	11.959	11.972	11.986
1110	11.986	12.000	12.013	12.027	12.041	12.054	12.068	12.082	12.096	12.109	12.123

TABLE 18 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1120	12.123	12.137	12.150	12.164	12.178	12.191	12.205	12.219	12.233	12.246	12.260
1130	12.260	12.274	12.288	12.301	12.315	12.329	12.342	12.356	12.370	12.384	12.397
1140	12.397	12.411	12.425	12.439	12.453	12.466	12.480	12.494	12.508	12.521	12.535
1150	12.535	12.549	12.563	12.577	12.590	12.604	12.618	12.632	12.646	12.659	12.673
1160	12.673	12.687	12.701	12.715	12.729	12.742	12.756	12.770	12.784	12.798	12.812
1170	12.812	12.825	12.839	12.853	12.867	12.881	12.895	12.909	12.922	12.936	12.950
1180	12.950	12.964	12.978	12.992	13.006	13.019	13.033	13.047	13.061	13.075	13.089
1190	13.089	13.103	13.117	13.131	13.145	13.158	13.172	13.186	13.200	13.214	13.228
1200	13.228	13.242	13.256	13.270	13.284	13.298	13.311	13.325	13.339	13.353	13.367
1210	13.367	13.381	13.395	13.409	13.423	13.437	13.451	13.465	13.479	13.493	13.507
1220	13.507	13.521	13.535	13.549	13.563	13.577	13.590	13.604	13.618	13.632	13.646
1230	13.646	13.660	13.674	13.688	13.702	13.715	13.730	13.744	13.758	13.772	13.786
1240	13.786	13.800	13.814	13.828	13.842	13.856	13.870	13.884	13.898	13.912	13.926
1250	13.926	13.940	13.954	13.968	13.982	13.996	14.010	14.024	14.038	14.052	14.066
1260	14.066	14.081	14.095	14.109	14.123	14.137	14.151	14.165	14.179	14.193	14.207
1270	14.207	14.221	14.235	14.249	14.263	14.277	14.291	14.305	14.319	14.333	14.347
1280	14.347	14.361	14.375	14.390	14.404	14.418	14.432	14.446	14.460	14.474	14.488
1290	14.488	14.502	14.516	14.530	14.544	14.558	14.572	14.586	14.601	14.515	14.629
1300	14.629	14.643	14.657	14.671	14.685	14.699	14.713	14.727	14.741	14.755	14.770
1310	14.770	14.784	14.798	14.812	14.826	14.840	14.854	14.868	14.882	14.896	14.911
1320	14.911	14.925	14.939	14.953	14.967	14.981	14.995	15.009	15.023	15.037	15.052
1330	15.052	15.066	15.080	15.094	15.108	15.122	15.136	15.150	15.164	15.179	15.193
1340	15.193	15.207	15.221	15.235	15.249	15.263	15.277	15.291	15.306	15.320	15.334
1350	15.334	15.348	15.362	15.376	15.390	15.404	15.419	15.433	15.447	15.461	15.475
1360	15.475	15.489	15.503	15.517	15.531	15.546	15.560	15.574	15.588	15.602	15.616
1370	15.616	15.630	15.645	15.659	15.673	15.687	15.701	15.715	15.729	15.743	15.758
1380	15.758	15.772	15.785	15.800	15.814	15.828	15.842	15.856	15.871	15.885	15.899
1390	15.899	15.913	15.927	15.941	15.955	15.969	15.984	15.998	16.012	16.026	16.040
1400	16.040	16.054	16.068	16.082	16.097	15.111	16.125	16.139	16.153	16.167	16.181
1410	16.181	16.196	16.210	16.224	16.238	16.252	16.266	16.280	16.294	16.309	16.323
1420	16.323	16.337	16.351	16.365	16.379	16.393	16.407	16.422	16.436	16.450	16.464
1430	16.464	16.478	16.492	16.506	16.520	16.534	16.549	16.563	16.577	16.591	16.605
1440	16.605	16.619	16.633	16.647	16.662	16.676	16.690	16.704	16.718	16.732	16.746
1450	16.746	16.760	15.774	16.789	16.803	15.817	16.831	16.845	16.859	16.873	16.887
1460	16.887	16.901	16.915	16.930	16.944	16.958	16.972	16.986	17.000	17.014	17.028
1470	17.028	17.042	17.056	17.071	17.085	17.099	17.113	17.127	17.141	17.155	17.169
1480	17.169	17.183	17.197	17.211	17.225	17.240	17.254	17.268	17.282	17.296	17.310
1490	17.310	17.324	17.338	17.352	17.366	17.380	17.394	17.408	17.423	17.437	17.451
1500	17.451	17.465	17.479	17.493	17.507	17.521	17.535	17.549	17.563	17.577	17.591
1510	17.591	17.605	17.619	17.633	17.647	17.661	17.676	17.690	17.704	17.718	17.732
1520	17.732	17.746	17.760	17.774	17.788	17.802	17.816	17.830	17.844	17.858	17.872
1530	17.872	17.886	17.900	17.914	17.928	17.942	17.956	17.970	17.984	17.998	18.012
1540	18.012	18.026	18.040	18.054	18.068	18.082	18.096	18.110	18.124	18.138	18.152
1550	18.152	18.166	18.180	18.194	18.208	18.222	18.236	18.250	18.264	18.278	18.292
1550	18.292	18.306	18.320	18.334	18.348	18.362	18.376	18.390	18.404	18.417	18.431
1570	18.431	18.445	18.459	18.473	18.487	18.501	18.515	18.529	18.543	18.557	18.571
1580	18.571	18.585	18.599	18.613	18.627	18.640	18.654	18.668	18.682	18.696	18.710
1590	18.710	18.724	18.738	18.752	18.766	18.779	18.793	18.807	18.821	18.835	18.849
1600	18.849	18.863	18.877	18.891	18.904	18.918	18.932	18.946	18.960	18.974	18.988
1610	18.988	19.002	19.015	19.029	19.043	19.057	19.071	19.085	19.098	19.112	19.126
1620	19.126	19.140	19.154	19.168	19.181	19.195	19.209	19.223	19.237	19.250	19.264
1630	19.264	19.278	19.292	19.306	19.319	19.333	19.347	19.361	19.375	19.388	19.402
1640	19.402	19.416	19.430	19.444	19.457	19.471	19.485	19.499	19.512	19.526	19.540
1650	19.540	19.554	19.567	19.581	19.595	19.609	19.622	19.636	19.650	19.663	19.677
1660	19.677	19.691	19.705	19.718	19.732	19.746	19.759	19.773	19.787	19.800	19.814
1670	19.814	19.828	19.841	19.855	19.859	19.882	19.896	19.910	19.923	19.937	19.951
1680	19.951	19.964	19.978	19.992	20.005	20.019	20.032	20.046	20.060	20.073	20.087
1690	20.087	20.100	20.114	20.127	20.141	20.154	20.168	20.181	20.195	20.208	20.222
1700	20.222	20.235	20.249	20.262	20.275	20.289	20.302	20.316	20.329	20.342	20.356

TABLE 18 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1710	20.356	20.369	20.382	20.396	20.409	20.422	20.436	20.449	20.462	20.475	20.488
1720	20.488	20.502	20.515	20.528	20.541	20.554	20.567	20.581	20.594	20.607	20.620
1730	20.620	20.633	20.646	20.659	20.672	20.685	20.698	20.711	20.724	20.736	20.749
1740	20.749	20.762	20.775	20.788	20.801	20.813	20.826	20.839	20.852	20.864	20.877
1750	20.877	20.890	20.902	20.915	20.928	20.940	20.953	20.965	20.978	20.990	21.003
1760	21.003	21.015	21.027	21.040	21.052	21.065	21.077	21.089	21.101		

TABLE 19 Type R Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–50	–0.210	–0.212	–0.214	–0.216	–0.218	–0.220	–0.222	–0.224	–0.226		
–40	–0.188	–0.190	–0.192	–0.194	–0.197	–0.199	–0.201	–0.203	–0.205	–0.208	–0.210
–30	–0.165	–0.167	–0.169	–0.172	–0.174	–0.176	–0.179	–0.181	–0.183	–0.185	–0.188
–20	–0.141	–0.143	–0.145	–0.148	–0.150	–0.153	–0.155	–0.158	–0.160	–0.162	–0.155
–10	–0.116	–0.118	–0.121	–0.123	–0.126	–0.128	–0.131	–0.133	–0.136	–0.138	–0.141
0	–0.090	–0.092	–0.095	–0.097	–0.100	–0.103	–0.105	–0.108	–0.110	–0.113	–0.116
0	–0.090	–0.087	–0.084	–0.082	–0.079	–0.076	–0.073	–0.071	–0.068	–0.0065	–0.063
10	–0.063	–0.060	–0.057	–0.054	–0.051	–0.049	–0.046	–0.043	–0.040	–0.037	–0.035
20	–0.035	–0.032	–0.029	–0.026	–0.023	–0.020	–0.017	–0.015	–0.012	–0.009	–0.006
30	–0.006	–0.003	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024
40	0.024	0.027	0.030	0.033	0.036	0.039	0.042	0.045	0.048	0.051	0.054
50	0.054	0.057	0.060	0.064	0.067	0.070	0.073	0.076	0.079	0.082	0.086
60	0.086	0.089	0.092	0.095	0.098	0.102	0.105	0.108	0.111	0.114	0.118
70	0.118	0.121	0.124	0.127	0.131	0.134	0.137	0.141	0.144	0.147	0.151
80	0.151	0.154	0.157	0.161	0.154	0.167	0.171	0.174	0.177	0.181	0.184
90	0.184	0.188	0.191	0.194	0.198	0.201	0.205	0.208	0.212	0.215	0.218
100	0.218	0.222	0.225	0.229	0.232	0.236	0.239	0.243	0.246	0.250	0.254
110	0.254	0.257	0.261	0.264	0.268	0.271	0.275	0.278	0.282	0.286	0.289
120	0.289	0.293	0.296	0.300	0.304	0.307	0.311	0.315	0.318	0.322	0.326
130	0.326	0.329	0.333	0.337	0.340	0.344	0.348	0.352	0.355	0.359	0.363
140	0.363	0.366	0.370	0.374	0.378	0.382	0.385	0.389	0.393	0.397	0.400
150	0.400	0.404	0.408	0.412	0.416	0.420	0.423	0.427	0.431	0.435	0.439
160	0.439	0.443	0.447	0.450	0.454	0.458	0.462	0.466	0.470	0.474	0.478
170	0.478	0.482	0.486	0.489	0.493	0.497	0.501	0.505	0.509	0.513	0.517
180	0.517	0.521	0.525	0.529	0.533	0.537	0.541	0.545	0.549	0.553	0.557
190	0.557	0.561	0.565	0.569	0.573	0.578	0.582	0.586	0.590	0.594	0.598
200	0.598	0.602	0.606	0.610	0.614	0.618	0.623	0.627	0.631	0.635	0.639
210	0.639	0.543	0.647	0.652	0.656	0.660	0.664	0.668	0.672	0.677	0.681
220	0.681	0.685	0.689	0.693	0.698	0.702	0.706	0.710	0.715	0.719	0.723
230	0.723	0.727	0.732	0.736	0.740	0.744	0.749	0.753	0.757	0.761	0.766
240	0.766	0.770	0.774	0.779	0.783	0.787	0.792	0.795	0.800	0.805	0.809
250	0.809	0.813	0.818	0.822	0.826	0.831	0.835	0.839	0.844	0.848	0.853
260	0.853	0.857	0.861	0.866	0.870	0.875	0.879	0.883	0.888	0.892	0.897
270	0.897	0.901	0.906	0.910	0.915	0.919	0.923	0.928	0.932	0.937	0.941
280	0.941	0.946	0.950	0.955	0.959	0.964	0.968	0.973	0.977	0.982	0.986
290	0.986	0.991	0.995	1.000	1.005	1.009	1.014	1.018	1.023	1.027	1.032
300	1.032	1.036	1.041	1.046	1.050	1.055	1.059	1.064	1.069	1.073	1.078
310	1.078	1.082	1.087	1.092	1.096	1.101	1.105	1.110	1.115	1.119	1.124
320	1.124	1.129	1.133	1.138	1.143	1.147	1.152	1.157	1.161	1.166	1.171
330	1.171	1.175	1.180	1.185	1.190	1.194	1.199	1.204	1.208	1.213	1.218
340	1.218	1.223	1.227	1.232	1.237	1.242	1.246	1.251	1.256	1.261	1.265
350	1.265	1.270	1.275	1.280	1.284	1.289	1.294	1.299	1.304	1.308	1.313
360	1.313	1.318	1.323	1.328	1.332	1.337	1.342	1.347	1.352	1.356	1.361
370	1.361	1.366	1.371	1.376	1.381	1.386	1.390	1.395	1.400	1.405	1.410
380	1.410	1.415	1.420	1.425	1.429	1.434	1.439	1.444	1.449	1.454	1.459
390	1.459	1.464	1.469	1.473	1.478	1.483	1.488	1.493	1.498	1.503	1.508
400	1.508	1.513	1.518	1.523	1.528	1.533	1.538	1.543	1.548	1.553	1.558
410	1.558	1.563	1.568	1.572	1.577	1.582	1.587	1.592	1.597	1.602	1.607
420	1.607	1.612	1.617	1.622	1.627	1.632	1.638	1.643	1.648	1.653	1.658
430	1.658	1.663	1.668	1.673	1.678	1.683	1.688	1.693	1.698	1.703	1.708
440	1.708	1.713	1.718	1.723	1.728	1.733	1.739	1.744	1.749	1.754	1.759
450	1.759	1.764	1.769	1.774	1.779	1.784	1.790	1.795	1.800	1.805	1.810
460	1.810	1.815	1.820	1.825	1.831	1.836	1.841	1.846	1.851	1.856	1.861
470	1.861	1.867	1.872	1.877	1.882	1.887	1.892	1.898	1.903	1.908	1.913
480	1.913	1.918	1.923	1.929	1.934	1.939	1.944	1.949	1.955	1.960	1.965
490	1.965	1.970	1.975	1.981	1.986	1.991	1.996	2.002	2.007	2.012	2.017
500	2.017	2.022	2.028	2.033	2.038	2.043	2.049	2.054	2.059	2.064	2.070
510	2.070	2.075	2.080	2.085	2.091	2.096	2.101	2.107	2.112	2.117	2.122
520	2.122	2.128	2.133	2.138	2.144	2.149	2.154	2.159	2.165	2.170	2.175

TABLE 19 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
530	2.175	2.181	2.186	2.191	2.197	2.202	2.207	2.213	2.218	2.223	2.229
540	2.229	2.234	2.239	2.245	2.250	2.255	2.261	2.266	2.271	2.277	2.282
550	2.282	2.287	2.293	2.298	2.304	2.309	2.314	2.320	2.325	2.330	2.336
560	2.336	2.341	2.347	2.352	2.357	2.363	2.368	2.374	2.379	2.384	2.390
570	2.390	2.395	2.401	2.406	2.411	2.417	2.422	2.428	2.433	2.438	2.444
580	2.444	2.449	2.455	2.460	2.466	2.471	2.477	2.482	2.487	2.493	2.498
590	2.498	2.504	2.509	2.515	2.520	2.526	2.531	2.537	2.542	2.547	2.553
600	2.553	2.558	2.564	2.569	2.575	2.580	2.586	2.591	2.597	2.602	2.608
610	2.608	2.613	2.619	2.624	2.630	2.635	2.641	2.646	2.652	2.657	2.663
620	2.653	2.668	2.674	2.679	2.685	2.690	2.696	2.701	2.707	2.713	2.718
630	2.718	2.724	2.729	2.735	2.740	2.746	2.751	2.757	2.762	2.768	2.773
640	2.773	2.779	2.785	2.790	2.796	2.801	2.807	2.812	2.818	2.824	2.829
650	2.829	2.835	2.840	2.846	2.851	2.857	2.863	2.868	2.874	2.879	2.885
660	2.885	2.891	2.896	2.902	2.907	2.913	2.919	2.924	2.930	2.935	2.941
670	2.941	2.947	2.952	2.958	2.964	2.969	2.975	2.980	2.986	2.992	2.997
680	2.997	3.003	3.009	3.014	3.020	3.026	3.031	3.037	3.042	3.048	3.054
690	3.054	3.059	3.065	3.071	3.076	3.082	3.088	3.093	3.099	3.105	3.110
700	3.110	3.116	3.122	3.127	3.133	3.139	3.144	3.150	3.156	3.161	3.167
710	3.167	3.173	3.179	3.184	3.190	3.196	3.201	3.207	3.213	3.218	3.224
720	3.224	3.230	3.236	3.241	3.247	3.253	3.258	3.264	3.270	3.276	3.281
730	3.281	3.287	3.293	3.298	3.304	3.310	3.316	3.321	3.327	3.333	3.339
740	3.339	3.344	3.350	3.356	3.362	3.367	3.373	3.379	3.385	3.390	3.396
750	3.396	3.402	3.408	3.413	3.419	3.425	3.431	3.437	3.442	3.448	3.454
760	3.454	3.460	3.465	3.471	3.477	3.483	3.489	3.494	3.500	3.506	3.512
770	3.512	3.517	3.523	3.529	3.535	3.541	3.546	3.552	3.558	3.564	3.570
780	3.570	3.576	3.581	3.587	3.593	3.599	3.605	3.610	3.616	3.622	3.628
790	3.628	3.634	3.640	3.645	3.651	3.657	3.663	3.669	3.675	3.680	3.686
800	3.686	3.692	3.698	3.704	3.710	3.716	3.721	3.727	3.733	3.739	3.745
810	3.745	3.751	3.757	3.762	3.768	3.774	3.780	3.786	3.792	3.798	3.803
820	3.803	3.809	3.815	3.821	3.827	3.833	3.839	3.845	3.851	3.856	3.862
830	3.862	3.868	3.874	3.880	3.886	3.892	3.898	3.904	3.909	3.915	3.921
840	3.921	3.927	3.933	3.939	3.945	3.951	3.957	3.953	3.969	3.975	3.980
850	3.980	3.986	3.992	3.998	4.004	4.010	4.016	4.022	4.028	4.034	4.040
860	4.040	4.046	4.052	4.058	4.064	4.069	4.075	4.081	4.087	4.093	4.099
870	4.099	4.105	4.111	4.117	4.123	4.129	4.135	4.141	4.147	4.153	4.159
880	4.159	4.165	4.171	4.177	4.183	4.189	4.195	4.201	4.207	4.213	4.219
890	4.219	4.225	4.231	4.237	4.243	4.249	4.255	4.261	4.267	4.273	4.279
900	4.279	4.285	4.291	4.297	4.303	4.309	4.315	4.321	4.327	4.333	4.339
910	4.339	4.345	4.351	4.357	4.363	4.369	4.375	4.381	4.387	4.393	4.399
920	4.399	4.405	4.411	4.417	4.423	4.429	4.435	4.441	4.447	4.453	4.459
930	4.459	4.465	4.471	4.477	4.483	4.489	4.495	4.502	4.508	4.514	4.520
940	4.520	4.526	4.532	4.538	4.544	4.550	4.556	4.562	4.568	4.574	4.580
950	4.580	4.586	4.593	4.599	4.605	4.611	4.617	4.623	4.629	4.635	4.541
960	4.641	4.647	4.653	4.659	4.666	4.672	4.678	4.684	4.690	4.696	4.702
970	4.702	4.708	4.714	4.720	4.727	4.733	4.739	4.745	4.751	4.757	4.763
980	4.763	4.769	4.775	4.782	4.788	4.794	4.800	4.806	4.812	4.818	4.824
990	4.824	4.831	4.837	4.843	4.849	4.855	4.861	4.867	4.874	4.880	4.886
1000	4.886	4.892	4.898	4.904	4.910	4.917	4.923	4.929	4.935	4.941	4.947
1010	4.947	4.954	4.960	4.966	4.972	4.978	4.984	4.991	4.997	5.003	5.009
1020	5.009	5.015	5.021	5.028	5.034	5.040	5.046	5.052	5.059	5.065	5.071
1030	5.071	5.077	5.083	5.090	5.096	5.102	5.108	5.114	5.121	5.127	5.133
1040	5.133	5.139	5.145	5.152	5.158	5.164	5.170	5.176	5.183	5.189	5.195
1050	5.195	5.201	5.207	5.214	5.220	5.226	5.232	5.239	5.245	5.251	5.257
1060	5.257	5.264	5.270	5.276	5.282	5.289	5.295	5.301	5.307	5.313	5.320
1070	5.320	5.326	5.332	5.338	5.345	5.351	5.357	5.364	5.370	5.376	5.382
1080	5.382	5.389	5.395	5.401	5.407	5.414	5.420	5.426	5.432	5.439	5.445
1090	5.445	5.451	5.458	5.464	5.470	5.476	5.483	5.489	5.495	5.502	5.508
1100	5.508	5.514	5.520	5.527	5.533	5.539	5.546	5.552	5.558	5.565	5.571
1110	5.571	5.577	5.583	5.590	5.596	5.602	5.609	5.615	5.621	5.628	5.634

TABLE 19 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1120	5.634	5.640	5.647	5.653	5.659	5.666	5.672	5.678	5.685	5.691	5.697
1130	5.697	5.704	5.710	5.716	5.723	5.729	5.735	5.742	5.748	5.754	5.761
1140	5.761	5.767	5.773	5.780	5.786	5.792	5.799	5.805	5.812	5.818	5.824
1150	5.824	5.831	5.837	5.843	5.850	5.856	5.862	5.869	5.875	5.882	5.888
1160	5.888	5.894	5.901	5.907	5.913	5.920	5.926	5.933	5.939	5.945	5.952
1170	5.952	5.958	5.965	5.971	5.977	5.984	5.990	5.997	6.003	6.009	6.016
1180	6.016	6.022	6.029	6.035	6.041	6.048	6.054	6.061	6.067	6.074	6.080
1190	6.080	5.086	6.093	6.099	6.106	6.112	6.119	6.125	6.131	5.138	6.144
1200	6.144	6.151	6.157	6.164	6.170	6.176	6.183	6.189	6.196	6.202	6.209
1210	6.209	6.215	6.222	6.228	6.235	6.241	6.247	6.254	6.260	6.267	6.273
1220	6.273	6.280	6.286	6.293	6.299	6.306	6.312	6.319	6.325	6.332	6.338
1230	6.338	6.345	6.351	6.358	6.364	6.370	6.377	6.383	6.390	6.396	6.403
1240	6.403	6.409	6.416	6.422	6.429	6.435	6.442	6.448	6.455	6.461	6.468
1250	6.468	6.474	6.481	6.488	6.494	5.501	6.507	6.514	6.520	6.527	6.533
1260	6.533	6.540	6.546	6.553	6.559	6.566	6.572	6.579	6.585	6.592	6.598
1270	6.598	6.605	6.612	6.618	6.625	6.631	6.638	6.644	6.651	6.657	6.664
1280	6.664	6.671	6.677	6.684	6.690	6.697	6.703	6.710	6.716	6.723	6.730
1290	6.730	6.736	6.743	6.749	6.756	6.762	6.769	6.776	6.782	6.789	6.795
1300	6.795	6.802	6.809	6.815	6.822	6.828	6.835	6.841	6.848	6.855	6.861
1310	6.861	6.868	6.874	6.881	6.888	6.894	6.901	6.908	6.914	6.921	6.927
1320	6.927	6.934	6.941	6.947	6.954	6.960	6.967	6.974	6.980	6.987	5.994
1330	6.994	7.000	7.007	7.013	7.020	7.027	7.033	7.040	7.047	7.053	7.060
1340	7.060	7.067	7.073	7.080	7.086	7.093	7.100	7.106	7.113	7.120	7.126
1350	7.126	7.133	7.140	7.146	7.153	7.160	7.166	7.173	7.180	7.185	7.193
1360	7.193	7.200	7.206	7.213	7.220	7.226	7.233	7.240	7.247	7.253	7.260
1370	7.260	7.267	7.273	7.280	7.287	7.293	7.300	7.307	7.313	7.320	7.327
1380	7.327	7.334	7.340	7.347	7.354	7.360	7.357	7.374	7.381	7.387	7.394
1390	7.394	7.401	7.407	7.414	7.421	7.428	7.434	7.441	7.448	7.454	7.461
1400	7.461	7.468	7.475	7.481	7.488	7.495	7.502	7.508	7.515	7.522	7.529
1410	7.529	7.535	7.542	7.549	7.556	7.562	7.569	7.576	7.583	7.589	7.596
1420	7.596	7.603	7.610	7.616	7.623	7.630	7.637	7.644	7.650	7.657	7.664
1430	7.564	7.671	7.677	7.684	7.691	7.698	7.705	7.711	7.718	7.725	7.732
1440	7.732	7.739	7.745	7.752	7.759	7.766	7.772	7.779	7.786	7.793	7.800
1450	7.800	7.807	7.813	7.820	7.827	7.834	7.841	7.847	7.854	7.861	7.868
1460	7.868	7.875	7.882	7.888	7.895	7.902	7.909	7.916	7.922	7.929	7.936
1470	7.936	7.943	7.950	7.957	7.964	7.970	7.977	7.984	7.991	7.998	8.005
1480	8.005	8.011	8.018	8.025	8.032	8.039	8.046	8.053	8.059	8.066	8.073
1490	8.073	8.080	8.087	8.094	8.101	8.108	8.114	8.121	8.128	8.135	8.142
1500	8.142	8.149	8.156	8.163	8.169	8.176	8.183	8.190	8.197	8.204	8.211
1510	8.211	8.218	8.225	8.232	8.238	8.245	8.252	8.259	8.266	8.273	8.280
1520	8.280	8.287	8.294	8.301	8.308	8.314	8.321	8.328	8.335	8.342	8.349
1530	8.349	8.356	8.363	8.370	8.377	8.384	8.391	8.398	8.405	8.411	8.418
1540	8.418	8.425	8.432	8.439	8.446	8.453	8.460	8.467	8.474	8.481	8.488
1550	8.488	8.495	8.502	8.509	8.516	8.523	8.530	8.537	8.544	8.551	8.557
1560	8.557	8.564	8.571	8.578	8.585	8.592	8.599	8.606	8.613	8.620	8.627
1570	8.627	8.634	8.641	8.648	8.655	8.662	8.669	8.676	8.683	8.690	8.697
1580	8.697	8.704	8.711	8.718	8.725	8.732	8.739	8.746	8.753	8.760	8.767
1590	8.767	8.774	8.781	8.788	8.795	8.802	8.809	8.816	8.823	8.830	8.837
1600	8.837	8.844	8.852	8.859	8.866	8.873	8.880	8.887	8.894	8.901	8.908
1610	8.908	8.915	8.922	8.929	8.936	8.943	8.950	8.957	8.964	8.971	8.978
1620	8.978	8.985	8.992	8.999	9.007	9.014	9.021	9.028	9.035	9.042	9.049
1630	9.049	9.056	9.063	9.070	9.077	9.084	9.091	9.098	9.106	9.113	9.120
1640	9.120	9.127	9.134	9.141	9.148	9.155	9.162	9.169	9.176	9.184	9.191
1650	9.191	9.198	9.205	9.212	9.219	9.226	9.233	9.240	9.248	9.255	9.262
1660	9.262	9.269	9.276	9.283	9.290	9.297	9.304	9.312	9.319	9.326	9.333
1670	9.333	9.340	9.347	9.354	9.361	9.369	9.376	9.383	9.390	9.397	9.404
1680	9.404	9.411	9.419	9.426	9.433	9.440	9.447	9.454	9.461	9.469	9.476
1690	9.476	9.483	9.490	9.497	9.504	9.512	9.519	9.526	9.533	9.540	9.547
1700	9.547	9.555	9.562	9.569	9.576	9.583	9.590	9.598	9.605	9.612	9.619

TABLE 19 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1710	9.619	9.626	9.634	9.641	9.648	9.655	9.662	9.670	9.677	9.684	9.691
1720	9.691	9.698	9.706	9.713	9.720	9.727	9.734	9.742	9.749	9.756	9.763
1730	9.763	9.770	9.778	9.785	9.792	9.799	9.806	9.814	9.821	9.828	9.835
1740	9.835	9.843	9.850	9.857	9.864	9.872	9.879	9.886	9.893	9.900	9.908
1750	9.908	9.915	9.922	9.929	9.937	9.944	9.951	9.958	9.966	9.973	9.980
1760	9.980	9.987	9.995	10.002	10.009	10.016	10.024	10.031	10.038	10.046	10.053
1770	10.053	10.060	10.067	10.075	10.082	10.089	10.096	10.104	10.111	10.118	10.126
1780	10.126	10.133	10.140	10.147	10.155	10.152	10.169	10.177	10.184	10.191	10.198
1790	10.198	10.206	10.213	10.220	10.228	10.235	10.242	10.250	10.257	10.264	10.271
1800	10.271	10.279	10.286	10.293	10.301	10.308	10.315	10.323	10.330	10.337	10.345
1810	10.345	10.352	10.359	10.367	10.374	10.381	10.389	10.396	10.403	10.411	10.418
1820	10.418	10.425	10.433	10.440	10.447	10.455	10.462	10.469	10.477	10.484	10.491
1830	10.491	10.499	10.506	10.513	10.521	10.528	10.535	10.543	10.550	10.557	10.565
1840	10.565	10.572	10.580	10.587	10.594	10.602	10.609	10.616	10.624	10.631	10.638
1850	10.638	10.646	10.653	10.661	10.668	10.675	10.683	10.690	10.698	10.705	10.712
1860	10.712	10.720	10.727	10.734	10.742	10.749	10.757	10.764	10.771	10.779	10.786
1870	10.786	10.794	10.801	10.808	10.816	10.823	10.831	10.838	10.845	10.853	10.860
1880	10.860	10.868	10.875	10.883	10.890	10.897	10.905	10.912	10.920	10.927	10.934
1890	10.934	10.942	10.949	10.957	10.964	10.972	10.979	10.986	10.994	11.001	11.009
1900	11.009	11.016	11.024	11.031	11.039	11.046	11.053	11.061	11.068	11.076	11.083
1910	11.083	11.091	11.098	11.106	11.113	11.121	11.128	11.135	11.143	11.150	11.158
1920	11.158	11.165	11.173	11.180	11.188	11.195	11.203	11.210	11.218	11.225	11.233
1930	11.233	11.240	11.247	11.255	11.262	11.270	11.277	11.285	11.292	11.300	11.307
1940	11.307	11.315	11.322	11.330	11.337	11.345	11.352	11.360	11.367	11.375	11.382
1950	11.382	11.390	11.397	11.405	11.412	11.420	11.427	11.435	11.442	11.450	11.457
1960	11.457	11.465	11.472	11.480	11.487	11.495	11.502	11.510	11.518	11.525	11.533
1970	11.533	11.540	11.548	11.555	11.563	11.570	11.578	11.585	11.593	11.600	11.608
1980	11.608	11.615	11.623	11.631	11.638	11.646	11.653	11.661	11.668	11.676	11.683
1990	11.683	11.691	11.698	11.706	11.714	11.721	11.729	11.736	11.744	11.751	11.759
2000	11.759	11.766	11.774	11.782	11.789	11.797	11.804	11.812	11.819	11.827	11.835
2010	11.835	11.842	11.850	11.857	11.865	11.872	11.880	11.888	11.895	11.903	11.910
2020	11.910	11.918	11.925	11.933	11.941	11.948	11.956	11.963	11.971	11.979	11.986
2030	11.986	11.994	12.001	12.009	12.016	12.024	12.032	12.039	12.047	12.054	12.062
2040	12.062	12.070	12.077	12.085	12.092	12.100	12.108	12.115	12.123	12.131	12.138
2050	12.138	12.146	12.153	12.161	12.169	12.176	12.184	12.191	12.199	12.207	12.214
2060	12.214	12.222	12.230	12.237	12.245	12.252	12.260	12.268	12.275	12.283	12.291
2070	12.291	12.298	12.306	12.313	12.321	12.329	12.336	12.344	12.352	12.359	12.367
2080	12.367	12.375	12.382	12.390	12.398	12.405	12.413	12.420	12.428	12.436	12.443
2090	12.443	12.451	12.459	12.466	12.474	12.482	12.489	12.497	12.505	12.512	12.520
2100	12.520	12.528	12.535	12.543	12.551	12.558	12.566	12.574	12.581	12.589	12.597
2110	12.597	12.604	12.612	12.620	12.627	12.635	12.643	12.650	12.658	12.666	12.673
2120	12.673	12.681	12.589	12.696	12.704	12.712	12.719	12.727	12.735	12.742	12.750
2130	12.750	12.758	12.765	12.773	12.781	12.788	12.796	12.804	12.812	12.819	12.827
2140	12.827	12.835	12.842	12.850	12.858	12.865	12.873	12.881	12.889	12.896	12.904
2150	12.904	12.912	12.919	12.927	12.935	12.942	12.950	12.958	12.966	12.973	12.981
2150	12.981	12.989	12.996	13.004	13.012	13.019	13.027	13.035	13.043	13.050	13.058
2170	13.058	13.066	13.073	13.081	13.089	13.097	13.104	13.112	13.120	13.128	13.135
2180	13.135	13.143	13.151	13.158	13.166	13.174	13.182	13.189	13.197	13.205	13.213
2190	13.213	13.220	13.228	13.236	13.243	13.251	13.259	13.267	13.274	13.282	13.290
2200	13.290	13.298	13.305	13.313	13.321	13.329	13.336	13.344	13.352	13.359	13.367
2210	13.367	13.375	13.383	13.390	13.398	13.406	13.414	13.421	13.429	13.437	13.445
2220	13.445	13.452	13.460	13.468	13.476	13.483	13.491	13.499	13.507	13.514	13.522
2230	13.522	13.530	13.538	13.545	13.553	13.561	13.569	13.577	13.584	13.592	13.600
2240	13.600	13.608	13.615	13.623	13.631	13.639	13.646	13.654	13.662	13.670	13.677
2250	13.677	13.685	13.693	13.701	13.709	13.716	13.724	13.732	13.740	13.747	13.755
2260	13.755	13.763	13.771	13.778	13.786	13.794	13.802	13.810	13.817	13.825	13.833
2270	13.833	13.841	13.848	13.856	13.854	13.872	13.880	13.887	13.895	13.903	13.911
2280	13.911	13.919	13.926	13.934	13.942	13.950	13.957	13.965	13.973	13.981	13.989
2290	13.989	13.996	14.004	14.012	14.020	14.028	14.035	14.043	14.051	14.059	14.066

TABLE 19 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2300	14.066	14.074	14.082	14.090	14.098	14.105	14.113	14.121	14.129	14.137	14.144
2310	14.144	14.152	14.160	14.168	14.176	14.183	14.191	14.199	14.207	14.215	14.222
2320	14.222	14.230	14.238	14.246	14.254	14.261	14.269	14.277	14.285	14.293	14.300
2330	14.300	14.308	14.316	14.324	14.332	14.340	14.347	14.355	14.363	14.371	14.379
2340	14.379	14.386	14.394	14.402	14.410	14.418	14.425	14.433	14.441	14.449	14.457
2350	14.457	14.465	14.472	14.480	14.488	14.496	14.504	14.511	14.519	14.527	14.535
2360	14.535	14.543	14.551	14.558	14.566	14.574	14.582	14.590	14.597	14.605	14.613
2370	14.613	14.621	14.629	14.637	14.644	14.652	14.660	14.668	14.676	14.683	14.691
2380	14.691	14.699	14.707	14.715	14.723	14.730	14.738	14.746	14.754	14.762	14.770
2390	14.770	14.777	14.785	14.793	14.801	14.809	14.817	14.824	14.832	14.840	14.848
2400	14.848	14.856	14.864	14.871	14.879	14.887	14.895	14.903	14.911	14.918	14.926
2410	14.926	14.934	14.942	14.950	14.958	14.965	14.973	14.981	14.989	14.997	15.005
2420	15.005	15.012	15.020	15.028	15.036	15.044	15.052	15.059	15.067	15.075	15.083
2430	15.083	15.091	15.099	15.106	15.114	15.122	15.130	15.138	15.146	15.153	15.161
2440	15.161	15.169	15.177	15.185	15.193	15.200	15.208	15.216	15.224	15.232	15.240
2450	15.240	15.248	15.255	15.263	15.271	15.279	15.287	15.295	15.302	15.310	15.318
2460	15.318	15.326	15.334	15.342	15.349	15.357	15.365	15.373	15.381	15.389	15.397
2470	15.397	15.404	15.412	15.420	15.428	15.436	15.444	15.451	15.459	15.467	15.475
2480	15.475	15.483	15.491	15.499	15.506	15.514	15.522	15.530	15.538	15.546	15.553
2490	15.553	15.561	15.569	15.577	15.585	15.593	15.601	15.608	15.616	15.624	15.632
2500	15.632	15.640	15.648	15.655	15.663	15.671	15.679	15.687	15.695	15.703	15.710
2510	15.710	15.718	15.726	15.734	15.742	15.750	15.758	15.765	15.773	15.781	15.789
2520	15.789	15.797	15.805	15.812	15.820	15.828	15.836	15.844	15.852	15.860	15.867
2530	15.867	15.875	15.883	15.891	15.899	15.907	15.915	15.922	15.930	15.938	15.946
2540	15.946	15.954	15.962	15.969	15.977	15.985	15.993	16.001	16.009	16.017	16.024
2550	16.024	16.032	16.040	16.048	16.056	16.064	16.071	16.079	16.087	16.095	16.103
2560	16.103	16.111	16.119	16.126	16.134	16.142	16.150	15.158	16.166	16.174	16.181
2570	16.181	16.189	16.197	16.205	16.213	16.221	16.228	15.236	16.244	16.252	16.260
2580	16.260	16.268	16.276	16.283	16.291	16.299	16.307	16.315	16.323	16.330	16.338
2590	16.338	16.346	16.354	16.362	16.370	16.378	16.385	16.393	16.401	16.409	16.417
2600	16.417	16.425	16.432	16.440	16.448	16.456	16.464	16.472	16.480	16.487	16.495
2610	16.495	16.503	16.511	16.519	16.527	16.534	16.542	16.550	16.558	16.566	16.574
2620	16.574	16.582	16.589	16.597	16.605	16.613	16.621	16.629	16.636	16.644	16.652
2630	16.652	16.660	16.668	16.676	16.683	16.691	16.699	16.707	16.715	16.723	16.731
2640	16.731	16.738	16.746	16.754	16.762	16.770	16.778	16.785	16.793	16.801	16.809
2550	16.809	16.817	16.825	16.832	16.840	16.848	16.856	16.864	16.872	16.879	16.887
2660	16.887	16.895	16.903	16.911	16.919	16.926	16.934	16.942	16.950	16.958	16.966
2670	16.966	16.973	16.981	16.989	16.997	17.005	17.013	17.020	17.028	17.036	17.044
2680	17.044	17.052	17.060	17.067	17.075	17.083	17.091	17.099	17.107	17.114	17.122
2690	17.122	17.130	17.138	17.146	17.154	17.161	17.169	17.177	17.185	17.193	17.200
2700	17.200	17.208	17.216	17.224	17.232	17.240	17.247	17.255	17.263	17.271	17.279
2710	17.279	17.285	17.294	17.302	17.310	17.318	17.326	17.333	17.341	17.349	17.357
2720	17.357	17.365	17.373	17.380	17.388	17.396	17.404	17.412	17.419	17.427	17.435
2730	17.435	17.443	17.451	17.458	17.466	17.474	17.482	17.490	17.498	17.505	17.513
2740	17.513	17.521	17.529	17.537	17.544	17.552	17.560	17.568	17.576	17.583	17.591
2750	17.591	17.599	17.607	17.615	17.622	17.630	17.638	17.646	17.654	17.661	17.669
2760	17.669	17.677	17.685	17.693	17.700	17.708	17.716	17.724	17.732	17.739	17.747
2770	17.747	17.755	17.753	17.771	17.778	17.786	17.794	17.802	17.810	17.817	17.825
2780	17.825	17.833	17.841	17.849	17.856	17.864	17.872	17.880	17.888	17.895	17.903
2790	17.903	17.911	17.919	17.926	17.934	17.942	17.950	17.958	17.965	17.973	17.981
2800	17.981	17.989	17.997	18.004	18.012	18.020	18.028	18.035	18.043	18.051	18.059
2810	18.059	18.067	18.074	18.082	18.090	18.098	18.105	18.113	18.121	18.129	18.137
2820	18.137	18.144	18.152	18.160	18.168	18.175	18.183	18.191	18.199	18.206	18.214
2830	18.214	18.222	18.230	18.238	18.245	18.253	18.261	18.269	18.276	18.284	18.292
2840	18.292	18.300	18.307	18.315	18.323	18.331	18.338	18.346	18.354	18.362	18.369
2850	18.369	18.377	18.385	18.393	18.400	18.408	18.416	18.424	18.431	18.439	18.447
2860	18.447	18.455	18.462	18.470	18.478	18.486	18.493	18.501	18.509	18.517	18.524
2870	18.524	18.532	18.540	18.548	18.555	18.563	18.571	18.579	18.586	18.594	18.602
2880	18.602	18.610	18.617	18.625	18.633	18.640	18.648	18.656	18.664	18.671	18.679
2890	18.679	18.687	18.695	18.702	18.710	18.718	18.725	18.733	18.741	18.749	18.756

TABLE 19 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2900	18.756	18.764	18.772	18.779	18.787	18.795	18.803	18.810	18.818	18.826	18.834
2910	18.834	18.841	18.849	18.857	18.864	18.872	18.880	18.887	18.895	18.903	18.911
2920	18.911	18.918	18.926	18.934	18.941	18.949	18.957	18.965	18.972	18.980	18.988
2930	18.988	18.995	19.003	19.011	19.018	19.026	19.034	19.042	19.049	19.057	19.065
2940	19.065	19.072	19.080	19.088	19.095	19.103	19.111	19.118	19.126	19.134	19.141
2950	19.141	19.149	19.157	19.165	19.172	19.180	19.188	19.195	19.203	19.211	19.218
2960	19.218	19.226	19.234	19.241	19.249	19.257	19.264	19.272	19.280	19.287	19.295
2970	19.295	19.303	19.310	19.318	19.326	19.333	19.341	19.349	19.356	19.364	19.372
2980	19.372	19.379	19.387	19.395	19.402	19.410	19.418	19.425	19.433	19.440	19.448
2990	19.448	19.456	19.463	19.471	19.479	19.486	19.494	19.502	19.509	19.517	19.525
3000	19.525	19.532	19.540	19.547	19.555	19.563	19.570	19.578	19.586	19.593	19.601
3010	19.601	19.609	19.616	19.624	19.631	19.639	19.647	19.654	19.662	19.670	19.677
3020	19.677	19.685	19.692	19.700	19.708	19.715	19.723	19.730	19.738	19.746	19.753
3030	19.753	19.761	19.769	19.776	19.784	19.791	19.799	19.807	19.814	19.822	19.829
3040	19.829	19.837	19.845	19.852	19.860	19.867	19.875	19.882	19.890	19.898	19.905
3050	19.905	19.913	19.920	19.928	19.936	19.943	19.951	19.958	19.966	19.973	19.981
3060	19.981	19.989	19.996	20.004	20.011	20.019	20.026	20.034	20.041	20.049	20.056
3070	20.056	20.064	20.072	20.079	20.087	20.094	20.102	20.109	20.117	20.124	20.132
3080	20.132	20.139	20.147	20.154	20.162	20.169	20.177	20.184	20.192	20.199	20.207
3090	20.207	20.214	20.222	20.229	20.237	20.244	20.252	20.259	20.266	20.274	20.281
3100	20.281	20.289	20.296	20.304	20.311	20.319	20.326	20.333	20.341	20.348	20.356
3110	20.356	20.363	20.371	20.378	20.385	20.393	20.400	20.407	20.415	20.422	20.430
3120	20.430	20.437	20.444	20.452	20.459	20.466	20.474	20.481	20.488	20.496	20.503
3130	20.503	20.510	20.518	20.525	20.532	20.540	20.547	20.554	20.562	20.569	20.576
3140	20.576	20.583	20.591	20.598	20.605	20.612	20.620	20.627	20.634	20.641	20.649
3150	20.649	20.656	20.663	20.670	20.678	20.685	20.692	20.699	20.706	20.714	20.721
3160	20.721	20.728	20.735	20.742	20.749	20.756	20.764	20.771	20.778	20.785	20.792
3170	20.792	20.799	20.806	20.813	20.821	20.828	20.835	20.842	20.849	20.856	20.863
3180	20.863	20.870	20.877	20.884	20.891	20.898	20.905	20.912	20.919	20.926	20.933
3190	20.933	20.940	20.947	20.954	20.961	20.968	20.975	20.982	20.989	20.996	21.003
3200	21.003	21.010	21.016	21.023	21.030	21.037	21.044	21.051	21.058	21.065	21.071
3210	21.071	21.078	21.085	21.092	21.099						

TABLE 20 Type S Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–50	–0.236										
–40	–0.194	–0.199	–0.203	–0.207	–0.211	–0.215	–0.219	–0.224	–0.228	–0.232	–0.236
–30	–0.150	–0.155	–0.159	–0.164	–0.168	–0.173	–0.177	–0.181	–0.186	–0.190	–0.194
–20	–0.103	–0.108	–0.113	–0.117	–0.122	–0.127	–0.132	–0.136	–0.141	–0.146	–0.150
–10	–0.053	–0.058	–0.063	–0.068	–0.073	–0.078	–0.083	–0.088	–0.093	–0.098	–0.103
0	0.000	–0.005	–0.011	–0.016	–0.021	–0.027	–0.032	–0.037	–0.042	–0.048	–0.053
0	0.000	0.005	0.011	0.016	0.022	0.027	0.033	0.038	0.044	0.050	0.055
10	0.055	0.061	0.067	0.072	0.078	0.084	0.090	0.095	0.101	0.107	0.113
20	0.113	0.119	0.125	0.131	0.137	0.143	0.149	0.155	0.161	0.167	0.173
30	0.173	0.179	0.185	0.191	0.197	0.204	0.210	0.216	0.222	0.229	0.235
40	0.235	0.241	0.248	0.254	0.260	0.267	0.273	0.280	0.286	0.292	0.299
50	0.299	0.305	0.312	0.319	0.325	0.332	0.338	0.345	0.352	0.358	0.365
60	0.365	0.372	0.378	0.385	0.392	0.399	0.405	0.412	0.419	0.426	0.433
70	0.433	0.440	0.446	0.453	0.460	0.467	0.474	0.481	0.488	0.495	0.502
80	0.502	0.509	0.516	0.523	0.530	0.538	0.545	0.552	0.559	0.566	0.573
90	0.573	0.580	0.588	0.595	0.602	0.609	0.617	0.624	0.631	0.639	0.646
100	0.646	0.653	0.661	0.668	0.675	0.683	0.690	0.698	0.705	0.713	0.720
110	0.720	0.727	0.735	0.743	0.750	0.758	0.765	0.773	0.780	0.788	0.795
120	0.795	0.803	0.811	0.818	0.826	0.834	0.841	0.849	0.857	0.865	0.872
130	0.872	0.880	0.888	0.896	0.903	0.911	0.919	0.927	0.935	0.942	0.950
140	0.950	0.958	0.966	0.974	0.982	0.990	0.998	1.006	1.013	1.021	1.029
150	1.029	1.037	1.045	1.053	1.061	1.069	1.077	1.085	1.094	1.102	1.110
160	1.110	1.118	1.126	1.134	1.142	1.150	1.158	1.167	1.175	1.183	1.191
170	1.191	1.199	1.207	1.216	1.224	1.232	1.240	1.249	1.257	1.265	1.273
180	1.273	1.282	1.290	1.298	1.307	1.315	1.323	1.332	1.340	1.348	1.357
190	1.357	1.365	1.373	1.382	1.390	1.399	1.407	1.415	1.424	1.432	1.441
200	1.441	1.449	1.458	1.466	1.475	1.483	1.492	1.500	1.509	1.517	1.526
210	1.526	1.534	1.543	1.551	1.560	1.569	1.577	1.586	1.594	1.603	1.612
220	1.612	1.620	1.629	1.638	1.646	1.655	1.663	1.672	1.681	1.690	1.698
230	1.698	1.707	1.716	1.724	1.733	1.742	1.751	1.759	1.768	1.777	1.786
240	1.786	1.794	1.803	1.812	1.821	1.829	1.838	1.847	1.856	1.865	1.874
250	1.874	1.882	1.891	1.900	1.909	1.918	1.927	1.936	1.944	1.953	1.962
260	1.962	1.971	1.980	1.989	1.998	2.007	2.016	2.025	2.034	2.043	2.05?
270	2.052	2.061	2.070	2.078	2.087	2.096	2.105	2.114	2.123	2.132	2.141
280	2.141	2.151	2.160	2.169	2.178	2.187	2.196	2.205	2.214	2.223	2.232
290	2.232	2.241	2.250	2.259	2.268	2.277	2.287	2.296	2.305	2.314	2.323
300	2.323	2.332	2.341	2.350	2.360	2.369	2.378	2.387	2.396	2.405	2.415
310	2.415	2.424	2.433	2.442	2.451	2.461	2.470	2.479	2.488	2.497	2.507
320	2.507	2.516	2.525	2.534	2.544	2.553	2.562	2.571	2.581	2.590	2.599
330	2.599	2.609	2.618	2.627	2.636	2.646	2.655	2.664	2.674	2.683	2.692
340	2.692	2.702	2.711	2.720	2.730	2.739	2.748	2.758	2.767	2.776	2.786
350	2.786	2.795	2.805	2.814	2.823	2.833	2.842	2.851	2.861	2.870	2.880
360	2.880	2.889	2.899	2.908	2.917	2.927	2.936	2.946	2.955	2.965	2.974
370	2.974	2.983	2.993	3.002	3.012	3.021	3.031	3.040	3.050	3.059	3.069
380	3.069	3.078	3.088	3.097	3.107	3.116	3.126	3.135	3.145	3.154	3.164
390	3.164	3.173	3.183	3.192	3.202	3.212	3.221	3.231	3.240	3.250	3.259
400	3.259	3.269	3.279	3.288	3.298	3.307	3.317	3.326	3.336	3.346	3.355
410	3.355	3.365	3.374	3.384	3.394	3.403	3.413	3.423	3.432	3.442	3.451
420	3.451	3.461	3.471	3.480	3.490	3.500	3.509	3.519	3.529	3.538	3.548
430	3.548	3.558	3.567	3.577	3.587	3.596	3.606	3.616	3.626	3.635	3.645
440	3.645	3.655	3.664	3.674	3.684	3.694	3.703	3.713	3.723	3.732	3.742
450	3.742	3.752	3.762	3.771	3.781	3.791	3.801	3.810	3.820	3.830	3.840
460	3.840	3.850	3.859	3.869	3.879	3.889	3.898	3.908	3.918	3.928	3.938
470	3.938	3.947	3.957	3.967	3.977	3.987	3.997	4.006	4.016	4.026	4.036
480	4.036	4.046	4.056	4.065	4.075	4.085	4.095	4.105	4.115	4.125	4.134
490	4.134	4.144	4.154	4.164	4.174	4.184	4.194	4.204	4.213	4.223	4.233
500	4.233	4.243	4.253	4.263	4.273	4.283	4.293	4.303	4.313	4.323	4.332
510	4.332	4.342	4.352	4.362	4.372	4.382	4.392	4.402	4.412	4.422	4.432
520	4.432	4.442	4.452	4.462	4.472	4.482	4.492	4.502	4.512	4.522	4.532

TABLE 20 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
530	4.532	4.542	4.552	4.562	4.572	4.582	4.592	4.602	4.612	4.622	4.632
540	4.632	4.642	4.652	4.662	4.672	4.682	4.692	4.702	4.712	4.722	4.732
550	4.732	4.742	4.752	4.762	4.772	4.782	4.793	4.803	4.813	4.823	4.833
560	4.833	4.843	4.853	4.863	4.873	4.883	4.893	4.904	4.914	4.924	4.934
570	4.934	4.944	4.954	4.964	4.974	4.984	4.995	5.005	5.015	5.025	5.035
580	5.035	5.045	5.055	5.066	5.076	5.086	5.096	5.106	5.116	5.127	5.137
590	5.137	5.147	5.157	5.167	5.178	5.188	5.198	5.208	5.218	5.228	5.239
600	5.239	5.249	5.259	5.269	5.280	5.290	5.300	5.310	5.320	5.331	5.341
610	5.341	5.351	5.361	5.372	5.382	5.392	5.402	5.413	5.423	5.433	5.443
620	5.443	5.454	5.464	5.474	5.485	5.495	5.505	5.515	5.526	5.536	5.546
630	5.546	5.557	5.567	5.577	5.588	5.598	5.608	5.618	5.629	5.639	5.649
640	5.649	5.660	5.670	5.680	5.691	5.701	5.712	5.722	5.732	5.743	5.753
650	5.753	5.763	5.774	5.784	5.794	5.805	5.815	5.826	5.836	5.846	5.857
660	5.857	5.867	5.878	5.888	5.898	5.909	5.919	5.930	5.940	5.950	5.961
670	5.961	5.971	5.982	5.992	6.003	6.013	6.024	6.034	6.044	6.055	6.065
680	6.065	6.076	6.086	6.097	6.107	6.118	6.128	6.139	6.149	6.160	6.170
690	6.170	6.181	6.191	6.202	6.212	6.223	6.233	6.244	6.254	6.265	6.275
700	6.275	6.286	6.296	6.307	6.317	6.328	6.338	6.349	6.360	6.370	6.381
710	6.381	6.391	6.402	6.412	6.423	6.434	6.444	6.455	6.465	6.476	6.486
720	6.486	6.497	6.508	6.518	6.529	6.539	6.550	6.561	6.571	6.582	6.593
730	6.593	6.603	6.614	6.624	6.635	6.646	6.656	6.667	6.678	6.688	6.699
740	6.699	6.710	6.720	6.731	6.742	6.752	6.763	6.774	6.784	6.795	6.806
750	6.806	6.817	6.827	6.838	6.849	6.859	6.870	6.881	6.892	6.902	6.913
760	6.913	6.924	6.934	6.945	6.956	6.967	6.977	6.988	6.999	7.010	7.020
770	7.020	7.031	7.042	7.053	7.064	7.074	7.085	7.096	7.107	7.117	7.128
780	7.128	7.139	7.150	7.161	7.172	7.182	7.193	7.204	7.215	7.226	7.236
790	7.236	7.247	7.258	7.269	7.280	7.291	7.302	7.312	7.323	7.334	7.345
800	7.345	7.356	7.367	7.378	7.388	7.399	7.410	7.421	7.432	7.443	7.454
810	7.454	7.465	7.476	7.487	7.497	7.508	7.519	7.530	7.541	7.552	7.563
820	7.563	7.574	7.585	7.596	7.607	7.618	7.629	7.640	7.651	7.662	7.673
830	7.673	7.684	7.695	7.706	7.717	7.728	7.739	7.750	7.761	7.772	7.783
840	7.783	7.794	7.805	7.816	7.827	7.838	7.849	7.860	7.871	7.882	7.893
850	7.893	7.904	7.915	7.926	7.937	7.948	7.959	7.970	7.981	7.992	8.003
860	8.003	8.014	8.026	8.037	8.048	8.059	8.070	8.081	8.092	8.103	8.114
870	8.114	8.125	8.137	8.148	8.159	8.170	8.181	8.192	8.203	8.214	8.226
880	8.226	8.237	8.248	8.259	8.270	8.281	8.293	8.304	8.315	8.326	8.337
890	8.337	8.348	8.360	8.371	8.382	8.393	8.404	8.416	8.427	8.438	8.449
900	8.449	8.460	8.472	8.483	8.494	8.505	8.517	8.528	8.539	8.550	8.562
910	8.562	8.573	8.584	8.595	8.607	8.618	8.629	8.540	8.652	8.663	8.674
920	8.674	8.685	8.697	8.708	8.719	8.731	8.742	8.753	8.765	8.776	8.787
930	8.787	8.798	8.810	8.821	8.832	8.844	8.855	8.866	8.878	8.889	8.900
940	8.900	8.912	8.923	8.935	8.946	8.957	8.969	8.980	8.991	9.003	9.014
950	9.014	9.025	9.037	9.048	9.060	9.071	9.082	9.094	9.105	9.117	9.128
960	9.128	9.139	9.151	9.162	9.174	9.185	9.197	9.208	9.219	9.231	9.242
970	9.242	9.254	9.265	9.277	9.288	9.300	9.311	9.323	9.334	9.345	9.357
980	9.357	9.368	9.380	9.391	9.403	9.414	9.426	9.437	9.449	9.460	9.472
990	9.472	9.483	9.495	9.506	9.518	9.529	9.541	9.552	9.564	9.576	9.587
1000	9.587	9.599	9.610	9.622	9.633	9.645	9.656	9.668	9.680	9.691	9.703
1010	9.703	9.714	9.726	9.737	9.749	9.761	9.772	9.784	9.795	9.807	9.819
1020	9.819	9.830	9.842	9.853	9.865	9.877	9.888	9.900	9.911	9.923	9.935
1030	9.935	9.946	9.958	9.970	9.981	9.993	10.005	10.016	10.028	10.040	10.051
1040	10.051	10.063	10.075	10.086	10.098	10.110	10.121	10.133	10.145	10.156	10.168
1050	10.168	10.180	10.191	10.203	10.215	10.227	10.238	10.250	10.262	10.273	10.285
1060	10.285	10.297	10.309	10.320	10.332	10.344	10.356	10.357	10.379	10.391	10.403
1070	10.403	10.414	10.426	10.438	10.450	10.461	10.473	10.485	10.497	10.509	10.520
1080	10.520	10.532	10.544	10.556	10.567	10.579	10.591	10.603	10.515	10.626	10.638
1090	10.638	10.650	10.662	10.674	10.686	10.697	10.709	10.721	10.733	10.745	10.757
1100	10.757	10.768	10.780	10.792	10.804	10.816	10.828	10.839	10.851	10.863	10.875
1110	10.875	10.887	10.899	10.911	10.922	10.934	10.946	10.958	10.970	10.982	10.994

TABLE 20 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1120	10.994	11.006	11.017	11.029	11.041	11.053	11.065	11.077	11.089	11.101	11.113
1130	11.113	11.125	11.136	11.148	11.160	11.172	11.184	11.196	11.208	11.220	11.232
1140	11.232	11.244	11.256	11.268	11.280	11.291	11.303	11.315	11.327	11.339	11.351
1150	11.351	11.363	11.375	11.387	11.399	11.411	11.423	11.435	11.447	11.459	11.471
1160	11.471	11.483	11.495	11.507	11.519	11.531	11.542	11.554	11.566	11.578	11.590
1170	11.590	11.602	11.614	11.626	11.638	11.650	11.662	11.674	11.686	11.598	11.710
1180	11.710	11.722	11.734	11.746	11.758	11.770	11.782	11.794	11.806	11.818	11.830
1190	11.830	11.842	11.854	11.866	11.878	11.890	11.902	11.914	11.926	11.939	11.951
1200	11.951	11.963	11.975	11.987	11.999	12.011	12.023	12.035	12.047	12.059	12.071
1210	12.071	12.083	12.095	12.107	12.119	12.131	12.143	12.155	12.167	12.179	12.191
1220	12.191	12.203	12.216	12.228	12.240	12.252	12.264	12.276	12.288	12.300	12.312
1230	12.312	12.324	12.336	12.348	12.360	12.372	12.384	12.397	12.409	12.421	12.433
1240	12.433	12.445	12.457	12.469	12.481	12.493	12.505	12.517	12.529	12.542	12.554
1250	12.554	12.566	12.578	12.590	12.602	12.614	12.626	12.638	12.650	12.662	12.675
1260	12.675	12.687	12.699	12.711	12.723	12.735	12.747	12.759	12.771	12.783	12.796
1270	12.796	12.808	12.820	12.832	12.844	12.856	12.868	12.880	12.892	12.905	12.917
1280	12.917	12.929	12.941	12.953	12.965	12.977	12.989	13.001	13.014	13.026	13.038
1290	13.038	13.050	13.062	13.074	13.086	13.098	13.111	13.123	13.135	13.147	13.159
1300	13.159	13.171	13.183	13.195	13.208	13.220	13.232	13.244	13.256	13.268	13.280
1310	13.280	13.292	13.305	13.317	13.329	13.341	13.353	13.365	13.377	13.390	13.402
1320	13.402	13.414	13.426	13.438	13.450	13.462	13.474	13.487	13.499	13.511	13.523
1330	13.523	13.535	13.547	13.559	13.572	13.584	13.596	13.608	13.620	13.632	13.644
1340	13.644	13.657	13.669	13.681	13.693	13.705	13.717	13.729	13.742	13.754	13.766
1350	13.766	13.778	13.790	13.802	13.814	13.826	13.839	13.851	13.863	13.875	13.887
1350	13.887	13.899	13.911	13.924	13.936	13.948	13.960	13.972	13.984	13.996	14.009
1370	14.009	14.021	14.033	14.045	14.057	14.069	14.081	14.094	14.106	14.118	14.130
1380	14.130	14.142	14.154	14.166	14.178	14.191	14.203	14.215	14.227	14.239	14.251
1390	14.251	14.263	14.276	14.288	14.300	14.312	14.324	14.336	14.348	14.360	14.373
1400	14.373	14.385	14.397	14.409	14.421	14.433	14.445	14.457	14.470	14.482	14.494
1410	14.494	14.506	14.518	14.530	14.542	14.554	14.567	14.579	14.591	14.603	14.615
1420	14.615	14.627	14.639	14.651	14.664	14.676	14.688	14.700	14.712	14.724	14.736
1430	14.736	14.748	14.760	14.773	14.785	14.797	14.809	14.821	14.833	14.845	14.857
1440	14.857	14.869	14.881	14.894	14.906	14.918	14.930	14.942	14.954	14.966	14.978
1450	14.978	14.990	15.002	15.015	15.027	15.039	15.051	15.063	15.075	15.087	15.099
1460	15.099	15.111	15.123	15.135	15.148	15.160	15.172	15.184	15.196	15.208	15.220
1470	15.220	15.232	15.244	15.256	15.268	15.280	15.292	15.304	15.317	15.329	15.341
1480	15.341	15.353	15.365	15.377	15.389	15.401	15.413	15.425	15.437	15.449	15.461
1490	15.461	15.473	15.485	15.497	15.509	15.521	15.534	15.546	15.558	15.570	15.582
1500	15.582	15.594	15.606	15.618	15.630	15.642	15.654	15.666	15.678	15.690	15.702
1510	15.702	15.714	15.726	15.738	15.750	15.762	15.774	15.786	15.798	15.810	15.822
1520	15.822	15.834	15.846	15.858	15.870	15.882	15.894	15.906	15.918	15.930	15.942
1530	15.942	15.954	15.966	15.978	15.990	16.002	16.014	16.026	16.038	16.050	16.062
1540	16.062	16.074	16.086	16.098	16.110	16.122	16.134	16.146	16.158	16.170	16.182
1550	16.182	16.194	16.205	16.217	16.229	16.241	16.253	16.265	16.277	16.289	16.301
1560	16.301	16.313	16.325	16.337	16.349	16.361	16.373	16.385	16.396	16.408	16.420
1570	16.420	16.432	16.444	16.456	16.468	16.480	16.492	16.504	16.516	16.527	16.539
1580	16.539	16.551	16.563	16.575	16.587	16.599	16.611	16.623	16.634	16.646	16.658
1590	16.658	16.670	16.682	16.694	16.706	16.718	16.729	16.741	16.753	16.765	16.777
1600	16.777	16.789	16.801	16.812	16.824	16.836	16.848	16.860	16.872	16.883	16.895
1610	16.895	16.907	16.919	16.931	16.943	16.954	16.966	16.978	16.990	17.002	17.013
1620	17.013	17.025	17.037	17.049	17.061	17.072	17.084	17.096	17.108	17.120	17.131
1630	17.131	17.143	17.155	17.167	17.178	17.190	17.202	17.214	17.225	17.237	17.249
1640	17.249	17.261	17.272	17.284	17.296	17.308	17.319	17.331	17.343	17.355	17.366
1650	17.366	17.378	17.390	17.401	17.413	17.425	17.437	17.448	17.460	17.472	17.483
1660	17.483	17.495	17.507	17.518	17.530	17.542	17.553	17.565	17.577	17.588	17.600
1670	17.500	17.612	17.623	17.635	17.647	17.658	17.670	17.682	17.693	17.705	17.717
1680	17.717	17.728	17.740	17.751	17.763	17.775	17.786	17.798	17.809	17.821	17.832
1690	17.832	17.844	17.855	17.867	17.878	17.890	17.901	17.913	17.924	17.936	17.947
1700	17.947	17.959	17.970	17.982	17.993	18.004	18.016	18.027	18.039	18.050	18.061

TABLE 20 *Continued*

Temperature in Degrees Celsius (ITS–90)											
										Reference Junctions at 0°C	
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1710	18.061	18.073	18.084	18.095	18.107	18.118	18.129	18.140	18.152	18.163	18.174
1720	18.174	18.185	18.196	18.208	18.219	18.230	18.241	18.252	18.263	18.274	18.285
1730	18.285	18.297	18.308	18.319	18.330	18.341	18.352	18.362	18.373	18.384	18.395
1740	18.395	18.406	18.417	18.428	18.439	18.449	18.460	18.471	18.482	18.493	18.503
1750	18.503	18.514	18.525	18.535	18.546	18.557	18.567	18.578	18.588	18.599	18.609
1760	18.609	18.620	18.630	18.641	18.651	18.661	18.672	18.682	18.693		

TABLE 21 Type S Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–50	–0.218	–0.220	–0.222	–0.224	–0.227	–0.229	–0.231	–0.233	–0.236		
–40	–0.194	–0.197	–0.199	–0.201	–0.204	–0.206	–0.208	–0.211	–0.213	–0.215	–0.218
–30	–0.170	–0.173	–0.175	–0.178	–0.180	–0.182	–0.185	–0.187	–0.190	–0.192	–0.194
–20	–0.145	–0.148	–0.150	–0.153	–0.155	–0.158	–0.160	–0.163	–0.165	–0.168	–0.170
–10	–0.119	–0.122	–0.124	–0.127	–0.129	–0.132	–0.135	–0.137	–0.140	–0.142	–0.145
0	–0.092	–0.095	–0.097	–0.100	–0.103	–0.106	–0.108	–0.111	–0.114	–0.116	–0.119
0	–0.092	–0.089	–0.085	–0.084	–0.081	–0.078	–0.075	–0.073	–0.070	–0.067	–0.064
10	–0.064	–0.061	–0.058	–0.056	–0.053	–0.050	–0.047	–0.044	–0.041	–0.038	–0.035
20	–0.035	–0.033	–0.030	–0.027	–0.024	–0.021	–0.018	–0.015	–0.012	–0.009	–0.006
30	–0.006	–0.003	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024
40	0.024	0.027	0.030	0.033	0.037	0.040	0.043	0.046	0.049	0.052	0.055
50	0.055	0.058	0.062	0.065	0.068	0.071	0.074	0.077	0.081	0.084	0.087
60	0.087	0.090	0.093	0.097	0.100	0.103	0.106	0.110	0.113	0.116	0.119
70	0.119	0.123	0.126	0.129	0.133	0.136	0.139	0.143	0.146	0.149	0.153
80	0.153	0.156	0.159	0.163	0.166	0.169	0.171	0.176	0.180	0.183	0.186
90	0.186	0.190	0.193	0.197	0.200	0.204	0.207	0.210	0.214	0.217	0.221
100	0.221	0.224	0.228	0.231	0.235	0.238	0.242	0.245	0.249	0.252	0.256
110	0.256	0.260	0.263	0.267	0.270	0.274	0.277	0.281	0.285	0.288	0.292
120	0.292	0.295	0.299	0.303	0.306	0.310	0.313	0.317	0.321	0.324	0.328
130	0.328	0.332	0.335	0.339	0.343	0.346	0.350	0.354	0.357	0.361	0.365
140	0.365	0.369	0.372	0.376	0.380	0.384	0.387	0.391	0.395	0.399	0.402
150	0.402	0.406	0.410	0.414	0.417	0.421	0.425	0.429	0.433	0.436	0.440
160	0.440	0.444	0.448	0.452	0.456	0.459	0.463	0.467	0.471	0.475	0.479
170	0.479	0.483	0.487	0.490	0.494	0.498	0.502	0.506	0.510	0.514	0.518
180	0.518	0.522	0.526	0.530	0.534	0.538	0.541	0.545	0.549	0.553	0.557
190	0.557	0.561	0.565	0.569	0.573	0.577	0.581	0.585	0.589	0.593	0.597
200	0.597	0.601	0.605	0.609	0.613	0.617	0.622	0.626	0.630	0.634	0.638
210	0.638	0.642	0.646	0.650	0.624	0.658	0.662	0.666	0.670	0.675	0.679
220	0.679	0.683	0.687	0.691	0.695	0.699	0.703	0.708	0.712	0.716	0.720
230	0.720	0.724	0.728	0.732	0.737	0.741	0.745	0.749	0.753	0.758	0.762
240	0.762	0.766	0.770	0.774	0.779	0.783	0.787	0.791	0.795	0.800	0.804
250	0.804	0.808	0.812	0.817	0.821	0.825	0.829	0.834	0.838	0.842	0.847
260	0.847	0.851	0.855	0.859	0.864	0.868	0.872	0.877	0.881	0.885	0.883
270	0.889	0.894	0.898	0.902	0.907	0.911	0.915	0.920	0.924	0.928	0.933
280	0.933	0.937	0.942	0.946	0.950	0.955	0.959	0.963	0.968	0.972	0.977
290	0.977	0.981	0.985	0.990	0.994	0.998	1.003	1.007	1.012	1.016	1.021
300	1.021	1.025	1.029	1.034	1.030	1.043	1.047	1.052	1.056	1.061	1.065
310	1.065	1.069	1.074	1.078	1.083	1.087	1.092	1.096	1.101	1.105	1.110
320	1.110	1.114	1.119	1.123	1.128	1.132	1.137	1.141	1.146	1.150	1.155
330	1.155	1.159	1.164	1.168	1.173	1.177	1.182	1.186	1.191	1.196	1.200
340	1.200	1.205	1.209	1.214	1.218	1.223	1.227	1.232	1.237	1.241	1.246
350	1.246	1.250	1.255	1.260	1.264	1.269	1.273	1.278	1.283	1.287	1.292
360	1.292	1.296	1.301	1.306	1.310	1.315	1.319	1.324	1.329	1.333	1.338
370	1.338	1.343	1.347	1.352	1.357	1.361	1.366	1.371	1.375	1.380	1.305
380	1.385	1.389	1.394	1.399	1.403	1.408	1.413	1.417	1.422	1.427	1.431
390	1.431	1.436	1.441	1.445	1.450	1.455	1.460	1.464	1.469	1.474	1.478
400	1.478	1.483	1.488	1.493	1.497	1.502	1.507	1.512	1.516	1.521	1.526
410	1.526	1.531	1.535	1.540	1.545	1.550	1.554	1.559	1.564	1.569	1.573
420	1.573	1.578	1.583	1.588	1.592	1.597	1.602	1.607	1.612	1.616	1.621
430	1.621	1.626	1.631	1.636	1.640	1.645	1.650	1.655	1.660	1.664	1.669
440	1.669	1.674	1.679	1.684	1.689	1.693	1.698	1.703	1.708	1.713	1.718
450	1.718	1.722	1.727	1.732	1.737	1.742	1.747	1.752	1.756	1.761	1.756
460	1.766	1.771	1.776	1.781	1.786	1.790	1.795	1.800	1.805	1.810	1.815
470	1.815	1.820	1.825	1.829	1.834	1.839	1.844	1.849	1.854	1.859	1.864
480	1.854	1.869	1.874	1.878	1.883	1.888	1.893	1.898	1.903	1.908	1.913
490	1.913	1.918	1.923	1.928	1.933	1.938	1.942	1.947	1.952	1.957	1.962
500	1.962	1.967	1.972	1.977	1.982	1.987	1.992	1.997	2.002	2.007	2.012
510	2.012	2.017	2.022	2.027	2.032	2.037	2.042	2.047	2.052	2.057	2.062
520	2.062	2.067	2.072	2.076	2.081	2.086	2.091	2.096	2.101	2.106	2.111

TABLE 21 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
530	2.111	2.116	2.121	2.126	2.131	2.136	2.141	2.147	2.152	2.157	2.162
540	2.162	2.167	2.172	2.177	2.182	2.187	2.192	2.197	2.202	2.207	2.212
550	2.212	2.217	2.222	2.227	2.232	2.237	2.242	2.247	2.252	2.257	2.262
560	2.262	2.267	2.272	2.277	2.283	2.288	2.293	2.298	2.303	2.308	2.313
570	2.313	2.318	2.323	2.328	2.333	2.338	2.343	2.348	2.354	2.359	2.364
580	2.364	2.369	2.374	2.379	2.384	2.389	2.394	2.399	2.404	2.410	2.415
590	2.415	2.420	2.425	2.430	2.435	2.440	2.445	2.450	2.455	2.461	2.456
600	2.466	2.471	2.476	2.481	2.486	2.491	2.496	2.502	2.507	2.512	2.517
610	2.517	2.522	2.527	2.532	2.538	2.543	2.548	2.553	2.558	2.563	2.568
620	2.568	2.574	2.579	2.584	2.589	2.594	2.599	2.604	2.610	2.615	2.620
630	2.620	2.625	2.630	2.635	2.641	2.646	2.651	2.656	2.661	2.666	2.672
640	2.672	2.677	2.682	2.687	2.692	2.697	2.703	2.708	2.713	2.718	2.723
650	2.723	2.729	2.734	2.739	2.744	2.749	2.755	2.760	2.765	2.770	2.775
660	2.775	2.781	2.786	2.791	2.796	2.801	2.807	2.812	2.817	2.822	2.827
670	2.827	2.833	2.838	2.843	2.848	2.854	2.859	2.864	2.869	2.874	2.880
680	2.880	2.885	2.890	2.895	2.901	2.906	2.911	2.916	2.922	2.927	2.932
690	2.932	2.937	2.943	2.948	2.953	2.958	2.964	2.969	2.974	2.979	2.985
700	2.985	2.990	2.995	3.000	3.006	3.011	3.016	3.021	3.027	3.032	3.037
710	3.037	3.042	3.048	3.053	3.058	3.063	3.069	3.074	3.079	3.085	3.090
720	3.090	3.095	3.100	3.106	3.111	3.116	3.122	3.127	3.132	3.137	3.143
730	3.143	3.148	3.153	3.159	3.164	3.169	3.174	3.180	3.185	3.190	3.196
740	3.196	3.201	3.206	3.212	3.217	3.222	3.227	3.233	3.238	3.243	3.249
750	3.249	3.254	3.259	3.265	3.270	3.275	3.281	3.286	3.291	3.297	3.302
760	3.302	3.307	3.313	3.318	3.323	3.329	3.334	3.339	3.345	3.350	3.355
770	3.355	3.361	3.366	3.371	3.377	3.382	3.387	3.393	3.398	3.403	3.409
780	3.409	3.414	3.419	3.425	3.430	3.435	3.441	3.446	3.451	3.457	3.462
790	3.462	3.468	3.473	3.478	3.484	3.489	3.494	3.500	3.505	3.510	3.516
800	3.516	3.521	3.527	3.532	3.537	3.543	3.548	3.553	3.559	3.564	3.570
810	3.570	3.575	3.580	3.586	3.591	3.596	3.602	3.607	3.613	3.618	3.623
820	3.623	3.629	3.634	3.640	3.645	3.650	3.656	3.661	3.667	3.672	3.677
830	3.677	3.683	3.688	3.694	3.699	3.704	3.710	3.715	3.721	3.726	3.731
840	3.731	3.737	3.742	3.748	3.753	3.758	3.764	3.769	3.775	3.780	3.786
850	3.786	3.791	3.796	3.802	3.807	3.813	3.818	3.823	3.829	3.834	3.840
860	3.840	3.845	3.851	3.856	3.862	3.867	3.872	3.878	3.883	3.889	3.894
870	3.894	3.900	3.905	3.910	3.916	3.921	3.927	3.932	3.938	3.943	3.949
880	3.949	3.954	3.959	3.965	3.970	3.976	3.981	3.987	3.992	3.998	4.003
890	4.003	4.009	4.014	4.020	4.025	4.030	4.036	4.041	4.047	4.052	4.058
900	4.058	4.063	4.069	4.074	4.080	4.085	4.091	4.096	4.102	4.107	4.113
910	4.113	4.118	4.123	4.129	4.134	4.140	4.145	4.151	4.156	4.162	4.167
920	4.167	4.173	4.178	4.184	4.189	4.195	4.200	4.206	4.211	4.217	4.222
930	4.222	4.228	4.233	4.239	4.244	4.250	4.255	4.261	4.266	4.272	4.277
940	4.277	4.283	4.288	4.294	4.299	4.305	4.310	4.316	4.321	4.327	4.332
950	4.332	4.338	4.343	4.349	4.355	4.360	4.366	4.371	4.377	4.382	4.388
960	4.388	4.393	4.399	4.404	4.410	4.415	4.421	4.426	4.432	4.437	4.443
970	4.443	4.449	4.454	4.460	4.465	4.471	4.476	4.482	4.487	4.493	4.498
980	4.498	4.504	4.510	4.515	4.521	4.526	4.532	4.537	4.543	4.548	4.554
990	4.554	4.559	4.565	4.571	4.576	4.582	4.587	4.593	4.598	4.604	4.610
1000	4.610	4.615	4.621	4.626	4.632	4.637	4.643	4.648	4.654	4.660	4.665
1010	4.665	4.671	4.676	4.682	4.688	4.693	4.699	4.704	4.710	4.715	4.721
1020	4.721	4.727	4.732	4.738	4.743	4.749	4.755	4.760	4.766	4.771	4.777
1030	4.777	4.782	4.788	4.794	4.799	4.805	4.810	4.816	4.822	4.827	4.833
1040	4.833	4.838	4.844	4.850	4.855	4.861	4.866	4.872	4.878	4.883	4.889
1050	4.889	4.895	4.900	4.906	4.911	4.917	4.923	4.928	4.934	4.939	4.945
1060	4.945	4.951	4.956	4.962	4.968	4.973	4.979	4.984	4.990	4.996	5.001
1070	5.001	5.007	5.013	5.018	5.024	5.030	5.035	5.041	5.046	5.052	5.058
1080	5.058	5.063	5.069	5.075	5.080	5.086	5.092	5.097	5.103	5.109	5.114
1090	5.114	5.120	5.125	5.131	5.137	5.142	5.148	5.154	5.159	5.165	5.171
1100	5.171	5.176	5.182	5.188	5.193	5.199	5.205	5.210	5.216	5.222	5.227
1110	5.227	5.233	5.239	5.244	5.250	5.256	5.261	5.267	5.273	5.278	5.284

TABLE 21 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1120	5.284	5.290	5.295	5.301	5.307	5.312	5.318	5.324	5.330	5.335	5.341
1130	5.341	5.347	5.352	5.358	5.364	5.369	5.375	5.381	5.386	5.392	5.398
1140	5.398	5.404	5.409	5.415	5.421	5.426	5.432	5.438	5.443	5.449	5.455
1150	5.455	5.461	5.466	5.472	5.478	5.483	5.489	5.495	5.501	5.506	5.512
1160	5.512	5.518	5.523	5.529	5.535	5.541	5.546	5.552	5.558	5.563	5.569
1170	5.569	5.575	5.581	5.586	5.592	5.598	5.604	5.609	5.615	5.621	5.627
1180	5.627	5.632	5.638	5.644	5.649	5.555	5.661	5.667	5.672	5.678	5.584
1190	5.684	5.690	5.695	5.701	5.707	5.713	5.718	5.724	5.730	5.736	5.741
1200	5.741	5.747	5.753	5.759	5.764	5.770	5.776	5.782	5.788	5.793	5.799
1210	5.799	5.805	5.811	5.816	5.822	5.828	5.834	5.839	5.845	5.851	5.857
1220	5.857	5.863	5.868	5.874	5.880	5.886	5.891	5.897	5.903	5.909	5.915
1230	5.915	5.920	5.926	5.932	5.938	5.944	5.949	5.955	5.961	5.967	5.972
1240	5.972	5.978	5.984	5.990	5.996	6.001	6.007	6.013	6.019	6.025	6.030
1250	6.030	6.036	6.042	6.048	6.054	6.060	6.065	6.071	6.077	6.083	6.089
1260	6.089	6.094	6.100	6.106	6.112	6.118	6.124	6.129	6.135	6.141	6.147
1270	6.147	6.153	6.158	6.164	6.170	6.176	6.182	6.188	6.193	6.199	6.205
1280	6.205	6.211	6.217	6.223	6.228	6.234	6.240	6.246	6.252	6.258	6.264
1290	6.264	6.269	6.275	6.281	6.287	6.293	6.299	6.305	6.310	6.316	6.322
1300	6.322	6.328	6.334	6.340	6.346	6.351	6.357	6.363	6.369	6.375	6.381
1310	6.381	6.387	6.392	6.398	6.404	6.410	6.416	6.422	6.428	6.434	6.439
1320	6.439	6.445	6.451	6.457	6.463	6.469	6.475	6.481	6.486	6.492	6.498
1330	6.498	6.504	6.510	6.516	6.522	6.528	6.534	6.539	6.545	6.551	6.557
1340	6.557	6.563	6.569	6.575	6.581	6.587	6.593	6.598	6.604	6.610	6.616
1350	6.616	6.622	6.628	6.634	6.640	6.646	6.652	6.658	6.664	6.669	6.675
1360	6.675	5.681	6.687	6.693	6.699	6.705	6.711	6.717	6.723	6.729	6.735
1370	6.735	6.741	6.746	6.752	6.758	6.764	6.770	6.776	6.782	6.788	6.794
1380	6.794	6.800	6.806	6.812	6.818	6.824	6.830	5.836	6.842	6.847	6.853
1390	6.853	6.859	6.865	6.871	6.877	6.883	6.889	6.895	6.901	6.907	6.913
1400	6.913	6.919	6.925	6.931	6.937	6.943	6.949	6.955	6.961	5.967	6.973
1410	6.973	6.979	6.985	6.991	6.997	7.003	7.008	7.014	7.020	7.026	7.032
1420	7.032	7.038	7.044	7.050	7.056	7.062	7.068	7.074	7.080	7.086	7.092
1430	7.092	7.098	7.104	7.110	7.116	7.122	7.128	7.134	7.140	7.146	7.152
1440	7.152	7.158	7.164	7.170	7.176	7.182	7.188	7.194	7.200	7.206	7.212
1450	7.212	7.218	7.224	7.230	7.236	7.242	7.249	7.255	7.261	7.267	7.273
1460	7.273	7.279	7.285	7.291	7.297	7.303	7.309	7.315	7.321	7.327	7.333
1470	7.333	7.339	7.345	7.351	7.357	7.363	7.369	7.375	7.381	7.387	7.393
1480	7.393	7.399	7.405	7.411	7.418	7.424	7.430	7.436	7.442	7.448	7.454
1490	7.454	7.460	7.466	7.472	7.478	7.484	7.490	7.496	7.502	7.508	7.514
1500	7.514	7.521	7.527	7.533	7.539	7.545	7.551	7.557	7.563	7.559	7.575
1510	7.575	7.581	7.587	7.593	7.600	7.606	7.612	7.618	7.624	7.530	7.636
1520	7.636	7.642	7.648	7.654	7.660	7.667	7.673	7.679	7.685	7.691	7.697
1530	7.697	7.703	7.709	7.715	7.721	7.728	7.734	7.740	7.746	7.752	7.758
1540	7.758	7.764	7.770	7.776	7.783	7.789	7.795	7.801	7.807	7.813	7.819
1550	7.819	7.825	7.832	7.838	7.844	7.850	7.856	7.862	7.868	7.874	7.881
1560	7.881	7.887	7.893	7.899	7.905	7.911	7.917	7.923	7.930	7.936	7.942
1570	7.942	7.948	7.954	7.960	7.966	7.973	7.979	7.985	7.991	7.997	8.003
1580	8.003	8.010	8.016	8.022	8.028	8.034	8.040	8.047	8.053	8.059	8.065
1590	8.065	8.071	8.077	8.083	8.090	8.096	8.102	8.108	8.114	8.121	8.127
1600	8.127	8.133	8.139	8.145	8.151	8.158	8.164	8.170	8.176	8.182	8.189
1610	8.189	8.195	8.201	8.207	8.213	8.219	8.226	8.232	8.238	8.244	8.250
1620	8.250	8.257	8.263	8.269	8.275	8.281	8.288	8.294	8.300	8.306	8.312
1630	8.312	8.319	8.325	8.331	8.337	8.343	8.350	8.356	8.362	8.368	8.375
1640	8.375	8.381	8.387	8.393	8.399	8.406	8.412	8.418	8.424	8.431	8.437
1650	8.437	8.443	8.449	8.455	8.462	8.468	8.474	8.480	8.487	8.493	8.499
1660	8.499	8.505	8.512	8.518	8.524	8.530	8.537	8.543	8.549	8.555	8.562
1670	8.562	8.568	8.574	8.580	8.587	8.593	8.599	8.605	8.612	8.618	8.624
1680	8.524	8.630	8.637	8.643	8.649	8.655	8.662	8.668	8.674	8.680	8.687
1690	8.687	8.693	8.699	8.706	8.712	8.718	8.724	8.731	8.737	8.743	8.749
1700	8.749	8.756	8.762	8.768	8.775	8.781	8.787	8.793	8.800	8.806	8.812

