

Permits

Symbol of source of issue	Permits	Usable welding fillers	numerical designation
	Germanischer Lloyd Schipbuilding	DE 56 DE 58 DE 63 DE 64	R 5754 R 5356 R 5183 R 5087
	Lloyd's Register of Shipping Schipbuilding	DE 63 DE 56 DE 58 DE 63	R 5183 R 5754 R 5356 R 5183
DNV	Det Norske Veritas Schipbuilding	DE 58 DE 63	R 5356 R 5183
ABS	American Bureau of Shipping Schipbuilding	DE 58 DE 63	R 5356 R 5183
BV	Bureau Veritas Schipbuilding	DE 63 DE 64	R 5183 R 5087
	Deutsche Bahn AG (German Rail) Rail vehicle construction	DE 51 DE 53 DE 56 DE 57 DE 58 DE 59 DE 60 DE 63 DE 64	R 1080 A R 1450 R 5754 R 5249 R 5356 R 4043 A R 4047 A R 5183 R 5087
TÜV	Technical Inspection Association Pressure vessel construction	DE 50 DE 51 DE 53 DE 56 DE 57 DE 58 DE 63 DE 64 DE 65	R 1098 A R 1080 A R 1450 R 5754 R 5249 R 5356 R 5183 R 5087 not standardised
	Federal Agency for military defence technology and procurement of high-stressed components for military defence material	DE 63 DE 64	R 5183 R 5087

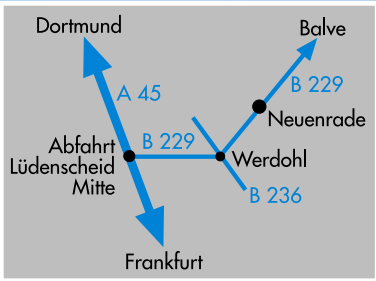
Unlimited Possibilities

by means of the allround materials
aluminium and magnesium

Aluminium wire products are indispensable in all industrial sectors. Persistent developments and modifications of alloys over the past decades have enhanced the basic material to such an extent that the application options are practically unlimited.



Ideas are impulses
towards unlimited
possibilities.
We have ideas.



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Aluminium wire
Magnesium wire

