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

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

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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 document 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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 240, *Thermal spraying and thermally sprayed coatings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 14919:2015), which has been technically revised.

The main changes are as follows:

- addition of the alloy ZnAl2, ZnAl4 and ZnAl22 in [Table 4](#).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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

## 1 Scope

This document 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

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 544:2017, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

ISO 10474:2013, *Steel and steel products — Inspection documents*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

## 4 Classification

### 4.1 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

**Table 1 (continued)**

Number	Term	Manufacturing process	Structure
6	oxide ceramic rods	extruding and sintering respectively drying of ceramic material	porous rod consisting of bonded ceramic particles

#### 4.2 Classification according to material groups and chemical composition

The material groups are given in [Table 2](#). The chemical composition shall conform to [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

**Table 3 — Tin and tin alloys**

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
1.1	Sn99	Sn $\geq 99,95$	total $\leq 0,05$ Sb $\leq 0,02$ Ag $\leq 0,01$ Bi $\leq 0,002$ Cu $\leq 0,01$ Fe $\leq 0,01$ Pb $\leq 0,02$ Al+Cd+Zn $\leq 0,002$	1
1.2	SnSbCu84	Sb 7 to 8 Cu 3 to 4 remainder Sn	Pb $\leq 0,35$ As $\leq 0,1$ Bi $\leq 0,08$ Fe $\leq 0,1$ Al $\leq 0,01$ Zn $\leq 0,01$ other: total $\leq 0,2$	1

Table 4 — Zinc and zinc alloys

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
2.1	Zn99,99	Zn ≥ 99,99	total ≤ 0,010 Pb ≤ 0,007 Cd ≤ 0,004 Pb+Cd ≤ 0,011 Sn ≤ 0,001 Fe ≤ 0,005 Cu ≤ 0,002 other: total ≤ 0,12	1
2.2	Zn99	Zn ≥ 99	total ≤ 1,0 Pb ≤ 0,05 Cd ≤ 0,005 Pb+Cd ≤ 0,06 Sn ≤ 0,001 Fe ≤ 0,01 Cu ≤ 0,7 Mo ≤ 0,01 Ti ≤ 0,16 Mg ≤ 0,01 Al ≤ 0,01 other: total ≤ 0,12	1
2.3	ZnAl15	Zn 84 to 86 Al 14 to 16	total ≤ 0,17 Pb ≤ 0,007 Cd ≤ 0,004 Pb+Cd ≤ 0,011 Sn ≤ 0,001 Fe ≤ 0,02 Cu ≤ 0,01 Si ≤ 0,12	1
2.4	ZnAl2	Zn 97,5 to 98,5 Al 1,5 to 2,5	total ≤ 0,17 Pb ≤ 0,007 Cd ≤ 0,004 Pb+Cd ≤ 0,011 Sn ≤ 0,001 Fe ≤ 0,02 Cu ≤ 0,01 Si ≤ 0,12	1

Table 4 (continued)

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
2.5	ZnAl4	Zn 95,5 to 96,5 Al 3,5 to 4,5	total ≤ 0,17 Pb ≤ 0,007 Cd ≤ 0,004 Pb+Cd ≤ 0,011 Sn ≤ 0,001 Fe ≤ 0,02 Cu ≤ 0,01 Si ≤ 0,12	1
2.6	ZnAl22	Zn 77 to 79 Al 21 to 23	total ≤ 0,17 Pb ≤ 0,007 Cd ≤ 0,004 Pb+Cd ≤ 0,011 Sn ≤ 0,001 Fe ≤ 0,05 Cu ≤ 0,01 Si ≤ 0,12	1

Table 5 — Aluminium and aluminium alloys

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
3.2	Al99,5	Al ≥ 99,5	total ≤ 0,3 Si ≤ 0,25 Fe ≤ 0,40 Ti ≤ 0,02 Cu ≤ 0,02 Zn ≤ 0,07 Mn ≤ 0,02 other: particular ≤ 0,03	1
3.3	AlMg5	Mg 4,5 to 5,6 Mn 0,05 to 0,20 Cr 0,05 to 0,20 Ti 0,06 to 0,20 remainder Al	total ≤ 0,9 Si ≤ 0,30 Fe ≤ 0,40 Cu ≤ 0,10 Zn ≤ 0,10 other: particular ≤ 0,15	1
3.4	AlZn5	Zn 4,5 to 5,1 remainder Al	total ≤ 1 Si ≤ 0,30 Fe ≤ 0,40 Cu ≤ 0,05 Sn ≤ 0,20 other: particular ≤ 0,05	1