TABLE 21 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1710	8.812	8.819	8.825	8.831	8.837	8.844	8.850	8.856	8.853	8.869	8.875
1720	8.875	8.882	8.888	8.894	8.900	8.907	8.913	8.919	8.926	8.932	8.938
1730	8.938	8.945	8.951	8.957	8.964	8.970	8.976	8.983	8.989	8.995	9.001
1740	9.001	9.008	9.014	9.020	9.027	9.033	9.039	9.046	9.052	9.058	9.065
1750	9.065	9.071	9.077	9.084	9.090	9.096	9.103	9.109	9.115	9.122	9.128
1760	9.128	9.134	9.141	9.147	9.153	9.160	9.165	9.172	9.179	9.185	9.192
1770	9.192	9.198	9.204	9.211	9.217	9.223	9.230	9.236	9.242	9.249	9.255
1780	9.255	9.261	9.268	9.274	9.281	9.287	9.293	9.300	9.306	9.312	9.319
1790	9.319	9.325	9.331	9.338	9.344	9.351	9.357	9.363	9.370	9.376	9.382
1800	9.382	9.389	9.395	9.402	9.408	9.414	9.421	9.427	9.434	9.440	9.446
1810	9.446	9.453	9.459	9.465	9.472	9.478	9.485	9.491	9.497	9.504	9.510
1820	9.510	9.517	9.523	9.529	9.536	9.542	9.549	9.555	9.561	9.568	9.574
1830	9.574	9.581	9.587	9.594	9.600	9.606	9.613	9.619	9.626	9.632	9.638
1840	9.638	9.645	9.651	9.658	9.664	9.671	9.677	9.683	9.690	9.696	9.703
1850	9.703	9.709	9.716	9.722	9.728	9.735	9.741	9.748	9.754	9.761	9.767
1860	9.767	9.773	9.780	9.786	9.793	9.799	9.806	9.812	9.819	9.825	9.831
1870	9.831	9.838	9.844	9.851	9.857	9.864	9.870	9.877	9.883	9.889	9.896
1880	9.896	9.902	9.909	9.915	9.922	9.928	9.935	9.941	9.948	9.954	9.951
1890	9.961	9.967	9.973	9.980	9.985	9.993	9.999	10.006	10.012	10.019	10.025
1900	10.025	10.032	10.038	10.045	10.051	10.058	10.064	10.071	10.077	10.084	10.090
1910	10.090	10.097	10.103	10.110	10.116	10.123	10.129	10.136	10.142	10.149	10.155
1920	10.155	10.162	10.168	10.175	10.181	10.188	10.194	10.201	10.207	10.214	10.220
1930	10.220	10.227	10.233	10.240	10.246	10.253	10.259	10.266	10.272	10.279	10.285
1940	10.285	10.292	10.298	10.305	10.311	10.318	10.324	10.331	10.337	10.344	10.350
1950	10.350	10.357	10.363	10.370	10.376	10.383	10.390	10.396	10.403	10.409	10.416
1960	10.416	10.422	10.429	10.435	10.442	10.448	10.455	10.461	10.468	10.475	10.481
1970	10.481	10.488	10.494	10.501	10.507	10.514	10.520	10.527	10.533	10.540	10.547
1980	10.547	10.553	10.560	10.566	10.573	10.579	10.586	10.592	10.599	10.606	10.612
1990	10.612	10.619	10.625	10.632	10.638	10.645	10.651	10.658	10.665	10.671	10.678
2000	10.678	10.684	10.691	10.697	10.704	10.711	10.717	10.724	10.730	10.737	10.743
2010	10.743	10.750	10.757	10.763	10.770	10.776	10.783	10.789	10.796	10.803	10.809
2020	10.809	10.816	10.822	10.829	10.836	10.842	10.849	10.855	10.862	10.868	10.875
2030	10.875	10.882	10.888	10.895	10.901	10.908	10.915	10.921	10.928	10.934	10.941
2040	10.941	10.948	10.954	10.961	10.967	10.974	10.981	10.987	10.994	11.000	11.007
2050	11.007	11.014	11.020	11.027	11.033	11.040	11.047	11.053	11.060	11.066	11.073
2060	11.073	11.080	11.086	11.093	11.099	11.106	11.113	11.119	11.126	11.132	11.139
2070	11.139	11.146	11.152	11.159	11.166	11.172	11.179	11.185	11.192	11.199	11.205
2080	11.205	11.212	11.219	11.225	11.232	11.238	11.245	11.252	11.258	11.265	11.272
2090	11.272	11.278	11.285	11.291	11.298	11.305	11.311	11.318	11.325	11.331	11.338
2100	11.338	11.345	11.351	11.358	11.364	11.371	11.378	11.384	11.391	11.398	11.404
2110	11.404	11.411	11.418	11.424	11.431	11.437	11.444	11.451	11.457	11.464	11.471
2120	11.471	11.477	11.484	11.491	11.497	11.504	11.511	11.517	11.524	11.531	11.537
2130	11.537	11.544	11.550	11.557	11.564	11.570	11.577	11.584	11.590	11.597	11.604
2140	11.604	11.610	11.617	11.624	11.630	11.637	11.644	11.650	11.657	11.664	11.670
2150	11.670	11.677	11.684	11.690	11.697	11.704	11.710	11.717	11.724	11.730	11.737
2160	11.737	11.744	11.750	11.757	11.764	11.770	11.777	11.784	11.790	11.797	11.804
2170	11.804	11.810	11.817	11.824	11.830	11.837	11.844	11.850	11.857	11.864	11.870
2180	11.870	11.877	11.884	11.890	11.897	11.904	11.910	11.917	11.924	11.931	11.937
2190	11.937	11.944	11.951	11.957	11.964	11.971	11.977	11.984	11.991	11.997	12.004
2200	12.004	12.011	12.017	12.024	12.031	12.037	12.044	12.051	12.058	12.064	12.071
2210	12.071	12.078	12.084	12.091	12.098	12.104	12.111	12.118	12.124	12.131	12.138
2220	12.138	12.145	12.151	12.158	12.165	12.171	12.178	12.185	12.191	12.198	12.205
2230	12.205	12.211	12.218	12.225	12.232	12.238	12.245	12.252	12.258	12.265	12.272
2240	12.272	12.278	12.285	12.292	12.299	12.305	12.312	12.319	12.325	12.332	12.339
2250	12.339	12.346	12.352	12.359	12.366	12.372	12.379	12.386	12.392	12.399	12.406
2260	12.406	12.413	12.419	12.426	12.433	12.439	12.446	12.453	12.460	12.465	12.473
2270	12.473	12.480	12.486	12.493	12.500	12.507	12.513	12.520	12.527	12.533	12.540
2280	12.540	12.547	12.554	12.560	12.567	12.574	12.580	12.587	12.594	12.601	12.607
2290	12.607	12.614	12.621	12.627	12.634	12.641	12.648	12.654	12.661	12.668	12.675

TABLE 21 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2300	12.675	12.681	12.688	12.695	12.701	12.708	12.715	12.722	12.728	12.735	12.742
2310	12.742	12.748	12.755	12.762	12.769	12.775	12.782	12.789	12.796	12.802	12.809
2320	12.809	12.816	12.822	12.829	12.836	12.843	12.849	12.856	12.863	12.870	12.876
2330	12.876	12.883	12.890	12.896	12.903	12.910	12.917	12.923	12.930	12.937	12.944
2340	12.944	12.950	12.957	12.964	12.971	12.977	12.984	12.991	12.997	13.004	13.011
2350	13.011	13.018	13.024	13.031	13.038	13.045	13.051	13.058	13.065	13.072	13.078
2360	13.078	13.085	13.092	13.098	13.105	13.112	13.119	13.125	13.132	13.139	13.146
2370	13.146	13.152	13.159	13.166	13.173	13.179	13.186	13.193	13.199	13.206	13.213
2380	13.213	13.220	13.226	13.233	13.240	13.247	13.253	13.260	13.267	13.274	13.280
2390	13.280	13.287	13.294	13.301	13.307	13.314	13.321	13.328	13.334	13.341	13.348
2400	13.348	13.354	13.361	13.368	13.375	13.381	13.388	13.395	13.402	13.408	13.415
2410	13.415	13.422	13.429	13.435	13.442	13.449	13.456	13.462	13.469	13.476	13.483
2420	13.483	13.489	13.496	13.503	13.510	13.516	13.523	13.530	13.537	13.543	13.550
2430	13.550	13.557	13.563	13.570	13.577	13.584	13.590	13.597	13.604	13.611	13.617
2440	13.617	13.624	13.631	13.638	13.644	13.651	13.658	13.665	13.671	13.678	13.685
2450	13.685	13.692	13.698	13.705	13.712	13.719	13.725	13.732	13.739	13.746	13.752
2460	13.752	13.759	13.766	13.773	13.779	13.786	13.793	13.800	13.806	13.813	13.820
2470	13.820	13.826	13.833	13.840	13.847	13.853	13.860	13.867	13.874	13.880	13.887
2480	13.887	13.894	13.901	13.907	13.914	13.921	13.928	13.934	13.941	13.948	13.955
2490	13.955	13.961	13.968	13.975	13.982	13.988	13.995	14.002	14.009	14.015	14.022
2500	14.022	14.029	14.036	14.042	14.049	14.056	14.063	14.069	14.076	14.083	14.089
2510	14.089	14.096	14.103	14.110	14.116	14.123	14.130	14.137	14.143	14.150	14.157
2520	14.157	14.164	14.170	14.177	14.184	14.191	14.197	14.204	14.211	14.218	14.224
2530	14.224	14.231	14.238	14.245	14.251	14.258	14.265	14.272	14.278	14.285	14.292
2540	14.292	14.298	14.305	14.312	14.319	14.325	14.332	14.339	14.346	14.352	14.359
2550	14.359	14.366	14.373	14.379	14.386	14.393	14.400	14.406	14.413	14.420	14.426
2560	14.426	14.433	14.440	14.447	14.453	14.460	14.457	14.474	14.480	14.487	14.494
2570	14.494	14.501	14.507	14.514	14.521	14.528	14.534	14.541	14.548	14.554	14.561
2580	14.561	14.568	14.575	14.581	14.588	14.595	14.602	14.508	14.615	14.622	14.629
2590	14.629	14.635	14.642	14.649	14.655	14.662	14.669	14.676	14.682	14.689	14.696
2600	14.696	14.703	14.709	14.716	14.723	14.729	14.736	14.743	14.750	14.756	14.763
2610	14.763	14.770	14.777	14.783	14.790	14.797	14.803	14.810	14.817	14.824	14.830
2620	14.830	14.837	14.844	14.851	14.857	14.864	14.871	14.877	14.884	14.891	14.898
2630	14.898	14.904	14.911	14.918	14.925	14.931	14.938	14.945	14.951	14.958	14.965
2640	14.965	14.972	14.978	14.985	14.992	14.998	15.005	15.012	15.019	15.025	15.032
2650	15.032	15.039	15.045	15.052	15.059	15.066	15.072	15.079	15.086	15.092	15.099
2660	15.099	15.106	15.113	15.119	15.126	15.133	15.139	15.146	15.153	15.160	15.166
2670	15.166	15.173	15.180	15.186	15.193	15.200	15.207	15.213	15.220	15.227	15.233
2680	15.233	15.240	15.247	15.254	15.260	15.267	15.274	15.280	15.287	15.294	15.300
2690	15.300	15.307	15.314	15.321	15.327	15.334	15.341	15.347	15.354	15.361	15.367
2700	15.367	15.374	15.381	15.388	15.394	15.401	15.408	15.414	15.421	15.428	15.434
2710	15.434	15.441	15.448	15.455	15.461	15.468	15.475	15.481	15.488	15.495	15.501
2720	15.501	15.508	15.515	15.521	15.528	15.535	15.542	15.548	15.555	15.562	15.568
2730	15.568	15.575	15.582	15.588	15.595	15.602	15.608	15.615	15.622	15.628	15.635
2740	15.635	15.642	15.649	15.655	15.662	15.669	15.675	15.682	15.689	15.695	15.702
2750	15.702	15.709	15.715	15.722	15.729	15.735	15.742	15.749	15.755	15.762	15.769
2760	15.769	15.775	15.782	15.789	15.795	15.802	15.809	15.815	15.822	15.829	15.835
2770	15.835	15.842	15.849	15.855	15.862	15.869	15.875	15.882	15.889	15.895	15.902
2780	15.902	15.909	15.915	15.922	15.929	15.935	15.942	15.949	15.955	15.962	15.969
2790	15.969	15.975	15.982	15.989	15.995	16.002	16.009	16.015	16.022	16.029	16.035
2800	16.035	16.042	16.049	16.055	16.062	16.069	16.075	16.082	16.089	16.095	16.102
2810	16.102	16.108	16.115	15.122	16.128	16.135	16.142	16.148	16.155	16.162	15.168
2820	16.168	16.175	16.182	16.188	16.195	16.202	16.208	15.215	16.221	16.228	16.235
2830	16.235	16.241	16.248	16.255	16.261	16.268	16.275	16.281	16.288	16.294	16.301
2840	16.301	16.308	16.314	16.321	16.328	16.334	16.341	16.347	16.354	16.361	16.367
2850	16.367	16.374	16.381	16.387	16.394	16.400	16.407	16.414	16.420	16.427	16.434
2860	16.434	16.440	16.447	16.453	16.460	16.467	16.473	16.480	16.486	16.493	16.500
2870	16.500	16.506	16.513	16.520	16.526	16.533	16.539	16.546	16.553	16.559	16.566
2880	16.566	16.572	16.579	16.586	16.592	16.599	16.605	16.612	16.619	16.625	16.632
2890	16.632	16.638	16.645	16.652	16.658	16.665	16.671	16.678	16.685	16.691	16.698

TABLE 21 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2900	16.698	16.704	16.711	16.718	16.724	16.731	16.737	16.744	16.751	16.757	16.764
2910	16.764	16.770	16.777	15.783	16.790	16.797	16.803	16.810	16.816	16.823	16.829
2920	16.829	16.836	16.843	16.849	16.856	16.862	16.869	16.876	16.882	16.889	16.895
2930	16.895	16.902	16.908	15.915	16.922	16.928	16.935	16.941	16.948	16.954	16.961
2940	16.961	16.967	16.974	16.981	16.987	16.994	17.000	17.007	17.013	17.020	17.026
2950	17.026	17.033	17.040	17.046	17.053	17.059	17.066	17.072	17.079	17.085	17.092
2960	17.092	17.099	17.105	17.112	17.118	17.125	17.131	17.138	17.144	17.151	17.157
2970	17.157	17.164	17.171	17.177	17.184	17.190	17.197	17.203	17.210	17.216	17.223
2980	17.223	17.229	17.236	17.242	17.249	17.255	17.262	17.268	17.275	17.282	17.288
2990	17.288	17.295	17.301	17.308	17.314	17.321	17.327	17.334	17.340	17.347	17.353
3000	17.353	17.360	17.366	17.373	17.379	17.386	17.392	17.399	17.405	17.412	17.418
3010	17.418	17.425	17.431	17.438	17.444	17.451	17.457	17.464	17.470	17.477	17.483
3020	17.483	17.490	17.496	17.503	17.509	17.516	17.522	17.529	17.535	17.542	17.548
3030	17.548	17.555	17.561	17.568	17.574	17.581	17.587	17.594	17.600	17.607	17.613
3040	17.613	17.620	17.626	17.633	17.639	17.645	17.652	17.658	17.665	17.671	17.678
3050	17.678	17.684	17.691	17.697	17.704	17.710	17.717	17.723	17.729	17.736	17.742
3060	17.742	17.749	17.755	17.762	17.768	17.775	17.781	17.787	17.794	17.800	17.807
3070	17.807	17.813	17.819	17.826	17.832	17.839	17.845	17.852	17.858	17.864	17.871
3080	17.871	17.877	17.884	17.890	17.896	17.903	17.909	17.915	17.922	17.928	17.935
3090	17.935	17.941	17.947	17.954	17.960	17.966	17.973	17.979	17.985	17.992	17.998
3100	17.998	18.004	18.011	18.017	18.023	18.030	18.036	18.042	18.049	18.055	18.061
3110	18.061	18.068	18.074	18.080	18.086	18.093	18.099	18.105	18.112	18.118	18.124
3120	18.124	18.130	18.137	18.143	18.149	18.155	18.162	18.168	18.174	18.180	18.187
3130	18.187	18.193	18.199	18.205	18.211	18.218	18.224	18.230	18.236	18.242	18.249
3140	18.249	18.255	18.261	18.267	18.273	18.279	18.285	18.292	18.298	18.304	18.310
3150	18.310	18.316	18.322	18.328	18.334	18.341	18.347	18.353	18.359	18.365	18.371
3160	18.371	18.377	18.383	18.389	18.395	18.401	18.407	18.413	18.419	18.425	18.431
3170	18.431	18.437	18.443	18.449	18.455	18.461	18.467	18.473	18.479	18.485	18.491
3180	18.491	18.497	18.503	18.509	18.515	18.521	18.527	18.533	18.539	18.545	18.551
3190	18.551	18.557	18.562	18.568	18.574	18.580	18.586	18.592	18.598	18.603	18.609
3200	18.609	18.615	18.521	18.627	18.633	18.638	18.644	18.650	18.656	18.661	18.667
3210	18.667	18.673	18.679	18.684	18.690						

TABLE 22 Type T Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–6.258										
–260	–6.232	–6.236	–6.239	–6.242	–6.245	–6.248	–6.251	–6.253	–6.255	–6.256	–6.258
–250	–6.180	–6.187	–6.193	–6.198	–6.204	–6.209	–6.214	–6.219	–6.223	–6.228	–6.232
–240	–6.105	–6.114	–6.122	–6.130	–6.138	–6.146	–6.153	–6.160	–6.167	–6.174	–6.180
–230	–6.007	–6.017	–6.028	–6.038	–6.049	–6.059	–6.068	–6.078	–6.087	–6.096	–6.105
–220	–5.888	–5.901	–5.914	–5.926	–5.938	–5.950	–5.962	–5.973	–5.985	–5.996	–6.007
–210	–5.753	–5.767	–5.782	–5.795	–5.809	–5.823	–5.836	–5.850	–5.863	–5.876	–5.888
–200	–5.603	–5.619	–5.634	–5.650	–5.665	–5.680	–5.695	–5.710	–5.724	–5.739	–5.753
–190	–5.439	–5.456	–5.473	–5.489	–5.506	–5.523	–5.539	–5.555	–5.571	–5.587	–5.603
–180	–5.261	–5.279	–5.297	–5.316	–5.334	–5.351	–5.369	–5.387	–5.404	–5.421	–5.439
–170	–5.070	–5.089	–5.109	–5.128	–5.148	–5.167	–5.186	–5.205	–5.224	–5.242	–5.261
–160	–4.865	–4.886	–4.907	–4.928	–4.949	–4.969	–4.989	–5.010	–5.030	–5.050	–5.070
–150	–4.648	–4.671	–4.693	–4.715	–4.737	–4.759	–4.780	–4.802	–4.823	–4.844	–4.865
–140	–4.419	–4.443	–4.466	–4.489	–4.512	–4.535	–4.558	–4.581	–4.604	–4.626	–4.648
–130	–4.177	–4.202	–4.226	–4.251	–4.275	–4.300	–4.324	–4.348	–4.372	–4.395	–4.419
–120	–3.923	–3.949	–3.975	–4.000	–4.026	–4.052	–4.077	–4.102	–4.127	–4.152	–4.177
–110	–3.657	–3.684	–3.711	–3.738	–3.765	–3.791	–3.818	–3.844	–3.871	–3.897	–3.923
–100	–3.379	–3.407	–3.435	–3.463	–3.491	–3.519	–3.547	–3.574	–3.602	–3.629	–3.657
–90	–3.089	–3.118	–3.148	–3.177	–3.206	–3.235	–3.264	–3.293	–3.322	–3.350	–3.379
–80	–2.788	–2.818	–2.849	–2.879	–2.910	–2.940	–2.970	–3.000	–3.030	–3.059	–3.089
–70	–2.476	–2.507	–2.539	–2.571	–2.602	–2.633	–2.664	–2.695	–2.726	–2.757	–2.788
–60	–2.153	–2.186	–2.218	–2.251	–2.283	–2.316	–2.348	–2.380	–2.412	–2.444	–2.476
–50	–1.819	–1.853	–1.887	–1.920	–1.954	–1.987	–2.021	–2.054	–2.087	–2.120	–2.153
–40	–1.475	–1.510	–1.545	–1.579	–1.614	–1.648	–1.683	–1.717	–1.751	–1.785	–1.819
–30	–1.121	–1.157	–1.192	–1.228	–1.264	–1.299	–1.335	–1.370	–1.405	–1.440	–1.475
–20	–0.757	–0.794	–0.830	–0.867	–0.904	–0.940	–0.976	–1.013	–1.049	–1.085	–1.121
–10	–0.383	–0.421	–0.459	–0.496	–0.534	–0.571	–0.608	–0.646	–0.683	–0.720	–0.757
0	0.000	–0.039	–0.077	–0.116	–0.154	–0.193	–0.231	–0.269	–0.307	–0.345	–0.383
0	0.000	0.039	0.078	0.117	0.156	0.195	0.234	0.273	0.312	0.352	0.391
10	0.391	0.431	0.470	0.510	0.549	0.589	0.629	0.669	0.709	0.749	0.790
20	0.790	0.830	0.870	0.911	0.951	0.992	1.033	1.074	1.114	1.155	1.196
30	1.196	1.238	1.279	1.320	1.362	1.403	1.445	1.486	1.528	1.570	1.612
40	1.612	1.654	1.696	1.738	1.780	1.823	1.865	1.908	1.950	1.993	2.036
50	2.036	2.079	2.122	2.165	2.208	2.251	2.294	2.338	2.381	2.425	2.468
60	2.468	2.512	2.556	2.600	2.643	2.687	2.732	2.776	2.820	2.864	2.909
70	2.909	2.953	2.998	3.043	3.087	3.132	3.177	3.222	3.267	3.312	3.358
80	3.358	3.403	3.448	3.494	3.539	3.585	3.631	3.677	3.722	3.768	3.814
90	3.814	3.860	3.907	3.953	3.999	4.046	4.092	4.138	4.185	4.232	4.279
100	4.279	4.325	4.372	4.419	4.466	4.513	4.561	4.608	4.655	4.702	4.750
110	4.750	4.798	4.845	4.893	4.941	4.988	5.036	5.084	5.132	5.180	5.228
120	5.228	5.277	5.325	5.373	5.422	5.470	5.519	5.567	5.616	5.665	5.714
130	5.714	5.763	5.812	5.861	5.910	5.959	6.008	6.057	6.107	6.156	6.206
140	6.206	6.255	6.305	6.355	6.404	6.454	6.504	6.554	6.604	6.654	6.704
150	6.704	6.754	6.805	6.855	6.905	6.956	7.006	7.057	7.107	7.158	7.209
160	7.209	7.260	7.310	7.361	7.412	7.463	7.515	7.566	7.617	7.668	7.720
170	7.720	7.771	7.823	7.874	7.926	7.977	8.029	8.081	8.133	8.185	8.237
180	8.237	8.289	8.341	8.393	8.445	8.497	8.550	8.602	8.654	8.707	8.759
190	8.759	8.812	8.865	8.917	8.970	9.023	9.076	9.129	9.182	9.235	9.288
200	9.288	9.341	9.395	9.448	9.501	9.555	9.608	9.662	9.715	9.769	9.822
210	9.822	9.876	9.930	9.984	10.038	10.092	10.146	10.200	10.254	10.308	10.362
220	10.362	10.417	10.471	10.525	10.580	10.634	10.689	10.743	10.798	10.853	10.907
230	10.907	10.962	11.017	11.072	11.127	11.182	11.237	11.292	11.347	11.403	11.458
240	11.458	11.513	11.569	11.624	11.680	11.735	11.791	11.846	11.902	11.958	12.013
250	12.013	12.069	12.125	12.181	12.237	12.293	12.349	12.405	12.461	12.518	12.574
260	12.574	12.630	12.687	12.743	12.799	12.856	12.912	12.969	13.026	13.082	13.139
270	13.139	13.196	13.253	13.310	13.366	13.423	13.480	13.537	13.595	13.652	13.709
280	13.709	13.766	13.823	13.881	13.938	13.995	14.053	14.110	14.168	14.226	14.283
290	14.283	14.341	14.399	14.456	14.514	14.572	14.630	14.688	14.746	14.804	14.862
300	14.862	14.920	14.978	15.036	15.095	15.153	15.211	15.270	15.328	15.386	15.445

TABLE 22 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
310	15.445	15.503	15.562	15.621	15.679	15.738	15.797	15.856	15.914	15.973	16.032
320	16.032	16.091	16.150	16.209	16.268	16.327	16.387	16.446	16.505	16.564	16.624
330	16.624	16.683	16.742	16.802	16.861	16.921	16.980	17.040	17.100	17.159	17.219
340	17.219	17.279	17.339	17.399	17.458	17.518	17.578	17.638	17.698	17.759	17.819
350	17.819	17.879	17.939	17.999	18.060	18.120	18.180	18.241	18.301	18.362	18.422
360	18.422	18.483	18.543	18.604	18.665	18.725	18.786	18.847	18.908	18.969	19.030
370	19.030	19.091	19.152	19.213	19.274	19.335	19.396	19.457	19.518	19.579	19.641
380	19.641	19.702	19.763	19.825	19.886	19.947	20.009	20.070	20.132	20.193	20.255
390	20.255	20.317	20.378	20.440	20.502	20.563	20.625	20.687	20.748	20.810	20.872
400	20.872										

TABLE 23 Type T Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–6.254	–6.255	–6.256	–6.257	–6.258						
–440	–6.240	–6.242	–6.243	–6.245	–6.247	–6.248	–6.250	–6.251	–6.252	–6.253	–6.254
–430	–6.217	–6.220	–6.222	–6.225	–6.227	–6.230	–6.232	–6.234	–6.236	–6.238	–6.240
–420	–6.187	–6.191	–6.194	–6.197	–6.200	–6.203	–6.206	–6.209	–6.212	–6.215	–6.217
–410	–6.150	–6.154	–6.158	–6.162	–6.166	–6.170	–6.173	–6.177	–6.180	–6.184	–6.187
–400	–6.105	–6.110	–6.115	–6.119	–6.124	–6.128	–6.133	–6.137	–6.141	–6.146	–6.150
–390	–6.053	–6.059	–6.064	–6.069	–6.075	–6.080	–6.085	–6.090	–6.095	–6.100	–6.105
–380	–5.994	–6.001	–6.007	–6.013	–6.019	–6.025	–6.030	–6.036	–6.042	–6.047	–6.053
–370	–5.930	–5.937	–5.943	–5.950	–5.956	–5.963	–5.969	–5.976	–5.982	–5.988	–5.994
–360	–5.860	–5.867	–5.874	–5.881	–5.888	–5.896	–5.902	–5.909	–5.916	–5.923	–5.930
–350	–5.785	–5.792	–5.800	–5.808	–5.815	–5.823	–5.830	–5.838	–5.845	–5.853	–5.860
–340	–5.705	–5.713	–5.721	–5.729	–5.737	–5.745	–5.753	–5.761	–5.769	–5.777	–5.785
–330	–5.620	–5.629	–5.638	–5.646	–5.655	–5.663	–5.672	–5.680	–5.688	–5.697	–5.705
–320	–5.532	–5.541	–5.550	–5.559	–5.568	–5.577	–5.585	–5.594	–5.603	–5.612	–5.620
–310	–5.439	–5.448	–5.458	–5.467	–5.476	–5.486	–5.495	–5.504	–5.513	–5.523	–5.532
–300	5.341	–5.351	–5.361	–5.371	–5.381	–5.391	–5.400	–5.410	–5.420	–5.429	–5.439
–290	–5.240	–5.250	–5.261	–5.271	–5.281	–5.291	–5.301	–5.312	–5.322	–5.332	–5.341
–280	–5.135	–5.145	–5.156	–5.167	–5.177	–5.188	–5.198	–5.209	–5.219	–5.230	–5.240
–270	–5.025	–5.036	–5.048	–5.059	–5.070	–5.081	–5.091	–5.102	–5.113	–5.124	–5.135
–260	–4.912	–4.923	–4.935	–4.946	4.958	–4.969	–4.980	–4.992	–5.003	–5.014	–5.025
–250	–4.794	–4.806	–4.818	–4.830	–4.842	–4.854	–4.865	–4.877	–4.889	–4.900	–4.912
–240	–4.673	–4.685	–4.698	–4.710	–4.722	–4.734	–4.746	–4.759	–4.771	–4.783	–4.794
–230	–4.548	–4.561	–4.573	–4.586	–4.599	–4.611	–4.624	–4.636	–4.648	–4.661	–4.673
–220	–4.419	4.432	–4.445	–4.458	–4.471	–4.484	–4.497	–4.510	–4.523	–4.535	–4.548
–210	–4.286	–4.300	–4.313	–4.326	–4.340	–4.353	–4.366	–4.380	–4.393	–4.406	–4.419
–200	–4.149	–4.163	–4.177	–4.191	–4.205	–4.218	–4.232	–4.246	–4.259	–4.273	–4.286
–190	–4.009	–4.023	–4.037	–4.052	–4.066	–4.080	–4.094	–4.108	–4.122	–4.136	–4.149
–180	–3.865	–3.879	–3.894	–3.908	–3.923	–3.937	–3.952	–3.966	–3.980	–3.995	–4.009
–170	–3.717	–3.732	–3.747	–3.762	–3.777	–3.791	–3.806	–3.821	–3.836	–3.850	–3.865
–160	–3.565	–3.581	3.596	–3.611	–3.626	–3.642	–3.657	–3.672	–3.687	–3.702	–3.717
–150	–3.410	–3.426	–3.441	–3.457	–3.473	–3.488	–3.504	–3.519	–3.535	–3.550	–3.565
140	–3.251	–3.267	–3.283	–3.299	–3.315	–3.331	–3.347	–3.363	–3.379	–3.394	–3.410
–130	–3.089	–3.105	–3.122	–3.138	–3.154	–3.171	–3.187	–3.203	–3.219	–3.235	–3.251
–120	–2.923	–2.940	–2.956	–2.973	–2.990	–3.006	–3.023	–3.040	–3.056	–3.072	–3.089
–110	–2.754	–2.771	–2.788	–2.805	–2.822	–2.839	–2.856	–2.873	–2.889	–2.906	–2.923
–100	–2.581	–2.598	–2.616	–2.633	–2.651	–2.668	–2.685	–2.702	–2.719	–2.737	–2.754
–90	–2.405	–2.423	–2.440	–2.458	–2.475	–2.493	–2.511	–2.529	–2.546	–2.564	–2.581
–80	–2.225	–2.244	–2.262	–2.280	–2.298	–2.316	–2.334	–2.351	–2.369	–2.387	–2.405
–70	–2.043	–2.061	–2.079	–2.098	–2.116	–2.134	–2.153	–2.171	–2.189	–2.207	–2.225
–60	–1.857	–1.875	–1.894	–1.913	–1.931	–1.950	–1.969	–1.987	–2.006	–2.024	–2.043
–50	–1.667	–1.686	–1.705	–1.724	–1.743	–1.762	–1.781	–1.800	–1.819	–1.838	–1.857
–40	–1.475	–1.494	–1.514	–1.533	–1.552	–1.572	–1.591	–1.610	–1.629	–1.648	–1.667
–30	–1.279	–1.299	–1.319	–1.338	–1.358	–1.378	–1.397	–1.417	–1.436	–1.456	–1.475
–20	–1.081	–1.101	–1.121	–1.141	–1.161	–1.181	–1.200	–1.220	–1.240	–1.260	–1.279
–10	–0.879	–0.900	–0.920	–0.940	–0.960	–0.980	–1.001	–1.021	–1.041	–1.061	–1.081
0	–0.675	–0.695	–0.716	–0.735	–0.757	–0.777	–0.798	–0.818	–0.839	–0.859	–0.879
0	–0.675	–0.654	–0.633	–0.613	–0.592	–0.571	–0.550	–0.530	–0.509	–0.488	–0.467
10	–0.457	–0.446	–0.425	–0.404	–0.383	–0.362	–0.341	–0.320	–0.299	–0.278	–0.256
20	–0.256	–0.235	–0.214	–0.193	–0.171	–0.150	0.129	–0.107	0.086	–0.064	–0.043
30	–0.043	–0.022	0.000	0.022	0.043	0.065	0.086	0.108	0.130	0.151	0.173
40	0.173	0.195	0.216	0.238	0.260	0.282	0.303	0.325	0.347	0.369	0.391
50	0.391	0.413	0.435	0.457	0.479	0.501	0.523	0.545	0.567	0.589	0.611
60	0.611	0.634	0.656	0.678	0.700	0.723	0.745	0.767	0.790	0.812	0.834
70	0.834	0.857	0.879	0.902	0.924	0.947	0.969	0.992	1.015	1.037	1.060
80	1.060	1.083	1.105	1.128	1.151	1.174	1.196	1.219	1.242	1.265	1.288
90	1.288	1.311	1.334	1.357	1.380	1.403	1.426	1.449	1.472	1.496	1.519
100	1.519	1.542	1.565	1.588	1.612	1.635	1.658	1.682	1.705	1.729	1.752
110	1.752	1.776	1.799	1.823	1.846	1.870	1.893	1.917	1.941	1.964	1.988
120	1.988	2.012	2.036	2.060	2.083	2.107	2.131	2.155	2.179	2.203	2.227

TABLE 23 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	2.227	2.251	2.275	2.299	2.323	2.347	2.371	2.395	2.420	2.444	2.468
140	2.468	2.492	2.517	2.541	2.565	2.590	2.614	2.639	2.663	2.687	2.712
150	2.712	2.737	2.761	2.786	2.810	2.835	2.860	2.884	2.909	2.934	2.958
160	2.958	2.983	3.008	3.033	3.058	3.082	3.107	3.132	3.157	3.182	3.207
170	3.207	3.232	3.257	3.282	3.307	3.333	3.358	3.383	3.408	3.433	3.459
180	3.459	3.484	3.509	3.534	3.560	3.585	3.610	3.636	3.661	3.687	3.712
190	3.712	3.738	3.763	3.789	3.814	3.840	3.866	3.891	3.917	3.943	3.968
200	3.968	3.994	4.020	4.046	4.071	4.097	4.123	4.149	4.175	4.201	4.227
210	4.227	4.253	4.279	4.305	4.331	4.357	4.383	4.409	4.435	4.461	4.487
220	4.487	4.513	4.540	4.566	4.592	4.618	4.645	4.671	4.697	4.724	4.750
230	4.750	4.776	4.803	4.829	4.856	4.882	4.909	4.935	4.962	4.988	5.015
240	5.015	5.042	5.068	5.095	5.122	5.148	5.175	5.202	5.228	5.255	5.282
250	5.282	5.309	5.336	5.363	5.389	5.416	5.443	5.470	5.497	5.524	5.551
260	5.551	5.578	5.605	5.632	5.660	5.687	5.714	5.741	5.768	5.795	5.823
270	5.823	5.850	5.877	5.904	5.932	5.959	5.986	6.014	6.041	6.068	6.096
280	6.096	6.123	6.151	6.178	6.206	6.233	6.261	6.288	6.316	6.343	6.371
290	6.371	6.399	6.426	6.454	6.482	6.510	6.537	6.565	6.593	6.621	6.648
300	6.648	6.676	6.704	6.732	6.760	6.788	6.816	6.844	6.872	6.900	6.928
310	6.928	6.956	6.984	7.012	7.040	7.068	7.096	7.124	7.152	7.181	7.209
320	7.209	7.237	7.265	7.294	7.322	7.350	7.378	7.407	7.435	7.463	7.492
330	7.492	7.520	7.549	7.577	7.606	7.634	7.663	7.691	7.720	7.748	7.777
340	7.777	7.805	7.834	7.863	7.891	7.920	7.949	7.977	8.006	8.035	8.064
350	8.064	8.092	8.121	8.150	8.179	8.208	8.237	8.266	8.294	8.323	8.352
360	8.352	8.381	8.410	8.439	8.468	8.497	8.526	8.555	8.585	8.614	8.643
370	8.643	8.672	8.701	8.730	8.759	8.789	8.818	8.847	8.876	8.906	8.935
380	8.935	8.964	8.994	9.023	9.052	9.082	9.111	9.141	9.170	9.200	9.229
390	9.229	9.259	9.288	9.318	9.347	9.377	9.406	9.436	9.466	9.495	9.525
400	9.525	9.555	9.584	9.614	9.644	9.673	9.703	9.733	9.763	9.793	9.822
410	9.822	9.852	9.882	9.912	9.942	9.972	10.002	10.032	10.062	10.092	10.122
420	10.122	10.152	10.182	10.212	10.242	10.272	10.302	10.332	10.362	10.392	10.423
430	10.423	10.453	10.483	10.513	10.543	10.574	10.604	10.634	10.664	10.695	10.725
440	10.725	10.755	10.786	10.816	10.847	10.877	10.907	10.938	10.968	10.999	11.029
450	11.029	11.060	11.090	11.121	11.151	11.182	11.213	11.243	11.274	11.304	11.335
460	11.335	11.366	11.396	11.427	11.458	11.489	11.519	11.550	11.581	11.612	11.643
470	11.643	11.673	11.704	11.735	11.766	11.797	11.828	11.859	11.690	11.920	11.951
480	11.951	11.982	12.013	12.044	12.075	12.106	12.138	12.169	12.200	12.231	12.262
490	12.262	12.293	12.324	12.355	12.386	12.418	12.449	12.480	12.511	12.543	12.574
500	12.574	12.605	12.636	12.668	12.699	12.730	12.762	12.793	12.824	12.856	12.887
510	12.887	12.919	12.950	12.982	13.013	13.045	13.076	13.108	13.139	13.171	13.202
520	13.202	13.234	13.265	13.297	13.328	13.360	13.392	13.423	13.455	13.487	13.518
530	13.518	13.550	13.582	13.614	13.645	13.677	13.709	13.741	13.772	13.804	13.836
540	13.836	13.868	13.900	13.932	13.964	13.995	14.027	14.059	14.091	14.123	14.155
550	14.155	14.187	14.219	14.251	14.283	14.315	14.347	14.379	14.411	14.444	14.476
560	14.476	14.508	14.540	14.572	14.604	14.636	14.669	14.701	14.733	14.765	14.797
570	14.797	14.830	14.862	14.894	14.926	14.959	14.991	15.023	15.056	15.088	15.121
580	15.121	15.153	15.185	15.218	15.250	15.283	15.315	15.347	15.380	15.412	15.445
590	15.445	15.477	15.510	15.543	15.575	15.608	15.640	15.673	15.705	15.738	15.771
600	15.771	15.803	15.836	15.869	15.901	15.934	15.967	15.999	16.032	16.065	16.098
610	16.098	16.130	16.163	16.196	16.229	16.262	16.295	16.327	16.360	16.393	16.426
620	16.426	16.459	16.492	16.525	16.558	16.591	16.624	16.657	16.690	16.723	16.756
630	16.756	16.789	16.822	16.855	16.888	16.921	16.954	16.987	17.020	17.053	17.086
640	17.086	17.120	17.153	17.186	17.219	17.252	17.286	17.319	17.352	17.385	17.418
650	17.418	17.452	17.485	17.518	17.552	17.585	17.618	17.652	17.685	17.718	17.752
660	17.752	17.785	17.819	17.852	17.886	17.919	17.952	17.986	18.019	18.053	18.086
670	18.086	18.120	18.153	18.187	18.221	18.254	18.288	18.321	18.355	18.389	18.422
680	18.422	18.456	18.490	18.523	18.557	18.591	18.624	18.658	18.692	18.725	18.759
690	18.759	18.793	18.827	18.861	18.894	18.928	18.962	18.996	19.030	19.064	19.097
700	19.097	19.131	19.165	19.199	19.233	19.267	19.301	19.335	19.369	19.403	19.437
710	19.437	19.471	19.505	19.539	19.573	19.607	19.641	19.675	19.709	19.743	19.777

TABLE 23 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	19.777	19.811	19.845	19.879	19.913	19.947	19.982	20.016	20.050	20.084	20.118
730	20.118	20.152	20.187	20.221	20.255	20.289	20.323	20.358	20.392	20.426	20.460
740	20.460	20.495	20.529	20.563	20.597	20.632	20.666	20.700	20.735	20.769	20.803
750	20.803	20.838	20.872								

TABLE 24 Type C Thermocouple

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
	Thermoelectric Voltage (emf) in Millivolts											
0	0.000	0.013	0.027	0.040	0.054	0.067	0.081	0.094	0.108	0.122	0.135	**0**
10	0.135	0.149	0.163	0.176	0.190	0.204	0.218	0.231	0.245	0.259	0.273	**10**
20	0.273	0.287	0.301	0.315	0.329	0.342	0.356	0.370	0.385	0.399	0.413	**20**
30	0.413	0.427	0.441	0.455	0.469	0.483	0.498	0.512	0.526	0.540	0.555	**30**
40	0.555	0.569	0.583	0.598	0.612	0.627	0.641	0.656	0.670	0.685	0.699	**40**
50	0.699	0.714	0.728	0.743	0.757	0.772	0.787	0.801	0.816	0.831	0.846	**50**
60	0.846	0.860	0.875	0.890	0.905	0.920	0.934	0.949	0.964	0.979	0.994	**60**
70	0.994	1.009	1.024	1.039	1.054	1.069	1.084	1.099	1.114	1.129	1.145	**70**
80	1.145	1.160	1.175	1.190	1.205	1.221	1.236	1.251	1.266	1.282	1.297	**80**
90	1.297	1.312	1.328	1.343	1.359	1.374	1.389	1.405	1.420	1.436	1.451	**90**
100	1.451	1.467	1.483	1.498	1.514	1.529	1.545	1.561	1.576	1.592	1.608	**100**
110	1.608	1.624	1.639	1.655	1.671	1.687	1.702	1.718	1.734	1.750	1.766	**110**
120	1.766	1.782	1.798	1.814	1.830	1.846	1.862	1.878	1.894	1.910	1.926	**120**
130	1.926	1.942	1.958	1.974	1.990	2.006	2.023	2.039	2.055	2.071	2.087	**130**
140	2.087	2.104	2.120	2.136	2.152	2.169	2.185	2.201	2.218	2.234	2.251	**140**
150	2.251	2.267	2.283	2.300	2.316	2.333	2.349	2.366	2.382	2.399	2.415	**150**
160	2.415	2.432	2.449	2.465	2.482	2.498	2.515	2.532	2.548	2.565	2.582	**160**
170	2.582	2.599	2.615	2.632	2.649	2.666	2.682	2.699	2.716	2.733	2.750	**170**
180	2.750	2.767	2.784	2.800	2.817	2.834	2.851	2.868	2.885	2.902	2.919	**180**
190	2.919	2.936	2.953	2.970	2.987	3.004	3.021	3.039	3.056	3.073	3.090	**190**
200	3.090	3.107	3.124	3.141	3.159	3.176	3.193	3.210	3.228	3.245	3.262	**200**
210	3.262	3.279	3.297	3.314	3.331	3.349	3.366	3.383	3.401	3.418	3.436	**210**
220	3.436	3.453	3.470	3.488	3.505	3.523	3.540	3.558	3.575	3.593	3.610	**220**
230	3.610	3.628	3.645	3.663	3.680	3.698	3.716	3.733	3.751	3.768	3.786	**230**
240	3.786	3.804	3.821	3.839	3.857	3.875	3.892	3.910	3.928	3.945	3.963	**240**
250	3.963	3.981	3.999	4.017	4.034	4.052	4.070	4.088	4.106	4.124	4.141	**250**
260	4.141	4.159	4.177	4.195	4.213	4.231	4.249	4.267	4.285	4.303	4.321	**260**
270	4.321	4.339	4.357	4.375	4.393	4.411	4.429	4.447	4.465	4.483	4.501	**270**
280	4.501	4.519	4.537	4.555	4.573	4.592	4.610	4.628	4.646	4.664	4.682	**280**
290	4.682	4.701	4.719	4.737	4.755	4.773	4.792	4.810	4.828	4.846	4.865	**290**
300	4.865	4.883	4.901	4.920	4.938	4.956	4.974	4.993	5.011	5.030	5.048	**300**
310	5.048	5.066	5.085	5.103	5.121	5.140	5.158	5.177	5.195	5.214	5.232	**310**
320	5.232	5.250	5.269	5.287	5.306	5.324	5.343	5.361	5.380	5.398	5.417	**320**
330	5.417	5.435	5.454	5.473	5.491	5.510	5.528	5.547	5.565	5.584	5.603	**330**
340	5.603	5.621	5.640	5.658	5.677	5.696	5.714	5.733	5.752	5.770	5.789	**340**
350	5.789	5.808	5.827	5.845	5.864	5.883	5.901	5.920	5.939	5.958	5.976	**350**
360	5.976	5.995	6.014	6.033	6.051	6.070	6.089	6.108	6.127	6.145	6.164	**360**
370	6.164	6.183	6.202	6.221	6.240	6.259	6.277	6.296	6.315	6.334	6.353	**370**
380	6.353	6.372	6.391	6.410	6.429	6.447	6.466	6.485	6.504	6.523	6.542	**380**
390	6.542	6.561	6.580	6.599	6.618	6.637	6.656	6.675	6.694	6.713	6.732	**390**
400	6.732	6.751	6.770	6.789	6.808	6.827	6.846	6.865	6.884	6.903	6.922	**400**
410	6.922	6.941	6.961	6.980	6.999	7.018	7.037	7.056	7.075	7.094	7.113	**410**
420	7.113	7.132	7.152	7.171	7.190	7.209	7.228	7.247	7.267	7.286	7.305	**420**
430	7.305	7.324	7.343	7.362	7.382	7.401	7.420	7.439	7.458	7.478	7.497	**430**
440	7.497	7.516	7.535	7.554	7.574	7.593	7.612	7.631	7.651	7.670	7.689	**440**
450	7.689	7.708	7.728	7.747	7.766	7.786	7.805	7.824	7.843	7.863	7.882	**450**
460	7.882	7.901	7.921	7.940	7.959	7.979	7.998	8.017	8.037	8.056	8.075	**460**
470	8.075	8.095	8.114	8.133	8.153	8.172	8.191	8.211	8.230	8.249	8.269	**470**
480	8.269	8.288	8.308	8.327	8.346	8.366	8.385	8.404	8.424	8.443	8.463	**480**
490	8.463	8.482	8.502	8.521	8.540	8.560	8.579	8.599	8.618	8.637	8.657	**490**
500	8.657	8.676	8.696	8.715	8.735	8.754	8.774	8.793	8.812	8.832	8.851	**500**
510	8.851	8.871	8.890	8.910	8.929	8.949	8.968	8.988	9.007	9.027	9.046	**510**
520	9.046	9.066	9.085	9.105	9.124	9.144	9.163	9.183	9.202	9.222	9.241	**520**
530	9.241	9.261	9.280	9.300	9.319	9.339	9.358	9.378	9.397	9.417	9.436	**530**
540	9.436	9.456	9.475	9.495	9.514	9.534	9.553	9.573	9.592	9.612	9.631	**540**
550	9.631	9.651	9.670	9.690	9.710	9.729	9.749	9.768	9.788	9.807	9.827	**550**
560	9.827	9.846	9.866	9.885	9.905	9.925	9.944	9.964	9.983	10.003	10.022	**560**
570	10.022	10.042	10.061	10.081	10.100	10.120	10.140	10.159	10.179	10.198	10.218	**570**
580	10.218	10.237	10.257	10.276	10.296	10.316	10.335	10.355	10.374	10.394	10.413	**580**
590	10.413	10.433	10.452	10.472	10.491	10.511	10.531	10.550	10.570	10.589	10.609	**590**

TABLE 24 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
						Thermoelectric Voltage (emf) in Millivolts						
600	10.609	10.628	10.648	10.667	10.687	10.706	10.726	10.746	10.765	10.785	10.804	**600**
610	10.804	10.824	10.843	10.863	10.882	10.902	10.921	10.941	10.960	10.980	10.999	**610**
620	10.999	11.019	11.038	11.058	11.077	11.097	11.117	11.136	11.156	11.175	11.195	**620**
630	11.195	11.214	11.234	11.253	11.273	11.292	11.312	11.331	11.351	11.370	11.390	**630**
640	11.390	11.409	11.429	11.448	11.468	11.487	11.507	11.526	11.546	11.565	11.585	**640**
650	11.585	11.604	11.624	11.643	11.663	11.682	11.702	11.721	11.741	11.760	11.780	**650**
660	11.780	11.799	11.818	11.838	11.857	11.877	11.896	11.916	11.935	11.955	11.974	**660**
670	11.974	11.994	12.013	12.033	12.052	12.072	12.091	12.111	12.130	12.150	12.169	**670**
680	12.169	12.189	12.208	12.228	12.247	12.267	12.286	12.306	12.325	12.344	12.364	**680**
690	12.364	12.383	12.403	12.422	12.442	12.461	12.481	12.500	12.520	12.539	12.559	**690**
700	12.559	12.578	12.597	12.617	12.636	12.656	12.675	12.695	12.714	12.734	12.753	**700**
710	12.753	12.772	12.792	12.811	12.831	12.850	12.870	12.889	12.908	12.928	12.947	**710**
720	12.947	12.967	12.986	13.006	13.025	13.044	13.064	13.083	13.103	13.122	13.141	**720**
730	13.141	13.161	13.180	13.200	13.219	13.238	13.258	13.277	13.297	13.316	13.335	**730**
740	13.335	13.355	13.374	13.393	13.413	13.432	13.452	13.471	13.490	13.510	13.529	**740**
750	13.529	13.548	13.568	13.587	13.606	13.626	13.645	13.665	13.684	13.703	13.723	**750**
760	13.723	13.742	13.761	13.781	13.800	13.819	13.839	13.858	13.877	13.896	13.916	**760**
770	13.916	13.935	13.954	13.974	13.993	14.012	14.032	14.051	14.070	14.089	14.109	**770**
780	14.109	14.128	14.147	14.167	14.186	14.205	14.224	14.244	14.263	14.282	14.301	**780**
790	14.301	14.321	14.340	14.359	14.378	14.398	14.417	14.436	14.455	14.475	14.494	**790**
800	14.494	14.513	14.532	14.551	14.571	14.590	14.609	14.628	14.647	14.667	14.686	**800**
810	14.686	14.705	14.724	14.743	14.763	14.782	14.801	14.820	14.839	14.858	14.878	**810**
820	14.878	14.897	14.916	14.935	14.954	14.973	14.993	15.012	15.031	15.050	15.069	**820**
830	15.069	15.088	15.107	15.126	15.146	15.165	15.184	15.203	15.222	15.241	15.260	**830**
840	15.260	15.279	15.298	15.317	15.336	15.356	15.375	15.394	15.413	15.432	15.451	**840**
850	15.451	15.470	15.489	15.508	15.527	15.546	15.565	15.584	15.603	15.622	15.641	**850**
860	15.641	15.660	15.679	15.698	15.717	15.736	15.755	15.774	15.793	15.812	15.831	**860**
870	15.831	15.850	15.869	15.888	15.907	15.926	15.945	15.964	15.983	16.002	16.021	**870**
880	16.021	16.040	16.058	16.077	16.096	16.115	16.134	16.153	16.172	16.191	16.210	**880**
890	16.210	16.229	16.248	16.266	16.285	16.304	16.323	16.342	16.361	16.380	16.398	**890**
900	16.398	16.417	16.436	16.455	16.474	16.493	16.511	16.530	16.549	16.568	16.587	**900**
910	16.587	16.606	16.624	16.643	16.662	16.681	16.699	16.718	16.737	16.756	16.775	**910**
920	16.775	16.793	16.812	16.831	16.850	16.868	16.887	16.906	16.924	16.943	16.962	**920**
930	16.962	16.981	16.999	17.018	17.037	17.055	17.074	17.093	17.111	17.130	17.149	**930**
940	17.149	17.167	17.186	17.205	17.223	17.242	17.261	17.279	17.298	17.317	17.335	**940**
950	17.335	17.354	17.373	17.391	17.410	17.428	17.447	17.465	17.484	17.503	17.521	**950**
960	17.521	17.540	17.558	17.577	17.595	17.614	17.633	17.651	17.670	17.688	17.707	**960**
970	17.707	17.725	17.744	17.762	17.781	17.799	17.818	17.836	17.855	17.873	17.892	**970**
980	17.892	17.910	17.929	17.947	17.966	17.984	18.002	18.021	18.039	18.058	18.076	**980**
990	18.076	18.095	18.113	18.131	18.150	18.168	18.187	18.205	18.223	18.242	18.260	**990**
1000	18.260	18.279	18.297	18.315	18.334	18.352	18.370	18.389	18.407	18.425	18.444	**1000**
1010	18.444	18.462	18.480	18.499	18.517	18.535	18.553	18.572	18.590	18.608	18.627	**1010**
1020	18.627	18.645	18.663	18.681	18.700	18.718	18.736	18.754	18.773	18.791	18.809	**1020**
1030	18.809	18.827	18.845	18.864	18.882	18.900	18.918	18.936	18.955	18.973	18.991	**1030**
1040	18.991	19.009	19.027	19.045	19.064	19.082	19.100	19.118	19.136	19.154	19.172	**1040**
1050	19.172	19.190	19.208	19.227	19.245	19.263	19.281	19.299	19.317	19.335	19.353	**1050**
1060	19.353	19.371	19.389	19.407	19.425	19.443	19.461	19.479	19.497	19.515	19.533	**1060**
1070	19.533	19.551	19.569	19.587	19.605	19.623	19.641	19.659	19.677	19.695	19.713	**1070**
1080	19.713	19.731	19.749	19.767	19.785	19.803	19.821	19.839	19.856	19.874	19.892	**1080**
1090	19.892	19.910	19.928	19.946	19.964	19.982	19.999	20.017	20.035	20.053	20.071	**1090**
1100	20.071	20.089	20.106	20.124	20.142	20.160	20.178	20.195	20.213	20.231	20.249	**1100**
1110	20.249	20.267	20.284	20.302	20.320	20.338	20.355	20.373	20.391	20.409	20.426	**1110**
1120	20.426	20.444	20.462	20.479	20.497	20.515	20.532	20.550	20.568	20.585	20.603	**1120**
1130	20.603	20.621	20.638	20.656	20.674	20.691	20.709	20.727	20.744	20.762	20.779	**1130**
1140	20.779	20.797	20.815	20.832	20.850	20.867	20.885	20.902	20.920	20.938	20.955	**1140**
1150	20.955	20.973	20.990	21.008	21.025	21.043	21.060	21.078	21.095	21.113	21.130	**1150**
1160	21.130	21.148	21.165	21.183	21.200	21.218	21.235	21.253	21.270	21.287	21.305	**1160**
1170	21.305	21.322	21.340	21.357	21.375	21.392	21.409	21.427	21.444	21.461	21.479	**1170**
1180	21.479	21.496	21.514	21.531	21.548	21.566	21.583	21.600	21.618	21.635	21.652	**1180**

TABLE 24 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
						Thermoelectric Voltage (emf) in Millivolts						
1190	21.652	21.670	21.687	21.704	21.721	21.739	21.756	21.773	21.790	21.808	21.825	**1190**
1200	21.825	21.842	21.859	21.877	21.894	21.911	21.928	21.946	21.963	21.980	21.997	**1200**
1210	21.997	22.014	22.032	22.049	22.066	22.083	22.100	22.117	22.135	22.152	22.169	**1210**
1220	22.169	22.186	22.203	22.220	22.237	22.254	22.271	22.289	22.306	22.323	22.340	**1220**
1230	22.340	22.357	22.374	22.391	22.408	22.425	22.442	22.459	22.476	22.493	22.510	**1230**
1240	22.510	22.527	22.544	22.561	22.578	22.595	22.612	22.629	22.646	22.663	22.680	**1240**
1250	22.680	22.697	22.714	22.731	22.748	22.765	22.782	22.799	22.815	22.832	22.849	**1250**
1260	22.849	22.866	22.883	22.900	22.917	22.934	22.950	22.967	22.984	23.001	23.018	**1260**
1270	23.018	23.035	23.052	23.068	23.085	23.102	23.119	23.136	23.152	23.169	23.186	**1270**
1280	23.186	23.203	23.219	23.236	23.253	23.270	23.286	23.303	23.320	23.337	23.353	**1280**
1290	23.353	23.370	23.387	23.403	23.420	23.437	23.453	23.470	23.487	23.503	23.520	**1290**
1300	23.520	23.537	23.553	23.570	23.587	23.603	23.620	23.636	23.653	23.670	23.686	**1300**
1310	23.686	23.703	23.719	23.736	23.753	23.769	23.786	23.802	23.819	23.835	23.852	**1310**
1320	23.852	23.868	23.885	23.901	23.918	23.934	23.951	23.967	23.984	24.000	24.017	**1320**
1330	24.017	24.033	24.050	24.066	24.083	24.099	24.116	24.132	24.148	24.165	24.181	**1330**
1340	24.181	24.198	24.214	24.230	24.247	24.263	24.280	24.296	24.312	24.329	24.345	**1340**
1350	24.345	24.361	24.378	24.394	24.410	24.427	24.443	24.459	24.476	24.492	24.508	**1350**
1360	24.508	24.524	24.541	24.557	24.573	24.590	24.606	24.622	24.638	24.655	24.671	**1360**
1370	24.671	24.687	24.703	24.719	24.736	24.752	24.768	24.784	24.800	24.817	24.833	**1370**
1380	24.833	24.849	24.865	24.881	24.897	24.913	24.930	24.946	24.962	24.978	24.994	**1380**
1390	24.994	25.010	25.026	25.042	25.058	25.075	25.091	25.107	25.123	25.139	25.155	**1390**
1400	25.155	25.171	25.187	25.203	25.219	25.235	25.251	25.267	25.283	25.299	25.315	**1400**
1410	25.315	25.331	25.347	25.363	25.379	25.395	25.411	25.427	25.443	25.459	25.475	**1410**
1420	25.475	25.490	25.506	25.522	25.538	25.554	25.570	25.586	25.602	25.618	25.633	**1420**
1430	25.633	25.649	25.665	25.681	25.697	25.713	25.729	25.744	25.760	25.776	25.792	**1430**
1440	25.792	25.808	25.823	25.839	25.855	25.871	25.886	25.902	25.918	25.934	25.949	**1440**
1450	25.949	25.965	25.981	25.997	26.012	26.028	26.044	26.060	26.075	26.091	26.107	**1450**
1460	26.107	26.122	26.138	26.154	26.169	26.185	26.201	26.216	26.232	26.248	26.263	**1460**
1470	26.263	26.279	26.294	26.310	26.326	26.341	26.357	26.372	26.388	26.403	26.419	**1470**
1480	26.419	26.435	26.450	26.466	26.481	26.497	26.512	26.528	26.543	26.559	26.574	**1480**
1490	26.574	26.590	26.605	26.621	26.636	26.652	26.667	26.683	26.698	26.714	26.729	**1490**
1500	26.729	26.744	26.760	26.775	26.791	26.806	26.822	26.837	26.852	26.868	26.883	**1500**
1510	26.883	26.899	26.914	26.929	26.945	26.960	26.975	26.991	27.006	27.021	27.037	**1510**
1520	27.037	27.052	27.067	27.083	27.098	27.113	27.128	27.144	27.159	27.174	27.190	**1520**
1530	27.190	27.205	27.220	27.235	27.250	27.266	27.281	27.296	27.311	27.327	27.342	**1530**
1540	27.342	27.357	27.372	27.387	27.403	27.418	27.433	27.448	27.463	27.478	27.493	**1540**
1550	27.493	27.509	27.524	27.539	27.554	27.569	27.584	27.599	27.614	27.629	27.645	**1550**
1560	27.645	27.660	27.675	27.690	27.705	27.720	27.735	27.750	27.765	27.780	27.795	**1560**
1570	27.795	27.810	27.825	27.840	27.855	27.870	27.885	27.900	27.915	27.930	27.945	**1570**
1580	27.945	27.960	27.975	27.990	28.005	28.020	28.034	28.049	28.064	28.079	28.094	**1580**
1590	28.094	28.109	28.124	28.139	28.154	28.169	28.183	28.198	28.213	28.228	28.243	**1590**
1600	28.243	28.258	28.272	28.287	28.302	28.317	28.332	28.346	28.361	28.376	28.391	**1600**
1610	28.391	28.406	28.420	28.435	28.450	28.465	28.479	28.494	28.509	28.524	28.538	**1610**
1620	28.538	28.553	28.568	28.582	28.597	28.612	28.626	28.641	28.656	28.670	28.685	**1620**
1630	28.685	28.700	28.714	28.729	28.744	28.758	28.773	28.787	28.802	28.817	28.831	**1630**
1640	28.831	28.846	28.860	28.875	28.890	28.904	28.919	28.933	28.948	28.962	28.977	**1640**
1650	28.977	28.991	29.006	29.020	29.035	29.049	29.064	29.078	29.093	29.107	29.122	**1650**
1660	29.122	29.136	29.151	29.165	29.180	29.194	29.209	29.223	29.237	29.252	29.266	**1660**
1670	29.266	29.281	29.295	29.309	29.324	29.338	29.353	29.367	29.381	29.396	29.410	**1670**
1680	29.410	29.424	29.439	29.453	29.467	29.482	29.496	29.510	29.525	29.539	29.553	**1680**
1690	29.553	29.567	29.582	29.596	29.610	29.625	29.639	29.653	29.667	29.681	29.696	**1690**
1700	29.696	29.710	29.724	29.738	29.753	29.767	29.781	29.795	29.809	29.823	29.838	**1700**
1710	29.838	29.852	29.866	29.880	29.894	29.908	29.922	29.937	29.951	29.965	29.979	**1710**
1720	29.979	29.993	30.007	30.021	30.035	30.049	30.063	30.077	30.091	30.106	30.120	**1720**
1730	30.120	30.134	30.148	30.162	30.176	30.190	30.204	30.218	30.232	30.246	30.260	**1730**
1740	30.260	30.274	30.288	30.302	30.315	30.329	30.343	30.357	30.371	30.385	30.399	**1740**
1750	30.399	30.413	30.427	30.441	30.455	30.469	30.482	30.496	30.510	30.524	30.538	**1750**
1760	30.538	30.552	30.565	30.579	30.593	30.607	30.621	30.635	30.648	30.662	30.676	**1760**
1770	30.676	30.690	30.704	30.717	30.731	30.745	30.759	30.772	30.786	30.800	30.813	**1770**

TABLE 24 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
						Thermoelectric Voltage (emf) in Millivolts						
1780	30.813	30.827	30.841	30.855	30.868	30.882	30.896	30.909	30.923	30.937	30.950	**1780**
1790	30.950	30.964	30.978	30.991	31.005	31.019	31.032	31.046	31.059	31.073	31.087	**1790**
1800	31.087	31.100	31.114	31.127	31.141	31.154	31.168	31.182	31.195	31.209	31.222	**1800**
1810	31.222	31.236	31.249	31.263	31.276	31.290	31.303	31.317	31.330	31.344	31.357	**1810**
1820	31.357	31.371	31.384	31.397	31.411	31.424	31.438	31.451	31.465	31.478	31.491	**1820**
1830	31.491	31.505	31.518	31.532	31.545	31.558	31.572	31.585	31.598	31.612	31.625	**1830**
1840	31.625	31.638	31.652	31.665	31.678	31.692	31.705	31.718	31.731	31.745	31.758	**1840**
1850	31.758	31.771	31.784	31.798	31.811	31.824	31.837	31.851	31.864	31.877	31.890	**1850**
1860	31.890	31.903	31.917	31.930	31.943	31.956	31.969	31.982	31.996	32.009	32.022	**1860**
1870	32.022	32.035	32.048	32.061	32.074	32.087	32.101	32.114	32.127	32.140	32.153	**1870**
1880	32.153	32.166	32.179	32.192	32.205	32.218	32.231	32.244	32.257	32.270	32.283	**1880**
1890	32.283	32.296	32.309	32.322	32.335	32.348	32.361	32.374	32.387	32.400	32.413	**1890**
1900	32.413	32.426	32.439	32.451	32.464	32.477	32.490	32.503	32.516	32.529	32.542	**1900**
1910	32.542	32.554	32.567	32.580	32.593	32.606	32.619	32.631	32.644	32.657	32.670	**1910**
1920	32.670	32.683	32.695	32.708	32.721	32.734	32.746	32.759	32.772	32.784	32.797	**1920**
1930	32.797	32.810	32.823	32.835	32.848	32.861	32.873	32.886	32.899	32.911	32.924	**1930**
1940	32.924	32.937	32.949	32.962	32.974	32.987	33.000	33.012	33.025	33.037	33.050	**1940**
1950	33.050	33.063	33.075	33.088	33.100	33.113	33.125	33.138	33.150	33.163	33.175	**1950**
1960	33.175	33.188	33.200	33.213	33.225	33.238	33.250	33.263	33.275	33.287	33.300	**1960**
1970	33.300	33.312	33.325	33.337	33.350	33.362	33.374	33.387	33.399	33.411	33.424	**1970**
1980	33.424	33.436	33.448	33.461	33.473	33.485	33.498	33.510	33.522	33.535	33.547	**1980**
1990	33.547	33.559	33.571	33.584	33.596	33.608	33.620	33.632	33.645	33.657	33.669	**1990**
2000	33.669	33.681	33.693	33.706	33.718	33.730	33.742	33.754	33.766	33.779	33.791	**2000**
2010	33.791	33.803	33.815	33.827	33.839	33.851	33.863	33.875	33.887	33.899	33.911	**2010**
2020	33.911	33.923	33.936	33.948	33.960	33.972	33.984	33.996	34.008	34.019	34.031	**2020**
2030	34.031	34.043	34.055	34.067	34.079	34.091	34.103	34.115	34.127	34.139	34.151	**2030**
2040	34.151	34.163	34.174	34.186	34.198	34.210	34.222	34.234	34.245	34.257	34.269	**2040**
2050	34.269	34.281	34.293	34.304	34.316	34.328	34.340	34.351	34.363	34.375	34.387	**2050**
2060	34.387	34.398	34.410	34.422	34.433	34.445	34.457	34.468	34.480	34.492	34.503	**2060**
2070	34.503	34.515	34.527	34.538	34.550	34.561	34.573	34.585	34.596	34.608	34.619	**2070**
2080	34.619	34.631	34.642	34.654	34.665	34.677	34.688	34.700	34.711	34.723	34.734	**2080**
2090	34.734	34.746	34.757	34.769	34.780	34.792	34.803	34.814	34.826	34.837	34.849	**2090**
2100	34.849	34.860	34.871	34.883	34.894	34.905	34.917	34.928	34.939	34.951	34.962	**2100**
2110	34.962	34.973	34.984	34.996	35.007	35.018	35.029	35.041	35.052	35.063	35.074	**2110**
2120	35.074	35.085	35.097	35.108	35.119	35.130	35.141	35.152	35.164	35.175	35.186	**2120**
2130	35.186	35.197	35.208	35.219	35.230	35.241	35.252	35.263	35.274	35.285	35.296	**2130**
2140	35.296	35.307	35.318	35.329	35.340	35.351	35.362	35.373	35.384	35.395	35.406	**2140**
2150	35.406	35.417	35.428	35.439	35.450	35.461	35.472	35.482	35.493	35.504	35.515	**2150**
2160	35.515	35.526	35.537	35.547	35.558	35.569	35.580	35.591	35.601	35.612	35.623	**2160**
2170	35.623	35.634	35.644	35.655	35.666	35.676	35.687	35.698	35.708	35.719	35.730	**2170**
2180	35.730	35.740	35.751	35.762	35.772	35.783	35.793	35.804	35.814	35.825	35.836	**2180**
2190	35.836	35.846	35.857	35.867	35.878	35.888	35.899	35.909	35.920	35.930	35.940	**2190**
2200	35.940	35.951	35.961	35.972	35.982	35.993	36.003	36.013	36.024	36.034	36.044	**2200**
2210	36.044	36.055	36.065	36.075	36.086	36.096	36.106	36.116	36.127	36.137	36.147	**2210**
2220	36.147	36.157	36.168	36.178	36.188	36.198	36.208	36.219	36.229	36.239	36.249	**2220**
2230	36.249	36.259	36.269	36.279	36.289	36.300	36.310	36.320	36.330	36.340	36.350	**2230**
2240	36.350	36.360	36.370	36.380	36.390	36.400	36.410	36.420	36.430	36.440	36.449	**2240**
2250	36.449	36.459	36.469	36.479	36.489	36.499	36.509	36.519	36.528	36.538	36.548	**2250**
2260	36.548	36.558	36.568	36.577	36.587	36.597	36.607	36.616	36.626	36.636	36.645	**2260**
2270	36.645	36.655	36.665	36.675	36.684	36.694	36.703	36.713	36.723	36.732	36.742	**2270**
2280	36.742	36.751	36.761	36.771	36.780	36.790	36.799	36.809	36.818	36.828	36.837	**2280**
2290	36.837	36.846	36.856	36.865	36.875	36.884	36.894	36.903	36.912	36.922	36.931	**2290**
2300	36.931	36.940	36.950	36.959	36.968	36.978	36.987	36.996	37.005	37.015	37.024	**2300**
2310	37.024	37.033	37.042	37.051	37.061	37.070						**2310**

