

Australian/New Zealand Standard™

Welding and brazing—Filler metals

Part 1: Filler metal for brazing and braze welding



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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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1 SCOPE

This Standard specifies requirements for filler metals in all forms for brazing and braze welding processes. It includes requirements for chemical composition and analysis, packing and marking. In addition, a standard form of colour coding designed to be mutually acceptable to manufacturers and users has been recommended for identification purposes.

NOTE: In this Standard, the term brazing is used to imply both processes.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1674 Safety in welding and allied processes

5 IDENTIFICATION

Individual items of filler metal shall be identified by either embossing or colour coding. Where colour coding is used, the colours employed should follow the colour guidance given in Tables 1 to 4.

6 FORM AND SIZE

Specification of the required form and size is a matter for the purchaser at the time of placing the order. If required, filler rods may be supplied coated with a suitable brazing flux.

7 PACKING

Brazing filler metals shall be packed to guard against damage and deterioration during transportation, handling and storage.

8 GENERAL SAFETY WARNINGS

A label shall be attached or a statement displayed with at least the following warning:

PROTECT YOURSELF AND OTHERS. READ AND UNDERSTAND THIS LABEL.

FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH.

HEAT RAYS (INFRA RED RADIATION FROM FLAME OR HOT METAL) CAN INJURE EYES.

WARNING:

READ AND UNDERSTAND THE MATERIALS SAFETY DATA SHEETS

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TABLE 1
SILVER BRAZING ALLOYS

1	2	3	4	5	6	7	8	9	10	11
Alloy designation	Chemical composition*, percent									
	Silver		Copper		Zinc		Tin		Nickel	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
A2	55.0	57.0	21.0	23.0	15.0	19.0	4.5	5.5	—	—
A8	39.0	41.0	29.0	31.0	26.0	30.0	—	—	1.5	2.5
A15	38.0	40.0	29.5	31.5	26.0	30.0	2.25	2.75	—	—
A16	29.0	31.0	34.5	36.5	30.0	34.0	2.25	2.75	—	—
A18	33.0	35.0	35.0	37.0	25.5	29.5	2.5	3.5	—	—
A19	44.0	46.0	26.0	28.0	23.5	27.5	2.0	3.0	—	—
A20	48.0	50.0	15.0	17.0	21.0	25.0	—	—	4.0	5.0
A21	48.0	50.0	26.5	28.5	19.5	21.5	—	—	0.4	0.6
A22	54.0	56.0	20.0	22.0	21.0	23.0	1.5	2.5	—	—
A23	55.0	57.0	26.2	28.3	—	0.05	—	—	2.0	2.5
							Melting range† °C		Colour identification guide	
							Solidus	Liquidus	Colour	AS 2700 Colour No.
							620	650	White	—
							660	780	Gold	—
							650	705	Dark brown	X65
							665	755	Lilac	P23
							630	730	Emerald Green	G13
							640	680	Rock	X24
							680	705	Tropical	T11
							670	690	Citronella	G46
							630	660	Malachite	T14
							600	710	Erica	P41

* The maximum impurity levels applicable to all types of alloys are as follows:

- Aluminium + beryllium 0.0015%
- Bismuth, tellurium 0.005% each
- Titanium + zirconium 0.005%
- Cadmium, phosphorus 0.01% each
- Arsenic + indium + antimony + tin (as an impurity) 0.10%
- Other elements present as impurities 0.05%
- Total of all impurities 0.25%

† The melting range shown is for general information only and does not constitute a requirement for the product concerned.

TABLE 2
COPPER-PHOSPHORUS BRAZING ALLOYS

1	2	3	4	5	6	7	8	9	10	11
Alloy designation	Chemical composition*, percent					Melting range† °C		Indicative Brazing Temp Range† °C	Colour identification guide	
	Silver		Copper	Phosphorus						
	Min.	Max.		Min.	Max.	Solidus	Liquidus		Colour	AS 2700 Colour No
B1	—	—	Remainder	7.00	8.25	705	800	720–840	Signal red	R13
B2	1.80	2.20	Remainder	6.00	7.00	645	820	740–830	Canary	Y11
B3	4.75	5.25	Remainder	5.75	6.50	645	810	710–820	Silver	—
B4	14.50	15.50	Remainder	4.50	5.50	645	800	720–820	Tan	X51

* Maximum impurity levels applicable to all types of alloys are as follows:

Cadmium, aluminium	0.01% each
Zinc	0.05%
Lead	0.02%
Tellurium	0.005%
Bismuth	0.001%
Total of all impurities	0.20%

† The melting range shown is for general information only and does not constitute a test requirement for the product concerned.

