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**Wires, rods and cords for flame and
arc thermal spraying**

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal of establishing of Japanese Industrial Standard submitted by Japan Thermal Spraying Society (JTSS)/ Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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Wires, rods and cords for flame and arc thermal spraying

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 14919** published in 2001 with some modifications of the technical contents involving the difference in values of the material elements in detail.

The portions given dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with explanations is given in Annex JA.

1 Scope

This Standard specifies the chemical compositions and properties of wires, rods and cords for flame and arc thermal spraying (hereafter referred to as “thermal spraying material”).

This Standard shall apply to the flame and arc thermal spraying.

NOTE : This Standard specifies the characteristics of thermal spraying material. However, it is not intended to perform conformity assessment with this Standard.

The International Standard corresponding to this Standard and the symbol which denotes the degree of correspondence are as follows:

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

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are **IDT** (identical), **MOD** (modified), and **NEQ** (not equivalent) according to **ISO/IEC Guide 21**.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this Standard. The most recent edition of the standard (including amendments) indicated below shall be applied.

JIS H 8200 *Thermal spraying terms*

3 Terms and definitions

For the purposes of this Standard, the definitions given in **JIS H 8200** shall apply.

4 Types and chemical compositions

4.1 Classification according to manufacturing process and structure

The classification of thermal spraying material according to the manufacturing process and structure shall be in accordance with table 1.

Table 1 Classification of thermal spraying material according to manufacturing process and structure

Classification	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	Cord	Simultaneous extruding of powder, binder and organic sheath	Plastic shell with powder filling
6	Ceramic rod	Extruding and sintering of ceramic material	Porous rod consisting of bonded ceramic particles

4.2 Types and chemical compositions

The types and chemical compositions of thermal spraying material shall be as follows.

- a) **Tin and tin alloys** The types of tin and tin alloys shall be classified as shown in table 2 according to the code number and symbol.

The chemical compositions of these tin and tin alloys shall be analyzed in accordance with clause 7, and shall satisfy values in table 2.

Table 2 Tin and tin alloys

Type		Alloying elements % (mass fraction)	Other elements % (mass fraction)		Classification ^{c)}
Code number	Symbol				
1.1	Sn99	Sn 99.95 min.	Total ^{a)} 0.05 max. Sb 0.02 max. Ag 0.01 max. Bi 0.002 max. Cu 0.01 max. Fe 0.01 max. Pb 0.02 max. Al+Cd+Zn 0.002 max.		1

Table 2 (concluded)

Type		Alloying elements % (mass fraction)	Other elements % (mass fraction)		Classifi- cation ^{c)}
Code number	Symbol				
1.2	SnSbCu84	Sb 7 to 8 Cu 3 to 4 Sn 88	Pb 0.35 max. As 0.1 max. Bi 0.08 max. Fe 0.1 max. Al 0.01 max. Zn 0.01 max. Total of others ^{b)} 0.2 max.		1
Notes ^{a)} The total here shall be the sum of elements excluding alloying elements.					
^{b)} Total of others shall be the sum of remaining elements of those specified in other elements.					
^{c)} The classification shall be in accordance with table 1.					

- b) **Zinc and zinc alloys** The types of zinc and zinc alloys shall be classified as shown in table 3 according to the code number and symbol.

The chemical compositions of these zinc and zinc alloys shall be analyzed in accordance with clause 7, and shall satisfy values in table 3.

Table 3 Zinc and zinc alloys

Type		Alloying elements % (mass fraction)	Other elements % (mass fraction)		Classifi- cation ^{b)}
Code number	Symbol				
2.1	Zn99.99	Zn 99.99 min.	Pb 0.007 max. Cd 0.004 max. Fe 0.005 max.		1
2.2	Zn99	Zn 99 min.	Total ^{a)} 1.0 max. Pb 0.009 max. Cd 0.009 max. Pb+Cd 0.009 max. Sn 0.001 max. Fe 0.01 max. Cu 0.7 max. Mo 0.01 max. Ti 0.16 max. Mg 0.01 max. Al 0.01 max.		1
2.3	ZnAl15	Zn 84 to 86 Al 14 to 16	Pb 0.007 max. Cd 0.004 max. Fe 0.02 max.		1
Notes ^{a)} The total here shall be the sum of elements excluding alloying elements.					
^{b)} The classification shall be in accordance with table 1.					

- c) **Aluminium and aluminium alloys** The types of aluminium and aluminium alloys shall be classified as shown in table 4 according to the code number and symbol.

The chemical compositions of these aluminium and aluminium alloys shall be analyzed in accordance with clause 7, and shall satisfy values in table 4.

Table 4 Aluminium and aluminium alloys

Type		Alloying elements % (mass fraction)	Other elements % (mass fraction)	Classifi- cation ^{e)}
Code number	Symbol			
3.1	Al99.98	Al 99.98 min.	Total ^{a)} 0.02 max. Si 0.01 max. Zn 0.01 max. Fe 0.006 max. Cu 0.003 max. Ti 0.003 max. Total of others ^{b)} 0.003 max.	1
3.2	Al99.5	Al 99.5 min.	Total ^{a)} 0.3 max. Si 0.25 max. Fe 0.40 max. Ti 0.02 max. Cu 0.02 max. Mn 0.02 max.	1
3.3	AlMg5	Mg 4.5 to 5.6 Al Remainder	Si 0.30 max. Fe 0.40 max. Cu 0.10 max. Mn 0.05 to 0.20 Cr 0.05 to 0.20 Zn 0.10 max. Total of others ^{b)} 0.15 max.	1
3.4	AlZn5	Zn 4.5 to 5.1 Al Remainder	Total ^{a)} 1 max. Si 0.30 max. Fe 0.40 max. Cu 0.05 max. Sn 0.20 max. Total of others ^{b)} 0.05 max.	1
3.5	AlSi5	Si 4.5 to 6.0 Al Remainder	Fe 0.8 max. Cu 0.30 max. Mn 0.05 max. Mg 0.05 max. Zn 0.10 max. Total of others ^{b)} 0.15 max.	1