TABLE 25 Type C Thermocouple

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
						Thermoelectric Voltage (emf) in Millivolts						
30			0.000	0.007	0.015	0.022	0.030	0.037	0.045	0.052	0.060	**30**
40	0.060	0.067	0.075	0.082	0.090	0.097	0.105	0.113	0.120	0.128	0.135	**40**
50	0.135	0.143	0.150	0.158	0.166	0.173	0.181	0.188	0.196	0.204	0.211	**50**
60	0.211	0.219	0.227	0.234	0.242	0.250	0.257	0.265	0.273	0.281	0.288	**60**
70	0.288	0.296	0.304	0.311	0.319	0.327	0.335	0.342	0.350	0.358	0.366	**70**
80	0.366	0.374	0.381	0.389	0.397	0.405	0.413	0.421	0.428	0.436	0.444	**80**
90	0.444	0.452	0.460	0.468	0.476	0.483	0.491	0.499	0.507	0.515	0.523	**90**
100	0.523	0.531	0.539	0.547	0.555	0.563	0.571	0.579	0.587	0.595	0.603	**100**
110	0.603	0.611	0.619	0.627	0.635	0.643	0.651	0.659	0.667	0.675	0.683	**110**
120	0.683	0.691	0.699	0.707	0.715	0.723	0.731	0.740	0.748	0.756	0.764	**120**
130	0.764	0.772	0.780	0.788	0.796	0.805	0.813	0.821	0.829	0.837	0.846	**130**
140	0.846	0.854	0.862	0.870	0.878	0.887	0.895	0.903	0.911	0.920	0.928	**140**
150	0.928	0.936	0.944	0.953	0.961	0.969	0.977	0.986	0.994	1.002	1.011	**150**
160	1.011	1.019	1.027	1.036	1.044	1.052	1.061	1.069	1.077	1.086	1.094	**160**
170	1.094	1.103	1.111	1.119	1.128	1.136	1.145	1.153	1.161	1.170	1.178	**170**
180	1.178	1.187	1.195	1.204	1.212	1.221	1.229	1.238	1.246	1.254	1.263	**180**
190	1.263	1.272	1.280	1.289	1.297	1.306	1.314	1.323	1.331	1.340	1.348	**190**
200	1.348	1.357	1.365	1.374	1.383	1.391	1.400	1.408	1.417	1.426	1.434	**200**
210	1.434	1.443	1.451	1.460	1.469	1.477	1.486	1.495	1.503	1.512	1.521	**210**
220	1.521	1.529	1.538	1.547	1.555	1.564	1.573	1.582	1.590	1.599	1.608	**220**
230	1.608	1.617	1.625	1.634	1.643	1.652	1.660	1.669	1.678	1.687	1.695	**230**
240	1.695	1.704	1.713	1.722	1.731	1.739	1.748	1.757	1.766	1.775	1.784	**240**
250	1.784	1.792	1.801	1.810	1.819	1.828	1.837	1.846	1.855	1.863	1.872	**250**
260	1.872	1.881	1.890	1.899	1.908	1.917	1.926	1.935	1.944	1.953	1.962	**260**
270	1.962	1.970	1.979	1.988	1.997	2.006	2.015	2.024	2.033	2.042	2.051	**270**
280	2.051	2.060	2.069	2.078	2.087	2.096	2.105	2.114	2.124	2.133	2.142	**280**
290	2.142	2.151	2.160	2.169	2.178	2.187	2.196	2.205	2.214	2.223	2.232	**290**
300	2.232	2.242	2.251	2.260	2.269	2.278	2.287	2.296	2.305	2.315	2.324	**300**
310	2.324	2.333	2.342	2.351	2.360	2.370	2.379	2.388	2.397	2.406	2.415	**310**
320	2.415	2.425	2.434	2.443	2.452	2.462	2.471	2.480	2.489	2.498	2.508	**320**
330	2.508	2.517	2.526	2.536	2.545	2.554	2.563	2.573	2.582	2.591	2.600	**330**
340	2.600	2.610	2.619	2.628	2.638	2.647	2.656	2.666	2.675	2.684	2.694	**340**
350	2.694	2.703	2.712	2.722	2.731	2.740	2.750	2.759	2.769	2.778	2.787	**350**
360	2.787	2.797	2.806	2.815	2.825	2.834	2.844	2.853	2.863	2.872	2.881	**360**
370	2.881	2.891	2.900	2.910	2.919	2.929	2.938	2.948	2.957	2.966	2.976	**370**
380	2.976	2.985	2.995	3.004	3.014	3.023	3.033	3.042	3.052	3.061	3.071	**380**
390	3.071	3.080	3.090	3.099	3.109	3.119	3.128	3.138	3.147	3.157	3.166	**390**
400	3.166	3.176	3.185	3.195	3.205	3.214	3.224	3.233	3.243	3.252	3.262	**400**
410	3.262	3.272	3.281	3.291	3.301	3.310	3.320	3.329	3.339	3.349	3.358	**410**
420	3.358	3.368	3.378	3.387	3.397	3.407	3.416	3.426	3.436	3.445	3.455	**420**
430	3.455	3.465	3.474	3.484	3.494	3.503	3.513	3.523	3.532	3.542	3.552	**430**
440	3.552	3.562	3.571	3.581	3.591	3.600	3.610	3.620	3.630	3.639	3.649	**440**
450	3.649	3.659	3.669	3.678	3.688	3.698	3.708	3.718	3.727	3.737	3.747	**450**
460	3.747	3.757	3.767	3.776	3.786	3.796	3.806	3.816	3.825	3.835	3.845	**460**
470	3.845	3.855	3.865	3.875	3.884	3.894	3.904	3.914	3.924	3.934	3.943	**470**
480	3.943	3.953	3.963	3.973	3.983	3.993	4.003	4.013	4.022	4.032	4.042	**480**
490	4.042	4.052	4.062	4.072	4.082	4.092	4.102	4.112	4.122	4.131	4.141	**490**
500	4.141	4.151	4.161	4.171	4.181	4.191	4.201	4.211	4.221	4.231	4.241	**500**
510	4.241	4.251	4.261	4.271	4.281	4.291	4.301	4.311	4.321	4.331	4.341	**510**
520	4.341	4.351	4.361	4.371	4.381	4.391	4.401	4.411	4.421	4.431	4.441	**520**
530	4.441	4.451	4.461	4.471	4.481	4.491	4.501	4.511	4.521	4.531	4.541	**530**
540	4.541	4.551	4.561	4.571	4.582	4.592	4.602	4.612	4.622	4.632	4.642	**540**
550	4.642	4.652	4.662	4.672	4.682	4.692	4.703	4.713	4.723	4.733	4.743	**550**
560	4.743	4.753	4.763	4.773	4.784	4.794	4.804	4.814	4.824	4.834	4.844	**560**
570	4.844	4.855	4.865	4.875	4.885	4.895	4.905	4.915	4.926	4.936	4.946	**570**
580	4.946	4.956	4.966	4.977	4.987	4.997	5.007	5.017	5.027	5.038	5.048	**560**
590	5.048	5.058	5.068	5.078	5.089	5.099	5.109	5.119	5.130	5.140	5.150	**590**
600	5.150	5.160	5.170	5.181	5.191	5.201	5.211	5.222	5.232	5.242	5.252	**600**
610	5.252	5.263	5.273	5.283	5.294	5.304	5.314	5.324	5.335	5.345	5.355	**610**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
						Thermoelectric Voltage (emf) in Millivolts						
620	5.355	5.365	5.376	5.386	5.396	5.407	5.417	5.427	5.437	5.448	5.458	**620**
630	5.458	5.468	5.479	5.489	5.499	5.510	5.520	5.530	5.541	5.551	5.561	**630**
640	5.561	5.572	5.582	5.592	5.603	5.613	5.623	5.634	5.644	5.654	5.665	**640**
650	5.665	5.675	5.685	5.696	5.706	5.717	5.727	5.737	5.748	5.758	5.768	**650**
660	5.768	5.779	5.789	5.800	5.810	5.820	5.831	5.841	5.851	5.862	5.872	**660**
670	5.872	5.883	5.893	5.903	5.914	5.924	5.935	5.945	5.956	5.966	5.976	**670**
630	5.976	5.987	5.997	6.008	6.018	6.028	6.039	6.049	6.060	6.070	6.081	**680**
690	6.081	6.091	6.102	6.112	6.122	6.133	6.143	6.154	6.164	6.175	6.185	**690**
700	6.185	6.196	6.206	6.217	6.227	6.238	6.248	6.259	6.269	6.279	6.290	**700**
710	6.290	6.300	6.311	6.321	6.332	6.342	6.353	6.363	6.374	6.384	6.395	**710**
720	6.395	6.405	6.416	6.426	6.437	6.447	6.458	6.468	6.479	6.490	6.500	**720**
730	6.500	6.511	6.521	6.532	6.542	6.553	6.563	6.574	6.584	6.595	6.605	**730**
740	6.605	6.616	6.626	6.637	6.648	6.658	6.669	6.679	6.690	6.700	6.711	**740**
750	6.711	6.721	6.732	6.743	6.753	6.764	6.774	6.785	6.795	6.806	6.817	**750**
760	6.817	6.827	6.838	6.848	6.859	6.869	6.880	6.891	6.901	6.912	6.922	**760**
770	6.922	6.933	6.944	6.954	6.965	6.975	6.986	6.997	7.007	7.018	7.028	**770**
760	7.028	7.039	7.050	7.060	7.071	7.082	7.092	7.103	7.113	7.124	7.135	**780**
790	7.135	7.145	7.156	7.167	7.177	7.188	7.198	7.209	7.220	7.230	7.241	**790**
800	7.241	7.252	7.262	7.273	7.284	7.294	7.305	7.315	7.326	7.337	7.347	**800**
810	7.347	7.358	7.369	7.379	7.390	7.401	7.411	7.422	7.433	7.443	7.454	**810**
820	7.454	7.465	7.475	7.486	7.497	7.507	7.518	7.529	7.540	7.550	7.561	**820**
830	7.561	7.572	7.582	7.593	7.604	7.614	7.625	7.636	7.646	7.657	7.668	**830**
840	7.668	7.678	7.689	7.700	7.711	7.721	7.732	7.743	7.753	7.764	7.775	**840**
850	7.775	7.786	7.796	7.807	7.818	7.828	7.839	7.850	7.861	7.871	7.882	**850**
860	7.882	7.893	7.903	7.914	7.925	7.936	7.946	7.957	7.968	7.979	7.989	**860**
870	7.989	8.000	8.011	8.022	8.032	8.043	8.054	8.064	8.075	8.086	8.097	**870**
880	8.097	8.107	8.118	8.129	8.140	8.150	8.161	8.172	8.183	8.193	8.204	**860**
890	8.204	8.215	8.226	8.236	8.247	8.258	8.269	8.280	8.290	8.301	8.312	**890**
900	8.312	8.323	8.333	8.344	8.355	8.366	8.376	8.387	8.398	8.409	8.420	**900**
910	8.420	8.430	8.441	8.452	8.463	8.473	8.484	8.495	8.506	8.517	8.527	**910**
920	8.527	8.538	8.549	8.560	8.571	8.581	8.592	8.603	8.614	8.625	8.635	**920**
930	8.635	8.646	8.657	8.668	8.678	8.689	8.700	8.711	8.722	8.732	8.743	**930**
940	8.743	8.754	8.765	8.776	8.787	8.797	8.808	8.819	8.830	8.841	8.851	**940**
950	8.851	8.862	8.873	8.884	8.895	8.905	8.916	8.927	8.938	8.949	8.960	**950**
960	8.960	8.970	8.981	8.992	9.003	9.014	9.024	9.035	9.046	9.057	9.068	**960**
970	9.068	9.079	9.089	9.100	9.111	9.122	9.133	9.144	9.154	9.165	9.176	**970**
980	9.176	9.187	9.198	9.209	9.219	9.230	9.241	9.252	9.263	9.274	9.284	**980**
990	9.284	9.295	9.306	9.317	9.328	9.339	9.349	9.360	9.371	9.382	9.393	**990**
1000	9.393	9.404	9.414	9.425	9.436	9.447	9.458	9.469	9.480	9.490	9.501	**1000**
1010	9.501	9.512	9.523	9.534	9.545	9.555	9.566	9.577	9.588	9.599	9.610	**1010**
1020	9.610	9.621	9.631	9.642	9.653	9.664	9.675	9.686	9.697	9.707	9.718	**1020**
1030	9.718	9.729	9.740	9.751	9.762	9.773	9.783	9.794	9.805	9.816	9.827	**1030**
1040	9.827	9.838	9.849	9.859	9.870	9.881	9.892	9.903	9.914	9.925	9.935	**1040**
1050	9.935	9.946	9.957	9.968	9.979	9.990	10.001	10.011	10.022	10.033	10.044	**1050**
1060	10.044	10.055	10.066	10.077	10.087	10.098	10.109	10.120	10.131	10.142	10.153	**1060**
1070	10.153	10.163	10.174	10.185	10.196	10.207	10.218	10.229	10.239	10.250	10.261	**1070**
1080	10.261	10.272	10.283	10.294	10.305	10.316	10.326	10.337	10.348	10.359	10.370	**1080**
1090	10.370	10.381	10.392	10.402	10.413	10.424	10.435	10.446	10.457	10.468	10.478	**1090**
1100	10.478	10.489	10.500	10.511	10.522	10.533	10.544	10.554	10.565	10.576	10.587	**1100**
1110	10.587	10.598	10.609	10.620	10.630	10.641	10.652	10.663	10.674	10.685	10.696	**1110**
1120	10.696	10.706	10.717	10.728	10.739	10.750	10.761	10.772	10.782	10.793	10.804	**1120**
1130	10.804	10.815	10.826	10.837	10.848	10.858	10.869	10.880	10.891	10.902	10.913	**1130**
1140	10.913	10.923	10.934	10.945	10.956	10.967	10.978	10.989	10.999	11.010	11.021	**1140**
1150	11.021	11.032	11.043	11.054	11.064	11.075	11.086	11.097	11.108	11.119	11.130	**1150**
1160	11.130	11.140	11.151	11.162	11.173	11.184	11.195	11.205	11.216	11.227	11.238	**1160**
1170	11.238	11.249	11.260	11.270	11.281	11.292	11.303	11.314	11.325	11.335	11.346	**1170**
1180	11.346	11.357	11.368	11.379	11.390	11.400	11.411	11.422	11.433	11.444	11.455	**1180**
1190	11.455	11.465	11.476	11.487	11.498	11.509	11.520	11.530	11.541	11.552	11.563	**1190**
1200	11.563	11.574	11.585	11.595	11.606	11.617	11.628	11.639	11.650	11.660	11.671	**1200**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
						Thermoelectric Voltage (emf) in Millivolts						
1210	11.671	11.682	11.693	11.704	11.715	11.725	11.736	11.747	11.758	11.769	11.780	**1210**
1220	11.780	11.790	11.801	11.812	11.823	11.834	11.844	11.855	11.866	11.877	11.888	**1220**
1230	11.888	11.899	11.909	11.920	11.931	11.942	11.953	11.964	11.974	11.985	11.996	**1230**
1240	11.996	12.007	12.018	12.029	12.039	12.050	12.061	12.072	12.083	12.093	12.104	**1240**
1250	12.104	12.115	12.126	12.137	12.148	12.158	12.169	12.180	12.191	12.202	12.213	**1250**
1260	12.213	12.223	12.234	12.245	12.256	12.267	12.277	12.288	12.299	12.310	12.321	**1260**
1270	12.321	12.332	12.342	12.353	12.364	12.375	12.386	12.396	12.407	12.418	12.429	**1270**
1280	12.429	12.440	12.450	12.461	12.472	12.483	12.494	12.505	12.515	12.526	12.537	**1280**
1290	12.537	12.548	12.559	12.569	12.580	12.591	12.602	12.613	12.623	12.634	12.645	**1290**
1300	12.645	12.656	12.667	12.677	12.688	12.699	12.710	12.721	12.731	12.742	12.753	**1300**
1310	12.753	12.764	12.775	12.785	12.796	12.807	12.818	12.829	12.839	12.850	12.861	**1310**
1320	12.861	12.872	12.883	12.893	12.904	12.915	12.926	12.937	12.947	12.958	12.969	**1320**
1330	12.969	12.980	12.990	13.001	13.012	13.023	13.034	13.044	13.055	13.066	13.077	**1330**
1340	13.077	13.088	13.098	13.109	13.120	13.131	13.141	13.152	13.163	13.174	13.185	**1340**
1350	13.185	13.195	13.206	13.217	13.228	13.238	13.249	13.260	13.271	13.282	13.292	**1350**
1360	13.292	13.303	13.314	13.325	13.335	13.346	13.357	13.368	13.378	13.389	13.400	**1360**
1370	13.400	13.411	13.421	13.432	13.443	13.454	13.465	13.475	13.486	13.497	13.508	**1370**
1380	13.508	13.518	13.529	13.540	13.551	13.561	13.572	13.583	13.594	13.604	13.615	**1380**
1390	13.615	13.626	13.637	13.647	13.658	13.669	13.680	13.690	13.701	13.712	13.723	**1390**
1400	13.723	13.733	13.744	13.755	13.766	13.776	13.787	13.798	13.808	13.819	13.830	**1400**
1410	13.830	13.841	13.851	13.862	13.873	13.884	13.894	13.905	13.916	13.926	13.937	**1410**
1420	13.937	13.948	13.959	13.969	13.980	13.991	14.002	14.012	14.023	14.034	14.044	**1420**
1430	14.044	14.055	14.066	14.077	14.087	14.098	14.109	14.119	14.130	14.141	14.152	**1430**
1440	14.152	14.162	14.173	14.184	14.194	14.205	14.216	14.227	14.237	14.248	14.259	**1440**
1450	14.259	14.269	14.280	14.291	14.301	14.312	14.323	14.333	14.344	14.355	14.366	**1450**
1460	14.366	14.376	14.387	14.398	14.408	14.419	14.430	14.440	14.451	14.462	14.472	**1460**
1470	14.472	14.483	14.494	14.504	14.515	14.526	14.537	14.547	14.558	14.569	14.579	**1470**
1480	14.579	14.590	14.601	14.611	14.622	14.633	14.643	14.654	14.665	14.675	14.686	**1480**
1490	14.686	14.697	14.707	14.718	14.729	14.739	14.750	14.760	14.771	14.782	14.792	**1490**
1500	14.792	14.803	14.814	14.824	14.835	14.846	14.856	14.867	14.878	14.888	14.899	**1500**
1510	14.899	14.910	14.920	14.931	14.941	14.952	14.963	14.973	14.984	14.995	15.005	**1510**
1520	15.005	15.016	15.027	15.037	15.048	15.058	15.069	15.080	15.090	15.101	15.112	**1520**
1530	15.112	15.122	15.133	15.143	15.154	15.165	15.175	15.186	15.196	15.207	15.218	**1530**
1540	15.218	15.228	15.239	15.250	15.260	15.271	15.281	15.292	15.303	15.313	15.324	**1540**
1550	15.324	15.334	15.345	15.356	15.366	15.377	15.387	15.398	15.408	15.419	15.430	**1550**
1560	15.430	15.440	15.451	15.461	15.472	15.483	15.493	15.504	15.514	15.525	15.535	**1560**
1570	15.535	15.546	15.557	15.567	15.578	15.588	15.599	15.609	15.620	15.631	15.641	**1570**
1580	15.641	15.652	15.662	15.673	15.683	15.694	15.704	15.715	15.726	15.736	15.747	**1580**
1590	15.747	15.757	15.768	15.778	15.789	15.799	15.810	15.821	15.831	15.842	15.852	**1590**
1600	15.852	15.863	15.873	15.884	15.894	15.905	15.915	15.926	15.936	15.947	15.957	**1600**
1610	15.957	15.968	15.979	15.989	16.000	16.010	16.021	16.031	16.042	16.052	16.063	**1610**
1620	16.063	16.073	16.084	16.094	16.105	16.115	16.126	16.136	16.147	16.157	16.168	**1620**
1630	16.168	16.178	16.189	16.199	16.210	16.220	16.231	16.241	16.252	16.262	16.273	**1630**
1640	16.273	16.283	16.294	16.304	16.315	16.325	16.336	16.346	16.357	16.367	16.377	**1640**
1650	16.377	16.388	16.398	16.409	16.419	16.430	16.440	16.451	16.461	16.472	16.482	**1650**
1660	16.482	16.493	16.503	16.514	16.524	16.534	16.545	16.555	16.566	16.576	16.587	**1660**
1670	16.587	16.597	16.608	16.618	16.628	16.639	16.649	16.660	16.670	16.681	16.691	**1670**
1680	16.691	16.702	16.712	16.722	16.733	16.743	16.754	16.764	16.775	16.785	16.795	**1680**
1690	16.795	16.806	16.816	16.827	16.837	16.847	16.858	16.868	16.879	16.889	16.899	**1690**
1700	16.899	16.910	16.920	16.931	16.941	16.952	16.962	16.972	16.983	16.993	17.003	**1700**
1710	17.003	17.014	17.024	17.035	17.045	17.055	17.066	17.076	17.087	17.097	17.107	**1710**
1720	17.107	17.118	17.128	17.138	17.149	17.159	17.170	17.180	17.190	17.201	17.211	**1720**
1730	17.211	17.221	17.232	17.242	17.252	17.263	17.273	17.284	17.294	17.304	17.315	**1730**
1740	17.315	17.325	17.335	17.346	17.356	17.366	17.377	17.387	17.397	17.408	17.418	**1740**
1750	17.418	17.428	17.439	17.449	17.459	17.470	17.480	17.490	17.501	17.511	17.521	**1750**
1760	17.521	17.532	17.542	17.552	17.563	17.573	17.583	17.593	17.604	17.614	17.624	**1760**
1770	17.624	17.635	17.645	17.655	17.666	17.676	17.686	17.696	17.707	17.717	17.727	**1770**
1780	17.727	17.738	17.748	17.758	17.768	17.779	17.789	17.799	17.810	17.820	17.830	**1780**
1790	17.830	17.840	17.851	17.861	17.871	17.881	17.892	17.902	17.912	17.922	17.933	**1790**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)												
											Reference Junctions at 32°F	
°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage (emf) in Millivolts												
1800	17.933	17.943	17.953	17.964	17.974	17.984	17.994	18.005	18.015	18.025	18.035	**1800**
1810	18.035	18.045	18.056	18.066	18.076	18.086	18.097	18.107	18.117	18.127	18.138	**1810**
1820	18.138	18.148	18.158	18.168	18.178	18.189	18.199	18.209	18.219	18.230	18.240	**1820**
1830	18.240	18.250	18.260	18.270	18.281	18.291	18.301	18.311	18.321	18.332	18.342	**1830**
1840	18.342	18.352	18.362	18.372	18.383	18.393	18.403	18.413	18.423	18.433	18.444	**1840**
1850	18.444	18.454	18.464	18.474	18.484	18.495	18.505	18.515	18.525	18.535	18.545	**1850**
1860	18.545	18.556	18.566	18.576	18.586	18.596	18.606	18.616	18.627	18.637	18.647	**1860**
1870	18.647	18.657	18.667	18.677	18.687	18.698	18.708	18.718	18.728	18.738	18.748	**1870**
1880	18.748	18.758	18.769	18.779	18.789	18.799	18.809	18.819	18.829	18.839	18.849	**1880**
1890	18.849	18.860	18.870	18.880	18.890	18.900	18.910	18.920	18.930	18.940	18.951	**1890**
1900	18.951	18.961	18.971	18.981	18.991	19.001	19.011	19.021	19.031	19.041	19.051	**1900**
1910	19.051	19.062	19.072	19.082	19.092	19.102	19.112	19.122	19.132	19.142	19.152	**1910**
1920	19.152	19.162	19.172	19.182	19.192	19.202	19.212	19.223	19.233	19.243	19.253	**1920**
1930	19.253	19.263	19.273	19.283	19.293	19.303	19.313	19.323	19.333	19.343	19.353	**1930**
1940	19.353	19.363	19.373	19.383	19.393	19.403	19.413	19.423	19.433	19.443	19.453	**1940**
1950	19.453	19.463	19.473	19.483	19.493	19.503	19.513	19.523	19.533	19.543	19.553	**1950**
1960	19.553	19.563	19.573	19.583	19.593	19.603	19.613	19.623	19.633	19.643	19.653	**1960**
1970	19.653	19.663	19.673	19.683	19.693	19.703	19.713	19.723	19.733	19.743	19.753	**1970**
1980	19.753	19.763	19.773	19.783	19.793	19.803	19.813	19.823	19.833	19.842	19.852	**1980**
1990	19.852	19.862	19.872	19.882	19.892	19.902	19.912	19.922	19.932	19.942	19.952	**1990**
2000	19.952	19.962	19.972	19.982	19.991	20.001	20.011	20.021	20.031	20.041	20.051	**2000**
2010	20.051	20.061	20.071	20.081	20.091	20.100	20.110	20.120	20.130	20.140	20.150	**2010**
2020	20.150	20.160	20.170	20.180	20.190	20.199	20.209	20.219	20.229	20.239	20.249	**2020**
2030	20.249	20.259	20.269	20.278	20.288	20.298	20.308	20.318	20.328	20.338	20.347	**2030**
2040	20.347	20.357	20.367	20.377	20.387	20.397	20.407	20.416	20.426	20.436	20.446	**2040**
2050	20.446	20.456	20.466	20.475	20.485	20.495	20.505	20.515	20.525	20.534	20.544	**2050**
2060	20.544	20.554	20.564	20.574	20.584	20.593	20.603	20.613	20.623	20.633	20.642	**2060**
2070	20.642	20.652	20.662	20.672	20.682	20.691	20.701	20.711	20.721	20.731	20.740	**2070**
2080	20.740	20.750	20.760	20.770	20.779	20.789	20.799	20.809	20.819	20.828	20.838	**2080**
2090	20.838	20.848	20.858	20.867	20.877	20.887	20.897	20.906	20.916	20.926	20.936	**2090**
2100	20.936	20.945	20.955	20.965	20.975	20.984	20.994	21.004	21.014	21.023	21.033	**2100**
2110	21.033	21.043	21.053	21.062	21.072	21.082	21.091	21.101	21.111	21.121	21.130	**2110**
2120	21.130	21.140	21.150	21.159	21.169	21.179	21.189	21.198	21.208	21.218	21.227	**2120**
2130	21.227	21.237	21.247	21.256	21.266	21.276	21.285	21.295	21.305	21.315	21.324	**2130**
2140	21.324	21.334	21.344	21.353	21.363	21.373	21.382	21.392	21.402	21.411	21.421	**2140**
2150	21.421	21.431	21.440	21.450	21.460	21.469	21.479	21.488	21.498	21.508	21.517	**2150**
2160	21.517	21.527	21.537	21.546	21.556	21.566	21.575	21.585	21.594	21.604	21.614	**2160**
2170	21.614	21.623	21.633	21.643	21.652	21.662	21.671	21.681	21.691	21.700	21.710	**2170**
2180	21.710	21.719	21.729	21.739	21.748	21.758	21.767	21.777	21.787	21.796	21.806	**2180**
2190	21.806	21.815	21.825	21.835	21.844	21.854	21.863	21.873	21.882	21.892	21.902	**2190**
2200	21.902	21.911	21.921	21.930	21.940	21.949	21.959	21.969	21.978	21.988	21.997	**2200**
2210	21.997	22.007	22.016	22.026	22.035	22.045	22.054	22.064	22.074	22.083	22.093	**2210**
2220	22.093	22.102	22.112	22.121	22.131	22.140	22.150	22.159	22.169	22.178	22.188	**2220**
2230	22.188	22.197	22.207	22.216	22.226	22.235	22.245	22.254	22.264	22.273	22.283	**2230**
2240	22.283	22.292	22.302	22.311	22.321	22.330	22.340	22.349	22.359	22.368	22.378	**2240**
2250	22.378	22.387	22.397	22.406	22.416	22.425	22.435	22.444	22.453	22.463	22.472	**2250**
2260	22.472	22.482	22.491	22.501	22.510	22.520	22.529	22.539	22.548	22.557	22.567	**2260**
2270	22.567	22.576	22.586	22.595	22.605	22.614	22.624	22.633	22.642	22.652	22.661	**2270**
2280	22.661	22.671	22.680	22.689	22.699	22.708	22.718	22.727	22.737	22.746	22.755	**2280**
2290	22.755	22.765	22.774	22.784	22.793	22.802	22.812	22.821	22.830	22.840	22.849	**2290**
2300	22.849	22.859	22.868	22.877	22.887	22.896	22.906	22.915	22.924	22.934	22.943	**2300**
2310	22.943	22.952	22.962	22.971	22.980	22.990	22.999	23.009	23.018	23.027	23.037	**2310**
2320	23.037	23.046	23.055	23.065	23.074	23.083	23.093	23.102	23.111	23.121	23.130	**2320**
2330	23.130	23.139	23.149	23.158	23.167	23.177	23.186	23.195	23.205	23.214	23.223	**2330**
2340	23.223	23.232	23.242	23.251	23.260	23.270	23.279	23.288	23.298	23.307	23.316	**2340**
2350	23.316	23.325	23.335	23.344	23.353	23.363	23.372	23.381	23.390	23.400	23.409	**2350**
2360	23.409	23.418	23.427	23.437	23.446	23.455	23.465	23.474	23.483	23.492	23.502	**2360**
2370	23.502	23.511	23.520	23.529	23.539	23.548	23.557	23.566	23.576	23.585	23.594	**2370**
2380	23.594	23.603	23.612	23.622	23.631	23.640	23.649	23.659	23.668	23.677	23.686	**2380**
2390	23.686	23.695	23.705	23.714	23.723	23.732	23.742	23.751	23.760	23.769	23.778	**2390**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)												
											Reference Junctions at 32°F	
°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage (emf) in Millivolts												
2400	23.778	23.788	23.797	23.806	23.815	23.824	23.834	23.843	23.852	23.861	23.870	**2400**
2410	23.870	23.879	23.889	23.898	23.907	23.916	23.925	23.934	23.944	23.953	23.962	**2410**
2420	23.962	23.971	23.980	23.989	23.999	24.008	24.017	24.026	24.035	24.044	24.053	**2420**
2430	24.053	24.063	24.072	24.081	24.090	24.099	24.108	24.117	24.127	24.136	24.145	**2430**
2440	24.145	24.154	24.163	24.172	24.181	24.190	24.199	24.209	24.218	24.227	24.236	**2440**
2450	24.236	24.245	24.254	24.263	24.272	24.281	24.290	24.300	24.309	24.318	24.327	**2450**
2460	24.327	24.336	24.345	24.354	24.363	24.372	24.381	24.390	24.399	24.409	24.418	**2460**
2470	24.418	24.427	24.436	24.445	24.454	24.463	24.472	24.481	24.490	24.499	24.508	**2470**
2480	24.508	24.517	24.526	24.535	24.544	24.553	24.562	24.571	24.581	24.590	24.599	**2480**
2490	24.599	24.608	24.617	24.626	24.635	24.644	24.653	24.662	24.671	24.680	24.689	**2490**
2500	24.689	24.698	24.707	24.716	24.725	24.734	24.743	24.752	24.761	24.770	24.779	**2500**
2510	24.779	24.788	24.797	24.806	24.815	24.824	24.833	24.842	24.851	24.860	24.869	**2510**
2520	24.869	24.878	24.887	24.896	24.905	24.913	24.922	24.931	24.940	24.949	24.958	**2520**
2530	24.958	24.967	24.976	24.985	24.994	25.003	25.012	25.021	25.030	25.039	25.048	**2530**
2540	25.048	25.057	25.066	25.075	25.083	25.092	25.101	25.110	25.119	25.128	25.137	**2540**
2550	25.137	25.146	25.155	25.164	25.173	25.182	25.190	25.199	25.208	25.217	25.226	**2550**
2560	25.226	25.235	25.244	25.253	25.262	25.271	25.279	25.288	25.297	25.306	25.315	**2560**
2570	25.315	25.324	25.333	25.342	25.350	25.359	25.368	25.377	25.386	25.395	25.404	**2570**
2580	25.404	25.413	25.421	25.430	25.439	25.448	25.457	25.466	25.475	25.483	25.492	**2580**
2590	25.492	25.501	25.510	25.519	25.528	25.536	25.545	25.554	25.563	25.572	25.581	**2590**
2600	25.581	25.589	25.598	25.607	25.616	25.625	25.633	25.642	25.651	25.660	25.669	**2600**
2610	25.669	25.677	25.686	25.695	25.704	25.713	25.721	25.730	25.739	25.748	25.757	**2610**
2620	25.757	25.765	25.774	25.783	25.792	25.801	25.809	25.818	25.827	25.836	25.844	**2620**
2630	25.844	25.853	25.862	25.871	25.879	25.888	25.897	25.906	25.915	25.923	25.932	**2630**
2640	25.932	25.941	25.949	25.958	25.967	25.976	25.984	25.993	26.002	26.011	26.019	**2640**
2650	26.019	26.028	26.037	26.046	26.054	26.063	26.072	26.080	26.089	26.098	26.107	**2650**
2660	26.107	26.115	26.124	26.133	26.141	26.150	26.159	26.168	26.176	26.185	26.194	**2660**
2670	26.194	26.202	26.211	26.220	26.228	26.237	26.246	26.254	26.263	26.272	26.280	**2670**
2680	26.280	26.289	26.298	26.306	26.315	26.324	26.332	26.341	26.350	26.358	26.367	**2680**
2690	26.367	26.376	26.384	26.393	26.402	26.410	26.419	26.428	26.436	26.445	26.454	**2690**
2700	26.454	26.462	26.471	26.480	26.488	26.497	26.505	26.514	26.523	26.531	26.540	**2700**
2710	26.540	26.548	26.557	26.566	26.574	26.583	26.592	26.600	26.609	26.617	26.626	**2710**
2720	26.626	26.635	26.643	26.652	26.660	26.669	26.678	26.686	26.695	26.703	26.712	**2720**
2730	26.712	26.720	26.729	26.738	26.746	26.755	26.763	26.772	26.780	26.789	26.798	**2730**
2740	26.798	26.806	26.815	26.823	26.832	26.840	26.849	26.857	26.866	26.875	26.883	**2740**
2750	26.883	26.892	26.900	26.909	26.917	26.926	26.934	26.943	26.951	26.960	26.968	**2750**
2760	26.968	26.977	26.986	26.994	27.003	27.011	27.020	27.028	27.037	27.045	27.054	**2760**
2770	27.054	27.062	27.071	27.079	27.088	27.096	27.105	27.113	27.122	27.130	27.139	**2770**
2780	27.139	27.147	27.156	27.164	27.173	27.181	27.190	27.198	27.206	27.215	27.223	**2780**
2790	27.223	27.232	27.240	27.249	27.257	27.266	27.274	27.283	27.291	27.300	27.308	**2790**
2800	27.308	27.316	27.325	27.333	27.342	27.350	27.359	27.367	27.376	27.384	27.392	**2800**
2810	27.392	27.401	27.409	27.418	27.426	27.435	27.443	27.451	27.460	27.468	27.477	**2810**
2820	27.477	27.485	27.493	27.502	27.510	27.519	27.527	27.535	27.544	27.552	27.561	**2820**
2830	27.561	27.569	27.577	27.586	27.594	27.603	27.611	27.619	27.628	27.636	27.645	**2830**
2840	27.645	27.653	27.661	27.670	27.678	27.686	27.695	27.703	27.711	27.720	27.728	**2840**
2850	27.728	27.737	27.745	27.753	27.762	27.770	27.778	27.787	27.795	27.803	27.812	**2850**
2860	27.812	27.820	27.828	27.837	27.845	27.853	27.862	27.870	27.878	27.887	27.895	**2860**
2870	27.895	27.903	27.912	27.920	27.928	27.937	27.945	27.953	27.961	27.970	27.978	**2870**
2880	27.978	27.986	27.995	28.003	28.011	28.020	28.028	28.036	28.044	28.053	28.061	**2880**
2890	28.061	28.069	28.078	28.086	28.094	28.102	28.111	28.119	28.127	28.135	28.144	**2890**
2900	28.144	28.152	28.160	28.169	28.177	28.185	28.193	28.202	28.210	28.218	28.226	**2900**
2910	28.226	28.235	28.243	28.251	28.259	28.267	28.276	28.284	28.292	28.300	28.309	**2910**
2920	28.309	28.317	28.325	28.333	28.342	28.350	28.358	28.366	28.374	28.383	28.391	**2920**
2930	28.391	28.399	28.407	28.415	28.424	28.432	28.440	28.448	28.456	28.465	28.473	**2930**
2940	28.473	28.481	28.489	28.497	28.506	28.514	28.522	28.530	28.538	28.546	28.555	**2940**
2950	28.555	28.563	28.571	28.579	28.587	28.595	28.604	28.612	28.620	28.628	28.636	**2950**
2960	28.636	28.644	28.652	28.661	28.669	28.677	28.685	28.693	28.701	28.709	28.718	**2960**
2970	28.718	28.726	28.734	28.742	28.750	28.758	28.766	28.774	28.783	28.791	28.799	**2970**
2980	28.799	28.807	28.815	28.823	28.831	28.839	28.847	28.856	28.864	28.872	28.880	**2980**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
						Thermoelectric Voltage (emf) in Millivolts						
2990	28.880	28.888	28.896	28.904	28.912	28.920	28.928	28.936	28.945	28.953	28.961	**2990**
3000	28.961	28.969	28.977	28.985	28.993	29.001	29.009	29.017	29.025	29.033	29.041	**3000**
3010	29.041	29.049	29.058	29.066	29.074	29.082	29.090	29.098	29.106	29.114	29.122	**3010**
3020	29.122	29.130	29.138	29.146	29.154	29.162	29.170	29.178	29.186	29.194	29.202	**3020**
3030	29.202	29.210	29.218	29.226	29.234	29.242	29.250	29.258	29.266	29.274	29.282	**3030**
3040	29.282	29.290	29.298	29.306	29.314	29.322	29.330	29.338	29.346	29.354	29.362	**3040**
3050	29.362	29.370	29.378	29.386	29.394	29.402	29.410	29.418	29.426	29.434	29.442	**3050**
3060	29.442	29.450	29.458	29.466	29.474	29.482	29.490	29.498	29.506	29.513	29.521	**3060**
3070	29.521	29.529	29.537	29.545	29.553	29.561	29.569	29.577	29.585	29.593	29.601	**3070**
3080	29.601	29.609	29.617	29.625	29.632	29.640	29.648	29.656	29.664	29.672	29.680	**3080**
3090	29.680	29.688	29.696	29.704	29.711	29.719	29.727	29.735	29.743	29.751	29.759	**3090**
3100	29.759	29.767	29.775	29.782	29.790	29.798	29.806	29.814	29.822	29.830	29.838	**3100**
3110	29.838	29.845	29.853	29.861	29.869	29.877	29.885	29.893	29.900	29.908	29.916	**3110**
3120	29.916	29.924	29.932	29.940	29.948	29.955	29.963	29.971	29.979	29.987	29.995	**3120**
3130	29.995	30.002	30.010	30.018	30.026	30.034	30.042	30.049	30.057	30.065	30.073	**3130**
3140	30.073	30.081	30.088	30.096	30.104	30.112	30.120	30.127	30.135	30.143	30.151	**3140**
3150	30.151	30.159	30.166	30.174	30.182	30.190	30.197	30.205	30.213	30.221	30.229	**3150**
3160	30.229	30.236	30.244	30.252	30.260	30.267	30.275	30.283	30.291	30.298	30.306	**3160**
3170	30.306	30.314	30.322	30.329	30.337	30.345	30.353	30.360	30.368	30.376	30.384	**3170**
3180	30.384	30.391	30.399	30.407	30.414	30.422	30.430	30.438	30.445	30.453	30.461	**3180**
3190	30.461	30.469	30.476	30.484	30.492	30.499	30.507	30.515	30.522	30.530	30.538	**3190**
3200	30.538	30.546	30.553	30.561	30.569	30.576	30.584	30.592	30.599	30.607	30.615	**3200**
3210	30.615	30.622	30.630	30.638	30.645	30.653	30.661	30.668	30.676	30.684	30.691	**3210**
3220	30.691	30.699	30.707	30.714	30.722	30.730	30.737	30.745	30.752	30.760	30.768	**3220**
3230	30.768	30.775	30.783	30.791	30.798	30.806	30.813	30.821	30.829	30.836	30.844	**3230**
3240	30.844	30.852	30.859	30.867	30.874	30.882	30.890	30.897	30.905	30.912	30.920	**3240**
3250	30.920	30.928	30.935	30.943	30.950	30.958	30.966	30.973	30.981	30.988	30.996	**3250**
3260	30.996	31.003	31.011	31.019	31.026	31.034	31.041	31.049	31.056	31.064	31.071	**3260**
3270	31.071	31.079	31.087	31.094	31.102	31.109	31.117	31.124	31.132	31.139	31.147	**3270**
3280	31.147	31.154	31.162	31.170	31.177	31.185	31.192	31.200	31.207	31.215	31.222	**3280**
3290	31.222	31.230	31.237	31.245	31.252	31.260	31.267	31.275	31.282	31.290	31.297	**3290**
3300	31.297	31.305	31.312	31.320	31.327	31.335	31.342	31.350	31.357	31.365	31.372	**3300**
3310	31.372	31.380	31.387	31.394	31.402	31.409	31.417	31.424	31.432	31.439	31.447	**3310**
3320	31.447	31.454	31.462	31.469	31.477	31.484	31.491	31.499	31.506	31.514	31.521	**3320**
3330	31.521	31.529	31.536	31.543	31.551	31.558	31.566	31.573	31.581	31.588	31.595	**3330**
3340	31.595	31.603	31.610	31.618	31.625	31.632	31.640	31.647	31.655	31.662	31.669	**3340**
3350	31.669	31.677	31.684	31.692	31.699	31.706	31.714	31.721	31.728	31.736	31.743	**3350**
3360	31.743	31.751	31.758	31.765	31.773	31.780	31.787	31.795	31.802	31.810	31.817	**3360**
3370	31.817	31.824	31.832	31.839	31.846	31.854	31.861	31.868	31.876	31.883	31.890	**3370**
3380	31.890	31.898	31.905	31.912	31.920	31.927	31.934	31.942	31.949	31.956	31.963	**3380**
3390	31.963	31.971	31.978	31.985	31.993	32.000	32.007	32.015	32.022	32.029	32.036	**3390**
3400	32.036	32.044	32.051	32.058	32.066	32.073	32.080	32.087	32.095	32.102	32.109	**3400**
3410	32.109	32.117	32.124	32.131	32.138	32.146	32.153	32.160	32.167	32.175	32.182	**3410**
3420	32.182	32.189	32.196	32.204	32.211	32.218	32.225	32.233	32.240	32.247	32.254	**3420**
3430	32.254	32.261	32.269	32.276	32.283	32.290	32.298	32.305	32.312	32.319	32.326	**3430**
3440	32.326	32.334	32.341	32.348	32.355	32.362	32.370	32.377	32.384	32.391	32.398	**3440**
3450	32.398	32.405	32.413	32.420	32.427	32.434	32.441	32.449	32.456	32.463	32.470	**3450**
3460	32.470	32.477	32.484	32.492	32.499	32.506	32.513	32.520	32.527	32.534	32.542	**3460**
3470	32.542	32.549	32.556	32.563	32.570	32.577	32.584	32.591	32.599	32.606	32.613	**3470**
3480	32.613	32.620	32.627	32.634	32.641	32.648	32.656	32.663	32.670	32.677	32.684	**3480**
3490	32.684	32.691	32.698	32.705	32.712	32.719	32.726	32.734	32.741	32.748	32.755	**3490**
3500	32.755	32.762	32.769	32.776	32.783	32.790	32.797	32.804	32.811	32.818	32.825	**3500**
3510	32.825	32.832	32.840	32.847	32.854	32.861	32.868	32.875	32.882	32.889	32.896	**3510**
3520	32.896	32.903	32.910	32.917	32.924	32.931	32.938	32.945	32.952	32.959	32.966	**3520**
3530	32.966	32.973	32.980	32.987	32.994	33.001	33.008	33.015	33.022	33.029	33.036	**3530**
3540	33.036	33.043	33.050	33.057	33.064	33.071	33.078	33.085	33.092	33.099	33.106	**3540**
3550	33.106	33.113	33.120	33.127	33.134	33.141	33.148	33.154	33.161	33.168	33.175	**3550**
3560	33.175	33.182	33.189	33.196	33.203	33.210	33.217	33.224	33.231	33.238	33.245	**3560**
3570	33.245	33.252	33.258	33.265	33.272	33.279	33.286	33.293	33.300	33.307	33.314	**3570**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
						Thermoelectric Voltage (emf) in Millivolts						
3580	33.314	33.321	33.327	33.334	33.341	33.348	33.355	33.362	33.369	33.376	33.383	**3580**
3590	33.383	33.389	33.396	33.403	33.410	33.417	33.424	33.431	33.437	33.444	33.451	**3590**
3600	33.451	33.458	33.465	33.472	33.479	33.485	33.492	33.499	33.506	33.513	33.520	**3600**
3610	33.520	33.526	33.533	33.540	33.547	33.554	33.560	33.567	33.574	33.581	33.588	**3610**
3620	33.588	33.594	33.601	33.608	33.615	33.622	33.628	33.635	33.642	33.649	33.656	**3620**
3630	33.656	33.662	33.669	33.676	33.683	33.689	33.696	33.703	33.710	33.716	33.723	**3630**
3640	33.723	33.730	33.737	33.743	33.750	33.757	33.764	33.770	33.777	33.784	33.791	**3640**
3650	33.791	33.797	33.804	33.811	33.818	33.824	33.831	33.838	33.844	33.851	33.858	**3650**
3660	33.858	33.865	33.871	33.878	33.885	33.891	33.898	33.905	33.911	33.918	33.925	**3660**
3670	33.925	33.931	33.938	33.945	33.952	33.958	33.965	33.972	33.978	33.985	33.992	**3670**
3680	33.992	33.998	34.005	34.011	34.018	34.025	34.031	34.038	34.045	34.051	34.058	**3680**
3690	34.058	34.065	34.071	34.078	34.085	34.091	34.098	34.104	34.111	34.118	34.124	**3690**
3700	34.124	34.131	34.137	34.144	34.151	34.157	34.164	34.170	34.177	34.184	34.190	**3700**
3710	34.190	34.197	34.203	34.210	34.217	34.223	34.230	34.236	34.243	34.249	34.256	**3710**
3720	34.256	34.262	34.269	34.276	34.282	34.289	34.295	34.302	34.308	34.315	34.321	**3720**
3730	34.321	34.328	34.334	34.341	34.347	34.354	34.361	34.367	34.374	34.380	34.387	**3730**
3740	34.387	34.393	34.400	34.406	34.413	34.419	34.426	34.432	34.439	34.445	34.452	**3740**
3750	34.452	34.458	34.465	34.471	34.477	34.484	34.490	34.497	34.503	34.510	34.516	**3750**
3760	34.516	34.523	34.529	34.536	34.542	34.549	34.555	34.561	34.568	34.574	34.581	**3760**
3770	34.581	34.587	34.594	34.600	34.606	34.613	34.619	34.626	34.632	34.638	34.645	**3770**
3780	34.645	34.651	34.658	34.664	34.670	34.677	34.683	34.690	34.696	34.702	34.709	**3780**
3790	34.709	34.715	34.722	34.728	34.734	34.741	34.747	34.753	34.760	34.766	34.772	**3790**
3800	34.772	34.779	34.785	34.792	34.798	34.804	34.811	34.817	34.823	34.830	34.836	**3800**
3810	34.836	34.842	34.849	34.855	34.861	34.867	34.874	34.880	34.886	34.893	34.899	**3810**
3820	34.899	34.905	34.912	34.918	34.924	34.930	34.937	34.943	34.949	34.956	34.962	**3820**
3830	34.962	34.968	34.974	34.981	34.987	34.993	34.999	35.006	35.012	35.018	35.024	**3830**
3840	35.024	35.031	35.037	35.043	35.049	35.056	35.062	35.068	35.074	35.081	35.087	**3840**
3850	35.087	35.093	35.099	35.105	35.112	35.118	35.124	35.130	35.136	35.143	35.149	**3850**
3860	35.149	35.155	35.161	35.167	35.173	35.180	35.186	35.192	35.198	35.204	35.211	**3860**
3870	35.211	35.217	35.223	35.229	35.235	35.241	35.247	35.254	35.260	35.266	35.272	**3870**
3880	35.272	35.278	35.284	35.290	35.296	35.303	35.309	35.315	35.321	35.327	35.333	**3880**
3890	35.333	35.339	35.345	35.351	35.358	35.364	35.370	35.376	35.382	35.388	35.394	**3890**
3900	35.394	35.400	35.406	35.412	35.418	35.424	35.430	35.437	35.443	35.449	35.455	**3900**
3910	35.455	35.461	35.467	35.473	35.479	35.485	35.491	35.497	35.503	35.509	35.515	**3910**
3920	35.515	35.521	35.527	35.533	35.539	35.545	35.551	35.557	35.563	35.569	35.575	**3920**
3930	35.575	35.581	35.587	35.593	35.599	35.605	35.611	35.617	35.623	35.629	35.635	**3930**
3940	35.635	35.641	35.647	35.653	35.659	35.664	35.670	35.676	35.682	35.688	35.694	**3940**
3950	35.694	35.700	35.706	35.712	35.718	35.724	35.730	35.736	35.741	35.747	35.753	**3950**
3960	35.753	35.759	35.765	35.771	35.777	35.783	35.789	35.795	35.800	35.806	35.812	**3960**
3970	35.812	35.818	35.824	35.830	35.836	35.841	35.847	35.853	35.859	35.865	35.871	**3970**
3980	35.871	35.876	35.882	35.888	35.894	35.900	35.906	35.911	35.917	35.923	35.929	**3980**
3990	35.929	35.935	35.940	35.946	35.952	35.958	35.964	35.969	35.975	35.981	35.987	**3990**
4000	35.987	35.993	35.998	36.004	36.010	36.016	36.021	36.027	36.033	36.039	36.044	**4000**
4010	36.044	36.050	36.056	36.062	36.067	36.073	36.079	36.084	36.090	36.096	36.102	**4010**
4020	36.102	36.107	36.113	36.119	36.124	36.130	36.136	36.142	36.147	36.153	36.159	**4020**
4030	36.159	36.164	36.170	36.176	36.181	36.187	36.193	36.198	36.204	36.210	36.215	**4030**
4040	36.215	36.221	36.226	36.232	36.238	36.243	36.249	36.255	36.260	36.266	36.271	**4040**
4050	36.271	36.277	36.283	36.288	36.294	36.300	36.305	36.311	36.316	36.322	36.327	**4050**
4060	36.327	36.333	36.339	36.344	36.350	36.355	36.361	36.366	36.372	36.378	36.383	**4060**
4070	36.383	36.389	36.394	36.400	36.405	36.411	36.416	36.422	36.427	36.433	36.438	**4070**
4080	36.438	36.444	36.449	36.455	36.460	36.466	36.471	36.477	36.482	36.488	36.493	**4080**
4090	36.493	36.499	36.504	36.510	36.515	36.521	36.526	36.532	36.537	36.543	36.548	**4090**
4100	36.548	36.553	36.559	36.564	36.570	36.575	36.581	36.586	36.591	36.597	36.602	**4100**
4110	36.602	36.608	36.613	36.619	36.624	36.629	36.635	36.640	36.645	36.651	36.656	**4110**
4120	36.656	36.662	36.667	36.672	36.678	36.683	36.688	36.694	36.699	36.704	36.710	**4120**
4130	36.710	36.715	36.721	36.726	36.731	36.737	36.742	36.747	36.752	36.758	36.763	**4130**
4140	36.763	36.768	36.774	36.779	36.784	36.790	36.795	36.800	36.805	36.811	36.816	**4140**
4150	36.816	36.821	36.826	36.832	36.837	36.842	36.848	36.853	36.858	36.863	36.868	**4150**
4160	36.868	36.874	36.879	36.884	36.889	36.895	36.900	36.905	36.910	36.915	36.921	**4160**

TABLE 25 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)												
												Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10	°F
	Thermoelectric Voltage (emf) in Millivolts											
4170	36.921	36.926	36.931	36.936	36.941	36.947	36.952	36.957	36.962	36.967	36.972	**4170**
4180	36.972	36.978	36.983	36.988	36.993	36.998	37.003	37.008	37.014	37.019	37.024	**4180**
4190	37.024	37.029	37.034	37.039	37.044	37.049	37.055	37.060	37.065	37.070	37.075	**4190**
4200	37.075											**4200**

TABLE 26 Type BP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
0	0.000	0.005	0.010	0.015	0.020	0.025	0.029	0.035	0.040	0.045	0.050
10	0.050	0.055	0.060	0.065	0.071	0.076	0.081	0.086	0.092	0.097	0.103
20	0.103	0.108	0.113	0.119	0.124	0.130	0.136	0.141	0.147	0.153	0.158
30	0.158	0.164	0.170	0.175	0.181	0.187	0.193	0.199	0.205	0.211	0.217
40	0.217	0.223	0.229	0.235	0.241	0.247	0.253	0.259	0.265	0.271	0.278
50	0.278	0.284	0.290	0.296	0.303	0.309	0.316	0.322	0.328	0.335	0.341
60	0.341	0.348	0.354	0.361	0.367	0.374	0.381	0.387	0.394	0.401	0.407
70	0.407	0.414	0.421	0.428	0.434	0.441	0.448	0.455	0.462	0.469	0.476
80	0.476	0.483	0.490	0.497	0.504	0.511	0.518	0.525	0.532	0.539	0.546
90	0.546	0.554	0.561	0.568	0.575	0.583	0.590	0.597	0.604	0.612	0.619
100	0.619	0.627	0.634	0.641	0.649	0.656	0.664	0.671	0.679	0.687	0.694
110	0.694	0.702	0.709	0.717	0.725	0.732	0.740	0.748	0.756	0.763	0.771
120	0.771	0.779	0.787	0.795	0.802	0.810	0.818	0.826	0.834	0.842	0.850
130	0.850	0.858	0.866	0.874	0.882	0.890	0.898	0.906	0.914	0.923	0.931
140	0.931	0.939	0.947	0.955	0.964	0.972	0.980	0.988	0.997	1.005	1.013
150	1.013	1.022	1.030	1.039	1.047	1.055	1.064	1.072	1.081	1.089	1.098
160	1.098	1.106	1.115	1.123	1.132	1.141	1.149	1.158	1.167	1.175	1.184
170	1.184	1.193	1.201	1.210	1.219	1.228	1.236	1.245	1.254	1.263	1.272
180	1.272	1.281	1.289	1.298	1.307	1.316	1.325	1.334	1.343	1.352	1.361
190	1.361	1.370	1.379	1.388	1.397	1.406	1.415	1.425	1.434	1.443	1.452
200	1.452	1.461	1.470	1.480	1.489	1.498	1.507	1.517	1.526	1.535	1.544
210	1.544	1.554	1.563	1.572	1.582	1.591	1.601	1.610	1.620	1.629	1.638
220	1.638	1.648	1.657	1.667	1.676	1.686	1.695	1.705	1.715	1.724	1.734
230	1.734	1.743	1.753	1.763	1.772	1.782	1.792	1.801	1.811	1.821	1.831
240	1.831	1.840	1.850	1.860	1.870	1.880	1.889	1.899	1.909	1.919	1.929
250	1.929	1.939	1.949	1.959	1.969	1.979	1.988	1.998	2.008	2.018	2.028
260	2.028	2.038	2.049	2.059	2.069	2.079	2.089	2.099	2.109	2.119	2.129
270	2.129	2.140	2.150	2.160	2.170	2.180	2.191	2.201	2.211	2.221	2.232
280	2.232	2.242	2.252	2.263	2.273	2.283	2.294	2.304	2.314	2.325	2.335
290	2.335	2.346	2.356	2.366	2.377	2.387	2.398	2.408	2.419	2.429	2.440
300	2.440	2.450	2.461	2.472	2.482	2.493	2.503	2.514	2.525	2.535	2.546
310	2.546	2.557	2.567	2.578	2.589	2.599	2.610	2.621	2.632	2.642	2.653
320	2.653	2.664	2.675	2.686	2.696	2.707	2.718	2.729	2.740	2.751	2.762
330	2.762	2.772	2.783	2.794	2.805	2.816	2.827	2.838	2.849	2.860	2.871
340	2.871	2.882	2.893	2.904	2.915	2.926	2.938	2.949	2.960	2.971	2.982
350	2.982	2.993	3.004	3.016	3.027	3.038	3.049	3.060	3.072	3.083	3.094
360	3.094	3.105	3.117	3.128	3.139	3.150	3.162	3.173	3.184	3.196	3.207
370	3.207	3.219	3.230	3.241	3.253	3.264	3.276	3.287	3.299	3.310	3.321
380	3.321	3.333	3.344	3.356	3.367	3.379	3.391	3.402	3.414	3.425	3.437
390	3.437	3.448	3.460	3.472	3.483	3.495	3.507	3.518	3.530	3.542	3.553
400	3.553	3.565	3.577	3.589	3.600	3.612	3.624	3.636	3.647	3.659	3.671
410	3.671	3.683	3.695	3.707	3.718	3.730	3.742	3.754	3.766	3.778	3.790
420	3.790	3.802	3.814	3.826	3.838	3.850	3.862	3.874	3.886	3.898	3.910
430	3.910	3.922	3.934	3.946	3.958	3.970	3.982	3.994	4.006	4.018	4.031
440	4.031	4.043	4.055	4.067	4.079	4.091	4.104	4.116	4.128	4.140	4.153
450	4.153	4.165	4.177	4.189	4.202	4.214	4.226	4.239	4.251	4.263	4.276
460	4.276	4.288	4.300	4.313	4.325	4.338	4.350	4.363	4.375	4.387	4.400
470	4.400	4.412	4.425	4.437	4.450	4.462	4.475	4.487	4.500	4.513	4.525
480	4.525	4.538	4.550	4.563	4.576	4.588	4.601	4.613	4.626	4.639	4.651
490	4.651	4.664	4.677	4.690	4.702	4.715	4.728	4.740	4.753	4.766	4.779
500	4.779	4.792	4.804	4.817	4.830	4.843	4.856	4.869	4.881	4.894	4.907
510	4.907	4.920	4.933	4.946	4.959	4.972	4.985	4.998	5.011	5.024	5.037
520	5.037	5.050	5.063	5.076	5.089	5.102	5.115	5.128	5.141	5.154	5.167
530	5.167	5.180	5.193	5.206	5.220	5.233	5.246	5.259	5.272	5.285	5.299
540	5.299	5.312	5.325	5.338	5.351	5.365	5.378	5.391	5.405	5.418	5.431
550	5.431	5.444	5.458	5.471	5.484	5.498	5.511	5.525	5.538	5.551	5.565
560	5.565	5.578	5.592	5.605	5.618	5.632	5.645	5.659	5.672	5.686	5.699
570	5.699	5.713	5.726	5.740	5.753	5.767	5.781	5.794	5.808	5.821	5.835
580	5.835	5.849	5.862	5.876	5.889	5.903	5.917	5.930	5.944	5.958	5.972
590	5.972	5.985	5.999	6.013	6.026	6.040	6.054	6.068	6.082	6.095	6.109

TABLE 26 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
600	6.109	6.123	6.137	6.151	6.164	6.178	6.192	6.206	6.220	6.234	6.248
610	6.248	6.262	6.276	6.290	6.303	6.317	6.331	6.345	6.359	6.373	6.387
620	6.387	6.401	6.415	6.429	6.444	6.458	6.472	6.486	6.500	6.514	6.528
630	6.528	6.542	6.556	6.570	6.585	6.599	6.613	6.627	6.641	6.655	6.670
640	6.670	6.684	6.698	6.712	6.726	6.741	6.755	6.769	6.784	6.798	6.812
650	6.812	6.826	6.841	6.855	6.869	6.884	6.898	6.912	6.927	6.941	6.956
660	6.956	6.970	6.984	6.999	7.013	7.028	7.042	7.057	7.071	7.085	7.100
670	7.100	7.114	7.129	7.143	7.158	7.173	7.187	7.202	7.216	7.231	7.245
680	7.245	7.260	7.275	7.289	7.304	7.318	7.333	7.348	7.362	7.377	7.392
690	7.392	7.406	7.421	7.436	7.450	7.465	7.480	7.495	7.509	7.524	7.539
700	7.539	7.554	7.569	7.583	7.598	7.613	7.628	7.643	7.658	7.672	7.687
710	7.687	7.702	7.717	7.732	7.747	7.762	7.777	7.792	7.807	7.822	7.837
720	7.837	7.852	7.867	7.882	7.897	7.912	7.927	7.942	7.957	7.972	7.987
730	7.987	8.002	8.017	8.032	8.047	8.062	8.078	8.093	8.108	8.123	8.138
740	8.138	8.153	8.169	8.184	8.199	8.214	8.230	8.245	8.260	8.275	8.291
750	8.291	8.306	8.321	8.336	8.352	8.367	8.382	8.398	8.413	8.429	8.444
760	8.444	8.459	8.475	8.490	8.505	8.521	8.536	8.552	8.567	8.583	8.598
770	8.598	8.614	8.629	8.645	8.660	8.676	8.691	8.707	8.722	8.738	8.754
780	8.754	8.769	8.785	8.800	8.816	8.832	8.847	8.863	8.878	8.894	8.910
790	8.910	8.925	8.941	8.957	8.973	8.988	9.004	9.020	9.036	9.051	9.067
800	9.067	9.083	9.099	9.114	9.130	9.146	9.162	9.178	9.194	9.209	9.225
810	9.225	9.241	9.257	9.273	9.289	9.305	9.321	9.337	9.353	9.369	9.385
820	9.385	9.401	9.417	9.433	9.449	9.465	9.481	9.497	9.513	9.529	9.545
830	9.545	9.561	9.577	9.593	9.609	9.625	9.641	9.657	9.674	9.690	9.706
840	9.706	9.722	9.738	9.754	9.771	9.787	9.803	9.819	9.836	9.852	9.868
850	9.868	9.884	9.901	9.917	9.933	9.949	9.966	9.982	9.998	10.015	10.031
860	10.031	10.047	10.064	10.080	10.097	10.113	10.129	10.146	10.162	10.179	10.195
870	10.195	10.211	10.228	10.244	10.261	10.277	10.294	10.310	10.327	10.343	10.360
880	10.360	10.376	10.393	10.410	10.426	10.443	10.459	10.476	10.493	10.509	10.526
890	10.526	10.542	10.559	10.576	10.592	10.609	10.626	10.642	10.659	10.676	10.693
900	10.693	10.709	10.726	10.743	10.759	10.776	10.793	10.810	10.827	10.843	10.860
910	10.860	10.877	10.894	10.911	10.928	10.944	10.961	10.978	10.995	11.012	11.029
920	11.029	11.046	11.063	11.079	11.096	11.113	11.130	11.147	11.164	11.181	11.198
930	11.198	11.215	11.232	11.249	11.266	11.283	11.300	11.317	11.334	11.351	11.369
940	11.369	11.386	11.403	11.420	11.437	11.454	11.471	11.488	11.505	11.523	11.540
950	11.540	11.557	11.574	11.591	11.608	11.626	11.643	11.660	11.677	11.695	11.712
960	11.712	11.729	11.746	11.764	11.781	11.798	11.815	11.833	11.850	11.867	11.885
970	11.885	11.902	11.919	11.937	11.954	11.972	11.989	12.006	12.024	12.041	12.058
980	12.058	12.076	12.093	12.111	12.128	12.146	12.163	12.181	12.198	12.216	12.233
990	12.233	12.251	12.268	12.286	12.303	12.321	12.338	12.356	12.373	12.391	12.409
1000	12.409	12.426	12.444	12.461	12.479	12.497	12.514	12.532	12.550	12.567	12.585
1010	12.585	12.603	12.620	12.638	12.656	12.673	12.691	12.709	12.726	12.744	12.762
1020	12.762	12.780	12.797	12.815.	12.833	12.851	12.869	12.886	12.904	12.922	12.940
1030	12.940	12.958	12.976	12.993	13.011	13.029	13.047	13.065	13.083	13.101	13.119
1040	13.119	13.136	13.154	13.172	13.190	13.208	13.226	13.244	13.262	13.280	13.298
1050	13.298	13.316	13.334	13.352	13.370	13.388	13.406	13.424	13.442	13.460	13.478
1060	13.478	13.496	13.515	13.533	13.551	13.569	13.587	13.605	13.623	13.641	13.659
1070	13.659	13.678	13.696	13.714	13.732	13.750	13.768	13.787	13.805	13.823	13.841
1080	13.841	13.860	13.878	13.896	13.914	13.932	13.951	13.969	13.987	14.006	14.024
1090	14.024	14.042	14.060	14.079	14.097	14.115	14.134	14.152	14.170	14.189	14.207
1100	14.207	14.226	14.244	14.262	14.281	14.299	14.318	14.336	14.354	14.373	14.391
1110	14.391	14.410	14.428	14.447	14.465	14.484	14.502	14.521	14.539	14.558	14.576
1120	14.576	14.595	14.613	14.632	14.650	14.669	14.687	14.706	14.725	14.743	14.762
1130	14.762	14.780	14.799	14.817	14.836	14.855	14.873	14.892	14.911	14.929	14.948
1140	14.948	14.967	14.985	15.004	15.023	15.041	15.060	15.079	15.097	15.116	15.135
1150	15.135	15.154	15.172	15.191	15.210	15.229	15.247	15.266	15.285	15.304	15.323
1160	15.323	15.341	15.360	15.379	15.398	15.417	15.435	15.454	15.473	15.492	15.511
1170	15.511	15.530	15.549	15.568	15.586	15.605	15.624	15.643	15.662	15.681	15.700
1180	15.700	15.719	15.738	15.757	15.776	15.795	15.814	15.833	15.852	15.871	15.890

TABLE 26 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1190	15.890	15.909	15.928	15.947	15.966	15.985	16.004	16.023	16.042	16.061	16.080
1200	16.080	16.099	16.118	16.137	16.156	16.175	16.194	16.213	16.233	16.252	16.271
1210	16.271	16.290	16.309	16.328	16.347	16.367	16.386	16.405	16.424	16.443	16.462
1220	16.462	16.482	16.501	16.520	16.539	16.558	16.578	16.597	16.616	16.635	16.655
1230	16.655	16.674	16.693	16.712	16.732	16.751	16.770	16.789	16.809	16.828	16.847
1240	16.847	16.867	16.886	16.905	16.925	16.944	16.963	16.983	17.002	17.021	17.041
1250	17.041	17.060	17.079	17.099	17.118	17.137	17.157	17.176	17.196	17.215	17.234
1260	17.234	17.254	17.273	17.293	17.312	17.332	17.351	17.371	17.390	17.409	17.429
1270	17.429	17.448	17.468	17.487	17.507	17.526	17.546	17.565	17.585	17.604	17.624
1280	17.624	17.643	17.663	17.682	17.702	17.722	17.741	17.761	17.780	17.800	17.819
1290	17.819	17.839	17.858	17.878	17.898	17.917	17.937	17.956	17.976	17.996	18.015
1300	18.015	18.035	18.055	18.074	18.094	18.113	18.133	18.153	18.172	18.192	18.212
1310	18.212	18.231	18.201	18.271	18.290	18.310	18.330	18.350	18.369	18.389	18.409
1320	18.409	18.428	18.448	18.468	18.487	18.507	18.527	18.547	18.566	18.586	18.606
1330	18.606	18.626	18.645	18.665	18.685	18.705	18.725	18.744	18.764	18.784	18.804
1340	18.804	18.823	18.843	18.863	18.883	18.903	18.923	18.942	18.962	18.982	19.002
1350	19.002	19.022	19.041	19.061	19.081	19.101	19.121	19.141	19.161	19.180	19.200
1360	19.200	19.220	19.240	19.260	19.280	19.300	19.320	19.340	19.359	19.379	19.399
1370	19.399	19.419	19.439	19.459	19.479	19.499	19.519	19.539	19.559	19.578	19.598
1380	19.598	19.618	19.638	19.658	19.678	19.698	19.718	19.738	19.758	19.778	19.798
1390	19.798	19.818	19.838	19.858	19.878	19.898	19.918	19.938	19.958	19.978	19.998
1400	19.998	20.018	20.038	20.058	20.078	20.098	20.118	20.138	20.158	20.178	20.198
1410	20.198	20.218	20.238	20.258	20.278	20.298	20.318	20.338	20.358	20.378	20.398
1420	20.398	20.418	20.438	20.458	20.478	20.498	20.518	20.538	20.558	20.579	20.599
1430	20.599	20.619	20.639	20.659	20.679	20.699	20.719	20.739	20.759	20.779	20.799
1440	20.799	20.819	20.839	20.860	20.880	20.900	20.920	20.940	20.960	20.980	21.000
1450	21.000	21.020	21.040	21.060	21.081	21.101	21.121	21.141	21.161	21.181	21.201
1460	21.201	21.221	21.241	21.262	21.282	21.302	21.322	21.342	21.362	21.382	21.402
1470	21.402	21.422	21.443	21.463	21.483	21.503	21.523	21.543	21.563	21.583	21.604
1480	21.604	21.624	21.644	21.664	21.684	21.704	21.724	21.744	21.765	21.785	21.805
1490	21.805	21.825	21.845	21.865	21.885	21.906	21.926	21.946	21.966	21.986	22.006
1500	22.006	22.026	22.046	22.067	22.087	22.107	22.127	22.147	22.167	22.187	22.208
1510	22.208	22.228	22.248	22.268	22.288	22.308	22.328	22.349	22.369	22.389	22.409
1520	22.409	22.429	22.449	22.469	22.489	22.510	22.530	22.550	22.570	22.590	22.610
1530	22.610	22.630	22.650	22.671	22.691	22.711	22.731	22.751	22.771	22.791	22.811
1540	22.811	22.832	22.852	22.872	22.892	22.912	22.932	22.952	22.972	22.993	23.013
1550	23.013	23.033	23.053	23.073	23.093	23.113	23.133	23.153	23.173	23.194	23.214
1560	23.214	23.234	23.254	23.274	23.294	23.314	23.334	23.354	23.374	23.394	23.415
1570	23.415	23.435	23.455	23.475	23.495	23.515	23.535	23.555	23.575	23.595	23.615
1580	23.615	23.635	23.655	23.676	23.696	23.716	23.736	23.756	23.776	23.796	23.816
1590	23.816	23.836	23.856	23.876	23.896	23.916	23.936	23.956	23.976	23.996	24.016
1600	24.016	24.035	24.056	24.076	24.096	24.116	24.136	24.156	24.176	24.196	24.216
1610	24.216	24.235	24.256	24.276	24.296	24.316	24.336	24.356	24.376	24.396	24.416
1620	24.416	24.436	24.456	24.476	24.496	24.516	24.536	24.556	24.576	24.596	24.616
1630	24.616	24.636	24.656	24.676	24.696	24.715	24.735	24.755	24.775	24.795	24.815
1640	24.815	24.835	24.855	24.875	24.895	24.915	24.935	24.954	24.974	24.994	25.014
1650	25.014	25.034	25.054	25.074	25.094	25.113	25.133	25.153	25.173	25.193	25.213
1660	25.213	25.233	25.252	25.272	25.292	25.312	25.332	25.352	25.371	25.391	25.411
1670	25.411	25.431	25.451	25.470	25.490	25.510	25.530	25.550	25.569	25.589	25.609
1680	25.609	25.629	25.648	25.668	25.688	25.708	25.727	25.747	25.767	25.787	25.806
1690	25.806	25.826	25.846	25.866	25.885	25.905	25.925	25.944	25.964	25.984	26.004
1700	26.004	26.023	26.043	26.063	26.082	26.102	26.122	26.141	26.161	26.181	26.200
1710	26.200	26.220	26.239	26.259	26.279	26.298	26.318	26.338	26.357	26.377	26.396
1720	26.396	26.416	26.436	26.455	26.475	26.494	26.514	26.534	26.553	26.573	26.592
1730	26.592	26.612	26.631	26.651	26.670	26.690	26.710	26.729	26.749	26.768	26.788
1740	26.788	26.807	26.827	26.846	26.866	26.885	25.905	26.924	26.944	26.963	26.983
1750	26.983	27.002	27.021	27.041	27.060	27.080	27.099	27.119	27.138	27.158	27.177
1760	27.177	27.196	27.216	27.235	27.255	27.274	27.293	27.313	27.332		

TABLE 27 Type BP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
30			0.000	0.003	0.005	0.008	0.011	0.014	0.016	0.019	0.022
40	0.022	0.025	0.027	0.030	0.033	0.036	0.038	0.041	0.044	0.047	0.050
50	0.050	0.053	0.055	0.058	0.061	0.064	0.067	0.070	0.073	0.076	0.079
60	0.079	0.082	0.085	0.088	0.091	0.094	0.097	0.100	0.103	0.106	0.109
70	0.109	0.112	0.115	0.118	0.121	0.124	0.127	0.130	0.133	0.136	0.139
80	0.139	0.142	0.146	0.149	0.152	0.155	0.158	0.161	0.165	0.168	0.171
90	0.171	0.174	0.177	0.181	0.184	0.187	0.190	0.194	0.197	0.200	0.203
100	0.203	0.207	0.210	0.213	0.217	0.220	0.223	0.227	0.230	0.233	0.237
110	0.237	0.240	0.243	0.247	0.250	0.254	0.257	0.260	0.264	0.267	0.271
120	0.271	0.274	0.278	0.281	0.285	0.288	0.292	0.295	0.299	0.302	0.306
130	0.306	0.309	0.313	0.316	0.320	0.323	0.327	0.330	0.334	0.338	0.341
140	0.341	0.345	0.348	0.352	0.356	0.359	0.363	0.367	0.370	0.374	0.378
150	0.378	0.381	0.385	0.389	0.392	0.396	0.400	0.404	0.407	0.411	0.415
160	0.415	0.419	0.422	0.426	0.430	0.434	0.437	0.441	0.445	0.449	0.453
170	0.453	0.456	0.460	0.464	0.468	0.472	0.476	0.480	0.483	0.487	0.491
180	0.491	0.495	0.499	0.503	0.507	0.511	0.515	0.519	0.523	0.527	0.530
190	0.530	0.534	0.538	0.542	0.546	0.550	0.554	0.558	0.562	0.566	0.570
200	0.570	0.574	0.578	0.583	0.587	0.591	0.595	0.599	0.603	0.607	0.611
210	0.611	0.615	0.619	0.623	0.627	0.632	0.636	0.640	0.644	0.648	0.652
220	0.652	0.656	0.661	0.665	0.669	0.673	0.677	0.681	0.686	0.690	0.694
230	0.694	0.698	0.703	0.707	0.711	0.715	0.720	0.724	0.728	0.732	0.737
240	0.737	0.741	0.745	0.750	0.754	0.758	0.762	0.767	0.771	0.775	0.780
250	0.780	0.784	0.788	0.793	0.797	0.802	0.806	0.810	0.815	0.819	0.823
260	0.823	0.828	0.832	0.837	0.841	0.846	0.850	0.854	0.859	0.863	0.868
270	0.868	0.872	0.877	0.881	0.886	0.890	0.895	0.899	0.904	0.908	0.913
280	0.913	0.917	0.922	0.926	0.931	0.935	0.940	0.944	0.949	0.954	0.958
290	0.958	0.963	0.967	0.972	0.976	0.981	0.986	0.990	0.995	1.000	1.004
300	1.004	1.009	1.013	1.018	1.023	1.027	1.032	1.037	1.041	1.046	1.051
310	1.051	1.055	1.060	1.065	1.069	1.074	1.079	1.084	1.088	1.093	1.098
320	1.098	1.103	1.107	1.112	1.117	1.122	1.126	1.131	1.136	1.141	1.145
330	1.145	1.150	1.155	1.160	1.165	1.169	1.174	1.179	1.184	1.189	1.194
340	1.194	1.198	1.203	1.208	1.213	1.218	1.223	1.228	1.232	1.237	1.242
350	1.242	1.247	1.252	1.257	1.262	1.267	1.272	1.277	1.282	1.286	1.291
360	1.291	1.296	1.301	1.306	1.311	1.316	1.321	1.326	1.331	1.336	1.341
370	1.341	1.346	1.351	1.356	1.361	1.366	1.371	1.376	1.381	1.386	1.391
380	1.391	1.396	1.401	1.406	1.411	1.416	1.421	1.427	1.432	1.437	1.442
390	1.442	1.447	1.452	1.457	1.462	1.467	1.472	1.478	1.483	1.488	1.493
400	1.493	1.498	1.503	1.508	1.513	1.519	1.524	1.529	1.534	1.539	1.544
410	1.544	1.550	1.555	1.560	1.565	1.570	1.576	1.581	1.586	1.591	1.596
420	1.596	1.602	1.607	1.612	1.617	1.623	1.628	1.633	1.638	1.644	1.649
430	1.649	1.654	1.659	1.665	1.670	1.675	1.681	1.686	1.691	1.697	1.702
440	1.702	1.707	1.713	1.718	1.723	1.728	1.734	1.739	1.745	1.750	1.755
450	1.755	1.761	1.766	1.771	1.777	1.782	1.787	1.793	1.798	1.804	1.809
460	1.809	1.814	1.820	1.825	1.831	1.836	1.842	1.847	1.852	1.858	1.863
470	1.863	1.869	1.874	1.880	1.885	1.891	1.896	1.901	1.907	1.912	1.918
480	1.918	1.923	1.929	1.934	1.940	1.945	1.951	1.956	1.962	1.967	1.973
490	1.973	1.979	1.984	1.990	1.995	2.001	2.006	2.012	2.017	2.023	2.028
500	2.028	2.034	2.040	2.045	2.051	2.056	2.062	2.068	2.073	2.079	2.084
510	2.084	2.090	2.096	2.101	2.107	2.112	2.118	2.124	2.129	2.135	2.141
520	2.141	2.146	2.152	2.158	2.163	2.169	2.175	2.180	2.186	2.192	2.197
530	2.197	2.203	2.209	2.214	2.220	2.226	2.232	2.237	2.243	2.249	2.254
540	2.254	2.260	2.266	2.272	2.277	2.283	2.289	2.295	2.300	2.306	2.312
550	2.312	2.318	2.324	2.329	2.335	2.341	2.347	2.352	2.358	2.364	2.370
560	2.370	2.376	2.382	2.387	2.393	2.399	2.405	2.411	2.416	2.422	2.428
570	2.428	2.434	2.440	2.446	2.452	2.457	2.463	2.469	2.475	2.481	2.487
580	2.487	2.493	2.499	2.505	2.510	2.516	2.522	2.528	2.534	2.540	2.546
590	2.546	2.552	2.558	2.564	2.570	2.576	2.582	2.587	2.593	2.599	2.605
600	2.605	2.611	2.617	2.623	2.629	2.635	2.641	2.647	2.653	2.659	2.665
610	2.665	2.671	2.677	2.683	2.689	2.695	2.701	2.707	2.713	2.719	2.725

TABLE 27 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
620	2.725	2.731	2.737	2.743	2.749	2.756	2.762	2.768	2.774	2.780	2.786
630	2.786	2.792	2.798	2.804	2.810	2.816	2.822	2.828	2.835	2.841	2.847
640	2.847	2.853	2.859	2.865	2.871	2.877	2.883	2.890	2.896	2.902	2.908
650	2.908	2.914	2.920	2.926	2.933	2.939	2.945	2.951	2.957	2.963	2.970
660	2.970	2.976	2.982	2.988	2.994	3.001	3.007	3.013	3.019	3.025	3.032
670	3.032	3.038	3.044	3.050	3.057	3.063	3.069	3.075	3.082	3.088	3.094
680	3.094	3.100	3.107	3.113	3.119	3.125	3.132	3.138	3.144	3.150	3.157
690	3.157	3.163	3.169	3.176	3.182	3.188	3.195	3.201	3.207	3.213	3.220
700	3.220	3.226	3.232	3.239	3.245	3.251	3.258	3.264	3.271	3.277	3.283
710	3.283	3.290	3.296	3.302	3.309	3.315	3.321	3.328	3.334	3.341	3.347
720	3.347	3.353	3.360	3.366	3.373	3.379	3.385	3.392	3.398	3.405	3.411
730	3.411	3.418	3.424	3.430	3.437	3.443	3.450	3.456	3.463	3.469	3.476
740	3.476	3.482	3.489	3.495	3.501	3.508	3.514	3.521	3.527	3.534	3.540
750	3.540	3.547	3.553	3.560	3.566	3.573	3.579	3.586	3.592	3.599	3.606
760	3.606	3.612	3.619	3.625	3.632	3.638	3.645	3.651	3.658	3.664	3.671
770	3.671	3.678	3.684	3.691	3.697	3.704	3.711	3.717	3.724	3.730	3.737
780	3.737	3.743	3.750	3.757	3.763	3.770	3.777	3.783	3.790	3.796	3.803
790	3.803	3.810	3.816	3.823	3.830	3.836	3.843	3.850	3.856	3.863	3.870
800	3.870	3.876	3.883	3.890	3.896	3.903	3.910	3.916	3.923	3.930	3.936
810	3.936	3.943	3.950	3.957	3.963	3.970	3.977	3.983	3.990	3.997	4.004
820	4.004	4.010	4.017	4.024	4.031	4.037	4.044	4.051	4.058	4.064	4.071
830	4.071	4.078	4.085	4.091	4.098	4.105	4.112	4.119	4.125	4.132	4.139
840	4.139	4.146	4.153	4.159	4.166	4.173	4.180	4.187	4.194	4.200	4.207
850	4.207	4.214	4.221	4.228	4.235	4.241	4.248	4.255	4.262	4.269	4.276
860	4.276	4.283	4.289	4.296	4.303	4.310	4.317	4.324	4.331	4.338	4.345
870	4.345	4.351	4.358	4.365	4.372	4.379	4.386	4.393	4.400	4.407	4.414
880	4.414	4.421	4.428	4.435	4.442	4.448	4.455	4.462	4.469	4.476	4.483
890	4.483	4.490	4.497	4.504	4.511	4.518	4.525	4.532	4.539	4.546	4.553
900	4.553	4.560	4.567	4.574	4.581	4.588	4.595	4.602	4.609	4.616	4.623
910	4.623	4.630	4.637	4.644	4.651	4.658	4.666	4.673	4.680	4.687	4.694
920	4.694	4.701	4.708	4.715	4.722	4.729	4.736	4.743	4.750	4.757	4.765
930	4.765	4.772	4.779	4.786	4.793	4.800	4.807	4.814	4.821	4.829	4.836
940	4.836	4.843	4.850	4.857	4.864	4.871	4.879	4.886	4.893	4.900	4.907
950	4.907	4.914	4.921	4.929	4.936	4.943	4.950	4.957	4.965	4.972	4.979
960	4.979	4.986	4.993	5.001	5.008	5.015	5.022	5.029	5.037	5.044	5.051
970	5.051	5.058	5.066	5.073	5.080	5.087	5.094	5.102	5.109	5.116	5.123
980	5.123	5.131	5.138	5.145	5.153	5.160	5.167	5.174	5.182	5.189	5.196
990	5.196	5.204	5.211	5.218	5.225	5.233	5.240	5.247	5.255	5.262	5.269
1000	5.269	5.277	5.284	5.291	5.299	5.306	5.313	5.321	5.328	5.335	5.343
1010	5.343	5.350	5.357	5.365	5.372	5.379	5.387	5.394	5.402	5.409	5.416
1020	5.416	5.424	5.431	5.439	5.446	5.453	5.461	5.468	5.476	5.483	5.490
1030	5.490	5.498	5.505	5.513	5.520	5.527	5.535	5.542	5.550	5.557	5.565
1040	5.565	5.572	5.580	5.587	5.595	5.602	5.609	5.617	5.624	5.632	5.639
1050	5.639	5.647	5.654	5.662	5.669	5.677	5.684	5.692	5.699	5.707	5.714
1060	5.714	5.722	5.729	5.737	5.744	5.752	5.759	5.767	5.774	5.782	5.790
1070	5.790	5.797	5.805	5.812	5.820	5.827	5.835	5.842	5.850	5.858	5.865
1080	5.865	5.873	5.880	5.888	5.895	5.903	5.911	5.918	5.926	5.933	5.941
1090	5.941	5.949	5.956	5.964	5.972	5.979	5.987	5.994	6.002	6.010	6.017
1100	6.017	6.025	6.033	6.040	6.048	6.055	6.063	6.071	6.078	6.086	6.094
1110	6.094	6.101	6.109	6.117	6.124	6.132	6.140	6.148	6.155	6.163	6.171
1120	6.171	6.178	6.186	6.194	6.201	6.209	6.217	6.225	6.232	6.240	6.248
1130	6.248	6.255	6.263	6.271	6.279	6.286	6.294	6.302	6.310	6.317	6.325
1140	6.325	6.333	6.341	6.348	6.356	6.364	6.372	6.380	6.387	6.395	6.403
1150	6.403	6.411	6.419	6.426	6.434	6.442	6.450	6.458	6.465	6.473	6.481
1160	6.481	6.489	6.497	6.505	6.512	6.520	6.528	6.536	6.544	6.552	6.559
1170	6.559	6.567	6.575	6.583	6.591	6.599	6.607	6.614	6.622	6.630	6.638
1180	6.638	6.646	6.654	6.662	6.670	6.677	6.685	6.693	6.701	6.709	6.717
1190	6.717	6.725	6.733	6.741	6.749	6.757	6.764	6.772	6.780	6.788	6.796
1200	6.796	6.804	6.812	6.820	6.828	6.836	6.844	6.852	6.860	6.868	6.876

TABLE 27 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1210	6.876	6.884	6.892	6.900	6.908	6.916	6.924	6.932	6.940	6.948	6.956
1220	6.956	6.964	6.972	6.980	6.988	6.996	7.004	7.012	7.020	7.028	7.036
1230	7.036	7.044	7.052	7.060	7.068	7.076	7.084	7.092	7.100	7.108	7.116
1240	7.116	7.124	7.132	7.140	7.148	7.156	7.164	7.173	7.181	7.189	7.197
1250	7.197	7.205	7.213	7.221	7.229	7.237	7.245	7.253	7.262	7.270	7.278
1260	7.278	7.286	7.294	7.302	7.310	7.318	7.326	7.335	7.343	7.351	7.359
1270	7.359	7.367	7.375	7.383	7.392	7.400	7.408	7.416	7.424	7.432	7.441
1280	7.441	7.449	7.457	7.465	7.473	7.482	7.490	7.498	7.506	7.514	7.523
1290	7.523	7.531	7.539	7.547	7.555	7.564	7.572	7.580	7.588	7.597	7.605
1300	7.605	7.613	7.621	7.630	7.638	7.646	7.654	7.663	7.671	7.679	7.687
1310	7.687	7.696	7.704	7.712	7.720	7.729	7.737	7.745	7.754	7.762	7.770
1320	7.770	7.778	7.787	7.795	7.803	7.812	7.820	7.828	7.837	7.845	7.853
1330	7.853	7.862	7.870	7.878	7.887	7.895	7.903	7.912	7.920	7.928	7.937
1340	7.937	7.945	7.953	7.962	7.970	7.979	7.987	7.995	8.004	8.012	8.020
1350	8.020	8.029	8.037	8.046	8.054	8.062	8.071	8.079	8.088	8.096	8.105
1360	8.105	8.113	8.121	8.130	8.138	8.147	8.155	8.164	8.172	8.180	8.189
1370	8.189	8.197	8.206	8.214	8.223	8.231	8.240	8.248	8.257	8.265	8.274
1380	8.274	8.282	8.291	8.299	8.308	8.316	8.325	8.333	8.342	8.350	8.359
1390	8.359	8.367	8.376	8.384	8.393	8.401	8.410	8.418	8.427	8.435	8.444
1400	8.444	8.452	8.461	8.470	8.478	8.487	8.495	8.504	8.512	8.521	8.529
1410	8.529	8.538	8.547	8.555	8.564	8.572	8.581	8.590	8.598	8.607	8.615
1420	8.615	8.624	8.633	8.641	8.650	8.658	8.667	8.676	8.684	8.693	8.702
1430	8.702	8.710	8.719	8.728	8.736	8.745	8.754	8.762	8.771	8.779	8.788
1440	8.788	8.797	8.805	8.814	8.823	8.832	8.840	8.649	8.858	8.866	8.875
1450	8.875	8.884	8.892	8.901	8.910	8.919	8.927	8.936	8.945	8.953	8.962
1460	8.962	8.971	8.980	8.988	8.997	9.006	9.015	9.023	9.032	9.041	9.050
1470	9.050	9.058	9.067	9.076	9.085	9.093	9.102	9.111	9.120	9.129	9.137
1480	9.137	9.146	9.155	9.164	9.172	9.181	9.190	9.199	9.208	9.217	9.225
1490	9.225	9.234	9.243	9.252	9.261	9.269	9.278	9.287	9.296	9.305	9.314
1500	9.314	9.323	9.331	9.340	9.349	9.358	9.367	9.376	9.385	9.393	9.402
1510	9.402	9.411	9.420	9.429	9.438	9.447	9.456	9.465	9.473	9.482	9.491
1520	9.491	9.500	9.509	9.518	9.527	9.536	9.545	9.554	9.563	9.572	9.580
1530	9.580	9.589	9.598	9.607	9.616	9.625	9.634	9.643	9.652	9.661	9.670
1540	9.670	9.679	9.688	9.697	9.706	9.715	9.724	9.733	9.742	9.751	9.760
1550	9.760	9.769	9.778	9.787	9.796	9.805	9.814	9.823	9.832	9.841	9.850
1560	9.850	9.859	9.868	9.877	9.886	9.895	9.904	9.913	9.922	9.931	9.940
1570	9.940	9.949	9.958	9.968	9.977	9.986	9.995	10.004	10.013	10.022	10.031
1580	10.031	10.040	10.049	10.058	10.067	10.077	10.086	10.095	10.104	10.113	10.122
1590	10.122	10.131	10.140	10.149	10.159	10.168	10.177	10.186	10.195	10.204	10.213
1600	10.213	10.222	10.232	10.241	10.250	10.259	10.268	10.277	10.287	10.296	10.305
1610	10.305	10.314	10.323	10.332	10.342	10.351	10.360	10.369	10.378	10.388	10.397
1620	10.397	10.406	10.415	10.424	10.434	10.443	10.452	10.461	10.470	10.480	10.489
1630	10.489	10.498	10.507	10.517	10.526	10.535	10.544	10.554	10.563	10.572	10.581
1640	10.581	10.591	10.600	10.609	10.618	10.628	10.637	10.646	10.655	10.665	10.674
1650	10.674	10.683	10.693	10.702	10.711	10.720	10.730	10.739	10.748	10.758	10.767
1660	10.767	10.776	10.786	10.795	10.804	10.814	10.823	10.832	10.842	10.851	10.860
1670	10.860	10.870	10.879	10.888	10.898	10.907	10.916	10.926	10.935	10.944	10.954
1680	10.954	10.963	10.972	10.982	10.991	11.001	11.010	11.019	11.029	11.038	11.048
1690	11.048	11.057	11.066	11.076	11.085	11.095	11.104	11.113	11.123	11.132	11.142
1700	11.142	11.151	11.160	11.170	11.179	11.189	11.198	11.208	11.217	11.227	11.236
1710	11.236	11.245	11.255	11.264	11.274	11.283	11.293	11.302	11.312	11.321	11.331
1720	11.331	11.340	11.350	11.359	11.369	11.378	11.388	11.397	11.406	11.416	11.425
1730	11.425	11.435	11.445	11.454	11.464	11.473	11.483	11.492	11.502	11.511	11.521
1740	11.521	11.530	11.540	11.549	11.559	11.568	11.578	11.587	11.597	11.607	11.616
1750	11.616	11.626	11.635	11.645	11.654	11.664	11.673	11.683	11.693	11.702	11.712
1760	11.712	11.721	11.731	11.741	11.750	11.760	11.769	11.779	11.789	11.798	11.808
1770	11.808	11.817	11.827	11.837	11.846	11.856	11.865	11.875	11.885	11.894	11.904
1780	11.904	11.914	11.923	11.933	11.943	11.952	11.962	11.972	11.981	11.991	12.000
1790	12.000	12.010	12.020	12.029	12.039	12.049	12.058	12.068	12.078	12.088	12.097

TABLE 27 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1800	12.097	12.107	12.117	12.126	12.136	12.146	12.155	12.165	12.175	12.185	12.194
1810	12.194	12.204	12.214	12.223	12.233	12.243	12.253	12.262	12.272	12.282	12.292
1820	12.292	12.301	12.311	12.321	12.330	12.340	12.350	12.360	12.370	12.379	12.389
1830	12.389	12.399	12.409	12.418	12.428	12.438	12.448	12.457	12.467	12.477	12.487
1840	12.487	12.497	12.506	12.516	12.526	12.536	12.546	12.555	12.565	12.575	12.585
1850	12.585	12.595	12.604	12.614	12.624	12.634	12.644	12.654	12.663	12.673	12.683
1860	12.683	12.693	12.703	12.713	12.723	12.732	12.742	12.752	12.762	12.772	12.782
1870	12.782	12.792	12.801	12.811	12.821	12.831	12.841	12.851	12.861	12.871	12.880
1880	12.880	12.890	12.900	12.910	12.920	12.930	12.940	12.950	12.960	12.970	12.980
1890	12.980	12.989	12.999	13.009	13.019	13.029	13.039	13.049	13.059	13.069	13.079
1900	13.079	13.089	13.099	13.109	13.119	13.129	13.138	13.148	13.158	13.168	13.178
1910	13.178	13.188	13.198	13.208	13.218	13.228	13.238	13.248	13.258	13.268	13.278
1920	13.278	13.288	13.298	13.308	13.318	13.328	13.338	13.348	13.358	13.368	13.378
1930	13.378	13.388	13.398	13.408	13.418	13.428	13.438	13.448	13.458	13.468	13.478
1940	13.478	13.488	13.498	13.508	13.519	13.529	13.539	13.549	13.559	13.569	13.579
1950	13.579	13.589	13.599	13.609	13.619	13.629	13.639	13.649	13.659	13.670	13.680
1960	13.680	13.690	13.700	13.710	13.720	13.730	13.740	13.750	13.760	13.770	13.781
1970	13.781	13.791	13.801	13.811	13.821	13.831	13.841	13.851	13.862	13.872	13.882
1980	13.882	13.892	13.902	13.912	13.922	13.932	13.943	13.953	13.963	13.973	13.983
1990	13.983	13.993	14.004	14.014	14.024	14.034	14.044	14.054	14.065	14.075	14.085
2000	14.085	14.095	14.105	14.115	14.126	14.136	14.146	14.156	14.166	14.177	14.187
2010	14.187	14.197	14.207	14.217	14.228	14.238	14.248	14.258	14.269	14.279	14.289
2020	14.289	14.299	14.309	14.320	14.330	14.340	14.350	14.361	14.371	14.381	14.391
2030	14.391	14.402	14.412	14.422	14.432	14.443	14.453	14.463	14.473	14.484	14.494
2040	14.494	14.504	14.514	14.525	14.535	14.545	14.556	14.566	14.576	14.586	14.597
2050	14.597	14.607	14.617	14.628	14.638	14.648	14.659	14.669	14.679	14.689	14.700
2060	14.700	14.710	14.720	14.731	14.741	14.751	14.762	14.772	14.782	14.793	14.803
2070	14.803	14.813	14.824	14.834	14.844	14.855	14.865	14.875	14.886	14.896	14.906
2080	14.906	14.917	14.927	14.938	14.948	14.958	14.969	14.979	14.989	15.000	15.010
2090	15.010	15.021	15.031	15.041	15.052	15.062	15.073	15.083	15.093	15.104	15.114
2100	15.114	15.125	15.135	15.145	15.156	15.166	15.177	15.187	15.197	15.208	15.218
2110	15.218	15.229	15.239	15.250	15.260	15.270	15.281	15.291	15.302	15.312	15.323
2120	15.323	15.333	15.343	15.354	15.364	15.375	15.385	15.396	15.406	15.417	15.427
2130	15.427	15.438	15.448	15.459	15.469	15.479	15.490	15.500	15.511	15.521	15.532
2140	15.532	15.542	15.553	15.563	15.574	15.584	15.595	15.605	15.616	15.626	15.637
2150	15.637	15.647	15.658	15.668	15.679	15.689	15.700	15.710	15.721	15.731	15.742
2160	15.742	15.753	15.763	15.774	15.784	15.795	15.805	15.816	15.826	15.837	15.847
2170	15.847	15.858	15.868	15.879	15.890	15.900	15.911	15.921	15.932	15.942	15.953
2180	15.953	15.963	15.974	15.985	15.995	16.006	16.016	16.027	16.038	16.048	16.059
2190	16.059	16.069	16.080	16.090	16.101	16.112	16.122	16.133	16.143	16.154	16.165
2200	16.165	16.175	16.186	16.196	16.207	16.218	16.228	16.239	16.250	16.260	16.271
2210	16.271	16.281	16.292	16.303	16.313	16.324	16.335	16.345	16.356	16.367	16.377
2220	16.377	16.388	16.398	16.409	16.420	16.430	16.441	16.452	16.462	16.473	16.484
2230	16.484	16.494	16.505	16.516	16.526	16.537	16.548	16.558	16.569	16.580	16.590
2240	16.590	16.601	16.612	16.622	16.633	16.644	16.655	16.665	16.676	16.687	16.697
2250	16.697	16.708	16.719	16.729	16.740	16.751	16.762	16.772	16.783	16.794	16.804
2260	16.804	16.815	16.826	16.837	16.847	16.858	16.869	16.879	16.890	16.901	16.912
2270	16.912	16.922	16.933	16.944	16.955	16.965	16.976	16.987	16.998	17.008	17.019
2280	17.019	17.030	17.041	17.051	17.062	17.073	17.084	17.094	17.105	17.116	17.127
2290	17.127	17.137	17.148	17.159	17.170	17.181	17.191	17.202	17.213	17.224	17.234
2300	17.234	17.245	17.256	17.267	17.278	17.288	17.299	17.310	17.321	17.332	17.342
2310	17.342	17.353	17.364	17.375	17.386	17.396	17.407	17.418	17.429	17.440	17.451
2320	17.451	17.461	17.472	17.483	17.494	17.505	17.515	17.526	17.537	17.548	17.559
2330	17.559	17.570	17.580	17.591	17.602	17.613	17.624	17.635	17.646	17.656	17.667
2340	17.667	17.678	17.689	17.700	17.711	17.722	17.732	17.743	17.754	17.765	17.776
2350	17.776	17.787	17.798	17.808	17.819	17.830	17.841	17.852	17.863	17.874	17.885
2360	17.885	17.895	17.906	17.917	17.928	17.939	17.950	17.961	17.972	17.983	17.993
2370	17.993	18.004	18.015	18.026	18.037	18.048	18.059	18.070	18.081	18.092	18.103
2380	18.103	18.113	18.124	18.135	18.146	18.157	18.168	18.179	18.190	18.201	18.212
2390	18.212	18.223	18.234	18.245	18.255	18.266	18.277	18.288	18.299	18.310	18.321

