INTERNATIONAL STANDARD

ISO 14919

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2001-08-15

Thermal spraying — Wires, rods and cords for flame and arc spraying — Classification — Technical supply conditions

Projection thermique — Fils, baguettes et cordons pour projection thermique à l'arc et au pistolet dans une flamme — Classification — Conditions techniques d'approvisionnement

Reference number
ISO 14919:2001(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14919 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 107, *Metallic and other inorganic coatings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

Contents

Foreword

The text of EN ISO 14919:2001 has been prepared by Technical Committee CEN/TC 240 "Thermal spraying and thermally sprayed coatings", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 107 "Metallic and other inorganic coatings".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2002, and conflicting national standards shall be withdrawn at the latest by February 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies requirements for classification of metal and non metal wires (solid and cored), rods, cords processed by means of thermal spraying, especially by arc and flame spraying.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 10204:1991
Metallic products – Types of inspection documents

3 Classification

3.1 Classification according to the manufacturing process and resulting structure

The thermal spray materials are classified according to the manufacturing process and the resulting structure, as given in table 1.

Table 1: Classification of thermal spraying material and resulting structure

Number	Term	Manufacturing process	Structure
1	solid wire/rod	metallurgical manufacturing and forming	homogeneous composition
2	solid wire/rod	powder metallurgical manufacturing and forming	homogeneous composition
3	cored wire (tube shaped wire)	filling up a metal tube and compressed by means of forming	seamless metal shell with powder filling
4	cored wire (folded wire)	forming a metal sheet with powder filling, binder and compressed by means of drawing	metal shell with powder filling
5	cords	simultaneous extruding of powder, binder and organic sheath	plastic shell with powder filling
6	ceramic rods	extruding and sintering of ceramic material	porous rod consisting of bonded ceramic particles

3.2 Classification according to material groups and chemical composition

The material groups are given in table 2, and the chemical composition shall comply with tables 3 to 10.

Table 2: Classification according to material groups

Code Number	Term
1	tin and tin alloys
2	zinc and zinc alloys
3	aluminium and aluminium alloys
4	copper and copper alloys
5	iron and iron alloys
6	nickel and nickel alloys
7	molybdenum
8	oxide ceramics

3.2.1 Tin and tin alloys

Table 3: Tin and tin alloys

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
1.1	Sn99	Sn min. 99,95	total ≤ 0,05 Sb ≤ 0,02 Ag ≤ 0,01 Bi ≤ 0,002 Cu ≤ 0,01 Fe ≤ 0,01 Pb ≤ 0,02 Al+Cd+Zn ≤ 0,002	1
1.2	SnSbCu84	Sb 7 to 8 Cu 3 to 4 remainder Sn	Pb ≤ 0,35 As ≤ 0,1 Bi ≤ 0,08 Fe ≤ 0,1 Al ≤ 0,01 Zn ≤ 0,01 other: total ≤ 0,2	1

3.2.2 Zinc and zinc alloys

Table 4: Zinc and zinc alloys

code number	symbol	alloying elements mass fraction in %		other elements mass fraction %		manu-facturing process
2.1	Zn99,99	Zn	min. 99,99	total Pb Cd Pb+Cd Sn Fe Cu other: total	≤ 0,010 ≤ 0,005 ≤ 0,005 ≤ 0,006 ≤ 0,001 ≤ 0,003 ≤ 0,002 ≤ 0,12	1
2.2	Zn99	Zn	min. 99	total Pb Cd Pb+Cd Sn Fe Cu Mo Ti Mg Al other: total	≤ 1,0 ≤ 0,005 ≤ 0,005 ≤ 0,006 ≤ 0,001 ≤ 0,01 ≤ 0,7 ≤ 0,01 ≤ 0,16 ≤ 0,01 ≤ 0,01 ≤ 0,12	1
2.3	ZnAl15	Zn Al	84 to 86 14 to 16	total Pb Cd Pb+Cd Sn Fe Cu Si	≤ 0,17 ≤ 0,005 ≤ 0,005 ≤ 0,006 ≤ 0,001 ≤ 0,05 ≤ 0,01 ≤ 0,12	1

3.2.3 Aluminium and aluminium alloys

Table 5: Aluminium and aluminium alloys

code number	symbol	alloying elements mass fraction in %		other elements mass fraction in %		manu-facturing process
3.1	Al99,98	Al	min. 99,98	total Si Zn Fe Cu Ti other: particular	≤ 0,02 ≤ 0,01 ≤ 0,01 ≤ 0,006 ≤ 0,003 ≤ 0,003 ≤ 0,003	1

