INTERNATIONAL STANDARD

ISO 636

Fourth edition
2015-11-15

Welding consumables — Rods, wires and deposits for tungsten inert gas welding of non-alloy and fine-grain steels — Classification

Produits consommables pour le soudage — Baguettes et fils pour dépôts par soudage TIG des aciers non alliés et des aciers à grains fins — Classification

Reference number
ISO 636:2015(E)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

This fourth edition cancels and replaces the third edition (ISO 636:2004), which has been technically revised.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 3, through your national standards body, a complete listing of which can be found at www.iso.org.

Introduction

This International Standard provides a classification for the designation of rods and wires in terms of their chemical composition and, where required, in terms of the yield strength, tensile strength, and elongation of the all-weld metal. The ratio of yield to tensile strength of weld metal is generally higher than that of parent metal. Matching weld metal yield strength to parent metal yield strength will not necessarily ensure that the weld metal tensile strength matches that of the parent material. Where the application requires matching tensile strengths, selection of consumables is made by reference to column 3 of Table 1A or Table 1B.

Of note is that the mechanical properties of all-weld metal test specimens used to classify the rods and wires vary from those obtained in production joints because of differences in welding procedure such as diameter, width of weave, welding position, and material composition.

The classification according to system A is mainly based on EN 1668:1997. The classification according to system B is mainly based upon standards used around the Pacific Rim.

Welding consumables — Rods, wires and deposits for tungsten inert gas welding of non-alloy and fine-grain steels — Classification

1 Scope

This International Standard specifies requirements for classification of rods and wires in the as-welded condition and in the post-weld heat-treated condition for tungsten inert gas welding of non-alloy and fine-grain steels with a minimum yield strength of up to 500 MPa or a minimum tensile strength of up to 570 MPa.

This International Standard is a combined specification providing classification utilizing a system based upon the yield strength and the average impact energy of 47 J of all-weld metal or utilizing a system based upon the tensile strength and the average impact energy of 27 J of all-weld metal.

a) Paragraphs and tables which carry the suffix letter "A" are applicable only to rods and wires classified to the system based upon the yield strength and the average impact energy of 47 J of all-weld metal in accordance with this International Standard.

b) Paragraphs and tables which carry the suffix letter "B" are applicable only to rods and wires classified to the system based upon the tensile strength and the average impact energy of 27 J of all-weld metal in accordance with this International Standard.

c) Paragraphs and tables which have neither the suffix letter "A" nor the suffix letter "B" are applicable to all rods and wires classified in accordance with this International Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 544, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

ISO 14344, *Welding consumables — Procurement of filler materials and fluxes*

ISO 15792-1:2000, *Welding consumables — Test methods — Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys*. Amended by ISO 15792-1:2000/Amd 1:2011

ISO 80000-1:2009, *Quantities and units — Part 1: General.* Corrected by ISO 80000-1:2009/Cor 1:2011

3 Classification

Classification designations are based upon two approaches to indicate the tensile properties and the impact properties of the all-weld metal obtained with rods or wires. The two designation approaches include additional designators for some other classification requirements, but not all as will be clear from the following sections. In most cases, a given commercial product can be classified to the

classification requirements in both systems. Then, either or both classification designations can be used for the product.

Rods or wires shall be classified according to their chemical composition in accordance with Table 3A or Table 3B.

3A Classification by yield strength and 47 J impact energy

The classification is divided into four parts.

1) The first part gives a symbol indicating the product/process to be identified.
2) The second part gives a symbol indicating the strength and elongation of the all-weld metal (see Table 1A).
3) The third part gives a symbol indicating the impact properties of all-weld metal (see Table 2).
4) The fourth part gives a symbol indicating the chemical composition of the rods or wires used (see Table 3A).

3B Classification according to alloy type

The classification is divided into four parts.

1) The first part gives a symbol indicating the product/process to be identified.
2) The second part gives a symbol indicating the strength and elongation of the all-weld metal in either the as-welded or post-weld heat-treated condition (see Table 1B).
3) The third part gives a symbol indicating the impact properties of all-weld metal in the same condition as specified for the tensile strength (see Table 2). The letter "U" after this designator indicates that the deposit meets an average optional requirement of 47 J at the designated Charpy test temperature.
4) The fourth part gives a symbol indicating the chemical composition of the rods or wires used (see Table 3B).

