



SLOVENSKI STANDARD SIST EN ISO 14919:2002

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Thermal spraying - Wires, rods and cords for flame and arc spraying - Classification -
Technical supply conditions (ISO 14919:2001)

Thermisches Spritzen - Drähte, Stäbe und Schnüre zum Flammsspritzen und
Lichtbogenspritzen - Einteilung Technische Lieferbedingungen (ISO 14919:2001)

Projection thermique - Fils, baguettes et cordons pour projection thermique a l'arc et au
pistolet dans une flamme - Classification - Conditions techniques d'approvisionnement
(ISO 14919:2001)

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Ta slovenski standard je istoveten z: EN ISO 14919:2001

ICS:

25.220.20 Površinska obdelava Surface treatment

SIST EN ISO 14919:2002 en

ICS 25.220.20

English version

Thermal spraying - Wires, rods and cords for flame and arc spraying - Classification - Technical supply conditions (ISO 14919:2001)

Projection thermique - Fils, baguettes et cordons pour projection thermique à l'arc et au pistolet dans une flamme
- Classification - Conditions techniques d'approvisionnement (ISO 14919:2001)

Thermisches Spritzen - Drähte, Stäbe und Schnüre zum Flammsspritzen und Lichtbogenspritzen - Einteilung - Technische Lieferbedingungen (ISO 14919:2001)

This European Standard was approved by CEN on 13 May 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

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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 $\leq 0,05$ 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

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 ≤ 0,010 Pb ≤ 0,005 Cd ≤ 0,005 Pb+Cd ≤ 0,006 Sn ≤ 0,001 Fe ≤ 0,003 Cu ≤ 0,002 other: total ≤ 0,12	1
2.2	Zn99	Zn min. 99	total ≤ 1,0 Pb ≤ 0,005 Cd ≤ 0,005 Pb+Cd ≤ 0,006 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 <small>SIST EN 14919:2002</small>	total ≤ 0,17 Pb ≤ 0,005 Cd ≤ 0,005 Pb+Cd ≤ 0,006 Sn ≤ 0,001 Fe ≤ 0,05 Cu ≤ 0,01 Si ≤ 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 ≤ 0,02 Si ≤ 0,01 Zn ≤ 0,01 Fe ≤ 0,006 Cu ≤ 0,003 Ti ≤ 0,003 other: particular ≤ 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 $\leq 0,5$ Si $\leq 0,3$ Fe $\leq 0,4$ Ti $\leq 0,05$ Cu $\leq 0,05$ Zn $\leq 0,07$ Mn $\leq 0,05$ other: particular $\leq 0,03$	1
3.3	AlMg5	Mg 4,5 to 5,5 Mn 0 to 0,5 Cr 0 to 0,3 Ti 0,10 to 0,25 remainder Al	total $\leq 0,9$ Si $\leq 0,25$ Fe $\leq 0,40$ Cu $\leq 0,05$ Zn $\leq 0,2$ other: particular $\leq 0,05$	1
3.4	AlZn5	Zn 4,5 to 5,1 remainder Al	total ≤ 1 Si $\leq 0,30$ Fe $\leq 0,40$ Cu $\leq 0,05$ Sn $\leq 0,20$ other: particular $\leq 0,05$	1
3.5	AlSi5	Si 4,5 bis 5,5 remainder Al	total ≤ 1 Si $\leq 0,30$ Fe $\leq 0,40$ Cu $\leq 0,05$ Sn $\leq 0,20$ other: particular $\leq 0,05$	1

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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 %	manufacturing process
4.1	Cu99	Cu $\geq 99,9$	other $\leq 0,01$	1
4.2	CuZn37	Cu 62,0 to 64 remainder Zn	Al $\leq 0,03$ Fe $\leq 0,1$ Mn $\leq 0,1$ Ni $\leq 0,3$ Pb $\leq 0,1$ Sb $\leq 0,01$ Sn $\leq 0,1$ other: total $\leq 0,5$	1
4.3	CuZn39	Cu 56 to 62 Sn 0,5 to 1,5 Si 0,1 to 0,5 remainder Zn	Ni $\leq 1,5$ Mn $\leq 1,0$ Fe $\leq 0,5$ Al $\leq 0,01$ Pb $\leq 0,03$ other: total $\leq 0,2$	1
4.4	CuSn6	Sn 5,0 to 8,0 remainder Cu	Fe $\leq 0,1$ Al $\leq 0,01$ Zn $\leq 0,1$ Pb $\leq 0,02$ P 0,01 to 0,4 other: total $\leq 0,4$	1
4.5	CuSn12	Sn 11,0 to 13,0 remainder Cu	Fe $\leq 0,1$ Al $\leq 0,01$ Zn $\leq 0,1$ Pb $\leq 0,02$ P 0,01 to 0,4 other: total $\leq 0,4$	1
4.6	CuAl8	Al 7,5 to 9,5 remainder Cu	Mn $\leq 1,8$ Ni $\leq 0,8$ Fe $\leq 0,5$ Si $\leq 0,2$ Zn $\leq 0,2$ other: total $\leq 0,5$	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 $\leq 1,0$ Pb $\leq 0,05$ Si $\leq 0,2$ Zn $\leq 0,5$ other: total $\leq 0,3$	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 $\leq 0,15$ Cu $\leq 0,20$ Ni $\leq 0,15$ P $\leq 0,030$ S $\leq 0,030$	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 $\leq 0,15$ Cu $\leq 0,20$ Mo $\leq 0,15$ Ni $\leq 0,15$ P $\leq 0,025$ S $\leq 0,025$	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 $\leq 0,035$ S $\leq 0,035$	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 $\leq 0,035$ S $\leq 0,035$	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 $\leq 0,030$ S $\leq 0,030$	1

(continued)