(continued)

Table 5 (concluded)

code number	symbol	alloying elements mass fraction in %		other elements mass fraction in %		manu-facturing process
3.2	Al99,5	Al	min. 99,5	total Si Fe Ti Cu Zn Mn other: particular	≤ 0,5 ≤ 0,3 ≤ 0,4 ≤ 0,05 ≤ 0,05 ≤ 0,07 ≤ 0,05 ≤ 0,03	1
3.3	AlMg5	Mg Mn Cr Ti remainder Al	4,5 to 5,5 0 to 0,5 0 to 0,3 0,10 to 0,25	total Si Fe Cu Zn other: particular	≤ 0,9 ≤ 0,25 ≤ 0,40 ≤ 0,05 ≤ 0,2 ≤ 0,05	1
3.4	AlZn5	Zn remainder Al	4,5 to 5,1	total Si Fe Cu Sn other: particular	≤ 1 ≤ 0,30 ≤ 0,40 ≤ 0,05 ≤ 0,20 ≤ 0,05	1
3.5	AlSi5	Si remainder Al	4,5 bis 5,5	total Si Fe Cu Sn other: particular	≤ 1 ≤ 0,30 ≤ 0,40 ≤ 0,05 ≤ 0,20 ≤ 0,05	1

3.2.4 Copper and copper alloys

Table 6: Copper and copper alloys

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
4.1	Cu99	Cu ≥ 99,9	other ≤ 0,01	1
4.2	CuZn37	Cu 62,0 to 64 remainder Zn	Al ≤ 0,03 Fe ≤ 0,1 Mn ≤ 0,1 Ni ≤ 0,3 Pb ≤ 0,1 Sb ≤ 0,01 Sn ≤ 0,1 other: total ≤ 0,5	1
4.3	CuZn39	Cu 56 to 62 Sn 0,5 to 1,5 Si 0,1 to 0,5 remainder Zn	Ni ≤ 1,5 Mn ≤ 1,0 Fe ≤ 0,5 Al ≤ 0,01 Pb ≤ 0,03 other: total ≤ 0,2	1
4.4	CuSn6	Sn 5,0 to 8,0 remainder Cu	Fe ≤ 0,1 Al ≤ 0,01 Zn ≤ 0,1 Pb ≤ 0,02 P 0,01 to 0,4 other: total ≤ 0,4	1
4.5	CuSn12	Sn 11,0 to 13,0 remainder Cu	Fe ≤ 0,1 Al ≤ 0,01 Zn ≤ 0,1 Pb ≤ 0,02 P 0,01 to 0,4 other: total ≤ 0,4	1
4.6	CuAl8	Al 7,5 to 9,5 remainder Cu	Mn ≤ 1,8 Ni ≤ 0,8 Fe ≤ 0,5 Si ≤ 0,2 Zn ≤ 0,2 other: total ≤ 0,5	1

(continued)

Table 6 (concluded)

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
4.7	CuAl10	Al 9,0 to 11,0 Fe 2,0 to 4,0 Mn 1,5 to 3,5 remainder Cu	Ni ≤ 1,0 Pb ≤ 0,05 Si ≤ 0,2 Zn ≤ 0,5 other: total ≤ 0,3	1

3.2.5 Iron and iron alloys

Table 7: Iron and iron alloys

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
5.1	10 Mn	C 0,04 to 0,12 Mn 0,42 to 0,68 remainder Fe	Si traces Cr ≤ 0,15 Cu ≤ 0,20 Ni ≤ 0,15 P ≤ 0,030 S ≤ 0,030	1
5.2	10 MnSi4	C 0,07 to 0,14 Si 0,07 to 0,14 Mn 1,3 to 1,6 remainder Fe	Cr ≤ 0,15 Cu ≤ 0,20 Mo ≤ 0,15 Ni ≤ 0,15 P ≤ 0,025 S ≤ 0,025	1
5.3	80 MnSi	C 0,8 to 0,85 Si 0,15 to 0,35 Mn 0,50 to 0,70 remainder Fe	P ≤ 0,035 S ≤ 0,035	1
5.4	150 Cr4	C 1,4 to 1,6 Si 0,15 to 0,30 Mn 0,50 to 0,70 Cr 1,3 to 1,5 remainder Fe	P ≤ 0,035 S ≤ 0,035	1
5.5	110 Cr3	C 0,9 to 1,2 Si 0,20 to 0,40 Mn 0,20 to 0,40 Cr 0,9 to 1,1 remainder Fe	P ≤ 0,030 S ≤ 0,030	1