4 Symbols and requirements

4.1 Symbol for the product/process

The symbol of weld deposit by the tungsten inert gas welding process shall be the letter "W" placed at the beginning of the designation.

The symbol of rods or wires for the tungsten inert gas welding shall be the letter "W" placed at the beginning of the rod or wire designation.

4.2 Symbol for strength and elongation of all-weld metal

4.2A Classification by yield strength and 47 J impact energy

The symbol in Table 1A indicates yield strength, tensile strength, and elongation of the all-weld metal in the as-welded condition determined in accordance with Clause 5.

Table 1A — Symbol for strength and elongation of all-weld metal

Symbol	Minimum yield strength[a]	Tensile strength	Minimum elongation[b]
	MPa	MPa	%
35	355	440 to 570	22
38	380	470 to 600	20
42	420	500 to 640	20
46	460	530 to 680	20
50	500	560 to 720	18

[a] For yield strength, the lower yield (R_{eL}) is used when yielding occurs. Otherwise, the 0,2 % proof strength ($R_{p0,2}$) is used.

[b] Gauge length is equal to five times the test specimen diameter.

4.2B Classification by tensile strength and 27 J impact energy

The symbol in Table 1B indicates yield strength, tensile strength, and elongation of the all-weld metal in the as-welded condition or in the post-weld heat-treated condition determined in accordance with Clause 5.

Table 1B — Symbol for strength and elongation of all-weld metal

Symbol[a]	Minimum yield strength[b]	Tensile strength	Minimum elongation[c]
	MPa	MPa	%
43X	330	430 to 600	20
49X	390	490 to 670	18
55X	460	550 to 740	17
57X	490	570 to 770	17

[a] X is “A” or “P”. Where “A” indicates testing in the as-welded condition and “P” indicates testing in the post weld heat-treated condition.

[b] For yield strength, the lower yield (R_{eL}) is used when yielding occurs. Otherwise, the 0,2 % proof strength ($R_{p0,2}$) is used.

[c] Gauge length is equal to five times the test specimen diameter.

4.3 Symbol for impact properties of all-weld metal

4.3A Classification by yield strength and 47 J impact energy

The symbols in Table 2 indicate the temperature at which impact energy of 47 J is achieved under the conditions given in Clause 5.

Three test specimens shall be tested. Only one individual value can be lower than 47 J, but not lower than 32 J. The average of the three values shall be at least 47 J.

4.3B Classification by tensile strength and 27 J impact energy

The symbol in Table 2 indicates the temperature at which impact energy of 27 J is achieved in the as-welded condition or in the post-weld heat-treated condition under the conditions given in Clause 5.

Five test specimens shall be tested. The lowest and highest values obtained shall be disregarded. Two of the three remaining values shall be equal or greater than the specified 27 J level. One of the three can be lower, but shall not be less than 20 J. The average of the three remaining values shall be at least 27 J.

The addition of the optional symbol U immediately after the symbol for condition of heat treatment indicates that the supplemental requirement of 47 J impact energy at the normal 27 J impact test temperature has also been satisfied. For the 47 J impact requirement, the number of specimens tested and values obtained shall meet the requirement of 4.3A.

Table 2 — Symbol for impact properties of all-weld metal

Symbol	Temperature for minimum average impact energy of 47 J[a] or 27 J[b] °C
Z	No requirements
A[a] or Y[b]	+20
0	0
2	−20
3	−30
4	−40
5	−50
6	−60
7	−70
8	−80
9	−90
10	−100

[a] Classification by yield strength and 47 J impact energy.

[b] Classification by tensile strength and 27 J impact energy.

4.4 Symbol for the chemical composition of rods or wires

The symbol in Table 3A or Table 3B indicates the chemical composition of the rods or wires and includes an indication of characteristic alloying elements.