TABLE 27 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2400	18.321	18.332	18.343	18.354	18.365	18.376	18.387	18.398	18.409	18.420	18.431
2410	18.431	18.441	18.452	18.463	18.474	18.485	18.496	18.507	18.518	18.529	18.540
2420	18.540	18.551	18.562	18.573	18.584	18.595	18.606	18.617	18.628	18.639	18.650
2430	18.650	18.661	18.672	18.683	18.694	18.705	18.716	18.727	18.738	18.749	18.760
2440	18.760	18.771	18.782	18.793	18.804	18.815	18.826	18.837	18.848	18.859	18.870
2450	18.870	18.881	18.892	18.903	18.914	18.925	18.936	18.947	18.958	18.969	18.980
2460	18.980	18.991	19.002	19.013	19.024	19.035	19.046	19.057	19.068	19.079	19.090
2470	19.090	19.101	19.112	19.123	19.134	19.145	19.156	19.167	19.178	19.189	19.200
2480	19.200	19.211	19.222	19.233	19.245	19.256	19.267	19.278	19.289	19.300	19.311
2490	19.311	19.322	19.333	19.344	19.355	19.366	19.377	19.388	19.399	19.410	19.421
2500	19.421	19.432	19.443	19.455	19.466	19.477	19.488	19.499	19.510	19.521	19.532
2510	19.532	19.543	19.554	19.565	19.576	19.587	19.598	19.609	19.621	19.632	19.643
2520	19.643	19.654	19.665	19.676	19.687	19.698	19.709	19.720	19.731	19.742	19.754
2530	19.754	19.765	19.776	19.787	19.798	19.809	19.820	19.831	19.842	19.853	19.864
2540	19.864	19.876	19.887	19.898	19.909	19.920	19.931	19.942	19.953	19.964	19.976
2550	19.976	19.987	19.998	20.009	20.020	20.031	20.042	20.053	20.064	20.075	20.087
2560	20.087	20.098	20.109	20.120	20.131	20.142	20.153	20.164	20.176	20.187	20.198
2570	20.198	20.209	20.220	20.231	20.242	20.253	20.265	20.276	20.287	20.298	20.309
2580	20.309	20.320	20.331	20.342	20.354	20.365	20.376	20.387	20.398	20.409	20.420
2590	20.420	20.431	20.443	20.454	20.465	20.476	20.487	20.498	20.509	20.521	20.532
2600	20.532	20.543	20.554	20.565	20.576	20.587	20.599	20.610	20.621	20.632	20.643
2610	20.643	20.654	20.665	20.677	20.688	20.699	20.710	20.721	20.732	20.744	20.755
2620	20.755	20.766	20.777	20.788	20.799	20.810	20.822	20.833	20.844	20.855	20.866
2630	20.866	20.877	20.889	20.900	20.911	20.922	20.933	20.944	20.956	20.967	20.978
2640	20.978	20.989	21.000	21.011	21.023	21.034	21.045	21.056	21.067	21.078	21.090
2650	21.090	21.101	21.112	21.123	21.134	21.145	21.157	21.168	21.179	21.190	21.201
2660	21.201	21.212	21.224	21.235	21.246	21.257	21.268	21.279	21.291	21.302	21.313
2670	21.313	21.324	21.335	21.346	21.358	21.369	21.380	21.391	21.402	21.414	21.425
2680	21.425	21.436	21.447	21.458	21.469	21.481	21.492	21.503	21.514	21.525	21.537
2690	21.537	21.548	21.559	21.570	21.581	21.592	21.604	21.615	21.626	21.637	21.648
2700	21.648	21.659	21.671	21.682	21.693	21.704	21.715	21.727	21.738	21.749	21.760
2710	21.760	21.771	21.783	21.794	21.805	21.816	21.827	21.838	21.850	21.861	21.872
2720	21.872	21.883	21.894	21.906	21.917	21.928	21.939	21.950	21.961	21.973	21.984
2730	21.984	21.995	22.006	22.017	22.029	22.040	22.051	22.062	22.073	22.085	22.096
2740	22.096	22.107	22.118	22.129	22.140	22.152	22.163	22.174	22.185	22.196	22.208
2750	22.208	22.219	22.230	22.241	22.252	22.264	22.275	22.286	22.297	22.308	22.319
2760	22.319	22.331	22.342	22.353	22.364	22.375	22.387	22.398	22.409	22.420	22.431
2770	22.431	22.442	22.454	22.465	22.476	22.487	22.498	22.510	22.521	22.532	22.543
2780	22.543	22.554	22.565	22.577	22.588	22.599	22.610	22.621	22.633	22.644	22.655
2790	22.655	22.666	22.677	22.688	22.700	22.711	22.722	22.733	22.744	22.756	22.767
2800	22.767	22.778	22.789	22.800	22.811	22.823	22.834	22.845	22.856	22.867	22.879
2810	22.879	22.890	22.901	22.912	22.923	22.934	22.946	22.957	22.968	22.979	22.990
2820	22.990	23.001	23.013	23.024	23.035	23.046	23.057	23.068	23.080	23.091	23.102
2830	23.102	23.113	23.124	23.136	23.147	23.158	23.169	23.180	23.191	23.203	23.214
2840	23.214	23.225	23.236	23.247	23.258	23.269	23.281	23.292	23.303	23.314	23.325
2850	23.325	23.336	23.348	23.359	23.370	23.381	23.392	23.403	23.415	23.426	23.437
2860	23.437	23.448	23.459	23.470	23.482	23.493	23.504	23.515	23.526	23.537	23.548
2870	23.548	23.560	23.571	23.582	23.593	23.604	23.615	23.626	23.638	23.649	23.660
2880	23.660	23.671	23.682	23.693	23.704	23.716	23.727	23.738	23.749	23.760	23.771
2890	23.771	23.782	23.794	23.805	23.816	23.827	23.838	23.849	23.860	23.872	23.883
2900	23.883	23.894	23.905	23.916	23.927	23.938	23.949	23.961	23.972	23.983	23.994
2910	23.994	24.005	24.016	24.027	24.038	24.050	24.061	24.072	24.083	24.094	24.105
2920	24.105	24.116	24.127	24.139	24.150	24.161	24.172	24.183	24.194	24.205	24.216
2930	24.216	24.227	24.239	24.250	24.261	24.272	24.283	24.294	24.305	24.316	24.327
2940	24.327	24.339	24.350	24.361	24.372	24.383	24.394	24.405	24.416	24.427	24.438
2950	24.438	24.450	24.461	24.472	24.483	24.494	24.505	24.516	24.527	24.538	24.549
2960	24.549	24.560	24.571	24.583	24.594	24.605	24.616	24.627	24.638	24.649	24.660
2970	24.660	24.671	24.682	24.693	24.704	24.715	24.727	24.738	24.749	24.760	24.771
2980	24.771	24.782	24.793	24.804	24.815	24.826	24.837	24.848	24.859	24.870	24.881

TABLE 27 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2990	24.881	24.893	24.904	24.915	24.926	24.937	24.948	24.959	24.970	24.981	24.992
3000	24.992	25.003	25.014	25.025	25.036	25.047	25.058	25.069	25.080	25.091	25.102
3010	25.102	25.113	25.124	25.136	25.147	25.158	25.169	25.180	25.191	25.202	25.213
3020	25.213	25.224	25.235	25.246	25.257	25.268	25.279	25.290	25.301	25.312	25.323
3030	25.323	25.334	25.345	25.356	25.367	25.378	25.389	25.400	25.411	25.422	25.433
3040	25.433	25.444	25.455	25.466	25.477	25.488	25.499	25.510	25.521	25.532	25.543
3050	25.543	25.554	25.565	25.576	25.587	25.598	25.609	25.620	25.631	25.642	25.653
3060	25.653	25.664	25.675	25.686	25.697	25.708	25.719	25.730	25.741	25.752	25.763
3070	25.763	25.774	25.784	25.795	25.806	25.817	25.828	25.839	25.850	25.861	25.872
3080	25.872	25.883	25.894	25.905	25.916	25.927	25.938	25.949	25.960	25.971	25.982
3090	25.982	25.993	26.004	26.014	26.025	26.036	26.047	26.058	26.069	26.080	26.091
3100	26.091	26.102	26.113	26.124	26.135	26.146	26.157	26.167	26.178	26.189	26.200
3110	26.200	26.211	26.222	26.233	26.244	26.255	26.266	26.277	26.287	26.298	26.309
3120	26.309	26.320	26.331	26.342	26.353	26.364	26.375	26.386	26.396	26.407	26.418
3130	26.418	26.429	26.440	26.451	26.462	26.473	26.484	26.494	26.505	26.516	26.527
3140	26.527	26.538	26.549	26.560	26.571	26.581	26.592	26.603	26.614	26.625	26.636
3150	26.636	26.647	26.657	26.568	26.679	26.690	26.701	26.712	26.723	26.733	26.744
3160	26.744	26.755	26.766	26.777	26.788	26.798	26.809	26.820	26.831	26.842	26.853
3170	26.853	26.863	26.874	26.885	26.896	26.907	26.918	26.928	26.939	26.950	26.961
3180	26.961	26.972	26.983	26.993	27.004	27.015	27.026	27.037	27.047	27.058	27.069
3190	27.069	27.080	27.091	27.101	27.112	27.123	27.134	27.145	27.155	27.166	27.177
3200	27.177	27.188	27.199	27.209	27.220	27.231	27.242	27.252	27.263	27.274	27.285
3210	27.285	27.296	27.306	27.317	27.328						

TABLE 28 Type BN Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
0	0.000	0.005	0.010	0.015	0.020	0.026	0.031	0.036	0.041	0.046	0.052
10	0.052	0.057	0.062	0.068	0.073	0.078	0.084	0.089	0.094	0.100	0.105
20	0.105	0.111	0.116	0.122	0.127	0.133	0.138	0.144	0.149	0.155	0.160
30	0.160	0.166	0.172	0.177	0.183	0.189	0.194	0.200	0.206	0.211	0.217
40	0.217	0.223	0.229	0.234	0.240	0.246	0.252	0.258	0.264	0.269	0.275
50	0.275	0.281	0.287	0.293	0.299	0.305	0.311	0.317	0.323	0.329	0.335
60	0.335	0.341	0.347	0.353	0.359	0.365	0.372	0.378	0.384	0.390	0.396
70	0.396	0.402	0.408	0.415	0.421	0.427	0.433	0.439	0.446	0.452	0.458
80	0.458	0.465	0.471	0.477	0.483	0.490	0.496	0.502	0.509	0.515	0.522
90	0.522	0.528	0.534	0.541	0.547	0.554	0.560	0.567	0.573	0.580	0.586
100	0.586	0.592	0.599	0.606	0.612	0.619	0.625	0.632	0.638	0.645	0.651
110	0.651	0.658	0.665	0.671	0.678	0.684	0.691	0.698	0.704	0.711	0.718
120	0.718	0.724	0.731	0.738	0.744	0.751	0.758	0.765	0.771	0.778	0.785
130	0.785	0.792	0.798	0.805	0.812	0.819	0.825	0.832	0.839	0.846	0.853
140	0.853	0.850	0.866	0.873	0.880	0.887	0.894	0.901	0.908	0.914	0.921
150	0.921	0.928	0.935	0.942	0.949	0.956	0.963	0.970	0.977	0.984	0.991
160	0.991	0.998	1.005	1.012	1.019	1.026	1.033	1.040	1.047	1.054	1.061
170	1.061	1.068	1.075	1.082	1.089	1.096	1.103	1.110	1.117	1.124	1.131
180	1.131	1.138	1.145	1.152	1.159	1.167	1.174	1.181	1.188	1.195	1.202
190	1.202	1.209	1.216	1.224	1.231	1.238	1.245	1.252	1.259	1.267	1.274
200	1.274	1.281	1.288	1.295	1.302	1.310	1.317	1.324	1.331	1.338	1.346
210	1.346	1.353	1.360	1.367	1.375	1.382	1.389	1.396	1.404	1.411	1.418
220	1.418	1.425	1.433	1.440	1.447	1.454	1.462	1.469	1.476	1.484	1.491
230	1.491	1.498	1.506	1.513	1.520	1.527	1.535	1.542	1.549	1.557	1.564
240	1.564	1.571	1.579	1.586	1.593	1.601	1.608	1.616	1.623	1.630	1.638
250	1.638	1.645	1.652	1.660	1.667	1.574	1.682	1.689	1.697	1.704	1.711
260	1.711	1.719	1.726	1.734	1.741	1.748	1.756	1.763	1.771	1.778	1.785
270	1.785	1.793	1.800	1.808	1.815	1.823	1.830	1.838	1.845	1.852	1.860
280	1.860	1.867	1.875	1.882	1.890	1.897	1.905	1.912	1.919	1.927	1.934
290	1.934	1.942	1.949	1.957	1.964	1.972	1.979	1.987	1.994	2.002	2.009
300	2.009	2.017	2.024	2.032	2.039	2.047	2.054	2.062	2.069	2.077	2.084
310	2.084	2.092	2.099	2.107	2.114	2.122	2.129	2.137	2.144	2.152	2.159
320	2.159	2.167	2.175	2.182	2.190	2.197	2.205	2.212	2.220	2.227	2.235
330	2.235	2.242	2.250	2.258	2.265	2.273	2.280	2.288	2.295	2.303	2.310
340	2.310	2.318	2.326	2.333	2.341	2.348	2.356	2.363	2.371	2.379	2.386
350	2.386	2.394	2.401	2.409	2.416	2.424	2.432	2.439	2.447	2.454	2.462
360	2.462	2.470	2.477	2.485	2.492	2.500	2.508	2.515	2.523	2.530	2.538
370	2.538	2.546	2.553	2.561	2.568	2.576	2.584	2.591	2.599	2.607	2.614
380	2.614	2.622	2.629	2.637	2.645	2.652	2.660	2.668	2.675	2.683	2.690
390	2.690	2.698	2.706	2.713	2.721	2.729	2.736	2.744	2.752	2.759	2.767
400	2.767	2.775	2.782	2.790	2.797	2.805	2.813	2.820	2.828	2.836	2.843
410	2.843	2.851	2.859	2.866	2.874	2.882	2.889	2.897	2.905	2.912	2.920
420	2.920	2.928	2.935	2.943	2.951	2.958	2.966	2.974	2.981	2.989	2.997
430	2.997	3.004	3.012	3.020	3.028	3.035	3.043	3.051	3.058	3.066	3.074
440	3.074	3.081	3.089	3.097	3.104	3.112	3.120	3.127	3.135	3.143	3.151
450	3.151	3.158	3.166	3.174	3.181	3.189	3.197	3.205	3.212	3.220	3.228
460	3.228	3.235	3.243	3.251	3.259	3.266	3.274	3.282	3.289	3.297	3.305
470	3.305	3.313	3.320	3.328	3.336	3.343	3.351	3.359	3.367	3.374	3.382
480	3.382	3.390	3.398	3.405	3.413	3.421	3.428	3.436	3.444	3.452	3.459
490	3.459	3.467	3.475	3.483	3.490	3.498	3.506	3.514	3.521	3.529	3.537
500	3.537	3.545	3.552	3.560	3.568	3.576	3.583	3.591	3.599	3.607	3.614
510	3.614	3.622	3.630	3.638	3.646	3.653	3.661	3.669	3.677	3.684	3.692
520	3.692	3.700	3.708	3.715	3.723	3.731	3.739	3.747	3.754	3.762	3.770
530	3.770	3.778	3.786	3.793	3.801	3.809	3.817	3.824	3.832	3.840	3.848
540	3.848	3.856	3.863	3.871	3.879	3.887	3.895	3.902	3.910	3.918	3.926
550	3.926	3.934	3.941	3.949	3.957	3.965	3.973	3.980	3.988	3.996	4.004
560	4.004	4.012	4.019	4.027	4.035	4.043	4.051	4.059	4.066	4.074	4.082
570	4.082	4.090	4.098	4.106	4.113	4.121	4.129	4.137	4.145	4.153	4.160
580	4.160	4.168	4.176	4.184	4.192	4.200	4.207	4.215	4.223	4.231	4.239
590	4.239	4.247	4.254	4.262	4.270	4.278	4.286	4.294	4.302	4.309	4.317

TABLE 28 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
600	4.317	4.325	4.333	4.341	4.349	4.357	4.364	4.372	4.380	4.388	4.396
610	4.396	4.404	4.412	4.419	4.427	4.435	4.443	4.451	4.459	4.467	4.475
620	4.475	4.482	4.490	4.498	4.506	4.514	4.522	4.530	4.538	4.546	4.553
630	4.553	4.561	4.569	4.577	4.585	4.593	4.601	4.609	4.617	4.625	4.632
640	4.632	4.640	4.648	4.656	4.664	4.672	4.680	4.688	4.696	4.704	4.711
650	4.711	4.719	4.727	4.735	4.743	4.751	4.759	4.767	4.775	4.783	4.791
660	4.791	4.799	4.806	4.814	4.822	4.830	4.838	4.846	4.854	4.862	4.870
670	4.870	4.878	4.886	4.894	4.902	4.910	4.917	4.925	4.933	4.941	4.949
680	4.949	4.957	4.965	4.973	4.981	4.989	4.997	5.005	5.013	5.021	5.029
690	5.029	5.037	5.045	5.053	5.061	5.069	5.076	5.084	5.092	5.100	5.108
700	5.108	5.116	5.124	5.132	5.140	5.148	5.156	5.164	5.172	5.180	5.188
710	5.188	5.196	5.204	5.212	5.220	5.228	5.236	5.244	5.252	5.260	5.268
720	5.268	5.276	5.284	5.292	5.300	5.308	5.316	5.324	5.332	5.340	5.348
730	5.348	5.356	5.364	5.372	5.380	5.388	5.396	5.404	5.412	5.420	5.428
740	5.428	5.436	5.444	5.453	5.461	5.469	5.477	5.485	5.493	5.501	5.509
750	5.509	5.517	5.525	5.533	5.541	5.549	5.557	5.565	5.573	5.581	5.589
760	5.589	5.597	5.606	5.614	5.622	5.630	5.638	5.646	5.654	5.662	5.670
770	5.670	5.678	5.686	5.694	5.703	5.711	5.719	5.727	5.735	5.743	5.751
780	5.751	5.759	5.767	5.775	5.784	5.792	5.800	5.808	5.816	5.824	5.832
790	5.832	5.840	5.848	5.857	5.865	5.873	5.881	5.889	5.897	5.905	5.913
800	5.913	5.922	5.930	5.938	5.946	5.954	5.962	5.970	5.979	5.987	5.995
810	5.995	6.003	6.011	6.019	6.028	6.036	6.044	6.052	6.060	6.068	6.077
820	6.077	6.085	6.093	6.101	6.109	6.117	6.126	6.134	6.142	6.150	6.158
830	6.158	6.166	6.175	6.183	6.191	6.199	6.207	6.216	6.224	6.232	6.240
840	6.240	6.248	6.257	6.265	6.273	6.281	6.290	6.298	6.306	6.314	6.322
850	6.322	6.331	6.339	6.347	6.355	6.364	6.372	6.380	6.388	6.396	6.405
860	6.405	6.413	6.421	6.429	6.438	6.446	6.454	6.462	6.471	6.479	6.487
870	6.487	6.495	6.504	6.512	6.520	6.528	6.537	6.545	6.553	6.562	6.570
880	6.570	6.578	6.586	6.595	6.603	6.611	6.619	6.628	6.636	6.644	6.653
890	6.653	6.661	6.669	6.677	6.686	6.694	6.702	6.711	6.719	6.727	6.736
900	6.736	6.744	6.752	6.761	6.769	6.777	6.785	6.794	6.802	6.810	6.819
910	6.819	6.827	6.835	6.844	6.852	6.860	6.869	6.877	6.885	6.894	6.902
920	6.902	6.910	6.919	6.927	6.935	6.944	6.952	6.960	6.969	6.977	6.986
930	6.986	6.994	7.002	7.011	7.019	7.027	7.036	7.044	7.052	7.061	7.069
940	7.069	7.078	7.086	7.094	7.103	7.111	7.119	7.128	7.136	7.145	7.153
950	7.153	7.161	7.170	7.178	7.187	7.195	7.203	7.212	7.220	7.228	7.237
960	7.237	7.245	7.254	7.262	7.271	7.279	7.287	7.296	7.304	7.313	7.321
970	7.321	7.329	7.338	7.346	7.355	7.363	7.372	7.380	7.388	7.397	7.405
980	7.405	7.414	7.422	7.431	7.439	7.447	7.456	7.464	7.473	7.481	7.490
990	7.490	7.498	7.507	7.515	7.523	7.532	7.540	7.549	7.557	7.566	7.574
1000	7.574	7.583	7.591	7.600	7.608	7.617	7.625	7.634	7.642	7.650	7.659
1010	7.659	7.667	7.676	7.684	7.693	7.701	7.710	7.718	7.727	7.735	7.744
1020	7.744	7.752	7.761	7.769	7.778	7.786	7.795	7.803	7.812	7.820	7.829
1030	7.829	7.837	7.846	7.854	7.863	7.871	7.880	7.888	7.897	7.905	7.914
1040	7.914	7.922	7.931	7.940	7.948	7.957	7.965	7.974	7.982	7.991	7.999
1050	7.999	8.008	8.016	8.025	8.033	8.042	8.050	8.059	8.068	8.076	8.085
1060	8.085	8.093	8.102	8.110	8.119	8.127	8.136	8.145	8.153	8.162	8.170
1070	8.170	8.179	8.187	8.196	8.204	8.213	8.222	8.230	8.239	8.247	8.256
1080	8.256	8.265	8.273	8.282	8.290	8.299	8.307	8.316	8.325	8.333	8.342
1090	8.342	8.350	8.359	8.368	8.376	8.385	8.393	8.402	8.411	8.419	8.428
1100	8.428	8.436	8.445	8.454	8.462	8.471	8.479	8.488	8.497	8.505	8.514
1110	8.514	8.522	8.531	8.540	8.548	8.557	8.565	8.574	8.583	8.591	8.600
1120	8.600	8.609	8.617	8.626	8.634	8.643	8.652	8.660	8.669	8.678	8.686
1130	8.686	8.695	8.704	8.712	8.721	8.729	8.738	8.747	8.755	8.764	8.773
1140	8.773	8.781	8.790	8.799	8.807	8.816	8.825	8.833	8.842	8.851	8.859
1150	8.859	8.868	8.877	8.885	8.894	8.903	8.911	8.920	8.929	8.937	8.946
1160	8.946	8.955	8.963	8.972	8.981	8.989	8.998	9.007	9.015	9.024	9.033
1170	9.033	9.041	9.050	9.059	9.067	9.076	9.085	9.093	9.102	9.111	9.119
1180	9.119	9.128	9.137	9.146	9.154	9.163	9.172	9.180	9.189	9.198	9.206

TABLE 28 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
1190	9.206	9.215	9.224	9.233	9.241	9.250	9.259	9.267	9.276	9.285	9.293
1200	9.293	9.302	9.311	9.320	9.328	9.337	9.346	9.354	9.363	9.372	9.381
1210	9.381	9.389	9.398	9.407	9.415	9.424	9.433	9.442	9.450	9.459	9.468
1220	9.468	9.476	9.485	9.494	9.503	9.511	9.520	9.529	9.538	9.546	9.555
1230	9.555	9.564	9.572	9.581	9.590	9.599	9.607	9.616	9.625	9.634	9.642
1240	9.642	9.651	9.660	9.668	9.677	9.686	9.695	9.703	9.712	9.721	9.730
1250	9.730	9.738	9.747	9.756	9.765	9.773	9.782	9.791	9.800	9.808	9.817
1260	9.817	9.826	9.835	9.843	9.852	9.861	9.870	9.878	9.887	9.896	9.905
1270	9.905	9.913	9.922	9.931	9.939	9.948	9.957	9.966	9.974	9.983	9.992
1280	9.992	10.001	10.009	10.018	10.027	10.036	10.045	10.053	10.062	10.071	10.080
1290	10.080	10.088	10.097	10.106	10.115	10.123	10.132	10.141	10.150	10.158	10.167
1300	10.167	10.176	10.185	10.193	10.202	10.211	10.220	10.228	10.237	10.246	10.255
1310	10.255	10.263	10.272	10.281	10.290	10.298	10.307	10.316	10.325	10.333	10.342
1320	10.342	10.351	10.360	10.368	10.377	10.386	10.395	10.403	10.412	10.421	10.430
1330	10.430	10.438	10.447	10.456	10.465	10.473	10.482	10.491	10.500	10.508	10.517
1340	10.517	10.526	10.535	10.543	10.552	10.561	10.570	10.578	10.587	10.596	10.605
1350	10.605	10.613	10.622	10.631	10.640	10.648	10.657	10.666	10.675	10.683	10.692
1360	10.692	10.701	10.710	10.718	10.727	10.736	10.745	10.753	10.762	10.771	10.780
1370	10.780	10.788	10.797	10.806	10.815	10.823	10.832	10.841	10.850	10.858	10.867
1380	10.867	10.876	10.884	10.893	10.902	10.911	10.919	10.928	10.937	10.946	10.954
1390	10.954	10.963	10.972	10.980	10.989	10.998	11.007	11.015	11.024	11.033	11.042
1400	11.042	11.050	11.059	11.068	11.076	11.085	11.094	11.103	11.111	11.120	11.129
1410	11.129	11.137	11.146	11.155	11.163	11.172	11.181	11.190	11.198	11.207	11.216
1420	11.216	11.224	11.233	11.242	11.250	11.259	11.268	11.277	11.285	11.294	11.303
1430	11.303	11.311	11.320	11.329	11.337	11.346	11.355	11.363	11.372	11.381	11.389
1440	11.389	11.398	11.407	11.415	11.424	11.433	11.441	11.450	11.459	11.467	11.476
1450	11.476	11.485	11.493	11.502	11.511	11.519	11.528	11.537	11.545	11.554	11.563
1460	11.563	11.571	11.580	11.589	11.597	11.606	11.614	11.623	11.632	11.640	11.649
1470	11.649	11.658	11.666	11.675	11.684	11.692	11.701	11.709	11.718	11.727	11.735
1480	11.735	11.744	11.752	11.761	11.770	11.778	11.787	11.796	11.804	11.813	11.821
1490	11.821	11.830	11.838	11.847	11.856	11.864	11.873	11.881	11.890	11.899	11.907
1500	11.907	11.916	11.924	11.933	11.941	11.950	11.959	11.967	11.976	11.984	11.993
1510	11.993	12.001	12.010	12.018	12.027	12.036	12.044	12.053	12.061	12.070	12.078
1520	12.078	12.087	12.095	12.104	12.112	12.121	12.129	12.138	12.146	12.155	12.164
1530	12.164	12.172	12.181	12.189	12.198	12.206	12.215	12.223	12.232	12.240	12.249
1540	12.249	12.257	12.265	12.274	12.282	12.291	12.299	12.308	12.316	12.325	12.333
1550	12.333	12.342	12.350	12.359	12.367	12.376	12.384	12.392	12.401	12.409	12.418
1560	12.418	12.426	12.435	12.443	12.452	12.460	12.468	12.477	12.485	12.494	12.502
1570	12.502	12.510	12.519	12.527	12.536	12.544	12.553	12.561	12.569	12.578	12.586
1580	12.586	12.594	12.603	12.611	12.620	12.628	12.636	12.645	12.653	12.661	12.670
1590	12.670	12.678	12.687	12.695	12.703	12.712	12.720	12.728	12.737	12.745	12.753
1600	12.753	12.762	12.770	12.778	12.787	12.795	12.803	12.811	12.820	12.828	12.836
1610	12.836	12.845	12.853	12.861	12.870	12.878	12.886	12.894	12.903	12.911	12.919
1620	12.919	12.928	12.936	12.944	12.952	12.961	12.969	12.977	12.985	12.994	13.002
1630	13.002	13.010	13.018	13.027	13.035	13.043	13.051	13.059	13.068	13.076	13.084
1640	13.084	13.092	13.100	13.109	13.117	13.125	13.133	13.141	13.150	13.158	13.166
1650	13.166	13.174	13.182	13.191	13.199	13.207	13.215	13.223	13.231	13.239	13.248
1660	13.248	13.256	13.264	13.272	13.280	13.288	13.296	13.305	13.313	13.321	13.329
1670	13.329	13.337	13.345	13.353	13.361	13.369	13.378	13.386	13.394	13.402	13.410
1680	13.410	13.418	13.426	13.434	13.442	13.450	13.458	13.466	13.474	13.483	13.491
1690	13.491	13.499	13.507	13.515	13.523	13.531	13.539	13.547	13.555	13.563	13.571
1700	13.571	13.579	13.587	13.595	13.603	13.611	13.619	13.627	13.635	13.643	13.651
1710	13.651	13.659	13.667	13.675	13.683	13.691	13.699	13.707	13.715	13.723	13.731
1720	13.731	13.739	13.747	13.755	13.763	13.771	13.778	13.786	13.794	13.802	13.810
1730	13.810	13.818	13.826	13.834	13.842	13.850	13.858	13.866	13.874	13.881	13.889
1740	13.889	13.897	13.905	13.913	13.921	13.929	13.937	13.945	13.952	13.960	13.968
1750	13.968	13.976	13.984	13.992	14.000	14.008	14.015	14.023	14.031	14.039	14.047
1760	14.047	14.055	14.062	14.070	14.078	14.086	14.094	14.102	14.109		

TABLE 29 Type BN Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
30			0.000	0.003	0.006	0.008	0.011	0.014	0.017	0.020	0.023
40	0.023	0.026	0.028	0.031	0.034	0.037	0.040	0.043	0.046	0.049	0.052
50	0.052	0.055	0.058	0.060	0.063	0.066	0.069	0.072	0.075	0.078	0.081
60	0.081	0.084	0.087	0.090	0.093	0.096	0.099	0.102	0.105	0.108	0.111
70	0.111	0.114	0.117	0.120	0.123	0.126	0.129	0.133	0.136	0.139	0.142
80	0.142	0.145	0.148	0.151	0.154	0.157	0.160	0.163	0.167	0.170	0.173
90	0.173	0.176	0.179	0.182	0.185	0.189	0.192	0.195	0.198	0.201	0.204
100	0.204	0.208	0.211	0.214	0.217	0.220	0.223	0.227	0.230	0.233	0.236
110	0.236	0.240	0.243	0.246	0.249	0.253	0.256	0.259	0.262	0.266	0.269
120	0.269	0.272	0.275	0.279	0.282	0.285	0.289	0.292	0.295	0.298	0.302
130	0.302	0.305	0.308	0.312	0.315	0.318	0.322	0.325	0.328	0.332	0.335
140	0.335	0.338	0.342	0.345	0.349	0.352	0.355	0.359	0.362	0.365	0.369
150	0.369	0.372	0.376	0.379	0.382	0.386	0.389	0.393	0.396	0.399	0.403
160	0.403	0.406	0.410	0.413	0.417	0.420	0.424	0.427	0.430	0.434	0.437
170	0.437	0.441	0.444	0.448	0.451	0.455	0.458	0.462	0.465	0.469	0.472
180	0.472	0.476	0.479	0.483	0.486	0.490	0.493	0.497	0.500	0.504	0.507
190	0.507	0.511	0.515	0.518	0.522	0.525	0.529	0.532	0.536	0.539	0.543
200	0.543	0.547	0.550	0.554	0.557	0.561	0.564	0.568	0.572	0.575	0.579
210	0.579	0.582	0.586	0.590	0.593	0.597	0.600	0.604	0.608	0.611	0.615
220	0.615	0.619	0.622	0.626	0.629	0.633	0.637	0.640	0.644	0.648	0.651
230	0.651	0.655	0.659	0.662	0.666	0.670	0.673	0.677	0.681	0.684	0.688
240	0.688	0.692	0.695	0.699	0.703	0.707	0.710	0.714	0.718	0.721	0.725
250	0.725	0.729	0.732	0.736	0.740	0.744	0.747	0.751	0.755	0.759	0.762
260	0.762	0.766	0.770	0.774	0.777	0.781	0.785	0.789	0.792	0.796	0.800
270	0.800	0.804	0.807	0.811	0.815	0.819	0.822	0.826	0.830	0.834	0.838
280	0.838	0.841	0.845	0.849	0.853	0.856	0.860	0.864	0.868	0.872	0.876
290	0.876	0.879	0.883	0.887	0.891	0.895	0.898	0.902	0.906	0.910	0.914
300	0.914	0.918	0.921	0.925	0.929	0.933	0.937	0.941	0.944	0.948	0.952
310	0.952	0.956	0.960	0.964	0.967	0.971	0.975	0.979	0.983	0.987	0.991
320	0.991	0.995	0.998	1.002	1.006	1.010	1.014	1.018	1.022	1.026	1.029
330	1.029	1.033	1.037	1.041	1.045	1.049	1.053	1.057	1.061	1.065	1.068
340	1.068	1.072	1.076	1.080	1.084	1.088	1.092	1.096	1.100	1.104	1.108
350	1.108	1.111	1.115	1.119	1.123	1.127	1.131	1.135	1.139	1.143	1.147
360	1.147	1.151	1.155	1.159	1.163	1.167	1.171	1.174	1.178	1.182	1.186
370	1.186	1.190	1.194	1.198	1.202	1.206	1.210	1.214	1.218	1.222	1.226
380	1.226	1.230	1.234	1.238	1.242	1.246	1.250	1.254	1.258	1.262	1.266
390	1.266	1.270	1.274	1.278	1.282	1.286	1.290	1.294	1.298	1.302	1.306
400	1.306	1.310	1.314	1.318	1.322	1.326	1.330	1.334	1.338	1.342	1.346
410	1.346	1.350	1.354	1.358	1.362	1.366	1.370	1.374	1.378	1.382	1.386
420	1.386	1.390	1.394	1.398	1.402	1.406	1.410	1.414	1.418	1.422	1.426
430	1.426	1.430	1.434	1.438	1.442	1.446	1.450	1.454	1.459	1.463	1.467
440	1.467	1.471	1.475	1.479	1.483	1.487	1.491	1.495	1.499	1.503	1.507
450	1.507	1.511	1.515	1.519	1.523	1.527	1.532	1.536	1.540	1.544	1.548
460	1.548	1.552	1.556	1.560	1.564	1.568	1.572	1.576	1.580	1.584	1.589
470	1.589	1.593	1.597	1.601	1.605	1.609	1.613	1.617	1.621	1.625	1.629
480	1.629	1.634	1.638	1.642	1.646	1.650	1.654	1.658	1.662	1.666	1.670
490	1.670	1.674	1.679	1.683	1.687	1.691	1.695	1.699	1.703	1.707	1.711
500	1.711	1.716	1.720	1.724	1.728	1.732	1.736	1.740	1.744	1.748	1.753
510	1.753	1.757	3.761	1.765	1.769	1.773	1.777	1.781	1.785	1.790	1.794
520	1.794	1.798	1.802	1.806	1.810	1.814	1.819	1.823	1.827	1.831	1.835
530	1.835	1.839	1.843	1.847	1.852	1.856	1.860	1.864	1.868	1.872	1.876
540	1.876	1.881	1.885	1.889	1.893	1.897	1.901	1.905	1.910	1.914	1.918
550	1.918	1.922	1.926	1.930	1.934	1.939	1.943	1.947	1.951	1.955	1.959
560	1.959	1.963	1.968	1.972	1.976	1.980	1.984	1.988	1.993	1.997	2.001
570	2.001	2.005	2.009	2.013	2.018	2.022	2.026	2.030	2.034	2.038	2.043
580	2.043	2.047	2.051	2.055	2.059	2.063	2.068	2.072	2.076	2.080	2.084
590	2.084	2.088	2.093	2.097	2.101	2.105	2.109	2.113	2.118	2.122	2.126
600	2.126	2.130	2.134	2.139	2.143	2.147	2.151	2.155	2.159	2.164	2.168
610	2.168	2.172	2.176	2.180	2.185	2.189	2.193	2.197	2.201	2.206	2.210

TABLE 29 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
620	2.210	2.214	2.218	2.222	2.226	2.231	2.235	2.239	2.243	2.247	2.252
630	2.252	2.256	2.260	2.264	2.268	2.273	2.277	2.281	2.285	2.289	2.294
640	2.294	2.298	2.302	2.306	2.310	2.315	2.319	2.323	2.327	2.331	2.336
650	2.336	2.340	2.344	2.348	2.352	2.357	2.361	2.365	2.369	2.374	2.378
660	2.378	2.382	2.386	2.390	2.395	2.399	2.403	2.407	2.411	2.416	2.420
670	2.420	2.424	2.428	2.433	2.437	2.441	2.445	2.449	2.454	2.458	2.462
680	2.462	2.466	2.470	2.475	2.479	2.483	2.487	2.492	2.496	2.500	2.504
690	2.504	2.508	2.513	2.517	2.521	2.525	2.530	2.534	2.538	2.542	2.546
700	2.546	2.551	2.555	2.559	2.563	2.568	2.572	2.576	2.580	2.585	2.589
710	2.589	2.593	2.597	2.601	2.606	2.610	2.614	2.618	2.623	2.627	2.631
720	2.631	2.635	2.640	2.644	2.648	2.652	2.657	2.661	2.665	2.669	2.674
730	2.674	2.678	2.682	2.686	2.690	2.695	2.699	2.703	2.707	2.712	2.716
740	2.716	2.720	2.724	2.729	2.733	2.737	2.741	2.746	2.750	2.754	2.758
750	2.758	2.763	2.767	2.771	2.775	2.780	2.784	2.788	2.792	2.797	2.801
760	2.801	2.805	2.809	2.814	2.818	2.822	2.826	2.831	2.835	2.839	2.843
770	2.843	2.848	2.852	2.856	2.860	2.865	2.869	2.873	2.877	2.882	2.886
780	2.886	2.890	2.894	2.899	2.903	2.907	2.912	2.916	2.920	2.924	2.929
790	2.929	2.933	2.937	2.941	2.946	2.950	2.954	2.958	2.963	2.967	2.971
800	2.971	2.975	2.980	2.984	2.988	2.993	2.997	3.001	3.005	3.010	3.014
810	3.014	3.018	3.022	3.027	3.031	3.035	3.039	3.044	3.048	3.052	3.057
820	3.057	3.061	3.065	3.069	3.074	3.078	3.082	3.086	3.091	3.095	3.099
830	3.099	3.104	3.108	3.112	3.116	3.121	3.125	3.129	3.133	3.138	3.142
840	3.142	3.146	3.151	3.155	3.159	3.163	3.168	3.172	3.176	3.181	3.185
850	3.185	3.189	3.193	3.198	3.202	3.206	3.211	3.215	3.219	3.223	3.228
860	3.228	3.232	3.236	3.241	3.245	3.249	3.253	3.258	3.262	3.266	3.271
870	3.271	3.275	3.279	3.283	3.288	3.292	3.296	3.301	3.305	3.309	3.313
880	3.313	3.318	3.322	3.326	3.331	3.335	3.339	3.343	3.348	3.352	3.356
890	3.356	3.361	3.365	3.369	3.373	3.378	3.382	3.386	3.391	3.395	3.399
900	3.399	3.404	3.408	3.412	3.416	3.421	3.425	3.429	3.434	3.438	3.442
910	3.442	3.447	3.451	3.455	3.459	3.464	3.468	3.472	3.477	3.481	3.485
920	3.485	3.490	3.494	3.498	3.502	3.507	3.511	3.515	3.520	3.524	3.528
930	3.528	3.533	3.537	3.541	3.546	3.550	3.554	3.558	3.563	3.567	3.571
940	3.571	3.576	3.580	3.584	3.589	3.593	3.597	3.602	3.606	3.610	3.614
950	3.614	3.619	3.623	3.627	3.632	3.636	3.640	3.645	3.649	3.653	3.658
960	3.658	3.662	3.666	3.671	3.675	3.679	3.684	3.688	3.692	3.696	3.701
970	3.701	3.705	3.709	3.714	3.718	3.722	3.727	3.731	3.735	3.740	3.744
980	3.744	3.748	3.753	3.757	3.761	3.766	3.770	3.774	3.779	3.783	3.787
990	3.787	3.792	3.796	3.800	3.805	3.809	3.813	3.818	3.822	3.826	3.830
1000	3.830	3.835	3.839	3.843	3.848	3.852	3.856	3.861	3.865	3.869	3.874
1010	3.874	3.878	3.882	3.887	3.891	3.895	3.900	3.904	3.908	3.913	3.917
1020	3.917	3.921	3.926	3.930	3.934	3.939	3.943	3.947	3.952	3.956	3.960
1030	3.960	3.965	3.969	3.973	3.978	3.982	3.987	3.991	3.995	4.000	4.004
1040	4.004	4.008	4.013	4.017	4.021	4.026	4.030	4.034	4.039	4.043	4.047
1050	4.047	4.052	4.056	4.060	4.065	4.069	4.073	4.078	4.082	4.086	4.091
1060	4.091	4.095	4.099	4.104	4.108	4.112	4.117	4.121	4.126	4.130	4.134
1070	4.134	4.139	4.143	4.147	4.152	4.156	4.160	4.165	4.169	4.173	4.178
1080	4.178	4.182	4.186	4.191	4.195	4.200	4.204	4.208	4.213	4.217	4.221
1090	4.221	4.226	4.230	4.234	4.239	4.243	4.247	4.252	4.256	4.261	4.265
1100	4.265	4.269	4.274	4.278	4.282	4.287	4.291	4.295	4.300	4.304	4.309
1110	4.309	4.313	4.317	4.322	4.326	4.330	4.335	4.339	4.343	4.348	4.352
1120	4.352	4.357	4.361	4.365	4.370	4.374	4.378	4.383	4.387	4.392	4.396
1130	4.396	4.400	4.405	4.409	4.413	4.418	4.422	4.426	4.431	4.435	4.440
1140	4.440	4.444	4.448	4.453	4.457	4.461	4.466	4.470	4.475	4.479	4.483
1150	4.483	4.488	4.492	4.497	4.501	4.505	4.510	4.514	4.518	4.523	4.527
1160	4.527	4.532	4.536	4.540	4.545	4.549	4.553	4.558	4.562	4.567	4.571
1170	4.571	4.575	4.580	4.584	4.589	4.593	4.597	4.602	4.606	4.610	4.615
1180	4.615	4.619	4.624	4.628	4.632	4.637	4.641	4.646	4.650	4.654	4.659
1190	4.659	4.663	4.668	4.672	4.676	4.681	4.685	4.689	4.694	4.698	4.703
1200	4.703	4.707	4.711	4.716	4.720	4.725	4.729	4.733	4.738	4.742	4.747

TABLE 29 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1210	4.747	4.751	4.755	4.760	4.764	4.769	4.773	4.777	4.782	4.786	4.791
1220	4.791	4.795	4.799	4.804	4.808	4.813	4.817	4.821	4.826	4.830	4.835
1230	4.835	4.839	4.843	4.848	4.852	4.857	4.861	4.865	4.870	4.874	4.879
1240	4.879	4.883	4.887	4.892	4.896	4.901	4.905	4.910	4.914	4.918	4.923
1250	4.923	4.927	4.932	4.936	4.940	4.945	4.949	4.954	4.958	4.962	4.967
1260	4.967	4.971	4.976	4.980	4.985	4.989	4.993	4.998	5.002	5.007	5.011
1270	5.011	5.015	5.020	5.024	5.029	5.033	5.038	5.042	5.046	5.051	5.055
1280	5.055	5.060	5.064	5.069	5.073	5.077	5.082	5.086	5.091	5.095	5.100
1290	5.100	5.104	5.108	5.113	5.117	5.122	5.126	5.131	5.135	5.139	5.144
1300	5.144	5.148	5.153	5.157	5.162	5.166	5.170	5.175	5.179	5.184	5.188
1310	5.188	5.193	5.197	5.201	5.206	5.210	5.215	5.219	5.224	5.228	5.233
1320	5.233	5.237	5.241	5.246	5.250	5.255	5.259	5.264	5.268	5.273	5.277
1330	5.277	5.281	5.286	5.290	5.295	5.299	5.304	5.308	5.313	5.317	5.321
1340	5.321	5.326	5.330	5.335	5.339	5.344	5.348	5.353	5.357	5.362	5.366
1350	5.366	5.370	5.375	5.379	5.384	5.388	5.393	5.397	5.402	5.406	5.411
1360	5.411	5.415	5.420	5.424	5.428	5.433	5.437	5.442	5.446	5.451	5.455
1370	5.455	5.460	5.464	5.469	5.473	5.478	5.482	5.486	5.491	5.495	5.500
1380	5.500	5.504	5.509	5.513	5.518	5.522	5.527	5.531	5.536	5.540	5.545
1390	5.545	5.549	5.554	5.558	5.563	5.567	5.572	5.576	5.580	5.585	5.589
1400	5.589	5.594	5.598	5.603	5.607	5.612	5.616	5.621	5.625	5.630	5.634
1410	5.634	5.639	5.643	5.648	5.652	5.657	5.661	5.666	5.670	5.675	5.679
1420	5.679	5.684	5.688	5.693	5.697	5.702	5.706	5.711	5.715	5.720	5.724
1430	5.724	5.729	5.733	5.738	5.742	5.747	5.751	5.756	5.760	5.765	5.769
1440	5.769	5.774	5.778	5.783	5.787	5.792	5.796	5.801	5.805	5.810	5.814
1450	5.814	5.819	5.823	5.828	5.832	5.837	5.841	5.846	5.850	5.855	5.859
1460	5.859	5.864	5.868	5.873	5.877	5.882	5.886	5.891	5.895	5.900	5.904
1470	5.904	5.909	5.913	5.918	5.923	5.927	5.932	5.936	5.941	5.945	5.950
1480	5.950	5.954	5.959	5.963	5.968	5.972	5.977	5.981	5.986	5.990	5.995
1490	5.995	5.999	6.004	6.008	6.013	6.018	6.022	6.027	6.031	6.036	6.040
1500	6.040	6.045	6.049	6.054	6.058	6.063	6.067	6.072	6.077	6.081	6.086
1510	6.086	6.090	6.095	6.099	6.104	6.108	6.113	6.117	6.122	6.126	6.131
1520	6.131	6.136	6.140	6.145	6.149	6.154	6.158	6.163	6.157	6.172	6.177
1530	6.177	6.181	6.186	6.190	6.195	6.199	6.204	6.208	6.213	6.217	6.222
1540	6.222	6.227	6.231	6.236	6.240	6.245	6.249	6.254	6.259	6.263	6.268
1550	6.268	6.272	6.277	6.281	6.286	6.290	6.295	6.300	6.304	6.309	6.313
1560	6.313	6.318	6.322	6.327	6.332	6.336	6.341	6.345	6.350	6.354	6.359
1570	6.359	6.364	6.368	6.373	6.377	6.382	6.386	6.391	6.396	6.400	6.405
1580	6.405	6.409	6.414	6.418	6.423	6.428	6.432	6.437	6.441	6.446	6.450
1590	6.450	6.455	6.460	6.464	6.469	6.473	6.478	6.483	6.487	6.492	6.496
1600	6.496	6.501	6.506	6.510	6.515	6.519	6.524	6.528	6.533	6.538	6.542
1610	6.542	6.547	6.551	6.556	6.561	6.565	6.570	6.574	6.579	6.584	6.588
1620	6.588	6.593	6.597	6.602	6.607	6.611	6.616	6.620	6.625	6.630	6.634
1630	6.634	6.639	6.643	6.648	6.653	6.657	6.662	6.666	6.671	6.676	6.680
1640	6.680	6.685	6.689	6.694	6.699	6.703	6.708	6.713	6.717	6.722	6.726
1650	6.726	6.731	6.736	6.740	6.745	6.749	6.754	6.759	6.763	6.768	6.773
1660	6.773	6.777	6.782	6.786	6.791	6.796	6.800	6.805	6.809	6.814	6.819
1670	6.819	6.823	6.828	6.833	6.837	6.842	6.846	6.851	6.856	6.860	6.865
1680	6.865	6.870	6.874	6.879	6.884	6.888	6.893	6.897	6.902	6.907	6.911
1690	6.911	6.916	6.921	6.925	6.930	6.934	6.939	6.944	6.948	6.953	6.958
1700	6.958	6.962	6.967	6.972	6.976	6.981	6.986	6.990	6.995	6.999	7.004
1710	7.004	7.009	7.013	7.018	7.023	7.027	7.032	7.037	7.041	7.046	7.051
1720	7.051	7.055	7.060	7.064	7.069	7.074	7.078	7.083	7.088	7.092	7.097
1730	7.097	7.102	7.106	7.111	7.116	7.120	7.125	7.130	7.134	7.139	7.144
1740	7.144	7.148	7.153	7.158	7.162	7.167	7.172	7.176	7.181	7.186	7.190
1750	7.190	7.195	7.200	7.204	7.209	7.214	7.218	7.223	7.228	7.232	7.237
1760	7.237	7.242	7.246	7.251	7.256	7.260	7.265	7.270	7.274	7.279	7.284
1770	7.284	7.288	7.293	7.298	7.302	7.307	7.312	7.316	7.321	7.326	7.330
1780	7.330	7.335	7.340	7.344	7.349	7.354	7.358	7.363	7.368	7.372	7.377
1790	7.377	7.382	7.387	7.391	7.396	7.401	7.405	7.410	7.415	7.419	7.424

TABLE 29 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
						Thermoelectric Voltage (emf) in Millivolts					
1800	7.424	7.429	7.433	7.438	7.443	7.447	7.452	7.457	7.462	7.466	7.471
1810	7.471	7.476	7.480	7.485	7.490	7.494	7.499	7.504	7.508	7.513	7.518
1820	7.518	7.523	7.527	7.532	7.537	7.541	7.546	7.551	7.555	7.560	7.565
1830	7.565	7.570	7.574	7.579	7.584	7.588	7.593	7.598	7.602	7.607	7.612
1840	7.612	7.617	7.621	7.626	7.631	7.635	7.640	7.645	7.650	7.654	7.659
1850	7.659	7.664	7.668	7.673	7.678	7.683	7.687	7.692	7.697	7.701	7.706
1860	7.706	7.711	7.716	7.720	7.725	7.730	7.734	7.739	7.744	7.749	7.753
1870	7.753	7.758	7.763	7.767	7.772	7.777	7.782	7.786	7.791	7.796	7.800
1880	7.800	7.805	7.810	7.815	7.819	7.824	7.829	7.834	7.838	7.843	7.848
1890	7.848	7.852	7.857	7.862	7.867	7.871	7.876	7.881	7.886	7.890	7.895
1900	7.895	7.900	7.904	7.909	7.914	7.919	7.923	7.928	7.933	7.938	7.942
1910	7.942	7.947	7.952	7.957	7.961	7.966	7.971	7.976	7.980	7.985	7.990
1920	7.990	7.995	7.999	8.004	8.009	8.013	8.018	8.023	8.028	8.032	8.037
1930	8.037	8.042	8.047	8.051	8.056	8.061	8.066	8.070	8.075	8.080	8.085
1940	8.085	8.089	8.094	8.099	8.104	8.108	8.113	8.118	8.123	8.127	8.132
1950	8.132	8.137	8.142	8.146	8.151	8.156	8.161	8.165	8.170	8.175	8.180
1960	8.180	8.185	8.189	8.194	8.199	8.204	8.208	8.213	8.218	8.223	8.227
1970	8.227	8.232	8.237	8.242	8.246	8.251	8.256	8.261	8.265	8.270	8.275
1980	8.275	8.280	8.285	8.289	8.294	8.299	8.304	8.308	8.313	8.318	8.323
1990	8.323	8.327	8.332	8.337	8.342	8.347	8.351	8.356	8.361	8.366	8.370
2000	8.370	8.375	8.380	8.385	8.389	8.394	8.399	8.404	8.409	8.413	8.418
2010	8.418	8.423	8.428	8.432	8.437	8.442	8.447	8.452	8.456	8.461	8.466
2020	8.466	8.471	8.476	8.480	8.485	8.490	8.495	8.499	8.504	8.509	8.514
2030	8.514	8.519	8.523	8.528	8.533	8.538	8.543	8.547	8.552	8.557	8.562
2040	8.562	8.566	8.571	8.576	8.581	8.586	8.590	8.595	8.600	8.605	8.610
2050	8.610	8.614	8.619	8.624	8.629	8.634	8.638	8.643	8.648	8.653	8.658
2060	8.658	8.662	8.667	8.672	8.677	8.682	8.686	8.691	8.696	8.701	8.705
2070	8.705	8.710	8.715	8.720	8.725	8.729	8.734	8.739	8.744	8.749	8.754
2080	8.754	8.758	8.763	8.768	8.773	8.778	8.782	8.787	8.792	8.797	8.802
2090	8.802	8.806	8.811	8.816	8.821	8.826	8.830	8.835	8.840	8.845	8.850
2100	8.850	8.854	8.859	8.864	8.869	8.874	8.879	8.883	8.888	8.893	8.898
2110	8.898	8.903	8.907	8.912	8.917	8.922	8.927	8.931	8.936	8.941	8.946
2120	8.946	8.951	8.956	8.960	8.965	8.970	8.975	8.980	8.984	8.989	8.994
2130	8.994	8.999	9.004	9.009	9.013	9.018	9.023	9.028	9.033	9.037	9.042
2140	9.042	9.047	9.052	9.057	9.062	9.066	9.071	9.076	9.081	9.086	9.091
2150	9.091	9.095	9.100	9.105	9.110	9.115	9.119	9.124	9.129	9.134	9.139
2160	9.139	9.144	9.148	9.153	9.158	9.163	9.168	9.173	9.177	9.182	9.187
2170	9.187	9.192	9.197	9.202	9.206	9.211	9.216	9.221	9.226	9.231	9.235
2180	9.235	9.240	9.245	9.250	9.255	9.260	9.264	9.269	9.274	9.279	9.284
2190	9.284	9.289	9.293	9.298	9.303	9.308	9.313	9.318	9.322	9.327	9.332
2200	9.332	9.337	9.342	9.347	9.352	9.356	9.361	9.366	9.371	9.376	9.381
2210	9.381	9.385	9.390	9.395	9.400	9.405	9.410	9.414	9.419	9.424	9.429
2220	9.429	9.434	9.439	9.443	9.448	9.453	9.458	9.463	9.468	9.473	9.477
2230	9.477	9.482	9.487	9.492	9.497	9.502	9.506	9.511	9.516	9.521	9.526
2240	9.526	9.531	9.536	9.540	9.545	9.550	9.555	9.560	9.565	9.570	9.574
2250	9.574	9.579	9.584	9.589	9.594	9.599	9.603	9.608	9.613	9.618	9.623
2260	9.623	9.628	9.633	9.637	9.642	9.647	9.652	9.657	9.662	9.667	9.671
2270	9.671	9.676	9.681	9.686	9.691	9.696	9.701	9.705	9.710	9.715	9.720
2280	9.720	9.725	9.730	9.734	9.739	9.744	9.749	9.754	9.759	9.764	9.768
2290	9.768	9.773	9.778	9.783	9.788	9.793	9.798	9.802	9.807	9.812	9.817
2300	9.817	9.822	9.827	9.832	9.836	9.841	9.846	9.851	9.856	9.861	9.866
2310	9.866	9.870	9.875	9.880	9.885	9.890	9.895	9.900	9.905	9.909	9.914
2320	9.914	9.919	9.924	9.929	9.934	9.939	9.943	9.948	9.953	9.958	9.963
2330	9.963	9.968	9.973	9.977	9.982	9.987	9.992	9.997	10.002	10.007	10.011
2340	10.011	10.016	10.021	10.026	10.031	10.036	10.041	10.045	10.050	10.055	10.060
2350	10.060	10.065	10.070	10.075	10.080	10.084	10.089	10.094	10.099	10.104	10.109
2360	10.109	10.114	10.118	10.123	10.128	10.133	10.138	10.143	10.148	10.152	10.157
2370	10.157	10.162	10.167	10.172	10.177	10.182	10.187	10.191	10.196	10.201	10.206
2380	10.206	10.211	10.216	10.221	10.225	10.230	10.235	10.240	10.245	10.250	10.255
2390	10.255	10.259	10.264	10.269	10.274	10.279	10.284	10.289	10.294	10.298	10.303

TABLE 29 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2400	10.303	10.308	10.313	10.318	10.323	10.328	10.332	10.337	10.342	10.347	10.352
2410	10.352	10.357	10.362	10.366	10.371	10.376	10.381	10.386	10.391	10.396	10.401
2420	10.401	10.405	10.410	10.415	10.420	10.425	10.430	10.435	10.439	10.444	10.449
2430	10.449	10.454	10.459	10.464	10.469	10.473	10.478	10.483	10.488	10.493	10.498
2440	10.498	10.503	10.507	10.512	10.517	10.522	10.527	10.532	10.537	10.542	10.546
2450	10.546	10.551	10.556	10.561	10.566	10.571	10.576	10.580	10.585	10.590	10.595
2460	10.595	10.600	10.605	10.610	10.614	10.619	10.524	10.629	10.634	10.639	10.644
2470	10.644	10.648	10.653	10.658	10.663	10.668	10.673	10.678	10.682	10.687	10.692
2480	10.692	10.697	10.702	10.707	10.712	10.716	10.721	10.726	10.731	10.736	10.741
2490	10.741	10.746	10.750	10.755	10.760	10.765	10.770	10.775	10.780	10.784	10.789
2500	10.789	10.794	10.799	10.804	10.809	10.814	10.818	10.823	10.828	10.833	10.838
2510	10.838	10.841	10.848	10.852	10.857	10.862	10.867	10.872	10.877	10.882	10.886
2520	10.886	10.891	10.896	10.901	10.906	10.911	10.915	10.920	10.925	10.930	10.935
2530	10.935	10.940	10.945	10.949	10.954	10.959	10.964	10.969	10.974	10.979	10.983
2540	10.983	10.988	10.993	10.998	11.003	11.008	11.012	11.017	11.022	11.027	11.032
2550	11.032	11.037	11.042	11.046	11.051	11.056	11.061	11.066	11.071	11.075	11.080
2560	11.080	11.085	11.090	11.095	11.100	11.104	11.109	11.114	11.119	11.124	11.129
2570	11.129	11.133	11.138	11.143	11.148	11.153	11.158	11.163	11.167	11.172	11.177
2580	11.177	11.182	11.187	11.192	11.196	11.201	11.206	11.211	11.216	11.221	11.225
2590	11.225	11.230	11.235	11.240	11.245	11.250	11.254	11.259	11.264	11.269	11.274
2600	11.274	11.278	11.283	11.288	11.293	11.298	11.303	11.307	11.312	11.317	11.322
2610	11.322	11.327	11.332	11.336	11.341	11.346	11.351	11.356	11.361	11.365	11.370
2620	11.370	11.375	11.380	11.385	11.389	11.394	11.399	11.404	11.409	11.414	11.418
2630	11.418	11.423	11.428	11.433	11.438	11.442	11.447	11.452	11.457	11.462	11.466
2640	11.466	11.471	11.476	11.481	11.486	11.491	11.495	11.500	11.505	11.510	11.515
2650	11.515	11.519	11.524	11.529	11.534	11.539	11.543	11.548	11.553	11.558	11.563
2660	11.563	11.567	11.572	11.577	11.582	11.587	11.591	11.596	11.601	11.606	11.611
2670	11.611	11.615	11.620	11.625	11.630	11.635	11.639	11.644	11.649	11.654	11.659
2680	11.659	11.663	11.668	11.673	11.678	11.683	11.687	11.692	11.697	11.702	11.707
2690	11.707	11.711	11.716	11.721	11.726	11.730	11.735	11.740	11.745	11.750	11.754
2700	11.754	11.759	11.764	11.769	11.774	11.778	11.783	11.788	11.793	11.797	11.802
2710	11.802	11.807	11.812	11.817	11.821	11.826	11.831	11.836	11.840	11.845	11.850
2720	11.850	11.855	11.859	11.864	11.869	11.874	11.879	11.883	11.888	11.893	11.898
2730	11.898	11.902	11.907	11.912	11.917	11.921	11.926	11.931	11.936	11.940	11.945
2740	11.945	11.950	11.955	11.960	11.964	11.969	11.974	11.979	11.983	11.988	11.993
2750	11.993	11.998	12.002	12.007	12.012	12.017	12.021	12.026	12.031	12.036	12.040
2760	12.040	12.045	12.050	12.055	12.059	12.064	12.069	12.074	12.078	12.083	12.088
2770	12.088	12.093	12.097	12.102	12.107	12.111	12.116	12.121	12.126	12.130	12.135
2780	12.135	12.140	12.145	12.149	12.154	12.159	12.164	12.168	12.173	12.178	12.182
2790	12.182	12.187	12.192	12.197	12.201	12.206	12.211	12.215	12.220	12.225	12.230
2800	12.230	12.234	12.239	12.244	12.249	12.253	12.258	12.263	12.267	12.272	12.277
2810	12.277	12.282	12.286	12.291	12.296	12.300	12.305	12.310	12.314	12.319	12.324
2820	12.324	12.329	12.333	12.338	12.343	12.347	12.352	12.357	12.361	12.366	12.371
2830	12.371	12.376	12.380	12.385	12.390	12.394	12.399	12.404	12.408	12.413	12.418
2840	12.418	12.423	12.427	12.432	12.437	12.441	12.446	12.451	12.455	12.460	12.465
2850	12.465	12.469	12.474	12.479	12.483	12.488	12.493	12.497	12.502	12.507	12.511
2860	12.511	12.516	12.521	12.525	12.530	12.535	12.539	12.544	12.549	12.553	12.558
2870	12.558	12.563	12.567	12.572	12.577	12.581	12.586	12.591	12.595	12.600	12.605
2880	12.605	12.609	12.614	12.619	12.623	12.628	12.633	12.637	12.642	12.647	12.651
2890	12.651	12.656	12.661	12.665	12.670	12.674	12.679	12.684	12.688	12.693	12.698
2900	12.698	12.702	12.707	12.712	12.716	12.721	12.725	12.730	12.735	12.739	12.744
2910	12.744	12.749	12.753	12.758	12.762	12.767	12.772	12.776	12.781	12.786	12.790
2920	12.790	12.795	12.799	12.804	12.809	12.813	12.818	12.823	12.827	12.832	12.836
2930	12.836	12.841	12.846	12.850	12.855	12.859	12.864	12.869	12.873	12.878	12.882
2940	12.882	12.887	12.892	12.896	12.901	12.905	12.910	12.915	12.919	12.924	12.928
2950	12.928	12.933	12.938	12.942	12.947	12.951	12.956	12.961	12.965	12.970	12.974
2960	12.974	12.979	12.983	12.988	12.993	12.997	13.002	13.006	13.011	13.016	13.020
2970	13.020	13.025	13.029	13.034	13.038	13.043	13.048	13.052	13.057	13.061	13.066
2980	13.066	13.070	13.075	13.079	13.084	13.089	13.093	13.098	13.102	13.107	13.111

TABLE 29 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2990	13.111	13.116	13.121	13.125	13.130	13.134	13.139	13.143	13.148	13.152	13.157
3000	13.157	13.161	13.166	13.171	13.175	13.180	13.184	13.189	13.193	13.198	13.202
3010	13.202	13.207	13.211	13.216	13.220	13.225	13.230	13.234	13.239	13.243	13.248
3020	13.248	13.252	13.257	13.261	13.266	13.270	13.275	13.279	13.284	13.288	13.293
3030	13.293	13.297	13.302	13.306	13.311	13.315	13.320	13.324	13.329	13.333	13.338
3040	13.338	13.342	13.347	13.351	13.356	13.360	13.365	13.369	13.374	13.378	13.383
3050	13.383	13.387	13.392	13.396	13.401	13.405	13.410	13.414	13.419	13.423	13.428
3060	13.428	13.432	13.437	13.441	13.446	13.450	13.455	13.459	13.464	13.468	13.473
3070	13.473	13.477	13.482	13.486	13.491	13.495	13.500	13.504	13.508	13.513	13.517
3080	13.517	13.522	13.526	13.531	13.535	13.540	13.544	13.549	13.553	13.558	13.562
3090	13.562	13.567	13.571	13.575	13.580	13.584	13.589	13.593	13.598	13.602	13.607
3100	13.607	13.611	13.615	13.620	13.624	13.629	13.633	13.638	13.642	13.647	13.651
3110	13.651	13.655	13.660	13.664	13.669	13.673	13.678	13.682	13.687	13.691	13.695
3120	13.695	13.700	13.704	13.709	13.713	13.717	13.722	13.726	13.731	13.735	13.740
3130	13.740	13.744	13.748	13.753	13.757	13.762	13.766	13.771	13.775	13.779	13.784
3140	13.784	13.788	13.793	13.797	13.801	13.806	13.810	13.815	13.819	13.823	13.828
3150	13.828	13.832	13.837	13.841	13.845	13.850	13.854	13.859	13.863	13.867	13.872
3160	13.872	13.876	13.881	13.885	13.889	13.894	13.898	13.903	13.907	13.911	13.916
3170	13.916	13.920	13.924	13.929	13.933	13.938	13.942	13.946	13.951	13.955	13.959
3180	13.959	13.964	13.968	13.973	13.977	13.981	13.986	13.990	13.994	13.999	14.003
3190	14.003	14.008	14.012	14.016	14.021	14.025	14.029	14.034	14.038	14.042	14.047
3200	14.047	14.051	14.055	14.060	14.064	14.069	14.073	14.077	14.082	14.086	14.090
3210	14.090	14.095	14.099	14.103	14.108						

TABLE 30 Type JP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–210	–2.560										
–200	–2.553	–2.555	–2.556	–2.557	–2.558	–2.559	–2.560	–2.560	–2.560	–2.560	–2.560
–190	–2.527	–2.530	–2.534	–2.537	–2.540	–2.542	–2.545	–2.547	–2.549	–2.551	–2.553
–180	–2.483	–2.488	–2.493	–2.498	–2.503	–2.507	–2.512	–2.516	–2.520	–2.523	–2.527
–170	–2.423	–2.430	–2.436	–2.443	–2.449	–2.455	–2.461	–2.467	–2.472	–2.478	–2.483
–160	–2.349	–2.357	–2.365	–2.372	–2.380	–2.388	–2.395	–2.402	–2.409	–2.416	–2.423
–150	–2.261	–2.270	–2.279	–2.288	–2.297	–2.306	–2.315	–2.324	–2.332	–2.340	–2.349
–140	–2.160	–2.171	–2.181	–2.191	–2.202	–2.212	–2.222	–2.232	–2.241	–2.251	–2.261
–130	–2.049	–2.060	–2.072	–2.083	–2.095	–2.106	–2.117	–2.128	–2.139	–2.149	–2.160
–120	–1.927	–1.940	–1.952	–1.965	–1.977	–1.989	–2.001	–2.013	–2.025	–2.037	–2.049
–110	–1.797	–1.810	–1.824	–1.837	–1.850	–1.863	–1.876	–1.889	–1.902	–1.915	–1.927
–100	–1.658	–1.673	–1.687	–1.701	–1.715	–1.729	–1.742	–1.756	–1.770	–1.783	–1.797
–90	–1.513	–1.528	–1.542	–1.557	–1.572	–1.586	–1.601	–1.615	–1.630	–1.644	–1.658
–80	–1.361	–1.376	–1.392	–1.407	–1.422	–1.437	–1.453	–1.468	–1.483	–1.498	–1.513
–70	–1.203	–1.219	–1.235	–1.251	–1.267	–1.283	–1.298	–1.314	–1.330	–1.345	–1.361
–60	–1.041	–1.057	–1.074	–1.090	–1.106	–1.122	–1.139	–1.155	–1.171	–1.187	–1.203
–50	–0.874	–0.891	–0.908	–0.925	–0.941	–0.958	–0.975	–0.991	–1.008	–1.024	–1.041
–40	–0.704	–0.721	–0.738	–0.755	–0.773	–0.790	–0.807	–0.824	–0.840	–0.857	–0.874
–30	–0.531	–0.549	–0.566	–0.583	–0.601	–0.618	–0.635	–0.653	–0.670	–0.687	–0.704
–20	–0.356	–0.373	–0.391	–0.409	–0.426	–0.444	–0.461	–0.479	–0.496	–0.514	–0.531
–10	–0.179	–0.196	–0.214	–0.232	–0.250	–0.267	–0.285	–0.303	–0.320	–0.338	–0.356
0	0.000	–0.018	–0.036	–0.054	–0.072	–0.089	–0.107	–0.125	–0.143	–0.161	–0.179
0	0.000	0.018	0.036	0.054	0.072	0.090	0.108	0.126	0.144	0.162	0.180
10	0.180	0.198	0.216	0.234	0.252	0.270	0.288	0.306	0.324	0.342	0.360
20	0.360	0.378	0.396	0.414	0.432	0.450	0.468	0.486	0.504	0.522	0.540
30	0.540	0.558	0.576	0.594	0.612	0.630	0.648	0.666	0.684	0.702	0.720
40	0.720	0.738	0.756	0.774	0.792	0.810	0.828	0.845	0.863	0.881	0.899
50	0.899	0.917	0.935	0.953	0.971	0.989	1.007	1.024	1.042	1.060	1.078
60	1.078	1.096	1.113	1.131	1.149	1.167	1.185	1.202	1.220	1.238	1.255
70	1.255	1.273	1.291	1.308	1.326	1.344	1.361	1.379	1.396	1.414	1.432
80	1.432	1.449	1.467	1.484	1.502	1.519	1.537	1.554	1.571	1.589	1.606
90	1.606	1.623	1.641	1.658	1.675	1.693	1.710	1.727	1.745	1.762	1.779
100	1.779	1.796	1.813	1.830	1.847	1.865	1.882	1.899	1.916	1.933	1.950
110	1.950	1.967	1.984	2.000	2.017	2.034	2.051	2.068	2.085	2.102	2.118
120	2.118	2.135	2.152	2.168	2.185	2.202	2.218	2.235	2.252	2.268	2.285
130	2.285	2.301	2.318	2.334	2.350	2.367	2.383	2.400	2.416	2.432	2.448
140	2.448	2.465	2.481	2.497	2.513	2.529	2.546	2.562	2.578	2.594	2.610
150	2.610	2.626	2.642	2.658	2.673	2.689	2.705	2.721	2.737	2.753	2.768
160	2.768	2.784	2.800	2.815	2.831	2.847	2.862	2.878	2.893	2.909	2.924
170	2.924	2.940	2.955	2.970	2.986	3.001	3.016	3.032	3.047	3.062	3.077
180	3.077	3.092	3.107	3.123	3.138	3.153	3.168	3.183	3.198	3.212	3.227
190	3.227	3.242	3.257	3.272	3.287	3.301	3.316	3.331	3.345	3.360	3.375
200	3.375	3.389	3.404	3.418	3.433	3.447	3.461	3.476	3.490	3.504	3.519
210	3.519	3.533	3.547	3.561	3.576	3.590	3.604	3.618	3.632	3.646	3.660
220	3.660	3.674	3.688	3.702	3.716	3.730	3.743	3.757	3.771	3.785	3.798
230	3.798	3.812	3.826	3.839	3.853	3.866	3.880	3.893	3.907	3.920	3.934
240	3.934	3.947	3.960	3.974	3.987	4.000	4.013	4.026	4.040	4.053	4.066
250	4.066	4.079	4.092	4.105	4.118	4.131	4.144	4.157	4.170	4.182	4.195
260	4.195	4.208	4.221	4.234	4.246	4.259	4.272	4.284	4.297	4.309	4.322
270	4.322	4.334	4.347	4.359	4.372	4.384	4.396	4.409	4.421	4.433	4.445
280	4.445	4.458	4.470	4.482	4.494	4.506	4.518	4.530	4.542	4.554	4.566
290	4.566	4.578	4.590	4.602	4.614	4.626	4.638	4.649	4.661	4.673	4.685
300	4.685	4.696	4.708	4.720	4.731	4.743	4.754	4.766	4.777	4.789	4.800
310	4.800	4.812	4.823	4.834	4.846	4.857	4.868	4.880	4.891	4.902	4.913
320	4.913	4.925	4.936	4.947	4.958	4.969	4.980	4.991	5.002	5.013	5.024
330	5.024	5.035	5.046	5.057	5.068	5.079	5.089	5.100	5.111	5.122	5.133
340	5.133	5.143	5.154	5.165	5.175	5.186	5.197	5.207	5.218	5.228	5.239
350	5.239	5.249	5.260	5.270	5.281	5.291	5.302	5.312	5.322	5.333	5.343
360	5.343	5.353	5.364	5.374	5.384	5.395	5.405	5.415	5.425	5.435	5.446

TABLE 30 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
370	5.446	5.456	5.466	5.476	5.486	5.496	5.506	5.516	5.526	5.536	5.546
380	5.546	5.556	5.566	5.576	5.586	5.596	5.606	5.616	5.626	5.636	5.646
390	5.646	5.655	5.665	5.675	5.685	5.695	5.704	5.714	5.724	5.734	5.743
400	5.743	5.753	5.763	5.772	5.782	5.792	5.801	5.811	5.821	5.830	5.840
410	5.840	5.850	5.859	5.869	5.878	5.888	5.898	5.907	5.917	5.926	5.936
420	5.936	5.945	5.955	5.964	5.974	5.983	5.993	6.002	6.012	6.021	6.031
430	6.031	6.040	6.049	6.059	6.068	6.078	6.087	5.097	6.106	6.115	6.125
440	6.125	6.134	6.144	6.153	6.162	6.172	6.181	6.191	6.200	6.209	6.219
450	6.219	6.228	6.237	6.247	6.256	6.266	6.275	6.284	6.294	6.303	6.312
460	6.312	6.322	6.331	6.341	6.350	6.359	6.369	6.378	6.387	6.397	6.406
470	6.406	6.416	6.425	6.434	6.444	6.453	6.463	6.472	6.481	6.491	6.500
480	6.500	6.510	6.519	6.529	6.538	6.547	6.557	6.566	6.576	6.585	6.595
490	6.595	6.604	6.614	6.623	6.633	6.642	6.652	6.661	6.671	6.681	6.690
500	6.690	6.700	6.709	6.719	6.729	6.738	6.748	6.757	6.767	6.777	6.786
510	6.786	6.796	6.806	6.816	6.825	6.835	6.845	6.855	6.864	6.874	6.884
520	6.884	6.894	6.904	6.913	6.923	6.933	6.943	6.953	6.963	6.973	6.983
530	6.983	6.993	7.003	7.013	7.023	7.033	7.043	7.053	7.063	7.073	7.083
540	7.083	7.094	7.104	7.114	7.124	7.134	7.145	7.155	7.165	7.175	7.186
550	7.186	7.196	7.207	7.217	7.227	7.238	7.248	7.259	7.269	7.280	7.290
560	7.290	7.301	7.312	7.322	7.333	7.344	7.354	7.365	7.376	7.387	7.397
570	7.397	7.408	7.419	7.430	7.441	7.452	7.463	7.474	7.485	7.496	7.507
580	7.507	7.518	7.529	7.540	7.551	7.563	7.574	7.585	7.596	7.608	7.619
590	7.619	7.630	7.642	7.653	7.665	7.676	7.688	7.699	7.711	7.723	7.734
600	7.734	7.746	7.758	7.769	7.781	7.793	7.805	7.817	7.829	7.840	7.852
610	7.852	7.864	7.876	7.889	7.901	7.913	7.925	7.937	7.949	7.962	7.974
620	7.974	7.986	7.999	8.011	8.024	8.036	8.049	8.061	8.074	8.086	8.099
630	8.099	8.112	8.124	8.137	8.150	8.163	8.176	8.189	8.202	8.215	8.228
640	8.228	8.241	8.254	8.267	8.280	8.293	8.307	8.320	8.333	8.347	8.360
650	8.360	8.373	8.387	8.400	8.414	8.427	8.441	8.455	8.468	8.482	8.496
660	8.496	8.510	8.524	8.538	8.551	8.565	8.579	8.594	8.608	8.622	8.636
670	8.636	8.650	8.664	8.679	8.693	8.707	8.722	8.736	8.751	8.765	8.780
680	8.780	8.794	8.809	8.824	8.838	8.853	8.868	8.883	8.897	8.912	8.927
690	8.927	8.942	8.957	8.972	8.987	9.003	9.018	9.033	9.048	9.064	9.079
700	9.079	9.094	9.110	9.125	9.141	9.156	9.172	9.187	9.203	9.218	9.234
710	9.234	9.250	9.266	9.282	9.297	9.313	9.329	9.345	9.361	9.377	9.393
720	9.393	9.409	9.425	9.442	9.458	9.474	9.490	9.507	9.523	9.539	9.556
730	9.556	9.572	9.589	9.605	9.622	9.638	9.655	9.672	9.688	9.705	9.722
740	9.722	9.738	9.755	9.772	9.789	9.806	9.823	9.840	9.857	9.874	9.891
750	9.891	9.908	9.925	9.942	9.959	9.976	9.994	10.011	10.028	10.045	10.063
760	10.063										

TABLE 31 Type JP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–340	–2.560	–2.560	–2.560	–2.560	–2.560	–2.560	–2.560				
–330	–2.555	–2.556	–2.556	–2.557	–2.558	–2.558	–2.559	–2.559	–2.560	–2.560	–2.560
–320	–2.544	–2.545	–2.547	–2.548	–2.549	–2.550	–2.551	–2.552	–2.553	–2.554	–2.555
–310	–2.527	–2.529	–2.531	–2.533	–2.534	–2.536	–2.538	–2.539	–2.541	–2.542	–2.544
–300	–2.505	–2.507	–2.510	–2.512	–2.514	–2.517	–2.519	–2.521	–2.523	–2.525	–2.527
–290	–2.477	–2.480	–2.483	–2.486	–2.489	–2.492	–2.494	–2.497	–2.500	–2.502	–2.505
–280	–2.445	–2.448	–2.452	–2.455	–2.458	–2.462	–2.465	–2.468	–2.471	–2.474	–2.477
–270	–2.408	–2.412	–2.416	–2.420	–2.423	–2.427	–2.431	–2.434	–2.438	–2.441	–2.445
–260	–2.366	–2.371	–2.375	–2.379	–2.384	–2.388	–2.392	–2.396	–2.400	–2.404	–2.408
–250	–2.321	–2.325	–2.330	–2.335	–2.339	–2.344	–2.349	–2.353	–2.358	–2.362	–2.366
–240	–2.271	–2.276	–2.281	–2.286	–2.291	–2.296	–2.301	–2.306	–2.311	–2.316	–2.321
–230	–2.217	–2.223	–2.228	–2.234	–2.239	–2.245	–2.250	–2.255	–2.261	–2.266	–2.271
–220	–2.160	–2.166	–2.172	–2.178	–2.183	–2.189	–2.195	–2.201	–2.206	–2.212	–2.217
–210	–2.100	–2.106	–2.112	–2.118	–2.124	–2.130	–2.136	–2.142	–2.148	–2.154	–2.160
–200	–2.036	–2.042	–2.049	–2.055	–2.062	–2.068	–2.074	–2.081	–2.087	–2.093	–2.100
–190	–1.969	–1.976	–1.982	–1.989	–1.996	–2.003	–2.009	–2.016	–2.023	–2.029	–2.036
–180	–1.899	–1.906	–1.913	–1.920	–1.927	–1.934	–1.941	–1.948	–1.955	–1.962	–1.969
–170	–1.827	–1.834	–1.841	–1.849	–1.856	–1.863	–1.870	–1.878	–1.885	–1.892	–1.899
–160	–1.752	–1.759	–1.767	–1.774	–1.782	–1.789	–1.797	–1.804	–1.812	–1.819	–1.827
–150	–1.674	–1.682	–1.690	–1.698	–1.705	–1.713	–1.721	–1.729	–1.736	–1.744	–1.752
–140	–1.594	–1.602	–1.611	–1.619	–1.627	–1.635	–1.642	–1.650	–1.658	–1.666	–1.674
–130	–1.513	–1.521	–1.529	–1.537	–1.546	–1.554	–1.562	–1.570	–1.578	–1.586	–1.594
–120	–1.429	–1.437	–1.446	–1.454	–1.463	–1.471	–1.479	–1.488	–1.496	–1.504	–1.513
–110	–1.343	–1.352	–1.361	–1.369	–1.378	–1.386	–1.395	–1.403	–1.412	–1.420	–1.429
–100	–1.256	–1.265	–1.274	–1.283	–1.291	–1.300	–1.309	–1.317	–1.326	–1.335	–1.343
–90	–1.167	–1.176	–1.185	–1.194	–1.203	–1.212	–1.221	–1.230	–1.239	–1.247	–1.256
–80	–1.077	–1.086	–1.095	–1.104	–1.113	–1.122	–1.132	–1.141	–1.149	–1.158	–1.167
–70	–0.986	–0.995	–1.004	–1.013	–1.022	–1.032	–1.041	–1.050	–1.059	–1.068	–1.077
–60	–0.893	–0.902	–0.912	–0.921	–0.930	–0.939	–0.949	–0.958	–0.967	–0.976	–0.986
–50	–0.799	–0.808	–0.818	–0.827	–0.837	–0.846	–0.855	–0.865	–0.874	–0.884	–0.893
–40	–0.704	–0.714	–0.723	–0.733	–0.742	–0.752	–0.761	–0.771	–0.780	–0.790	–0.799
–30	–0.608	–0.618	–0.628	–0.637	–0.647	–0.656	–0.666	–0.675	–0.685	–0.695	–0.704
–20	–0.512	–0.521	–0.531	–0.541	–0.551	–0.560	–0.570	–0.579	–0.589	–0.599	–0.608
–10	–0.414	–0.424	–0.434	–0.444	–0.453	–0.463	–0.473	–0.483	–0.492	–0.502	–0.512
0	–0.317	–0.326	–0.336	–0.346	–0.356	–0.366	–0.375	–0.385	–0.395	–0.405	–0.414
0	–0.317	–0.307	–0.297	–0.287	–0.277	–0.267	–0.258	–0.248	–0.238	–0.228	–0.218
10	–0.218	–0.208	–0.198	–0.188	–0.179	–0.169	–0.159	–0.149	–0.139	–0.129	–0.119
20	–0.119	–0.109	–0.099	–0.089	–0.080	–0.070	–0.060	–0.050	–0.040	–0.030	–0.020
30	–0.020	–0.010	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080
40	0.080	0.090	0.100	0.110	0.120	0.130	0.140	0.150	0.160	0.170	0.180
50	0.180	0.190	0.200	0.210	0.220	0.230	0.240	0.250	0.260	0.270	0.280
60	0.280	0.290	0.300	0.310	0.320	0.330	0.340	0.350	0.360	0.370	0.380
70	0.380	0.390	0.400	0.410	0.420	0.430	0.440	0.450	0.460	0.470	0.480
80	0.480	0.490	0.500	0.510	0.520	0.530	0.540	0.550	0.560	0.570	0.580
90	0.580	0.590	0.600	0.610	0.620	0.630	0.640	0.650	0.660	0.670	0.680
100	0.680	0.690	0.700	0.710	0.720	0.730	0.740	0.750	0.760	0.770	0.780
110	0.780	0.790	0.800	0.810	0.820	0.830	0.840	0.849	0.859	0.869	0.879
120	0.879	0.889	0.899	0.909	0.919	0.929	0.939	0.949	0.959	0.969	0.979
130	0.979	0.989	0.999	1.009	1.018	1.028	1.038	1.048	1.058	1.068	1.078
140	1.078	1.088	1.098	1.108	1.117	1.127	1.137	1.147	1.157	1.167	1.177
150	1.177	1.187	1.196	1.206	1.216	1.226	1.236	1.246	1.255	1.265	1.275
160	1.275	1.285	1.295	1.304	1.314	1.324	1.334	1.344	1.353	1.363	1.373
170	1.373	1.383	1.393	1.402	1.412	1.422	1.432	1.441	1.451	1.461	1.471
180	1.471	1.480	1.490	1.500	1.509	1.519	1.529	1.538	1.548	1.558	1.567
190	1.567	1.577	1.587	1.596	1.606	1.616	1.625	1.635	1.645	1.654	1.664
200	1.664	1.674	1.683	1.693	1.702	1.712	1.722	1.731	1.741	1.750	1.760
210	1.760	1.769	1.779	1.788	1.798	1.808	1.817	1.827	1.836	1.846	1.855
220	1.855	1.865	1.874	1.884	1.893	1.902	1.912	1.921	1.931	1.940	1.950
230	1.950	1.959	1.969	1.978	1.987	1.997	2.006	2.016	2.025	2.034	2.044
240	2.044	2.053	2.062	2.072	2.081	2.090	2.100	2.109	2.118	2.128	2.137