(continued)

Table 7 (continued)

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
5.6	110 MnCrTi5 5	C 0,97 to 1,23 Si 0,12 to 0,38 Mn 1,76 to 2,27 Cr 1,65 to 1,95 remainder Fe	Ti 0,13 to 0,35 P ≤ 0,025 S ≤ 0,025	1
5.7	X 45 Cr13 a) with Cu plating b) without Cu plating	C 0,3 to 0,50 Si ≤ 1,0 Mn ≤ 1,0 Cr 12 to 14 remainder Fe	P ≤ 0,045 S ≤ 0,030	1
5.8	X 20 CrMo 13 1	C 0,17 to 0,22 Si ≤ 1,0 Mn ≤ 1,0 Cr 12 to 14 Mo 0,9 to 1,3 remainder Fe	Ni ≤ 1,0 P ≤ 0,045 S ≤ 0,030	1
5.9	X 6 CrAl 22 4	C ≤ 0,055 Si ≤ 0,65 Mn ≤ 0,45 Al 3,5 to 5,5 Cr 21 to 23 remainder Fe	P ≤ 0,040 S ≤ 0,025	1
5.10	X 6 CrNi19 9	C ≤ 0,06 Si ≤ 1,5 Mn ≤ 2,0 Cr 18 to 20 Ni 8,5 to 10,5 remainder Fe	P ≤ 0,030 S ≤ 0,020	1
5.11	X 5 CrNiMo17 12 2	C ≤ 0,07 Si ≤ 1,0 Mn ≤ 2,0 Cr 16,5 to 18,5 Mo 2 to 2,5 Ni 10,5 to 13,5 remainder Fe	P ≤ 0,045 S ≤ 0,030	1
5.12	X 12 CrNiMn 18 8 6	C ≤ 0,20 Si ≤ 1,0 Mn 5,5 to 8,0 Cr 17 to 20 Ni 7,5 to 9,5 remainder Fe	P ≤ 0,040 S ≤ 0,025	1
5.13	X 12 CrNi25 20	C ≤ 0,15 Si ≤ 1,5 Mn 1,5 to 3,5 Cr 24 to 27 Ni 19 to 22 remainder Fe	P ≤ 0,025 S ≤ 0,020	1

(continued)

Table 7 (concluded)

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
5.14	X 25 CrCuB26 3 3	C ≤ 0,3 Cr ≤ 26 Mn ≤ 1 Si ≤ 0,3 Cu ≤ 3 B ≤ 3 remainder Fe	other ≤ 1	3, 4
5.15	X 25 MnAlSi7 5	C ≤ 0,3 Al 4 to 5 Mn 6 to 8 Si ≤ 1,0 remainder Fe	other ≤ 1	3, 4

3.2.6 Nickel and nickel alloys

Table 8: Nickel and nickel alloys

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
6.1	NiCu30	Ni min. 62,0 Cu 27,0 to 35,0 Mn 1,0 to 4,0 Fe 1,0 to 2,5	Al ≤ 0,5 C ≤ 0,15 Si ≤ 1,0 S ≤ 0,02 Ti ≤ 1,0 Nb ≤ 2,5 other: total ≤ 0,5	1
6.2	Ni99	Ni min. 99,2	Cu ≤ 0,1 C ≤ 0,25 Fe ≤ 0,4 Mg ≤ 0,15 Mn ≤ 0,3 S ≤ 0,005 Si ≤ 0,2	1
6.3	NiCrFe15 20	Cr 14 to 19 Fe 19 to 25 Ni min. 59	Cu ≤ 0,5 C ≤ 0,15 Mn ≤ 2,5 Si ≤ 2,0	1
6.4	NiCr20	Cr 18 to 21 remainder Ni	Cu ≤ 0,5 C ≤ 0,25 Fe ≤ 0,5 Mn ≤ 1,2 Si ≤ 0,5 S ≤ 0,015	1

(continued)

Table 8 (concluded)

