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**Aluminium alloy brazing filler metals
and brazing sheets**

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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 the Japan Light Metal Welding and Construction Association (JLWA)/ the Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law. Consequently **JIS Z 3263 : 1992** is replaced with this Standard.

In this revision, the prevailing technology situation in Japan is considered in specifying the types of cores and brazing sheets, and constitution and mechanical properties of brazing sheets, and others.

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Aluminium alloy brazing filler metals and brazing sheets

1 Scope This Japanese Industrial Standard specifies types, qualities, dimensions and tolerances thereof, tests, inspection, designations, and markings of the products of the aluminium alloy brazing filler metals (hereafter referred to as “brazing filler metals”) and brazing sheets, to be used for brazing.

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

- JIS H 0001 *Aluminium, magnesium and their alloys—Temper designation*
- JIS H 0321 *General rules for inspection of non-ferrous metal materials*
- JIS H 1305 *Method for photoelectric emission spectrochemical analysis of aluminium and aluminium alloy*
- JIS H 1306 *Methods for atomic absorption spectrometric analysis of aluminium and aluminium alloys*
- JIS H 1351 *General rules for chemical analysis of aluminium and aluminium alloy*
- 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 Z 2201 *Test pieces for tensile test for metallic materials*
- JIS Z 2241 *Method of tensile test for metallic materials*
- JIS Z 2611 *General rules for photoelectric emission spectrochemical analysis of metal materials*
- JIS Z 3001 *Welding terms*

3 Definitions For the purposes of this Standard, the definitions in **JIS Z 3001** apply, and the rest of the terms are as follows.

- a) **brazing filler metals** Those which are used independently or used as the skins of brazing sheets.

- b) **core** The main aluminium alloy composing the brazing sheets of which solid-phase line temperature is higher than the liquid-phase line temperature of the brazing filler metals.
- c) **skin** Brazing filler metal which has been clad on the core surface.
- d) **sacrifice anode** Aluminium alloy that has been clad on the core surface whose electric potential is lower than that of the core.
- e) **clad ratio** The ratio (%) of the depth of skin (single side) to that of the brazing sheet.

4 Types The types of brazing filler metals, cores and sacrifice anodes and the constitution and types of brazing sheets shall be in accordance with the following:

- a) Types and symbols of the brazing filler metals shall be as given in Table 1 according to uses.
- b) Types of the cores and the sacrifice anodes shall be as given in Table 2.
- c) The constitution of the brazing sheets shall be as given in Table 3.
- d) Types and the symbols of the brazing sheets shall be as given in Table 4.

Table 1 Types and symbols of brazing filler metals

Type				Information		
Alloy No.	Shape	Symbol ⁽²⁾	Nominal No. ⁽³⁾	Solid-phase line temperature °C	Liquid-phase line temperature °C	Brazing temperature °C
4343	Plate, strip	BA4343P	—	577	615	600 to 620
	Skin	—	1			
4045	Wire	BA4045W	—	577	590	590 to 605
	Rod	BA4045B				
	Plate, strip	BA4045P				
	Skin	—	2			
4004 ⁽¹⁾	Skin	—	3	559	591	590 to 605
4005 ⁽¹⁾	Skin	—	4	559	591	590 to 605
4N04 ⁽¹⁾	Skin	—	5	559	579	580 to 600
4104 ⁽¹⁾	Skin	—	6	559	591	590 to 605
4N43	Skin	—	7	576	609	600 to 620
4N45	Skin	—	8	576	588	590 to 605
4145	Rod	BA4145B	—	520	585	570 to 605
4047	Wire	BA4047W	—	577	580	580 to 605
	Rod	BA4047B				
	Plate, strip	BA4047P				

Notes (1) To be used as the skins of the brazing sheets for vacuum brazing.

(2) Symbol in the case where it is used independently as the brazing filler metal.

(3) Nominal number of the brazing filler metal as skins.