Table 3A — Symbol for chemical composition (classification by yield strength and 47 J impact energy)

Symbol	**Chemical composition** (percentage mass fraction)[a]										
	C	**Si**	**Mn**	**P**	**S**	**Ni**	**Cr**	**Mo**	**V**	**Al**	**Ti + Zr**
2Si	0,06 to 0,14	0,50 to 0,80	0,90 to 1,30	0,025	0,025	0,15	0,15	0,15	0,03	0,02	0,15
3Si1	0,06 to 0,14	0,70 to 1,00	1,30 to 1,60	0,025	0,025	0,15	0,15	0,15	0,03	0,02	0,15
4Si1	0,06 to 0,14	0,80 to 1,20	1,60 to 1,90	0,025	0,025	0,15	0,15	0,15	0,03	0,02	0,15
2Ti	0,04 to 0,14	0,40 to 0,80	0,90 to 1,40	0,025	0,025	0,15	0,15	0,15	0,03	0,05 to 0,20	0,05 to 0,25
3Ni1	0,06 to 0,14	0,50 to 0,90	1,00 to 1,60	0,020	0,020	0,80 to 1,50	0,15	0,15	0,03	0,02	0,15
2Ni2	0,06 to 0,14	0,40 to 0,80	0,80 to 1,40	0,020	0,020	2,10 to 2,70	0,15	0,15	0,03	0,02	0,15
2Mo	0,08 to 0,12	0,30 to 0,70	0,90 to 1,30	0,020	0,020	0,15	0,15	0,40 to 0,60	0,03	0,02	0,15
Z[b]	Any other agreed composition										

[a] Single values shown in the table are maximum values.

[b] Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

Table 3B — Symbol for chemical composition (classification by tensile strength and 27 J impact energy)

Symbol	Chemical composition (percentage mass fraction)[a, b]											
	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu[c]	Al	Ti + Zr
2	0,07	0,40 to 0,70	0,90 to 1,40	0,025	0,035	0,15	0,15	0,15	0,03	0,50	0,05 to 0,15	Ti: 0,05 to 0,15 Zr: 0,02 to 0,12
3	0,06 to 0,15	0,45 to 0,75	0,90 to 1,40	0,025	0,035	0,15	0,15	0,15	0,03	0,50	—	—
4	0,07 to 0,15	0,65 to 0,85	1,00 to 1,50	0,025	0,035	0,15	0,15	0,15	0,03	0,50	—	—
6	0,06 to 0,15	0,80 to 1,15	1,40 to 1,85	0,025	0,035	0,15	0,15	0,15	0,03	0,50	—	—
12	0,02 to 0,15	0,55 to 1,00	1,25 to 1,90	0,030	0,030	—	—	—	—	0,50	—	—
16	0,02 to 0,15	0,40 to 1,00	0,90 to 1,60	0,030	0,030	—	—	—	—	0,50	—	—
1M3	0,12	0,30 to 0,70	1,30	0,025	0,025	0,20	—	0,40 to 0,65	—	0,35	—	—
2M3	0,12	0,30 to 0,70	0,60 to 1,40	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	—
2M31	0,12	0,30 to 0,90	0,80 to 1,50	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	—
2M32	0,05	0,30 to 0,90	0,80 to 1,40	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	—
3M1T	0,12	0,40 to 1,00	1,40 to 2,10	0,025	0,025	—	—	0,10 to 0,45	—	0,50	—	Ti: 0,02 to 0,30
3M3	0,12	0,60 to 0,90	1,10 to 1,60	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	—

[a] The electrode shall be analysed for the specific elements for which values are shown in this table. If the presence of other elements is indicated in the course of this work, the amount of these elements shall be determined to ensure that their total (excluding iron) does not exceed 0,50 %.

[b] Single values shown in the table are maximum values.

[c] Total copper including any coating.