TABLE 31 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
250	2.137	2.146	2.155	2.165	2.174	2.183	2.192	2.202	2.211	2.220	2.229
260	2.229	2.239	2.248	2.257	2.266	2.275	2.285	2.294	2.303	2.312	2.321
270	2.321	2.330	2.339	2.349	2.358	2.367	2.376	2.385	2.394	2.403	2.412
280	2.412	2.421	2.430	2.439	2.448	2.457	2.466	2.475	2.485	2.493	2.502
290	2.502	2.511	2.520	2.529	2.538	2.547	2.556	2.565	2.574	2.583	2.592
300	2.592	2.601	2.610	2.619	2.627	2.636	2.645	2.654	2.663	2.672	2.681
310	2.681	2.689	2.698	2.707	2.716	2.725	2.733	2.742	2.751	2.760	2.768
320	2.768	2.777	2.786	2.794	2.803	2.812	2.821	2.829	2.838	2.847	2.855
330	2.855	2.864	2.873	2.881	2.890	2.898	2.907	2.916	2.924	2.933	2.941
340	2.941	2.950	2.958	2.967	2.976	2.984	2.993	3.001	3.010	3.018	3.027
350	3.027	3.035	3.043	3.052	3.060	3.069	3.077	3.086	3.094	3.102	3.111
360	3.111	3.119	3.128	3.136	3.144	3.153	3.161	3.169	3.178	3.186	3.194
370	3.194	3.203	3.211	3.219	3.227	3.236	3.244	3.252	3.260	3.269	3.277
380	3.277	3.285	3.293	3.301	3.309	3.318	3.326	3.334	3.342	3.350	3.358
390	3.358	3.366	3.375	3.383	3.391	3.399	3.407	3.415	3.423	3.431	3.439
400	3.439	3.447	3.455	3.463	3.471	3.479	3.487	3.495	3.503	3.511	3.519
410	3.519	3.527	3.535	3.543	3.550	3.558	3.566	3.574	3.582	3.590	3.598
420	3.598	3.605	3.613	3.621	3.629	3.637	3.644	3.652	3.660	3.668	3.676
430	3.676	3.683	3.691	3.699	3.706	3.714	3.722	3.730	3.737	3.745	3.753
440	3.753	3.760	3.768	3.775	3.783	3.791	3.798	3.806	3.813	3.821	3.829
450	3.829	3.836	3.844	3.851	3.859	3.866	3.874	3.881	3.889	3.896	3.904
460	3.904	3.911	3.919	3.926	3.934	3.941	3.948	3.956	3.963	3.971	3.978
470	3.978	3.985	3.993	4.000	4.007	4.015	4.022	4.029	4.037	4.044	4.051
480	4.051	4.059	4.066	4.073	4.080	4.088	4.095	4.102	4.109	4.117	4.124
490	4.124	4.131	4.138	4.145	4.152	4.160	4.167	4.174	4.181	4.188	4.195
500	4.195	4.202	4.209	4.217	4.224	4.231	4.238	4.245	4.252	4.259	4.266
510	4.266	4.273	4.280	4.287	4.294	4.301	4.308	4.315	4.322	4.329	4.336
520	4.336	4.343	4.350	4.356	4.363	4.370	4.377	4.384	4.391	4.398	4.405
530	4.405	4.411	4.418	4.425	4.432	4.439	4.445	4.452	4.459	4.466	4.473
540	4.473	4.479	4.486	4.493	4.500	4.506	4.513	4.520	4.526	4.533	4.540
550	4.540	4.546	4.553	4.560	4.566	4.573	4.580	4.586	4.593	4.599	4.606
560	4.606	4.613	4.619	4.626	4.632	4.639	4.645	4.652	4.659	4.665	4.672
570	4.672	4.678	4.685	4.691	4.698	4.704	4.711	4.717	4.723	4.730	4.736
580	4.736	4.743	4.749	4.756	4.762	4.768	4.775	4.781	4.788	4.794	4.800
590	4.800	4.807	4.813	4.819	4.826	4.832	4.838	4.845	4.851	4.857	4.863
600	4.863	4.870	4.876	4.882	4.888	4.895	4.901	4.907	4.913	4.920	4.926
610	4.926	4.932	4.938	4.944	4.951	4.957	4.963	4.969	4.975	4.981	4.987
620	4.987	4.994	5.000	5.006	5.012	5.018	5.024	5.030	5.036	5.042	5.048
630	5.048	5.054	5.060	5.067	5.073	5.079	5.085	5.091	5.097	5.103	5.109
640	5.109	5.115	5.121	5.127	5.133	5.139	5.144	5.150	5.156	5.162	5.168
650	5.168	5.174	5.180	5.186	5.192	5.198	5.204	5.210	5.215	5.221	5.227
660	5.227	5.233	5.239	5.245	5.251	5.256	5.262	5.268	5.274	5.280	5.285
670	5.285	5.291	5.297	5.303	5.309	5.314	5.320	5.326	5.332	5.337	5.343
680	5.343	5.349	5.355	5.360	5.366	5.372	5.378	5.383	5.389	5.395	5.400
690	5.400	5.406	5.412	5.417	5.423	5.429	5.434	5.440	5.446	5.451	5.457
700	5.457	5.463	5.468	5.474	5.479	5.485	5.491	5.496	5.502	5.507	5.513
710	5.513	5.519	5.524	5.530	5.535	5.541	5.546	5.552	5.557	5.563	5.569
720	5.569	5.574	5.580	5.585	5.591	5.596	5.602	5.607	5.613	5.618	5.624
730	5.624	5.629	5.635	5.640	5.646	5.651	5.656	5.662	5.667	5.673	5.678
740	5.678	5.684	5.689	5.695	5.700	5.705	5.711	5.716	5.722	5.727	5.733
750	5.733	5.738	5.743	5.749	5.754	5.760	5.765	5.770	5.776	5.781	5.786
760	5.786	5.792	5.797	5.803	5.808	5.813	5.819	5.824	5.829	5.835	5.840
770	5.840	5.845	5.851	5.856	5.861	5.867	5.872	5.877	5.883	5.888	5.893
780	5.893	5.899	5.904	5.909	5.915	5.920	5.925	5.930	5.936	5.941	5.946
790	5.946	5.952	5.957	5.962	5.967	5.973	5.978	5.983	5.988	5.994	5.999
800	5.999	6.004	6.010	6.015	6.020	6.025	6.031	6.036	6.041	6.046	6.052
810	6.052	6.057	6.062	6.067	6.073	6.078	6.083	6.088	6.093	6.099	6.104
820	6.104	6.109	6.114	6.120	6.125	6.130	6.135	6.141	6.146	6.151	6.156

TABLE 31 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
830	6.156	6.161	6.167	6.172	6.177	6.182	6.187	6.193	6.198	6.203	6.208
840	6.208	6.214	6.219	6.224	6.229	6.234	6.240	6.245	6.250	6.255	6.260
850	6.260	6.266	6.271	6.276	6.281	6.286	6.292	6.297	6.302	6.307	6.312
860	6.312	6.318	6.323	6.328	6.333	6.338	6.344	6.349	6.354	6.359	6.365
870	6.365	6.370	6.375	6.380	6.385	6.391	6.396	6.401	6.406	6.411	6.417
880	6.417	6.422	6.427	6.432	6.438	6.443	6.448	6.453	6.458	6.464	6.469
890	6.469	6.474	6.479	6.485	6.490	6.495	6.500	6.506	6.511	6.516	6.521
900	6.521	6.526	6.532	6.537	6.542	6.547	6.553	6.558	6.563	6.569	6.574
910	6.574	6.579	6.584	6.590	6.595	6.600	6.605	6.611	6.616	6.621	6.627
920	6.627	6.632	6.637	6.642	6.648	6.653	6.658	6.664	6.669	6.674	6.680
930	6.680	6.685	6.690	6.695	6.701	6.706	6.711	6.717	6.722	6.727	6.733
940	6.733	6.738	6.743	6.749	6.754	6.760	6.765	6.770	6.776	6.781	6.786
950	6.786	6.792	6.797	6.803	6.808	6.813	6.819	6.824	6.830	6.835	6.840
960	6.840	6.846	6.851	6.857	6.862	6.868	6.873	6.878	6.884	6.869	6.895
970	6.895	6.900	6.906	6.911	6.917	6.922	6.928	6.933	6.939	6.944	6.950
980	6.950	6.955	6.961	6.966	6.972	6.977	6.983	6.988	6.994	6.999	7.005
990	7.005	7.011	7.016	7.022	7.027	7.033	7.038	7.044	7.050	7.055	7.061
1000	7.061	7.066	7.072	7.078	7.083	7.089	7.095	7.100	7.106	7.112	7.117
1010	7.117	7.123	7.129	7.134	7.140	7.146	7.151	7.157	7.163	7.169	7.174
1020	7.174	7.180	7.186	7.192	7.197	7.203	7.209	7.215	7.220	7.226	7.232
1030	7.232	7.238	7.244	7.249	7.255	7.261	7.267	7.273	7.279	7.285	7.290
1040	7.290	7.296	7.302	7.308	7.314	7.320	7.326	7.332	7.338	7.344	7.350
1050	7.350	7.355	7.361	7.367	7.373	7.379	7.385	7.391	7.397	7.403	7.409
1060	7.409	7.415	7.421	7.427	7.434	7.440	7.446	7.452	7.458	7.464	7.470
1070	7.470	7.476	7.482	7.488	7.494	7.501	7.507	7.513	7.519	7.525	7.531
1080	7.531	7.538	7.544	7.550	7.556	7.563	7.569	7.575	7.581	7.588	7.594
1090	7.594	7.600	7.606	7.613	7.619	7.625	7.632	7.638	7.644	7.651	7.657
1100	7.657	7.663	7.670	7.676	7.683	7.689	7.695	7.702	7.708	7.715	7.721
1110	7.721	7.728	7.734	7.741	7.747	7.754	7.760	7.767	7.773	7.780	7.786
1120	7.786	7.793	7.799	7.806	7.813	7.819	7.826	7.833	7.839	7.846	7.852
1130	7.852	7.859	7.866	7.872	7.879	7.886	7.893	7.899	7.906	7.913	7.920
1140	7.920	7.926	7.933	7.940	7.947	7.954	7.960	7.967	7.974	7.981	7.988
1150	7.988	7.995	8.002	8.008	8.015	8.022	8.029	8.036	8.043	8.050	8.057
1160	8.057	8.064	8.071	8.078	8.085	8.092	8.099	8.106	8.113	8.120	8.127
1170	8.127	8.134	8.142	8.149	8.156	8.163	8.170	8.177	8.184	8.192	8.199
1180	8.199	8.206	8.213	8.220	8.228	8.235	8.242	8.249	8.257	8.264	8.271
1190	8.271	8.279	8.286	8.293	8.301	8.308	8.315	8.323	8.330	8.338	8.345
1200	8.345	8.352	8.360	8.367	8.375	8.382	8.390	8.397	8.405	8.412	8.420
1210	8.420	8.427	8.435	8.443	8.450	8.458	8.465	8.473	8.481	8.488	8.496
1220	8.496	8.504	8.511	8.519	8.527	8.534	8.542	8.550	8.558	8.565	8.573
1230	8.573	8.581	8.589	8.597	8.604	8.612	8.620	8.628	8.636	8.644	8.652
1240	8.652	8.660	8.668	8.675	8.683	8.691	8.699	8.707	8.715	8.723	8.731
1250	8.731	8.739	8.747	8.755	8.764	8.772	8.780	8.788	8.796	8.804	8.812
1250	8.812	8.820	8.828	8.837	8.845	8.853	8.861	8.869	8.878	8.886	8.894
1270	8.894	8.902	8.911	8.919	8.927	8.936	8.944	8.952	8.961	8.969	8.977
1280	8.977	8.986	8.994	9.003	9.011	9.019	9.028	9.036	9.045	9.053	9.062
1290	9.062	9.070	9.079	9.087	9.096	9.104	9.113	9.122	9.130	9.139	9.147
1300	9.147	9.156	9.165	9.173	9.182	9.191	9.199	9.208	9.217	9.225	9.234
1310	9.234	9.243	9.252	9.260	9.269	9.278	9.287	9.296	9.304	9.313	9.322
1320	9.322	9.331	9.340	9.349	9.358	9.366	9.375	9.384	9.393	9.402	9.411
1330	9.411	9.420	9.429	9.438	9.447	9.456	9.465	9.474	9.483	9.492	9.501
1340	9.501	9.510	9.519	9.528	9.538	9.547	9.556	9.565	9.574	9.583	9.592
1350	9.592	9.602	9.611	9.620	9.629	9.638	9.648	9.657	9.666	9.675	9.685
1360	9.685	9.694	9.703	9.712	9.722	9.731	9.740	9.750	9.759	9.768	9.778
1370	9.778	9.787	9.796	9.806	9.815	9.825	9.834	9.843	9.853	9.862	9.872
1380	9.872	9.881	9.891	9.900	9.910	9.919	9.929	9.938	9.948	9.957	9.967
1390	9.967	9.976	9.986	9.995	10.005	10.015	10.024	10.034	10.043	10.053	10.063
1400	10.063										

TABLE 32 Platinum (NIST Pt–67) Versus Type JN Thermoelement

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–210	–5.535										
–200	–5.337	–5.357	5.377	–5.397	–5.417	–5.437	–5.457	–5.477	–5.496	–5.516	–5.535
–190	–5.132	–5.153	–5.174	–5.194	–5.215	–5.236	–5.256	–5.276	–5.297	–5.317	–5.337
–180	–4.919	–4.941	4.962	–4.984	–5.005	–5.027	–5.048	–5.069	–5.090	–5.111	–5.132
–170	–4.700	–4.722	–4.744	–4.766	–4.788	–4.810	–4.832	–4.854	–4.876	–4.898	–4.919
–160	–4.473	–4.496	–4.519	–4.542	–4.564	–4.587	–4.610	–4.632	–4.655	–4.677	–4.700
–150	–4.239	–4.263	–4.287	–4.310	–4.333	–4.357	–4.380	–4.403	–4.427	–4.450	–4.473
–140	–3.999	–4.023	–4.048	–4.072	–4.096	–4.120	–4.144	–4.168	–4.192	–4.216	–4.239
–130	–3.752	–3.777	–3.802	–3.827	–3.852	–3.877	–3.901	–3.926	–3.950	–3.975	–3.999
–120	–3.499	–3.525	–3.550	–3.576	–3.601	–3.627	–3.652	–3.677	–3.702	–3.727	–3.752
–110	–3.240	–3.266	–3.292	–3.318	–3.344	–3.370	–3.396	–3.422	–3.448	–3.474	–3.499
–100	–2.974	–3.001	–3.028	–3.055	–3.081	–3.108	–3.134	–3.161	–3.187	–3.214	–3.240
–90	–2.703	–2.730	–2.757	–2.785	–2.812	–2.839	–2.866	–2.893	–2.920	–2.947	–2.974
–80	–2.425	–2.453	–2.481	–2.509	–2.537	–2.564	–2.592	–2.620	–2.647	–2.675	–2.703
–70	–2.141	–2.170	–2.199	–2.227	–2.255	–2.284	–2.312	–2.340	–2.369	–2.397	–2.425
–60	–1.852	–1.881	–1.910	–1.939	–1.968	–1.997	–2.026	–2.055	–2.084	–2.113	–2.141
–50	–1.557	–1.587	–1.617	–1.646	–1.676	–1.705	–1.735	–1.764	–1.794	–1.823	–1.852
–40	–1.257	–1.287	–1.317	–1.347	–1.377	–1.407	–1.438	–1.467	–1.497	–1.527	–1.557
–30	–0.950	–0.981	–1.012	–1.043	–1.074	–1.104	–1.135	–1.165	–1.196	–1.226	–1.257
–20	–0.639	–0.670	–0.702	–0.733	0.764	–0.795	–0.826	–0.858	–0.889	–0.920	–0.950
–10	–0.322	–0.354	–0.386	–0.418	–0.449	–0.481	–0.513	–0.544	–0.576	–0.607	–0.639
0	0.000	–0.032	–0.065	–0.097	–0.129	–0.162	–0.194	–0.226	–0.258	–0.290	–0.322
0	0.000	0.032	0.065	0.098	0.130	0.163	0.196	0.229	0.261	0.294	0.327
10	0.327	0.360	0.393	0.426	0.460	0.493	0.526	0.559	0.593	0.626	0.660
20	0.660	0.693	0.727	0.760	0.794	0.828	0.861	0.895	0.929	0.963	0.997
30	0.997	1.031	1.065	1.099	1.133	1.167	1.202	1.236	1.270	1.305	1.339
40	1.339	1.374	1.408	1.443	1.477	1.512	1.547	1.581	1.616	1.651	1.686
50	1.686	1.721	1.756	1.791	1.826	1.861	1.897	1.932	1.967	2.002	2.038
60	2.038	2.073	2.109	2.144	2.180	2.215	2.251	2.287	2.322	2.358	2.394
70	2.394	2.430	2.466	2.502	2.538	2.574	2.610	2.646	2.682	2.719	2.755
80	2.755	2.791	2.828	2.864	2.901	2.937	2.974	3.010	3.047	3.084	3.120
90	3.120	3.157	3.194	3.231	3.268	3.305	3.342	3.379	3.416	3.453	3.490
100	3.490	3.527	3.564	3.602	3.639	3.676	3.714	3.751	3.789	3.826	3.864
110	3.864	3.902	3.939	3.977	4.015	4.052	4.090	4.128	4.166	4.204	4.242
120	4.242	4.280	4.318	4.356	4.394	4.433	4.471	4.509	4.547	4.586	4.624
130	4.624	4.663	4.701	4.740	4.778	4.817	4.855	4.894	4.933	4.971	5.010
140	5.010	5.049	5.088	5.127	5.166	5.205	5.244	5.283	5.322	5.361	5.400
150	5.400	5.439	5.479	5.518	5.557	5.597	5.636	5.675	5.715	5.754	5.794
160	5.794	5.833	5.873	5.913	5.952	5.992	6.032	6.072	6.111	6.151	6.191
170	6.191	6.231	6.271	6.311	6.351	6.391	6.431	6.472	6.512	6.552	6.592
180	6.592	6.632	6.673	6.713	6.753	6.794	6.834	6.875	6.915	6.956	6.997
190	6.997	7.037	7.078	7.118	7.159	7.200	7.241	7.282	7.322	7.363	7.404
200	7.404	7.445	7.486	7.527	7.568	7.609	7.650	7.692	7.733	7.774	7.815
210	7.815	7.856	7.898	7.939	7.980	8.022	8.063	8.105	8.146	8.188	8.229
220	8.229	8.271	8.312	8.354	8.396	8.437	8.479	8.521	8.563	8.605	8.646
230	8.646	8.688	8.730	8.772	8.814	8.856	8.898	8.940	8.982	9.024	9.066
240	9.066	9.109	9.151	9.193	9.235	9.278	9.320	9.362	9.405	9.447	9.489
250	9.489	9.532	9.574	9.617	9.659	9.702	9.744	9.787	9.830	9.872	9.915
260	9.915	9.958	10.000	10.043	10.086	10.129	10.172	10.214	10.257	10.300	10.343
270	10.343	10.386	10.429	10.472	10.515	10.558	10.601	10.644	10.688	10.731	10.774
280	10.774	10.817	10.860	10.904	10.947	10.990	11.034	11.077	11.120	11.164	11.207
290	11.207	11.251	11.294	11.338	11.381	11.425	11.468	11.512	11.555	11.599	11.643
300	11.643	11.686	11.730	11.774	11.817	11.861	11.905	11.949	11.993	12.036	12.080
310	12.080	12.124	12.168	12.212	12.256	12.300	12.344	12.388	12.432	12.476	12.520
320	12.520	12.564	12.608	12.653	12.697	12.741	12.785	12.829	12.874	12.918	12.962
330	12.962	13.006	13.051	13.095	13.139	13.184	13.228	13.273	13.317	13.361	13.406
340	13.406	13.450	13.495	13.539	13.584	13.629	13.673	13.718	13.762	13.807	13.852
350	13.852	13.896	13.941	13.986	14.030	14.075	14.120	14.165	14.209	14.254	14.299
360	14.299	14.344	14.389	14.434	14.478	14.523	14.568	14.613	14.658	14.703	14.748

TABLE 32 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
370	14.748	14.793	14.838	14.883	14.928	14.973	15.018	15.063	15.109	15.154	15.199
380	15.199	15.244	15.289	15.334	15.380	15.425	15.470	15.515	15.561	15.606	15.651
390	15.651	15.696	15.742	15.787	15.832	15.878	15.923	15.968	16.014	16.059	16.105
400	16.105	16.150	16.196	16.241	16.287	16.332	16.378	16.423	16.469	16.514	16.560
410	16.560	16.605	16.651	16.696	16.742	16.788	16.833	16.879	16.925	16.970	17.016
420	17.016	17.062	17.107	17.153	17.199	17.244	17.290	17.336	17.382	17.427	17.473
430	17.473	17.519	17.565	17.611	17.657	17.702	17.748	17.794	17.840	17.886	17.932
440	17.932	17.978	18.024	18.070	18.116	18.161	18.207	18.253	18.299	18.345	18.391
450	18.391	18.437	18.483	18.529	18.575	18.622	18.668	18.714	18.760	18.806	18.852
460	18.852	18.898	18.944	18.990	19.036	19.083	19.129	19.175	19.221	19.267	19.313
470	19.313	19.360	19.406	19.452	19.498	19.544	19.591	19.637	19.683	19.729	19.776
480	19.776	19.822	19.868	19.914	19.961	20.007	20.053	20.100	20.146	20.192	20.239
490	20.239	20.285	20.331	20.378	20.424	20.470	20.517	20.563	20.610	20.656	20.702
500	20.702	20.749	20.795	20.842	20.888	20.935	20.981	21.028	21.074	21.120	21.167
510	21.167	21.213	21.260	21.306	21.353	21.399	21.446	21.492	21.539	21.585	21.632
520	21.632	21.679	21.725	21.772	21.818	21.865	21.911	21.958	22.004	22.051	22.098
530	22.098	22.144	22.191	22.237	22.284	22.331	22.377	22.424	22.470	22.517	22.564
540	22.564	22.610	22.657	22.704	22.750	22.797	22.844	22.890	22.937	22.984	23.030
550	23.030	23.077	23.124	23.170	23.217	23.264	23.310	23.357	23.404	23.451	23.497
560	23.497	23.544	23.591	23.637	23.684	23.731	23.778	23.824	23.871	23.918	23.965
570	23.965	24.011	24.058	24.105	24.152	24.198	24.245	24.292	24.339	24.385	24.432
580	24.432	24.479	24.526	24.573	24.619	24.666	24.713	24.760	24.807	24.853	24.900
590	24.900	24.947	24.994	25.041	25.087	25.134	25.181	25.228	25.275	25.321	25.368
600	25.368	25.415	25.462	25.509	25.556	25.602	25.649	25.696	25.743	25.790	25.837
610	25.837	25.883	25.930	25.977	26.024	26.071	26.118	26.164	26.211	26.258	26.305
620	26.305	26.352	26.399	26.446	26.492	26.539	26.586	26.633	26.680	26.727	26.774
630	26.774	26.820	26.867	26.914	26.961	27.008	27.055	27.102	27.148	27.195	27.242
640	27.242	27.289	27.336	27.383	27.430	27.476	27.523	27.570	27.617	27.664	27.711
650	27.711	27.758	27.805	27.851	27.898	27.945	27.992	28.039	28.086	28.133	28.179
660	28.179	28.226	28.273	28.320	28.367	28.414	28.461	28.507	28.554	28.601	26.648
670	28.648	28.695	28.742	28.789	28.835	28.882	28.929	28.976	29.023	29.070	29.116
680	29.116	29.163	29.210	29.257	29.304	29.351	29.397	29.444	29.491	29.538	29.585
690	29.585	29.632	29.678	29.725	29.772	29.819	29.866	29.913	29.959	30.006	30.053
700	30.053	30.100	30.147	30.193	30.240	30.287	30.334	30.381	30.427	30.474	30.521
710	30.521	30.568	30.614	30.661	30.708	30.755	30.802	30.848	30.895	30.942	30.989
720	30.989	31.035	31.082	31.129	31.176	31.222	31.269	31.316	31.363	31.409	31.456
730	31.456	31.503	31.549	31.596	31.643	31.690	31.736	31.783	31.830	31.876	31.923
740	31.923	31.970	32.016	32.063	32.110	32.156	32.203	32.250	32.296	32.343	32.390
750	32.390	32.436	32.483	32.530	32.576	32.623	32.670	32.716	32.763	32.809	32.856
760	32.856										

TABLE 33 Platinum (NIST Pt–67) Versus Type JN Thermoelement

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–340	–5.470	–5.481	–5.492	–5.503	–5.514	–5.524	–5.535				
–330	–5.360	–5.371	–5.382	–5.393	–5.404	–5.415	–5.426	–5.437	–5.448	–5.459	–5.470
–320	–5.247	–5.258	–5.270	–5.281	–5.292	–5.304	–5.315	–5.326	–5.337	–5.348	–5.360
–310	–5.132	–5.144	–5.155	–5.167	–5.178	–5.190	–5.201	–5.213	–5.224	–5.236	–5.247
–300	–5.015	–5.027	–5.038	–5.050	–5.062	–5.074	–5.085	–5.097	–5.109	–5.120	–5.132
–290	–4.895	–4.907	–4.919	–4.931	–4.943	–4.955	–4.967	–4.979	–4.991	–5.003	–5.015
–280	–4.774	–4.786	–4.798	–4.810	–4.822	–4.835	–4.847	–4.859	–4.871	–4.883	–4.895
–270	–4.650	–4.662	–4.675	–4.687	–4.700	–4.712	–4.724	–4.737	–4.749	–4.761	–4.774
–260	–4.524	–4.536	–4.549	–4.562	–4.574	–4.587	–4.600	–4.612	–4.625	–4.637	–4.650
–250	–4.396	–4.409	–4.421	–4.434	–4.447	–4.460	–4.473	–4.486	–4.498	–4.511	–4.524
–240	–4.266	–4.279	–4.292	–4.305	–4.318	–4.331	–4.344	–4.357	–4.370	–4.383	–4.396
–230	–4.133	–4.147	–4.160	–4.173	–4.186	–4.200	–4.213	–4.226	–4.239	–4.252	–4.266
–220	–3.999	–4.013	–4.026	–4.040	–4.053	–4.066	–4.080	–4.093	–4.107	–4.120	–4.133
–210	–3.863	–3.877	–3.890	–3.904	–3.918	–3.931	–3.945	–3.958	–3.972	–3.986	–3.999
–200	–3.725	–3.738	–3.752	–3.766	–3.780	–3.794	–3.808	–3.822	–3.835	–3.849	–3.863
–190	–3.584	–3.598	–3.612	–3.627	–3.641	–3.655	–3.669	–3.683	–3.697	–3.711	–3.725
–180	–3.442	–3.456	–3.471	–3.485	–3.499	–3.513	–3.528	–3.542	–3.556	–3.570	–3.584
–170	–3.298	–3.312	–3.327	–3.341	–3.356	–3.370	–3.385	–3.399	–3.413	–3.428	–3.442
–160	–3.152	–3.167	–3.181	–3.196	–3.211	–3.225	–3.240	–3.254	–3.269	–3.283	–3.298
–150	–3.004	–3.019	–3.034	–3.049	–3.063	–3.078	–3.093	–3.108	–3.122	–3.137	–3.152
–140	–2.854	–2.869	–2.884	–2.899	–2.914	–2.929	–2.944	–2.959	–2.974	–2.989	–3.004
–130	–2.703	–2.718	–2.733	–2.748	–2.763	–2.779	–2.794	–2.809	–2.824	–2.839	–2.854
–120	–2.549	–2.564	–2.580	–2.595	–2.611	–2.626	–2.641	–2.657	–2.672	–2.687	–2.703
–110	–2.394	–2.409	–2.425	–2.440	–2.456	–2.472	–2.487	–2.503	–2.518	–2.534	–2.549
–100	–2.237	–2.252	–2.268	–2.284	–2.300	–2.315	–2.331	–2.347	–2.362	–2.378	–2.394
–90	–2.078	–2.094	–2.109	–2.125	–2.141	–2.157	–2.173	–2.189	–2.205	–2.221	–2.237
–80	–1.917	–1.933	–1.949	–1.965	–1.981	–1.997	–2.013	–2.030	–2.046	–2.062	–2.078
–70	–1.754	–1.771	–1.787	–1.803	–1.820	–1.836	–1.852	–1.868	–1.884	–1.901	–1.917
–60	–1.590	–1.607	–1.623	–1.640	–1.656	–1.672	–1.689	–1.705	–1.722	–1.738	–1.754
–50	–1.424	–1.441	–1.458	–1.474	–1.491	–1.507	–1.524	–1.541	–1.557	–1.574	–1.590
–40	–1.257	–1.273	–1.290	–1.307	–1.324	–1.341	–1.357	–1.374	–1.391	–1.407	–1.424
–30	–1.087	–1.104	–1.121	–1.138	–1.155	–1.172	–1.189	–1.206	–1.223	–1.240	–1.257
–20	–0.916	–0.933	–0.950	–0.968	–0.985	–1.002	–1.019	–1.036	–1.053	–1.070	–1.087
–10	–0.743	–0.761	–0.778	–0.795	–0.813	–0.830	–0.847	–0.864	–0.882	–0.899	–0.916
0	–0.569	–0.586	–0.604	–0.621	–0.639	–0.656	–0.674	–0.691	–0.709	–0.726	–0.743
0	–0.569	–0.551	–0.534	–0.516	–0.499	–0.481	–0.464	–0.446	–0.428	–0.411	–0.393
10	–0.393	–0.375	–0.358	–0.340	–0.322	–0.304	–0.287	–0.269	–0.251	–0.233	–0.215
20	–0.215	–0.197	–0.180	–0.162	–0.144	–0.126	–0.108	–0.090	–0.072	–0.054	–0.036
30	–0.036	–0.018	0.000	0.018	0.036	0.054	0.072	0.090	0.109	0.127	0.145
40	0.145	0.163	0.181	0.199	0.218	0.236	0.254	0.272	0.291	0.309	0.327
50	0.327	0.346	0.364	0.382	0.401	0.419	0.437	0.456	0.474	0.493	0.511
60	0.511	0.530	0.548	0.567	0.585	0.604	0.622	0.641	0.660	0.678	0.697
70	0.697	0.715	0.734	0.753	0.771	0.790	0.809	0.828	0.846	0.865	0.884
80	0.884	0.903	0.921	0.940	0.959	0.978	0.997	1.016	1.035	1.054	1.072
90	1.072	1.091	1.110	1.129	1.148	1.167	1.186	1.205	1.224	1.244	1.263
100	1.263	1.282	1.301	1.320	1.339	1.358	1.377	1.397	1.416	1.435	1.454
110	1.454	1.473	1.493	1.512	1.531	1.551	1.570	1.589	1.609	1.628	1.647
120	1.647	1.667	1.686	1.705	1.725	1.744	1.764	1.783	1.803	1.822	1.842
130	1.842	1.861	1.881	1.900	1.920	1.940	1.959	1.979	1.998	2.018	2.038
140	2.038	2.057	2.077	2.097	2.117	2.136	2.156	2.176	2.196	2.215	2.235
150	2.235	2.255	2.275	2.295	2.315	2.334	2.354	2.374	2.394	2.414	2.434
160	2.434	2.454	2.474	2.494	2.514	2.534	2.554	2.574	2.594	2.614	2.634
170	2.634	2.654	2.674	2.695	2.715	2.735	2.755	2.775	2.795	2.816	2.836
180	2.836	2.856	2.876	2.897	2.917	2.937	2.957	2.978	2.998	3.018	3.039
190	3.039	3.059	3.080	3.100	3.120	3.141	3.161	3.182	3.202	3.223	3.243
200	3.243	3.264	3.284	3.305	3.325	3.346	3.366	3.387	3.407	3.428	3.449
210	3.449	3.469	3.490	3.511	3.531	3.552	3.573	3.593	3.614	3.635	3.656
220	3.656	3.676	3.697	3.718	3.739	3.760	3.780	3.801	3.822	3.843	3.864
230	3.864	3.885	3.906	3.927	3.948	3.969	3.990	4.010	4.031	4.052	4.073
240	4.073	4.094	4.116	4.137	4.158	4.179	4.200	4.221	4.242	4.263	4.284

TABLE 33 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
250	4.284	4.305	4.327	4.348	4.369	4.390	4.411	4.433	4.454	4.475	4.496
260	4.496	4.518	4.539	4.560	4.581	4.603	4.624	4.645	4.667	4.688	4.710
270	4.710	4.731	4.752	4.774	4.795	4.817	4.838	4.860	4.881	4.903	4.924
280	4.924	4.946	4.967	4.989	5.010	5.032	5.053	5.075	5.097	5.118	5.140
290	5.140	5.161	5.183	5.205	5.226	5.248	5.270	5.291	5.313	5.335	5.357
300	5.357	5.378	5.400	5.422	5.444	5.466	5.487	5.509	5.531	5.553	5.575
310	5.575	5.597	5.618	5.640	5.662	5.684	5.706	5.728	5.750	5.772	5.794
320	5.794	5.816	5.838	5.860	5.882	5.904	5.926	5.948	5.970	5.992	6.014
330	6.014	6.036	6.058	6.081	6.103	6.125	6.147	6.169	6.191	6.213	6.236
340	6.236	6.258	6.280	6.302	6.324	6.347	6.369	6.391	6.414	6.436	6.458
350	6.458	6.480	6.503	6.525	6.547	6.570	6.592	6.615	6.637	6.659	6.682
360	6.682	6.704	6.727	6.749	6.771	6.794	6.816	6.839	6.861	6.884	6.906
370	6.906	6.929	6.951	6.974	6.997	7.019	7.042	7.064	7.087	7.109	7.132
380	7.132	7.155	7.177	7.200	7.223	7.245	7.268	7.291	7.313	7.336	7.359
390	7.359	7.381	7.404	7.427	7.450	7.472	7.495	7.518	7.541	7.564	7.586
400	7.586	7.609	7.632	7.655	7.678	7.701	7.724	7.746	7.769	7.792	7.815
410	7.815	7.838	7.861	7.884	7.907	7.930	7.953	7.976	7.999	8.022	8.045
420	8.045	8.068	8.091	8.114	8.137	8.160	8.183	8.206	8.229	8.252	8.275
430	8.275	8.299	8.322	8.345	8.368	8.391	8.414	8.437	8.461	8.484	8.507
440	8.507	8.530	8.553	8.577	8.600	8.623	8.646	8.670	8.693	8.716	8.739
450	8.739	8.763	8.786	8.809	8.833	8.856	8.879	8.903	8.926	8.949	8.973
460	8.973	8.996	9.020	9.043	9.066	9.090	9.113	9.137	9.160	9.184	9.207
470	9.207	9.231	9.254	9.278	9.301	9.325	9.348	9.372	9.395	9.419	9.442
480	9.442	9.466	9.489	9.513	9.536	9.560	9.584	9.607	9.631	9.655	9.678
490	9.678	9.702	9.725	9.749	9.773	9.796	9.820	9.844	9.868	9.891	9.915
500	9.915	9.939	9.962	9.986	10.010	10.034	10.057	10.081	10.105	10.129	10.153
510	10.153	10.176	10.200	10.224	10.248	10.272	10.295	10.319	10.343	10.367	10.391
520	10.391	10.415	10.439	10.463	10.486	10.510	10.534	10.558	10.582	10.606	10.630
530	10.630	10.654	10.678	10.702	10.726	10.750	10.774	10.798	10.822	10.846	10.870
540	10.870	10.894	10.918	10.942	10.966	10.990	11.014	11.038	11.062	11.087	11.111
550	11.111	11.135	11.159	11.183	11.207	11.231	11.255	11.280	11.304	11.328	11.352
560	11.352	11.376	11.400	11.425	11.449	11.473	11.497	11.521	11.546	11.570	11.594
570	11.594	11.618	11.643	11.667	11.691	11.715	11.740	11.764	11.788	11.813	11.837
580	11.837	11.861	11.886	11.910	11.934	11.959	11.983	12.007	12.032	12.056	12.080
590	12.080	12.105	12.129	12.153	12.178	12.202	12.227	12.251	12.276	12.300	12.324
600	12.324	12.349	12.373	12.398	12.422	12.447	12.471	12.496	12.520	12.545	12.569
610	12.569	12.594	12.618	12.643	12.667	12.692	12.716	12.741	12.765	12.790	12.815
620	12.815	12.839	12.864	12.888	12.913	12.937	12.962	12.987	13.011	13.036	13.061
630	13.061	13.085	13.110	13.134	13.159	13.184	13.208	13.233	13.258	13.282	13.307
640	13.307	13.332	13.357	13.381	13.406	13.431	13.455	13.480	13.505	13.530	13.554
650	13.554	13.579	13.604	13.629	13.653	13.678	13.703	13.728	13.752	13.777	13.802
660	13.802	13.827	13.852	13.876	13.901	13.926	13.951	13.976	14.001	14.025	14.050
670	14.050	14.075	14.100	14.125	14.150	14.175	14.199	14.224	14.249	14.274	14.299
680	14.299	14.324	14.349	14.374	14.399	14.424	14.449	14.474	14.498	14.523	14.548
690	14.548	14.573	14.598	14.623	14.648	14.673	14.698	14.723	14.748	14.773	14.798
700	14.798	14.823	14.848	14.873	14.898	14.923	14.948	14.973	14.998	15.023	15.048
710	15.048	15.074	15.099	15.124	15.149	15.174	15.199	15.224	15.249	15.274	15.299
720	15.299	15.324	15.349	15.375	15.400	15.425	15.450	15.475	15.500	15.525	15.550
730	15.550	15.576	15.601	15.626	15.651	15.676	15.701	15.727	15.752	15.777	15.802
740	15.802	15.827	15.853	15.878	15.903	15.928	15.953	15.979	16.004	16.029	16.054
750	16.054	16.079	16.105	16.130	16.155	16.180	16.206	16.231	16.256	16.281	16.307
760	16.307	16.332	16.357	16.383	16.408	16.433	16.458	16.484	16.509	16.534	16.560
770	16.560	16.585	16.610	16.636	16.661	16.686	16.712	16.737	16.762	16.788	16.813
780	16.813	16.838	16.864	16.889	16.914	16.940	16.965	16.990	17.016	17.041	17.067
790	17.067	17.092	17.117	17.143	17.168	17.194	17.219	17.244	17.270	17.295	17.321
800	17.321	17.346	17.372	17.397	17.422	17.448	17.473	17.499	17.524	17.550	17.575
810	17.575	17.601	17.626	17.651	17.677	17.702	17.728	17.753	17.779	17.804	17.830
820	17.830	17.855	17.881	17.906	17.932	17.957	17.983	18.008	18.034	18.059	18.085

TABLE 33 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
830	18.085	18.110	18.136	18.161	18.187	18.213	18.238	18.264	18.289	18.315	18.340
840	18.340	18.366	18.391	18.417	18.442	18.468	18.494	18.519	18.545	18.570	18.596
850	18.596	18.622	18.647	18.673	18.698	18.724	18.749	18.775	18.801	18.826	18.852
860	18.852	18.878	18.903	18.929	18.954	18.980	19.006	19.031	19.057	19.083	19.108
870	19.108	19.134	19.159	19.185	19.211	19.236	19.262	19.288	19.313	19.339	19.365
880	19.365	19.390	19.416	19.442	19.467	19.493	19.519	19.544	19.570	19.596	19.621
890	19.621	19.647	19.673	19.699	19.724	19.750	19.776	19.801	19.827	19.853	19.878
900	19.878	19.904	19.930	19.956	19.981	20.007	20.033	20.059	20.084	20.110	20.136
910	20.136	20.161	20.187	20.213	20.239	20.264	20.290	20.316	20.342	20.367	20.393
920	20.393	20.419	20.445	20.471	20.496	20.522	20.548	20.574	20.599	20.625	20.651
930	20.651	20.677	20.702	20.728	20.754	20.780	20.806	20.831	20.857	20.883	20.909
940	20.909	20.935	20.960	20.986	21.012	21.038	21.064	21.089	21.115	21.141	21.167
950	21.167	21.193	21.219	21.244	21.270	21.296	21.322	21.348	21.374	21.399	21.425
960	21.425	21.451	21.477	21.503	21.529	21.554	21.580	21.606	21.632	21.658	21.684
970	21.684	21.710	21.735	21.761	21.787	21.813	21.839	21.865	21.891	21.916	21.942
980	21.942	21.968	21.994	22.020	22.046	22.072	22.098	22.123	22.149	22.175	22.201
990	22.201	22.227	22.253	22.279	22.305	22.331	22.356	22.382	22.408	22.434	22.460
1000	22.460	22.486	22.512	22.538	22.564	22.590	22.616	22.641	22.667	22.693	22.719
1010	22.719	22.745	22.771	22.797	22.823	22.849	22.875	22.901	22.927	22.952	22.978
1020	22.978	23.004	23.030	23.056	23.082	23.108	23.134	23.160	23.186	23.212	23.238
1030	23.238	23.264	23.290	23.316	23.342	23.367	23.393	23.419	23.445	23.471	23.497
1040	23.497	23.523	23.549	23.575	23.601	23.627	23.653	23.679	23.705	23.731	23.757
1050	23.757	23.783	23.809	23.835	23.861	23.887	23.913	23.939	23.965	23.991	24.017
1060	24.017	24.042	24.068	24.094	24.120	24.146	24.172	24.198	24.224	24.250	24.276
1070	24.276	24.302	24.328	24.354	24.380	24.406	24.432	24.458	24.484	24.510	24.536
1080	24.536	24.562	24.588	24.614	24.640	24.666	24.692	24.718	24.744	24.770	24.796
1090	24.796	24.822	24.848	24.874	24.900	24.926	24.952	24.978	25.004	25.030	25.056
1100	25.056	25.082	25.108	25.134	25.160	25.186	25.212	25.238	25.264	25.290	25.316
1110	25.316	25.342	25.368	25.394	25.420	25.446	25.472	25.498	25.524	25.550	25.576
1120	25.576	25.602	25.628	25.654	25.680	25.706	25.732	25.758	25.785	25.811	25.837
1130	25.837	25.863	25.889	25.915	25.941	25.967	25.993	26.019	26.045	26.071	26.097
1140	26.097	26.123	26.149	26.175	26.201	26.227	26.253	26.279	26.305	26.331	26.357
1150	26.357	26.383	26.409	26.435	26.461	26.487	26.513	26.539	26.565	26.591	26.617
1160	26.617	26.643	26.669	26.695	26.721	26.748	26.774	26.800	26.826	26.852	26.878
1170	26.878	26.904	26.930	26.956	26.982	27.008	27.034	27.060	27.086	27.112	27.138
1180	27.138	27.164	27.190	27.216	27.242	27.268	27.294	27.320	27.346	27.372	27.398
1190	27.398	27.424	27.450	27.476	27.503	27.529	27.555	27.581	27.607	27.633	27.659
1200	27.659	27.685	27.711	27.737	27.763	27.789	27.815	27.841	27.867	27.893	27.919
1210	27.919	27.945	27.971	27.997	28.023	28.049	28.075	28.101	28.127	28.153	28.179
1220	28.179	28.205	28.231	28.258	28.284	28.310	28.336	28.362	28.388	28.414	28.440
1230	28.440	28.466	28.492	28.518	28.544	28.570	28.596	28.622	28.648	28.674	28.700
1240	28.700	28.726	28.752	28.778	28.804	28.830	28.856	28.882	28.908	28.934	28.960
1250	28.960	28.986	29.012	29.038	29.064	29.090	29.116	29.142	29.169	29.195	29.221
1260	29.221	29.247	29.273	29.299	29.325	29.351	29.377	29.403	29.429	29.455	29.481
1270	29.481	29.507	29.533	29.559	29.585	29.611	29.637	29.663	29.689	29.715	29.741
1280	29.741	29.767	29.793	29.819	29.845	29.871	29.897	29.923	29.949	29.975	30.001
1290	30.001	30.027	30.053	30.079	30.105	30.131	30.157	30.183	30.209	30.235	30.261
1300	30.261	30.287	30.313	30.339	30.365	30.391	30.417	30.443	30.469	30.495	30.521
1310	30.521	30.547	30.573	30.599	30.625	30.651	30.677	30.703	30.729	30.755	30.781
1320	30.781	30.807	30.833	30.859	30.885	30.911	30.937	30.963	30.989	31.015	31.041
1330	31.041	31.067	31.093	31.118	31.144	31.170	31.196	31.222	31.248	31.274	31.300
1340	31.300	31.326	31.352	31.378	31.404	31.430	31.456	31.482	31.508	31.534	31.560
1350	31.560	31.586	31.612	31.638	31.664	31.690	31.716	31.742	31.767	31.793	31.819
1360	31.819	31.845	31.871	31.897	31.923	31.949	31.975	32.001	32.027	32.053	32.079
1370	32.079	32.105	32.131	32.156	32.182	32.208	32.234	32.260	32.286	32.312	32.338
1380	32.338	32.364	32.390	32.416	32.442	32.468	32.493	32.519	32.545	32.571	32.597
1390	32.597	32.623	32.649	32.675	32.701	32.727	32.752	32.778	32.804	32.830	32.856
1400	32.856										

TABLE 34 Type KP or EP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–3.558										
–260	–3.549	–3.550	–3.551	–3.552	–3.553	–3.553	–3.554	–3.555	–3.556	–3.557	–3.558
–250	–3.539	–3.540	–3.541	–3.542	–3.543	–3.544	–3.545	–3.546	–3.547	–3.548	–3.549
–240	–3.528	–3.529	–3.530	–3.532	–3.533	–3.534	–3.535	–3.536	–3.537	–3.538	–3.539
–230	–3.513	–3.514	–3.516	–3.518	–3.519	–3.521	–3.522	–3.524	–3.525	–3.527	–3.528
–220	–3.491	–3.494	–3.496	–3.498	–3.501	–3.503	–3.505	–3.507	–3.509	–3.511	–3.513
–210	–3.460	–3.463	–3.467	–3.470	–3.474	–3.477	–3.480	–3.483	–3.486	–3.488	–3.491
–200	–3.416	–3.421	–3.426	–3.431	–3.435	–3.440	–3.444	–3.448	–3.452	–3.456	–3.460
–190	–3.359	–3.366	–3.372	–3.378	–3.384	–3.390	–3.395	–3.401	–3.406	–3.411	–3.416
–180	–3.288	–3.295	–3.303	–3.311	–3.318	–3.325	–3.332	–3.339	–3.346	–3.353	–3.359
–170	–3.201	–3.211	–3.220	–3.229	–3.238	–3.246	–3.255	–3.263	–3.271	–3.280	–3.288
–160	–3.101	–3.111	–3.122	–3.132	–3.143	–3.153	–3.163	–3.173	–3.182	–3.192	–3.201
–150	–2.986	–2.998	–3.010	–3.022	–3.034	–3.045	–3.057	–3.068	–3.079	–3.090	–3.101
–140	–2.859	–2.872	–2.885	–2.898	–2.911	–2.924	–2.937	–2.950	–2.962	–2.974	–2.986
–130	–2.718	–2.733	–2.748	–2.762	–2.776	–2.790	–2.804	–2.818	–2.832	–2.845	–2.859
–120	–2.566	–2.582	–2.597	–2.613	–2.628	–2.644	–2.659	–2.674	–2.689	–2.704	–2.718
–110	–2.402	–2.419	–2.436	–2.452	–2.469	–2.485	–2.502	–2.518	–2.534	–2.550	–2.566
–100	–2.227	–2.245	–2.263	–2.281	–2.299	–2.316	–2.333	–2.351	–2.368	–2.385	–2.402
–90	–2.042	–2.061	–2.080	–2.099	–2.118	–2.136	–2.155	–2.173	–2.191	–2.209	–2.227
–80	–1.848	–1.868	–1.888	–1.907	–1.927	–1.946	–1.966	–1.985	–2.004	–2.023	–2.042
–70	–1.644	–1.665	–1.686	–1.706	–1.727	–1.747	–1.767	–1.788	–1.808	–1.828	–1.848
–60	–1.432	–1.453	–1.475	–1.496	–1.518	–1.539	–1.560	–1.581	–1.602	–1.623	–1.644
–50	–1.211	–1.234	–1.256	–1.278	–1.300	–1.322	–1.344	–1.366	–1.388	–1.410	–1.432
–40	–0.983	–1.006	–1.029	–1.052	–1.075	–1.098	–1.121	–1.143	–1.166	–1.189	–1.211
–30	–0.747	–0.771	–0.795	–0.818	–0.842	–0.866	–0.889	–0.913	–0.936	–0.959	–0.983
–20	–0.505	–0.529	–0.554	–0.578	–0.602	–0.627	–0.651	–0.675	–0.699	–0.723	–0.747
–10	–0.255	–0.281	–0.306	–0.331	–0.356	–0.381	–0.406	–0.430	–0.455	–0.480	–0.505
0	0.000	–0.026	–0.052	–0.077	–0.103	–0.128	–0.154	–0.179	–0.205	–0.230	–0.255
0	0.000	0.026	0.052	0.078	0.104	0.130	0.156	0.182	0.208	0.234	0.261
10	0.261	0.287	0.314	0.340	0.367	0.393	0.420	0.446	0.473	0.500	0.527
20	0.527	0.554	0.580	0.607	0.634	0.661	0.689	0.716	0.743	0.770	0.797
30	0.797	0.825	0.852	0.880	0.907	0.935	0.962	0.990	1.018	1.045	1.073
40	1.073	1.101	1.129	1.157	1.184	1.212	1.240	1.269	1.297	1.325	1.353
50	1.353	1.381	1.410	1.438	1.466	1.495	1.523	1.552	1.580	1.609	1.637
60	1.637	1.666	1.695	1.723	1.752	1.781	1.810	1.839	1.868	1.897	1.926
70	1.926	1.955	1.984	2.013	2.042	2.071	2.101	2.130	2.159	2.189	2.218
80	2.218	2.248	2.277	2.307	2.336	2.366	2.395	2.425	2.455	2.484	2.514
90	2.514	2.544	2.574	2.604	2.634	2.663	2.693	2.723	2.754	2.784	2.814
100	2.814	2.844	2.874	2.904	2.935	2.965	2.995	3.025	3.056	3.086	3.117
110	3.117	3.147	3.178	3.208	3.239	3.269	3.300	3.331	3.361	3.392	3.423
120	3.423	3.454	3.485	3.515	3.546	3.577	3.608	3.639	3.670	3.701	3.732
130	3.732	3.763	3.794	3.826	3.857	3.888	3.919	3.950	3.982	4.013	4.044
140	4.044	4.076	4.107	4.139	4.170	4.201	4.233	4.265	4.296	4.328	4.359
150	4.359	4.391	4.423	4.454	4.486	4.518	4.549	4.581	4.613	4.645	4.677
160	4.677	4.709	4.741	4.773	4.804	4.836	4.868	4.901	4.933	4.965	4.997
170	4.997	5.029	5.061	5.093	5.125	5.158	5.190	5.222	5.254	5.287	5.319
180	5.319	5.351	5.384	5.416	5.449	5.481	5.513	5.546	5.578	5.611	5.644
190	5.644	5.676	5.709	5.741	5.774	5.807	5.839	5.872	5.905	5.937	5.970
200	5.970	6.003	6.036	6.068	6.101	6.134	6.167	6.200	6.233	6.266	6.299
210	6.299	6.332	6.365	6.398	6.431	6.464	6.497	6.530	6.563	6.596	6.629
220	6.629	6.662	6.695	6.728	6.762	6.795	6.828	6.861	6.894	6.928	6.961
230	6.961	6.994	7.028	7.061	7.094	7.128	7.161	7.194	7.228	7.261	7.294
240	7.294	7.328	7.361	7.395	7.428	7.462	7.495	7.529	7.562	7.596	7.630
250	7.630	7.663	7.697	7.730	7.764	7.798	7.831	7.865	7.899	7.932	7.966
260	7.966	8.000	8.033	8.067	8.101	8.135	8.168	8.202	8.236	8.270	8.304
270	8.304	8.337	8.371	8.405	8.439	8.473	8.507	8.541	8.575.	8.608	8.642
280	8.642	8.676	8.710	8.744	8.778	8.812	8.846	8.880	8.914	8.948	8.982
290	8.982	9.016	9.050	9.084	9.118	9.153	9.187	9.221	9.255	9.289	9.323
300	9.323	9.357	9.391	9.425	9.460	9.494	9.528	9.562	9.596	9.631	9.665

TABLE 34 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	9.665	9.699	9.733	9.767	9.802	9.836	9.870	9.904	9.939	9.973	10.007
320	10.007	10.041	10.076	10.110	10.144	10.179	10.213	10.247	10.282	10.316	10.350
330	10.350	10.385	10.419	10.453	10.488	10.522	10.556	10.591	10.625	10.660	10.694
340	10.694	10.728	10.763	10.797	10.832	10.866	10.900	10.935	10.969	11.004	11.038
350	11.038	11.073	11.107	11.142	11.176	11.210	11.245	11.279	11.314	11.348	11.383
360	11.383	11.417	11.452	11.486	11.521	11.555	11.590	11.624	11.659	11.693	11.728
370	11.728	11.762	11.797	11.831	11.866	11.900	11.935	11.969	12.004	12.039	12.073
380	12.073	12.108	12.142	12.177	12.211	12.246	12.280	12.315	12.349	12.384	12.419
390	12.419	12.453	12.488	12.522	12.557	12.591	12.626	12.660	12.695	12.730	12.764
400	12.764	12.799	12.833	12.868	12.902	12.937	12.971	13.006	13.041	13.075	13.110
410	13.110	13.144	13.179	13.213	13.248	13.283	13.317	13.352	13.386	13.421	13.455
420	13.455	13.490	13.524	13.559	13.594	13.628	13.663	13.697	13.732	13.766	13.801
430	13.801	13.835	13.870	13.905	13.939	13.974	14.008	14.043	14.077	14.112	14.146
440	14.146	14.181	14.215	14.250	14.285	14.319	14.354	14.388	14.423	14.457	14.492
450	14.492	14.526	14.561	14.595	14.630	14.664	14.699	14.733	14.768	14.802	14.837
460	14.837	14.871	14.906	14.940	14.975	15.009	15.044	15.078	15.113	15.147	15.181
470	15.181	15.216	15.250	15.285	15.319	15.354	15.388	15.423	15.457	15.491	15.526
480	15.526	15.560	15.595	15.629	15.664	15.698	15.732	15.767	15.801	15.835	15.870
490	15.870	15.904	15.939	15.973	16.007	16.042	16.076	16.110	16.145	16.179	16.213
500	16.213	16.248	16.282	16.316	16.351	16.385	16.419	16.454	16.488	16.522	16.557
510	16.557	16.591	16.625	16.659	16.694	16.728	16.762	16.797	16.831	16.865	16.899
520	16.899	16.933	16.968	17.002	17.036	17.070	17.105	17.139	17.173	17.207	17.241
530	17.241	17.275	17.310	17.344	17.378	17.412	17.446	17.480	17.515	17.549	17.583
540	17.583	17.617	17.651	17.685	17.719	17.753	17.787	17.822	17.856	17.890	17.924
550	17.924	17.958	17.992	18.026	18.060	18.094	18.128	18.162	18.196	18.230	18.264
560	18.264	18.298	18.332	18.366	18.400	18.434	18.468	18.502	18.536	18.570	18.604
570	18.604	18.638	18.671	18.705	18.739	18.773	18.807	18.841	18.875	18.909	18.943
580	18.943	18.976	19.010	19.044	19.078	19.112	19.146	19.179	19.213	19.247	19.281
590	19.281	19.315	19.348	19.382	19.416	19.450	19.483	19.517	19.551	19.585	19.618
600	19.618	19.652	19.686	19.719	19.753	19.787	19.820	19.854	19.888	19.921	19.955
610	19.955	19.989	20.022	20.056	20.090	20.123	20.157	20.190	20.224	20.257	20.291
620	20.291	20.325	20.358	20.392	20.425	20.459	20.492	20.526	20.559	20.593	20.626
630	20.626	20.660	20.693	20.727	20.760	20.794	20.827	20.860	20.894	20.927	20.961
640	20.961	20.994	21.028	21.061	21.094	21.128	21.161	21.194	21.228	21.261	21.294
650	21.294	21.328	21.361	21.394	21.428	21.461	21.494	21.528	21.561	21.594	21.627
660	21.627	21.661	21.694	21.727	21.760	21.793	21.827	21.860	21.893	21.926	21.959
670	21.959	21.993	22.026	22.059	22.092	22.125	22.158	22.191	22.225	22.258	22.291
680	22.291	22.324	22.357	22.390	22.423	22.456	22.489	22.522	22.555	22.588	22.621
690	22.621	22.654	22.687	22.720	22.753	22.786	22.819	22.852	22.885	22.918	22.951
700	22.951	22.984	23.017	23.050	23.083	23.115	23.148	23.181	23.214	23.247	23.280
710	23.280	23.313	23.346	23.378	23.411	23.444	23.477	23.510	23.542	23.575	23.608
720	23.608	23.641	23.674	23.706	23.739	23.772	23.804	23.837	23.870	23.903	23.935
730	23.935	23.968	24.001	24.033	24.066	24.099	24.131	24.164	24.197	24.229	24.262
740	24.262	24.294	24.327	24.360	24.392	24.425	24.457	24.490	24.523	24.555	24.588
750	24.588	24.620	24.653	24.685	24.718	24.750	24.783	24.815	24.848	24.880	24.913
760	24.913	24.945	24.978	25.010	25.042	25.075	25.107	25.140	25.172	25.204	25.237
770	25.237	25.269	25.302	25.334	25.366	25.399	25.431	25.463	25.496	25.528	25.560
780	25.560	25.593	25.625	25.657	25.689	25.722	25.754	25.786	25.819	25.851	25.883
790	25.883	25.915	25.947	25.980	26.012	26.044	26.076	26.108	26.141	26.173	26.205
800	26.205	26.237	26.269	26.301	26.334	26.366	26.398	26.430	26.462	26.494	26.526
810	26.526	26.558	26.590	26.622	26.655	26.687	26.719	26.751	26.783	26.815	26.847
820	26.847	26.879	26.911	26.943	26.975	27.007	27.039	27.071	27.103	27.135	27.167
830	27.167	27.198	27.230	27.262	27.294	27.326	27.358	27.390	27.422	27.454	27.486
840	27.486	27.517	27.549	27.581	27.613	27.645	27.677	27.709	27.740	27.772	27.804
850	27.804	27.836	27.868	27.899	27.931	27.963	27.995	28.026	28.058	28.090	28.122
860	28.122	28.153	28.185	28.217	28.249	28.280	28.312	28.344	28.375	28.407	28.439
870	28.439	28.470	28.502	28.534	28.565	28.597	28.629	28.660	28.692	28.723	28.755
880	28.755	28.787	28.818	28.850	28.881	28.913	28.944	28.976	29.008	29.039	29.071
890	29.071	29.102	29.134	29.165	29.197	29.228	29.260	29.291	29.323	29.354	29.386

TABLE 34 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
900	29.386	29.417	29.448	29.480	29.511	29.543	29.574	29.606	29.637	29.668	29.700
910	29.700	29.731	29.763	29.794	29.825	29.857	29.888	29.919	29.951	29.982	30.014
920	30.014	30.045	30.076	30.107	30.139	30.170	30.201	30.233	30.264	30.295	30.326
930	30.326	30.358	30.389	30.420	30.451	30.483	30.514	30.545	30.576	30.608	30.639
940	30.639	30.670	30.701	30.732	30.764	30.795	30.826	30.857	30.888	30.919	30.950
950	30.950	30.982	31.013	31.044	31.075	31.106	31.137	31.168	31.199	31.230	31.261
960	31.261	31.293	31.324	31.355	31.386	31.417	31.448	31.479	31.510	31.541	31.572
970	31.572	31.603	31.634	31.665	31.696	31.727	31.758	31.789	31.820	31.851	31.881
980	31.881	31.912	31.943	31.974	32.005	32.036	32.067	32.098	32.129	32.160	32.190
990	32.190	32.221	32.252	32.283	32.314	32.345	32.376	32.406	32.437	32.468	32.499
1000	32.499	32.530	32.560	32.591	32.622	32.653	32.683	32.714	32.745	32.776	32.806
1010	32.806	32.837	32.868	32.899	32.929	32.960	32.991	33.021	33.052	33.083	33.113
1020	33.113	33.144	33.175	33.205	33.236	33.267	33.297	33.328	33.359	33.389	33.420
1030	33.420	33.450	33.481	33.511	33.542	33.573	33.603	33.634	33.664	33.695	33.725
1040	33.725	33.756	33.786	33.817	33.847	33.878	33.908	33.939	33.969	34.000	34.030
1050	34.030	34.061	34.091	34.122	34.152	34.182	34.213	34.243	34.274	34.304	34.334
1060	34.334	34.365	34.395	34.425	34.456	34.486	34.517	34.547	34.577	34.607	34.638
1070	34.638	34.668	34.698	34.729	34.759	34.789	34.820	34.850	34.880	34.910	34.940
1080	34.940	34.971	35.001	35.031	35.061	35.092	35.122	35.152	35.182	35.212	35.242
1090	35.242	35.273	35.303	35.333	35.363	35.393	35.423	35.453	35.483	35.513	35.544
1100	35.544	35.574	35.604	35.634	35.664	35.694	35.724	35.754	35.784	35.814	35.844
1110	35.844	35.874	35.904	35.934	35.964	35.994	36.024	36.054	36.084	36.114	36.143
1120	36.143	36.173	36.203	36.233	36.263	36.293	36.323	36.353	36.383	36.412	36.442
1130	36.442	36.472	36.502	36.532	36.561	36.591	36.621	36.651	36.681	36.710	36.740
1140	36.740	36.770	36.800	36.829	36.859	36.889	36.918	36.948	36.978	37.007	37.037
1150	37.037	37.067	37.096	37.126	37.156	37.185	37.215	37.244	37.274	37.304	37.333
1160	37.333	37.363	37.392	37.422	37.451	37.481	37.510	37.540	37.569	37.599	37.628
1170	37.628	37.658	37.687	37.717	37.746	37.776	37.805	37.835	37.864	37.893	37.923
1180	37.923	37.952	37.981	38.011	36.040	38.069	38.099	38.128	38.157	38.187	38.216
1190	38.216	38.245	38.274	38.304	38.333	38.362	38.391	38.421	38.450	38.479	38.508
1200	38.508	38.537	38.567	38.596	38.625	38.654	38.683	38.712	38.741	38.770	38.799
1210	38.799	38.829	38.858	38.887	38.916	38.945	38.974	39.003	39.032	39.061	39.090
1220	39.090	39.119	39.148	39.176	39.205	39.234	39.263	39.292	39.321	39.350	39.379
1230	39.379	39.407	39.436	39.465	39.494	39.523	39.552	39.580	39.609	39.638	39.667
1240	39.667	39.695	39.724	39.753	39.781	39.810	39.839	39.867	39.896	39.925	39.953
1250	39.953	39.982	40.010	40.039	40.067	40.096	40.124	40.153	40.182	40.210	40.238
1260	40.238	40.267	40.295	40.324	40.352	40.381	40.409	40.437	40.466	40.494	40.522
1270	40.522	40.551	40.579	40.607	40.636	40.664	40.692	40.720	40.749	40.777	40.805
1280	40.805	40.833	40.861	40.890	40.918	40.946	40.974	41.002	41.030	41.058	41.086
1290	41.086	41.114	41.142	41.170	41.198	41.226	41.254	41.282	41.310	41.338	41.366
1300	41.366	41.393	41.421	41.449	41.477	41.505	41.532	41.560	41.588	41.616	41.643
1310	41.643	41.671	41.699	41.726	41.754	41.781	41.809	41.837	41.864	41.892	41.919
1320	41.919	41.947	41.974	42.002	42.029	42.056	42.084	42.111	42.138	42.166	42.193
1330	42.193	42.220	42.248	42.275	42.302	42.329	42.356	42.384	42.411	42.438	42.465
1340	42.465	42.492	42.519	42.546	42.573	42.600	42.627	42.654	42.681	42.708	42.734
1350	42.734	42.761	42.788	42.815	42.842	42.868	42.895	42.922	42.948	42.975	43.002
1360	43.002	43.028	43.055	43.081	43.108	43.134	43.160	43.187	43.213	43.240	43.266
1370	43.266	43.292	43.318								

TABLE 35 Type KP or EP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–3.556	–3.556	–3.557	–3.557	–3.558						
–440	–3.551	–3.552	–3.552	–3.553	–3.553	–3.553	–3.554	–3.554	–3.555	–3.555	–3.556
–430	–3.546	–3.546	–3.547	–3.548	–3.548	–3.549	–3.549	–3.550	–3.550	–3.551	–3.551
–420	–3.541	–3.541	–3.542	–3.542	–3.543	–3.543	–3.544	–3.544	–3.545	–3.545	–3.546
–410	–3.535	–3.535	–3.536	–3.536	–3.537	–3.538	–3.538	–3.539	–3.539	–3.540	–3.541
–400	–3.528	–3.529	–3.529	–3.530	–3.531	–3.531	–3.532	–3.533	–3.533	–3.534	–3.535
–390	–3.520	–3.521	–3.522	–3.523	–3.523	–3.524	–3.525	–3.526	–3.526	–3.527	–3.528
–380	–3.511	–3.512	–3.513	–3.514	–3.515	–3.516	–3.517	–3.517	–3.518	–3.519	–3.520
–370	–3.499	–3.500	–3.502	–3.503	–3.504	–3.505	–3.506	–3.507	–3.509	–3.510	–3.511
–360	–3.485	–3.487	–3.488	–3.490	–3.491	–3.492	–3.494	–3.495	–3.497	–3.498	–3.499
–350	–3.468	–3.470	–3.471	–3.473	–3.475	–3.477	–3.478	–3.480	–3.482	–3.483	–3.485
–340	–3.447	–3.449	–3.451	–3.453	–3.456	–3.458	–3.460	–3.462	–3.464	–3.466	–3.468
–330	–3.422	–3.425	–3.427	–3.430	–3.432	–3.435	–3.437	–3.440	–3.442	–3.444	–3.447
–320	–3.393	–3.396	–3.399	–3.402	–3.405	–3.408	–3.411	–3.414	–3.416	–3.419	–3.422
–310	–3.359	–3.363	–3.366	–3.370	–3.373	–3.377	–3.380	–3.383	–3.386	–3.390	–3.393
–300	–3.321	–3.325	–3.329	–3.333	–3.337	–3.341	–3.345	–3.348	–3.352	–3.356	–3.359
–290	–3.279	–3.283	–3.288	–3.292	–3.296	–3.301	–3.305	–3.309	–3.313	–3.317	–3.321
–280	–3.232	–3.237	–3.241	–3.246	–3.251	–3.256	–3.260	–3.265	–3.270	–3.274	–3.279
–270	–3.180	–3.186	–3.191	–3.196	–3.201	–3.206	–3.212	–3.217	–3.222	–3.227	–3.232
–260	–3.124	–3.130	–3.136	–3.142	–3.147	–3.153	–3.158	–3.164	–3.169	–3.175	–3.180
–250	–3.064	–3.070	–3.077	–3.083	–3.089	–3.095	–3.101	–3.107	–3.113	–3.119	–3.124
–240	–3.000	–3.006	–3.013	–3.020	–3.026	–3.033	–3.039	–3.045	–3.052	–3.058	–3.064
–230	–2.931	–2.938	–2.945	–2.952	–2.959	–2.966	–2.973	–2.980	–2.986	–2.993	–3.000
–220	–2.859	–2.866	–2.874	–2.881	–2.888	–2.896	–2.903	–2.910	–2.917	–2.924	–2.931
–210	–2.782	–2.790	–2.798	–2.806	–2.813	–2.821	–2.829	–2.836	–2.844	–2.851	–2.859
–200	–2.702	–2.710	–2.718	–2.727	–2.735	–2.743	–2.751	–2.759	–2.767	–2.775	–2.782
–190	–2.618	–2.627	–2.635	–2.644	–2.652	–2.661	–2.669	–2.677	–2.686	–2.694	–2.702
–180	–2.531	–2.539	–2.548	–2.557	–2.566	–2.575	–2.584	–2.592	–2.601	–2.610	–2.618
–170	–2.439	–2.449	–2.458	–2.467	–2.476	–2.485	–2.495	–2.504	–2.513	–2.522	–2.531
–160	–2.345	–2.355	–2.364	–2.374	–2.383	–2.393	–2.402	–2.412	–2.421	–2.430	–2.439
–150	–2.247	–2.257	–2.267	–2.277	–2.287	–2.297	–2.306	–2.316	–2.326	–2.335	–2.345
–140	–2.146	–2.157	–2.167	–2.177	–2.187	–2.197	–2.207	–2.217	–2.227	–2.237	–2.247
–130	–2.042	–2.053	–2.063	–2.074	–2.084	–2.095	–2.105	–2.116	–2.126	–2.136	–2.146
–120	–1.936	–1.946	–1.957	–1.968	–1.979	–1.989	–2.000	–2.011	–2.021	–2.032	–2.042
–110	–1.826	–1.837	–1.848	–1.859	–1.870	–1.881	–1.892	–1.903	–1.914	–1.925	–1.936
–100	–1.713	–1.724	–1.736	–1.747	–1.758	–1.770	–1.781	–1.792	–1.803	–1.815	–1.826
–90	–1.598	–1.609	–1.621	–1.633	–1.644	–1.656	–1.667	–1.679	–1.690	–1.702	–1.713
–80	–1.480	–1.492	–1.504	–1.515	–1.527	–1.539	–1.551	–1.563	–1.574	–1.586	–1.598
–70	–1.359	–1.371	–1.383	–1.396	–1.408	–1.420	–1.432	–1.444	–1.456	–1.468	–1.480
–60	–1.236	–1.248	–1.261	–1.273	–1.286	–1.298	–1.310	–1.322	–1.335	–1.347	–1.359
–50	–1.111	–1.123	–1.136	–1.148	–1.161	–1.174	–1.186	–1.199	–1.211	–1.224	–1.236
–40	–0.983	–0.996	–1.008	–1.021	–1.034	–1.047	–1.060	–1.072	–1.085	–1.098	–1.111
–30	–0.853	–0.866	–0.879	–0.892	–0.905	–0.918	–0.931	–0.944	–0.957	–0.970	–0.983
–20	–0.720	–0.734	–0.747	–0.760	–0.774	–0.787	–0.800	–0.813	–0.826	–0.840	–0.853
–10	–0.586	–0.600	–0.613	–0.627	–0.640	–0.654	–0.667	–0.680	–0.694	–0.707	–0.720
0	–0.450	–0.463	–0.477	–0.491	–0.505	–0.518	–0.532	–0.545	–0.559	–0.573	–0.586
0	–0.450	–0.436	–0.422	–0.408	–0.395	–0.381	–0.367	–0.353	–0.339	–0.325	–0.311
10	–0.311	–0.297	–0.283	–0.269	–0.255	–0.241	–0.227	–0.213	–0.199	–0.185	–0.171
20	–0.171	–0.157	–0.143	–0.128	–0.114	–0.100	–0.086	–0.072	–0.057	–0.043	–0.029
30	–0.029	–0.014	0.000	0.014	0.029	0.043	0.057	0.072	0.086	0.101	0.115
40	0.115	0.130	0.144	0.159	0.173	0.188	0.202	0.217	0.232	0.246	0.261
50	0.261	0.275	0.290	0.305	0.319	0.334	0.349	0.364	0.378	0.393	0.408
60	0.408	0.423	0.437	0.452	0.467	0.482	0.497	0.512	0.527	0.542	0.557
70	0.557	0.571	0.586	0.601	0.616	0.631	0.646	0.661	0.677	0.692	0.707
80	0.707	0.722	0.737	0.752	0.767	0.782	0.797	0.813	0.828	0.843	0.858
90	0.858	0.874	0.889	0.904	0.919	0.935	0.950	0.965	0.981	0.996	1.011
100	1.011	1.027	1.042	1.058	1.073	1.088	1.104	1.119	1.135	1.150	1.166
110	1.166	1.181	1.197	1.212	1.228	1.244	1.259	1.275	1.290	1.306	1.322
120	1.322	1.337	1.353	1.369	1.384	1.400	1.416	1.432	1.447	1.463	1.479

TABLE 35 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	1.479	1.495	1.510	1.526	1.542	1.558	1.574	1.590	1.606	1.621	1.637
140	1.637	1.653	1.669	1.685	1.701	1.717	1.733	1.749	1.765	1.781	1.797
150	1.797	1.813	1.829	1.845	1.861	1.877	1.894	1.910	1.926	1.942	1.958
160	1.958	1.974	1.990	2.007	2.023	2.039	2.055	2.071	2.088	2.104	2.120
170	2.120	2.136	2.153	2.169	2.185	2.202	2.218	2.234	2.251	2.267	2.284
180	2.284	2.300	2.316	2.333	2.349	2.366	2.382	2.399	2.415	2.432	2.448
190	2.448	2.465	2.481	2.498	2.514	2.531	2.547	2.564	2.580	2.597	2.614
200	2.614	2.630	2.647	2.663	2.680	2.697	2.713	2.730	2.747	2.764	2.780
210	2.780	2.797	2.814	2.830	2.847	2.864	2.881	2.898	2.914	2.931	2.948
220	2.948	2.965	2.982	2.999	3.015	3.032	3.049	3.066	3.083	3.100	3.117
230	3.117	3.134	3.151	3.168	3.184	3.201	3.218	3.235	3.252	3.269	3.286
240	3.286	3.303	3.321	3.338	3.355	3.372	3.389	3.406	3.423	3.440	3.457
250	3.457	3.474	3.491	3.509	3.526	3.543	3.560	3.577	3.594	3.612	3.629
260	3.629	3.646	3.663	3.680	3.698	3.715	3.732	3.749	3.767	3.784	3.801
270	3.801	3.819	3.836	3.853	3.871	3.888	3.905	3.923	3.940	3.957	3.975
280	3.975	3.992	4.010	4.027	4.044	4.062	4.079	4.097	4.114	4.132	4.149
290	4.149	4.166	4.184	4.201	4.219	4.236	4.254	4.272	4.289	4.307	4.324
300	4.324	4.342	4.359	4.377	4.394	4.412	4.430	4.447	4.465	4.482	4.500
310	4.500	4.518	4.535	4.553	4.571	4.588	4.606	4.624	4.641	4.659	4.677
320	4.677	4.694	4.712	4.730	4.748	4.765	4.783	4.801	4.819	4.836	4.854
330	4.854	4.872	4.890	4.908	4.925	4.943	4.961	4.979	4.997	5.015	5.032
340	5.032	5.050	5.068	5.086	5.104	5.122	5.140	5.158	5.176	5.193	5.211
350	5.211	5.229	5.247	5.265	5.283	5.301	5.319	5.337	5.355	5.373	5.391
360	5.391	5.409	5.427	5.445	5.463	5.481	5.499	5.517	5.535	5.553	5.571
370	5.571	5.589	5.607	5.625	5.644	5.662	5.680	5.698	5.716	5.734	5.752
380	5.752	5.770	5.788	5.807	5.825	5.843	5.861	5.879	5.897	5.916	5.934
390	5.934	5.952	5.970	5.988	6.007	6.025	6.043	6.061	6.079	6.098	6.116
400	6.116	6.134	6.152	6.171	6.189	6.207	6.225	6.244	6.262	6.280	6.299
410	6.299	6.317	6.335	6.354	6.372	6.390	6.409	6.427	6.445	6.464	6.482
420	6.482	6.500	6.519	6.537	6.555	6.574	6.592	6.611	6.629	6.647	6.666
430	6.666	6.684	6.703	6.721	6.739	6.758	6.776	6.795	6.813	6.832	6.850
440	6.850	6.869	6.887	6.905	6.924	6.942	6.961	6.979	6.998	7.016	7.035
450	7.035	7.053	7.072	7.090	7.109	7.128	7.146	7.165	7.183	7.202	7.220
460	7.220	7.239	7.257	7.276	7.294	7.313	7.332	7.350	7.369	7.387	7.406
470	7.406	7.425	7.443	7.462	7.480	7.499	7.518	7.536	7.555	7.574	7.592
480	7.592	7.611	7.630	7.648	7.667	7.686	7.704	7.723	7.742	7.760	7.779
490	7.779	7.798	7.816	7.835	7.854	7.872	7.891	7.910	7.928	7.947	7.966
500	7.966	7.985	8.003	8.022	8.041	8.060	8.078	8.097	8.116	8.135	8.153
510	8.153	8.172	8.191	8.210	8.228	8.247	8.266	8.285	8.304	8.322	8.341
520	8.341	8.360	8.379	8.398	8.416	8.435	8.454	8.473	8.492	8.511	8.529
530	8.529	8.548	8.567	8.586	8.605	8.624	8.642	8.661	8.680	8.699	8.718
540	8.718	8.737	8.756	8.774	8.793	8.812	8.831	8.850	8.869	8.888	8.907
550	8.907	8.926	8.944	8.963	8.982	9.001	9.020	9.039	9.058	9.077	9.096
560	9.096	9.115	9.134	9.153	9.171	9.190	9.209	9.228	9.247	9.266	9.285
570	9.285	9.304	9.323	9.342	9.361	9.380	9.399	9.418	9.437	9.456	9.475
580	9.475	9.494	9.513	9.532	9.551	9.570	9.589	9.608	9.627	9.646	9.665
590	9.665	9.684	9.703	9.722	9.741	9.760	9.779	9.798	9.817	9.836	9.855
600	9.855	9.874	9.893	9.912	9.931	9.950	9.969	9.988	10.007	10.026	10.045
610	10.045	10.064	10.083	10.102	10.121	10.141	10.160	10.179	10.198	10.217	10.236
620	10.236	10.255	10.274	10.293	10.312	10.331	10.350	10.369	10.388	10.408	10.427
630	10.427	10.446	10.465	10.484	10.503	10.522	10.541	10.560	10.579	10.598	10.618
640	10.618	10.637	10.656	10.675	10.694	10.713	10.732	10.751	10.770	10.790	10.809
650	10.809	10.828	10.847	10.866	10.885	10.904	10.923	10.943	10.962	10.981	11.000
660	11.000	11.019	11.038	11.057	11.076	11.096	11.115	11.134	11.153	11.172	11.191
670	11.191	11.210	11.230	11.249	11.268	11.287	11.306	11.325	11.345	11.364	11.383
680	11.383	11.402	11.421	11.440	11.459	11.479	11.498	11.517	11.536	11.555	11.574
690	11.574	11.594	11.613	11.632	11.651	11.670	11.689	11.709	11.728	11.747	11.766
700	11.766	11.785	11.804	11.824	11.843	11.862	11.881	11.900	11.920	11.939	11.958
710	11.958	11.977	11.996	12.015	12.035	12.054	12.073	12.092	12.111	12.131	12.150

