
**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*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 14919:2015

[https://standards.iteh.ai/catalog/standards/sist/c8ded3c9-77ec-40e6-a499-
de862abac32a/iso-14919-2015](https://standards.iteh.ai/catalog/standards/sist/c8ded3c9-77ec-40e6-a499-de862abac32a/iso-14919-2015)



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 14919:2015

<https://standards.iteh.ai/catalog/standards/sist/c8ded3c9-77ec-40e6-a499-de862abac32a/iso-14919-2015>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Classification	1
3.1 Classification according to the manufacturing process and resulting structure.....	1
3.2 Classification according to material groups and chemical composition.....	1
3.2.1 Tin and tin alloys.....	2
3.2.2 Zinc and zinc alloys.....	3
3.2.3 Aluminium and aluminium alloys.....	4
3.2.4 Copper and copper alloys.....	5
3.2.5 Iron and iron alloys.....	6
3.2.6 Nickel and nickel alloys.....	8
3.2.7 Molybdenum.....	9
3.2.8 Ceramics.....	9
4 Sizes and tolerances	10
5 Properties	11
5.1 Mechanical properties.....	11
5.2 Surface properties.....	11
5.3 Workability: Winding of wires.....	12
6 Designation	12
7 Technical supply conditions	12
7.1 Forms of delivery.....	12
7.2 Identification.....	14
7.3 Packaging and storage.....	14
8 Inspection documents	14

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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](#)

ISO 14919 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 240, *Thermal spraying and thermally sprayed coatings*, in collaboration with ISO Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14919:2001), which has been technically revised.

Introduction

Requests for official interpretations of any aspect of this standard should be directed to the secretariat of ISO/TC 107/WG 1 via your national standards body; a complete listing can be found at www.iso.org.

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 14919:2015

<https://standards.iteh.ai/catalog/standards/sist/c8ded3c9-77ec-40e6-a499-de862abac32a/iso-14919-2015>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 14919:2015

<https://standards.iteh.ai/catalog/standards/sist/c8ded3c9-77ec-40e6-a499-de862abac32a/iso-14919-2015>

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

1 Scope

This International 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

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

ISO 544:2011, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

3 Classification

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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	oxide ceramic rods	extruding and sintering respectively drying 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 %	Manufacturing process
1.1	Sn99	Sn ≥ 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 in %	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

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 %	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: ≤ 0,03 particular	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: ≤ 0,15 particular	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: ≤ 0,05 particular	1
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: ≤ 0,15 particular	1

Table 5 (continued)

Code number	Symbol	Alloying elements mass fraction in %	Other elements mass fraction in %	Manufacturing process
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

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 ≥ 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