[d] Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

Table 3B *(continued)*

Symbol	Chemical composition (percentage mass fraction)[a, b]											
	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu[c]	Al	Ti + Zr
4M3	0,12	0,30	1,50 to 2,00	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	—
4M31	0,07 to 0,12	0,50 to 0,80	1,60 to 2,10	0,025	0,025	—	—	0,40 to 0,60	—	0,50	—	—
4M3T	0,12	0,50 to 0,80	1,60 to 2,20	0,025	0,025	—	—	0,40 to 0,65	—	0,50	—	Ti: 0,02 to 0,30
N1	0,12	0,20 to 0,50	1,25	0,025	0,025	0,60 to 1,00	—	0,35	—	0,35	—	—
N2	0,12	0,40 to 0,80	1,25	0,025	0,025	0,80 to 1,10	0,15	0,35	0,05	0,35	—	—
N3	0,12	0,30 to 0,80	1,20 to 1,60	0,025	0,025	1,50 to 1,90	—	0,35	—	0,35	—	—
N5	0,12	0,40 to 0,80	1,25	0,025	0,025	2,00 to 2,75	—	—	—	0,35	—	—
N7	0,12	0,20 to 0,50	1,25	0,025	0,025	3,00 to 3,75	—	0,35	—	0,35	—	—
N71	0,12	0,40 to 0,80	1,25	0,025	0,025	3,00 to 3,75	—	—	—	0,35	—	—
N9	0,10	0,50	1,40	0,025	0,025	4,00 to 4,75	—	0,35	—	0,35	—	Ti: 0,02 to 0,30
NCC	0,12	0,60 to 0,90	1,00 to 1,65	0,030	0,030	0,10 to 0,30	0,50 to 0,80	—	—	0,20 to 0,60	—	Ti: 0,02 to 0,30
NCC1	0,12	0,20 to 0,40	0,40 to 0,70	0,030	0,030	0,50 to 0,80	0,50 to 0,80	—	—	0,30 to 0,75	—	Ti: 0,02 to 0,30

[a] The electrode shall be analysed for the specific elements for which values are shown in this table. If the presence of other elements is indicated in the course of this work, the amount of these elements shall be determined to ensure that their total (excluding iron) does not exceed 0,50 %.

[b] Single values shown in the table are maximum values.

[c] Total copper including any coating.

[d] Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

Table 3B *(continued)*

Symbol	Chemical composition (percentage mass fraction)[a, b]											
	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu[c]	Al	Ti + Zr
NCCT	0,12	0,60 to 0,90	1,00 to 1,65	0,030	0,030	0,10 to 0,30	0,50 to 0,80	—	—	0,20 to 0,60	—	Ti: 0,02 to 0,30
NCCT1	0,12	0,50 to 0,80	1,20 to 1,80	0,030	0,030	0,10 to 0,40	0,50 to 0,80	0,02 to 0,30	—	0,20 to 0,60	—	—
NCCT2	0,12	0,50 to 0,90	1,10 to 1,70	0,030	0,030	0,40 to 0,80	0,50 to 0,80	—	—	0,20 to 0,60	—	—
N1M2T	0,12	0,60 to 1,00	1,70 to 2,30	0,025	0,025	0,40 to 0,80	—	0,20 to 0,60	—	0,50	—	—
N1M3	0,12	0,20 to 0,80	1,00 to 1,80	0,025	0,025	0,30 to 0,90	—	0,40 to 0,65	—	0,50	—	—
N2M3	0,12	0,30	1,10 to 1,60	0,025	0,025	0,80 to 1,20	—	0,40 to 0,65	—	0,50	—	—
Z[d]	Any other agreed composition											

[a] The electrode shall be analysed for the specific elements for which values are shown in this table. If the presence of other elements is indicated in the course of this work, the amount of these elements shall be determined to ensure that their total (excluding iron) does not exceed 0,50 %.

[b] Single values shown in the table are maximum values.

[c] Total copper including any coating.

[d] Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

5 Mechanical tests

5A Classification by yield strength and 47 J impact energy

Tensile and impact tests and any required retests shall be carried out in the as-welded condition using an all-weld metal test assembly type 1.3 in accordance with ISO 15792-1:2000 using 2,4 mm diameter rods or wires and welding conditions as described below in 5.1A and 5.2A.