TABLE 35 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
720	12.150	12.169	12.188	12.207	12.227	12.246	12.265	12.284	12.303	12.323	12.342
730	12.342	12.361	12.380	12.399	12.419	12.438	12.457	12.476	12.495	12.514	12.534
740	12.534	12.553	12.572	12.591	12.610	12.630	12.649	12.668	12.687	12.706	12.726
750	12.726	12.745	12.764	12.783	12.802	12.822	12.841	12.860	12.879	12.898	12.918
760	12.918	12.937	12.956	12.975	12.995	13.014	13.033	13.052	13.071	13.091	13.110
770	13.110	13.129	13.148	13.167	13.187	13.206	13.225	13.244	13.263	13.283	13.302
780	13.302	13.321	13.340	13.359	13.379	13.398	13.417	13.436	13.455	13.475	13.494
790	13.494	13.513	13.532	13.551	13.571	13.590	13.609	13.628	13.647	13.667	13.686
800	13.686	13.705	13.724	13.743	13.763	13.782	13.801	13.820	13.839	13.859	13.878
810	13.878	13.897	13.916	13.935	13.954	13.974	13.993	14.012	14.031	14.050	14.070
820	14.070	14.089	14.108	14.127	14.146	14.166	14.185	14.204	14.223	14.242	14.262
830	14.262	14.281	14.300	14.319	14.338	14.357	14.377	14.396	14.415	14.434	14.453
840	14.453	14.472	14.492	14.511	14.530	14.549	14.568	14.588	14.607	14.626	14.645
850	14.645	14.664	14.683	14.703	14.722	14.741	14.760	14.779	14.798	14.818	14.837
860	14.837	14.856	14.875	14.894	14.913	14.932	14.952	14.971	14.990	15.009	15.028
870	15.028	15.047	15.067	15.086	15.105	15.124	15.143	15.162	15.181	15.201	15.220
880	15.220	15.239	15.258	15.277	15.296	15.315	15.335	15.354	15.373	15.392	15.411
890	15.411	15.430	15.449	15.468	15.488	15.507	15.526	15.545	15.564	15.583	15.602
900	15.602	15.621	15.641	15.660	15.679	15.698	15.717	15.736	15.755	15.774	15.793
910	15.793	15.813	15.832	15.851	15.870	15.889	15.908	15.927	15.946	15.965	15.984
920	15.984	16.004	16.023	16.042	16.061	16.080	16.099	16.118	16.137	16.156	16.175
930	16.175	16.194	16.213	16.233	16.252	16.271	16.290	16.309	16.328	16.347	16.366
940	16.366	16.385	16.404	16.423	16.442	16.461	16.480	16.499	16.519	16.538	16.557
950	16.557	16.576	16.595	16.614	16.633	16.652	16.671	16.690	16.709	16.728	16.747
960	16.747	16.766	16.785	16.804	16.823	16.842	16.861	16.880	16.899	16.918	16.937
970	16.937	16.956	16.975	16.994	17.013	17.032	17.051	17.070	17.089	17.108	17.127
980	17.127	17.146	17.165	17.184	17.203	17.222	17.241	17.260	17.279	17.298	17.317
990	17.317	17.336	17.355	17.374	17.393	17.412	17.431	17.450	17.469	17.488	17.507
1000	17.507	17.526	17.545	17.564	17.583	17.602	17.621	17.640	17.659	17.678	17.697
1010	17.697	17.715	17.734	17.753	17.772	17.791	17.810	17.829	17.848	17.867	17.886
1020	17.886	17.905	17.924	17.943	17.962	17.980	17.999	18.018	18.037	18.056	18.075
1030	18.075	18.094	18.113	18.132	18.151	18.170	18.188	18.207	18.226	18.245	18.264
1040	18.264	18.283	18.302	18.321	18.340	18.358	18.377	18.396	18.415	18.434	18.453
1050	18.453	18.472	18.490	18.509	18.528	18.547	18.566	18.585	18.604	18.622	18.641
1060	18.641	18.660	18.679	18.698	18.717	18.735	18.754	18.773	18.792	18.811	18.830
1070	18.830	18.848	18.867	18.886	18.905	18.924	18.943	18.961	18.980	18.999	19.018
1080	19.018	19.037	19.055	19.074	19.093	19.112	19.131	19.149	19.168	19.187	19.206
1090	19.206	19.224	19.243	19.262	19.281	19.300	19.318	19.337	19.356	19.375	19.393
1100	19.393	19.412	19.431	19.450	19.468	19.487	19.506	19.525	19.543	19.562	19.581
1110	19.581	19.600	19.618	19.637	19.656	19.674	19.693	19.712	19.731	19.749	19.768
1120	19.768	19.787	19.805	19.824	19.843	19.862	19.880	19.899	19.918	19.936	19.955
1130	19.955	19.974	19.992	20.011	20.030	20.048	20.067	20.086	20.104	20.123	20.142
1140	20.142	20.160	20.179	20.198	20.216	20.235	20.254	20.272	20.291	20.310	20.328
1150	20.328	20.347	20.366	20.384	20.403	20.421	20.440	20.459	20.477	20.496	20.515
1160	20.515	20.533	20.552	20.570	20.589	20.608	20.626	20.645	20.663	20.682	20.701
1170	20.701	20.719	20.738	20.756	20.775	20.794	20.812	20.831	20.849	20.868	20.886
1180	20.886	20.905	20.924	20.942	20.961	20.979	20.998	21.016	21.035	21.054	21.072
1190	21.072	21.091	21.109	21.128	21.146	21.165	21.183	21.202	21.220	21.239	21.257
1200	21.257	21.276	21.294	21.313	21.331	21.350	21.368	21.387	21.405	21.424	21.442
1210	21.442	21.461	21.479	21.498	21.516	21.535	21.553	21.572	21.590	21.609	21.627
1220	21.627	21.646	21.664	21.683	21.701	21.720	21.738	21.757	21.775	21.793	21.812
1230	21.812	21.830	21.849	21.867	21.886	21.904	21.923	21.941	21.959	21.978	21.996
1240	21.996	22.015	22.033	22.052	22.070	22.088	22.107	22.125	22.144	22.162	22.180
1250	22.180	22.199	22.217	22.236	22.254	22.272	22.291	22.309	22.327	22.346	22.364
1260	22.364	22.383	22.401	22.419	22.438	22.456	22.474	22.493	22.511	22.530	22.548
1270	22.548	22.566	22.585	22.603	22.621	22.640	22.658	22.676	22.695	22.713	22.731
1280	22.731	22.750	22.768	22.786	22.805	22.823	22.841	22.859	22.878	22.896	22.914
1290	22.914	22.933	22.951	22.969	22.988	23.006	23.024	23.042	23.061	23.079	23.097
1300	23.097	23.115	23.134	23.152	23.170	23.189	23.207	23.225	23.243	23.262	23.280

TABLE 35 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1310	23.280	23.298	23.316	23.335	23.353	23.371	23.389	23.408	23.426	23.444	23.462
1320	23.462	23.480	23.499	23.517	23.535	23.553	23.572	23.590	23.608	23.626	23.644
1330	23.644	23.663	23.681	23.699	23.717	23.735	23.754	23.772	23.790	23.808	23.826
1340	23.826	23.844	23.863	23.881	23.899	23.917	23.935	23.953	23.972	23.990	24.008
1350	24.008	24.026	24.044	24.062	24.081	24.099	24.117	24.135	24.153	24.171	24.189
1360	24.189	24.207	24.226	24.244	24.262	24.280	24.298	24.316	24.334	24.352	24.371
1370	24.371	24.389	24.407	24.425	24.443	24.461	24.479	24.497	24.515	24.533	24.551
1380	24.551	24.570	24.588	24.606	24.624	24.642	24.660	24.678	24.696	24.714	24.732
1390	24.732	24.750	24.768	24.786	24.804	24.822	24.840	24.858	24.877	24.895	24.913
1400	24.913	24.931	24.949	24.967	24.985	25.003	25.021	25.039	25.057	25.075	25.093
1410	25.093	25.111	25.129	25.147	25.165	25.183	25.201	25.219	25.237	25.255	25.273
1420	25.273	25.291	25.309	25.327	25.345	25.363	25.381	25.399	25.417	25.435	25.453
1430	25.453	25.471	25.488	25.506	25.524	25.542	25.560	25.578	25.596	25.614	25.632
1440	25.632	25.650	25.668	25.686	25.704	25.722	25.740	25.758	25.776	25.793	25.811
1450	25.811	25.829	25.847	25.865	25.883	25.901	25.919	25.937	25.955	25.973	25.990
1460	25.990	26.008	26.026	26.044	26.062	26.080	26.098	26.116	26.133	26.151	26.169
1470	26.169	26.187	26.205	26.223	26.241	26.259	26.276	26.294	26.312	26.330	26.348
1480	26.348	26.366	26.384	26.401	26.419	26.437	26.455	26.473	26.491	26.508	26.526
1490	26.526	26.544	26.562	26.580	26.597	26.615	26.633	26.651	26.669	26.687	26.704
1500	26.704	26.722	26.740	26.758	26.776	26.793	26.811	26.829	26.847	26.865	26.882
1510	26.882	26.900	26.918	26.936	26.953	26.971	26.989	27.007	27.024	27.042	27.060
1520	27.060	27.078	27.096	27.113	27.131	27.149	27.167	27.184	27.202	27.220	27.237
1530	27.237	27.255	27.273	27.291	27.308	27.326	27.344	27.362	27.379	27.397	27.415
1540	27.415	27.432	27.450	27.468	27.486	27.503	27.521	27.539	27.556	27.574	27.592
1550	27.592	27.609	27.627	27.645	27.663	27.680	27.698	27.716	27.733	27.751	27.769
1560	27.769	27.786	27.804	27.822	27.839	27.857	27.875	27.892	27.910	27.928	27.945
1570	27.945	27.963	27.981	27.998	28.016	28.033	28.051	28.069	28.086	28.104	28.122
1580	28.122	28.139	28.157	28.175	28.192	28.210	28.227	28.245	28.263	28.280	28.298
1590	28.298	28.315	28.333	28.351	28.368	28.386	28.403	28.421	28.439	28.456	28.474
1600	28.474	28.491	28.509	28.527	28.544	28.562	28.579	28.597	28.614	28.632	28.650
1610	28.650	28.667	28.685	28.702	28.720	28.737	28.755	28.773	28.790	28.808	28.825
1620	28.825	28.843	28.860	28.878	28.895	28.913	28.930	28.948	28.965	28.983	29.001
1630	29.001	29.018	29.036	29.053	29.071	29.088	29.106	29.123	29.141	29.158	29.176
1640	29.176	29.193	29.211	29.228	29.246	29.263	29.281	29.298	29.316	29.333	29.351
1650	29.351	29.368	29.386	29.403	29.421	29.438	29.455	29.473	29.490	29.508	29.525
1660	29.525	29.543	29.560	29.578	29.595	29.613	29.630	29.648	29.665	29.682	29.700
1670	29.700	29.717	29.735	29.752	29.770	29.787	29.804	29.822	29.839	29.857	29.874
1680	29.874	29.892	29.909	29.926	29.944	29.961	29.979	29.996	30.014	30.031	30.048
1690	30.048	30.066	30.083	30.101	30.118	30.135	30.153	30.170	30.187	30.205	30.222
1700	30.222	30.240	30.257	30.274	30.292	30.309	30.326	30.344	30.361	30.379	30.396
1710	30.396	30.413	30.431	30.448	30.465	30.483	30.500	30.517	30.535	30.552	30.569
1720	30.569	30.587	30.604	30.621	30.639	30.656	30.673	30.691	30.708	30.725	30.743
1730	30.743	30.760	30.777	30.795	30.812	30.829	30.847	30.864	30.881	30.899	30.916
1740	30.916	30.933	30.950	30.968	30.985	31.002	31.020	31.037	31.054	31.071	31.089
1750	31.089	31.106	31.123	31.141	31.158	31.175	31.192	31.210	31.227	31.244	31.261
1760	31.261	31.279	31.296	31.313	31.330	31.348	31.365	31.382	31.399	31.417	31.434
1770	31.434	31.451	31.468	31.486	31.503	31.520	31.537	31.555	31.572	31.589	31.606
1780	31.606	31.623	31.641	31.658	31.675	31.692	31.710	31.727	31.744	31.761	31.778
1790	31.778	31.796	31.813	31.830	31.847	31.864	31.881	31.899	31.916	31.933	31.950
1800	31.950	31.967	31.985	32.002	32.019	32.036	32.053	32.070	32.088	32.105	32.122
1810	32.122	32.139	32.156	32.173	32.190	32.208	32.225	32.242	32.259	32.276	32.293
1820	32.293	32.310	32.328	32.345	32.362	32.379	32.396	32.413	32.430	32.447	32.465
1830	32.465	32.482	32.499	32.516	32.533	32.550	32.567	32.584	32.601	32.619	32.636
1840	32.636	32.653	32.670	32.687	32.704	32.721	32.738	32.755	32.772	32.789	32.806
1850	32.806	32.824	32.841	32.858	32.875	32.892	32.909	32.926	32.943	32.960	32.977
1860	32.977	32.994	33.011	33.028	33.045	33.062	33.079	33.096	33.113	33.130	33.148
1870	33.148	33.165	33.182	33.199	33.216	33.233	33.250	33.267	33.284	33.301	33.318
1880	33.318	33.335	33.352	33.369	33.386	33.403	33.420	33.437	33.454	33.471	33.488
1890	33.488	33.505	33.522	33.539	33.556	33.573	33.590	33.607	33.624	33.641	33.657

TABLE 35 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1900	33.657	33.674	33.691	33.708	33.725	33.742	33.759	33.776	33.793	33.810	33.827
1910	33.827	33.844	33.861	33.878	33.895	33.912	33.929	33.946	33.963	33.979	33.996
1920	33.996	34.013	34.030	34.047	34.064	34.081	34.098	34.115	34.132	34.149	34.165
1930	34.165	34.182	34.199	34.216	34.233	34.250	34.267	34.284	34.301	34.317	34.334
1940	34.334	34.351	34.368	34.385	34.402	34.419	34.436	34.452	34.469	34.486	34.503
1950	34.503	34.520	34.537	34.554	34.570	34.587	34.604	34.621	34.638	34.655	34.671
1960	34.671	34.688	34.705	34.722	34.739	34.756	34.772	34.789	34.806	34.823	34.840
1970	34.840	34.856	34.873	34.890	34.907	34.924	34.940	34.957	34.974	34.991	35.008
1980	35.008	35.024	35.041	35.058	35.075	35.092	35.108	35.125	35.142	35.159	35.175
1990	35.175	35.192	35.209	35.226	35.242	35.259	35.276	35.293	35.309	35.326	35.343
2000	35.343	35.360	35.376	35.393	35.410	35.427	35.443	35.460	35.477	35.493	35.510
2010	35.510	35.527	35.544	35.560	35.577	35.594	35.610	35.627	35.644	35.660	35.677
2020	35.677	35.694	35.711	35.727	35.744	35.761	35.777	35.794	35.811	35.827	35.844
2030	35.844	35.861	35.877	35.894	35.911	35.927	35.944	35.961	35.977	35.994	35.010
2040	36.010	36.027	36.044	36.060	36.077	36.094	36.110	36.127	36.143	36.160	36.177
2050	36.177	36.193	36.210	36.227	36.243	36.260	36.276	36.293	36.310	36.326	36.343
2060	36.343	36.359	36.376	36.392	36.409	36.426	36.442	36.459	36.475	36.492	36.508
2070	36.508	36.525	36.542	36.558	36.575	36.591	36.608	36.624	36.641	36.657	36.674
2080	36.674	36.691	36.707	36.724	36.740	36.757	36.773	36.790	36.806	36.823	36.839
2090	36.839	36.856	36.872	36.889	36.905	36.922	36.938	36.955	36.971	36.988	37.004
2100	37.004	37.021	37.037	37.054	37.070	37.087	37.103	37.119	37.136	37.152	37.169
2110	37.169	37.185	37.202	37.218	37.235	37.251	37.267	37.284	37.300	37.317	37.333
2120	37.333	37.350	37.366	37.382	37.399	37.415	37.432	37.448	37.465	37.481	37.497
2130	37.497	37.514	37.530	37.547	37.563	37.579	37.596	37.612	37.628	37.645	37.661
2140	37.661	37.678	37.694	37.710	37.727	37.743	37.759	37.776	37.792	37.808	37.825
2150	37.825	37.841	37.857	37.874	37.890	37.906	37.923	37.939	37.955	37.972	37.988
2160	37.988	38.004	38.021	38.037	38.053	38.069	38.086	38.102	38.118	38.135	38.151
2170	38.151	38.167	38.183	38.200	38.216	38.232	38.248	38.265	38.281	38.297	38.314
2180	38.314	38.330	38.346	38.362	38.378	38.395	38.411	38.427	38.443	38.460	38.476
2190	38.476	38.492	38.508	38.524	38.541	38.557	38.573	38.589	38.605	38.622	38.638
2200	38.638	38.654	38.670	38.686	38.703	38.719	38.735	38.751	38.767	38.783	38.799
2210	38.799	38.816	38.832	38.848	38.864	38.880	38.896	38.912	38.929	38.945	38.961
2220	38.961	38.977	38.993	39.009	39.025	39.041	39.057	39.074	39.090	39.106	39.122
2230	39.122	39.138	39.154	39.170	39.186	39.202	39.218	39.234	39.250	39.266	39.282
2240	39.282	39.298	39.315	39.331	39.347	39.363	39.379	39.395	39.411	39.427	39.443
2250	39.443	39.459	39.475	39.491	39.507	39.523	39.539	39.555	39.571	39.587	39.603
2260	39.603	39.619	39.635	39.651	39.667	39.682	39.698	39.714	39.730	39.746	39.762
2270	39.762	39.778	39.794	39.810	39.826	39.842	39.858	39.874	39.890	39.905	39.921
2280	39.921	39.937	39.953	39.969	39.985	40.001	40.017	40.033	40.048	40.064	40.080
2290	40.080	40.096	40.112	40.128	40.144	40.159	40.175	40.191	40.207	40.223	40.238
2300	40.238	40.254	40.270	40.286	40.302	40.318	40.333	40.349	40.365	40.381	40.396
2310	40.396	40.412	40.428	40.444	40.459	40.475	40.491	40.507	40.522	40.538	40.554
2320	40.554	40.570	40.585	40.601	40.617	40.633	40.648	40.664	40.680	40.695	40.711
2330	40.711	40.727	40.742	40.758	40.774	40.789	40.805	40.821	40.836	40.852	40.868
2340	40.868	40.883	40.899	40.915	40.930	40.946	40.961	40.977	40.993	41.008	41.024
2350	41.024	41.039	41.055	41.071	41.086	41.102	41.117	41.133	41.148	41.164	41.179
2360	41.179	41.195	41.210	41.226	41.242	41.257	41.273	41.288	41.304	41.319	41.335
2370	41.335	41.350	41.366	41.381	41.396	41.412	41.427	41.443	41.458	41.474	41.489
2380	41.489	41.505	41.520	41.535	41.551	41.566	41.582	41.597	41.612	41.628	41.643
2390	41.643	41.659	41.674	41.689	41.705	41.720	41.735	41.751	41.766	41.781	41.797
2400	41.797	41.812	41.827	41.843	41.858	41.873	41.889	41.904	41.919	41.934	41.950
2410	41.950	41.965	41.980	41.995	42.011	42.026	42.041	42.056	42.072	42.087	42.102
2420	42.102	42.117	42.132	42.148	42.163	42.178	42.193	42.208	42.223	42.239	42.254
2430	42.254	42.269	42.284	42.299	42.314	42.329	42.344	42.359	42.375	42.390	42.405
2440	42.405	42.420	42.435	42.450	42.465	42.480	42.495	42.510	42.525	42.540	42.555
2450	42.555	42.570	42.585	42.600	42.615	42.630	42.645	42.660	42.675	42.690	42.705
2460	42.705	42.720	42.734	42.749	42.764	42.779	42.794	42.809	42.824	42.839	42.853
2470	42.853	42.868	42.883	42.898	42.913	42.928	42.942	42.957	42.972	42.987	43.002
2480	43.002	43.016	43.031	43.046	43.061	43.075	43.090	43.105	43.119	43.134	43.149
2490	43.149	43.163	43.178	43.193	43.207	43.222	43.237	43.251	43.266	43.281	43.295

TABLE 35 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2500	43.295	43.310									

TABLE 36 Platinum (NIST Pt–67) Versus Type KN Thermoelement

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–2.900										
–260	–2.892	–2.894	–2.895	–2.896	–2.897	–2.898	–2.899	–2.900	–2.900	–2.900	–2.900
–250	–2.864	–2.868	–2.871	–2.875	–2.878	–2.881	–2.883	–2.886	–2.888	–2.890	–2.892
–240	–2.816	–2.822	–2.827	–2.833	–2.838	–2.843	–2.847	–2.852	–2.856	–2.860	–2.864
–230	–2.749	–2.757	–2.764	–2.771	–2.778	–2.785	–2.791	–2.798	–2.804	–2.810	–2.816
–220	–2.667	–2.676	–2.685	–2.693	–2.702	–2.710	–2.718	–2.726	–2.734	–2.742	–2.749
–210	–2.575	–2.584	–2.594	–2.604	–2.613	–2.622	–2.631	–2.641	–2.650	–2.659	–2.667
–200	–2.475	–2.485	–2.495	–2.506	–2.516	–2.526	–2.536	–2.546	–2.555	–2.565	–2.575
–190	–2.371	–2.381	–2.392	–2.402	–2.413	–2.423	–2.434	–2.444	–2.454	–2.465	–2.475
–180	–2.263	–2.274	–2.285	–2.295	–2.306	–2.317	–2.328	–2.338	–2.349	–2.360	–2.371
–170	–2.153	–2.164	–2.175	–2.186	–2.197	–2.208	–2.219	–2.230	–2.241	–2.252	–2.263
–160	–2.040	–2.052	–2.063	–2.074	–2.086	–2.097	–2.108	–2.119	–2.130	–2.142	–2.153
–150	–1.926	–1.938	–1.949	–1.961	–1.972	–1.984	–1.995	–2.006	–2.018	–2.029	–2.040
–140	–1.810	–1.822	–1.834	–1.845	–1.857	–1.868	–1.880	–1.892	–1.903	–1.915	–1.926
–130	–1.692	–1.704	–1.716	–1.728	–1.740	–1.751	–1.763	–1.775	–1.787	–1.798	–1.810
–120	–1.572	–1.584	–1.596	–1.608	–1.620	–1.632	–1.644	–1.656	–1.668	–1.680	–1.692
–110	–1.450	–1.463	–1.475	–1.487	–1.499	–1.511	–1.524	–1.536	–1.548	–1.560	–1.572
–100	–1.326	–1.339	–1.351	–1.364	–1.376	–1.388	–1.401	–1.413	–1.426	–1.438	–1.450
–90	–1.200	–1.213	–1.226	–1.238	–1.251	–1.263	–1.276	–1.289	–1.301	–1.314	–1.326
–80	–1.072	–1.085	–1.098	–1.111	–1.124	–1.136	–1.149	–1.162	–1.175	–1.188	–1.200
–70	–0.942	–0.955	–0.969	–0.982	–0.995	–1.008	–1.021	–1.033	–1.046	–1.059	–1.072
–60	–0.811	–0.824	–0.837	–0.851	–0.864	–0.877	–0.890	–0.903	–0.916	–0.929	–0.942
–50	–0.678	–0.692	–0.705	–0.718	–0.732	–0.745	–0.758	–0.771	–0.785	–0.798	–0.811
–40	–0.544	–0.558	–0.571	–0.585	–0.598	–0.611	–0.625	–0.638	–0.652	–0.665	–0.678
–30	–0.409	–0.423	–0.436	–0.450	–0.463	–0.477	–0.490	–0.504	–0.517	–0.531	–0.544
–20	–0.273	–0.287	–0.300	–0.314	–0.328	–0.341	–0.355	–0.368	–0.382	–0.396	–0.409
–10	–0.136	–0.150	–0.164	–0.177	–0.191	–0.205	–0.218	–0.232	–0.246	–0.259	–0.273
0	0.000	–0.014	–0.027	–0.041	–0.055	–0.068	–0.082	–0.095	–0.109	–0.123	–0.136
0	0.000	0.014	0.027	0.041	0.055	0.068	0.082	0.095	0.109	0.123	0.136
10	0.136	0.150	0.163	0.177	0.190	0.204	0.217	0.231	0.244	0.258	0.271
20	0.271	0.285	0.298	0.312	0.325	0.339	0.352	0.366	0.379	0.392	0.406
30	0.406	0.419	0.433	0.446	0.459	0.472	0.486	0.499	0.512	0.526	0.539
40	0.539	0.552	0.565	0.578	0.592	0.605	0.618	0.631	0.644	0.657	0.670
50	0.670	0.683	0.696	0.709	0.722	0.735	0.748	0.761	0.774	0.786	0.799
60	0.799	0.812	0.825	0.837	0.850	0.863	0.875	0.888	0.900	0.913	0.925
70	0.925	0.938	0.950	0.963	0.975	0.987	1.000	1.012	1.024	1.036	1.049
80	1.049	1.061	1.073	1.085	1.097	1.109	1.121	1.132	1.144	1.156	1.168
90	1.168	1.179	1.191	1.203	1.214	1.226	1.237	1.249	1.260	1.271	1.282
100	1.282	1.294	1.305	1.316	1.327	1.338	1.349	1.360	1.371	1.382	1.392
110	1.392	1.403	1.414	1.424	1.435	1.445	1.456	1.466	1.476	1.487	1.497
120	1.497	1.507	1.517	1.527	1.537	1.547	1.557	1.567	1.577	1.587	1.596
130	1.596	1.606	1.615	1.625	1.634	1.644	1.653	1.663	1.672	1.681	1.690
140	1.690	1.699	1.708	1.717	1.726	1.735	1.744	1.753	1.762	1.770	1.779
150	1.779	1.788	1.796	1.805	1.813	1.822	1.830	1.839	1.847	1.855	1.863
160	1.863	1.872	1.880	1.888	1.896	1.904	1.912	1.920	1.928	1.936	1.944
170	1.944	1.952	1.959	1.967	1.975	1.983	1.990	1.998	2.006	2.013	2.021
180	2.021	2.029	2.036	2.044	2.051	2.059	2.066	2.073	2.081	2.088	2.096
190	2.096	2.103	2.110	2.118	2.125	2.132	2.139	2.147	2.154	2.161	2.168
200	2.168	2.176	2.183	2.190	2.197	2.204	2.211	2.219	2.226	2.233	2.240
210	2.240	2.247	2.254	2.261	2.268	2.276	2.283	2.290	2.297	2.304	2.311
220	2.311	2.318	2.325	2.332	2.339	2.346	2.353	2.361	2.368	2.375	2.382
230	2.382	2.389	2.396	2.403	2.410	2.417	2.424	2.431	2.438	2.446	2.453
240	2.453	2.460	2.467	2.474	2.481	2.488	2.495	2.502	2.510	2.517	2.524
250	2.524	2.531	2.538	2.545	2.552	2.560	2.567	2.574	2.581	2.588	2.595
260	2.595	2.603	2.610	2.617	2.624	2.631	2.639	2.646	2.653	2.660	2.667
270	2.667	2.675	2.682	2.689	2.696	2.703	2.711	2.718	2.725	2.732	2.740
280	2.740	2.747	2.754	2.761	2.769	2.776	2.783	2.791	2.798	2.805	2.812
290	2.812	2.820	2.827	2.834	2.842	2.849	2.856	2.864	2.871	2.878	2.885
300	2.885	2.893	2.900	2.907	2.915	2.922	2.929	2.937	2.944	2.951	2.959

TABLE 36 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	2.959	2.966	2.974	2.981	2.988	2.996	3.003	3.010	3.018	3.025	3.032
320	3.032	3.040	3.047	3.055	3.062	3.069	3.077	3.084	3.092	3.099	3.106
330	3.106	3.114	3.121	3.129	3.136	3.143	3.151	3.158	3.166	3.173	3.181
340	3.181	3.188	3.195	3.203	3.210	3.218	3.225	3.233	3.240	3.248	3.255
350	3.255	3.262	3.270	3.277	3.285	3.292	3.300	3.307	3.315	3.322	3.330
360	3.330	3.337	3.345	3.352	3.360	3.367	3.375	3.382	3.390	3.397	3.405
370	3.405	3.412	3.420	3.428	3.435	3.443	3.450	3.458	3.465	3.473	3.481
380	3.481	3.488	3.496	3.503	3.511	3.518	3.526	3.534	3.541	3.549	3.557
390	3.557	3.564	3.572	3.579	3.587	3.595	3.602	3.610	3.618	3.625	3.633
400	3.633	3.641	3.648	3.656	3.664	3.672	3.679	3.687	3.695	3.702	3.710
410	3.710	3.718	3.726	3.733	3.741	3.749	3.757	3.764	3.772	3.780	3.788
420	3.788	3.796	3.803	3.811	3.819	3.827	3.835	3.842	3.850	3.858	3.866
430	3.866	3.874	3.882	3.889	3.897	3.905	3.913	3.921	3.929	3.937	3.945
440	3.945	3.953	3.961	3.968	3.976	3.984	3.992	4.000	4.008	4.016	4.024
450	4.024	4.032	4.040	4.048	4.056	4.064	4.072	4.080	4.088	4.096	4.104
460	4.104	4.112	4.120	4.128	4.136	4.144	4.153	4.161	4.169	4.177	4.185
470	4.185	4.193	4.201	4.209	4.217	4.225	4.234	4.242	4.250	4.258	4.266
480	4.266	4.274	4.283	4.291	4.299	4.307	4.315	4.324	4.332	4.340	4.348
490	4.348	4.356	4.365	4.373	4.381	4.389	4.398	4.406	4.414	4.423	4.431
500	4.431	4.439	4.447	4.456	4.464	4.472	4.481	4.489	4.497	4.506	4.514
510	4.514	4.522	4.531	4.539	4.547	4.556	4.564	4.573	4.581	4.589	4.598
520	4.598	4.606	4.615	4.623	4.632	4.640	4.648	4.657	4.665	4.674	4.682
530	4.682	4.691	4.699	4.708	4.716	4.725	4.733	4.742	4.750	4.759	4.767
540	4.767	4.776	4.784	4.793	4.801	4.810	4.818	4.827	4.836	4.844	4.853
550	4.853	4.861	4.870	4.878	4.887	4.896	4.904	4.913	4.921	4.930	4.939
560	4.939	4.947	4.956	4.965	4.973	4.982	4.991	4.999	5.008	5.017	5.025
570	5.025	5.034	5.043	5.051	5.060	5.069	5.077	5.086	5.095	5.103	5.112
580	5.112	5.121	5.130	5.138	5.147	5.156	5.164	5.173	5.182	5.191	5.199
590	5.199	5.208	5.217	5.226	5.235	5.243	5.252	5.261	5.270	5.278	5.287
600	5.287	5.296	5.305	5.314	5.322	5.331	5.340	5.349	5.358	5.366	5.375
610	5.375	5.384	5.393	5.402	5.411	5.419	5.428	5.437	5.446	5.455	5.464
620	5.464	5.473	5.481	5.490	5.499	5.508	5.517	5.526	5.535	5.544	5.552
630	5.552	5.561	5.570	5.579	5.588	5.597	5.606	5.615	5.624	5.632	5.641
640	5.641	5.650	5.659	5.668	5.677	5.686	5.695	5.704	5.713	5.722	5.730
650	5.730	5.739	5.748	5.757	5.766	5.775	5.784	5.793	5.802	5.811	5.820
660	5.820	5.829	5.838	5.847	5.856	5.864	5.873	5.882	5.891	5.900	5.909
670	5.909	5.918	5.927	5.936	5.945	5.954	5.963	5.972	5.981	5.990	5.999
680	5.999	6.008	6.017	6.026	6.035	6.044	6.053	6.061	6.070	6.079	6.088
690	6.088	6.097	6.106	6.115	6.124	6.133	6.142	6.151	6.160	6.169	6.178
700	6.178	6.187	6.196	6.205	6.214	6.223	6.232	6.241	6.250	6.259	6.268
710	6.268	6.277	6.286	6.295	6.304	6.313	6.321	6.330	6.339	6.348	6.357
720	6.357	6.366	6.375	6.384	6.393	6.402	6.411	6.420	6.429	6.438	6.447
730	6.447	6.456	6.465	6.474	6.483	6.492	6.501	6.510	6.519	6.527	6.536
740	6.536	6.545	6.554	6.563	6.572	6.581	6.590	6.599	6.608	6.617	6.626
750	6.626	6.635	6.644	6.653	6.662	6.670	6.679	6.688	6.697	6.706	6.715
760	6.715	6.724	6.733	6.742	6.751	6.760	6.769	6.778	6.786	6.795	6.804
770	6.804	6.813	6.822	6.831	6.840	6.849	6.858	6.866	6.875	6.884	6.893
780	6.893	6.902	6.911	6.920	6.929	6.938	6.946	6.955	6.964	6.973	6.982
790	6.982	6.991	7.000	7.008	7.017	7.026	7.035	7.044	7.053	7.062	7.070
800	7.070	7.079	7.088	7.097	7.106	7.115	7.123	7.132	7.141	7.150	7.159
810	7.159	7.167	7.176	7.185	7.194	7.203	7.212	7.220	7.229	7.238	7.247
820	7.247	7.255	7.264	7.273	7.282	7.291	7.299	7.308	7.317	7.326	7.334
830	7.334	7.343	7.352	7.361	7.369	7.378	7.387	7.396	7.404	7.413	7.422
840	7.422	7.431	7.439	7.448	7.457	7.466	7.474	7.483	7.492	7.500	7.509
850	7.509	7.518	7.527	7.535	7.544	7.553	7.561	7.570	7.579	7.587	7.596
860	7.596	7.605	7.613	7.622	7.631	7.639	7.648	7.657	7.665	7.674	7.683
870	7.683	7.691	7.700	7.708	7.717	7.726	7.734	7.743	7.752	7.760	7.769
880	7.769	7.777	7.786	7.795	7.803	7.812	7.820	7.829	7.838	7.846	7.855
890	7.855	7.863	7.872	7.880	7.889	7.898	7.906	7.915	7.923	7.932	7.940

TABLE 36 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
900	7.940	7.949	7.957	7.966	7.974	7.983	7.992	8.000	8.009	8.017	8.026
910	8.026	8.034	8.043	8.051	8.060	8.068	8.077	8.085	8.094	8.102	8.110
920	8.110	8.119	8.127	8.136	8.144	8.153	8.161	8.170	8.178	8.187	8.195
930	8.195	8.203	8.212	8.220	8.229	8.237	8.246	8.254	8.262	8.271	8.279
940	8.279	8.288	8.296	8.304	8.313	8.321	8.330	8.338	8.346	8.355	8.363
950	8.363	8.371	8.380	8.388	8.397	8.405	8.413	8.422	8.430	8.438	8.447
960	8.447	8.455	8.463	8.472	8.480	8.488	8.496	8.505	8.513	8.521	8.530
970	8.530	8.538	8.546	8.555	8.563	8.571	8.579	8.588	8.596	8.604	8.612
980	8.612	8.621	8.629	8.637	8.645	8.654	8.662	8.670	8.678	8.687	8.695
990	8.695	8.703	8.711	8.719	8.728	8.736	8.744	8.752	8.760	8.769	8.777
1000	8.777	8.785	8.793	8.801	8.809	8.818	8.826	8.834	8.842	8.850	8.858
1010	8.858	8.867	8.875	8.883	8.891	8.899	8.907	8.915	8.923	8.932	8.940
1020	8.940	8.948	8.956	8.964	8.972	8.980	8.988	8.996	9.004	9.012	9.021
1030	9.021	9.029	9.037	9.045	9.053	9.061	9.069	9.077	9.085	9.093	9.101
1040	9.101	9.109	9.117	9.125	9.133	9.141	9.149	9.157	9.165	9.173	9.181
1050	9.181	9.189	9.197	9.205	9.213	9.221	9.229	9.237	9.245	9.253	9.261
1060	9.261	9.269	9.277	9.285	9.292	9.300	9.308	9.316	9.324	9.332	9.340
1070	9.340	9.348	9.356	9.364	9.372	9.379	9.387	9.395	9.403	9.411	9.419
1080	9.419	9.427	9.434	9.442	9.450	9.458	9.466	9.474	9.482	9.489	9.497
1090	9.497	9.505	9.513	9.521	9.528	9.536	9.544	9.552	9.560	9.567	9.575
1100	9.575	9.583	9.591	9.598	9.606	9.614	9.622	9.629	9.637	9.645	9.653
1110	9.653	9.660	9.668	9.676	9.684	9.691	9.699	9.707	9.714	9.722	9.730
1120	9.730	9.737	9.745	9.753	9.761	9.768	9.776	9.784	9.791	9.799	9.806
1130	9.806	9.814	9.822	9.829	9.837	9.845	9.852	9.860	9.867	9.875	9.883
1140	9.883	9.890	9.898	9.905	9.913	9.921	9.928	9.936	9.943	9.951	9.958
1150	9.958	9.966	9.973	9.981	9.989	9.996	10.004	10.011	10.019	10.026	10.034
1160	10.034	10.041	10.049	10.056	10.064	10.071	10.079	10.086	10.093	10.101	10.108
1170	10.108	10.116	10.123	10.131	10.138	10.146	10.153	10.160	10.168	10.175	10.183
1180	10.183	10.190	10.198	10.205	10.212	10.220	10.227	10.234	10.242	10.249	10.257
1190	10.257	10.264	10.271	10.279	10.286	10.293	10.301	10.308	10.315	10.323	10.330
1200	10.330	10.337	10.345	10.352	10.359	10.367	10.374	10.381	10.388	10.396	10.403
1210	10.403	10.410	10.417	10.425	10.432	10.439	10.447	10.454	10.461	10.468	10.475
1220	10.475	10.483	10.490	10.497	10.504	10.512	10.519	10.526	10.533	10.540	10.548
1230	10.548	10.555	10.562	10.569	10.576	10.584	10.591	10.598	10.605	10.612	10.619
1240	10.619	10.626	10.634	10.641	10.648	10.655	10.662	10.669	10.676	10.684	10.691
1250	10.691	10.698	10.705	10.712	10.719	10.726	10.733	10.741	10.748	10.755	10.762
1260	10.762	10.769	10.776	10.783	10.790	10.797	10.804	10.811	10.819	10.826	10.833
1270	10.833	10.840	10.847	10.854	10.861	10.868	10.875	10.882	10.889	10.896	10.903
1280	10.903	10.911	10.918	10.925	10.932	10.939	10.946	10.953	10.960	10.967	10.974
1290	10.974	10.981	10.988	10.995	11.002	11.009	11.016	11.024	11.031	11.038	11.045
1300	11.045	11.052	11.059	11.066	11.073	11.080	11.087	11.094	11.101	11.108	11.116
1310	11.116	11.123	11.130	11.137	11.144	11.151	11.158	11.165	11.172	11.180	11.187
1320	11.187	11.194	11.201	11.208	11.215	11.222	11.229	11.237	11.244	11.251	11.258
1330	11.258	11.265	11.273	11.280	11.287	11.294	11.301	11.309	11.316	11.323	11.330
1340	11.330	11.338	11.345	11.352	11.359	11.367	11.374	11.381	11.389	11.396	11.403
1350	11.403	11.411	11.418	11.425	11.433	11.440	11.448	11.455	11.462	11.470	11.477
1360	11.477	11.485	11.492	11.500	11.507	11.515	11.522	11.530	11.537	11.545	11.553
1370	11.553	11.560	11.568								

TABLE 37 Platinum (NIST Pt–67) Versus Type KN Thermoelement

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–2.900	–2.900	–2.900	–2.900	–2.900						
–440	–2.895	–2.896	–2.897	–2.897	–2.898	–2.898	–2.899	–2.899	–2.899	–2.900	–2.900
–430	–2.885	–2.886	–2.888	–2.889	–2.890	–2.891	–2.892	–2.893	–2.894	–2.895	–2.895
–420	–2.868	–2.870	–2.872	–2.874	–2.876	–2.878	–2.879	–2.881	–2.882	–2.884	–2.885
–410	–2.845	–2.848	–2.850	–2.853	–2.855	–2.858	–2.860	–2.862	–2.864	–2.866	–2.868
–400	–2.816	–2.819	–2.822	–2.825	–2.828	–2.831	–2.834	–2.837	–2.840	–2.843	–2.845
–390	–2.781	–2.785	–2.788	–2.792	–2.796	–2.799	–2.803	–2.806	–2.809	–2.813	–2.816
–380	–2.741	–2.745	–2.749	–2.753	–2.757	–2.761	–2.765	–2.769	–2.773	–2.777	–2.781
–370	–2.696	–2.701	–2.705	–2.710	–2.714	–2.719	–2.723	–2.728	–2.732	–2.736	–2.741
–360	–2.648	–2.653	–2.658	–2.662	–2.667	–2.672	–2.677	–2.682	–2.687	–2.691	–2.696
–350	–2.596	–2.601	–2.607	–2.612	–2.617	–2.622	–2.627	–2.632	–2.638	–2.643	–2.648
–340	–2.542	–2.548	–2.553	–2.559	–2.564	–2.569	–2.575	–2.580	–2.586	–2.591	–2.596
–330	–2.486	–2.492	–2.498	–2.503	–2.509	–2.515	–2.520	–2.526	–2.531	–2.537	–2.542
–320	–2.429	–2.435	–2.441	–2.446	–2.452	–2.458	–2.464	–2.469	–2.475	–2.481	–2.486
–310	–2.371	–2.376	–2.382	–2.388	–2.394	–2.400	–2.406	–2.412	–2.417	–2.423	–2.429
–300	–2.311	–2.317	–2.323	–2.329	–2.335	–2.341	–2.347	–2.353	–2.359	–2.365	–2.371
–290	–2.251	–2.257	–2.263	–2.269	–2.275	–2.281	–2.287	–2.293	–2.299	–2.305	–2.311
–280	–2.190	–2.196	–2.202	–2.208	–2.214	–2.220	–2.226	–2.232	–2.239	–2.245	–2.251
–270	–2.128	–2.134	–2.140	–2.146	–2.153	–2.159	–2.165	–2.171	–2.177	–2.183	–2.190
–260	–2.066	–2.072	–2.078	–2.084	–2.091	–2.097	–2.103	–2.109	–2.115	–2.122	–2.128
–250	–2.003	–2.009	–2.015	–2.022	–2.028	–2.034	–2.040	–2.047	–2.053	–2.059	–2.066
–240	–1.939	–1.945	–1.952	–1.958	–1.965	–1.971	–1.977	–1.984	–1.990	–1.996	–2.003
–230	–1.875	–1.881	–1.888	–1.894	–1.901	–1.907	–1.913	–1.920	–1.926	–1.933	–1.939
–220	–1.810	–1.817	–1.823	–1.830	–1.836	–1.843	–1.849	–1.856	–1.862	–1.868	–1.875
–210	–1.745	–1.751	–1.758	–1.765	–1.771	–1.778	–1.784	–1.791	–1.797	–1.804	–1.810
–200	–1.679	–1.686	–1.692	–1.699	–1.705	–1.712	–1.719	–1.725	–1.732	–1.738	–1.745
–190	–1.612	–1.619	–1.626	–1.632	–1.639	–1.646	–1.652	–1.659	–1.666	–1.672	–1.679
–180	–1.545	–1.552	–1.559	–1.565	–1.572	–1.579	–1.586	–1.592	–1.599	–1.606	–1.612
–170	–1.478	–1.484	–1.491	–1.498	–1.505	–1.511	–1.518	–1.525	–1.532	–1.539	–1.545
–160	–1.409	–1.416	–1.423	–1.430	–1.437	–1.443	–1.450	–1.457	–1.464	–1.471	–1.478
–150	–1.340	–1.347	–1.354	–1.361	–1.368	–1.375	–1.382	–1.388	–1.395	–1.402	–1.409
–140	–1.270	–1.277	–1.284	–1.291	–1.298	–1.305	–1.312	–1.319	–1.326	–1.333	–1.340
–130	–1.200	–1.207	–1.214	–1.221	–1.228	–1.235	–1.242	–1.249	–1.256	–1.263	–1.270
–120	–1.129	–1.136	–1.144	–1.151	–1.158	–1.165	–1.172	–1.179	–1.186	–1.193	–1.200
–110	–1.058	–1.065	–1.072	–1.079	–1.087	–1.094	–1.101	–1.108	–1.115	–1.122	–1.129
–100	–0.986	–0.993	–1.000	–1.008	–1.015	–1.022	–1.029	–1.036	–1.044	–1.051	–1.058
–90	–0.913	–0.921	–0.928	–0.935	–0.942	–0.950	–0.957	–0.964	–0.971	–0.979	–0.986
–80	–0.840	–0.848	–0.855	–0.862	–0.870	–0.877	–0.884	–0.892	–0.899	–0.906	–0.913
–70	–0.767	–0.774	–0.782	–0.789	–0.796	–0.804	–0.811	–0.818	–0.826	–0.833	–0.840
–60	–0.693	–0.700	–0.708	–0.715	–0.723	–0.730	–0.737	–0.745	–0.752	–0.760	–0.767
–50	–0.619	–0.626	–0.634	–0.641	–0.649	–0.656	–0.663	–0.671	–0.678	–0.686	–0.693
–40	–0.544	–0.552	–0.559	–0.567	–0.574	–0.582	–0.589	–0.597	–0.604	–0.611	–0.619
–30	–0.469	–0.477	–0.484	–0.492	–0.499	–0.507	–0.514	–0.522	–0.529	–0.537	–0.544
–20	–0.394	–0.402	–0.409	–0.417	–0.424	–0.432	–0.439	–0.447	–0.454	–0.462	–0.469
–10	–0.318	–0.326	–0.334	–0.341	–0.349	–0.356	–0.364	–0.371	–0.379	–0.386	–0.394
0	–0.243	–0.250	–0.258	–0.265	–0.273	–0.281	–0.288	–0.296	–0.303	–0.311	–0.318
0	–0.243	–0.235	–0.228	–0.220	–0.212	–0.205	–0.197	–0.190	–0.182	–0.174	–0.167
10	–0.167	–0.159	–0.152	–0.144	–0.136	–0.129	–0.121	–0.114	–0.106	–0.099	–0.091
20	–0.091	–0.083	–0.076	–0.068	–0.061	–0.053	–0.045	–0.038	–0.030	–0.023	–0.015
30	–0.015	–0.008	0.000	0.008	0.015	0.023	0.030	0.038	0.045	0.053	0.061
40	0.061	0.068	0.076	0.083	0.091	0.098	0.106	0.113	0.121	0.129	0.136
50	0.136	0.144	0.151	0.159	0.166	0.174	0.181	0.189	0.196	0.204	0.211
60	0.211	0.219	0.226	0.234	0.241	0.249	0.256	0.264	0.271	0.279	0.286
70	0.286	0.294	0.301	0.309	0.316	0.324	0.331	0.339	0.346	0.354	0.361
80	0.361	0.369	0.376	0.383	0.391	0.398	0.406	0.413	0.421	0.428	0.435
90	0.435	0.443	0.450	0.458	0.465	0.472	0.480	0.487	0.495	0.502	0.509
100	0.509	0.517	0.524	0.531	0.539	0.546	0.553	0.561	0.568	0.575	0.583
110	0.583	0.590	0.597	0.605	0.612	0.619	0.627	0.634	0.641	0.648	0.656
120	0.656	0.663	0.670	0.677	0.685	0.692	0.699	0.706	0.713	0.721	0.728

TABLE 37 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	0.728	0.735	0.742	0.749	0.756	0.764	0.771	0.778	0.785	0.792	0.799
140	0.799	0.806	0.813	0.820	0.827	0.835	0.842	0.849	0.856	0.863	0.870
150	0.870	0.877	0.884	0.891	0.898	0.905	0.912	0.919	0.925	0.932	0.939
160	0.939	0.946	0.953	0.960	0.967	0.974	0.981	0.987	0.994	1.001	1.008
170	1.008	1.015	1.022	1.028	1.035	1.042	1.049	1.055	1.062	1.069	1.075
180	1.075	1.082	1.089	1.095	1.102	1.109	1.115	1.122	1.128	1.135	1.142
190	1.142	1.148	1.155	1.161	1.168	1.174	1.181	1.187	1.194	1.200	1.207
200	1.207	1.213	1.219	1.226	1.232	1.238	1.245	1.251	1.257	1.264	1.270
210	1.270	1.276	1.282	1.289	1.295	1.301	1.307	1.314	1.320	1.326	1.332
220	1.332	1.338	1.344	1.350	1.356	1.362	1.368	1.374	1.380	1.386	1.392
230	1.392	1.398	1.404	1.410	1.415	1.422	1.428	1.434	1.439	1.445	1.451
240	1.451	1.457	1.463	1.468	1.474	1.480	1.486	1.491	1.497	1.503	1.508
250	1.508	1.514	1.519	1.525	1.531	1.536	1.542	1.547	1.553	1.558	1.564
260	1.564	1.569	1.575	1.580	1.585	1.591	1.596	1.602	1.607	1.612	1.618
270	1.618	1.623	1.628	1.633	1.639	1.644	1.649	1.654	1.659	1.665	1.670
280	1.670	1.675	1.680	1.685	1.690	1.695	1.700	1.705	1.710	1.715	1.720
290	1.720	1.725	1.730	1.735	1.740	1.745	1.750	1.755	1.760	1.765	1.769
300	1.769	1.774	1.779	1.784	1.789	1.793	1.798	1.803	1.808	1.812	1.817
310	1.817	1.822	1.826	1.831	1.836	1.840	1.845	1.850	1.854	1.859	1.863
320	1.863	1.868	1.873	1.877	1.882	1.886	1.891	1.895	1.900	1.904	1.909
330	1.909	1.913	1.917	1.922	1.926	1.931	1.935	1.939	1.944	1.948	1.953
340	1.953	1.957	1.961	1.966	1.970	1.974	1.978	1.983	1.987	1.991	1.996
350	1.996	2.000	2.004	2.008	2.013	2.017	2.021	2.025	2.029	2.034	2.038
360	2.038	2.042	2.046	2.050	2.054	2.059	2.063	2.067	2.071	2.075	2.079
370	2.079	2.083	2.087	2.091	2.096	2.100	2.104	2.108	2.112	2.116	2.120
380	2.120	2.124	2.128	2.132	2.136	2.140	2.144	2.148	2.152	2.156	2.160
390	2.160	2.164	2.168	2.172	2.176	2.180	2.184	2.188	2.192	2.196	2.200
400	2.200	2.204	2.208	2.212	2.216	2.220	2.224	2.228	2.232	2.236	2.240
410	2.240	2.244	2.248	2.252	2.256	2.260	2.264	2.268	2.272	2.276	2.279
420	2.279	2.283	2.287	2.291	2.295	2.299	2.303	2.307	2.311	2.315	2.319
430	2.319	2.323	2.327	2.331	2.335	2.339	2.342	2.346	2.350	2.354	2.358
440	2.358	2.362	2.366	2.370	2.374	2.378	2.382	2.386	2.390	2.394	2.398
450	2.398	2.401	2.405	2.409	2.413	2.417	2.421	2.425	2.429	2.433	2.437
460	2.437	2.441	2.445	2.449	2.453	2.457	2.461	2.465	2.468	2.472	2.476
470	2.476	2.480	2.484	2.488	2.492	2.496	2.500	2.504	2.508	2.512	2.516
480	2.516	2.520	2.524	2.528	2.532	2.536	2.540	2.544	2.548	2.552	2.556
490	2.556	2.560	2.564	2.568	2.571	2.575	2.579	2.583	2.587	2.591	2.595
500	2.595	2.599	2.603	2.607	2.611	2.615	2.619	2.623	2.627	2.631	2.635
510	2.635	2.639	2.643	2.647	2.651	2.655	2.659	2.663	2.667	2.671	2.675
520	2.675	2.679	2.683	2.687	2.691	2.695	2.699	2.703	2.708	2.712	2.716
530	2.716	2.720	2.724	2.728	2.732	2.736	2.740	2.744	2.748	2.752	2.756
540	2.756	2.760	2.764	2.768	2.772	2.776	2.780	2.784	2.788	2.792	2.796
550	2.796	2.800	2.804	2.808	2.812	2.816	2.821	2.825	2.829	2.833	2.837
560	2.837	2.841	2.845	2.849	2.853	2.857	2.861	2.865	2.869	2.873	2.877
570	2.877	2.881	2.885	2.890	2.894	2.898	2.902	2.906	2.910	2.914	2.918
580	2.918	2.922	2.926	2.930	2.934	2.938	2.943	2.947	2.951	2.955	2.959
590	2.959	2.963	2.967	2.971	2.975	2.979	2.983	2.987	2.992	2.996	3.000
600	3.000	3.004	3.008	3.012	3.016	3.020	3.024	3.028	3.032	3.037	3.041
610	3.041	3.045	3.049	3.053	3.057	3.061	3.065	3.069	3.073	3.078	3.082
620	3.082	3.086	3.090	3.094	3.098	3.102	3.106	3.110	3.115	3.119	3.123
630	3.123	3.127	3.131	3.135	3.139	3.143	3.148	3.152	3.156	3.160	3.164
640	3.164	3.168	3.172	3.176	3.181	3.185	3.189	3.193	3.197	3.201	3.205
650	3.205	3.209	3.214	3.218	3.222	3.226	3.230	3.234	3.238	3.243	3.247
660	3.247	3.251	3.255	3.259	3.263	3.267	3.272	3.276	3.280	3.284	3.288
670	3.288	3.292	3.296	3.301	3.305	3.309	3.313	3.317	3.321	3.326	3.330
680	3.330	3.334	3.338	3.342	3.346	3.351	3.355	3.359	3.363	3.367	3.371
690	3.371	3.376	3.380	3.384	3.388	3.392	3.397	3.401	3.405	3.409	3.413
700	3.413	3.417	3.422	3.426	3.430	3.434	3.438	3.443	3.447	3.451	3.455
710	3.455	3.459	3.464	3.468	3.472	3.476	3.481	3.485	3.489	3.493	3.497

TABLE 37 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	3.497	3.502	3.506	3.510	3.514	3.518	3.523	3.527	3.531	3.535	3.540
730	3.540	3.544	3.548	3.552	3.557	3.561	3.565	3.569	3.573	3.578	3.582
740	3.582	3.586	3.590	3.595	3.599	3.603	3.607	3.612	3.616	3.620	3.625
750	3.625	3.629	3.633	3.637	3.642	3.646	3.650	3.654	3.659	3.663	3.667
760	3.667	3.672	3.676	3.680	3.684	3.689	3.693	3.697	3.702	3.706	3.710
770	3.710	3.714	3.719	3.723	3.727	3.732	3.736	3.740	3.745	3.749	3.753
780	3.753	3.757	3.762	3.766	3.770	3.775	3.779	3.783	3.788	3.792	3.796
790	3.796	3.801	3.805	3.809	3.814	3.818	3.822	3.827	3.831	3.835	3.840
800	3.840	3.844	3.848	3.853	3.857	3.862	3.866	3.870	3.875	3.879	3.883
810	3.883	3.888	3.892	3.896	3.901	3.905	3.910	3.914	3.918	3.923	3.927
820	3.927	3.932	3.936	3.940	3.945	3.949	3.954	3.958	3.962	3.967	3.971
830	3.971	3.976	3.980	3.984	3.989	3.993	3.998	4.002	4.006	4.011	4.015
840	4.015	4.020	4.024	4.029	4.033	4.037	4.042	4.046	4.051	4.055	4.060
850	4.060	4.064	4.069	4.073	4.077	4.082	4.086	4.091	4.095	4.100	4.104
860	4.104	4.109	4.113	4.118	4.122	4.127	4.131	4.136	4.140	4.144	4.149
870	4.149	4.153	4.158	4.162	4.167	4.171	4.176	4.180	4.185	4.189	4.194
880	4.194	4.198	4.203	4.207	4.212	4.216	4.221	4.225	4.230	4.235	4.239
890	4.239	4.244	4.248	4.253	4.257	4.262	4.266	4.271	4.275	4.280	4.284
900	4.284	4.289	4.293	4.298	4.303	4.307	4.312	4.316	4.321	4.325	4.330
910	4.330	4.335	4.339	4.344	4.348	4.353	4.357	4.362	4.367	4.371	4.376
920	4.376	4.380	4.385	4.389	4.394	4.399	4.403	4.408	4.412	4.417	4.422
930	4.422	4.426	4.431	4.435	4.440	4.445	4.449	4.454	4.458	4.463	4.468
940	4.468	4.472	4.477	4.482	4.486	4.491	4.495	4.500	4.505	4.509	4.514
950	4.514	4.519	4.523	4.528	4.533	4.537	4.542	4.547	4.551	4.556	4.561
960	4.561	4.565	4.570	4.575	4.579	4.584	4.589	4.593	4.598	4.603	4.607
970	4.607	4.612	4.617	4.621	4.626	4.631	4.635	4.640	4.645	4.649	4.654
980	4.654	4.659	4.663	4.668	4.673	4.678	4.682	4.687	4.692	4.696	4.701
990	4.701	4.706	4.711	4.715	4.720	4.725	4.729	4.734	4.739	4.744	4.748
1000	4.748	4.753	4.758	4.762	4.767	4.772	4.777	4.781	4.786	4.791	4.796
1010	4.796	4.800	4.805	4.810	4.815	4.819	4.824	4.829	4.834	4.638	4.843
1020	4.843	4.848	4.853	4.857	4.862	4.867	4.872	4.877	4.881	4.886	4.891
1030	4.891	4.896	4.900	4.905	4.910	4.915	4.920	4.924	4.929	4.934	4.939
1040	4.939	4.943	4.948	4.953	4.958	4.963	4.967	4.972	4.977	4.982	4.987
1050	4.987	4.992	4.996	5.001	5.006	5.011	5.016	5.020	5.025	5.030	5.035
1060	5.035	5.040	5.044	5.049	5.054	5.059	5.064	5.069	5.073	5.078	5.083
1070	5.083	5.088	5.093	5.098	5.102	5.107	5.112	5.117	5.122	5.127	5.131
1080	5.131	5.136	5.141	5.146	5.151	5.156	5.161	5.165	5.170	5.175	5.180
1090	5.180	5.185	5.190	5.195	5.199	5.204	5.209	5.214	5.219	5.224	5.229
1100	5.229	5.234	5.238	5.243	5.248	5.253	5.258	5.263	5.268	5.273	5.277
1110	5.277	5.282	5.287	5.292	5.297	5.302	5.307	5.312	5.317	5.321	5.326
1120	5.326	5.331	5.336	5.341	5.346	5.351	5.356	5.361	5.365	5.370	5.375
1130	5.375	5.380	5.385	5.390	5.395	5.400	5.405	5.410	5.415	5.419	5.424
1140	5.424	5.429	5.434	5.439	5.444	5.449	5.454	5.459	5.464	5.469	5.474
1150	5.474	5.478	5.483	5.488	5.493	5.498	5.503	5.508	5.513	5.518	5.523
1160	5.523	5.528	5.533	5.538	5.543	5.547	5.552	5.557	5.562	5.567	5.572
1170	5.572	5.577	5.582	5.587	5.592	5.597	5.602	5.607	5.612	5.617	5.622
1180	5.622	5.626	5.631	5.636	5.641	5.646	5.651	5.656	5.661	5.666	5.671
1190	5.671	5.676	5.681	5.686	5.691	5.696	5.701	5.706	5.711	5.716	5.721
1200	5.721	5.725	5.730	5.735	5.740	5.745	5.750	5.755	5.760	5.765	5.770
1210	5.770	5.775	5.780	5.785	5.790	5.795	5.800	5.805	5.810	5.815	5.820
1220	5.820	5.825	5.830	5.835	5.840	5.845	5.850	5.855	5.859	5.864	5.869
1230	5.869	5.874	5.879	5.884	5.889	5.894	5.899	5.904	5.909	5.914	5.919
1240	5.919	5.924	5.929	5.934	5.939	5.944	5.949	5.954	5.959	5.964	5.969
1250	5.969	5.974	5.979	5.984	5.989	5.994	5.999	6.004	6.009	6.014	6.019
1260	6.019	6.024	6.029	6.034	6.039	6.044	6.049	6.054	6.058	6.063	6.068
1270	6.068	6.073	6.078	6.083	6.088	6.093	6.098	6.103	6.108	6.113	6.118
1280	6.118	6.123	6.128	6.133	6.138	6.143	6.148	6.153	6.158	6.163	6.168
1290	6.168	6.173	6.178	6.183	6.188	6.193	6.198	6.203	6.208	6.213	6.218
1300	6.218	6.223	6.228	6.233	6.238	6.243	6.248	6.253	6.258	6.263	6.268

TABLE 37 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1310	6.268	6.273	6.278	6.283	6.288	6.293	6.298	6.303	6.308	6.313	6.318
1320	6.318	6.322	6.327	6.332	6.337	6.342	6.347	6.352	6.357	6.362	6.367
1330	6.367	6.372	6.377	6.382	6.387	6.392	6.397	6.402	6.407	6.412	6.417
1340	6.417	6.422	6.427	6.432	6.437	6.442	6.447	6.452	6.457	6.462	6.467
1350	6.467	6.472	6.477	6.482	6.487	6.492	6.497	6.502	6.507	6.512	6.517
1360	6.517	6.522	6.527	6.531	6.536	6.541	6.546	6.551	6.556	6.561	6.566
1370	6.566	6.571	6.576	6.581	6.586	6.591	6.596	6.601	6.606	6.611	6.616
1380	6.616	6.621	6.626	6.631	6.636	6.641	6.646	6.651	6.656	6.661	6.666
1390	6.666	6.670	6.675	6.680	6.685	6.690	6.695	6.700	6.705	6.710	6.715
1400	6.715	6.720	6.725	6.730	6.735	6.740	6.745	6.750	6.755	6.760	6.765
1410	6.765	6.770	6.775	6.779	6.784	6.789	6.794	6.799	6.804	6.809	6.814
1420	6.814	6.819	6.824	6.829	6.834	6.839	6.844	6.849	6.854	6.859	6.864
1430	6.864	6.868	6.873	6.878	6.883	6.888	6.893	6.898	6.903	6.908	6.913
1440	6.913	6.918	6.923	6.928	6.933	6.938	6.942	6.947	6.952	6.957	6.962
1450	6.962	6.967	6.972	6.977	6.982	6.987	6.992	6.997	7.002	7.007	7.011
1460	7.011	7.016	7.021	7.026	7.031	7.036	7.041	7.046	7.051	7.056	7.061
1470	7.061	7.065	7.070	7.075	7.080	7.085	7.090	7.095	7.100	7.105	7.110
1480	7.110	7.115	7.119	7.124	7.129	7.134	7.139	7.144	7.149	7.154	7.159
1490	7.159	7.164	7.168	7.173	7.178	7.183	7.188	7.193	7.198	7.203	7.208
1500	7.208	7.213	7.217	7.222	7.227	7.232	7.237	7.242	7.247	7.252	7.256
1510	7.256	7.261	7.266	7.271	7.276	7.281	7.286	7.291	7.295	7.300	7.305
1520	7.305	7.310	7.315	7.320	7.325	7.330	7.334	7.339	7.344	7.349	7.354
1530	7.354	7.359	7.364	7.369	7.373	7.378	7.383	7.388	7.393	7.398	7.403
1540	7.403	7.407	7.412	7.417	7.422	7.427	7.432	7.436	7.441	7.446	7.451
1550	7.451	7.456	7.461	7.466	7.470	7.475	7.480	7.485	7.490	7.495	7.499
1560	7.499	7.504	7.509	7.514	7.519	7.524	7.528	7.533	7.538	7.543	7.548
1570	7.548	7.553	7.557	7.562	7.567	7.572	7.577	7.582	7.586	7.591	7.596
1580	7.596	7.601	7.606	7.610	7.615	7.620	7.625	7.630	7.635	7.639	7.644
1590	7.644	7.649	7.654	7.659	7.663	7.668	7.673	7.678	7.683	7.687	7.692
1600	7.692	7.697	7.702	7.707	7.711	7.716	7.721	7.726	7.731	7.735	7.740
1610	7.740	7.745	7.750	7.754	7.759	7.764	7.769	7.774	7.778	7.783	7.788
1620	7.788	7.793	7.798	7.802	7.807	7.812	7.817	7.821	7.826	7.831	7.836
1630	7.836	7.840	7.845	7.850	7.855	7.860	7.864	7.869	7.874	7.879	7.883
1640	7.883	7.888	7.893	7.898	7.902	7.907	7.912	7.917	7.921	7.926	7.931
1650	7.931	7.936	7.940	7.945	7.950	7.955	7.959	7.964	7.969	7.974	7.978
1660	7.978	7.983	7.988	7.992	7.997	8.002	8.007	8.011	8.016	8.021	8.026
1670	8.026	8.030	8.035	8.040	8.044	8.049	8.054	8.059	8.063	8.068	8.073
1680	8.073	8.078	8.082	8.087	8.092	8.096	8.101	8.106	8.110	8.115	8.120
1690	8.120	8.125	8.129	8.134	8.139	8.143	8.148	8.153	8.158	8.162	8.167
1700	8.167	8.172	8.176	8.181	8.186	8.190	8.195	8.200	8.204	8.209	8.214
1710	8.214	8.218	8.223	8.228	8.233	8.237	8.242	8.247	8.251	8.256	8.261
1720	8.261	8.265	8.270	8.275	8.279	8.284	8.289	8.293	8.298	8.303	8.307
1730	8.307	8.312	8.317	8.321	8.326	8.331	8.335	8.340	8.344	8.349	8.354
1740	8.354	8.358	8.363	8.368	8.372	8.377	8.382	8.386	8.391	8.396	8.400
1750	8.400	8.405	8.410	8.414	8.419	8.423	8.428	8.433	8.437	8.442	8.447
1760	8.447	8.451	8.456	8.460	8.465	8.470	8.474	8.479	8.484	8.488	8.493
1770	8.493	8.497	8.502	8.507	8.511	8.516	8.520	8.525	8.530	8.534	8.539
1780	8.539	8.543	8.548	8.553	8.557	8.562	8.566	8.571	8.576	8.580	8.585
1790	8.585	8.589	8.594	8.599	8.603	8.608	8.612	8.617	8.622	8.626	8.631
1800	8.631	8.635	8.640	8.644	8.649	8.654	8.658	8.663	8.667	8.672	8.677
1810	8.677	8.681	8.686	8.690	8.695	8.699	8.704	8.708	8.713	8.718	8.722
1820	8.722	8.727	8.731	8.736	8.740	8.745	8.750	8.754	8.759	8.763	8.768
1830	8.768	8.772	8.777	8.781	8.786	8.790	8.795	8.800	8.804	8.809	8.813
1840	8.813	8.818	8.822	8.827	8.831	8.836	8.840	8.845	8.849	8.854	8.858
1850	8.858	8.863	8.867	8.872	8.877	8.881	8.886	8.890	8.895	8.899	8.904
1860	8.904	8.908	8.913	8.917	8.922	8.926	8.931	8.935	8.940	8.944	8.949
1870	8.949	8.953	8.958	8.962	8.967	8.971	8.976	8.980	8.985	8.989	8.994
1880	8.994	8.998	9.003	9.007	9.012	9.016	9.021	9.025	9.029	9.034	9.038
1890	9.038	9.043	9.047	9.052	9.056	9.061	9.065	9.070	9.074	9.079	9.083
1900	9.083	9.088	9.092	9.097	9.101	9.105	9.110	9.114	9.119	9.123	9.128

TABLE 37 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1910	9.128	9.132	9.137	9.141	9.145	9.150	9.154	9.159	9.163	9.168	9.172
1920	9.172	9.177	9.181	9.185	9.190	9.194	9.199	9.203	9.208	9.212	9.216
1930	9.216	9.221	9.225	9.230	9.234	9.239	9.243	9.247	9.252	9.256	9.261
1940	9.261	9.265	9.270	9.274	9.278	9.283	9.287	9.292	9.296	9.300	9.305
1950	9.305	9.309	9.314	9.318	9.322	9.327	9.331	9.336	9.340	9.344	9.349
1960	9.349	9.353	9.357	9.362	9.366	9.371	9.375	9.379	9.384	9.388	9.393
1970	9.393	9.397	9.401	9.406	9.410	9.414	9.419	9.423	9.428	9.432	9.436
1980	9.436	9.441	9.445	9.449	9.454	9.458	9.462	9.467	9.471	9.475	9.480
1990	9.480	9.484	9.488	9.493	9.497	9.502	9.506	9.510	9.515	9.519	9.523
2000	9.523	9.528	9.532	9.536	9.541	9.545	9.549	9.554	9.558	9.562	9.567
2010	9.567	9.571	9.575	9.579	9.584	9.588	9.592	9.597	9.601	9.605	9.610
2020	9.610	9.614	9.618	9.623	9.627	9.631	9.636	9.640	9.644	9.648	9.653
2030	9.653	9.657	9.661	9.666	9.670	9.674	9.678	9.683	9.687	9.691	9.696
2040	9.696	9.700	9.704	9.708	9.713	9.717	9.721	9.726	9.730	9.734	9.738
2050	9.738	9.743	9.747	9.751	9.755	9.760	9.764	9.768	9.772	9.777	9.781
2060	9.781	9.785	9.789	9.794	9.798	9.802	9.806	9.811	9.815	9.819	9.823
2070	9.823	9.828	9.832	9.836	9.840	9.845	9.849	9.853	9.857	9.862	9.866
2080	9.866	9.870	9.874	9.878	9.883	9.887	9.891	9.895	9.900	9.904	9.908
2090	9.908	9.912	9.916	9.921	9.925	9.929	9.933	9.937	9.942	9.946	9.950
2100	9.950	9.954	9.958	9.963	9.967	9.971	9.975	9.979	9.984	9.988	9.992
2110	9.992	9.996	10.000	10.004	10.009	10.013	10.017	10.021	10.025	10.029	10.034
2120	10.034	10.038	10.042	10.046	10.050	10.054	10.059	10.063	10.067	10.071	10.075
2130	10.075	10.079	10.084	10.088	10.092	10.096	10.100	10.104	10.108	10.113	10.117
2140	10.117	10.121	10.125	10.129	10.133	10.137	10.142	10.146	10.150	10.154	10.158
2150	10.158	10.162	10.166	10.170	10.175	10.179	10.183	10.187	10.191	10.195	10.199
2160	10.199	10.203	10.207	10.212	10.216	10.220	10.224	10.228	10.232	10.236	10.240
2170	10.240	10.244	10.248	10.253	10.257	10.261	10.265	10.269	10.273	10.277	10.281
2180	10.281	10.285	10.289	10.293	10.297	10.302	10.306	10.310	10.314	10.318	10.322
2190	10.322	10.326	10.330	10.334	10.338	10.342	10.346	10.350	10.354	10.358	10.362
2200	10.362	10.367	10.371	10.375	10.379	10.383	10.387	10.391	10.395	10.399	10.403
2210	10.403	10.407	10.411	10.415	10.419	10.423	10.427	10.431	10.435	10.439	10.443
2220	10.443	10.447	10.451	10.455	10.459	10.463	10.467	10.471	10.475	10.479	10.484
2230	10.484	10.488	10.492	10.496	10.500	10.504	10.508	10.512	10.516	10.520	10.524
2240	10.524	10.528	10.532	10.536	10.540	10.544	10.548	10.552	10.556	10.560	10.564
2250	10.564	10.568	10.572	10.576	10.580	10.584	10.588	10.591	10.595	10.599	10.603
2260	10.603	10.607	10.611	10.615	10.619	10.623	10.627	10.631	10.635	10.639	10.643
2270	10.643	10.647	10.651	10.655	10.659	10.663	10.667	10.671	10.675	10.679	10.683
2280	10.683	10.687	10.691	10.695	10.699	10.703	10.707	10.711	10.714	10.718	10.722
2290	10.722	10.726	10.730	10.734	10.738	10.742	10.746	10.750	10.754	10.758	10.762
2300	10.762	10.766	10.770	10.774	10.778	10.782	10.786	10.789	10.793	10.797	10.801
2310	10.801	10.805	10.809	10.813	10.817	10.821	10.825	10.829	10.833	10.837	10.841
2320	10.841	10.845	10.848	10.852	10.856	10.860	10.864	10.868	10.872	10.876	10.880
2330	10.880	10.884	10.888	10.892	10.896	10.900	10.903	10.907	10.911	10.915	10.919
2340	10.919	10.923	10.927	10.931	10.935	10.939	10.943	10.947	10.951	10.954	10.958
2350	10.958	10.962	10.966	10.970	10.974	10.978	10.982	10.986	10.990	10.994	10.998
2360	10.998	11.002	11.005	11.009	11.013	11.017	11.021	11.025	11.029	11.033	11.037
2370	11.037	11.041	11.045	11.049	11.053	11.057	11.060	11.064	11.068	11.072	11.076
2380	11.076	11.080	11.084	11.088	11.092	11.096	11.100	11.104	11.108	11.112	11.116
2390	11.116	11.119	11.123	11.127	11.131	11.135	11.139	11.143	11.147	11.151	11.155
2400	11.155	11.159	11.163	11.167	11.171	11.175	11.179	11.183	11.187	11.191	11.195
2410	11.195	11.199	11.202	11.206	11.210	11.214	11.218	11.222	11.226	11.230	11.234
2420	11.234	11.238	11.242	11.246	11.250	11.254	11.258	11.262	11.266	11.270	11.274
2430	11.274	11.278	11.282	11.286	11.290	11.294	11.298	11.302	11.306	11.310	11.314
2440	11.314	11.318	11.322	11.326	11.330	11.334	11.338	11.342	11.346	11.350	11.354
2450	11.354	11.359	11.363	11.367	11.371	11.375	11.379	11.383	11.387	11.391	11.395
2460	11.395	11.399	11.403	11.407	11.411	11.416	11.420	11.424	11.428	11.432	11.436
2470	11.436	11.440	11.444	11.448	11.452	11.457	11.461	11.465	11.469	11.473	11.477
2480	11.477	11.481	11.486	11.490	11.494	11.498	11.502	11.506	11.511	11.515	11.519
2490	11.519	11.523	11.527	11.532	11.536	11.540	11.544	11.548	11.553	11.557	11.561

TABLE 37 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
2500	11.561	11.565									

TABLE 38 Type NP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–200	–1.585										
–190	–1.594	–1.594	–1.593	–1.592	–1.591	–1.591	–1.590	–1.589	–1.587	–1.586	–1.585
–180	–1.593	–1.594	–1.594	–1.595	–1.595	–1.595	–1.595	–1.595	–1.595	–1.594	–1.594
–170	–1.583	–1.584	–1.586	–1.587	–1.588	–1.589	–1.590	–1.591	–1.592	–1.593	–1.593
–160	–1.561	–1.564	–1.567	–1.569	–1.571	–1.573	–1.575	–1.577	–1.579	–1.581	–1.583
–150	–1.530	–1.533	–1.537	–1.540	–1.544	–1.547	–1.550	–1.553	–1.556	–1.559	–1.561
–140	–1.488	–1.492	–1.497	–1.501	–1.506	–1.510	–1.514	–1.518	–1.522	–1.526	–1.530
–130	–1.436	–1.441	–1.447	–1.452	–1.458	–1.463	–1.468	–1.473	–1.478	–1.483	–1.488
–120	–1.374	–1.380	–1.387	–1.393	–1.400	–1.406	–1.412	–1.418	–1.424	–1.430	–1.436
–110	–1.302	–1.310	–1.317	–1.325	–1.332	–1.339	–1.346	–1.353	–1.360	–1.367	–1.374
–100	–1.222	–1.230	–1.239	–1.247	–1.255	–1.263	–1.271	–1.279	–1.287	–1.295	–1.302
–90	–1.133	–1.142	–1.151	–1.161	–1.170	–1.178	–1.187	–1.196	–1.205	–1.213	–1.222
–80	–1.036	–1.046	–1.056	–1.066	–1.076	–1.085	–1.095	–1.105	–1.114	–1.124	–1.133
–70	–0.930	–0.941	–0.952	–0.963	–0.973	–0.984	–0.994	–1.005	–1.015	–1.025	–1.036
–60	–0.818	–0.829	–0.841	–0.852	–0.864	–0.875	–0.886	–0.897	–0.909	–0.920	–0.930
–50	–0.698	–0.710	–0.722	–0.735	–0.747	–0.759	–0.771	–0.782	–0.794	–0.806	–0.818
–40	–0.571	–0.584	–0.597	–0.610	–0.622	–0.635	–0.648	–0.660	–0.673	–0.685	–0.698
–30	–0.437	–0.451	–0.465	–0.478	–0.492	–0.505	–0.518	–0.531	–0.545	–0.558	–0.571
–20	–0.297	–0.312	–0.326	–0.340	–0.354	–0.368	–0.382	–0.396	–0.410	–0.424	–0.437
–10	–0.152	–0.166	–0.181	–0.196	–0.211	–0.225	–0.240	–0.254	–0.269	–0.283	–0.297
0	0.000	–0.015	–0.031	–0.046	–0.061	–0.076	–0.092	–0.107	–0.122	–0.137	–0.152
0	0.000	0.015	0.031	0.047	0.062	0.078	0.094	0.109	0.125	0.141	0.157
10	0.157	0.173	0.189	0.205	0.221	0.238	0.254	0.270	0.287	0.303	0.319
20	0.319	0.336	0.352	0.369	0.386	0.402	0.419	0.436	0.453	0.470	0.487
30	0.487	0.504	0.521	0.538	0.555	0.572	0.589	0.607	0.624	0.641	0.659
40	0.659	0.676	0.694	0.711	0.729	0.747	0.764	0.782	0.800	0.818	0.836
50	0.836	0.854	0.872	0.890	0.908	0.926	0.944	0.962	0.980	0.999	1.017
60	1.017	1.035	1.054	1.072	1.091	1.109	1.128	1.147	1.165	1.184	1.203
70	1.203	1.222	1.240	1.259	1.278	1.297	1.316	1.335	1.354	1.374	1.393
80	1.393	1.412	1.431	1.451	1.470	1.489	1.509	1.528	1.548	1.567	1.587
90	1.587	1.606	1.626	1.646	1.665	1.685	1.705	1.725	1.745	1.765	1.784
100	1.784	1.804	1.825	1.845	1.865	1.885	1.905	1.925	1.945	1.966	1.986
110	1.986	2.006	2.027	2.047	2.068	2.088	2.109	2.129	2.150	2.170	2.191
120	2.191	2.212	2.232	2.253	2.274	2.295	2.316	2.337	2.358	2.379	2.400
130	2.400	2.421	2.442	2.463	2.484	2.505	2.526	2.547	2.569	2.590	2.611
140	2.611	2.633	2.654	2.675	2.697	2.718	2.740	2.761	2.783	2.805	2.826
150	2.826	2.848	2.869	2.891	2.913	2.935	2.956	2.978	3.000	3.022	3.044
160	3.044	3.066	3.088	3.110	3.132	3.154	3.176	3.198	3.220	3.243	3.265
170	3.265	3.287	3.309	3.332	3.354	3.376	3.399	3.421	3.443	3.466	3.488
180	3.488	3.511	3.533	3.556	3.578	3.601	3.624	3.646	3.669	3.692	3.714
190	3.714	3.737	3.760	3.783	3.806	3.828	3.851	3.874	3.897	3.920	3.943
200	3.943	3.966	3.989	4.012	4.035	4.058	4.081	4.105	4.128	4.151	4.174
210	4.174	4.197	4.221	4.244	4.267	4.291	4.314	4.337	4.361	4.384	4.408
220	4.408	4.431	4.454	4.478	4.502	4.525	4.549	4.572	4.596	4.620	4.643
230	4.643	4.667	4.691	4.714	4.738	4.762	4.786	4.809	4.833	4.857	4.881
240	4.881	4.905	4.929	4.953	4.977	5.001	5.025	5.049	5.073	5.097	5.121
250	5.121	5.145	5.169	5.193	5.217	5.242	5.266	5.290	5.314	5.338	5.363
260	5.363	5.387	5.411	5.436	5.460	5.484	5.509	5.533	5.558	5.582	5.606
270	5.606	5.631	5.655	5.680	5.704	5.729	5.754	5.778	5.803	5.827	5.852
280	5.852	5.877	5.901	5.926	5.951	5.975	6.000	6.025	6.050	6.074	6.099
290	6.099	6.124	6.149	6.174	6.199	6.224	6.248	6.273	6.298	6.323	6.348
300	6.348	6.373	6.398	6.423	6.448	6.473	6.498	6.524	6.549	6.574	6.599
310	6.599	6.624	6.649	6.674	6.700	6.725	6.750	6.775	6.801	6.826	6.851
320	6.851	6.876	6.902	6.927	6.952	6.978	7.003	7.029	7.054	7.079	7.105
330	7.105	7.130	7.156	7.181	7.207	7.232	7.258	7.283	7.309	7.334	7.360
340	7.360	7.386	7.411	7.437	7.462	7.488	7.514	7.539	7.565	7.591	7.617
350	7.617	7.642	7.668	7.694	7.720	7.745	7.771	7.797	7.823	7.849	7.874
360	7.874	7.900	7.926	7.952	7.978	8.004	8.030	8.056	8.082	8.108	8.134
370	8.134	8.160	8.186	8.212	8.238	8.264	8.290	8.316	8.342	8.368	8.394

TABLE 38 *Continued*

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
						Thermoelectric Voltage (emf) in Millivolts					
380	8.394	8.420	8.446	8.473	8.499	8.525	8.551	8.577	8.603	8.630	8.656
390	8.656	8.682	8.708	8.735	8.761	8.787	8.813	8.840	8.866	8.892	8.919
400	8.919	8.945	8.971	8.998	9.024	9.050	9.077	9.103	9.130	9.156	9.183
410	9.183	9.209	9.236	9.262	9.289	9.315	9.342	9.368	9.395	9.421	9.448
420	9.448	9.474	9.501	9.527	9.554	9.581	9.607	9.634	9.660	9.687	9.714
430	9.714	9.740	9.767	9.794	9.820	9.847	9.874	9.901	9.927	9.954	9.981
440	9.981	10.008	10.034	10.061	10.088	10.115	10.142	10.168	10.195	10.222	10.249
450	10.249	10.276	10.303	10.330	10.356	10.383	10.410	10.437	10.464	10.491	10.518
460	10.518	10.545	10.572	10.599	10.626	10.653	10.680	10.707	10.734	10.761	10.788
470	10.788	10.815	10.842	10.869	10.896	10.923	10.950	10.978	11.005	11.032	11.059
480	11.059	11.086	11.113	11.140	11.167	11.195	11.222	11.249	11.276	11.303	11.331
490	11.331	11.358	11.385	11.412	11.439	11.467	11.494	11.521	11.549	11.576	11.603
500	11.603	11.630	11.658	11.685	11.712	11.740	11.767	11.794	11.822	11.849	11.876
510	11.876	11.904	11.931	11.959	11.986	12.013	12.041	12.068	12.096	12.123	12.151
520	12.151	12.178	12.206	12.233	12.261	12.288	12.315	12.343	12.371	12.398	12.426
530	12.426	12.453	12.481	12.508	12.536	12.563	12.591	12.618	12.646	12.674	12.701
540	12.701	12.729	12.756	12.784	12.812	12.839	12.867	12.895	12.922	12.950	12.978
550	12.978	13.005	13.033	13.061	13.088	13.116	13.144	13.171	13.199	13.227	13.255
560	13.255	13.282	13.310	13.338	13.366	13.394	13.421	13.449	13.477	13.505	13.532
570	13.532	13.560	13.588	13.616	13.644	13.672	13.699	13.727	13.755	13.783	13.811
580	13.811	13.839	13.867	13.895	13.923	13.950	13.978	14.006	14.034	14.062	14.090
590	14.090	14.118	14.146	14.174	14.202	14.230	14.258	14.286	14.314	14.342	14.370
600	14.370	14.398	14.426	14.454	14.482	14.510	14.538	14.566	14.594	14.622	14.650
610	14.650	14.678	14.706	14.735	14.763	14.791	14.819	14.847	14.875	14.903	14.931
620	14.931	14.960	14.988	15.016	15.044	15.072	15.100	15.129	15.157	15.185	15.213
630	15.213	15.241	15.270	15.298	15.326	15.354	15.382	15.411	15.439	15.467	15.495
640	15.495	15.524	15.552	15.580	15.609	15.637	15.665	15.693	15.722	15.750	15.778
650	15.778	15.807	15.835	15.863	15.892	15.920	15.948	15.977	16.005	16.034	16.062
660	16.062	16.090	16.119	16.147	16.175	16.204	16.232	16.261	16.289	16.318	16.346
670	16.346	16.375	16.403	16.431	16.460	16.488	16.517	16.545	16.574	16.602	16.631
680	16.631	16.659	16.688	16.716	16.745	16.773	16.802	16.830	16.859	16.888	16.916
690	16.916	16.945	16.973	17.002	17.030	17.059	17.088	17.116	17.145	17.173	17.202
700	17.202	17.231	17.259	17.288	17.317	17.345	17.374	17.403	17.431	17.460	17.489
710	17.489	17.517	17.546	17.575	17.603	17.632	17.661	17.690	17.718	17.747	17.776
720	17.776	17.805	17.833	17.862	17.891	17.920	17.948	17.977	18.006	18.035	18.064
730	18.064	18.092	18.121	18.150	18.179	18.208	18.236	18.265	18.294	18.323	18.352
740	18.352	18.381	18.410	18.439	18.467	18.496	18.525	18.554	18.583	18.612	18.641
750	18.641	18.670	18.699	18.728	18.757	18.786	18.814	18.843	18.872	18.901	18.930
760	18.930	18.959	18.988	19.017	19.046	19.075	19.104	19.133	19.162	19.191	19.220
770	19.220	19.250	19.279	19.308	19.337	19.366	19.395	19.424	19.453	19.482	19.511
780	19.511	19.540	19.569	19.599	19.628	19.657	19.686	19.715	19.744	19.773	19.803
790	19.803	19.832	19.861	19.890	19.919	19.948	19.978	20.007	20.036	20.065	20.094
800	20.094	20.124	20.153	20.182	20.211	20.241	20.270	20.299	20.328	20.358	20.387
810	20.387	20.416	20.445	20.475	20.504	20.533	20.563	20.592	20.621	20.651	20.680
820	20.680	20.709	20.739	20.768	20.797	20.827	20.856	20.885	20.915	20.944	20.974
830	20.974	21.003	21.032	21.062	21.091	21.121	21.150	21.179	21.209	21.238	21.268
840	21.268	21.297	21.327	21.356	21.386	21.415	21.445	21.474	21.504	21.533	21.563
850	21.563	21.592	21.622	21.651	21.681	21.710	21.740	21.769	21.799	21.828	21.858
860	21.858	21.887	21.917	21.947	21.976	22.006	22.035	22.065	22.095	22.124	22.154
870	22.154	22.183	22.213	22.243	22.272	22.302	22.332	22.361	22.391	22.421	22.450
880	22.450	22.480	22.510	22.539	22.569	22.599	22.628	22.658	22.688	22.718	22.747
890	22.747	22.777	22.807	22.836	22.866	22.896	22.926	22.955	22.985	23.015	23.045
900	23.045	23.074	23.104	23.134	23.164	23.194	23.223	23.253	23.283	23.313	23.343
910	23.343	23.373	23.402	23.432	23.462	23.492	23.522	23.552	23.581	23.611	23.641
920	23.641	23.671	23.701	23.731	23.751	23.791	23.821	23.850	23.880	23.910	23.940
930	23.940	23.970	24.000	24.030	24.060	24.090	24.120	24.150	24.180	24.210	24.240
940	24.240	24.270	24.300	24.330	24.360	24.390	24.420	24.450	24.480	24.510	24.540
950	24.540	24.570	24.600	24.630	24.660	24.690	24.720	24.750	24.780	24.810	24.840
960	24.840	24.870	24.900	24.930	24.960	24.990	25.020	25.050	25.081	25.111	25.141

