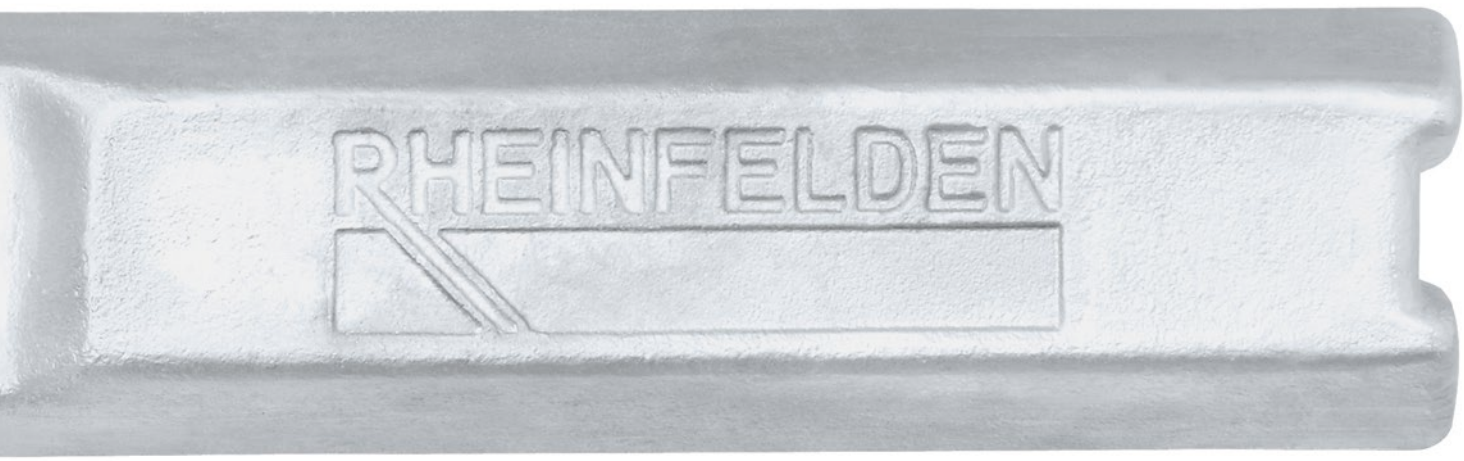
Primary aluminum
Casting alloys

RHEINFELDEN ALLOYS



RHEINFELDEN
Solutions thru Innovation

Quick finder for selecting the right alloy

RHEINFELDEN
Solutions thru Innovation

The first step in producing a cast is to select the alloy most suited to the production process and requirements. The table covering these two pages provides an overview of our most common materials, their areas of use and properties. It will help you to chose the right casting material. This table is no substitute for the service provided by our technical advisors, but does provide an overview and allows users to access the information as and when they need it.