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
6.5	NiAl5	Al 4,5 to 5,5 remainder Ni	Mn ≤ 0,3 Ti ≤ 0,4 Si ≤ 0,5 Fe ≤ 0,3 Cu ≤ 0,08 C ≤ 0,005	1, 3, 4, 5
6.6	NiAl20	Al 18 to 22 remainder Ni	Fe ≤ 0,3 Mn ≤ 0,3 Si ≤ 0,5 Cu ≤ 0,1 C ≤ 0,25	3, 4*
6.7	NiAlMo5 5	Al 4,5 to 5,5 Mo ≤ 5 remainder Ni	other ≤ 1	3, 4
6.8	NiCrAl20 6	Al 6 to 7 Cr 18 to 21 Mo ≤ 5 remainder Ni	other ≤ 1	3, 4
6.9	NiFeAlCr20 14 3	Al 14 to 15 Cr 3 to 5 Fe 17 to 23 remainder Ni	other ≤ 1	3, 4
6.10	NiCrBSi	Cr ≤ 9 Fe ≤ 3 Si ≤ 3,2 B ≤ 1,6 C ≤ 0,3 remainder Ni	other ≤ 1	5
* Filling is typically performed by a solid wire.				

3.2.7 Molybdenum

Table 9: Molybdenum

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
7.1	Mo	Mo ≥ 99,95	other ≤ 0,05	2

3.2.8 Ceramics

Table 10: Oxide ceramics

code number	symbol	alloying elements mass fraction in %		other elements mass fraction in %		manu-facturing process
8.1	ZrO_2 / CaO 95/5	ZrO_2 CaO	≥ 92 5 to 7	Al_2O_3 SiO_2 Fe_2O_3 TiO_2 Na_2O MgO	≤ 0,7 ≤ 0,4 ≤ 0,04 ≤ 0,4 ≤ 0,02 ≤ 0,07	6
8.2	ZrO_2 / CaO 70/30	ZrO_2 CaO	≥ 68 28 to 31	Al_2O_3 TiO_2 Na_2O MgO	≤ 0,7 ≤ 0,4 ≤ 0,02 ≤ 0,07	5
8.3	Cr_2O_3	Cr_2O_3	≥ 90,0	Al_2O_3 CaO SiO_2 Fe_2O_3 TiO_2 MgO	≤ 4 ≤ 0,2 ≤ 5 ≤ 0,3 ≤ 0,3 ≤ 0,1	5, 6
8.4	Al_2O_3	Al_2O_3	≥ 98	CaO SiO_2 Fe_2O_3 TiO_2 Na_2O MgO	≤ 0,2 ≤ 0,8 ≤ 0,09 ≤ 0,03 ≤ 0,06 ≤ 0,3	5, 6
8.5	Al_2O_3 / TiO_2 97/3	Al_2O_3 TiO_2	≥ 94 ≥ 3	CaO SiO_2 Fe_2O_3 Na_2O MgO Mn_3O_4	≤ 0,2 ≤ 1 ≤ 0,5 ≤ 0,04 ≤ 0,5 ≤ 0,05	5, 6
8.6	Al_2O_3 / TiO_2 87/13	Al_2O_3 TiO_2	85 to 87 13 to 15	CaO SiO_2 Fe_2O_3 Na_2O MgO	≤ 0,2 ≤ 0,5 ≤ 0,3 ≤ 0,2 ≤ 0,3	6
8.7	Al_2O_3 / TiO_2 60/40	Al_2O_3 TiO_2	58 to 60 40 to 42	CaO SiO_2 Fe_2O_3 Na_2O MgO	≤ 0,2 ≤ 0,5 ≤ 0,3 ≤ 0,2 ≤ 0,3	6
8.8	Al_2O_3 / SiO_2 70/30	Al_2O_3 SiO_2	72 to 78 22 to 28	CaO SiO_2 Fe_2O_3 Na_2O MgO	≤ 0,2 ≤ 0,5 ≤ 0,3 ≤ 0,2 ≤ 0,3	5

(continued)

Table 10 (concluded)

code number	symbol	alloying elements mass fraction in %	other elements mass fraction in %	manu-facturing process
8.9	Al_2O_3 / MgO 70/30	Al_2O_3 76 to 82 MgO 18 to 24	CaO≤ 0,2 SiO_2≤ 0,5 Fe_2O_3≤ 0,3 Na_2O≤ 0,2 MgO≤ 0,3	5, 6

4 Sizes and tolerances

Standard sizes and tolerances of diameter in millimetres for thermal spray wires, rods and cords are given in table 11, 12 and 13. If it is required, smaller ranges of tolerances can be arranged between costumer and manufacturer/-supplier. The straightness of the rods has to be formed so that the material is conveyed without faults.