TABLE 38 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
970	25.141	25.171	25.201	25.231	25.261	25.291	25.321	25.352	25.382	25.412	25.442
980	25.442	25.472	25.502	25.532	25.563	25.593	25.623	25.653	25.683	25.713	25.744
990	25.744	25.774	25.804	25.834	25.864	25.895	25.925	25.955	25.985	26.015	26.046
1000	26.046	26.076	26.106	26.136	26.166	26.197	26.227	26.257	26.287	26.318	26.348
1010	26.348	26.378	26.408	26.439	26.469	26.499	26.529	26.560	26.590	26.620	26.651
1020	26.651	26.681	26.711	26.741	26.772	26.802	26.832	26.863	26.893	26.923	26.954
1030	26.954	26.984	27.014	27.044	27.075	27.105	27.135	27.166	27.196	27.226	27.257
1040	27.257	27.287	27.318	27.348	27.378	27.409	27.439	27.469	27.500	27.530	27.560
1050	27.560	27.591	27.621	27.652	27.682	27.712	27.743	27.773	27.804	27.834	27.864
1060	27.864	27.895	27.925	27.956	27.986	28.016	28.047	28.077	28.108	28.138	28.169
1070	28.169	28.199	28.229	28.260	28.290	28.321	28.351	28.382	28.412	28.442	28.473
1080	28.473	28.503	28.534	28.564	28.595	28.625	28.656	28.686	28.717	28.747	28.778
1090	28.778	28.808	28.839	28.869	28.900	28.930	28.961	28.991	29.022	29.052	29.083
1100	29.083	29.113	29.144	29.174	29.205	29.235	29.266	29.296	29.327	29.357	29.388
1110	29.388	29.418	29.449	29.479	29.510	29.540	29.571	29.602	29.632	29.663	29.693
1120	29.693	29.724	29.754	29.785	29.815	29.846	29.877	29.907	29.938	29.968	29.999
1130	29.999	30.029	30.060	30.091	30.121	30.152	30.182	30.213	30.243	30.274	30.305
1140	30.305	30.335	30.366	30.396	30.427	30.458	30.488	30.519	30.550	30.580	30.611
1150	30.611	30.641	30.672	30.703	30.733	30.764	30.795	30.825	30.856	30.886	30.917
1160	30.917	30.948	30.978	31.009	31.040	31.070	31.101	31.132	31.162	31.193	31.224
1170	31.224	31.254	31.285	31.316	31.346	31.377	31.408	31.438	31.469	31.500	31.530
1180	31.530	31.561	31.592	31.622	31.653	31.684	31.714	31.745	31.776	31.807	31.837
1190	31.837	31.868	31.899	31.929	31.960	31.991	32.022	32.052	32.083	32.114	32.144
1200	32.144	32.175	32.206	32.237	32.267	32.298	32.329	32.360	32.390	32.421	32.452
1210	32.452	32.483	32.513	32.544	32.575	32.606	32.636	32.667	32.698	32.729	32.759
1220	32.759	32.790	32.821	32.852	32.882	32.913	32.944	32.975	33.005	33.036	33.067
1230	33.067	33.098	33.129	33.159	33.190	33.221	33.252	33.282	33.313	33.344	33.375
1240	33.375	33.406	33.436	33.467	33.498	33.529	33.559	33.590	33.621	33.652	33.683
1250	33.683	33.713	33.744	33.775	33.806	33.837	33.867	33.898	33.929	33.960	33.991
1260	33.991	34.021	34.052	34.083	34.114	34.144	34.175	34.206	34.237	34.268	34.298
1270	34.298	34.329	34.360	34.391	34.421	34.452	34.483	34.514	34.545	34.575	34.606
1280	34.606	34.637	34.668	34.698	34.729	34.760	34.791	34.821	34.852	34.883	34.914
1290	34.914	34.944	34.975	35.006	35.036	35.067	35.098	35.129	35.159	35.190	35.221
1300	35.221										

TABLE 39 Type NP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–320	–1.590	–1.590	–1.589	–1.588	–1.588	–1.587	–1.586	–1.586	–1.585		
–310	–1.594	–1.594	–1.593	–1.593	–1.593	–1.592	–1.592	–1.592	–1.591	–1.591	–1.590
–300	–1.595	–1.595	–1.595	–1.595	–1.595	–1.595	–1.595	–1.595	–1.594	–1.594	–1.594
–290	–1.593	–1.593	–1.593	–1.594	–1.594	–1.594	–1.594	–1.595	–1.595	–1.595	–1.595
–280	–1.587	–1.588	–1.589	–1.589	–1.590	–1.590	–1.591	–1.591	–1.592	–1.592	–1.593
–270	–1.579	–1.580	–1.581	–1.582	–1.583	–1.584	–1.584	–1.585	–1.586	–1.587	–1.587
–260	–1.567	–1.568	–1.570	–1.571	–1.572	–1.573	–1.575	–1.576	–1.577	–1.578	–1.579
–250	–1.552	–1.554	–1.555	–1.557	–1.558	–1.560	–1.561	–1.563	–1.564	–1.566	–1.567
–240	–1.534	–1.536	–1.538	–1.540	–1.541	–1.543	–1.545	–1.547	–1.549	–1.550	–1.552
–230	–1.512	–1.515	–1.517	–1.519	–1.521	–1.523	–1.526	–1.528	–1.530	–1.532	–1.534
–220	–1.488	–1.490	–1.493	–1.495	–1.498	–1.500	–1.503	–1.505	–1.508	–1.510	–1.512
–210	–1.460	–1.463	–1.466	–1.469	–1.471	–1.474	–1.477	–1.480	–1.482	–1.485	–1.488
–200	–1.429	–1.432	–1.436	–1.439	–1.442	–1.445	–1.448	–1.451	–1.454	–1.457	–1.460
–190	–1.395	–1.399	–1.402	–1.406	–1.409	–1.413	–1.416	–1.419	–1.423	–1.426	–1.429
–180	–1.359	–1.362	–1.366	–1.370	–1.374	–1.377	–1.381	–1.385	–1.388	–1.392	–1.395
–170	–1.319	–1.323	–1.327	–1.331	–1.335	–1.339	–1.343	–1.347	–1.351	–1.355	–1.359
–160	–1.277	–1.281	–1.285	–1.290	–1.294	–1.298	–1.302	–1.307	–1.311	–1.315	–1.319
–150	–1.231	–1.236	–1.241	–1.245	–1.250	–1.254	–1.259	–1.263	–1.268	–1.272	–1.277
–140	–1.183	–1.188	–1.193	–1.198	–1.203	–1.208	–1.212	–1.217	–1.222	–1.227	–1.231
–130	–1.133	–1.138	–1.143	–1.148	–1.153	–1.158	–1.164	–1.169	–1.174	–1.178	–1.183
–120	–1.080	–1.085	–1.091	–1.096	–1.101	–1.107	–1.112	–1.117	–1.123	–1.128	–1.133
–110	–1.024	–1.030	–1.036	–1.041	–1.047	–1.052	–1.058	–1.063	–1.069	–1.074	–1.080
–100	–0.966	–0.972	–0.978	–0.984	–0.990	–0.995	–1.001	–1.007	–1.013	–1.019	–1.024
–90	–0.906	–0.912	–0.918	–0.924	–0.930	–0.937	–0.943	–0.949	–0.954	–0.960	–0.966
–80	–0.843	–0.850	–0.856	–0.862	–0.869	–0.875	–0.881	–0.888	–0.894	–0.900	–0.906
–70	–0.779	–0.785	–0.792	–0.798	–0.805	–0.811	–0.818	–0.824	–0.831	–0.837	–0.843
–60	–0.711	–0.718	–0.725	–0.732	–0.739	–0.745	–0.752	–0.759	–0.765	–0.772	–0.779
–50	–0.642	–0.649	–0.656	–0.663	–0.670	–0.677	–0.684	–0.691	–0.698	–0.705	–0.711
–40	–0.571	–0.578	–0.585	–0.592	–0.600	–0.607	–0.614	–0.621	–0.628	–0.635	–0.642
–30	–0.497	–0.505	–0.512	–0.520	–0.527	–0.534	–0.542	–0.549	–0.556	–0.564	–0.571
–20	–0.422	–0.430	–0.437	–0.445	–0.452	–0.460	–0.468	–0.475	–0.483	–0.490	–0.497
–10	–0.345	–0.353	–0.360	–0.368	–0.376	–0.384	–0.391	–0.399	–0.407	–0.414	–0.422
0	–0.266	–0.274	–0.282	–0.289	–0.297	–0.305	–0.313	–0.321	–0.329	–0.337	–0.345
0	–0.266	–0.257	–0.249	–0.241	–0.233	–0.225	–0.217	–0.209	–0.201	–0.193	–0.184
10	–0.184	–0.176	–0.168	–0.160	–0.152	–0.143	–0.135	–0.127	–0.118	–0.110	–0.102
20	–0.102	–0.093	–0.085	–0.076	–0.068	–0.060	–0.051	–0.043	–0.034	–0.026	–0.017
30	–0.017	–0.009	0.000	0.009	0.017	0.026	0.034	0.043	0.052	0.060	0.069
40	0.069	0.078	0.087	0.095	0.104	0.113	0.122	0.131	0.139	0.148	0.157
50	0.157	0.166	0.175	0.184	0.193	0.202	0.211	0.220	0.229	0.238	0.247
60	0.247	0.256	0.265	0.274	0.283	0.292	0.301	0.310	0.319	0.329	0.338
70	0.338	0.347	0.356	0.365	0.375	0.384	0.393	0.402	0.412	0.421	0.430
80	0.430	0.440	0.449	0.458	0.468	0.477	0.487	0.496	0.506	0.515	0.525
90	0.525	0.534	0.544	0.553	0.563	0.572	0.582	0.591	0.601	0.611	0.620
100	0.620	0.630	0.640	0.649	0.659	0.669	0.678	0.688	0.698	0.708	0.717
110	0.717	0.727	0.737	0.747	0.757	0.766	0.776	0.786	0.796	0.806	0.816
120	0.816	0.826	0.836	0.846	0.856	0.866	0.876	0.886	0.896	0.906	0.916
130	0.916	0.926	0.936	0.946	0.956	0.966	0.976	0.987	0.997	1.007	1.017
140	1.017	1.027	1.038	1.048	1.058	1.068	1.079	1.089	1.099	1.109	1.120
150	1.120	1.130	1.140	1.151	1.161	1.172	1.182	1.192	1.203	1.213	1.224
160	1.224	1.234	1.245	1.255	1.266	1.276	1.287	1.297	1.308	1.318	1.329
170	1.329	1.340	1.350	1.361	1.371	1.382	1.393	1.403	1.414	1.425	1.436
180	1.436	1.446	1.457	1.468	1.478	1.489	1.500	1.511	1.522	1.532	1.543
190	1.543	1.554	1.565	1.576	1.587	1.598	1.608	1.619	1.630	1.641	1.652
200	1.652	1.663	1.674	1.685	1.696	1.707	1.718	1.729	1.740	1.751	1.762
210	1.762	1.773	1.784	1.796	1.807	1.818	1.829	1.840	1.851	1.862	1.874
220	1.874	1.885	1.896	1.907	1.918	1.930	1.941	1.952	1.963	1.975	1.986
230	1.986	1.997	2.009	2.020	2.031	2.043	2.054	2.065	2.077	2.088	2.099
240	2.099	2.111	2.122	2.134	2.145	2.157	2.168	2.180	2.191	2.203	2.214
250	2.214	2.226	2.237	2.249	2.260	2.272	2.283	2.295	2.306	2.318	2.330

TABLE 39 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
260	2.330	2.341	2.353	2.365	2.376	2.388	2.400	2.411	2.423	2.435	2.446
270	2.446	2.458	2.470	2.481	2.493	2.505	2.517	2.529	2.540	2.552	2.564
280	2.564	2.576	2.588	2.599	2.611	2.623	2.635	2.647	2.659	2.671	2.683
290	2.683	2.694	2.706	2.718	2.730	2.742	2.754	2.766	2.778	2.790	2.802
300	2.802	2.814	2.826	2.838	2.850	2.862	2.874	2.886	2.898	2.911	2.923
310	2.923	2.935	2.947	2.959	2.971	2.983	2.995	3.007	3.020	3.032	3.044
320	3.044	3.056	3.068	3.081	3.093	3.105	3.117	3.130	3.142	3.154	3.166
330	3.166	3.179	3.191	3.203	3.215	3.228	3.240	3.252	3.265	3.277	3.289
340	3.289	3.302	3.314	3.327	3.339	3.351	3.364	3.376	3.389	3.401	3.413
350	3.413	3.426	3.438	3.451	3.463	3.476	3.488	3.501	3.513	3.526	3.538
360	3.538	3.551	3.563	3.576	3.588	3.601	3.614	3.626	3.639	3.651	3.664
370	3.664	3.676	3.689	3.702	3.714	3.727	3.740	3.752	3.765	3.778	3.790
380	3.790	3.803	3.816	3.828	3.841	3.854	3.867	3.879	3.892	3.905	3.918
390	3.918	3.930	3.943	3.956	3.969	3.981	3.994	4.007	4.020	4.033	4.045
400	4.045	4.058	4.071	4.084	4.097	4.110	4.123	4.135	4.148	4.161	4.174
410	4.174	4.187	4.200	4.213	4.226	4.239	4.252	4.265	4.278	4.291	4.304
420	4.304	4.316	4.329	4.342	4.355	4.368	4.381	4.395	4.408	4.421	4.434
430	4.434	4.447	4.460	4.473	4.486	4.499	4.512	4.525	4.538	4.551	4.564
440	4.564	4.578	4.591	4.604	4.617	4.630	4.643	4.656	4.670	4.683	4.696
450	4.696	4.709	4.722	4.735	4.749	4.762	4.775	4.788	4.801	4.815	4.828
460	4.828	4.841	4.854	4.868	4.881	4.894	4.908	4.921	4.934	4.947	4.961
470	4.961	4.974	4.987	5.001	5.014	5.027	5.041	5.054	5.067	5.081	5.094
480	5.094	5.107	5.121	5.134	5.148	5.161	5.174	5.188	5.201	5.215	5.228
490	5.228	5.242	5.255	5.268	5.282	5.295	5.309	5.322	5.336	5.349	5.363
500	5.363	5.376	5.390	5.403	5.417	5.430	5.444	5.457	5.471	5.484	5.498
510	5.498	5.511	5.525	5.539	5.552	5.566	5.579	5.593	5.606	5.620	5.634
520	5.634	5.647	5.661	5.674	5.688	5.702	5.715	5.729	5.743	5.756	5.770
530	5.770	5.784	5.797	5.811	5.825	5.838	5.852	5.866	5.879	5.893	5.907
540	5.907	5.921	5.934	5.948	5.962	5.975	5.989	6.003	6.017	6.030	6.044
550	6.044	6.058	6.072	6.086	6.099	6.113	6.127	6.141	6.154	6.168	6.182
560	6.182	6.196	6.210	6.224	6.237	6.251	6.265	6.279	6.293	6.307	6.321
570	6.321	6.334	6.348	6.362	6.376	6.390	6.404	6.418	6.432	6.446	6.459
580	6.459	6.473	6.487	6.501	6.515	6.529	6.543	6.557	6.571	6.585	6.599
590	6.599	6.613	6.627	6.641	6.655	6.669	6.683	6.697	6.711	6.725	6.739
600	6.739	6.753	6.767	6.781	6.795	6.809	6.823	6.837	6.851	6.865	6.879
610	6.879	6.893	6.907	6.921	6.936	6.950	6.964	6.978	6.992	7.006	7.020
620	7.020	7.034	7.048	7.062	7.077	7.091	7.105	7.119	7.133	7.147	7.161
630	7.161	7.176	7.190	7.204	7.218	7.232	7.246	7.261	7.275	7.289	7.303
640	7.303	7.317	7.332	7.346	7.360	7.374	7.388	7.403	7.417	7.431	7.445
650	7.445	7.460	7.474	7.488	7.502	7.517	7.531	7.545	7.559	7.574	7.588
660	7.588	7.602	7.617	7.631	7.645	7.659	7.674	7.688	7.702	7.717	7.731
670	7.731	7.745	7.760	7.774	7.788	7.803	7.817	7.831	7.846	7.860	7.874
680	7.874	7.889	7.903	7.918	7.932	7.946	7.961	7.975	7.990	8.004	8.018
690	8.018	8.033	8.047	8.062	8.076	8.090	8.105	8.119	8.134	8.148	8.163
700	8.163	8.177	8.191	8.206	8.220	8.235	8.249	8.264	8.278	8.293	8.307
710	8.307	8.322	8.336	8.351	8.365	8.380	8.394	8.409	8.423	8.438	8.452
720	8.452	8.467	8.481	8.496	8.510	8.525	8.539	8.554	8.568	8.583	8.598
730	8.598	8.612	8.627	8.641	8.656	8.670	8.685	8.700	8.714	8.729	8.743
740	8.743	8.758	8.772	8.787	8.802	8.816	8.831	8.846	8.860	8.875	8.889
750	8.889	8.904	8.919	8.933	8.948	8.963	8.977	8.992	9.007	9.021	9.036
760	9.036	9.050	9.065	9.080	9.095	9.109	9.124	9.139	9.153	9.168	9.183
770	9.183	9.197	9.212	9.227	9.241	9.256	9.271	9.286	9.300	9.315	9.330
780	9.330	9.344	9.359	9.374	9.389	9.403	9.418	9.433	9.448	9.462	9.477
790	9.477	9.492	9.507	9.521	9.536	9.551	9.566	9.581	9.595	9.610	9.625
800	9.625	9.640	9.655	9.669	9.684	9.699	9.714	9.729	9.743	9.758	9.773
810	9.773	9.788	9.803	9.818	9.832	9.847	9.862	9.877	9.892	9.907	9.921
820	9.921	9.936	9.951	9.966	9.981	9.996	10.011	10.026	10.040	10.055	10.070
830	10.070	10.085	10.100	10.115	10.130	10.145	10.160	10.174	10.189	10.204	10.219
840	10.219	10.234	10.249	10.264	10.279	10.294	10.309	10.324	10.339	10.354	10.368

TABLE 39 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
850	10.368	10.383	10.398	10.413	10.428	10.443	10.458	10.473	10.488	10.503	10.518
860	10.518	10.533	10.548	10.563	10.578	10.593	10.608	10.623	10.638	10.653	10.668
870	10.668	10.683	10.698	10.713	10.728	10.743	10.758	10.773	10.788	10.803	10.818
880	10.818	10.833	10.848	10.863	10.878	10.893	10.908	10.923	10.938	10.953	10.968
890	10.968	10.984	10.999	11.014	11.029	11.044	11.059	11.074	11.089	11.104	11.119
900	11.119	11.134	11.149	11.164	11.180	11.195	11.210	11.225	11.240	11.255	11.270
910	11.270	11.285	11.300	11.315	11.331	11.346	11.361	11.376	11.391	11.406	11.421
920	11.421	11.436	11.452	11.467	11.482	11.497	11.512	11.527	11.542	11.558	11.573
930	11.573	11.588	11.603	11.618	11.633	11.649	11.664	11.679	11.694	11.709	11.725
940	11.725	11.740	11.755	11.770	11.785	11.800	11.816	11.831	11.846	11.861	11.876
950	11.876	11.892	11.907	11.922	11.937	11.953	11.968	11.983	11.998	12.013	12.029
960	12.029	12.044	12.059	12.074	12.090	12.105	12.120	12.135	12.151	12.166	12.181
970	12.181	12.196	12.212	12.227	12.242	12.257	12.273	12.288	12.303	12.319	12.334
980	12.334	12.349	12.364	12.380	12.395	12.410	12.426	12.441	12.456	12.471	12.487
990	12.487	12.502	12.517	12.533	12.548	12.563	12.579	12.594	12.609	12.625	12.640
1000	12.640	12.655	12.671	12.686	12.701	12.717	12.732	12.747	12.763	12.778	12.793
1010	12.793	12.809	12.824	12.839	12.855	12.870	12.885	12.901	12.916	12.931	12.947
1020	12.947	12.962	12.978	12.993	13.008	13.024	13.039	13.055	13.070	13.085	13.101
1030	13.101	13.116	13.131	13.147	13.162	13.178	13.193	13.208	13.224	13.239	13.255
1040	13.255	13.270	13.286	13.301	13.316	13.332	13.347	13.363	13.378	13.394	13.409
1050	13.409	13.424	13.440	13.455	13.471	13.486	13.502	13.517	13.532	13.548	13.563
1060	13.563	13.579	13.594	13.610	13.625	13.641	13.656	13.672	13.687	13.703	13.718
1070	13.718	13.734	13.749	13.765	13.780	13.795	13.811	13.826	13.842	13.857	13.873
1080	13.873	13.888	13.904	13.919	13.935	13.950	13.966	13.981	13.997	14.012	14.028
1090	14.028	14.044	14.059	14.075	14.090	14.106	14.121	14.137	14.152	14.168	14.183
1100	14.183	14.199	14.214	14.230	14.245	14.261	14.277	14.292	14.308	14.323	14.339
1110	14.339	14.354	14.370	14.385	14.401	14.417	14.432	14.448	14.463	14.479	14.494
1120	14.494	14.510	14.526	14.541	14.557	14.572	14.588	14.604	14.619	14.635	14.650
1130	14.650	14.666	14.682	14.697	14.713	14.728	14.744	14.760	14.775	14.791	14.806
1140	14.806	14.822	14.838	14.853	14.869	14.885	14.900	14.916	14.931	14.947	14.963
1150	14.963	14.978	14.994	15.010	15.025	15.041	15.057	15.072	15.088	15.103	15.119
1160	15.119	15.135	15.150	15.166	15.182	15.197	15.213	15.229	15.244	15.260	15.276
1170	15.276	15.291	15.307	15.323	15.338	15.354	15.370	15.386	15.401	15.417	15.433
1180	15.433	15.448	15.464	15.480	15.495	15.511	15.527	15.543	15.558	15.574	15.590
1190	15.590	15.605	15.621	15.637	15.653	15.668	15.684	15.700	15.715	15.731	15.747
1200	15.747	15.763	15.778	15.794	15.810	15.826	15.841	15.857	15.873	15.889	15.904
1210	15.904	15.920	15.936	15.952	15.967	15.983	15.999	16.015	16.030	16.046	16.062
1220	16.062	16.078	16.093	16.109	16.125	16.141	16.157	16.172	16.188	16.204	16.220
1230	16.220	16.235	16.251	16.267	16.283	16.299	16.314	16.330	16.346	16.362	16.378
1240	16.378	16.393	16.409	16.425	16.441	16.457	16.473	16.488	16.504	16.520	16.536
1250	16.536	16.552	16.567	16.583	16.599	16.615	16.631	16.647	16.662	16.678	16.694
1260	16.694	16.710	16.726	16.742	16.758	16.773	16.789	16.805	16.821	16.837	16.853
1270	16.853	16.869	16.884	16.900	16.916	16.932	16.948	16.964	16.980	16.996	17.011
1280	17.011	17.027	17.043	17.059	17.075	17.091	17.107	17.123	17.139	17.154	17.170
1290	17.170	17.186	17.202	17.218	17.234	17.250	17.266	17.282	17.298	17.313	17.329
1300	17.329	17.345	17.361	17.377	17.393	17.409	17.425	17.441	17.457	17.473	17.489
1310	17.489	17.505	17.521	17.536	17.552	17.568	17.584	17.600	17.616	17.632	17.648
1320	17.648	17.664	17.680	17.696	17.712	17.728	17.744	17.760	17.776	17.792	17.808
1330	17.808	17.824	17.840	17.856	17.872	17.888	17.904	17.920	17.936	17.952	17.968
1340	17.968	17.984	18.000	18.016	18.032	18.048	18.064	18.080	18.096	18.112	18.128
1350	18.128	18.144	18.160	18.176	18.192	18.208	18.224	18.240	18.256	18.272	18.288
1360	18.288	18.304	18.320	18.336	18.352	18.368	18.384	18.400	18.416	18.432	18.448
1370	18.448	18.464	18.480	18.496	18.512	18.528	18.544	18.561	18.577	18.593	18.609
1380	18.609	18.625	18.641	18.657	18.673	18.689	18.705	18.721	18.737	18.753	18.769
1390	18.769	18.786	18.802	18.818	18.834	18.850	18.866	18.882	18.898	18.914	18.930
1400	18.930	18.946	18.963	18.979	18.995	19.011	19.027	19.043	19.059	19.075	19.091
1410	19.091	19.108	19.124	19.140	19.156	19.172	19.188	19.204	19.220	19.237	19.253
1420	19.253	19.269	19.285	19.301	19.317	19.333	19.350	19.366	19.382	19.398	19.414
1430	19.414	19.430	19.447	19.463	19.479	19.495	19.511	19.527	19.544	19.560	19.576
1440	19.576	19.592	19.608	19.624	19.641	19.657	19.673	19.689	19.705	19.722	19.738

TABLE 39 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1450	19.738	19.754	19.770	19.786	19.803	19.819	19.835	19.851	19.867	19.884	19.900
1460	19.900	19.916	19.932	19.948	19.965	19.981	19.997	20.013	20.029	20.046	20.062
1470	20.062	20.078	20.094	20.111	20.127	20.143	20.159	20.176	20.192	20.208	20.224
1480	20.224	20.241	20.257	20.273	20.289	20.306	20.322	20.338	20.354	20.371	20.387
1490	20.387	20.403	20.419	20.436	20.452	20.468	20.484	20.501	20.517	20.533	20.550
1500	20.550	20.566	20.582	20.598	20.615	20.631	20.647	20.664	20.680	20.696	20.713
1510	20.713	20.729	20.745	20.761	20.778	20.794	20.810	20.827	20.843	20.859	20.876
1520	20.876	20.892	20.908	20.925	20.941	20.957	20.974	20.990	21.006	21.023	21.039
1530	21.039	21.055	21.072	21.088	21.104	21.121	21.137	21.153	21.170	21.186	21.202
1540	21.202	21.219	21.235	21.251	21.268	21.284	21.301	21.317	21.333	21.350	21.366
1550	21.366	21.382	21.399	21.415	21.431	21.448	21.464	21.481	21.497	21.513	21.530
1560	21.530	21.546	21.563	21.579	21.595	21.612	21.628	21.645	21.661	21.677	21.694
1570	21.694	21.710	21.727	21.743	21.759	21.776	21.792	21.809	21.825	21.841	21.858
1580	21.858	21.874	21.891	21.907	21.924	21.940	21.956	21.973	21.989	22.006	22.022
1590	22.022	22.039	22.055	22.072	22.088	22.104	22.121	22.137	22.154	22.170	22.187
1600	22.187	22.203	22.220	22.236	22.253	22.269	22.285	22.302	22.318	22.335	22.351
1610	22.351	22.368	22.384	22.401	22.417	22.434	22.450	22.467	22.483	22.500	22.516
1620	22.516	22.533	22.549	22.566	22.582	22.599	22.615	22.632	22.648	22.665	22.681
1630	22.681	22.698	22.714	22.731	22.747	22.764	22.780	22.797	22.813	22.830	22.846
1640	22.846	22.863	22.879	22.896	22.912	22.929	22.945	22.962	22.979	22.995	23.012
1650	23.012	23.028	23.045	23.061	23.078	23.094	23.111	23.127	23.144	23.161	23.177
1660	23.177	23.194	23.210	23.227	23.243	23.260	23.276	23.293	23.310	23.326	23.343
1670	23.343	23.359	23.376	23.392	23.409	23.426	23.442	23.459	23.475	23.492	23.509
1680	23.509	23.525	23.542	23.558	23.575	23.591	23.608	23.625	23.641	23.658	23.674
1690	23.674	23.691	23.708	23.724	23.741	23.757	23.774	23.791	23.807	23.824	23.841
1700	23.841	23.857	23.874	23.890	23.907	23.924	23.940	23.957	23.973	23.990	24.007
1710	24.007	24.023	24.040	24.057	24.073	24.090	24.107	24.123	24.140	24.156	24.173
1720	24.173	24.190	24.206	24.223	24.240	24.256	24.273	24.290	24.306	24.323	24.340
1730	24.340	24.356	24.373	24.390	24.406	24.423	24.440	24.456	24.473	24.490	24.506
1740	24.506	24.523	24.540	24.556	24.573	24.590	24.606	24.623	24.640	24.656	24.673
1750	24.673	24.690	24.706	24.723	24.740	24.757	24.773	24.790	24.807	24.823	24.840
1760	24.840	24.857	24.873	24.890	24.907	24.924	24.940	24.957	24.974	24.990	25.007
1770	25.007	25.024	25.040	25.057	25.074	25.091	25.107	25.124	25.141	25.158	25.174
1780	25.174	25.191	25.208	25.224	25.241	25.258	25.275	25.291	25.308	25.325	25.342
1790	25.342	25.358	25.375	25.392	25.408	25.425	25.442	25.459	25.475	25.492	25.509
1800	25.509	25.526	25.542	25.559	25.576	25.593	25.609	25.626	25.643	25.660	25.677
1810	25.677	25.693	25.710	25.727	25.744	25.760	25.777	25.794	25.811	25.827	25.844
1820	25.844	25.861	25.878	25.895	25.911	25.928	25.945	25.962	25.978	25.995	26.012
1830	26.012	26.029	26.046	26.062	26.079	26.096	26.113	26.129	26.146	26.163	26.180
1840	26.180	26.197	26.213	26.230	26.247	26.264	26.281	26.297	26.314	26.331	26.348
1850	26.348	26.365	26.381	26.398	26.415	26.432	26.449	26.466	26.482	26.499	26.516
1860	26.516	26.533	26.550	26.566	26.583	26.600	26.617	26.634	26.651	26.667	26.684
1870	26.684	26.701	26.718	26.735	26.751	26.768	26.785	26.802	26.819	26.836	26.852
1880	26.852	26.869	26.886	26.903	26.920	26.937	26.954	26.970	26.987	27.004	27.021
1890	27.021	27.038	27.055	27.071	27.088	27.105	27.122	27.139	27.156	27.173	27.189
1900	27.189	27.206	27.223	27.240	27.257	27.274	27.291	27.307	27.324	27.341	27.358
1910	27.358	27.375	27.392	27.409	27.425	27.442	27.459	27.476	27.493	27.510	27.527
1920	27.527	27.544	27.560	27.577	27.594	27.611	27.628	27.645	27.662	27.679	27.695
1930	27.695	27.712	27.729	27.746	27.763	27.780	27.797	27.814	27.831	27.847	27.864
1940	27.864	27.881	27.898	27.915	27.932	27.949	27.966	27.983	27.999	28.016	28.033
1950	28.033	28.050	28.067	28.084	28.101	28.118	28.135	28.152	28.169	28.185	28.202
1960	28.202	28.219	28.236	28.253	28.270	28.287	28.304	28.321	28.338	28.355	28.371
1970	28.371	28.388	28.405	28.422	28.439	28.456	28.473	28.490	28.507	28.524	28.541
1980	28.541	28.558	28.574	28.591	28.608	28.625	28.642	28.659	28.676	28.693	28.710
1990	28.710	28.727	28.744	28.761	28.778	28.795	28.812	28.828	28.845	28.862	28.879
2000	28.879	28.896	28.913	28.930	28.947	28.964	28.981	28.998	29.015	29.032	29.049
2010	29.049	29.066	29.083	29.100	29.116	29.133	29.150	29.167	29.184	29.201	29.218
2020	29.218	29.235	29.252	29.269	29.286	29.303	29.320	29.337	29.354	29.371	29.388
2030	29.388	29.405	29.422	29.439	29.456	29.473	29.490	29.506	29.523	29.540	29.557

TABLE 39 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2040	29.557	29.574	29.591	29.608	29.625	29.642	29.659	29.676	29.693	29.710	29.727
2050	29.727	29.744	29.761	29.778	29.795	29.812	29.829	29.846	29.863	29.880	29.897
2060	29.897	29.914	29.931	29.948	29.965	29.982	29.999	30.016	30.033	30.050	30.067
2070	30.067	30.084	30.101	30.118	30.135	30.152	30.169	30.186	30.203	30.220	30.237
2080	30.237	30.254	30.271	30.288	30.305	30.322	30.339	30.356	30.373	30.390	30.407
2090	30.407	30.424	30.441	30.458	30.475	30.492	30.509	30.526	30.543	30.560	30.577
2100	30.577	30.594	30.611	30.628	30.645	30.662	30.679	30.696	30.713	30.730	30.747
2110	30.747	30.764	30.781	30.798	30.815	30.832	30.849	30.866	30.883	30.900	30.917
2120	30.917	30.934	30.951	30.968	30.985	31.002	31.019	31.036	31.053	31.070	31.087
2130	31.087	31.104	31.121	31.138	31.155	31.172	31.190	31.207	31.224	31.241	31.258
2140	31.258	31.275	31.292	31.309	31.326	31.343	31.360	31.377	31.394	31.411	31.428
2150	31.428	31.445	31.462	31.479	31.496	31.513	31.530	31.547	31.564	31.581	31.599
2160	31.599	31.616	31.633	31.650	31.667	31.684	31.701	31.718	31.735	31.752	31.769
2170	31.769	31.786	31.803	31.820	31.837	31.854	31.871	31.888	31.906	31.923	31.940
2180	31.940	31.957	31.974	31.991	32.008	32.025	32.042	32.059	32.076	32.093	32.110
2190	32.110	32.127	32.144	32.162	32.179	32.196	32.213	32.230	32.247	32.264	32.281
2200	32.281	32.298	32.315	32.332	32.349	32.366	32.383	32.401	32.418	32.435	32.452
2210	32.452	32.469	32.486	32.503	32.520	32.537	32.554	32.571	32.588	32.606	32.623
2220	32.623	32.640	32.657	32.674	32.691	32.708	32.725	32.742	32.759	32.776	32.793
2230	32.793	32.811	32.828	32.845	32.862	32.879	32.896	32.913	32.930	32.947	32.964
2240	32.964	32.981	32.999	33.016	33.033	33.050	33.067	33.084	33.101	33.118	33.135
2250	33.135	33.152	33.170	33.187	33.204	33.221	33.238	33.255	33.272	33.289	33.306
2260	33.306	33.323	33.341	33.358	33.375	33.392	33.409	33.426	33.443	33.460	33.477
2270	33.477	33.494	33.512	33.529	33.546	33.563	33.580	33.597	33.614	33.631	33.648
2280	33.648	33.666	33.683	33.700	33.717	33.734	33.751	33.768	33.785	33.802	33.819
2290	33.819	33.837	33.854	33.871	33.888	33.905	33.922	33.939	33.956	33.973	33.991
2300	33.991	34.008	34.025	34.042	34.059	34.076	34.093	34.110	34.127	34.144	34.162
2310	34.162	34.179	34.196	34.213	34.230	34.247	34.264	34.281	34.298	34.315	34.333
2320	34.333	34.350	34.367	34.384	34.401	34.418	34.435	34.452	34.469	34.486	34.504
2330	34.504	34.521	34.538	34.555	34.572	34.589	34.606	34.623	34.640	34.657	34.674
2340	34.674	34.691	34.709	34.726	34.743	34.760	34.777	34.794	34.811	34.828	34.845
2350	34.845	34.862	34.879	34.896	34.914	34.931	34.948	34.965	34.982	34.999	35.016
2360	35.016	35.033	35.050	35.067	35.084	35.101	35.118	35.135	35.152	35.169	35.186
2370	35.186	35.204	35.221								

TABLE 40 Platinum (NIST Pt–67) Versus Type NN Thermoelement

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–200	–2.406										
–190	–2.290	–2.302	–2.314	–2.325	–2.337	–2.348	–2.360	–2.371	–2.383	–2.394	–2.406
–180	–2.172	–2.184	–2.196	–2.208	–2.220	–2.232	–2.243	–2.255	–2.267	–2.279	–2.290
–170	–2.052	–2.064	–2.076	–2.088	–2.100	–2.112	–2.124	–2.136	–2.148	–2.160	–2.172
–160	–1.930	–1.942	–1.954	–1.966	–1.979	–1.991	–2.003	–2.015	–2.027	–2.040	–2.052
–150	–1.807	–1.819	–1.831	–1.844	–1.856	–1.868	–1.881	–1.893	–1.905	–1.917	–1.930
–140	–1.683	–1.695	–1.708	–1.720	–1.732	–1.745	–1.757	–1.769	–1.782	–1.794	–1.807
–130	–1.559	–1.571	–1.583	–1.596	–1.608	–1.621	–1.633	–1.646	–1.658	–1.670	–1.683
–120	–1.434	–1.446	–1.459	–1.471	–1.484	–1.496	–1.509	–1.521	–1.534	–1.546	–1.559
–110	–1.309	–1.322	–1.334	–1.347	–1.359	–1.372	–1.384	–1.397	–1.409	–1.422	–1.434
–100	–1.185	–1.197	–1.210	–1.222	–1.235	–1.247	–1.260	–1.272	–1.285	–1.297	–1.309
–90	–1.061	–1.073	–1.085	–1.098	–1.110	–1.123	–1.135	–1.148	–1.160	–1.172	–1.185
–80	–0.937	–0.949	–0.961	–0.974	–0.986	–0.999	–1.011	–1.023	–1.036	–1.048	–1.061
–70	–0.814	–0.826	–0.838	–0.850	–0.863	–0.875	–0.887	–0.900	–0.912	–0.924	–0.937
–60	–0.692	–0.704	–0.716	–0.728	–0.740	–0.752	–0.765	–0.777	–0.789	–0.801	–0.814
–50	–0.571	–0.583	–0.595	–0.607	–0.619	–0.631	–0.643	–0.655	–0.667	–0.679	–0.692
–40	–0.452	–0.464	–0.476	–0.487	–0.499	–0.511	–0.523	–0.535	–0.547	–0.559	–0.571
–30	–0.335	–0.347	–0.358	–0.370	–0.382	–0.393	–0.405	–0.417	–0.428	–0.440	–0.452
–20	–0.221	–0.232	–0.243	–0.255	–0.266	–0.278	–0.289	–0.300	–0.312	–0.323	–0.335
–10	–0.109	–0.120	–0.131	–0.142	–0.153	–0.164	–0.176	–0.187	–0.198	–0.209	–0.221
0	0.000	–0.011	–0.022	–0.032	–0.043	–0.054	–0.065	–0.076	–0.087	–0.098	–0.109
0	0.000	0.010	0.021	0.031	0.042	0.052	0.063	0.073	0.083	0.094	0.104
10	0.104	0.114	0.124	0.135	0.145	0.155	0.165	0.175	0.186	0.196	0.206
20	0.206	0.216	0.226	0.236	0.246	0.256	0.266	0.276	0.286	0.296	0.306
30	0.306	0.316	0.326	0.336	0.346	0.356	0.366	0.376	0.386	0.396	0.406
40	0.406	0.416	0.425	0.435	0.445	0.455	0.465	0.475	0.484	0.494	0.504
50	0.504	0.514	0.524	0.533	0.543	0.553	0.563	0.573	0.582	0.592	0.602
60	0.602	0.612	0.621	0.631	0.641	0.651	0.660	0.670	0.680	0.689	0.699
70	0.699	0.709	0.719	0.728	0.738	0.748	0.757	0.767	0.777	0.786	0.796
80	0.796	0.806	0.815	0.825	0.835	0.845	0.854	0.864	0.874	0.883	0.893
90	0.893	0.903	0.912	0.922	0.932	0.941	0.951	0.961	0.970	0.980	0.990
100	0.990	0.999	1.009	1.019	1.028	1.038	1.048	1.057	1.067	1.077	1.086
110	1.086	1.096	1.106	1.115	1.125	1.135	1.145	1.154	1.164	1.174	1.183
120	1.183	1.193	1.203	1.212	1.222	1.232	1.242	1.251	1.261	1.271	1.281
130	1.281	1.290	1.300	1.310	1.319	1.329	1.339	1.349	1.358	1.368	1.378
140	1.378	1.388	1.397	1.407	1.417	1.427	1.437	1.446	1.456	1.466	1.476
150	1.476	1.486	1.495	1.505	1.515	1.525	1.535	1.544	1.554	1.564	1.574
160	1.574	1.584	1.593	1.603	1.613	1.623	1.633	1.643	1.653	1.662	1.672
170	1.672	1.682	1.692	1.702	1.712	1.722	1.732	1.742	1.751	1.761	1.771
180	1.771	1.781	1.791	1.801	1.811	1.821	1.831	1.841	1.851	1.861	1.871
190	1.871	1.881	1.891	1.900	1.910	1.920	1.930	1.940	1.950	1.960	1.970
200	1.970	1.980	1.990	2.000	2.010	2.020	2.030	2.041	2.051	2.061	2.071
210	2.071	2.081	2.091	2.101	2.111	2.121	2.131	2.141	2.151	2.161	2.171
220	2.171	2.181	2.192	2.202	2.212	2.222	2.232	2.242	2.252	2.262	2.272
230	2.272	2.283	2.293	2.303	2.313	2.323	2.333	2.344	2.354	2.364	2.374
240	2.374	2.384	2.394	2.405	2.415	2.425	2.435	2.445	2.456	2.466	2.476
250	2.476	2.486	2.497	2.507	2.517	2.527	2.538	2.548	2.558	2.568	2.579
260	2.579	2.589	2.599	2.609	2.620	2.630	2.640	2.651	2.661	2.671	2.682
270	2.682	2.692	2.702	2.712	2.723	2.733	2.743	2.754	2.764	2.775	2.785
280	2.785	2.795	2.806	2.816	2.826	2.837	2.847	2.857	2.868	2.878	2.889
290	2.889	2.899	2.909	2.920	2.930	2.941	2.951	2.962	2.972	2.982	2.993
300	2.993	3.003	3.014	3.024	3.035	3.045	3.056	3.066	3.076	3.087	3.097
310	3.097	3.108	3.118	3.129	3.139	3.150	3.160	3.171	3.181	3.192	3.202
320	3.202	3.213	3.223	3.234	3.245	3.255	3.266	3.276	3.287	3.297	3.308
330	3.308	3.318	3.329	3.339	3.350	3.361	3.371	3.382	3.392	3.403	3.414
340	3.414	3.424	3.435	3.445	3.456	3.467	3.477	3.488	3.498	3.509	3.520
350	3.520	3.530	3.541	3.552	3.562	3.573	3.583	3.594	3.605	3.615	3.626
360	3.626	3.637	3.647	3.658	3.669	3.679	3.690	3.701	3.711	3.722	3.733
370	3.733	3.744	3.754	3.765	3.776	3.786	3.797	3.808	3.818	3.829	3.840

TABLE 40 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
380	3.840	3.851	3.861	3.872	3.883	3.894	3.904	3.915	3.926	3.937	3.947
390	3.947	3.958	3.969	3.980	3.990	4.001	4.012	4.023	4.033	4.044	4.055
400	4.055	4.066	4.077	4.087	4.098	4.109	4.120	4.131	4.141	4.152	4.163
410	4.163	4.174	4.185	4.195	4.206	4.217	4.228	4.239	4.250	4.260	4.271
420	4.271	4.282	4.293	4.304	4.315	4.325	4.336	4.347	4.358	4.369	4.380
430	4.380	4.391	4.401	4.412	4.423	4.434	4.445	4.456	4.467	4.478	4.488
440	4.488	4.499	4.510	4.521	4.532	4.543	4.554	4.565	4.576	4.587	4.597
450	4.597	4.608	4.619	4.630	4.641	4.652	4.663	4.674	4.685	4.696	4.707
460	4.707	4.717	4.728	4.739	4.750	4.761	4.772	4.783	4.794	4.805	4.816
470	4.816	4.827	4.838	4.849	4.860	4.871	4.882	4.893	4.903	4.914	4.925
480	4.925	4.936	4.947	4.958	4.969	4.980	4.991	5.002	5.013	5.024	5.035
490	5.035	5.046	5.057	5.068	5.079	5.090	5.101	5.112	5.123	5.134	5.145
500	5.145	5.156	5.167	5.178	5.189	5.200	5.211	5.222	5.233	5.244	5.255
510	5.255	5.266	5.277	5.288	5.299	5.310	5.320	5.331	5.342	5.353	5.364
520	5.364	5.375	5.386	5.397	5.408	5.419	5.430	5.441	5.452	5.463	5.474
530	5.474	5.485	5.496	5.507	5.518	5.529	5.540	5.551	5.562	5.573	5.584
540	5.584	5.595	5.606	5.617	5.628	5.639	5.650	5.661	5.672	5.683	5.694
550	5.694	5.705	5.716	5.727	5.738	5.749	5.760	5.771	5.782	5.793	5.804
560	5.804	5.815	5.826	5.837	5.848	5.859	5.870	5.881	5.892	5.903	5.914
570	5.914	5.925	5.936	5.947	5.958	5.969	5.980	5.991	6.002	6.013	6.024
580	6.024	6.035	6.046	6.057	6.068	6.079	6.090	6.101	6.112	6.123	6.134
590	6.134	6.145	6.156	6.167	6.178	6.188	6.199	6.210	6.221	6.232	6.243
600	6.243	6.254	6.265	6.276	6.287	6.298	6.309	6.320	6.331	6.342	6.353
610	6.353	6.364	6.374	6.385	6.396	6.407	6.418	6.429	6.440	6.451	6.462
620	6.462	6.473	6.484	6.494	6.505	6.516	6.527	6.538	6.549	6.560	6.571
630	6.571	6.582	6.592	6.603	6.614	6.625	6.636	6.647	6.658	6.669	6.679
640	6.679	6.690	6.701	6.712	6.723	6.734	6.745	6.755	6.766	6.777	6.788
650	6.788	6.799	6.809	6.820	6.831	6.842	6.853	6.864	6.874	6.885	6.896
660	6.896	6.907	6.918	6.928	6.939	6.950	6.961	6.971	6.982	6.993	7.004
670	7.004	7.014	7.025	7.036	7.047	7.057	7.068	7.079	7.090	7.100	7.111
680	7.111	7.122	7.132	7.143	7.154	7.165	7.175	7.186	7.197	7.207	7.218
690	7.218	7.229	7.239	7.250	7.261	7.271	7.282	7.293	7.303	7.314	7.325
700	7.325	7.335	7.346	7.356	7.367	7.378	7.388	7.399	7.409	7.420	7.431
710	7.431	7.441	7.452	7.462	7.473	7.483	7.494	7.505	7.515	7.526	7.536
720	7.536	7.547	7.557	7.568	7.578	7.589	7.599	7.610	7.620	7.631	7.641
730	7.641	7.652	7.662	7.673	7.683	7.694	7.704	7.714	7.725	7.735	7.746
740	7.746	7.756	7.767	7.777	7.787	7.798	7.808	7.819	7.829	7.839	7.850
750	7.850	7.860	7.870	7.881	7.891	7.901	7.912	7.922	7.932	7.943	7.953
760	7.953	7.963	7.974	7.984	7.994	8.005	8.015	8.025	8.035	8.046	8.056
770	8.056	8.065	8.076	8.087	8.097	8.107	8.117	8.127	8.138	8.148	8.158
780	8.158	8.168	8.178	8.188	8.199	8.209	8.219	8.229	8.239	8.249	8.259
790	8.259	8.269	8.280	8.290	8.300	8.310	8.320	8.330	8.340	8.350	8.360
800	8.360	8.370	8.380	8.390	8.400	8.410	8.420	8.430	8.440	8.450	8.460
810	8.460	8.470	8.480	8.490	8.500	8.510	8.520	8.530	8.540	8.550	8.560
820	8.560	8.569	8.579	8.589	8.599	8.609	8.619	8.629	8.638	8.648	8.658
830	8.658	8.668	8.678	8.688	8.697	8.707	8.717	8.727	8.736	8.746	8.756
840	8.756	8.766	8.775	8.785	8.795	8.805	8.814	8.824	8.834	8.843	8.853
850	8.853	8.863	8.872	8.882	8.892	8.901	8.911	8.921	8.930	8.940	8.949
860	8.949	8.959	8.969	8.978	8.988	8.997	9.007	9.016	9.026	9.035	9.045
870	9.045	9.054	9.064	9.073	9.083	9.092	9.102	9.111	9.121	9.130	9.140
880	9.140	9.149	9.158	9.168	9.177	9.187	9.196	9.205	9.215	9.224	9.233
890	9.233	9.243	9.252	9.261	9.271	9.280	9.289	9.299	9.308	9.317	9.327
900	9.327	9.336	9.345	9.354	9.364	9.373	9.382	9.391	9.400	9.410	9.419
910	9.419	9.428	9.437	9.446	9.455	9.465	9.474	9.483	9.492	9.501	9.510
920	9.510	9.519	9.528	9.537	9.546	9.556	9.565	9.574	9.583	9.592	9.601
930	9.601	9.610	9.619	9.628	9.637	9.646	9.655	9.664	9.672	9.681	9.690
940	9.690	9.699	9.708	9.717	9.726	9.735	9.744	9.753	9.761	9.770	9.779
950	9.779	9.788	9.797	9.806	9.814	9.823	9.832	9.841	9.850	9.858	9.867
960	9.867	9.876	9.885	9.893	9.902	9.911	9.919	9.928	9.937	9.945	9.954

TABLE 40 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
970	9.954	9.963	9.971	9.980	9.989	9.997	10.006	10.015	10.023	10.032	10.040
980	10.040	10.049	10.057	10.066	10.075	10.083	10.092	10.100	10.109	10.117	10.126
990	10.126	10.134	10.143	10.151	10.159	10.168	10.176	10.185	10.193	10.202	10.210
1000	10.210	10.218	10.227	10.235	10.244	10.252	10.260	10.269	10.277	10.285	10.294
1010	10.294	10.302	10.310	10.318	10.327	10.335	10.343	10.351	10.360	10.368	10.376
1020	10.376	10.384	10.393	10.401	10.409	10.417	10.425	10.433	10.442	10.450	10.458
1030	10.458	10.466	10.474	10.482	10.490	10.498	10.506	10.514	10.523	10.531	10.539
1040	10.539	10.547	10.555	10.563	10.571	10.579	10.587	10.595	10.603	10.611	10.619
1050	10.619	10.626	10.634	10.642	10.650	10.658	10.666	10.674	10.682	10.690	10.697
1060	10.697	10.705	10.713	10.721	10.729	10.737	10.744	10.752	10.760	10.768	10.776
1070	10.776	10.783	10.791	10.799	10.806	10.814	10.822	10.830	10.837	10.845	10.853
1080	10.853	10.860	10.868	10.876	10.883	10.891	10.898	10.906	10.914	10.921	10.929
1090	10.929	10.936	10.944	10.951	10.959	10.967	10.974	10.982	10.989	10.997	11.004
1100	11.004	11.012	11.019	11.026	11.034	11.041	11.049	11.056	11.064	11.071	11.078
1110	11.078	11.086	11.093	11.100	11.108	11.115	11.122	11.130	11.137	11.144	11.152
1120	11.152	11.159	11.166	11.173	11.181	11.188	11.195	11.202	11.210	11.217	11.224
1130	11.224	11.231	11.238	11.245	11.253	11.260	11.267	11.274	11.281	11.288	11.295
1140	11.295	11.302	11.309	11.316	11.324	11.331	11.338	11.345	11.352	11.359	11.366
1150	11.366	11.373	11.380	11.387	11.393	11.400	11.407	11.414	11.421	11.428	11.435
1160	11.435	11.442	11.449	11.456	11.462	11.469	11.476	11.483	11.490	11.496	11.503
1170	11.503	11.510	11.517	11.524	11.530	11.537	11.544	11.550	11.557	11.564	11.571
1180	11.571	11.577	11.584	11.591	11.597	11.604	11.610	11.617	11.624	11.630	11.637
1190	11.637	11.643	11.650	11.656	11.663	11.669	11.676	11.682	11.689	11.695	11.702
1200	11.702	11.708	11.715	11.721	11.728	11.734	11.741	11.747	11.753	11.760	11.766
1210	11.766	11.772	11.779	11.785	11.791	11.798	11.804	11.810	11.816	11.823	11.829
1220	11.829	11.835	11.841	11.848	11.854	11.860	11.866	11.872	11.879	11.885	11.891
1230	11.891	11.897	11.903	11.909	11.915	11.921	11.927	11.934	11.940	11.946	11.952
1240	11.952	11.958	11.964	11.970	11.976	11.982	11.988	11.994	11.999	12.005	12.011
1250	12.011	12.017	12.023	12.029	12.035	12.041	12.047	12.052	12.058	12.064	12.070
1260	12.070	12.076	12.081	12.087	12.093	12.099	12.104	12.110	12.116	12.121	12.127
1270	12.127	12.133	12.138	12.144	12.150	12.155	12.161	12.167	12.172	12.178	12.183
1280	12.183	12.189	12.194	12.200	12.205	12.211	12.216	12.222	12.227	12.233	12.238
1290	12.238	12.244	12.249	12.255	12.260	12.265	12.271	12.276	12.282	12.287	12.292
1300	12.292										

TABLE 41 Platinum (NIST Pt–67) Versus Type NN Thermoelement

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–320	–2.355	–2.361	–2.368	–2.374	–2.380	–2.387	–2.393	–2.399	–2.406		
–310	–2.290	–2.297	–2.303	–2.310	–2.316	–2.323	–2.329	–2.336	–2.342	–2.348	–2.355
–300	–2.225	–2.232	–2.238	–2.245	–2.251	–2.258	–2.264	–2.271	–2.277	–2.284	–2.290
–290	–2.159	–2.166	–2.172	–2.179	–2.185	–2.192	–2.199	–2.205	–2.212	–2.219	–2.225
–280	–2.092	–2.099	–2.105	–2.112	–2.119	–2.126	–2.132	–2.139	–2.146	–2.152	–2.159
–270	–2.025	–2.031	–2.038	–2.045	–2.052	–2.058	–2.065	–2.072	–2.079	–2.085	–2.092
–260	–1.957	–1.964	–1.970	–1.977	–1.984	–1.991	–1.998	–2.004	–2.011	–2.018	–2.025
–250	–1.889	–1.896	–1.902	–1.909	–1.916	–1.923	–1.930	–1.936	–1.943	–1.950	–1.957
–240	–1.820	–1.827	–1.834	–1.841	–1.848	–1.855	–1.861	–1.868	–1.875	–1.882	–1.889
–230	–1.752	–1.758	–1.765	–1.772	–1.779	–1.786	–1.793	–1.800	–1.807	–1.813	–1.820
–220	–1.683	–1.690	–1.697	–1.703	–1.710	–1.717	–1.724	–1.731	–1.738	–1.745	–1.752
–210	–1.614	–1.621	–1.628	–1.635	–1.641	–1.648	–1.655	–1.662	–1.669	–1.676	–1.683
–200	–1.545	–1.552	–1.559	–1.565	–1.572	–1.579	–1.586	–1.593	–1.600	–1.607	–1.614
–190	–1.476	–1.482	–1.489	–1.496	–1.503	–1.510	–1.517	–1.524	–1.531	–1.538	–1.545
–180	–1.406	–1.413	–1.420	–1.427	–1.434	–1.441	–1.448	–1.455	–1.462	–1.469	–1.476
–170	–1.337	–1.344	–1.351	–1.358	–1.365	–1.372	–1.379	–1.386	–1.393	–1.399	–1.406
–160	–1.268	–1.275	–1.282	–1.289	–1.296	–1.303	–1.309	–1.316	–1.323	–1.330	–1.337
–150	–1.199	–1.206	–1.213	–1.219	–1.226	–1.233	–1.240	–1.247	–1.254	–1.261	–1.268
–140	–1.130	–1.136	–1.143	–1.150	–1.157	–1.164	–1.171	–1.178	–1.185	–1.192	–1.199
–130	–1.061	–1.067	–1.074	–1.081	–1.088	–1.095	–1.102	–1.109	–1.116	–1.123	–1.130
–120	–0.992	–0.999	–1.005	–1.012	–1.019	–1.026	–1.033	–1.040	–1.047	–1.054	–1.061
–110	–0.923	–0.930	–0.937	–0.944	–0.950	–0.957	–0.964	–0.971	–0.978	–0.985	–0.992
–100	–0.855	–0.861	–0.868	–0.875	–0.882	–0.889	–0.896	–0.902	–0.909	–0.916	–0.923
–90	–0.786	–0.793	–0.800	–0.807	–0.814	–0.820	–0.827	–0.834	–0.841	–0.848	–0.855
–80	–0.719	–0.725	–0.732	–0.739	–0.746	–0.752	–0.759	–0.766	–0.773	–0.780	–0.786
–70	–0.651	–0.658	–0.665	–0.671	–0.678	–0.685	–0.692	–0.698	–0.705	–0.712	–0.719
–60	–0.584	–0.591	–0.598	–0.604	–0.611	–0.618	–0.624	–0.631	–0.638	–0.644	–0.651
–50	–0.518	–0.524	–0.531	–0.538	–0.544	–0.551	–0.558	–0.564	–0.571	–0.577	–0.584
–40	–0.452	–0.458	–0.465	–0.472	–0.478	–0.485	–0.491	–0.498	–0.505	–0.511	–0.518
–30	–0.387	–0.393	–0.400	–0.406	–0.413	–0.419	–0.426	–0.432	–0.439	–0.445	–0.452
–20	–0.322	–0.329	–0.335	–0.341	–0.348	–0.354	–0.361	–0.367	–0.374	–0.380	–0.387
–10	–0.258	–0.265	–0.271	–0.278	–0.284	–0.290	–0.297	–0.303	–0.309	–0.316	–0.322
0	–0.196	–0.202	–0.208	–0.214	–0.221	–0.227	–0.233	–0.240	–0.246	–0.252	–0.258
0	–0.196	–0.189	–0.183	–0.177	–0.171	–0.164	–0.158	–0.152	–0.146	–0.140	–0.133
10	–0.133	–0.127	–0.121	–0.115	–0.109	–0.103	–0.097	–0.091	–0.084	–0.078	–0.072
20	–0.072	–0.066	–0.060	–0.054	–0.048	–0.042	–0.036	–0.030	–0.024	–0.018	–0.012
30	–0.012	–0.006	0.000	0.006	0.012	0.017	0.023	0.029	0.035	0.041	0.046
40	0.046	0.052	0.058	0.064	0.069	0.075	0.081	0.087	0.092	0.098	0.104
50	0.104	0.110	0.115	0.121	0.127	0.132	0.138	0.144	0.149	0.155	0.161
60	0.161	0.166	0.172	0.178	0.183	0.189	0.195	0.200	0.206	0.211	0.217
70	0.217	0.223	0.228	0.234	0.239	0.245	0.251	0.256	0.262	0.267	0.273
80	0.273	0.279	0.284	0.290	0.295	0.301	0.306	0.312	0.317	0.323	0.328
90	0.328	0.334	0.340	0.345	0.351	0.356	0.362	0.367	0.373	0.378	0.384
100	0.384	0.389	0.395	0.400	0.406	0.411	0.417	0.422	0.428	0.433	0.439
110	0.439	0.444	0.450	0.455	0.460	0.466	0.471	0.477	0.482	0.488	0.493
120	0.493	0.499	0.504	0.510	0.515	0.520	0.526	0.531	0.537	0.542	0.548
130	0.548	0.553	0.558	0.564	0.569	0.575	0.580	0.586	0.591	0.596	0.602
140	0.602	0.607	0.613	0.618	0.624	0.629	0.634	0.640	0.645	0.651	0.656
150	0.656	0.661	0.667	0.672	0.678	0.683	0.688	0.694	0.699	0.705	0.710
160	0.710	0.715	0.721	0.726	0.731	0.737	0.742	0.748	0.753	0.758	0.764
170	0.764	0.769	0.775	0.780	0.785	0.791	0.796	0.801	0.807	0.812	0.818
180	0.818	0.823	0.828	0.834	0.839	0.845	0.850	0.855	0.861	0.866	0.871
190	0.871	0.877	0.882	0.888	0.893	0.898	0.904	0.909	0.914	0.920	0.925
200	0.925	0.931	0.936	0.941	0.947	0.952	0.957	0.963	0.968	0.974	0.979
210	0.979	0.984	0.990	0.995	1.000	1.006	1.011	1.017	1.022	1.027	1.033
220	1.033	1.038	1.043	1.049	1.054	1.060	1.065	1.070	1.076	1.081	1.086
230	1.086	1.092	1.097	1.103	1.108	1.113	1.119	1.124	1.129	1.135	1.140
240	1.140	1.146	1.151	1.156	1.162	1.167	1.173	1.178	1.183	1.189	1.194
250	1.194	1.200	1.205	1.210	1.216	1.221	1.227	1.232	1.237	1.243	1.248

TABLE 41 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
260	1.248	1.254	1.259	1.264	1.270	1.275	1.281	1.286	1.291	1.297	1.302
270	1.302	1.308	1.313	1.318	1.324	1.329	1.335	1.340	1.345	1.351	1.356
280	1.356	1.362	1.367	1.373	1.378	1.383	1.389	1.394	1.400	1.405	1.411
290	1.411	1.416	1.421	1.427	1.432	1.438	1.443	1.449	1.454	1.459	1.465
300	1.465	1.470	1.476	1.481	1.487	1.492	1.497	1.503	1.508	1.514	1.519
310	1.519	1.525	1.530	1.536	1.541	1.547	1.552	1.557	1.563	1.568	1.574
320	1.574	1.579	1.585	1.590	1.596	1.601	1.607	1.612	1.618	1.623	1.629
330	1.629	1.634	1.639	1.645	1.650	1.656	1.661	1.667	1.672	1.678	1.683
340	1.683	1.689	1.694	1.700	1.705	1.711	1.716	1.722	1.727	1.733	1.738
350	1.738	1.744	1.749	1.755	1.760	1.766	1.771	1.777	1.782	1.788	1.793
360	1.793	1.799	1.804	1.810	1.815	1.821	1.826	1.832	1.837	1.843	1.848
370	1.848	1.854	1.860	1.865	1.871	1.876	1.882	1.887	1.893	1.898	1.904
380	1.904	1.909	1.915	1.920	1.926	1.932	1.937	1.943	1.948	1.954	1.959
390	1.959	1.965	1.970	1.976	1.982	1.987	1.993	1.998	2.004	2.009	2.015
400	2.015	2.020	2.026	2.032	2.037	2.043	2.048	2.054	2.059	2.065	2.071
410	2.071	2.076	2.082	2.087	2.093	2.099	2.104	2.110	2.115	2.121	2.127
420	2.127	2.132	2.138	2.143	2.149	2.155	2.160	2.166	2.171	2.177	2.183
430	2.183	2.188	2.194	2.199	2.205	2.211	2.216	2.222	2.227	2.233	2.239
440	2.239	2.244	2.250	2.256	2.261	2.267	2.272	2.278	2.284	2.289	2.295
450	2.295	2.301	2.306	2.312	2.318	2.323	2.329	2.334	2.340	2.346	2.351
460	2.351	2.357	2.363	2.368	2.374	2.380	2.385	2.391	2.397	2.402	2.408
470	2.408	2.414	2.419	2.425	2.431	2.436	2.442	2.448	2.453	2.459	2.465
480	2.465	2.470	2.476	2.482	2.487	2.493	2.499	2.505	2.510	2.516	2.522
490	2.522	2.527	2.533	2.539	2.544	2.550	2.556	2.561	2.567	2.573	2.579
500	2.579	2.584	2.590	2.596	2.601	2.607	2.613	2.619	2.624	2.630	2.636
510	2.636	2.641	2.647	2.653	2.659	2.664	2.670	2.676	2.682	2.687	2.693
520	2.693	2.699	2.704	2.710	2.716	2.722	2.727	2.733	2.739	2.745	2.750
530	2.750	2.756	2.762	2.768	2.773	2.779	2.785	2.791	2.796	2.802	2.808
540	2.808	2.814	2.819	2.825	2.831	2.837	2.842	2.848	2.854	2.860	2.866
550	2.866	2.871	2.877	2.883	2.889	2.894	2.900	2.906	2.912	2.918	2.923
560	2.923	2.929	2.935	2.941	2.946	2.952	2.958	2.964	2.970	2.975	2.981
570	2.981	2.987	2.993	2.999	3.004	3.010	3.016	3.022	3.028	3.033	3.039
580	3.039	3.045	3.051	3.057	3.063	3.068	3.074	3.080	3.086	3.092	3.097
590	3.097	3.103	3.109	3.115	3.121	3.127	3.132	3.138	3.144	3.150	3.156
600	3.156	3.162	3.167	3.173	3.179	3.185	3.191	3.197	3.202	3.208	3.214
610	3.214	3.220	3.226	3.232	3.238	3.243	3.249	3.255	3.261	3.267	3.273
620	3.273	3.278	3.284	3.290	3.296	3.302	3.308	3.314	3.320	3.325	3.331
630	3.331	3.337	3.343	3.349	3.355	3.361	3.366	3.372	3.378	3.384	3.390
640	3.390	3.396	3.402	3.408	3.414	3.419	3.425	3.431	3.437	3.443	3.449
650	3.449	3.455	3.461	3.467	3.472	3.478	3.484	3.490	3.496	3.502	3.508
660	3.508	3.514	3.520	3.526	3.531	3.537	3.543	3.549	3.555	3.561	3.567
670	3.567	3.573	3.579	3.585	3.591	3.596	3.602	3.608	3.614	3.620	3.626
680	3.626	3.632	3.638	3.644	3.650	3.656	3.662	3.668	3.673	3.679	3.685
690	3.685	3.691	3.697	3.703	3.709	3.715	3.721	3.727	3.733	3.739	3.745
700	3.745	3.751	3.757	3.763	3.769	3.774	3.780	3.786	3.792	3.798	3.804
710	3.804	3.810	3.816	3.822	3.828	3.834	3.840	3.846	3.852	3.858	3.864
720	3.864	3.870	3.876	3.882	3.888	3.894	3.900	3.906	3.912	3.917	3.923
730	3.923	3.929	3.935	3.941	3.947	3.953	3.959	3.965	3.971	3.977	3.983
740	3.983	3.989	3.995	4.001	4.007	4.013	4.019	4.025	4.031	4.037	4.043
750	4.043	4.049	4.055	4.061	4.067	4.073	4.079	4.085	4.091	4.097	4.103
760	4.103	4.109	4.115	4.121	4.127	4.133	4.139	4.145	4.151	4.157	4.163
770	4.163	4.169	4.175	4.181	4.187	4.193	4.199	4.205	4.211	4.217	4.223
780	4.223	4.229	4.235	4.241	4.247	4.253	4.259	4.265	4.271	4.277	4.283
790	4.283	4.289	4.295	4.301	4.307	4.313	4.319	4.325	4.332	4.338	4.344
800	4.344	4.350	4.356	4.362	4.368	4.374	4.380	4.386	4.392	4.398	4.404
810	4.404	4.410	4.416	4.422	4.428	4.434	4.440	4.446	4.452	4.458	4.464
820	4.464	4.470	4.476	4.482	4.488	4.495	4.501	4.507	4.513	4.519	4.525
830	4.525	4.531	4.537	4.543	4.549	4.555	4.561	4.567	4.573	4.579	4.585
840	4.585	4.591	4.597	4.603	4.610	4.616	4.622	4.628	4.634	4.640	4.646

TABLE 41 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
850	4.646	4.652	4.658	4.664	4.670	4.676	4.682	4.688	4.694	4.701	4.707
860	4.707	4.713	4.719	4.725	4.731	4.737	4.743	4.749	4.755	4.761	4.767
870	4.767	4.773	4.779	4.786	4.792	4.798	4.804	4.810	4.816	4.822	4.828
880	4.628	4.834	4.840	4.846	4.852	4.858	4.865	4.871	4.877	4.883	4.889
890	4.889	4.895	4.901	4.907	4.913	4.919	4.925	4.931	4.938	4.944	4.950
900	4.950	4.956	4.962	4.968	4.974	4.980	4.986	4.992	4.998	5.005	5.011
910	5.011	5.017	5.023	5.029	5.035	5.041	5.047	5.053	5.059	5.065	5.072
920	5.072	5.078	5.084	5.090	5.096	5.102	5.108	5.114	5.120	5.126	5.133
930	5.133	5.139	5.145	5.151	5.157	5.163	5.169	5.175	5.181	5.187	5.194
940	5.194	5.200	5.206	5.212	5.218	5.224	5.230	5.236	5.242	5.248	5.255
950	5.255	5.261	5.267	5.273	5.279	5.285	5.291	5.297	5.303	5.310	5.316
960	5.316	5.322	5.328	5.334	5.340	5.346	5.352	5.358	5.364	5.371	5.377
970	5.377	5.383	5.389	5.395	5.401	5.407	5.413	5.419	5.426	5.432	5.438
980	5.438	5.444	5.450	5.456	5.462	5.468	5.474	5.481	5.487	5.493	5.499
990	5.499	5.505	5.511	5.517	5.523	5.529	5.536	5.542	5.548	5.554	5.560
1000	5.560	5.566	5.572	5.578	5.584	5.590	5.597	5.603	5.609	5.615	5.621
1010	5.621	5.627	5.633	5.639	5.645	5.652	5.658	5.664	5.670	5.676	5.682
1020	5.682	5.688	5.694	5.700	5.707	5.713	5.719	5.725	5.731	5.737	5.743
1030	5.743	5.749	5.755	5.762	5.768	5.774	5.780	5.786	5.792	5.798	5.804
1040	5.804	5.810	5.817	5.823	5.829	5.835	5.841	5.847	5.853	5.859	5.865
1050	5.865	5.871	5.878	5.884	5.890	5.896	5.902	5.908	5.914	5.920	5.926
1060	5.926	5.932	5.939	5.945	5.951	5.957	5.963	5.969	5.975	5.981	5.987
1070	5.987	5.993	6.000	6.006	6.012	6.018	6.024	6.030	6.036	6.042	6.048
1080	6.048	6.054	6.061	6.067	6.073	6.079	6.085	6.091	6.097	6.103	6.109
1090	6.109	6.115	6.121	6.128	6.134	6.140	6.146	6.152	6.158	6.164	6.170
1100	6.170	6.176	6.182	6.188	6.195	6.201	6.207	6.213	6.219	6.225	6.231
1110	6.231	6.237	6.243	6.249	6.255	6.261	6.268	6.274	6.280	6.286	6.292
1120	6.292	6.298	6.304	6.310	6.316	6.322	6.328	6.334	6.340	6.347	6.353
1130	6.353	6.359	6.365	6.371	6.377	6.383	6.389	6.395	6.401	6.407	6.413
1140	6.413	6.419	6.425	6.431	6.438	6.444	6.450	6.456	6.462	6.468	6.474
1150	6.474	6.480	6.486	6.492	6.498	6.504	6.510	6.516	6.522	6.528	6.534
1160	6.534	6.540	6.547	6.553	6.559	6.565	6.571	6.577	6.583	6.589	6.595
1170	6.595	6.601	6.607	6.613	6.619	6.625	6.631	6.637	6.643	6.649	6.655
1180	6.655	6.661	6.667	6.673	6.679	6.685	6.691	6.698	6.704	6.710	6.716
1190	6.716	6.722	6.728	6.734	6.740	6.746	6.752	6.758	6.764	6.770	6.776
1200	6.776	6.782	6.788	6.794	6.800	6.806	6.812	6.818	6.824	6.830	6.836
1210	6.836	6.842	6.848	6.854	6.860	6.866	6.872	6.878	6.884	6.890	6.896
1220	6.896	6.902	6.908	6.914	6.920	6.926	6.932	6.938	6.944	6.950	6.956
1230	6.956	6.962	6.968	6.974	6.980	6.986	6.992	6.998	7.004	7.010	7.016
1240	7.016	7.022	7.028	7.034	7.040	7.045	7.051	7.057	7.063	7.069	7.075
1250	7.075	7.081	7.087	7.093	7.099	7.105	7.111	7.117	7.123	7.129	7.135
1260	7.135	7.141	7.147	7.153	7.159	7.165	7.171	7.176	7.182	7.188	7.194
1270	7.194	7.200	7.206	7.212	7.218	7.224	7.230	7.236	7.242	7.248	7.254
1280	7.254	7.259	7.265	7.271	7.277	7.283	7.289	7.295	7.301	7.307	7.313
1290	7.313	7.319	7.325	7.330	7.336	7.342	7.348	7.354	7.360	7.366	7.372
1300	7.372	7.378	7.384	7.389	7.395	7.401	7.407	7.413	7.419	7.425	7.431
1310	7.431	7.436	7.442	7.448	7.454	7.460	7.466	7.472	7.478	7.483	7.489
1320	7.489	7.495	7.501	7.507	7.513	7.519	7.524	7.530	7.536	7.542	7.548
1330	7.548	7.554	7.560	7.565	7.571	7.577	7.583	7.589	7.595	7.600	7.606
1340	7.606	7.612	7.618	7.624	7.630	7.635	7.641	7.647	7.653	7.659	7.665
1350	7.665	7.670	7.676	7.682	7.688	7.694	7.699	7.705	7.711	7.717	7.723
1360	7.723	7.728	7.734	7.740	7.746	7.752	7.757	7.763	7.769	7.775	7.780
1370	7.780	7.786	7.792	7.798	7.804	7.809	7.815	7.821	7.827	7.832	7.838
1380	7.838	7.844	7.850	7.855	7.861	7.867	7.873	7.878	7.884	7.890	7.896
1390	7.896	7.901	7.907	7.913	7.919	7.924	7.930	7.936	7.942	7.947	7.953
1400	7.953	7.959	7.965	7.970	7.976	7.982	7.987	7.993	7.999	8.005	8.010
1410	8.010	8.016	8.022	8.027	8.033	8.039	8.044	8.050	8.056	8.062	8.067
1420	8.067	8.073	8.079	8.084	8.090	8.096	8.101	8.107	8.113	8.118	8.124
1430	8.124	8.130	8.135	8.141	8.147	8.152	8.158	8.164	8.169	8.175	8.181
1440	8.181	8.186	8.192	8.197	8.203	8.209	8.214	8.220	8.226	8.231	8.237

TABLE 41 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1450	8.237	8.243	8.248	8.254	8.259	8.265	8.271	8.276	8.282	8.287	8.293
1460	8.293	8.299	8.304	8.310	8.315	8.321	8.327	8.332	8.338	8.343	8.349
1470	8.349	8.355	8.360	8.366	8.371	8.377	8.382	8.388	8.394	8.399	8.405
1480	8.405	8.410	8.416	8.421	8.427	8.432	8.438	8.444	8.449	8.455	8.460
1490	8.460	8.466	8.471	8.477	8.482	8.488	8.493	8.499	8.504	8.510	8.515
1500	8.515	8.521	8.526	8.532	8.538	8.543	8.549	8.554	8.560	8.565	8.571
1510	8.571	8.576	8.582	8.587	8.592	8.598	8.603	8.609	8.614	8.620	8.625
1520	8.625	8.631	8.636	8.642	8.647	8.653	8.658	8.664	8.669	8.674	8.680
1530	8.680	8.685	8.691	8.696	8.702	8.707	8.713	8.718	8.723	8.729	8.734
1540	8.734	8.740	8.745	8.751	8.756	8.761	8.767	8.772	8.778	8.783	8.788
1550	8.788	8.794	8.799	8.805	8.810	8.815	8.821	8.826	8.832	8.837	8.842
1560	8.842	8.848	8.853	8.858	8.864	8.869	8.875	8.880	8.885	8.891	8.896
1570	8.896	8.901	8.907	8.912	8.917	8.923	8.928	8.933	8.939	8.944	8.949
1580	8.949	8.955	8.960	8.965	8.971	8.976	8.981	8.987	8.992	8.997	9.003
1590	9.003	9.008	9.013	9.018	9.024	9.029	9.034	9.040	9.045	9.050	9.055
1600	9.055	9.061	9.066	9.071	9.077	9.082	9.087	9.092	9.098	9.103	9.108
1610	9.108	9.113	9.119	9.124	9.129	9.134	9.140	9.145	9.150	9.155	9.161
1620	9.161	9.166	9.171	9.176	9.181	9.187	9.192	9.197	9.202	9.207	9.213
1630	9.213	9.218	9.223	9.228	9.233	9.239	9.244	9.249	9.254	9.259	9.265
1640	9.265	9.270	9.275	9.280	9.285	9.290	9.296	9.301	9.306	9.311	9.316
1650	9.316	9.321	9.327	9.332	9.337	9.342	9.347	9.352	9.357	9.363	9.368
1660	9.368	9.373	9.378	9.383	9.388	9.393	9.398	9.403	9.409	9.414	9.419
1670	9.419	9.424	9.429	9.434	9.439	9.444	9.449	9.454	9.459	9.465	9.470
1680	9.470	9.475	9.480	9.485	9.490	9.495	9.500	9.505	9.510	9.515	9.520
1690	9.520	9.525	9.530	9.535	9.540	9.545	9.550	9.556	9.561	9.566	9.571
1700	9.571	9.576	9.581	9.586	9.591	9.596	9.601	9.606	9.611	9.616	9.621
1710	9.621	9.626	9.631	9.636	9.641	9.646	9.651	9.656	9.661	9.666	9.670
1720	9.670	9.675	9.680	9.685	9.690	9.695	9.700	9.705	9.710	9.715	9.720
1730	9.720	9.725	9.730	9.735	9.740	9.745	9.750	9.755	9.759	9.764	9.769
1740	9.769	9.774	9.779	9.784	9.789	9.794	9.799	9.804	9.809	9.813	9.818
1750	9.818	9.823	9.828	9.833	9.838	9.843	9.848	9.852	9.857	9.862	9.867
1760	9.867	9.872	9.877	9.882	9.885	9.891	9.896	9.901	9.906	9.911	9.916
1770	9.916	9.920	9.925	9.930	9.935	9.940	9.945	9.949	9.954	9.959	9.964
1780	9.964	9.969	9.973	9.978	9.983	9.988	9.993	9.997	10.002	10.007	10.012
1790	10.012	10.016	10.021	10.026	10.031	10.036	10.040	10.045	10.050	10.055	10.059
1800	10.059	10.064	10.069	10.074	10.078	10.083	10.088	10.093	10.097	10.102	10.107
1810	10.107	10.111	10.116	10.121	10.126	10.130	10.135	10.140	10.144	10.149	10.154
1820	10.154	10.159	10.163	10.168	10.173	10.177	10.182	10.187	10.191	10.196	10.201
1830	10.201	10.205	10.210	10.215	10.219	10.224	10.229	10.233	10.238	10.243	10.247
1840	10.247	10.252	10.257	10.261	10.266	10.270	10.275	10.280	10.284	10.289	10.294
1850	10.294	10.298	10.303	10.307	10.312	10.317	10.321	10.326	10.330	10.335	10.340
1860	10.340	10.344	10.349	10.353	10.358	10.362	10.367	10.372	10.376	10.381	10.385
1870	10.385	10.390	10.394	10.399	10.403	10.408	10.413	10.417	10.422	10.426	10.431
1880	10.431	10.435	10.440	10.444	10.449	10.453	10.458	10.462	10.467	10.471	10.476
1890	10.476	10.480	10.485	10.489	10.494	10.498	10.503	10.507	10.512	10.516	10.521
1900	10.521	10.525	10.530	10.534	10.539	10.543	10.548	10.552	10.556	10.561	10.565
1910	10.565	10.570	10.574	10.579	10.583	10.588	10.592	10.596	10.601	10.605	10.610
1920	10.610	10.614	10.619	10.623	10.627	10.632	10.636	10.641	10.645	10.649	10.654
1930	10.654	10.658	10.663	10.667	10.671	10.676	10.680	10.684	10.689	10.693	10.697
1940	10.697	10.702	10.706	10.711	10.715	10.719	10.724	10.728	10.732	10.737	10.741
1950	10.741	10.745	10.750	10.754	10.758	10.763	10.767	10.771	10.776	10.780	10.784
1960	10.784	10.788	10.793	10.797	10.801	10.806	10.810	10.814	10.818	10.823	10.827
1970	10.827	10.831	10.836	10.840	10.844	10.848	10.853	10.857	10.861	10.865	10.870
1980	10.870	10.874	10.878	10.882	10.887	10.891	10.895	10.899	10.904	10.908	10.912
1990	10.912	10.916	10.920	10.925	10.929	10.933	10.937	10.941	10.946	10.950	10.954
2000	10.954	10.958	10.962	10.967	10.971	10.975	10.979	10.983	10.987	10.992	10.996
2010	10.996	11.000	11.004	11.008	11.012	11.016	11.021	11.025	11.029	11.033	11.037
2020	11.037	11.041	11.045	11.050	11.054	11.058	11.062	11.066	11.070	11.074	11.078
2030	11.078	11.082	11.086	11.091	11.095	11.099	11.103	11.107	11.111	11.115	11.119

TABLE 41 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
2040	11.119	11.123	11.127	11.131	11.135	11.139	11.144	11.148	11.152	11.156	11.160
2050	11.160	11.164	11.168	11.172	11.176	11.180	11.184	11.188	11.192	11.196	11.200
2060	11.200	11.204	11.208	11.212	11.216	11.220	11.224	11.228	11.232	11.236	11.240
2070	11.240	11.244	11.248	11.252	11.256	11.260	11.264	11.268	11.272	11.276	11.280
2080	11.280	11.283	11.287	11.291	11.295	11.299	11.303	11.307	11.311	11.315	11.319
2090	11.319	11.323	11.327	11.331	11.334	11.338	11.342	11.346	11.350	11.354	11.358
2100	11.358	11.362	11.366	11.369	11.373	11.377	11.381	11.385	11.389	11.393	11.397
2110	11.397	11.400	11.404	11.408	11.412	11.416	11.420	11.423	11.427	11.431	11.435
2120	11.435	11.439	11.443	11.446	11.450	11.454	11.458	11.462	11.465	11.469	11.473
2130	11.473	11.477	11.481	11.484	11.488	11.492	11.496	11.499	11.503	11.507	11.511
2140	11.511	11.515	11.518	11.522	11.526	11.530	11.533	11.537	11.541	11.544	11.548
2150	11.548	11.552	11.556	11.559	11.563	11.567	11.571	11.574	11.578	11.582	11.585
2160	11.585	11.589	11.593	11.596	11.600	11.604	11.607	11.611	11.615	11.618	11.622
2170	11.622	11.626	11.629	11.633	11.637	11.640	11.644	11.648	11.651	11.655	11.659
2180	11.659	11.662	11.666	11.669	11.673	11.677	11.680	11.684	11.688	11.691	11.695
2190	11.695	11.698	11.702	11.706	11.709	11.713	11.716	11.720	11.723	11.727	11.731
2200	11.731	11.734	11.738	11.741	11.745	11.748	11.752	11.755	11.759	11.762	11.766
2210	11.766	11.770	11.773	11.777	11.780	11.784	11.787	11.791	11.794	11.798	11.801
2220	11.801	11.805	11.808	11.812	11.815	11.819	11.822	11.826	11.829	11.832	11.836
2230	11.836	11.839	11.843	11.846	11.850	11.853	11.857	11.860	11.864	11.867	11.870
2240	11.870	11.874	11.877	11.881	11.884	11.887	11.891	11.894	11.898	11.901	11.904
2250	11.904	11.908	11.911	11.915	11.918	11.921	11.925	11.928	11.932	11.935	11.938
2260	11.938	11.942	11.945	11.948	11.952	11.955	11.958	11.962	11.965	11.968	11.972
2270	11.972	11.975	11.978	11.982	11.985	11.988	11.992	11.995	11.998	12.001	12.005
2280	12.005	12.008	12.011	12.015	12.018	12.021	12.024	12.028	12.031	12.034	12.037
2290	12.037	12.041	12.044	12.047	12.050	12.054	12.057	12.060	12.063	12.067	12.070
2300	12.070	12.073	12.076	12.079	12.083	12.086	12.089	12.092	12.095	12.099	12.102
2310	12.102	12.105	12.108	12.111	12.114	12.118	12.121	12.124	12.127	12.130	12.133
2320	12.133	12.137	12.140	12.143	12.146	12.149	12.152	12.155	12.158	12.162	12.165
2330	12.165	12.168	12.171	12.174	12.177	12.180	12.183	12.186	12.189	12.193	12.196
2340	12.196	12.199	12.202	12.205	12.208	12.211	12.214	12.217	12.220	12.223	12.226
2350	12.226	12.229	12.232	12.235	12.238	12.241	12.244	12.247	12.250	12.253	12.256
2360	12.256	12.259	12.262	12.265	12.268	12.271	12.274	12.277	12.280	12.283	12.286
2370	12.286	12.289	12.292								