Table 5 (continued)

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
3.5	AlSi5	Si 4,5 to 6,0 remainder Al	total ≤ 1 Si ≤ 0,30 Fe ≤ 0,80 Cu ≤ 0,30 Mn ≤ 0,05 Mg ≤ 0,05 Zn ≤ 0,10 Sn ≤ 0,20 other: particular ≤ 0,15	1
3.6	AlSi12	Si 11,0 to 13,0 remainder Al	total ≤ 1 Fe ≤ 0,80 Cu ≤ 0,30 Mn ≤ 0,15 Mg ≤ 0,10 Zn ≤ 0,20 Ti ≤ 0,15 other particular: ≤ 0,05 other total: ≤ 0,15	1

Table 6 — Copper and copper alloys

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing 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

**Table 6 (continued)**

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
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
4.6	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
4.7	CuAl10	Al 8,5 to 11 Fe 0,5 to 1,5 remainder Cu	Ni+Co ≤ 1,0 Pb ≤ 0,02 Si ≤ 0,1 Mn ≤ 0,03 Zn ≤ 0,02 other: total ≤ 0,3	1

**Table 7 — Iron and iron alloys**

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
5.1	10Mn	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
5.3	80MnSi	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
5.6	110MnCrTi5-5	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	X45Cr13 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
<sup>a</sup> Material is similar to that in brackets. Different limit values are underlined.				

Table 7 (continued)

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
5.8	X20CrMo13-1	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 6CrAl22-4	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	X6CrNi19-9	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	(X5CrNi- Mo17-12-2) <sup>a</sup>	C ≤ 0,08 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, 4
5.12	(X12CrNiMn18-8-6) <sup>a</sup>	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, 4
5.13	X12CrNi25-20	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
5.14	X25CrCuB26-3-3	C ≤ 0,3 Cr ≤ 26 Mn ≤ 1 Si ≤ 0,3 Cu ≤ 3 B ≤ 3 remainder Fe	other ≤ 1	3, 4
5.15	X25MnAlSi7-5	C ≤ 0,3 Al 4 to 5 Mn 6 to 8 Si ≤ 1,0 remainder Fe	other ≤ 1	3, 4
5.16	X39CrMo17-1 a) with Cu plating b) without Cu plating	C 0,33 to 0,45 Si ≤ 1,0 Mn ≤ 1,5 Cr 15,5 to 17,5 Mo 0,80 to 1,3 remainder Fe	P ≤ 0,040 S ≤ 0,015	1

<sup>a</sup> Material is similar to that in brackets. Different limit values are underlined.

**Table 8 — Nickel and nickel alloys**

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
6.1	NiCu30Mn3Ti (NiCu30)	Ni ≥ 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 ≥ 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 ≥ 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
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 <sup>a</sup>
6.7	NiAlMo5–5	Al 4,5 to 5,5 Mo ≤ 5 remainder Ni	other ≤ 1	3, 4

<sup>a</sup> Filling is typically performed by a solid wire.

Table 8 (continued)

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
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
6.11	NiCr22Mo9Nb	Ni ≤ 58,0 Cr 18 to 23 Mo 8 to 10 Nb 3,15 to 4,15	C 0,03 to 0,10 Si ≤ 0,5 Mn ≤ 0,5 TiAl ≤ 0,2 Co ≤ 0,1 Cu 1,5 to 3 P ≤ 0,02 S ≤ 0,015 remainder Fe	1, 4
6.12	NiCu30Mn	Ni ≤ 63,0 Cu 26,5 to 34,0 Fe 1,00 to 2,5	C ≤ 0,15 Si ≤ 0,50 Mn ≤ 2,00 S ≤ 0,020 Ti ≤ 0,30 Al ≤ 0,5	1

<sup>a</sup> Filling is typically performed by a solid wire.