Table 2 Types of cores and sacrifice anodes

Type		Information	
Alloy No.	Nominal No.	Solid-phase line temperature °C	Liquid-phase line temperature °C
3003 ⁽⁴⁾	1	643	654
3N03 ⁽⁴⁾	2	641	653
3N33 ⁽⁴⁾	5	635	654
3005 ⁽⁴⁾	6	638	654
3N43 ⁽⁴⁾	7	637	653
6951 ⁽⁴⁾	4	616	654
7072 ⁽⁵⁾	—	646	657
7N82 ⁽⁵⁾	—	620	650

Notes ⁽⁴⁾ Core.

⁽⁵⁾ Sacrifice anode.

Table 3 Constitution of brazing sheets

Constitution	Nominal No.
One-side brazing filler metal clad	1
Both-sides brazing filler metal clad	2
One-side brazing filler metal/ One-side 7072 clad	3
One-side brazing filler metal/ One-side 7N82 clad	4

Table 4 Types and symbols of brazing sheets

Types and symbols of brazing sheets				Skin		Core		Information	
Constitution nominal No. of brazing sheets				Alloy No.	Nominal No.	Alloy No.	Nominal No.	Brazing temperature °C	Methods of brazing
1	2	3	4						
BAS111P	BAS211P	BAS311P	BAS411P	4343	1	3003	1	600 to 620	Flux brazing
BAS121P	BAS221P	BAS321P	—	4045	2			590 to 605	
BAS171P	BAS271P	BAS371P	—	4N43	7			600 to 620	
—	BAS281P	—	—	4N45	8			590 to 605	
—	BAS212P	—	—	4343	1	3N03	2	600 to 620	
—	BAS222P	—	—	4045	2			590 to 605	
—	BAS272P	—	—	4N43	7			600 to 620	
—	BAS282P	—	—	4N45	8			590 to 605	
BAS115P	BAS215P	BAS315P	BAS415P	4343	1	3N33	5	600 to 620	
BAS125P	—	BAS325P	—	4045	2			590 to 605	
—	—	—	—	4N43	7			600 to 620	
—	—	—	—	4N45	8			590 to 605	

Table 4 (concluded)

Types and symbols of brazing sheets				Skin		Core		Information	
Constitution nominal No. of brazing sheets				Alloy No.	Nominal No.	Alloy No.	Nominal No.	Brazing temperature °C	Methods of brazing
1	2	3	4						
BAS131P	BAS231P	BAS331P	BAS431P	4004	3	3003	1	590 to 605	Vacuum brazing
—	—	—	—	4005	4			590 to 605	
—	BAS251P	—	—	4N04	5			580 to 600	
BAS161P	BAS261P	BAS361P	—	4104	6			590 to 605	
—	BAS232P	—	—	4004	3	3N03	2	590 to 605	
—	—	—	—	4005	4			590 to 605	
—	—	—	—	4N04	5			580 to 600	
—	—	—	—	4104	6			590 to 605	
—	—	BAS335P	BAS435P	4004	3	3N33	5	590 to 605	
—	BAS245P	—	—	4005	4			590 to 605	
—	BAS255P	—	—	4N04	5			580 to 600	
—	BAS265P	BAS365P	—	4104	6			590 to 605	
BAS136P	—	—	—	4004	3	3005	6	590 to 605	
—	—	—	—	4005	4			590 to 605	
—	—	—	—	4N04	5			580 to 600	
—	—	—	—	4104	6			590 to 605	
—	—	—	—	4004	3	3N43	7	590 to 605	
—	—	—	—	4005	4			590 to 605	
—	BAS257P	—	—	4N04	5			580 to 600	
—	—	—	—	4104	6			590 to 605	
BAS114P	BAS214P	—	—	4343	1	6951	4	600 to 620	Flux brazing and vacuum brazing
BAS124P	BAS224P	—	—	4045	2			590 to 605	
BAS134P	—	—	—	4004	3			590 to 605	
—	—	—	—	4005	4			590 to 605	
—	BAS254P	—	—	4N04	5			580 to 600	
—	—	—	—	4104	6			590 to 605	
—	—	—	—	4N43	7			600 to 620	
—	—	—	—	4N45	8			590 to 605	

Remarks : The brazing sheets shall be classified broadly into four groups according to constitution thereof (see Table 3), and be indicated by BAS indicating the brazing sheets followed by the numerals of three figures. The numeral on the left indicates the constitution nominal No. of brazing