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Material



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Aluminium welding fillers

Materials – Technical Data

Designation of welding fillers		Chemical composition ¹⁾ ²⁾ ³⁾		Physical properties		Welding material values (20° C)		Permits	
numerical (works name)	chemical	Alloy constituents %	Allowable admixtures %	Melting range °C ≈	Density g/cm ³ ≈	0.2 - Yield limit N/mm	Tensile strenght N/mm		Elongation (A ₅) %
R 1098 A ¹⁾ (DE50)	R - Al 99.98	Al min. 99.98	total of wich Si Fe Cu Zn Ti other single	660	2.70	-	≥ 40	≥ 43	TÜV
R 1080 A (DE51)	R - Al 99.8 (A)	Al min. 99.80	total of wich Si Fe Cu Mn Mg Zn Ti other single	658	2.70	-	≥ 60	≥ 40	TÜV DB
R 1450 (DE53)	R - Al 99.5 Ti	Al min. 99.50 Ti 0.1 to 0.2	total of wich Si Fe Cu Mn Mg Zn other single	647 to 658	2.71	≥ 20	≥ 65	≥ 35	TÜV DB
R 2319 ¹⁾ (DE 71)	R - AlCu6Mn (A)	Cu 5.8 to 6.8 Ti 0.10 to 0.20 ¹⁾ V 0.05 to 0.15 Zr 0.10 to 0.25 Al residual	Si Fe Mn Mg Zn other single	543 to 643	2.84	75 ¹⁾	170 ¹⁾	18 ¹⁾	
R 3103 (DE54)	R - AlMn1	Mn 0.9 to 0.15 Al residual	Si Fe Cu Mg Cr Zn Ti+Zr 0.10 other single	648 to 657	2.73	≥ 35	≥ 90	≥ 24	
R 4018 (DE68)	R - AlSi7Mg	Si 6.5 to 7.5 Mg 0.50 to 0.8 Al residual	Fe Cu Mn Zn Ti other single	550 to 625	2.70	≥ 80	≥ 140	≥ 2	
R 4043 A (DE59)	R - AlSi5 (A)	Si 4.5 to 6.0 Al residual	Fe Cu Mn Mg Zn Ti other single	573 to 625	2.68	≥ 40	≥ 120	≥ 8	DB
R 4046 (DE61)	R - AlSi10Mg	Si 9.0 to 11.0 Mg 0.20 to 0.50 Al residual	Fe Cu Mn Zn Ti other single	570 to 610	2.65	≥ 70	≥ 140	≥ 4	
R 4047 A (DE60)	R - AlSi12 (A)	Si 11.0 to 13.0 Al residual	Fe Cu Mn Mg Zn Ti other single	573 to 585	2.65	≥ 60	≥ 130	≥ 5	DB
R 5249 (DE57)	R - AlMg2Mn0.8Zr	Mg 1.6 to 2.5 Mn 0.50 to 1.1 Zr 0.10 to 0.20 Al residual	Si Fe Cu Cr Zn Ti other single	615 to 650	2.71	≥ 80	≥ 190	≥ 20	TÜV DB
R 5754 (DE56)	R - AlMg3	Mg 2.6 to 3.6 Mn + Cr 0.10 to 0.6 Al residual	Si Fe Cu Mn Cr Zn Ti other single	615 to 642	2.66	≥ 80	≥ 190	≥ 20	GL DnV TÜV DB
R 5356 (DE58)	R - AlMg5Cr (A)	Mg 4.5 to 5.5 Mn 0.05 to 0.20 Cr 0.05 to 0.20 Ti 0.06 to 0.20 ¹⁾ Al residual	Si Fe Cu Zn other single	575 to 633	2.64	≥ 110	≥ 120	≥ 8	GL DnV ABS, BV TÜV, DB
R 5556 A (DE 70)	R - AlMg5Mn	Mg 5.0 to 5.5 Mn 0.6 to 1.0 Cr 0.05 to 0.20 Ti 0.05 to 0.20 ¹⁾ Al residual	Si Fe Cu Zn other single	574 to 638	2.66	≥ 140	≥ 275	≥ 15	
R 5183 (DE63)	R - AlMg4.5Mn0.7 (A)	Mg 4.3 to 5.2 Mn 0.50 to 1.0 Cr 0.05 to 0.25 Al residual	Si Fe Cu Zn Ti other single	574 to 638	2.66	≥ 125	≥ 275	≥ 17	GL DnV ABS, BV LR, TÜV DB, BWB
R 5087 (DE64)	R - AlMg4.5MnZr	Mg 4.5 to 5.2 Mn 0.7 to 1.1 Cr 0.05 to 0.25 Zr 0.10 to 0.20 Al residual	Si Fe Cu Zn Ti other single	574 to 638	2.66	≥ 125	≥ 275	≥ 17	GL TÜV DB BWB

Brazing solder (DE76)	L - AlSi12 (DIN 8513/4)	Si 11.0 to 13.0 Al residual	Fe 0.5 Cu 0.03 Mn 0.1 Mg 0.1 Zn 0.07 Ti 0.03 ¹⁾ other single	575 to 590	2.65	-	-	-
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¹⁾ The content of beryllium is to be limited to 0.0008% (a reduction by the EAA is planned). ²⁾ Single values in the chart are maximum values.
³⁾ The sum of other elements max. 0.15%. ¹⁾ The Ti-content can be completely or partially substituted by other fine-grain-supporting elements.
⁵⁾ In order to restrict the risk of weld cracks, an Si-content of ≅ 0.25% is recommended. ¹⁾ Not contained in the EN-ISO draft 18273. ¹⁾ Typical values