		Areas of use																				
Alloy denomination	**Chemical denomination**	*Architecture*	*Fittings*	*Automotive engineering*	*Builder's hardware*	*Lighting*	*Aircraft*	*Heavy cast*	*Domestic appliances*	*Electrical conductors*	*Air conditioning*	*E-Mobility/Battery design*	*Engines*	*Art cast*	*Foodstuffs industry*	*Mechanical engineering*	*Model/mold construction*	*Optics/furniture*	*Shipbuilding/Offshore*	*Chemical industry*	*Textile industry*	*Defence engineering*
Anticorodal-04	AlSi0.5MgE									x		x			x	x		x		x		
Anticorodal-50	AlSi5Mg	x	x			x			x		x			x	x	x	x	x	x	x		
Anticorodal-70	AlSi7Mg0.3	x	x	x		x	x		x		x		x	x	x	x	x		x	x		x
Anticorodal-78dv	AlSi7Mg0.3	x		x			x						x		x	x			x	x	x	x
Anticorodal-71	AlSi7Mg0.3E									x		x			x	x						
Anticorodal-72	AlSi7Mg0.6	x		x			x		x						x	x	x		x	x	x	x
Silafont-30	AlSi9Mg		x	x		x		x	x		x	x	x	x	x	x	x		x		x	x
Silafont-36	AlSi10MnMg	x	x	x	x	x	x		x		x	x	x		x	x			x			x
Silafont-38	AlSi9MnMgZn	x		x		x			x		x	x	x			x					x	x
Silafont-09	AlSi9		x	x		x			x		x	x	x		x	x			x			x
Silafont-13	AlSi11	x							x		x			x	x	x			x		x	
Silafont-20	AlSi11Mg	x		x				x				x			x	x						
Silafont-70	AlSi12CuNiMg			x									x			x						
Silafont-90	AlSi17Cu4Mg			x									x									
Castaman-35	AlSi10MnMg		x	x		x			x		x	x	x		x	x			x			
Castasil-37	AlSi9MnMoZr	x		x		x	x		x		x	x			x	x			x			x
Castasil-21	AlSi9SrE			x		x				x	x	x	x		x	x			x			x
Unifont-90	AlZn10Si8Mg							x	x							x	x	x			x	x
Unifont-94	AlZn10Si8Mg			x	x											x		x				x
Castadur-30	AlZn3Mg3Cr	x		x		x			x									x				
Castadur-50	AlZn5Mg	x		x		x			x					x		x	x	x				x
Peraluman-30	AlMg3	x	x		x	x			x		x			x	x	x	x	x	x	x		x
Peraluman-36	AlMg3Si	x	x		x	x		x	x			x		x	x	x	x	x	x	x		x
Peraluman-50	AlMg5	x	x	x	x	x			x		x	x		x	x			x	x	x		x
Peraluman-56	AlMg5Si	x	x			x			x		x			x	x	x		x	x	x		x
Magsimal-59	AlMg5Si2Mn	x		x			x		x		x	x	x		x	x		x	x	x	x	x
Magsimal-plus	AlMg6Si2MnZr	x		x			x		x		x	x	x		x	x		x	x	x		x
Castaduct-42	AlMg4Fe2	x		x	x	x	x		x		x	x	x		x	x		x	x	x	x	x
Castaduct-18	AlMg4Zn3Fe2			x		x	x					x				x					x	x
Alufont-47	AlCu4TiMg			x												x					x	
Alufont-48	AlCu4TiMgAg			x									x			x						x
Alufont-52	AlCu4Ti			x									x			x					x	x
Alufont-60	AlCu5NiCoSbZr			x									x									x
Thermodur-72	AlMg7Si3Mn			x			x				x	x	x			x			x	x		
Thermodur-73	AlSi11Cu2Ni2Mg2			x							x		x			x						x
Rotoren-Al 99.7	Al99.7E			x		x			x	x		x	x	x	x	x	x	x		x		
Aluman-16	AlMn1.6			x					x		x	x	x			x						

