

Technical data

Designation of the welding wire		Chemical composition ¹⁾ ²⁾ ³⁾		Physical properties		Welding deposit values (20 °C) ⁵⁾			Approvals
Numerical (works name)	Chemical	Alloy composition %	Permitted Ingredients %	Melting range °C ≈	Density g/cm ³ ≈	0,2 - elongation limit N/mm ²	Tensile strength N/mm ²	Expansion (A5) %	
S Al 1098 ⁷⁾ (DE50) *	Al99,98	Al min. 99,98	Si 0,010 Fe 0,006 Cu 0,003 Zn 0,015 Ti 0,003 AE 0,003 AZ -	660	2,70	-	≥ 40	≥ 43	TÜV
S Al 1080 A (DE51) *	Al99,8 (A)	Al min. 99,80	Si 0,15 Fe 0,15 Cu 0,03 Mn 0,02 Mg 0,02 Zn 0,06 Ga 0,03 Ti 0,02 AE 0,02 AZ -	658	2,70	-	≥ 60	≥ 40	TÜV DB
S Al 1450 (DE53) *	Al99,5 Ti	Al min. 99,50 Ti 0,10 to 0,20	Si 0,25 Fe 0,40 Cu 0,05 Mn 0,05 Mg 0,05 Zn 0,07 AE 0,03 AZ -	647 to 658	2,71	≥ 20	≥ 65	≥ 35	TÜV DB
S Al 2319 (DE71) *	AlCu6MnZrTi	Cu 5,8 to 6,8 Mn 0,20 to 0,40 Zr 0,10 to 0,25 Ti 0,10 to 0,20 Al Rest	Si 0,20 Fe 0,30 Mg 0,02 Zn 0,10 V 0,05 to 0,15	543 to 643	2,84	75 ⁶⁾	170 ⁶⁾	18 ⁶⁾	-
S Al 3103 (DE54)	AlMn1	Mn 0,9 to 1,5 Al Rest	Si 0,50 Fe 0,7 Cu 0,10 Mg 0,30 Cr 0,10 Zn 0,20 Ti+Zr 0,10	648 to 657	2,73	≥ 35	≥ 90	≥ 24	-
S Al 4018 (DE68)	AlSi7Mg	Si 6,5 to 7,5 Mg 0,50 to 0,8 Al Rest	Fe 0,20 Cu 0,05 Mn 0,10 Zn 0,10 Ti 0,20	550 to 625	2,70	≥ 80	≥ 140	≥ 2	TÜV DB
S Al 4020 (DE 33)	AlSi3Mn1	Si 2,5 to 3,5 Mn 0,8 to 1,2 Al Rest	Fe 0,20 Cu 0,03 Mg 0,01 Cr 0,01 Ti 0,005 Zr 0,01 AE 0,02 AZ 0,10	577 to 640	2,71	≥ 50	≥ 120	≥ 25	TÜV DB
S Al 4043 A (DE 59)	AlSi5 (A)	Si 4,5 to 6,0 Al Rest	Fe 0,6 Cu 0,30 Mn 0,15 Mg 0,20 Zn 0,10 Ti 0,15	573 to 625	2,68	≥ 40	≥ 120	≥ 8	TÜV DB
S Al 4046 (DE61)	AlSi10Mg	Si 9,0 to 11,0 Mg 0,20 to 0,50 Al Rest	Fe 0,50 Cu 0,03 Mn 0,40 Zn 0,10 Ti 0,15	570 to 610	2,65	≥ 70	≥ 140	≥ 4	-