Table 9 — Molybdenum

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
7.1	Mo	Mo ≥ 99,95	other ≤ 0,05	2

Table 10 — Oxide ceramics

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
8.1	95ZrO <sub>2</sub> -5CaO	ZrO <sub>2</sub> ≥ 92 CaO 5 to 7	Al <sub>2</sub> O <sub>3</sub> ≤ 0,7 SiO <sub>2</sub> ≤ 0,4 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,04 TiO <sub>2</sub> ≤ 0,4 Na <sub>2</sub> O ≤ 0,02 MgO ≤ 0,07	5, 6
8.2	70ZrO <sub>2</sub> -30CaO	ZrO <sub>2</sub> ≥ 68 CaO 28 to 31	Al <sub>2</sub> O <sub>3</sub> ≤ 0,7 TiO <sub>2</sub> ≤ 0,4 Na <sub>2</sub> O ≤ 0,02 MgO ≤ 0,07	5

Table 10 (continued)

Code number	Symbol	Alloying elements % (mass fraction)	Other elements % (mass fraction)	Manufacturing process
8.3	Cr <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub> ≥ 90,0	Al <sub>2</sub> O <sub>3</sub> ≤ 4 CaO ≤ 0,2 SiO <sub>2</sub> ≤ 5 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,3 TiO <sub>2</sub> ≤ 0,3 MgO ≤ 0,1	5, 6
8.4	Al <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub> ≥ 98	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 0,8 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,09 TiO <sub>2</sub> ≤ 0,03 Na <sub>2</sub> O ≤ 0,06 MgO ≤ 0,3	5, 6
8.5	97Al <sub>2</sub> O <sub>3</sub> -3TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> ≥ 94 ≥ 3 TiO <sub>2</sub>	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 1,0 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,5 Na <sub>2</sub> O ≤ 0,04 MgO ≤ 0,5 Mn <sub>3</sub> O <sub>4</sub> ≤ 0,05	5
8.6	87Al <sub>2</sub> O <sub>3</sub> -13TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> 85 to 87 TiO <sub>2</sub> 13 to 15	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 0,5 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,3 Na <sub>2</sub> O ≤ 0,2 MgO ≤ 0,3	5, 6
8.7	60Al <sub>2</sub> O <sub>3</sub> -40TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> 58 to 60 TiO <sub>2</sub> 40 to 42	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 0,5 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,3 Na <sub>2</sub> O ≤ 0,2 MgO ≤ 0,3	5, 6
8.8	70Al <sub>2</sub> O <sub>3</sub> -30SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> 72 to 78 SiO <sub>2</sub> 22 to 28	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 0,5 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,3 Na <sub>2</sub> O ≤ 0,2 MgO ≤ 0,3	5
8.9	70Al <sub>2</sub> O <sub>3</sub> -30MgO	Al <sub>2</sub> O <sub>3</sub> 76 to 82 MgO 18 to 24	CaO ≤ 0,2 SiO <sub>2</sub> ≤ 0,5 Fe <sub>2</sub> O <sub>3</sub> ≤ 0,3 Na <sub>2</sub> O ≤ 0,2 MgO ≤ 0,3	5

## 5 Sizes and tolerances

Standard sizes and tolerances of diameter in millimetres for thermal spray wires, rods and cords are given in [Tables 11](#), [12](#) and [13](#). If required, smaller ranges of tolerances can be agreed between the customer and the manufacturer/supplier. The straightness of the rods shall allow the spray material to be fed satisfactorily.

**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
2,4	+ 0; -0,06
2,5	+ 0; -0,06
3,0	+ 0; -0,07
3,17	+ 0; -0,07
3,48	+ 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

**Table 13 — Cord diameters**

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

## 6 Properties

### 6.1 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 the manufacturer, the supplier and the customer.

The temper of thermal spray wire should be suitable for uninterrupted feeding on thermal spray equipment.

NOTE 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) can cause problems with feeding.

### 6.2 Surface properties

The surface of the thermal spray wire shall 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 shall 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 shall cover the whole wire surface without visible defects.

For alloys number 5.7 (see [Table 7](#)) two variants are available: 5.7a) with copper plating and 5.7b) with another suitable plating. This condition is also valid for 5.16a) and 5.16b). 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.

Cored wires manufactured in accordance with [Table 1](#) should not be lubricated or treated by any liquids.

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

### 6.3 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.

## 7 Designation

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

**EXAMPLE** The designation of a thermal spray material made of an iron alloy containing 19 % Cr and 9 % Ni in accordance with [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 ISO 14919:2023-5.10-1,6-1

## 8 Technical supply conditions

### 8.1 Forms of delivery

The products shall be delivered on rims, coils, spools or drums in accordance with [Table 14](#) and [Table 15](#). Rods are delivered in packages of 25 or 100 pieces.