Table 11: Wire diameters

Size [mm]	Tolerance [mm]
1,6	+0; -0,05
1,62	+0; -0,05
2,0	+0; -0,06
2,3	+0; -0,06
2,5	+0; -0,06
3,0	+0; -0,07
3,17	+0; -0,07
3,48	+0; -0,07
4,0	+0; -0,07
4,76	+0; -0,07

Table 12: Rod diameters

Size [mm]	Tolerance [mm]
4,8	+0,05; -0,2
6,3	+0,05; -0,2
7,9	+0,05; -0,2

Table 13: Cord diameters

Size [mm]	Tolerance [mm]
3,17	±0,1
4,75	±0,1

5 Properties

5.1 Mechanical properties

The mechanical properties of the wires shall be suitable for trouble-free feeding and processing. If required, the mechanical properties should be specified among manufacturer, supplier and customer.

NOTE: The temper of thermal spray wire should be suitable for uninterrupted feeding on thermal spray equipment. Very hard, poorly tempered thermal spray wires are difficult to handle, hard to straighten, and cause excessive wear on vital gun parts such as drive rolls, guides and contact tubes or nozzles. On the other hand, too soft thermal spray wires (e.g. aluminium, tin, zinc) may cause problems with feeding.

5.2 Surface properties

The surface of the thermal spray wire has to be smooth and free of corrosion products, slivers and splits, shrinkholes, splices and scales, damages as well as neckings, welds and laps. Moreover, foreign matter that would adversely affect the thermal spray material's characteristics or properties of the sprayed coating is to be avoided.

For arc spraying, martensitic and ferritic steel thermal spray wire shall be protected with a plating of copper to prevent corrosion during storage. The plating has to cover the whole wire surface without visible defects.

For alloys number 5.7 (table 7) two variants are available: 5.7a with copper plating and 5.7b with another suitable plating. A very small amount of lubricant that will not degrade the sprayed coating may be applied to the thermal spray wire to permit smooth and low-friction feeding through the thermal spray equipment.

NOTE: Using cored wires manufactured according to clause 3, table 1, should not be lubricated or treated by any liquids.

The surface of cords has to be smooth and free of neckings. The surface of rods has to be free of neckings and without scratches. Rods shall not exhibit end kinks or end-to-end warpage that could adversely affect rod feed.

5.3 Workability: Winding of wires

Wires shall be wound onto rims, coils and spools or inserted into barrels in one length. Kinks and sharp bends shall be avoided. The end shall be fastened to prevent unwinding. The beginning of the wire shall be marked so that it can be located readily. The outermost layer on spools shall be at least 3 mm from the rim of the flanges of the spool. The diameter of an unwound single wire coil shall not exceed 120 % of the spool's outer diameter but shall not be smaller than the spool's inner diameter. The wire shall not contain a twist. An unwound winding shall remain flat when laying on the ground. Given careful handling, the coils shall unwind without problems.

6 Sampling and testing

Any testing of the thermal spraying material shall be carried out with the sample taken from the beginning of the thermal spraying material pack.

In order to asses a thermal spray material, a sprayability test can be arranged among supplier and customer.

For determination and testing of the composition, all kinds of analysis can be applied as far as the required limitation are provable.

7 Designation

The designation shall follow the principle given in the example below.

The designation of a thermal spray material made of an iron alloy containing 18 % Cr, 8 % Ni, 6 % Mn and 0,15% C according to table 7, code number 5.10, and a diameter of 1,6 mm, metallurgically manufactured and formed (see table 1, code number 1) is:

