
**Welding consumables — Wire
electrodes, wires and rods for welding
of aluminium and aluminium alloys —
Classification**

*Produits consommables pour le soudage — Fils-électrodes, fils et
baguettes pour le soudage de l'aluminium et les alliages d'aluminium
— Classification*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Classification	1
4 Symbols and requirements	5
4.1 Symbols for the product form	5
4.2 Symbol for the chemical composition	5
5 Mechanical properties of the weld metal	5
6 Chemical analysis	5
7 Rounding procedure	5
8 Retest	5
9 Technical delivery conditions	6
10 Designation	6

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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](#)

The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

This second edition cancels and replaces the first edition (ISO 18273:2004), which has been technically revised.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 3, through your national standards body, a complete listing of which can be found at www.iso.org.

Introduction

For aluminium welding consumables, there is no unique relationship between the product form (solid wire or rod) and the welding process used (e.g. gas shielded metal arc welding, gas tungsten arc welding, plasma arc welding, or other welding processes). For this reason, the solid wires or rods can be classified on the basis of any of the above product forms and can be used as appropriate for more than one of the above processes.

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Welding consumables — Wire electrodes, wires and rods for welding of aluminium and aluminium alloys — Classification

1 Scope

This International Standard specifies requirements for classification of solid wires and rods for fusion welding of aluminium and aluminium alloys. The classification of the solid wires and rods is based on their chemical composition.

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

ISO 14344, *Welding consumables — Procurement of filler materials and fluxes*

ISO 80000-1:2009, *Quantities and units — Part 1: General*. Corrected by ISO 80000-1:2009/Cor 1:2011

3 Classification

The classification is divided into two parts.

- a) The first part indicates the product form being solid wires or rods (see [4.1](#)).
- b) The second part gives a numerical symbol indicating the chemical composition of the solid wire or rod (see [Table 1](#)).

The aluminium or aluminium alloy chemical composition limits specified are strictly identical to those registered to the Aluminium Association, Washington, DC 20006, U.S.A. for the corresponding alloys.

Table 1 — Symbol for the chemical composition of solid wires and rods

Alloy symbol		Chemical composition in % (m/m) ^a													
Numerical	Chemical	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga, V	Ti	Zr	Al (min.)	Be	Other each	Other total
ALUMINIUM-LOW ALLOYED															
Al 1070	Al99,7	0,20	0,25	0,04	0,03	0,03	-	0,04	V 0,05	0,03	-	99,70	0,000 3	0,03	-
Al 1080A	Al99,8(A)	0,15	0,15	0,03	0,02	0,02	-	0,06	Ga 0,03	0,02	-	99,80	0,000 3	0,02	-
Al 1188	Al99,88	0,06	0,06	0,005	0,01	0,01	-	0,03	Ga 0,03 V 0,05	0,01	-	99,88	0,000 3	0,01	-
Al 1100	Al99,0Cu	Si + Fe 0,95		0,05 to 0,20	0,05	-	-	0,10	-	-	-	99,00	0,000 3	0,05	0,15
Al 1200	Al99,0	Si + Fe 1,00		0,05	0,05	-	-	0,10	-	0,05	-	99,00	0,000 3	0,05	0,15
Al 1450	Al99,5Ti	0,25	0,40	0,05	0,05	0,05	-	0,07	-	0,10 to 0,20	-	99,50	0,000 3	0,03	-
ALUMINIUM-COPPER															
Al 2319	AlCu6MnZrTi	0,20	0,30	5,8 to 6,8	0,20 to 0,40	0,02	-	0,10	V 0,05 to 0,15	0,10 to 0,20	0,10 to 0,25	Rem	0,0003	0,05	0,15
ALUMINIUM-MANGANESE															
Al 3103	AlMn1	0,50	0,7	0,10	0,9 to 1,5	0,30	-0,10	0,20	-	Ti + Zr 0,10	-	Rem	0,0003	0,05	0,15
ALUMINIUM-SILICIUM															
Al 4009	AlSi5Cu1Mg	4,5 to 5,5	0,20	1,0 to 1,5	0,10	0,45 to 0,6	-	0,10	-	0,20	-	Rem	0,000 3	0,05	0,15
Al 4010	AlSi7Mg	6,5 to 7,5	0,20	0,20	0,10	0,30 to 0,45	-	0,10	-	0,20	-	Rem	0,000 3	0,05	0,15
Al 4011	AlSi7Mg0,5Ti	6,5 to 7,5	0,20	0,20	0,10	0,45 to 0,7	-	0,10	-	0,04 to 0,20	-	Rem	0,04 to 0,07	0,05	0,15
Al 4018	AlSi7Mg	6,5 to 7,5	0,20	0,05	0,10	0,50 to 0,8	-	0,10	-	0,20	-	Rem	0,000 3	0,05	0,15
Al 4020 ^d	AlSi3Mn1	2,5 to 3,5	0,20	0,03	0,8 to 1,2	0,01	0,01	-	-	0,005	0,01	Rem	0,000 3	0,02	0,10
Al 4043	AlSi5	4,5 to 6,0	0,8	0,30	0,05	0,05	-	0,10	-	0,20	-	Rem	0,000 3	0,05	0,15