5B Classification by tensile strength and 27 J impact energy

Tensile and impact tests shall be carried out in the as-welded condition or in the post-weld heat-treated condition using an all-weld metal test assembly type 1.3 in accordance with ISO 15792-1:2000 using 2,4 mm diameter rods or wires and welding conditions as described below in 5.1B and 5.2B.

5.1 Preheating and interpass temperatures

5.1A Classification by yield strength and 47 J impact energy

Preheating is not required. Welding can start from room temperature. The interpass temperature shall be measured using temperature indicator crayons, surface thermometers, or thermocouples (see ISO 13916).

The interpass temperature shall not exceed 250 °C. If after any pass this interpass temperature is exceeded, the test assembly shall be cooled in air to a temperature below that limit.

5.1B Classification by tensile strength and 27 J impact energy

Preheating and interpass temperatures shall be selected for the appropriate weld metal type from Table 4B. The interpass temperature shall be measured using temperature indicator crayons, surface thermometers, or thermocouples (see ISO 13916).

Welding shall continue until the assembly has reached a maximum interpass temperature (165 °C). If after any pass this interpass temperature is exceeded, the test assembly shall be cooled in air to a temperature within that range. If below interpass temperature, reheat into interpass range.

Table 4B — Preheating and interpass temperatures

Symbol	Preheat temperature °C	Interpass temperature °C
2, 3, 4, 6, 12, 16	Room temperature	150 ± 15
1M3, 2M3, 2M31, 2M32, 3M1T, 3M3, 4M3, 4M31, 4M3T, N1, N2, N3, N5, N7, N71, N9, NCC, NCC1, NCCT, NCCT1, NCCT2, N1M2T, N1M3, N2M3	min. 100	
Z	As agreed between purchaser and supplier	

5.2 Welding conditions and pass sequence

5.2A Classification by yield strength and 47 J impact energy

The welding conditions and details of test assembly in Table 5A shall be used. The direction of welding to complete a layer consisting of two passes shall not vary, but the direction of welding of layers shall be alternated.

Table 5A — Welding conditions

Conditions	Parameters
Rod/wire diameter, mm	2,4
Length of weld deposit, mm	min. 200
Type of current[a]	d.c.
Welding current, A	240 ± 20
Welding speed, mm/min	140 ± 20
Shielding gas[b]	ISO 14175-I 1, 2, or 3
[a] d.c. means direct current. Electrode negative.	
[b] In case of dispute, the referee method is ISO 14175-I 1.	

5.2B Classification by tensile strength and 27 J impact energy

The welding conditions and details of test assembly in Table 5B shall be used. The welding conditions and pass sequence for other sizes shall be as recommended by the manufacturer.

Table 5B — Welding conditions

Conditions	Parameters
Rod/wire diameter, mm	2,4
Length of weld deposit, mm	min. 200
Type of current[a]	d.c.
Welding current, A	220 ± 30
Welding speed, mm/min	100 ± 30
Shielding gas[b]	ISO 14175-I 1, 2, or 3
[a] d.c. means direct current. Electrode negative.	
[b] In case of dispute, the referee method is ISO 14175-I 1.	

5.3 PWHT condition

5.3A Classification by yield strength and 47 J impact energy

No PWHT condition is used in this specification.

5.3B Classification by tensile strength and 27 J impact energy

Test assemblies made with rods and wires classified in the PWHT condition shall be heat-treated at 620 °C ± 15 °C for 1 h $^{+15}_{0}$ min. The furnace shall be at a temperature no higher than 315 °C when the test assembly is placed in it. The heating rate from that point to the 620 °C ± 15 °C holding temperature shall not exceed 220 °C/h. When the holding time has been completed, the assembly shall be allowed to cool in the furnace to a temperature below 315 °C at a rate not exceeding 195 °C/h. The assembly can be removed from the furnace at any temperature below 315 °C and allowed to cool in still air to room temperature.

6 Chemical analysis

Chemical analysis shall be performed on specimens of the rods or wires. Any analytical technique can be used, but in case of dispute, reference shall be made to established published methods.