TABLE 42 Type TP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	0.020										
–260	0.016	0.017	0.018	0.018	0.019	0.019	0.020	0.020	0.020	0.020	0.020
–250	–0.001	0.001	0.003	0.005	0.007	0.009	0.010	0.012	0.013	0.015	0.016
–240	–0.029	–0.026	–0.023	–0.020	–0.017	–0.014	–0.011	–0.009	–0.006	–0.004	–0.001
–230	–0.064	–0.061	–0.057	–0.053	–0.049	–0.046	–0.042	–0.039	–0.035	–0.032	–0.029
–220	–0.106	–0.101	–0.097	–0.093	–0.089	–0.084	–0.080	–0.076	–0.072	–0.068	–0.064
–210	–0.150	–0.146	–0.141	–0.137	–0.132	–0.128	–0.123	–0.119	–0.114	–0.110	–0.106
–200	–0.195	–0.190	–0.186	–0.181	–0.177	–0.173	–0.168	–0.164	–0.159	–0.155	–0.150
–190	–0.237	–0.233	–0.229	–0.225	–0.220	–0.216	–0.212	–0.208	–0.203	–0.199	–0.195
–180	–0.275	–0.271	–0.268	–0.264	–0.260	–0.257	–0.253	–0.249	–0.245	–0.241	–0.237
–170	–0.308	–0.305	–0.302	–0.298	–0.295	–0.292	–0.289	–0.285	–0.282	–0.278	–0.275
–160	–0.335	–0.332	–0.330	–0.327	–0.324	–0.322	–0.319	–0.316	–0.313	–0.311	–0.308
–150	–0.356	–0.354	–0.352	–0.350	–0.348	–0.346	–0.344	–0.341	–0.339	–0.337	–0.335
–140	–0.370	–0.369	–0.368	–0.367	–0.365	–0.364	–0.362	–0.361	–0.359	–0.357	–0.356
–130	–0.379	–0.379	–0.378	–0.377	–0.376	–0.376	–0.375	–0.374	–0.373	–0.372	–0.370
–120	–0.382	–0.382	–0.382	–0.382	–0.381	–0.381	–0.381	–0.381	–0.380	–0.380	–0.379
–110	–0.378	–0.379	–0.379	–0.380	–0.380	–0.381	–0.381	–0.381	–0.381	–0.382	–0.382
–100	–0.369	–0.370	–0.371	–0.372	–0.373	–0.374	–0.375	–0.376	–0.377	–0.377	–0.378
–90	–0.354	–0.356	–0.357	–0.359	–0.361	–0.362	–0.364	–0.365	–0.366	–0.368	–0.369
–80	–0.334	–0.336	–0.338	–0.340	–0.343	–0.345	–0.347	–0.348	–0.350	–0.352	–0.354
–70	–0.309	–0.311	–0.314	–0.317	–0.319	–0.322	–0.324	–0.327	–0.329	–0.332	–0.334
–60	–0.278	–0.282	–0.285	–0.288	–0.291	–0.294	–0.297	–0.300	–0.303	–0.306	–0.309
–50	–0.243	–0.247	–0.250	–0.254	–0.258	–0.261	–0.265	–0.268	–0.272	–0.275	–0.278
–40	–0.203	–0.207	–0.211	–0.215	–0.219	–0.223	–0.227	–0.231	–0.235	–0.239	–0.243
–30	–0.158	–0.163	–0.168	–0.172	–0.177	–0.181	–0.186	–0.190	–0.194	–0.199	–0.203
–20	–0.110	–0.115	–0.120	–0.125	–0.130	–0.135	–0.139	–0.144	–0.149	–0.154	–0.158
–10	–0.057	–0.062	–0.068	–0.073	–0.079	–0.084	–0.089	–0.094	–0.100	–0.105	–0.110
0	0.000	–0.006	–0.012	–0.017	–0.023	–0.029	–0.035	–0.040	–0.046	–0.051	–0.057
0	0.000	0.006	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.054	0.061
10	0.061	0.067	0.073	0.079	0.086	0.092	0.099	0.105	0.112	0.118	0.125
20	0.125	0.131	0.138	0.145	0.152	0.158	0.165	0.172	0.179	0.186	0.193
30	0.193	0.200	0.207	0.214	0.221	0.228	0.236	0.243	0.250	0.258	0.265
40	0.265	0.272	0.280	0.287	0.295	0.303	0.310	0.318	0.326	0.333	0.341
50	0.341	0.349	0.357	0.365	0.373	0.381	0.389	0.397	0.405	0.413	0.421
60	0.421	0.429	0.437	0.446	0.454	0.462	0.471	0.479	0.487	0.496	0.504
70	0.504	0.513	0.521	0.530	0.539	0.547	0.556	0.565	0.573	0.582	0.591
80	0.591	0.600	0.609	0.618	0.627	0.636	0.645	0.654	0.663	0.672	0.681
90	0.681	0.690	0.699	0.708	0.717	0.727	0.736	0.745	0.755	0.764	0.773
100	0.773	0.783	0.792	0.802	0.811	0.821	0.830	0.840	0.849	0.859	0.869
110	0.869	0.878	0.888	0.898	0.907	0.917	0.927	0.937	0.947	0.957	0.966
120	0.966	0.976	0.986	0.996	1.006	1.016	1.026	1.036	1.046	1.057	1.067
130	1.067	1.077	1.087	1.097	1.107	1.118	1.128	1.138	1.149	1.159	1.169
140	1.169	1.180	1.190	1.201	1.211	1.222	1.232	1.243	1.253	1.264	1.275
150	1.275	1.285	1.296	1.307	1.317	1.328	1.339	1.350	1.360	1.371	1.382
160	1.382	1.393	1.404	1.415	1.426	1.437	1.448	1.459	1.470	1.481	1.492
170	1.492	1.503	1.514	1.526	1.537	1.548	1.559	1.570	1.582	1.593	1.604
180	1.604	1.616	1.627	1.639	1.650	1.662	1.673	1.685	1.696	1.708	1.719
190	1.719	1.731	1.743	1.754	1.766	1.778	1.790	1.801	1.813	1.825	1.837
200	1.837	1.849	1.861	1.873	1.885	1.897	1.909	1.921	1.933	1.945	1.957
210	1.957	1.969	1.981	1.993	2.006	2.018	2.030	2.042	2.055	2.067	2.080
220	2.080	2.092	2.104	2.117	2.129	2.142	2.154	2.167	2.179	2.192	2.205
230	2.205	2.217	2.230	2.243	2.255	2.268	2.281	2.294	2.307	2.319	2.332
240	2.332	2.345	2.358	2.371	2.384	2.397	2.410	2.423	2.436	2.449	2.462
250	2.462	2.476	2.489	2.502	2.515	2.528	2.542	2.555	2.568	2.582	2.595
260	2.595	2.608	2.622	2.635	2.649	2.662	2.676	2.689	2.703	2.716	2.730
270	2.730	2.744	2.757	2.771	2.785	2.798	2.812	2.826	2.840	2.853	2.867
280	2.867	2.881	2.895	2.909	2.923	2.937	2.951	2.965	2.979	2.993	3.007
290	3.007	3.021	3.035	3.049	3.063	3.078	3.092	3.106	3.120	3.134	3.149
300	3.149	3.163	3.177	3.192	3.206	3.221	3.235	3.249	3.264	3.278	3.293

TABLE 42 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	3.293	3.307	3.322	3.337	3.351	3.366	3.381	3.395	3.410	3.425	3.439
320	3.439	3.454	3.469	3.484	3.499	3.513	3.528	3.543	3.558	3.573	3.588
330	3.588	3.603	3.618	3.633	3.648	3.663	3.678	3.694	3.709	3.724	3.739
340	3.739	3.754	3.770	3.785	3.800	3.816	3.831	3.846	3.862	3.877	3.892
350	3.892	3.908	3.923	3.939	3.954	3.970	3.986	4.001	4.017	4.032	4.048
360	4.048	4.064	4.079	4.095	4.111	4.127	4.143	4.158	4.174	4.190	4.206
370	4.206	4.222	4.238	4.254	4.270	4.286	4.302	4.318	4.334	4.350	4.366
380	4.366	4.382	4.398	4.414	4.430	4.446	4.463	4.479	4.495	4.511	4.527
390	4.527	4.544	4.560	4.576	4.592	4.609	4.625	4.641	4.657	4.674	4.690
400	4.690										

TABLE 43 Type TP Thermoelement Versus Platinum (NIST Pt–67)

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	0.020	0.020	0.020	0.020	0.020						
–440	0.018	0.018	0.019	0.019	0.019	0.019	0.020	0.020	0.020	0.020	0.020
–430	0.011	0.012	0.013	0.014	0.014	0.015	0.016	0.016	0.017	0.017	0.018
–420	0.001	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.010	0.010	0.011
–410	–0.013	–0.011	–0.010	–0.008	–0.007	–0.005	–0.004	–0.003	–0.001	–0.000	0.001
–400	–0.029	–0.027	–0.025	–0.024	–0.022	–0.020	–0.019	–0.017	–0.016	–0.014	–0.013
–390	–0.048	–0.046	–0.044	–0.042	–0.040	–0.038	–0.036	–0.034	–0.033	–0.031	–0.029
–380	–0.069	–0.067	–0.064	–0.062	–0.060	–0.058	–0.056	–0.054	–0.052	–0.050	–0.048
–370	–0.091	–0.089	–0.087	–0.084	–0.082	–0.080	–0.078	–0.075	–0.073	–0.071	–0.069
–360	–0.115	–0.113	–0.111	–0.108	–0.106	–0.103	–0.101	–0.099	–0.096	–0.094	–0.091
–350	–0.140	–0.138	–0.135	–0.133	–0.130	–0.128	–0.125	–0.123	–0.120	–0.118	–0.115
–340	–0.165	–0.163	–0.160	–0.158	–0.155	–0.153	–0.150	–0.148	–0.145	–0.143	–0.140
–330	–0.190	–0.187	–0.185	–0.182	–0.180	–0.178	–0.175	–0.173	–0.170	–0.168	–0.165
–320	–0.214	–0.212	–0.209	–0.207	–0.204	–0.202	–0.200	–0.197	–0.195	–0.192	–0.190
–310	–0.237	–0.235	–0.232	–0.230	–0.228	–0.226	–0.223	–0.221	–0.219	–0.216	–0.214
–300	–0.259	–0.257	–0.254	–0.252	–0.250	–0.248	–0.246	–0.244	–0.241	–0.239	–0.237
–290	–0.279	–0.277	–0.275	–0.273	–0.271	–0.269	–0.267	–0.265	–0.263	–0.261	–0.259
–280	–0.297	–0.296	–0.294	–0.292	–0.290	–0.288	–0.286	–0.285	–0.283	–0.281	–0.279
–270	–0.314	–0.312	–0.311	–0.309	–0.308	–0.306	–0.304	–0.303	–0.301	–0.299	–0.297
–260	–0.329	–0.328	–0.326	–0.325	–0.323	–0.322	–0.320	–0.319	–0.317	–0.316	–0.314
–250	–0.342	–0.341	–0.340	–0.338	–0.337	–0.336	–0.335	–0.333	–0.332	–0.330	–0.329
–240	–0.354	–0.352	–0.351	–0.350	–0.349	–0.348	–0.347	–0.346	–0.345	–0.343	–0.342
–230	–0.363	–0.362	–0.361	–0.360	–0.359	–0.358	–0.358	–0.357	–0.356	–0.355	–0.354
–220	–0.370	–0.370	–0.369	–0.368	–0.368	–0.367	–0.366	–0.365	–0.365	–0.364	–0.363
–210	–0.376	–0.376	–0.375	–0.375	–0.374	–0.374	–0.373	–0.372	–0.372	–0.371	–0.370
–200	–0.380	–0.379	–0.379	–0.379	–0.379	–0.378	–0.378	–0.377	–0.377	–0.377	–0.376
–190	–0.382	–0.381	–0.381	–0.381	–0.381	–0.381	–0.381	–0.380	–0.380	–0.380	–0.380
–180	–0.381	–0.382	–0.382	–0.382	–0.382	–0.382	–0.382	–0.382	–0.382	–0.382	–0.382
–170	–0.379	–0.380	–0.380	–0.380	–0.380	–0.381	–0.381	–0.381	–0.381	–0.381	–0.381
–160	–0.376	–0.376	–0.377	–0.377	–0.377	–0.378	–0.378	–0.378	–0.379	–0.379	–0.379
–150	–0.370	–0.371	–0.371	–0.372	–0.373	–0.373	–0.374	–0.374	–0.375	–0.375	–0.376
–140	–0.363	–0.364	–0.364	–0.365	–0.366	–0.367	–0.367	–0.368	–0.369	–0.369	–0.370
–130	–0.354	–0.355	–0.356	–0.357	–0.358	–0.359	–0.360	–0.360	–0.361	–0.362	–0.363
–120	–0.343	–0.345	–0.346	–0.347	–0.348	–0.349	–0.350	–0.351	–0.352	–0.353	–0.354
–110	–0.331	–0.333	–0.334	–0.335	–0.336	–0.338	–0.339	–0.340	–0.341	–0.342	–0.343
–100	–0.318	–0.319	–0.320	–0.322	–0.323	–0.325	–0.326	–0.327	–0.329	–0.330	–0.331
–90	–0.302	–0.304	–0.306	–0.307	–0.309	–0.310	–0.312	–0.313	–0.315	–0.316	–0.318
–80	–0.285	–0.287	–0.289	–0.291	–0.292	–0.294	–0.296	–0.297	–0.299	–0.301	–0.302
–70	–0.267	–0.269	–0.271	–0.273	–0.275	–0.276	–0.278	–0.280	–0.282	–0.284	–0.285
–60	–0.247	–0.249	–0.251	–0.253	–0.255	–0.257	–0.259	–0.261	–0.263	–0.265	–0.267
–50	–0.226	–0.228	–0.230	–0.232	–0.234	–0.237	–0.239	–0.241	–0.243	–0.245	–0.247
–40	–0.203	–0.205	–0.208	–0.210	–0.212	–0.214	–0.217	–0.219	–0.221	–0.223	–0.226
–30	–0.179	–0.181	–0.184	–0.186	–0.189	–0.191	–0.193	–0.196	–0.198	–0.201	–0.203
–20	–0.153	–0.156	–0.158	–0.161	–0.164	–0.166	–0.169	–0.171	–0.174	–0.176	–0.179
–10	–0.126	–0.129	–0.132	–0.135	–0.137	–0.140	–0.143	–0.145	–0.148	–0.151	–0.153
0	–0.098	–0.101	–0.104	–0.107	–0.110	–0.113	–0.115	–0.118	–0.121	–0.124	–0.126
0	–0.098	–0.095	–0.093	–0.090	–0.087	–0.084	–0.081	–0.078	–0.075	–0.072	–0.069
10	–0.069	–0.066	–0.063	–0.060	–0.057	–0.054	–0.051	–0.048	–0.045	–0.041	–0.038
20	–0.038	–0.035	–0.032	–0.029	–0.026	–0.023	–0.019	–0.016	–0.013	–0.010	–0.007
30	–0.007	–0.003	0.000	0.003	0.007	0.010	0.013	0.016	0.020	0.023	0.027
40	0.027	0.030	0.033	0.037	0.040	0.043	0.047	0.050	0.054	0.057	0.061
50	0.061	0.064	0.068	0.071	0.075	0.078	0.082	0.085	0.089	0.092	0.096
60	0.096	0.099	0.103	0.107	0.110	0.114	0.117	0.121	0.125	0.128	0.132
70	0.132	0.136	0.140	0.143	0.147	0.151	0.155	0.158	0.162	0.166	0.170
80	0.170	0.174	0.177	0.181	0.185	0.189	0.193	0.197	0.201	0.205	0.209
90	0.209	0.213	0.217	0.220	0.224	0.228	0.233	0.237	0.241	0.245	0.249
100	0.249	0.253	0.257	0.261	0.265	0.269	0.273	0.277	0.282	0.286	0.290
110	0.290	0.294	0.298	0.303	0.307	0.311	0.315	0.320	0.324	0.328	0.333
120	0.333	0.337	0.341	0.345	0.350	0.354	0.359	0.363	0.367	0.372	0.376

TABLE 43 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	0.376	0.381	0.385	0.390	0.394	0.398	0.403	0.407	0.412	0.416	0.421
140	0.421	0.426	0.430	0.435	0.439	0.444	0.448	0.453	0.458	0.462	0.467
150	0.467	0.472	0.476	0.481	0.486	0.490	0.495	0.500	0.504	0.509	0.514
160	0.514	0.519	0.523	0.528	0.533	0.538	0.542	0.547	0.552	0.557	0.562
170	0.562	0.567	0.571	0.576	0.581	0.586	0.591	0.596	0.601	0.606	0.611
180	0.611	0.616	0.621	0.626	0.631	0.636	0.641	0.646	0.651	0.656	0.661
190	0.661	0.666	0.671	0.676	0.681	0.686	0.691	0.696	0.701	0.706	0.711
200	0.711	0.716	0.722	0.727	0.732	0.737	0.742	0.747	0.753	0.758	0.763
210	0.763	0.768	0.773	0.779	0.784	0.789	0.794	0.800	0.805	0.810	0.815
220	0.815	0.821	0.826	0.831	0.837	0.842	0.847	0.853	0.858	0.863	0.869
230	0.869	0.874	0.879	0.885	0.890	0.896	0.901	0.906	0.912	0.917	0.923
240	0.923	0.928	0.934	0.939	0.944	0.950	0.955	0.961	0.966	0.972	0.977
250	0.977	0.983	0.988	0.994	1.000	1.005	1.011	1.016	1.022	1.027	1.033
260	1.033	1.039	1.044	1.050	1.055	1.061	1.067	1.072	1.078	1.084	1.089
270	1.089	1.095	1.101	1.106	1.112	1.118	1.123	1.129	1.135	1.141	1.146
280	1.146	1.152	1.158	1.164	1.169	1.175	1.181	1.187	1.193	1.198	1.204
290	1.204	1.210	1.216	1.222	1.228	1.233	1.239	1.245	1.251	1.257	1.263
300	1.263	1.269	1.275	1.280	1.286	1.292	1.298	1.304	1.310	1.316	1.322
310	1.322	1.328	1.334	1.340	1.346	1.352	1.358	1.364	1.370	1.376	1.382
320	1.382	1.388	1.394	1.400	1.406	1.412	1.418	1.425	1.431	1.437	1.443
330	1.443	1.449	1.455	1.461	1.467	1.474	1.480	1.486	1.492	1.498	1.504
340	1.504	1.511	1.517	1.523	1.529	1.535	1.542	1.548	1.554	1.560	1.567
350	1.567	1.573	1.579	1.586	1.592	1.598	1.604	1.611	1.617	1.623	1.630
360	1.630	1.636	1.643	1.649	1.655	1.662	1.668	1.674	1.681	1.687	1.694
370	1.694	1.700	1.707	1.713	1.719	1.726	1.732	1.739	1.745	1.752	1.758
380	1.758	1.765	1.771	1.778	1.784	1.791	1.797	1.804	1.811	1.817	1.824
390	1.824	1.830	1.837	1.844	1.850	1.857	1.863	1.870	1.877	1.883	1.890
400	1.890	1.897	1.903	1.910	1.917	1.923	1.930	1.937	1.943	1.950	1.957
410	1.957	1.964	1.970	1.977	1.984	1.991	1.998	2.004	2.011	2.018	2.025
420	2.025	2.032	2.038	2.045	2.052	2.059	2.066	2.073	2.080	2.086	2.093
430	2.093	2.100	2.107	2.114	2.121	2.128	2.135	2.142	2.149	2.156	2.163
440	2.163	2.170	2.177	2.184	2.191	2.198	2.205	2.212	2.219	2.226	2.233
450	2.233	2.240	2.247	2.254	2.261	2.268	2.275	2.282	2.289	2.297	2.304
460	2.304	2.311	2.318	2.325	2.332	2.339	2.347	2.354	2.361	2.368	2.375
470	2.375	2.383	2.390	2.397	2.404	2.411	2.419	2.426	2.433	2.441	2.448
480	2.448	2.455	2.462	2.470	2.477	2.484	2.492	2.499	2.506	2.514	2.521
490	2.521	2.528	2.536	2.543	2.550	2.558	2.565	2.573	2.580	2.588	2.595
500	2.595	2.602	2.610	2.617	2.625	2.632	2.640	2.647	2.655	2.662	2.670
510	2.670	2.677	2.685	2.692	2.700	2.707	2.715	2.722	2.730	2.737	2.745
520	2.745	2.753	2.760	2.768	2.775	2.783	2.791	2.798	2.806	2.814	2.821
530	2.821	2.829	2.837	2.844	2.852	2.860	2.867	2.875	2.883	2.890	2.898
540	2.898	2.906	2.914	2.921	2.929	2.937	2.945	2.952	2.960	2.968	2.976
550	2.976	2.983	2.991	2.999	3.007	3.015	3.023	3.030	3.038	3.046	3.054
560	3.054	3.062	3.070	3.078	3.085	3.093	3.101	3.109	3.117	3.125	3.133
570	3.133	3.141	3.149	3.157	3.165	3.173	3.181	3.189	3.197	3.205	3.213
580	3.213	3.221	3.229	3.237	3.245	3.253	3.261	3.269	3.277	3.285	3.293
590	3.293	3.301	3.309	3.317	3.325	3.333	3.342	3.350	3.358	3.366	3.374
600	3.374	3.382	3.390	3.398	3.407	3.415	3.423	3.431	3.439	3.448	3.456
610	3.456	3.464	3.472	3.480	3.489	3.497	3.505	3.513	3.522	3.530	3.538
620	3.538	3.547	3.555	3.563	3.571	3.580	3.588	3.596	3.605	3.613	3.621
630	3.621	3.630	3.638	3.647	3.655	3.663	3.672	3.680	3.689	3.697	3.705
640	3.705	3.714	3.722	3.731	3.739	3.748	3.756	3.765	3.773	3.782	3.790
650	3.790	3.799	3.807	3.816	3.824	3.833	3.841	3.850	3.858	3.867	3.875
660	3.875	3.884	3.892	3.901	3.910	3.918	3.927	3.935	3.944	3.953	3.961
670	3.961	3.970	3.979	3.987	3.996	4.005	4.013	4.022	4.031	4.039	4.048
680	4.048	4.057	4.066	4.074	4.083	4.092	4.100	4.109	4.118	4.127	4.136
690	4.136	4.144	4.153	4.162	4.171	4.179	4.188	4.197	4.206	4.215	4.224
700	4.224	4.232	4.241	4.250	4.259	4.268	4.277	4.286	4.294	4.303	4.312
710	4.312	4.321	4.330	4.339	4.348	4.357	4.366	4.375	4.384	4.393	4.402

TABLE 43 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	4.402	4.410	4.419	4.428	4.437	4.446	4.455	4.464	4.473	4.482	4.491
730	4.491	4.500	4.509	4.518	4.527	4.536	4.545	4.554	4.563	4.572	4.581
740	4.581	4.591	4.600	4.609	4.618	4.627	4.636	4.645	4.654	4.663	4.672
750	4.672	4.681	4.690								

TABLE 44 Platinum (NIST Pt–67) Versus Type TN or EN Thermoelement

Temperature in Degrees Celsius (ITS–90)

Reference Junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–270	–6.277										
–260	–6.248	–6.252	–6.257	–6.261	–6.264	–6.268	–6.270	–6.273	–6.275	–6.276	–6.277
–250	–6.179	–6.187	–6.196	–6.203	–6.211	–6.218	–6.224	–6.231	–6.237	–6.242	–6.248
–240	–6.076	–6.088	–6.099	–6.110	–6.121	–6.132	–6.142	–6.152	–6.161	–6.170	–6.179
–230	–5.942	–5.957	–5.971	–5.985	–5.999	–6.013	–6.026	–6.039	–6.052	–6.064	–6.076
–220	–5.783	–5.800	–5.816	–5.833	–5.849	–5.865	–5.881	–5.897	–5.912	–5.927	–5.942
–210	–5.603	–5.622	–5.640	–5.659	–5.677	–5.695	–5.713	–5.731	–5.748	–5.766	–5.783
–200	–5.408	–5.428	–5.448	–5.468	–5.488	–5.507	–5.527	–5.546	–5.565	–5.584	–5.603
–190	–5.202	–5.223	–5.244	–5.265	–5.286	–5.306	–5.327	–5.347	–5.368	–5.388	–5.408
–180	–4.986	–5.008	–5.030	–5.052	–5.073	–5.095	–5.116	–5.138	–5.159	–5.181	–5.202
–170	–4.762	–4.785	–4.807	–4.830	–4.852	–4.875	–4.897	–4.919	–4.942	–4.964	–4.986
–160	–4.531	–4.554	–4.578	–4.601	–4.624	–4.647	–4.670	–4.693	–4.716	–4.739	–4.762
–150	–4.293	–4.317	–4.341	–4.365	–4.389	–4.413	–4.436	–4.460	–4.484	–4.507	–4.531
–140	–4.049	–4.073	–4.098	–4.123	–4.147	–4.172	–4.196	–4.220	–4.245	–4.269	–4.293
–130	–3.798	–3.823	–3.849	–3.874	–3.899	–3.924	–3.949	–3.974	–3.999	–4.024	–4.049
–120	–3.541	–3.567	–3.593	–3.619	–3.645	–3.670	–3.696	–3.722	–3.747	–3.773	–3.798
–110	–3.279	–3.305	–3.332	–3.358	–3.384	–3.411	–3.437	–3.463	–3.489	–3.515	–3.541
–100	–3.010	–3.037	–3.064	–3.091	–3.118	–3.145	–3.172	–3.199	–3.225	–3.252	–3.279
–90	–2.735	–2.763	–2.790	–2.818	–2.846	–2.873	–2.901	–2.928	–2.955	–2.983	–3.010
–80	–2.454	–2.482	–2.511	–2.539	–2.567	–2.595	–2.623	–2.651	–2.679	–2.707	–2.735
–70	–2.167	–2.196	–2.225	–2.254	–2.283	–2.311	–2.340	–2.369	–2.397	–2.426	–2.454
–60	–1.874	–1.904	–1.933	–1.963	–1.992	–2.021	–2.051	–2.080	–2.109	–2.138	–2.167
–50	–1.576	–1.606	–1.636	–1.666	–1.696	–1.726	–1.756	–1.786	–1.815	–1.845	–1.874
–40	–1.272	–1.303	–1.333	–1.364	–1.394	–1.425	–1.455	–1.485	–1.516	–1.546	–1.576
–30	–0.962	–0.994	–1.025	–1.056	–1.087	–1.118	–1.149	–1.180	–1.211	–1.241	–1.272
–20	–0.647	–0.679	–0.711	–0.742	–0.774	–0.805	–0.837	–0.868	–0.900	–0.931	–0.962
–10	–0.326	–0.358	–0.391	–0.423	–0.455	–0.487	–0.519	–0.551	–0.583	–0.615	–0.647
0	0.000	–0.033	–0.066	–0.098	–0.131	–0.164	–0.196	–0.229	–0.261	–0.294	–0.326
0	0.000	0.033	0.066	0.099	0.132	0.165	0.198	0.231	0.264	0.297	0.330
10	0.330	0.364	0.397	0.430	0.464	0.497	0.531	0.564	0.598	0.631	0.665
20	0.665	0.699	0.732	0.766	0.800	0.834	0.868	0.901	0.935	0.969	1.004
30	1.004	1.038	1.072	1.106	1.140	1.175	1.209	1.243	1.278	1.312	1.347
40	1.347	1.381	1.416	1.451	1.485	1.520	1.555	1.590	1.625	1.660	1.695
50	1.695	1.730	1.765	1.800	1.835	1.870	1.906	1.941	1.976	2.012	2.047
60	2.047	2.083	2.118	2.154	2.190	2.225	2.261	2.297	2.333	2.369	2.405
70	2.405	2.441	2.477	2.513	2.549	2.585	2.621	2.658	2.694	2.730	2.767
80	2.767	2.803	2.840	2.876	2.913	2.950	2.986	3.023	3.060	3.097	3.134
90	3.134	3.171	3.208	3.245	3.282	3.319	3.356	3.393	3.431	3.468	3.505
100	3.505	3.543	3.580	3.618	3.655	3.693	3.730	3.768	3.806	3.844	3.881
110	3.881	3.919	3.957	3.995	4.033	4.071	4.109	4.147	4.186	4.224	4.262
120	4.262	4.300	4.339	4.377	4.416	4.454	4.493	4.531	4.570	4.608	4.647
130	4.647	4.686	4.725	4.763	4.802	4.841	4.880	4.919	4.958	4.997	5.036
140	5.036	5.075	5.115	5.154	5.193	5.232	5.272	5.311	5.351	5.390	5.430
150	5.430	5.469	5.509	5.548	5.588	5.628	5.667	5.707	5.747	5.787	5.827
160	5.827	5.867	5.907	5.947	5.987	6.027	6.067	6.107	6.147	6.187	6.228
170	6.228	6.268	6.308	6.349	6.389	6.429	6.470	6.510	6.551	6.592	6.632
180	6.632	6.673	6.713	6.754	6.795	6.836	6.876	6.917	6.958	6.999	7.040
190	7.040	7.081	7.122	7.163	7.204	7.245	7.286	7.328	7.369	7.410	7.451
200	7.451	7.492	7.534	7.575	7.617	7.658	7.699	7.741	7.782	7.824	7.865
210	7.865	7.907	7.949	7.990	8.032	8.074	8.115	8.157	8.199	8.241	8.283
220	8.283	8.325	8.367	8.408	8.450	8.492	8.534	8.577	8.619	8.661	8.703
230	8.703	8.745	8.787	8.829	8.872	8.914	8.956	8.999	9.041	9.083	9.126
240	9.126	9.168	9.211	9.253	9.295	9.338	9.381	9.423	9.466	9.508	9.551
250	9.551	9.594	9.636	9.679	9.722	9.765	9.807	9.850	9.893	9.936	9.979
260	9.979	10.022	10.065	10.108	10.151	10.194	10.237	10.280	10.323	10.366	10.409
270	10.409	10.452	10.495	10.539	10.582	10.625	10.668	10.712	10.755	10.798	10.842
280	10.842	10.885	10.928	10.972	11.015	11.059	11.102	11.146	11.189	11.233	11.276
290	11.276	11.320	11.364	11.407	11.451	11.495	11.538	11.582	11.626	11.669	11.713
300	11.713	11.757	11.801	11.845	11.888	11.932	11.976	12.020	12.064	12.108	12.152

TABLE 44 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
Thermoelectric Voltage (emf) in Millivolts											
310	12.152	12.196	12.240	12.284	12.328	12.372	12.416	12.460	12.504	12.549	12.593
320	12.593	12.637	12.681	12.725	12.770	12.814	12.858	12.902	12.947	12.991	13.035
330	13.035	13.080	13.124	13.169	13.213	13.257	13.302	13.346	13.391	13.435	13.480
340	13.480	13.524	13.569	13.614	13.658	13.703	13.747	13.792	13.837	13.881	13.926
350	13.926	13.971	14.016	14.060	14.105	14.150	14.195	14.240	14.284	14.329	14.374
360	14.374	14.419	14.464	14.509	14.554	14.599	14.644	14.689	14.734	14.779	14.824
370	14.824	14.869	14.914	14.959	15.004	15.049	15.094	15.139	15.185	15.230	15.275
380	15.275	15.320	15.365	15.411	15.456	15.501	15.546	15.592	15.637	15.682	15.728
390	15.728	15.773	15.818	15.864	15.909	15.955	16.000	16.045	16.091	16.136	16.182
400	16.182	16.227	16.273	16.318	16.364	16.410	16.455	16.501	16.546	16.592	16.638
410	16.638	16.683	16.729	16.774	16.820	16.866	16.912	16.957	17.003	17.049	17.095
420	17.095	17.140	17.186	17.232	17.278	17.324	17.369	17.415	17.461	17.507	17.553
430	17.553	17.599	17.645	17.691	17.736	17.782	17.828	17.874	17.920	17.966	18.012
440	18.012	18.058	18.104	18.150	18.197	18.243	18.289	18.335	18.381	18.427	18.473
450	18.473	18.519	18.565	18.612	18.658	18.704	18.750	18.796	18.842	18.889	18.935
460	18.935	18.981	19.027	19.074	19.120	19.166	19.213	19.259	19.305	19.351	19.398
470	19.398	19.444	19.490	19.537	19.583	19.630	19.676	19.722	19.769	19.815	19.862
480	19.862	19.908	19.954	20.001	20.047	20.094	20.140	20.187	20.233	20.280	20.326
490	20.326	20.373	20.419	20.466	20.512	20.559	20.606	20.652	20.699	20.745	20.792
500	20.792	20.838	20.885	20.932	20.978	21.025	21.072	21.118	21.165	21.211	21.258
510	21.258	21.305	21.351	21.398	21.445	21.492	21.538	21.585	21.632	21.678	21.725
520	21.725	21.772	21.819	21.865	21.912	21.959	22.006	22.052	22.099	22.146	22.193
530	22.193	22.239	22.286	22.333	22.380	22.427	22.473	22.520	22.567	22.614	22.661
540	22.661	22.707	22.754	22.801	22.848	22.895	22.942	22.989	23.035	23.082	23.129
550	23.129	23.176	23.223	23.270	23.317	23.363	23.410	23.457	23.504	23.551	23.598
560	23.598	23.645	23.692	23.739	23.786	23.832	23.879	23.926	23.973	24.020	24.067
570	24.067	24.114	24.161	24.208	24.255	24.302	24.349	24.395	24.442	24.489	24.536
580	24.536	24.583	24.630	24.677	24.724	24.771	24.818	24.865	24.912	24.959	25.006
590	25.006	25.053	25.100	25.146	25.193	25.240	25.287	25.334	25.381	25.428	25.475
600	25.475	25.522	25.569	25.616	25.663	25.710	25.757	25.804	25.851	25.898	25.945
610	25.945	25.991	26.038	26.085	26.132	26.179	26.226	26.273	26.320	26.367	26.414
620	26.414	26.461	26.508	26.555	26.602	26.649	26.696	26.742	26.789	26.836	26.883
630	26.883	26.930	26.977	27.024	27.071	27.118	27.165	27.212	27.259	27.305	27.352
640	27.352	27.399	27.446	27.493	27.540	27.587	27.634	27.681	27.727	27.774	27.821
650	27.821	27.868	27.915	27.962	28.009	28.056	28.102	28.149	28.196	28.243	28.290
660	28.290	28.337	28.384	28.430	28.477	28.524	28.571	28.618	28.665	28.711	28.758
670	28.758	28.805	28.852	28.899	28.946	28.992	29.039	29.086	29.133	29.180	29.226
680	29.226	29.273	29.320	29.367	29.413	29.460	29.507	29.554	29.601	29.647	29.694
690	29.694	29.741	29.788	29.834	29.881	29.928	29.975	30.021	30.068	30.115	30.161
700	30.161	30.208	30.255	30.302	30.348	30.395	30.442	30.488	30.535	30.582	30.628
710	30.628	30.675	30.722	30.768	30.815	30.862	30.908	30.955	31.002	31.048	31.095
720	31.095	31.142	31.188	31.235	31.282	31.328	31.375	31.421	31.468	31.515	31.561
730	31.561	31.608	31.654	31.701	31.748	31.794	31.841	31.887	31.934	31.981	32.027
740	32.027	32.074	32.120	32.167	32.213	32.260	32.306	32.353	32.399	32.446	32.492
750	32.492	32.539	32.585	32.632	32.678	32.725	32.771	32.818	32.864	32.911	32.957
760	32.957	33.004	33.050	33.097	33.143	33.190	33.236	33.283	33.329	33.375	33.422
770	33.422	33.468	33.515	33.561	33.608	33.654	33.700	33.747	33.793	33.840	33.886
780	33.886	33.932	33.979	34.025	34.071	34.118	34.164	34.210	34.257	34.303	34.349
790	34.349	34.396	34.442	34.488	34.535	34.581	34.627	34.674	34.720	34.766	34.812
800	34.812	34.859	34.905	34.951	34.997	35.044	35.090	35.136	35.182	35.229	35.275
810	35.275	35.321	35.367	35.413	35.460	35.506	35.552	35.598	35.644	35.690	35.737
820	35.737	35.783	35.829	35.875	35.921	35.967	36.013	36.060	36.106	36.152	36.198
830	36.198	36.244	36.290	36.336	36.382	36.428	36.474	36.520	36.566	36.612	36.658
840	36.658	36.704	36.750	36.796	36.842	36.888	36.934	36.980	37.026	37.072	37.118
850	37.118	37.164	37.210	37.256	37.301	37.347	37.393	37.439	37.485	37.531	37.577
860	37.577	37.622	37.668	37.714	37.760	37.806	37.851	37.897	37.943	37.989	38.034
870	38.034	38.080	38.126	38.171	38.217	38.263	38.309	38.354	38.400	38.445	38.491
880	38.491	38.537	38.582	38.628	38.673	38.719	38.765	38.810	38.856	38.901	38.947
890	38.947	38.992	39.038	39.083	39.129	39.174	39.219	39.265	39.310	39.356	39.401

TABLE 44 *Continued*

Temperature in Degrees Celsius (ITS–90)											
											Reference Junctions at 0°C
°C	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
900	39.401	39.446	39.492	39.537	39.582	39.628	39.673	39.718	39.764	39.809	39.854
910	39.854	39.899	39.945	39.990	40.035	40.080	40.125	40.170	40.216	40.261	40.306
920	40.306	40.351	40.396	40.441	40.486	40.531	40.576	40.621	40.666	40.711	40.756
930	40.756	40.801	40.846	40.891	40.936	40.981	41.025	41.070	41.115	41.160	41.205
940	41.205	41.250	41.294	41.339	41.384	41.429	41.473	41.518	41.563	41.608	41.652
950	41.652	41.697	41.742	41.786	41.831	41.875	41.920	41.965	42.009	42.054	42.098
960	42.098	42.143	42.187	42.232	42.276	42.321	42.365	42.410	42.454	42.499	42.543
970	42.543	42.588	42.632	42.676	42.721	42.765	42.810	42.854	42.898	42.943	42.987
980	42.987	43.032	43.076	43.120	43.165	43.209	43.253	43.298	43.342	43.386	43.431
990	43.431	43.475	43.519	43.564	43.608	43.652	43.697	43.741	43.785	43.830	43.874
1000	43.874										

TABLE 45 Platinum (NIST Pt–67) Versus Type TN or EN Thermoelement

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
–450	–6.274	–6.275	–6.276	–6.277	–6.277						
–440	–6.258	–6.260	–6.262	–6.264	–6.266	–6.268	–6.269	–6.271	–6.272	–6.273	–6.274
–430	–6.229	–6.232	–6.235	–6.239	–5.242	–6.245	–6.248	–6.250	–6.253	–6.255	–6.258
–420	–6.188	–6.193	–6.197	–6.202	–6.206	–6.210	–6.214	–6.218	–6.222	–6.225	–6.229
–410	–6.137	–6.143	–6.148	–6.154	–6.159	–6.164	–6.169	–6.174	–6.179	–6.184	–6.188
–400	–6.076	–6.083	–6.089	–6.095	–6.102	–6.108	–6.114	–6.120	–6.126	–6.132	–6.137
–390	–6.005	–6.013	–6.020	–6.027	–6.035	–6.042	–6.049	–6.056	–6.063	–6.069	–6.076
–380	–5.926	–5.934	–5.942	–5.950	–5.959	–5.967	–5.974	–5.982	–5.990	–5.998	–6.005
–370	–5.838	–5.847	–5.856	–5.865	–5.874	–5.883	–5.892	–5.900	–5.909	–5.917	–5.926
–360	–5.744	–5.754	–5.764	–5.773	–5.783	–5.792	–5.802	–5.811	–5.820	–5.829	–5.838
–350	–5.645	–5.655	–5.665	–5.675	–5.685	–5.695	–5.705	–5.715	–5.725	–5.735	–5.744
–340	–5.540	–5.550	–5.561	–5.572	–5.582	–5.593	–5.603	–5.614	–5.624	–5.634	–5.645
–330	–5.431	–5.442	–5.453	–5.464	–5.475	–5.486	–5.496	–5.507	–5.518	–5.529	–5.540
–320	–5.318	–5.329	–5.341	–5.352	–5.363	–5.375	–5.386	–5.397	–5.408	–5.419	–5.431
–310	–5.202	–5.213	–5.225	–5.237	–5.248	–5.260	–5.272	–5.283	–5.295	–5.306	–5.318
–300	–5.083	–5.095	–5.107	–5.119	–5.131	–5.143	–5.154	–5.166	–5.178	–5.190	–5.202
–290	–4.961	–4.974	–4.986	–4.998	–5.010	–5.022	–5.035	–5.047	–5.059	–5.071	–5.083
–280	–4.837	–4.850	–4.862	–4.875	–4.887	–4.900	–4.912	–4.924	–4.937	–4.949	–4.961
–2?0	–4.711	–4.724	–4.737	–4.749	–4.762	–4.775	–4.787	–4.800	–4.812	–4.825	–4.837
–260	–4.583	–4.596	–4.609	–4.622	–4.634	–4.647	–4.660	–4.673	–4.686	–4.698	–4.711
–250	–4.452	–4.465	–4.479	–4.492	–4.505	–4.518	–4.531	–4.544	–4.557	–4.570	–4.583
–240	–4.320	–4.333	–4.346	–4.360	–4.373	–4.386	–4.399	–4.413	–4.426	–4.439	–4.452
–230	–4.185	–4.199	–4.212	–4.226	–4.239	–4.253	–4.266	–4.280	–4.293	–4.306	–4.320
–220	–4.049	–4.062	–4.076	–4.090	–4.103	–4.117	–4.131	–4.144	–4.158	–4.172	–4.185
–210	–3.910	–3.924	–3.938	–3.952	–3.966	–3.980	–3.993	–4.007	–4.021	–4.035	–4.049
–200	–3.770	–3.784	–3.798	–3.812	–3.826	–3.840	–3.854	–3.868	–3.882	–3.896	–3.910
–190	–3.627	–3.642	–3.656	–3.670	–3.685	–3.699	–3.713	–3.727	–3.741	–3.756	–3.770
–180	–3.483	–3.498	–3.512	–3.527	–3.541	–3.556	–3.570	–3.584	–3.599	–3.613	–3.627
–170	–3.337	–3.352	–3.367	–3.381	–3.396	–3.411	–3.425	–3.440	–3.454	–3.469	–3.483
–160	–3.190	–3.205	–3.219	–3.234	–3.249	–3.264	–3.279	–3.293	–3.308	–3.323	–3.337
–150	–3.040	–3.055	–3.070	–3.085	–3.100	–3.115	–3.130	–3.145	–3.160	–3.175	–3.190
–140	–2.888	–2.904	–2.919	–2.934	–2.949	–2.964	–2.980	–2.995	–3.010	–3.025	–3.040
–130	–2.735	–2.750	–2.766	–2.781	–2.797	–2.812	–2.827	–2.843	–2.858	–2.873	–2.888
–120	–2.580	–2.595	–2.611	–2.626	–2.642	–2.657	–2.673	–2.689	–2.704	–2.719	–2.735
–110	–2.422	–2.438	–2.454	–2.470	–2.486	–2.501	–2.517	–2.533	–2.548	–2.564	–2.580
–100	–2.263	–2.279	–2.295	–2.311	–2.327	–2.343	–2.359	–2.375	–2.391	–2.407	–2.422
–90	–2.103	–2.119	–2.135	–2.151	–2.167	–2.183	–2.199	–2.215	–2.231	–2.247	–2.263
–80	–1.940	–1.956	–1.973	–1.989	–2.005	–2.021	–2.038	–2.054	–2.070	–2.086	–2.103
–70	–1.776	–1.792	–1.809	–1.825	–1.842	–1.858	–1.874	–1.891	–1.907	–1.924	–1.940
–60	–1.610	–1.626	–1.643	–1.660	–1.676	–1.693	–1.709	–1.726	–1.743	–1.759	–1.776
–50	–1.442	–1.459	–1.475	–1.492	–1.509	–1.526	–1.543	–1.559	–1.576	–1.593	–1.610
–40	–1.272	–1.289	–1.306	–1.323	–1.340	–1.357	–1.374	–1.391	–1.408	–1.425	–1.442
–30	–1.101	–1.118	–1.135	–1.152	–1.170	–1.187	–1.204	–1.221	–1.238	–1.255	–1.272
–20	–0.928	–0.945	–0.962	–0.980	–0.997	–1.014	–1.032	–1.049	–1.066	–1.084	–1.101
–10	–0.753	–0.770	–0.788	–0.805	–0.823	–0.840	–0.858	–0.875	–0.893	–0.910	–0.928
0	–0.576	–0.594	–0.612	–0.629	–0.647	–0.665	–0.682	–0.700	–0.718	–0.735	–0.753
0	–0.576	–0.558	–0.541	–0.523	–0.505	–0.487	–0.469	–0.452	–0.434	–0.416	–0.398
10	–0.398	–0.380	–0.362	–0.344	–0.326	–0.308	–0.290	–0.272	–0.254	–0.236	–0.218
20	–0.218	–0.200	–0.182	–0.164	–0.146	–0.127	–0.109	–0.091	–0.073	–0.055	–0.036
30	–0.036	–0.018	0.000	0.018	0.037	0.055	0.073	0.091	0.110	0.128	0.146
40	0.146	0.165	0.183	0.201	0.220	0.238	0.257	0.275	0.294	0.312	0.330
50	0.330	0.349	0.367	0.386	0.404	0.423	0.441	0.460	0.479	0.497	0.516
60	0.516	0.534	0.553	0.572	0.590	0.609	0.627	0.646	0.665	0.684	0.702
70	0.702	0.721	0.740	0.758	0.777	0.796	0.815	0.834	0.852	0.871	0.890
80	0.890	0.909	0.928	0.947	0.966	0.985	1.004	1.022	1.041	1.060	1.079
90	1.079	1.098	1.117	1.136	1.156	1.175	1.194	1.213	1.232	1.251	1.270
100	1.270	1.289	1.308	1.328	1.347	1.366	1.385	1.404	1.424	1.443	1.462
110	1.462	1.481	1.501	1.520	1.539	1.559	1.578	1.597	1.617	1.636	1.656
120	1.656	1.675	1.695	1.714	1.734	1.753	1.773	1.792	1.812	1.831	1.851

TABLE 45 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)											
											Reference Junctions at 32°F
°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
130	1.851	1.870	1.890	1.909	1.929	1.949	1.968	1.988	2.008	2.027	2.047
140	2.047	2.067	2.087	2.106	2.126	2.146	2.166	2.186	2.205	2.225	2.245
150	2.245	2.265	2.285	2.305	2.325	2.345	2.365	2.385	2.405	2.425	2.445
160	2.445	2.465	2.485	2.505	2.525	2.545	2.565	2.585	2.605	2.625	2.645
170	2.645	2.666	2.686	2.706	2.726	2.746	2.767	2.787	2.807	2.828	2.848
180	2.848	2.868	2.888	2.909	2.929	2.950	2.970	2.990	3.011	3.031	3.052
190	3.052	3.072	3.093	3.113	3.134	3.154	3.175	3.195	3.216	3.236	3.257
200	3.257	3.278	3.298	3.319	3.339	3.360	3.381	3.402	3.422	3.443	3.464
210	3.464	3.484	3.505	3.526	3.547	3.568	3.588	3.609	3.630	3.651	3.672
220	3.672	3.693	3.714	3.735	3.755	3.776	3.797	3.818	3.839	3.860	3.881
230	3.881	3.902	3.923	3.945	3.966	3.987	4.008	4.029	4.050	4.071	4.092
240	4.092	4.113	4.135	4.156	4.177	4.198	4.220	4.241	4.262	4.283	4.305
250	4.305	4.326	4.347	4.369	4.390	4.411	4.433	4.454	4.475	4.497	4.518
260	4.518	4.540	4.561	4.583	4.604	4.626	4.647	4.669	4.690	4.712	4.733
270	4.733	4.755	4.776	4.798	4.820	4.841	4.863	4.884	4.906	4.928	4.949
280	4.949	4.971	4.993	5.015	5.036	5.058	5.080	5.102	5.123	5.145	5.167
290	5.167	5.189	5.211	5.232	5.254	5.276	5.298	5.320	5.342	5.364	5.386
300	5.386	5.408	5.430	5.452	5.473	5.495	5.517	5.539	5.562	5.584	5.606
310	5.606	5.628	5.650	5.672	5.694	5.716	5.738	5.760	5.782	5.805	5.827
320	5.827	5.849	5.871	5.893	5.915	5.938	5.960	5.982	6.004	6.027	6.049
330	6.049	6.071	6.094	6.116	6.138	6.161	6.183	6.205	6.228	6.250	6.272
340	6.272	6.295	6.317	6.340	6.362	6.385	6.407	6.429	6.452	6.474	6.497
350	6.497	6.519	6.542	6.564	6.587	6.610	6.632	6.655	6.677	6.700	6.722
360	6.722	6.745	6.768	6.790	6.813	6.836	6.858	6.881	6.904	6.926	6.949
370	6.949	6.972	6.995	7.017	7.040	7.063	7.086	7.108	7.131	7.154	7.177
380	7.177	7.200	7.222	7.245	7.268	7.291	7.314	7.337	7.360	7.382	7.405
390	7.405	7.428	7.451	7.474	7.497	7.520	7.543	7.566	7.589	7.612	7.635
400	7.635	7.658	7.681	7.704	7.727	7.750	7.773	7.796	7.819	7.842	7.865
410	7.865	7.889	7.912	7.935	7.958	7.981	8.004	8.027	8.051	8.074	8.097
420	8.097	8.120	8.143	8.167	8.190	8.213	8.236	8.259	8.283	8.306	8.329
430	8.329	8.353	8.376	8.399	8.422	8.446	8.469	8.492	8.516	8.539	8.562
440	8.562	8.586	8.609	8.633	8.656	8.679	8.703	8.726	8.750	8.773	8.797
450	8.797	8.820	8.843	8.867	8.890	8.914	8.937	8.961	8.984	9.008	9.031
460	9.031	9.055	9.079	9.102	9.126	9.149	9.173	9.196	9.220	9.244	9.267
470	9.257	9.291	9.314	9.338	9.362	9.385	9.409	9.433	9.456	9.480	9.504
480	9.504	9.527	9.551	9.575	9.598	9.622	9.646	9.670	9.693	9.717	9.741
490	9.741	9.765	9.788	9.812	9.836	9.860	9.884	9.907	9.931	9.955	9.979
500	9.979	10.003	10.027	10.050	10.074	10.098	10.122	10.146	10.170	10.194	10.218
510	10.218	10.242	10.265	10.289	10.313	10.337	10.361	10.385	10.409	10.433	10.457
520	10.457	10.481	10.505	10.529	10.553	10.577	10.601	10.625	10.649	10.673	10.697
530	10.697	10.721	10.745	10.769	10.793	10.818	10.842	10.866	10.890	10.914	10.938
540	10.938	10.962	10.986	11.010	11.035	11.059	11.083	11.107	11.131	11.155	11.180
550	11.180	11.204	11.228	11.252	11.276	11.301	11.325	11.349	11.373	11.397	11.422
560	11.422	11.446	11.470	11.495	11.519	11.543	11.567	11.592	11.616	11.640	11.665
570	11.665	11.689	11.713	11.737	11.762	11.786	11.811	11.835	11.859	11.884	11.908
580	11.908	11.932	11.957	11.981	12.005	12.030	12.054	12.079	12.103	12.128	12.152
590	12.152	12.176	12.201	12.225	12.250	12.274	12.299	12.323	12.348	12.372	12.397
600	12.397	12.421	12.446	12.470	12.495	12.519	12.544	12.568	12.593	12.617	12.642
610	12.642	12.666	12.691	12.716	12.740	12.765	12.789	12.814	12.838	12.863	12.888
620	12.888	12.912	12.937	12.962	12.986	13.011	13.035	13.060	13.085	13.109	13.134
630	13.134	13.159	13.183	13.208	13.233	13.257	13.282	13.307	13.332	13.356	13.381
640	13.381	13.406	13.430	13.455	13.480	13.505	13.529	13.554	13.579	13.604	13.628
650	13.628	13.653	13.678	13.703	13.728	13.752	13.777	13.802	13.827	13.852	13.877
660	13.877	13.901	13.926	13.951	13.976	14.001	14.026	14.050	14.075	14.100	14.125
670	14.125	14.150	14.175	14.200	14.225	14.250	14.274	14.299	14.324	14.349	14.374
680	14.374	14.399	14.424	14.449	14.474	14.499	14.524	14.549	14.574	14.599	14.624
690	14.624	14.649	14.674	14.699	14.724	14.749	14.774	14.799	14.824	14.849	14.874
700	14.874	14.899	14.924	14.949	14.974	14.999	15.024	15.049	15.074	15.099	15.124
710	15.124	15.149	15.175	15.200	15.225	15.250	15.275	15.300	15.325	15.350	15.375

TABLE 45 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
720	15.375	15.401	15.426	15.451	15.476	15.501	15.526	15.551	15.577	15.602	15.627
730	15.627	15.652	15.677	15.702	15.728	15.753	15.778	15.803	15.828	15.854	15.879
740	15.879	15.904	15.929	15.955	15.980	16.005	16.030	16.056	16.081	16.106	16.131
750	16.131	16.157	16.182	16.207	16.232	16.258	16.283	16.308	16.334	16.359	16.384
760	16.384	16.410	16.435	16.460	16.485	16.511	16.536	16.561	16.587	16.612	16.638
770	16.638	16.663	16.688	16.714	16.739	16.764	16.790	16.815	16.840	16.866	16.891
780	16.891	16.917	16.942	16.967	16.993	17.018	17.044	17.069	17.095	17.120	17.145
790	17.145	17.171	17.196	17.222	17.247	17.273	17.298	17.324	17.349	17.374	17.400
800	17.400	17.425	17.451	17.476	17.502	17.527	17.553	17.578	17.604	17.629	17.655
810	17.655	17.680	17.706	17.731	17.757	17.782	17.808	17.834	17.859	17.885	17.910
820	17.910	17.936	17.961	17.987	18.012	18.038	18.063	18.089	18.115	18.140	18.166
830	18.166	18.191	18.217	18.243	18.268	18.294	18.319	18.345	18.371	18.396	18.422
840	18.422	18.447	18.473	18.499	18.524	18.550	18.576	18.601	18.627	18.653	18.678
850	18.678	18.704	18.730	18.755	18.781	18.807	18.832	18.858	18.884	18.909	18.935
860	18.935	18.961	18.986	19.012	19.038	19.063	19.089	19.115	19.140	19.166	19.192
870	19.192	19.218	19.243	19.269	19.295	19.321	19.346	19.372	19.398	19.424	19.449
880	19.449	19.475	19.501	19.527	19.552	19.578	19.604	19.630	19.655	19.681	19.707
890	19.707	19.733	19.758	19.784	19.810	19.836	19.862	19.887	19.913	19.939	19.965
900	19.965	19.991	20.016	20.042	20.068	20.094	20.120	20.146	20.171	20.197	20.223
910	20.223	20.249	20.275	20.300	20.326	20.352	20.378	20.404	20.430	20.456	20.481
920	20.481	20.507	20.533	20.559	20.585	20.611	20.637	20.662	20.688	20.714	20.740
930	20.740	20.766	20.792	20.818	20.844	20.870	20.895	20.921	20.947	20.973	20.999
940	20.999	21.025	21.051	21.077	21.103	21.129	21.154	21.180	21.206	21.232	21.258
950	21.258	21.284	21.310	21.336	21.362	21.388	21.414	21.440	21.466	21.492	21.517
960	21.517	21.543	21.569	21.595	21.621	21.647	21.673	21.699	21.725	21.751	21.777
970	21.777	21.803	21.829	21.855	21.881	21.907	21.933	21.959	21.985	22.011	22.037
980	22.037	22.063	22.089	22.115	22.141	22.167	22.193	22.219	22.245	22.271	22.297
990	22.297	22.323	22.349	22.375	22.401	22.427	22.453	22.479	22.505	22.531	22.557
1000	22.557	22.583	22.609	22.635	22.661	22.687	22.713	22.739	22.765	22.791	22.817
1010	22.817	22.843	22.869	22.895	22.921	22.947	22.973	22.999	23.025	23.051	23.077
1020	23.077	23.103	23.129	23.155	23.181	23.207	23.233	23.259	23.285	23.311	23.337
1030	23.337	23.363	23.390	23.416	23.442	23.468	23.494	23.520	23.546	23.572	23.598
1040	23.598	23.624	23.650	23.676	23.702	23.728	23.754	23.780	23.806	23.832	23.858
1050	23.858	23.885	23.911	23.937	23.963	23.989	24.015	24.041	24.067	24.093	24.119
1060	24.119	24.145	24.171	24.197	24.223	24.249	24.276	24.302	24.328	24.354	24.380
1070	24.380	24.406	24.432	24.458	24.484	24.510	24.536	24.562	24.588	24.614	24.641
1080	24.641	24.667	24.693	24.719	24.745	24.771	24.797	24.823	24.849	24.875	24.901
1090	24.901	24.927	24.953	24.980	25.006	25.032	25.058	25.084	25.110	25.136	25.162
1100	25.162	25.188	25.214	25.240	25.266	25.293	25.319	25.345	25.371	25.397	25.423
1110	25.423	25.449	25.475	25.501	25.527	25.553	25.579	25.606	25.632	25.658	25.684
1120	25.684	25.710	25.736	25.762	25.788	25.814	25.840	25.866	25.892	25.918	25.945
1130	25.945	25.971	25.997	26.023	26.049	26.075	26.101	26.127	26.153	26.179	26.205
1140	26.205	26.231	26.257	26.284	26.310	26.336	26.362	26.388	26.414	26.440	26.466
1150	26.466	26.492	26.518	26.544	26.570	26.596	26.623	26.649	26.675	26.701	26.727
1160	26.727	26.753	26.779	26.805	26.831	26.857	26.883	26.909	26.935	26.961	26.987
1170	26.987	27.014	27.040	27.066	27.092	27.118	27.144	27.170	27.196	27.222	27.248
1180	27.248	27.274	27.300	27.326	27.352	27.378	27.404	27.431	27.457	27.483	27.509
1190	27.509	27.535	27.561	27.587	27.613	27.639	27.665	27.691	27.717	27.743	27.769
1200	27.769	27.795	27.821	27.847	27.873	27.899	27.925	27.951	27.977	28.004	28.030
1210	28.030	28.056	28.082	28.108	28.134	28.160	28.186	28.212	28.238	28.264	28.290
1220	28.290	28.316	28.342	28.368	28.394	28.420	28.446	28.472	28.498	28.524	28.550
1230	28.550	28.576	28.602	28.628	28.654	28.680	28.706	28.732	28.758	28.784	28.810
1240	28.810	28.836	28.862	28.888	28.914	28.940	28.966	28.992	29.018	29.044	29.070
1250	29.070	29.096	29.122	29.148	29.174	29.200	29.226	29.252	29.278	29.304	29.330
1260	29.330	29.356	29.382	29.408	29.434	29.460	29.486	29.512	29.538	29.564	29.590
1270	29.590	29.616	29.642	29.668	29.694	29.720	29.746	29.772	29.798	29.824	29.850
1280	29.850	29.876	29.902	29.928	29.954	29.980	30.006	30.032	30.058	30.084	30.110
1290	30.110	30.135	30.161	30.187	30.213	30.239	30.265	30.291	30.317	30.343	30.369
1300	30.369	30.395	30.421	30.447	30.473	30.499	30.525	30.551	30.577	30.603	30.628

TABLE 45 *Continued*

Temperature in Degrees Fahrenheit—Converted from Degrees Celsius (ITS–90)

Reference Junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10
					Thermoelectric Voltage (emf) in Millivolts						
1310	30.628	30.654	30.680	30.706	30.732	30.758	30.784	30.810	30.836	30.862	30.888
1320	30.888	30.914	30.940	30.965	30.991	31.017	31.043	31.069	31.095	31.121	31.147
1330	31.147	31.173	31.199	31.225	31.251	31.276	31.302	31.328	31.354	31.380	31.406
1340	31.406	31.432	31.458	31.484	31.509	31.535	31.561	31.587	31.613	31.639	31.665
1350	31.665	31.691	31.717	31.742	31.768	31.794	31.820	31.846	31.872	31.898	31.924
1360	31.924	31.949	31.975	32.001	32.027	32.053	32.079	32.105	32.131	32.156	32.182
1370	32.182	32.208	32.234	32.260	32.286	32.312	32.337	32.363	32.389	32.415	32.441
1380	32.441	32.467	32.492	32.518	32.544	32.570	32.596	32.622	32.647	32.673	32.699
1390	32.699	32.725	32.751	32.777	32.802	32.828	32.854	32.880	32.906	32.932	32.957
1400	32.957	32.983	33.009	33.035	33.061	33.086	33.112	33.138	33.164	33.190	33.215
1410	33.215	33.241	33.267	33.293	33.319	33.344	33.370	33.396	33.422	33.448	33.473
1420	33.473	33.499	33.525	33.551	33.577	33.602	33.628	33.654	33.680	33.706	33.731
1430	33.731	33.757	33.783	33.809	33.834	33.860	33.886	33.912	33.937	33.963	33.989
1440	33.989	34.015	34.040	34.066	34.092	34.118	34.143	34.169	34.195	34.221	34.246
1450	34.246	34.272	34.298	34.324	34.349	34.375	34.401	34.427	34.452	34.478	34.504
1460	34.504	34.530	34.555	34.581	34.607	34.632	34.658	34.684	34.710	34.735	34.761
1470	34.761	34.787	34.812	34.838	34.864	34.890	34.915	34.941	34.967	34.992	35.018
1480	35.018	35.044	35.069	35.095	35.121	35.146	35.172	35.198	35.223	35.249	35.275
1490	35.275	35.300	35.326	35.352	35.377	35.403	35.429	35.454	35.480	35.506	35.531
1500	35.531	35.557	35.583	35.608	35.634	35.660	35.685	35.711	35.737	35.762	35.788
1510	35.788	35.814	35.839	35.865	35.890	35.916	35.942	35.967	35.993	36.019	36.044
1520	36.044	36.070	36.095	36.121	36.147	36.172	36.198	36.223	36.249	36.275	36.300
1530	36.300	36.326	36.351	36.377	36.403	36.428	36.454	36.479	36.505	36.530	36.556
1540	36.556	36.582	36.607	36.633	36.658	36.684	36.709	36.735	36.760	36.786	36.811
1550	36.811	36.837	36.863	36.888	36.914	36.939	36.965	36.990	37.016	37.041	37.067
1560	37.067	37.092	37.118	37.143	37.169	37.194	37.220	37.245	37.271	37.296	37.322
1570	37.322	37.347	37.373	37.398	37.424	37.449	37.475	37.500	37.526	37.551	37.577
1580	37.577	37.602	37.627	37.653	37.678	37.704	37.729	37.755	37.780	37.806	37.831
1590	37.831	37.856	37.882	37.907	37.933	37.958	37.984	38.009	38.034	38.060	38.085
1600	38.085	38.111	38.136	38.161	38.187	38.212	38.237	38.263	38.288	38.314	38.339
1610	38.339	38.364	38.390	38.415	38.440	38.466	38.491	38.516	38.542	38.567	38.592
1620	38.592	38.618	38.643	38.668	38.694	38.719	38.744	38.770	38.795	38.820	38.846
1630	38.846	38.871	38.896	38.921	38.947	38.972	38.997	39.022	39.048	39.073	39.098
1640	39.098	39.124	39.149	39.174	39.199	39.224	39.250	39.275	39.300	39.325	39.351
1650	39.351	39.376	39.401	39.426	39.451	39.477	39.502	39.527	39.552	39.577	39.603
1660	39.603	39.628	39.653	39.678	39.703	39.728	39.754	39.779	39.804	39.829	39.854
1670	39.854	39.879	39.904	39.929	39.955	39.980	40.005	40.030	40.055	40.080	40.105
1680	40.105	40.130	40.155	40.180	40.205	40.231	40.256	40.281	40.306	40.331	40.356
1690	40.356	40.381	40.406	40.431	40.456	40.481	40.506	40.531	40.556	40.581	40.606
1700	40.606	40.631	40.656	40.681	40.706	40.731	40.756	40.781	40.806	40.831	40.856
1710	40.856	40.881	40.906	40.931	40.956	40.981	41.006	41.030	41.055	41.080	41.105
1720	41.105	41.130	41.155	41.180	41.205	41.230	41.255	41.279	41.304	41.329	41.354
1730	41.354	41.379	41.404	41.429	41.454	41.478	41.503	41.528	41.553	41.578	41.603
1740	41.603	41.627	41.652	41.677	41.702	41.727	41.751	41.776	41.801	41.826	41.851
1750	41.851	41.875	41.900	41.925	41.950	41.974	41.999	42.024	42.049	42.074	42.098
1760	42.098	42.123	42.148	42.173	42.197	42.222	42.247	42.271	42.296	42.321	42.346
1770	42.346	42.370	42.395	42.420	42.444	42.469	42.494	42.519	42.543	42.568	42.593
1780	42.593	42.617	42.642	42.667	42.691	42.716	42.741	42.765	42.790	42.815	42.839
1790	42.839	42.864	42.889	42.913	42.938	42.963	42.987	43.012	43.036	43.061	43.086
1800	43.086	43.110	43.135	43.160	43.184	43.209	43.234	43.258	43.283	43.307	43.332
1810	43.332	43.357	43.381	43.406	43.431	43.455	43.480	43.505	43.529	43.554	43.578
1820	43.578	43.603	43.628	43.652	43.677	43.702	43.726	43.751	43.775	43.800	43.825
1830	43.825	43.849	43.874								

TABLE 46 Coefficients of Inverse Polynomials for Computation of Approximate Temperature as a Function of Thermocouple Emf

NOTE 1—The following table contains coefficients for sets of inverse polynomials for the various thermocouple types. The coefficients given are for an expression of the form: $T = c_0 + c_1E + c_2E^2 + c_3E^3 ... + c_nE^n$. In this expression, *E* is the thermocouple emf in mV, T is the temperature in °C, and c_0, c_1, c_2, c_3... c_n are the coefficients given in the following table.

NOTE 2—The user is cautioned against any attempt to extrapolate these functions beyond the stated ranges. Within the ranges given, values of temperature determined by evaluating these polynomials will be found to agree with the corresponding values produced by the polynomials of Table 7 to within the stated error range. When the magnitude of any discrepancy is significant, the value determined using the forward functions of Table 7 will take precedence.

NOTE 3—If temperatures on another scale are desired, first evaluate the appropriate polynomial for the emf of interest to determine temperature in °C, then convert °C to the desired temperature scale.

TYPE B Thermocouple				
Temperature Range		250°C to 700°C	700°C to 1820°C	
Voltage Range		0.291 mV to 2.431 mV	2.431 mV to 13.820 mV	
	c_0 =	9.842 332 1 × 10^{1}	2.131 507 1 × 10^{2}	
	c_1 =	6.997 150 0 × 10^{2}	2.851 050 4 × 10^{2}	
	c_2 =	–8.476 530 4 × 10^{2}	–5.274 288 7 × 10^{1}	
	c_3 =	1.005 264 4 × 10^{3}	9.916 080 4	
	c_4 =	–8.334 595 2 × 10^{2}	–1.296 530 3	
	c_5 =	4.550 854 2 × 10^{2}	1.119 587 0 × 10^{-1}	
	c_6 =	–1.552 303 7 × 10^{2}	–6.062 519 9 × 10^{-3}	
	c_7 =	2.988 675 0 × 10^{1}	1.866 169 6 × 10^{-4}	
	c_8 =	–2.474 286 0	–2.487 858 5 × 10^{-6}	
Error Range		0.03°C to –0.02°C	0.02°C to –0.01°C	
TYPE E Thermocouple				
Temperature Range		–200°C to 0°C	0°C to 1000°C	
Voltage Range		–8.825 mV to 0.0 mV	0.0 mV to 76.373 mV	
	c_0 =	0.0	0.0	
	c_1 =	1.697 728 8 × 10^{1}	1.705 703 5 × 10^{1}	
	c_2 =	–4.351 497 0 × 10^{-1}	–2.330 175 9 × 10^{-1}	
	c_3 =	–1.585 969 7 × 10^{-1}	6.543 558 5 × 10^{-3}	
	c_4 =	–9.250 287 1 × 10^{-2}	–7.356 274 9 × 10^{-5}	
	c_5 =	–2.608 431 4 × 10^{-2}	–1.789 600 1 × 10^{-6}	
	c_6 =	–4.136 019 9 × 10^{-3}	8.403 616 5 × 10^{-8}	
	c_7 =	–3.403 403 0 × 10^{-4}	–1.373 587 9 × 10^{-9}	
	c_8 =	–1.156 489 0 × 10^{-5}	1.062 982 3 × 10^{-11}	
	c_9 =		–3.244 708 7 × 10^{-14}	
Error Range		0.03°C to –0.01°C	0.02°C to –0.02°C	
TYPE J Thermocouple				
Temperature Range		–210°C to 0.0°C	0.0°C to 760°C	760°C to 1200°C
Voltage Range		–8.095 mV to 0.0 mV	0.0 mV to 42.919 mV	42.919 mV to 69.553 mV
	c_0 =	0.0	0.0	–3.113 581 87 × 10^{3}
	c_1 =	1.952 826 8 × 10^{1}	1.978 425 × 10^{1}	3.005 436 84 × 10^{2}
	c_2 =	–1.228 618 5	–2.001 204 × 10^{-1}	–9.947 732 30 ....
	c_3 =	–1.075 217 8	1.036 969 × 10^{-2}	1.702 766 30 × 10^{-1}
	c_4 =	–5.908 693 3 × 10^{-1}	–2.549 687 × 10^{-4}	–1.430 334 68 × 10^{-3}
	c_5 =	–1.725 671 3 × 10^{-1}	3.585 153 × 10^{-6}	4.738 860 84 × 10^{-6}
	c_6 =	–2.813 151 3 × 10^{-2}	–5.344 285 × 10^{-8}	
	c_7 =	–2.396 337 0 × 10^{-3}	5.099 890 × 10^{-10}	
	c_8 =	–8.382 332 1 × 10^{-5}		
Error Range		0.03°C to –0.05°C	0.04°C to –0.04°C	0.03°C to –0.04°C
TYPE K Thermocouple				
Temperature Range		–200°C to 0.0°C	0.0°C to 500°C	500°C to 1372°C
Voltage Range		–5.891 mV to 0.0 mV	0.0 mV to 20.644 mV	20.644 mV to 54.886 mV

TABLE 46 *Continued*

c_0 =	0.0	0.0		$-1.318\ 058 \times 10^{2}$
c_1 =	$2.517\ 346\ 2 \times 10^{1}$	$2.508\ 355 \times 10^{1}$		$4.830\ 222 \times 10^{1}$
c_2 =	$-1.166\ 287\ 8$	$7.860\ 106 \times 10^{-2}$		$-1.646\ 031$ ....
c_3 =	$-1.083\ 363\ 8$	$-2.503\ 131 \times 10^{-1}$		$5.464\ 731 \times 10^{-2}$
c_4 =	$-8.977\ 354\ 0 \times 10^{-1}$	$8.315\ 270 \times 10^{-2}$		$-9.650\ 715 \times 10^{-4}$
c_5 =	$-3.734\ 237\ 7 \times 10^{-1}$	$-1.228\ 034 \times 10^{-2}$		$8.802\ 193 \times 10^{-6}$
c_6 =	$-8.663\ 264\ 3 \times 10^{-2}$	$9.804\ 036 \times 10^{-4}$		$-3.110\ 810 \times 10^{-8}$
c_7 =	$-1.045\ 059\ 8 \times 10^{-2}$	$-4.413\ 030 \times 10^{-5}$		
c_8 =	$-5.192\ 057\ 7 \times 10^{-4}$	$1.057\ 734 \times 10^{-6}$		
c_9 =		$-1.052\ 755 \times 10^{-8}$		
Error Range	0.04°C to –0.02°C	0.04°C to –0.05°C		0.06°C to –0.05°C
TYPE N Thermocouple				
Temperature Range	–200°C to 0.0°C	0.0°C to 600°C		600°C to 1300°C
Voltage Range	–3.990 mV to 0.0 mV	0.0 mV to 20.613 mV		20.613 mV to 47.513 mV
c_0 =	0.0	0.0		$1.972\ 485 \times 10^{1}$
c_1 =	$3.843\ 684\ 7 \times 10^{1}$	$3.868\ 96 \times 10^{1}$		$3.300\ 943 \times 10^{1}$
c_2 =	$1.101\ 048\ 5$	$-1.082\ 67$		$-3.915\ 159 \times 10^{-1}$
c_3 =	$5.222\ 931\ 2$	$4.702\ 05 \times 10^{-2}$		$9.855\ 391 \times 10^{-3}$
c_4 =	$7.206\ 052\ 5$	$-2.121\ 69 \times 10^{-6}$ †		$-1.274\ 371 \times 10^{-4}$
c_5 =	$5.848\ 858\ 6$	$-1.172\ 72 \times 10^{-4}$		$7.767\ 022 \times 10^{-7}$
c_6 =	$2.775\ 491\ 6$	$5.392\ 80 \times 10^{-6}$ †		
c_7 =	$7.707\ 516\ 6 \times 10^{-1}$	$-7.981\ 56 \times 10^{-8}$		
c_8 =	$1.158\ 266\ 5 \times 10^{-1}$			
c_9 =	$7.313\ 886\ 8 \times 10^{-3}$			
Error Range	0.03 °C to –0.02 °C	0.03 °C to –0.02 °C		0.02 °C to –0.04 °C

† Figures were editorially changed in October 2011.

TYPE R Thermocouple				
Temperature Range	–50°C to 250°C	250°C to 1200°C	1064°C to 1664.5°C	1664.5°C to 1768.1°C
Voltage Range	–0.226 mV to 1.923 mV	1.923 mV to 13.228 mV	11.361 mV to 19.739 mV	19.739 mV to 21.102 mV
c_0 =	0.0	$1.334\ 584\ 505 \times 10^{1}$	$-8.199\ 599\ 416 \times 10^{1}$	$3.406\ 177\ 836 \times 10^{4}$
c_1 =	$1.889\ 138\ 0 \times 10^{2}$	$1.472\ 644\ 573 \times 10^{2}$	$1.553\ 962\ 042 \times 10^{2}$	$-7.023\ 729\ 171 \times 10^{3}$
c_2 =	$-9.383\ 529\ 0 \times 10^{1}$	$-1.844\ 024\ 844 \times 10^{1}$	$-8.342\ 197\ 663$	$5.582\ 903\ 813 \times 10^{2}$
c_3 =	$1.306\ 861\ 9 \times 10^{2}$	$4.031\ 129\ 726$	$4.279\ 433\ 549 \times 10^{-1}$	$-1.952\ 394\ 635 \times 10^{1}$
c_4 =	$-2.270\ 358\ 0 \times 10^{2}$	$-6.249\ 428\ 360 \times 10^{-1}$	$-1.191\ 577\ 910 \times 10^{-2}$	$2.560\ 740\ 231 \times 10^{-1}$
c_5 =	$3.514\ 565\ 9 \times 10^{2}$	$6.468\ 412\ 046 \times 10^{-2}$	$1.492\ 290\ 091 \times 10^{-4}$	
c_6 =	$-3.895\ 390\ 0 \times 10^{2}$	$-4.458\ 750\ 426 \times 10^{-3}$		
c_7 =	$2.823\ 947\ 1 \times 10^{2}$	$1.994\ 710\ 149 \times 10^{-4}$		
c_8 =	$-1.260\ 728\ 1 \times 10^{2}$	$-5.313\ 401\ 790 \times 10^{-6}$		
c_9 =	$3.135\ 361\ 1 \times 10^{1}$	$6.481\ 976\ 217 \times 10^{-8}$		
c_{10} =	$-3.318\ 776\ 9$			
Error Range	0.02°C to –0.02°C	0.005°C to –0.005°C	0.001°C to –0.0005°C	0.002°C to –0.001°C
TYPE S Thermocouple				
Temperature Range	–50°C to 250°C	250°C to 1200°C	1064°C to 1664.5°C	1664.5°C to 1768.1°C
Voltage Range	–0.235 mV to 1.874 mV	1.874 mV to 11.950 mV	10.332 mV to 17.536 mV	17.536 mV to 18.693 mV
c_0 =	0.0	$1.291\ 507\ 177 \times 10^{1}$	$-8.087\ 801\ 117 \times 10^{1}$	$5.333\ 875\ 126 \times 10^{4}$
c_1 =	$1.849\ 494\ 60 \times 10^{2}$	$1.466\ 298\ 863 \times 10^{2}$	$1.621\ 573\ 104 \times 10^{2}$	$-1.235\ 892\ 298 \times 10^{4}$
c_2 =	$-8.005\ 040\ 62 \times 10^{1}$	$-1.534\ 713\ 402 \times 10^{1}$	$-8.536\ 869\ 453$	$1.092\ 657\ 613 \times 10^{3}$
c_3 =	$1.022\ 374\ 30 \times 10^{2}$	$3.145\ 945\ 973$	$4.719\ 686\ 976 \times 10^{-1}$	$-4.265\ 693\ 686 \times 10^{1}$
c_4 =	$-1.522\ 485\ 92 \times 10^{2}$	$-4.163\ 257\ 839 \times 10^{-1}$	$-1.441\ 693\ 666 \times 10^{-2}$	$6.247\ 205\ 420 \times 10^{-1}$
c_5 =	$1.888\ 213\ 43 \times 10^{2}$	$3.187\ 963\ 771 \times 10^{-2}$	$2.081\ 618\ 890 \times 10^{-4}$	
c_6 =	$-1.590\ 859\ 41 \times 10^{2}$	$-1.291\ 637\ 500 \times 10^{-3}$		
c_7 =	$8.230\ 278\ 80 \times 10^{1}$	$2.183\ 475\ 087 \times 10^{-5}$		
c_8 =	$-2.341\ 819\ 44 \times 10^{1}$	$-1.447\ 379\ 511 \times 10^{-7}$		
c_9 =	$2.797\ 862\ 60$	$8.211\ 272\ 125 \times 10^{-9}$		
Error Range	0.02°C to –0.02°C	0.01°C to –0.01°C	0.0002°C to –0.0002°C	0.002°C to –0.002°C

TABLE 46 *Continued*

TYPE T Thermocouple			
Temperature Range		–200°C to 0°C	0°C to 400°C
Voltage Range		–5.603 mV to 0.0 mV	0.0 mV to 20.872 mV
	c_0 =	0.0	0.0
	c_1 =	$2.594\ 919\ 2 \times 10^{1}$	$2.592\ 800 \times 10^{1}$
	c_2 =	$-2.131\ 696\ 7 \times 10^{-1}$	$-7.602\ 961 \times 10^{-1}$
	c_3 =	$7.901\ 869\ 2 \times 10^{-1}$	$4.637\ 791 \times 10^{-2}$
	c_4 =	$4.252\ 777\ 7 \times 10^{-1}$	$-2.165\ 394 \times 10^{-3}$
	c_5 =	$1.330\ 447\ 3 \times 10^{-1}$	$6.048\ 144 \times 10^{-5}$
	c_6 =	$2.024\ 144\ 6 \times 10^{-2}$	$-7.293\ 422 \times 10^{-7}$
	c_7 =	$1.266\ 817\ 1 \times 10^{-3}$	
Error Range		0.04°C to –0.02°C	0.03°C to –0.03°C
TYPE C Thermocouple			

Note 1—The coefficients given are for an expression of the form: $t = a_0 + a_1E + a_2E^2 + a_3E^3 \ldots a_nE^n$, where E is the thermocouple emf in mV, t is the temperature in °C, and a_0, a_1, a_2, etc. are the coefficients. These expressions give approximate values of the temperature that agree with the values given in Table 24 within ± 0.5°C over the range 0°C to 2315°C.

Thermocouple Type	Coefficients
W–5 % Re / W–26 % Re	$a_0 = 0.000\ 000\ 00$
	$a_1 = 7.412\ 473\ 26 \times 10^{1}$
	$a_2 = -4.280\ 828\ 13$
	$a_3 = 5.211\ 389\ 20 \times 10^{-1}$
	$a_4 = -4.574\ 872\ 01 \times 10^{-2}$
	$a_5 = 2.805\ 782\ 84 \times 10^{-3}$
	$a_6 = -1.131\ 451\ 37 \times 10^{-4}$
	$a_7 = 2.854\ 896\ 84 \times 10^{-6}$
	$a_8 = -4.076\ 438\ 28 \times 10^{-8}$
	$a_9 = 2.513\ 580\ 71 \times 10^{-10}$

APPENDIX

(Nonmandatory Information)

X1. IEC COLOR CODE SYSTEM

X1.1 General

X1.1.1 The data in Tables 4 and 5 show the color coding required by this specification.

X1.1.2 In other parts of the world, there are alternative color code systems in use. An alternative color code system which has been widely accepted outside of the United States is that established by the International Electrotechnical Commission (IEC). For reference, Table X1.1 shows the IEC standard colors for thermocouple cables, extension cables, and compensating cables.

TABLE X1.1 IEC Color Codes for Insulated Thermocouple Wire and Extension Materials

NOTE 1—Data in this table are taken from IEC Standard 584–3. These colors are not compatible with the traditional colors widely used in the United States.

NOTE 2—For some types of insulations, colors may appear as a stripe or trace strand. High temperature braided insulation is not normally color coded.

NOTE 3—The noble metal thermocouples are not normally supplied with colored insulations. However, if they were so furnished, the color codes would be those given below.

NOTE 4—The IEC color coding system does not distinguish by color among thermocouple, extension, and compensating cables. Instead, a system of code letters are used to designate such cables. A single letter without a suffix denotes a thermocouple cable, an additional suffix "X" indicates an extension cable, and a suffix "C" is used to represent a compensating cable. Although the table below includes all three cable designations for each type, this should not be taken to mean that all three classes of cable are necessarily available for every type.

Thermocouple Cable Type	Thermoelement Polarity	Individual Conductor Color	Overall Jacket Color
T, TX, TC	(+)	Brown	Brown
	(-)	White	
J, JX, JC	(+)	Black	Black
	(-)	White	
E, EX, EC	(+)	Purple	Purple
	(-)	White	
K, KX, KC	(+)	Green	Green
	(-)	White	
N, NX, NC	(+)	Pink	Pink
	(-)	White	
B, BX, BC[A]	(+)	Grey	Grey
	(-)	White	
R, RX, RC[B]	(+)	Orange	Orange
	(-)	White	
S, SX, SC[B]	(+)	Orange	Orange
	(-)	White	

[A] Color code is applicable to constructions incorporating proprietary Type B compensating alloy wires. When uncompensated (copper/copper) extension materials are used with Type B thermocouples (at low temperatures and over limited temperature spans) the extension wire insulation is not normally color coded.
[B] Type R and S thermocouples utilize the same compensating cable.