^a Single values shown in the table are maximum values except for Al which are minimum values.

^b For Alloy Al 5754, the sum (Mn + Cr): 0,10 to 0,6.

^c Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

^d For Alloy Al 4020, B (Max.) = 0,005 %.

Table 1 (continued)

Alloy symbol		Chemical composition in % (m/m) ^a													
Numerical	Chemical	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga, V	Ti	Zr	Al (min.)	Be	Other each	Other total
Al 4043A	AlSi5(A)	4,5 to 6,0	0,6	0,30	0,15	0,20	-	0,10	-	0,15	-	Rem	0,000 3	0,05	0,15
Al 4046	AlSi10Mg	9,0 to 11,0	0,50	0,03	0,40	0,20 to 0,50	-	0,10	-	0,15	-	Rem	0,000 3	0,05	0,15
Al 4047	AlSi12	11,0 to 13,0	0,8	0,30	0,15	0,10	-	0,20	-	-	-	Rem	0,000 3	0,05	0,15
Al 4047A	AlSi12(A)	11,0 to 13,0	0,6	0,30	0,15	0,10	-	0,20	-	0,15	-	Rem	0,000 3	0,05	0,15
Al 4145	AlSi10Cu4	9,3 to 10,7	0,8	3,3 to 4,7	0,15	0,15	0,15	0,20	-	-	-	Rem	0,000 3	0,05	0,15
Al 4643	AlSi4Mg	3,6 to 4,6	0,8	0,10	0,05	0,10 to 0,30	-	0,10	-	0,15	-	Rem	0,000 3	0,05	0,15
Al 4943	AlSi5Mg	5,0 to 6,0	0,40	0,10	0,05	0,10 to 0,50	-	0,10	-	0,15	-	Rem	0,000 3	0,05	0,15
ALUMINIUM-MAGNESIUM															
Al 5249	AlMg2Mn0,8Zr	0,25	0,40	0,05	0,50 to 1,1	1,6 to 2,5	0,30	0,20	-	0,15	0,10 to 0,20	Rem	0,000 3	0,05	0,15
Al 5554	AlMg2,7Mn	0,25	0,40	0,10	0,50 to 1,0	2,4 to 3,0	0,05 to 0,20	0,25	-	0,05 to 0,20	-	Rem	0,000 3	0,05	0,15
Al 5654	AlMg3,5Ti(A)	Si + Fe 0,45	0,45	0,05	0,01	3,1 to 3,9	0,15 to 0,35	0,20	-	0,05 to 0,15	-	Rem	0,000 3	0,05	0,15
Al 5654A	AlMg3,5Ti	Si + Fe 0,45	0,45	0,05	0,01	3,1 to 3,9	0,15 to 0,35	0,20	-	0,05 to 0,15	-	Rem	0,000 5	0,05	0,15
Al 5754b	AlMg3	0,40	0,40	0,10	0,50	2,6 to 3,6	0,30	0,20	-	0,15	-	Rem	0,000 3	0,05	0,15
Al 5356	AlMg5Cr(A)	0,25	0,40	0,10	0,05 to 0,20	4,5 to 5,5	0,05 to 0,20	0,10	-	0,06 to 0,20	-	Rem	0,000 3	0,05	0,15
Al 5356A	AlMg5Cr	0,25	0,40	0,10	0,05 to 0,20	4,5 to 5,5	0,05 to 0,20	0,10	-	0,06 to 0,20	-	Rem	0,000 5	0,05	0,15

^a Single values shown in the table are maximum values except for Al which are minimum values.

^b For Alloy Al 5754, the sum (Mn + Cr): 0,10 to 0,6.

^c Consumables for which the chemical composition is not listed in this table shall be symbolized similarly and prefixed by the letter Z. The chemical composition ranges are not specified and therefore it is possible that two electrodes with the same Z classification are not interchangeable.

^d For Alloy Al 4020, B (Max.) = 0,005 %.