S Al 4047 A (DE60)	AlSi12 (A)	Si 11,0 to 13,0 Al Rest	Fe 0,6 Cu 0,30 Mn 0,15 Mg 0,10 Zn 0,20 Ti 0,15	575 to 585	2,65	≥ 60	≥ 130	≥ 5	TÜV DB
S Al 5249 (DE57) *	AlMg2Mn0,8Zr	Mg 1,6 to 2,5 Mn 0,50 to 1,1 Zr 0,10 to 0,20 Al Rest	Si 0,25 Fe 0,40 Cu 0,05 Cr 0,30 Zn 0,20 Ti 0,15	615 to 650	2,71	≥ 80	≥ 190	≥ 20	TÜV DB
S Al 5554 (DE65)	AlMg2,7Mn	Mg 2,4 to 3,0 Mn 0,50 to 1,0 Al Rest	Si 0,25 Fe 0,40 Cu 0,10 Cr 0,05 to 0,20 Zn 0,25 Ti 0,05 to 0,20 ⁸⁾	602 to 648	2,68	≥ 100	≥ 215	≥ 18	TÜV DB
S Al 5754 (DE56)	AlMg3	Mg 2,6 to 3,6 Al Rest	Si 0,40 ⁹⁾ Fe 0,40 Cu 0,10 Mn 0,50 Cr 0,30 Zn 0,20 Ti 0,15 (Mn + Cr 0,10 to 0,6)	615 to 642	2,66	≥ 80	≥ 190	≥ 20	TÜV DB
S Al 5356 (DE58)	AlMg5Cr (A)	Mg 4,5 to 5,5 Cr 0,05 to 0,20 Al Rest	Si 0,25 Fe 0,40 Cu 0,10 Mn 0,05 to 0,20 Zn 0,10 Ti 0,06 to 0,20 ⁸⁾	575 to 633	2,64	≥ 120	≥ 250	≥ 18	ABS BV DNV LR TÜV, DB BWB
S Al 5556 A (DE70)	AlMg5Mn1 (A)	Mg 5,0 to 5,5 Mn 0,6 to 1,0 Al Rest	Si 0,25 Fe 0,40 Cu 0,10 Cr 0,05 to 0,20 Zn 0,20 Ti 0,05 to 0,20 ⁸⁾	574 to 638	2,66	≥ 145	≥ 290	≥ 17	-
S Al 5183 (DE63)	AlMg4,5Mn0,7 (A)	Mg 4,3 to 5,2 Mn 0,50 to 1,0 Al Rest	Si 0,40 ⁹⁾ Fe 0,40 Cu 0,10 Cr 0,05 to 0,25 Zn 0,25 Ti 0,15	574 to 638	2,66	≥ 130	≥ 275	≥ 18	ABS, BV DNV LR TÜV, DB BWB
S Al 5087 (DE64)	AlMg4,5MnZr (A)	Mg 4,5 to 5,2 Mn 0,7 to 1,1 Zr 0,10 to 0,20 Al Rest	Si 0,25 Fe 0,40 Cu 0,05 Cr 0,05 to 0,25 Zn 0,25 Ti 0,15	574 to 638	2,66	≥ 140	≥ 285	≥ 18	ABS, BV DNV LR TÜV, DB BWB
Hartlot Al 112 DIN EN ISO 17672	B-Al88Si-575/585 (DIN EN ISO 3677)	Si 11,0 to 13,0 Al Rest	Fe 0,8 Cu 0,30 Mn 0,15 Mg 0,10 Zn 0,20 Cd 0,010 Pb 0,025	575 to 585	2,65	-	-	-	-