7 Rounding procedure

For the purposes of determining compliance with the requirements of this International Standard, the actual test values obtained shall be subject to ISO 80000-1:2009, B.3, Rule A. If the measured values are obtained by equipment calibrated in units other than those of this International Standard, the measured values shall be converted to the units of this International Standard before rounding. If an arithmetic average value is to be compared to the requirements of this International Standard, rounding shall be done only after calculating the arithmetic average. If the test method cited in Clause 2 contains instructions for rounding that conflict with the instructions of this International Standard, the rounding requirements of the test method standard shall apply. The rounded results shall fulfil the requirements of the appropriate table for the classification under test.

8 Retests

If any test fails to meet the requirements, that test shall be repeated twice. The results of both retests shall meet the requirements. Specimens for the retest could be taken from the original test assembly or from a new test assembly. For chemical analysis, retests need be only for those specific elements that failed to meet their test requirements. If the results of one or both retests fail to meet the requirements, the material under test shall be considered as not meeting the requirements of this specification for that classification.

In the event that during preparation or after completion of any test it is clearly determined that prescribed or proper procedures were not followed during preparation of the weld test assembly or test specimen(s) or in conducting the tests, the test shall be considered invalid without regard to whether the test was actually completed or whether the test results met or failed to meet the requirements. That test shall be repeated following proper prescribed procedures. In this case, the requirement for doubling the number of test specimens does not apply.

9 Technical delivery conditions

Technical delivery conditions shall meet the requirements in ISO 544 and ISO 14344.

10 Designation

10A Classification by yield strength and 47 J impact energy

The designation of the rod or wire shall follow the principle given in the examples below.

EXAMPLE 1A

A weld deposit produced by tungsten inert gas welding (W) having a minimum yield strength of 460 MPa (46) and a minimum average impact energy of 47 J at −30 °C (3) produced under argon shield, ISO 14175, using the rod W 3Si1 is designated as follows:

ISO 636-A – W 46 3 3Si1

A rod complying with the chemical requirement of W3Si1 in Table 3A is designated as follows:

ISO 636-A – W 3Si1

10B Classification by tensile strength and 27 J impact energy

The designation of the rod or the wire shall follow the principle given in the examples below.

EXAMPLE 1B

A weld deposit produced by tungsten inert gas welding (W) having a minimum tensile strength of 550 MPa (55) and a minimum average impact energy of 27 J at −30 °C (3) in the as-welded condition produced under argon shield, ISO 14175, using the wire W 3 is designated as follows:

ISO 636-B – W 55A 3 3

A rod complying with the chemical requirement of W 3 in Table 3B is designated as follows:

ISO 636-B – W 3

where

ISO 636-A	is the standard number with classification by yield strength and 47 J impact energy;
W	is the rod/wire and/or deposit/tungsten inert gas welding (see 4.1);
46	is the strength and elongation (see Table 1A);
3	is the impact properties in the as-weld condition (see Table 2);
3Si1	is the chemical composition of rod/wire (see Table 3A).

where

ISO 636-B	is the standard number with classification by tensile strength and 27 J impact energy
W	is the deposit/tungsten inert gas welding (see 4.1);
55A	is the strength and elongation in the as-welded condition (see Table 1B);
3	is the impact properties in the as-welded condition (see Table 2);
3	is the chemical composition of rod/wire (see Table 3B).

EXAMPLE 2B

A weld deposit produced by tungsten inert gas welding (W) having a minimum tensile strength of 490 MPa (49) and a minimum average impact energy of 47 J at 0 °C (0) in the as-welded condition produced under argon shield, ISO 14175, using the wire W 12 is designated as follows:

ISO 636-B – W 49A 0U 12

A rod complying with the chemical requirement of W 12 in Table 3B is designated as follows:

ISO 636-B – W 12

ISO 636-B	is the standard number with classification by tensile strength and 27 J impact energy;
W	is the deposit/tungsten inert gas welding (see 4.1);
49A	is the strength and elongation in the as-welded condition (see Table 1B);
0U	is the impact properties meeting 47 J in the as-welded condition [see 3B 3) and Table 2];
12	is the chemical composition of rod/wire (see Table 3B).

ICS 25.160.20

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