RHEINFELDEN
Solutions thru Innovation

● excellent
◕ very good
◐ good
◔ all right
○ poor
– not applicable

Appropriate casting method			Distinguishing properties																						
Sand casting	Gravity die casting	High pressure die casting	Flangeability	Electrical conductivity	Suitable for decorative anodising	Suitable for technical anodising	Suitable for punch riveting	Strength in as-cast state	Casting behavior	Elongation	Hardness	Corrosion resistance	For constructions with thin walls	For constructions with thick walls	Hard solderability	Maximum strength at 20 °C	Resistance to salt water	Polishability	Impact toughness/ductility	Weldability	Machinability at F	Machinability following T6	Wear resistance	Mechanical properties at elevated temperatures (200 °C)
◐	◐	◐	●	●	◕	●	◕	◐	◐	◐	◐	●	◕	●	◔	◐	●	●	◐	◕	◔	◕	–	◕
◕	◐	–	–	◔	◔	●	–	◕	◐	◐	◕	●	◐	●	–	◕	●	◕	◐	◕	◐	◕	–	◕
◕	◕	–	–	◐	○	●	◐	◕	◕	◕	◕	●	◐	●	–	◕	◕	◕	●	◕	◐	◕	–	◕
◕	◕	–	–	◐	○	●	◐	◕	◕	◕	◕	●	◐	●	–	◕	◕	◕	●	◕	◐	◕	–	◕
◕	◕	–	–	◕	○	●	–	◐	◐	◐	◕	●	◐	●	–	◕	–	◕	●	◕	–	◕	–	◕
◕	◕	–	–	◔	○	●	○	◕	◕	◐	◕	●	◐	●	–	◕	◕	◕	●	◕	–	◕	○	◕
●	●	–	–	–	–	●	–	◕	●	◐	◕	●	◕	●	–	◕	–	◐	◕	●	◐	◕	–	◕
–	–	●	●	◔	–	●	●	◕	●	●	◐	●	◕	●	–	◕	–	◐	◕	●	◕	◕	–	◕
–	–	●	◔	–	–	◐	◐	◕	●	◕	◕	◕	◕	◐	–	◕	–	◐	◐	●	◕	◕	–	◕
–	–	●	◕	–	–	◕	◕	◐	●	◐	◐	◕	◕	●	–	◐	–	◐	◐	●	◕	–	–	◕
●	●	–	●	○	–	◐	○	◐	◕	●	◔	◕	●	◐	–	◐	–	◔	◕	●	◐	–	○	◕
●	●	–	–	–	–	◐	–	◐	◕	◕	◐	◕	●	◐	–	◕	–	◔	◕	●	◕	◕	○	◕
◕	◕	◕	–	–	–	◐	–	◐	◕	◔	●	◔	●	◕	–	◕	–	◐	–	●	–	◕	●	●
◕	◕	◐	–	–	–	◐	–	◕	◕	◔	●	◔	●	◕	–	◕	–	◐	–	◕	–	●	●	●
–	–	●	◕	○	–	●	●	◕	●	◕	◐	●	◕	●	–	◕	–	◐	◕	●	◕	◕	–	◕
–	–	●	◐	◕	–	●	◕	◕	●	●	◐	◕	◕	◐	–	◐	–	◐	◕	●	◕	◕	–	◕
–	–	◕	◕	◕	–	◕	◐	◐	◕	◐	◐	◕	◕	◐	–	◐	–	◐	◐	●	◕	–	–	◕
◕	◕	–	–	–	–	●	–	●	◕	◔	◕	◐	◕	●	–	◕	–	◕	–	◕	◕	–	○	◕
–	–	◕	–	–	–	◕	–	●	◕	◔	◕	◐	◐	●	–	◕	–	◕	–	◕	◕	–	–	◕
◐	◐	–	◕	–	●	●	–	◕	◐	●	◐	●	◐	◕	–	◐	–	●	●	◐	●	–	–	–
◐	–	–	◐	–	●	●	–	◕	◐	◕	◐	◐	◔	◕	–	◐	–	●	◕	◐	●	–	–	–
◐	◐	–	◕	–	●	●	–	◐	◐	◕	◐	●	◐	◕	–	◐	●	●	●	◐	●	–	–	◐
◐	◐	–	–	–	◐	●	–	◐	◕	◐	◐	●	◐	◕	–	◐	●	●	◕	◕	●	–	–	◐
◐	◐	–	◕	–	●	●	–	◐	◕	◕	◐	●	◐	◕	–	◐	●	●	●	◐	●	–	–	◐
◐	◐	–	–	–	◐	●	–	◐	◕	◐	◐	●	◐	◕	–	◐	●	●	◕	◕	●	–	–	◐
–	–	◕	◕	–	◐	●	●	●	◕	●	◕	●	●	◔	–	◕	●	●	●	●	●	–	–	◐
–	–	◕	◐	–	◐	●	●	●	◕	●	◕	●	●	◔	–	●	●	●	●	●	●	–	–	◐
–	◐	◕	●	–	●	●	●	◐	◕	●	◐	●	●	◔	–	◐	●	●	●	●	●	–	–	◐
–	–	◕	◐	–	●	●	◕	◐	◕	●	◕	●	●	◔	–	◐	●	●	●	●	●	–	–	◐
◐	◐	–	–	–	●	●	–	◐	◐	◐	◐	◔	◐	◕	–	●	–	◕	●	◐	●	●	–	◐
◐	◔	–	–	–	●	●	–	◐	◐	◐	◕	◔	◐	◕	–	●	–	◕	●	◐	●	–	–	◐
◕	◐	–	–	–	●	●	–	◐	◐	◐	◕	◔	◐	◕	–	●	–	◕	●	◐	●	–	–	◐
◐	◐	–	–	–	–	●	–	◐	◐	◕	◕	○	◐	◕	–	◐	–	◕	–	○	–	●	○	●
–	◐	◕	–	–	◐	◕	○	●	◐	◕	◕	●	◕	◕	–	◕	●	●	◐	◕	●	–	–	●
◕	◕	◕	–	–	–	◐	–	◕	◕	◕	●	○	●	◕	–	◕	–	◐	–	●	◕	◕	○	●
◐	◐	◐	●	●	●	●	–	◕	◐	●	◕	●	◕	◕	●	◕	●	●	●	◕	◕	–	–	–
◐	◕	◐	◐	–	●	●	◕	◐	◐	●	◕	●	◕	◕	●	◐	●	–	◐	–	◕	–	–	◐

Tables for selecting alloys

RHEINFELDEN
Solutions thru Innovation

The tables will aid designers in selecting the suitable casting alloy for the cast they are producing.
They contain details of the 0.2 % yield tensile strength, elongation and corrosion resistance.
The values indicate the performance of the alloys which can be achieved through appropriate casting technology work in the cast or its different areas.