* Material upon request

¹⁾ Single values in the chart are maximum values.
²⁾ Other elements individually max 0,05 %.
³⁾ The sum of other elements max. 0,15 %.

⁴⁾ All filler metals according to DIN EN ISO 18273 contain Be max. 0,0003
⁵⁾ According to DIN 1732-3
⁶⁾ Typical values.
⁷⁾ Not contained in DIN EN ISO 18273.

⁸⁾ The Ti content can be completely or partially substituted by other fine-grain-supporting elements.
⁹⁾ In order to limit the risk of weld cracks, a Si content of 0,25 % is recommended.

Standard delivery dimensions

Welding rods	Elisental welding rods are 1000 mm long in their standard version and have the material designation embossed on one side.
Long box	<p>Packaging units: 10,0 kg (standard) 5,0 kg (on request) 2,5 kg (on request)</p>

Other lengths and weights on request.

Forms of supply	Ø [mm]	Tolerances [mm] DIN EN ISO 544
Spools	1.00 1.20 1.60	+0.01 -0.04
Drums	1.20 1.60	+0.01 -0.04
Rods	1.60 2.00 2.40 3.20	± 0.1

Other dimensions upon request.

Standard forms of supply

Spool type	Dimensions [mm]	Net weight [kg]
Mandrel-mounted reel S 300 DIN EN ISO 544		max. 6.0
Basket spool BS 300 DIN EN ISO 544		max. 7.0
Basket ring spool B 300 DIN EN ISO 544		max. 7.0
Basket ring spool B 400 DIN EN ISO 544		max. 40.0
Basket ring spool B 435 DIN EN ISO 544		max. 14.0
Large spool K 500 not standardised		max. 40.0

All details are given in nominal dimensions. Alternative spool types upon request.

Drum	Dimensions [mm]	Net weight [kg]
Drum type, round		max. 140 depending on drum type and material
Drum type, square		max. 140
Accessories		

Please enquire about more drum versions.

Application recommendations

The overview on this page is provided to help you select the optimum welding filler metal for your application, and shows the type series for the respective combinations of wrought and/or cast base materials to be welded.

Which of the welding filler metals from the respective type series (see the table on page 10) will ultimately be used is determined by the specific welding task. Please also note the explanations given in the footnotes.

Base mat.	AlCuMn	AlCu	AlSiCu	AlSiMg	AlZnMg	AlMgSi	AlMg 5% etc. with Mn	AlMg 3% etc. with Mn	AlMg<1%*	AlMn	Al
Al	4	4	4	4	5	4 0.5	5	4 0.5	4 0.5	4	4
AlMn	4	4	4	4	5	4 0.5	5	5	4	3 0.4	4
AlMg<1%*	4	4	4	4	5	4 0.5	5	5d	4	4	4
AlMg 3% etc. with Mn	4	4	4	4	5	5	5	5	5	5	5
AlMg 5%+ etc. with Mn	4	4	4	4	5	5	5	5	5	5	5
AlMgSi [†]	4	4	4	4	5	4 0.5	5	5	5	5	5
AlZnMg	4	4	4	4	5	5	5	5	5	5	5
AlSiMg [‡]	4	4	4	4	5	5	5	5	5	5	5
AlSiCu ^{††}	4	4	4	4	5	5	5	5	5	5	5
AlCu [*]	4	4	4	4	5	5	5	5	5	5	5
AlCuMn	2	2	2	2	2	2	2	2	2	2	2

The base materials are listed according to their chemical composition, without reference to whether they are wrought or cast materials.

Footnote explanations

- When welding without filler, these alloys are susceptible to forming solidification cracks. This can be prevented by employing rigid clamps, otherwise a change to a base material with Mg > 3 % is advisable.
- Under certain environmental conditions, e.g. at temperatures > 65 °C, alloys with a Mg content > 3 % can be susceptible to intercrystalline corrosion and/or stress corrosion cracking. This susceptibility increases with increasing Mg content, where the degree of mixing must be considered.
- These alloys are not recommendable for welding without a filler metal, since they are susceptible to forming cold cracks.
- The resistance of type 5 against intercrystalline corrosion and stress corrosion cracking is increased if the Mg content does not exceed - 3 %. Under conditions that could possibly cause intercrystalline corrosion and/or stress corrosion cracking, the Mg content of the weld metal should be similar to that of the base material and should not be significantly greater. Accordingly, this must be observed when welding the base material with the corresponding alloys for the welding filler metals.
- The Si content of the welding filler materials should be selected so as to match that of the cast base material as closely as possible.
- The weldability of die cast alloys depends greatly on its gas content.