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* The impurities antimony, arsenic and bismuth are limited to 0.01% max. each. Total of all impurities and elements not specified (including aluminium and lead but excluding iron) are 0.5% max.

‡ Where a rod is suitably identified by embossing, the colour identification may be omitted.

TABLE 4
ALUMINIUM BRAZING ALLOYS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Alloy designation	Aluminium	Chemical composition, percent										Melting range*, °C		Tip colour identification guide†	
		Silicon		Copper	Iron	Manganese	Zinc	Beryllium	Titanium	Other elements		Solidus	Liquidus	Colour	AS 2700 colour No.
		Min.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Each max.	Total max.				
R4047	Rem	11.00	13.0	0.30	0.8	0.10	0.20	0.0003	—	0.05	0.15	565	595	Golden Yellow	Y14
R4043	Rem	4.5	6.0	0.30	0.8	0.05	0.10	0.0003	0.20	0.05	0.15	565	630	Not coloured†	—

* The melting range shown is for general information only and does not constitute a test requirement or the product concerned.

† Some imported wire may have green colour code.

APPENDIX A
AUSTRALIAN ALLOY CLASSIFICATIONS AND THEIR EQUIVALENTS
(Informative)

Australian Standard AS 1167.1—2005	European Standard EN 1044:1999	American Standard AWS A5.8	ISO 3677:1992
A2	AG 102	BAg-7	B-Ag56CuZnSn-620/650
A8	—	Bag-4	B-Ag40CuZnNi-660/780
A15	—	—	B-Ag39CuZnSn-650/705
A16	—	—	B-Cu36ZnAgSn-665/755
A18	AG 106*	—	B-Cu36AgZnSn-630/730
A19	AG 104	Bag-36*	B-Ag45CuZnSn-640/680
A20	AG 502	Bag-22*	B-Ag49ZnCuMnNi-680/705
A21	—	—	B-Ag49CuZnMn(Ni)-670/690
A22	AG 103	—	B-Ag55ZnCuSn-630/660
A23	AG 403	—	B-Ag56CuInNi-600/710
B1	CP 201* CP 202*	BCuP-2*	B-Cu92P-705/800
B2	CP 105	BCuP-6*	B-Cu92PAg-645/820
B3	CP 104	BCuP-3*	B-Cu89PAg-654/810
B4	CP 102	BCuP-5*	B-Cu80AgP-645/800
RCuZn-A	—	RBCuZn-A	B-Cu60Zn-870/900
RCuZn-C	—	RBCuZn-C	B-Cu58ZnSn(Fe)(Mn)(Si)-870/900
RCuZn-D	CU 305	RBCuZn-D	B-Cu48ZnNi(Si)-920/940
RCuSi-A	—	—	B-Cu94Si-970/1020
R4047	AL 104*	BA1Si-4	B-A188Si-565/595
R4043	AL 101*	—	B-A195Si-565/630

*These alloys are equivalent but their specifications are not identical.

NOTES

NOTES



GPO Box 476 Sydney NSW 2001

Administration

Phone (02) 8206 6000

Fax (02) 8206 6001

Email mail@standards.com.au

Customer Service

Phone 1300 65 46 46

Fax 1300 65 49 49

Email sales@standards.com.au

Internet www.standards.org.au



Level 10 Radio New Zealand House

155 The Terrace Wellington 6001

(Private Bag 2439 Wellington 6020)

Phone (04) 498 5990

Fax (04) 498 5994

Customer Services (04) 498 5991

Information Service (04) 498 5992

Email snz@standards.co.nz

Internet www.standards.co.nz

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