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(JLWA/JSA)

**Aluminium and aluminium alloy welding
rods and wires**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Light Metal Welding & Construction Association (JLWA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS Z 3232:2000** is replaced with this Standard.

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Aluminium and aluminium alloy welding rods and wires

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of ISO 18273 published in 2004 with some modifications of the technical contents.

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

1 Scope

This Standard specifies the welding rods (hereafter referred to as "rods") and the welding wires (hereafter referred to as "wires") of aluminium and aluminium alloy used for MIG welding, TIG welding and oxy-acetylene welding.

NOTE : The International Standard corresponding to this Standard is as follows.

ISO 18273 : 2004 *Welding consumables — Wire electrodes, wires and rods for welding of aluminium and aluminium alloys — Classification* (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 references

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

JIS H 0321 *General rules for inspection of non-ferrous metal materials*

JIS H 1305 *Method for optical emission spectrochemical analysis of aluminium and aluminium alloys*

JIS H 1306 *Methods for atomic absorption spectrometric analysis of aluminium and aluminium alloys*

JIS H 1307 *Methods for inductively coupled plasma emission spectrometric analysis of aluminium and aluminium alloys*

JIS H 1352 *Methods for determination of silicon in aluminium and aluminium alloys*

- JIS H 1353 *Methods for determination of iron in aluminium and aluminium alloys*
- JIS H 1354 *Methods for determination of copper in aluminium and aluminium alloys*
- JIS H 1355 *Methods for determination of manganese in aluminium and aluminium alloys*
- JIS H 1356 *Method for determination of zinc in aluminium and aluminium alloys*
- JIS H 1357 *Methods for determination of magnesium in aluminium and aluminium alloys*
- JIS H 1358 *Methods for determination of chromium in aluminium and aluminium alloys*
- JIS H 1359 *Methods for determination of titanium in aluminium and aluminium alloys*
- JIS H 1362 *Method for determination of vanadium in aluminium and aluminium alloys*
- JIS H 1363 *Methods for determination of zirconium in aluminium alloys*
- JIS H 1367 *Methods for determination of beryllium in aluminium and aluminium alloys*
- JIS H 1368 *Method for determination of gallium in aluminium and aluminium alloys*
- JIS H 4000 *Aluminium and aluminium alloy sheets, strips and plates*
- JIS Z 2241 *Method of tensile test for metallic materials*
- JIS Z 2248 *Metallic materials — Bend test*
- JIS Z 3001-1 *Welding and allied processes — Vocabulary — Part 1 : General*
- JIS Z 3001-2 *Welding and allied processes — Vocabulary — Part 2 : Welding processes*
- JIS Z 3121 *Methods of tensile test for butt welded joints*
- JIS Z 3122 *Methods of bend test for butt welded joint*
- JIS Z 3200 *Welding consumables — Technical delivery conditions for welding filler materials — Type of product, dimensions, tolerances and markings*
- NOTE : Corresponding International Standard : ISO 544 *Welding consumables — Technical delivery conditions for welding filler materials — Type of product, dimensions, tolerances and markings* (MOD)
- JIS Z 3253 *Shielding gases for arc welding and plasma arc cutting*
- JIS Z 3604 *Recommended practice for inert gas shielded arc welding of aluminium and aluminium alloys*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in JIS Z 3001-1 and JIS Z 3001-2 shall apply.

4 Classification

Rods and wires shall be as follows.

- a) The classification according to the chemical composition shall be in accordance with table 1.

Either Symbol A or Symbol B shall be used.

- b) The classification according to the configuration shall be rods or wires, and the symbol thereof shall be BY and WY, respectively.

Table 1 Classification according to chemical composition and symbol thereof

Symbol A	Symbol B ^{a)}	Symbol A	Symbol B ^{a)}	Symbol A	Symbol B ^{a)}
A1070	Al 1070	A4043	Al 4043	A5754	Al 5754
A1080A	Al 1080A	A4043A	Al 4043A	A5356	Al 5356
A1188	Al 1188	A4046	Al 4046	A5356A	Al 5356A
A1100	Al 1100	A4047	Al 4047	A5556	Al 5556
A1200	Al 1200	A4047A	Al 4047A	A5556C	Al 5556C
A1450	Al 1450	A4145	Al 4145	A5556A	Al 5556A
A2319	Al 2319	A4643	Al 4643	A5556B	Al 5556B
A3103	Al 3103	A5249	Al 5249	A5183	Al 5183
A4009	Al 4009	A5554	Al 5554	A5183A	Al 5183A
A4010	Al 4010	A5654	Al 5654	A5087	Al 5087
A4018	Al 4018	A5654A	Al 5654A	A5187	Al 5187
Note ^{a)} Symbol B is the specification in accordance with ISO 18273.					