Thermal spray material EN ISO 14919 - 5.10 - 1,6 - 1

8 Technical supply conditions

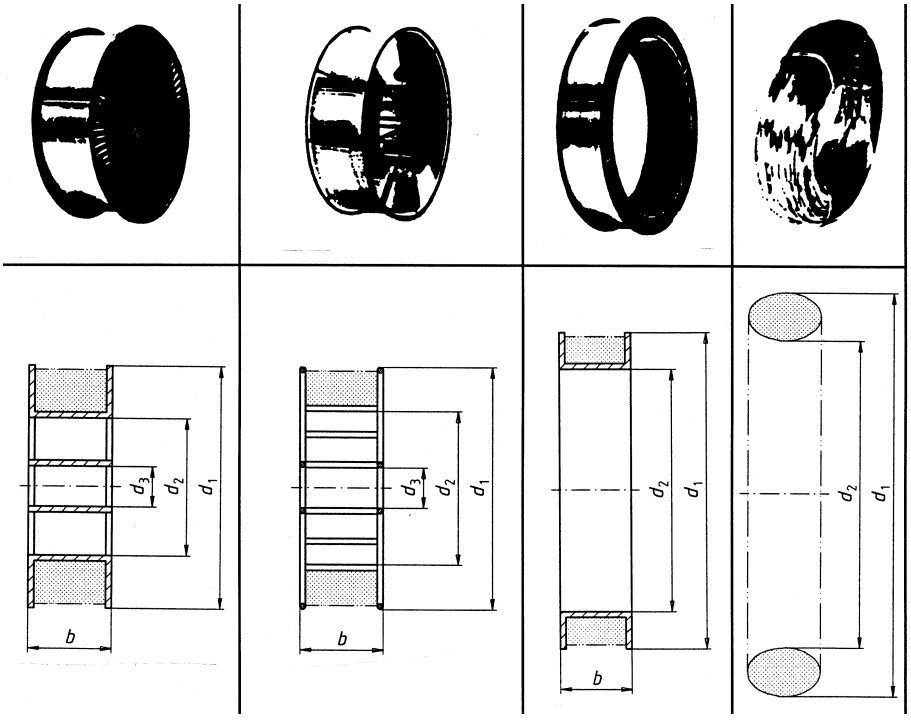
8.1 Technical forms of delivery

Technical forms are rims, coils, spools and drums. The dimensions are given in table 14. Rods are delivered in bunches of 50 or 100 pieces.

Table 14: Dimensions of spools, basket spools, rims, coils, and drums

designation	short designation	outer diameter d_1 [mm]	inner diameter d_2 [mm]	bore diameter d_3 [mm]	outer width b [mm]
spool (S)	S 300-180	300±5	180±3	$50_{0}^{+2,5}$	103_{-3}^{0}
spool (S)	S 300-210	300±5	210±3	$50_{0}^{+2,5}$	103_{-3}^{0}
basket spool (BS)	BS 300	300±5	190±3	$50_{0}^{+2,5}$	103_{-3}^{0}
rim (R)	R 392	392±5	300_{0}^{+15}	-----	90_{-3}^{0}
rim (R)	R 435	435±5	300_{0}^{+15}	-----	90_{-3}^{0}
coil (C)	C (d_1)*	500-800	300-550	-----	----
drum (D)	**				

spool (S)	basket spool (BS)	rim (R)	coil (C)



* The short designation of coils shall contain the outer diameter d_1 of the coil.

** When delivering thermal spray wire in drums the dimensions and weights of the drum shall be agreed between customer and supplier.

8.2 Identification

Spools, basket spools, rims, coils and drums and each package of ceramic rods have to be marked by durable labels providing following information:

– designation according to clause 7;

– name of manufacturer/supplier and trade designation;

– identification number;

– net weight.

– Spools and basket spools shall have the information securely affixed in a prominent location on the outside of at least one flange of or inside the spool ;

– Rims shall have a tag containing this information securely attached to the inside of the rim;

– Coils shall have the information securely affixed in a prominent location on the package;

– Drums shall have the information securely affixed in a prominent location on top of the drum and may also have the information on the side of the drum;

– Packages of ceramic rods shall have the information securely affixed in a prominent location on the side of the package;

– If the thermal spray material is supplied in an external package, the information shall also be affixed to the external package.

8.3 Packaging and storage

If there is no other agreement, the thermal spray material shall be delivered employing a packing. If handled properly, the packing shall provide a sufficient protection against damage, dirt and corrosion.

Ceramic rods shall be packaged in impact resistant tubular containers to prevent breakage during shipment.

The packaged thermal spray material shall be stored in a dry and suitable room at room temperature.

9 Certification

9.1 Certificate of compliance with the order

A certificate according to 2.1 of EN 10204:1991 shall be included with the delivery of thermal spray material.

9.2 Test report

If it is agreed among customer and manufacturer/supplier, a test report according to 2.2 of EN 10204:1991 shall also be provided.

Beside the results of the chemical analysis and the mechanical-technological testing, the supplier's designation of the product and the number of the charge shall be obtained as far as it is specified among customer and manufacturer/supplier.

ICS 25.220.20

Price based on 15 pages