Sand casting, as-cast state

Elongation A [%] \ 0.2 % yield tensile strength $R_{p0.2}$ [MPa]	60–120	90–160	200–230
0.5–3		Silafont-70 Silafont-20	Unifont-90 T1 Thermodur-73
3–6	Anticorodal-70/-78 dv Silafont-30 Peraluman-30/-36 Peraluman-50	Anticorodal-50 Peraluman-56 Castadur-50	
6–13	Silafont-13	Castadur-30	

Sand casting, heat-treated

Elongation A [%] \ 0.2 % yield tensile strength $R_{p0.2}$ [MPa]	90–160	160–300	300–450
0.3–3	Peraluman-56 T6	Anticorodal-50 T6 Anticorodal-72 T6 Silafont-20 T6 Silafont-70 T6	
2–5		Anticorodal-70/-78 dv T6 Silafont-30 T6 Peraluman-36	Alufont-47 T6 Alufont-48 T6 Alufont-52 T6
4–8	Anticorodal-70/-78 dv T64 Silafont-13 O Peraluman-30 T6	Anticorodal-50 T4 Alufont-47 T4 Alufont-48 T64 Alufont-52 T64	

Gravity die casting, as-cast state

Elongation A [%] \ 0.2 % yield tensile strength $R_{p0.2}$ [MPa]	70–100	90–180	180–260
0.5–2			Silafont-70 T5 Silafont-90 T5 Thermodur-73 T5
2–6	Peraluman-36	Anticorodal-50 Anticorodal-70 Silafont-30 Peraluman-56	Unifont-90 T1
6–20	Peraluman-30	Silafont-13 Silafont-20 Peraluman-50	Thermodur-72

Tables for selecting alloys

RHEINFELDEN
Solutions thru Innovation

Treatment state

F	as-cast state
O	annealed
T1	self-aged

T4	naturally aged
T5	stabilized
T5	quenched and aged

T6	artificially aged
T64	partially aged
T7	overaged

Gravity die casting, heat-treated

Elongation A [%]	0.2 % yield tensile strength $R_{p0.2}$ [MPa] 120 – 200	200 – 300	300 – 450
0.5 – 4		Anticorodal-50 T6	Silafont-70 T6 Silafont-90 T6 Alufont-36 T6
4 – 8	Anticorodal-50 T4 Peraluman-56 T6	Anticorodal-70/-78 dv T6 Anticorodal-72 T64 Silafont-30 T6 Silafont-20 T6	Alufont-47 T6 Alufont-48 T6 Alufont-52 T6
8 – 12	Anticorodal-70/-78 dv T64 Silafont-13 O Peraluman-30 T6	Alufont-47 T4 Alufont-52 T64	

High pressure die casting

Elongation A [%]	0.2 % yield tensile strength $R_{p0.2}$ [MPa] 80 – 120	120 – 220		220 – 280
0.1 – 5		Silafont-38		Silafont-90 T5 Thermodur-73 T5 Unifont-94 T1
5 – 20	Anticorodal-04 Aluman-16 Castasil-21	Silafont-09 Silafont-36 Silafont-36 T5 / T7 Silafont-38 T6 / T7 Magsimal-59	Castasil-37 Castaduct-42 Castaduct-18 Thermodur-72 Castaman-35 T7	Silafont-36 T6 Silafont-38 T6 Magsimal-plus / T5

Corrosion resistance

Corrosion resistance	Castability: average	good	very good	excellent
with surface protection	Alufont-47/-48 Alufont-52/-60 Silafont-90	Silafont-70 Thermodur-73		
from weathering	Castadur-30/-50	Castaduct-18	Silafont-30 Unifont-90 Unifont-94 Castasil-37 Castasil-21	Silafont-13 Silafont-20 Silafont-09 Silafont-36 / -38 Castaman-35
from salt water	Anticorodal-04 Peraluman-30/-36 Peraluman-50/-56	Anticorodal-50 Anticorodal-70/-78dv Anticorodal-71 Anticorodal-72	Magsimal-59 Thermodur-72 Magsimal-plus Castaduct-42	

Mechanical properties

RHEINFELDEN
Solutions thru Innovation

For sand and permanent mold castings, the mechanical properties were determined on separately cast test bars and on samples taken from the casts. For die casts, only separately cast plates or bars were used. The mechanical property ranges demonstrate the performance of the alloys, as well as the effects of casting method and alloy choice. Maximum values serve only as indication of values that can be achieved within a cast or one part of a cast when the most favorable casting method and the best casting techniques are used. Values in parentheses represent minimum values for casts with wall thicknesses up to 20 mm.