5 Quality

5.1 Chemical composition

The chemical composition of rods and wires shall conform to the requirements specified in table 2, when tested in accordance with the method of 8.1.

Table 2 Chemical composition

Unit : % (mass fraction)

Classification		Chemical composition													
		Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga and / or V	Zr	Ti	Be	Other ^{a)}		Al
Symbol A	Symbol B												each	total	
A1070	Al 1070	0.20 max.	0.25 max.	0.04 max.	0.03 max.	0.03 max.	—	0.04 max.	V 0.05 max.	—	0.03 max.	0.000 3 max.	0.03 max.	—	99.70 min.
A1080A	Al 1080A	0.15 max.	0.15 max.	0.03 max.	0.02 max.	0.02 max.	—	0.06 max.	Ga 0.03 max.	—	0.02 max.	0.000 3 max.	0.02 max.	—	99.80 min.
A1188	Al 1188	0.06 max.	0.06 max.	0.005 max.	0.01 max.	0.01 max.	—	0.03 max.	Ga 0.03 max. V 0.05 max.	—	0.01 max.	0.000 3 max.	0.01 max.	—	99.88 min.
A1100	Al 1100	Si+Fe 0.95 max.		0.05 to 0.20	0.05 max.	—	—	0.10 max.	—	—	—	0.000 3 max.	0.05 max.	0.15 max.	99.00 min.
A1200	Al 1200	Si+Fe 1.00 max.		0.05 max.	0.05 max.	—	—	0.10 max.	—	—	0.05 max.	0.000 3 max.	0.05 max.	0.15 max.	99.00 min.
A1450	Al 1450	0.25 max.	0.40 max.	0.05 max.	0.05 max.	0.05 max.	—	0.07 max.	—	—	0.10 to 0.20	0.000 3 max.	0.03 max.	—	99.50 min.
A2319	Al 2319	0.20 max.	0.30 max.	5.8 to 6.8	0.20 to 0.40	0.02 max.	—	0.10 max.	V 0.05 to 0.15	0.10 to 0.25	0.10 to 0.20	0.000 3 max.	0.05 max.	0.15 max.	Remainder
A3103	Al 3103	0.50 max.	0.7 max.	0.10 max.	0.9 to 1.5	0.30 max.	0.10 max.	0.20 max.	—	Ti+Zr 0.10 max.		0.000 3 max.	0.05 max.	0.15 max.	Remainder
A4009	Al 4009	4.5 to 5.5	0.20 max.	1.0 to 1.5	0.10 max.	0.45 to 0.6	—	0.10 max.	—	—	0.20 max.	0.000 3 max.	0.05 max.	0.15 max.	Remainder
A4010	Al 4010	6.5 to 7.5	0.20 max.	0.20 max.	0.10 max.	0.30 to 0.45	—	0.10 max.	—	—	0.20 max.	0.000 3 max.	0.05 max.	0.15 max.	Remainder
A4018	Al 4018	6.5 to 7.5	0.20 max.	0.05 max.	0.10 max.	0.50 to 0.8	—	0.10 max.	—	—	0.20 max.	0.000 3 max.	0.05 max.	0.15 max.	Remainder
A4043	Al 4043	4.5 to 6.0	0.8 max.	0.30 max.	0.05 max.	0.05 max.	—	0.10 max.	—	—	0.20 max.	0.000 3 max.	0.05 max.	0.15 max.	Remainder
A4043A	Al 4043A	4.5 to 6.0	0.6 max.	0.30 max.	0.15 max.	0.20 max.	—	0.10 max.	—	—	0.15 max.	0.000 3 max.	0.05 max.	0.15 max.	Remainder