Alloy brand name	Numerical denomination	Chemical denomination	Casting process / Treatment state	0.2%-yield tensile strength $R_{p0.2}$ MPa	Ultimate tensile strength R_m MPa	Elongation A %	Brinell hardness HBW 5/250 – 30	Fatigue strength σ_{bw} MPa
Anticorodal-04		AlSi0.5MgE	S F	60 – 100 (50)	90 – 130 (80)	15 – 20 (10)	35 – 40 (35)	
			S T7	160 – 180 (150)	190 – 210 (180)	3 – 5 (3)	70 – 75 (70)	
			K F	80 – 120 (70)	100 – 140 (90)	18 – 22 (12)	40 – 45 (40)	
			K T7	170 – 190 (150)	200 – 220 (190)	3 – 6 (3)	70 – 80 (70)	
			D F	80 – 120	100 – 140	7 – 12	40 – 45	
Anticorodal-50		AlSi5Mg	S F	100 – 130 (90)	140 – 180 (130)	2 – 4 (1)	60 – 70 (55)	60 – 65
			S T4	150 – 180 (120)	200 – 270 (150)	4 – 10 (2)	75 – 90 (70)	70 – 75
			S T6	220 – 290 (160)	260 – 320 (180)	2 – 4 (1)	95 – 115 (85)	70 – 75
			K F	120 – 160 (100)	160 – 200 (140)	2 – 5 (1)	60 – 75 (60)	70 – 75
			K T4	160 – 190 (130)	210 – 270 (170)	5 – 10 (3)	75 – 90 (70)	80 – 85
			K T6	240 – 290 (180)	260 – 320 (190)	2 – 7 (1)	100 – 115 (90)	80 – 85
Anticorodal-70	42100	AlSi7Mg0.3	S F	80 – 140 (80)	140 – 220 (140)	2 – 6 (2)	45 – 60 (45)	
			S T64	120 – 170 (120)	200 – 270 (200)	4 – 10 (4)	60 – 80 (55)	
			S T6	220 – 280 (200)	240 – 320 (240)	3 – 6 (2,5)	80 – 110 (80)	90 – 100
			K F	90 – 150 (90)	180 – 240 (180)	4 – 9 (2)	55 – 70 (50)	
			K T64	180 – 200 (140)	250 – 270 (220)	8 – 12 (5)	80 – 95 (80)	
			K T6	220 – 280 (200)	290 – 340 (250)	5 – 9 (3,5)	90 – 125 (90)	
Anticorodal-71		AlSi7Mg0.3E	S T7	160 – 200 (150)	220 – 250 (210)	2 – 4 (2)	70 – 80 (70)	
			K T7	160 – 200 (150)	220 – 250 (210)	4 – 6 (3)	70 – 80 (70)	
Anticorodal-72	42200	AlSi7Mg0.6	S T6	220 – 280 (220)	250 – 320 (250)	1 – 2 (1)	90 – 110 (90)	90 – 110
			K T64	210 – 240 (150)	290 – 320 (230)	6 – 8 (3)	90 – 100 (90)	
			K T6	240 – 280 (220)	320 – 350 (270)	4 – 6 (2,5)	100 – 115 (100)	110 – 115
Silafont-30	43300	AlSi9Mg	S F	80 – 140 (80)	160 – 220 (150)	2 – 6 (2)	50 – 70 (50)	65 – 75
			S T6	200 – 310 (180)	250 – 330 (220)	2 – 5 (2)	80 – 115 (75)	80 – 100
			K F	90 – 150 (90)	180 – 240 (180)	2 – 9 (2)	60 – 80 (60)	80 – 100
			K T64	180 – 210 (140)	250 – 290 (220)	6 – 10 (3)	80 – 90 (80)	
			K T6	210 – 310 (190)	290 – 360 (240)	4 – 7 (2)	90 – 120 (90)	90 – 110
Silafont-36	43500	AlSi10MnMg	D F	120 – 150	250 – 290	5 – 11	75 – 95	80 – 90
			D T5	155 – 245	275 – 340	4 – 9	80 – 110	
			D T6	210 – 280	290 – 340	7 – 12	90 – 110	
			D T7	120 – 170	200 – 240	10 – 20	60 – 75	
Silafont-38		AlSi9MnMgZn	D F	135 – 160	270 – 300	4 – 8	80 – 105	
			D Wasser – T6	230 – 280	300 – 350	6 – 9	90 – 115	
			D Luft – T6	180 – 210	250 – 290	8 – 11	80 – 110	
Silafont-09	44400	AlSi9	D F	120 – 160	220 – 260	4 – 8	55 – 80	60 – 70
Silafont-13		AlSi11	S F	70 – 120 (70)	150 – 210 (150)	7 – 13 (6)	45 – 60 (45)	55 – 70
			S O	60 – 120 (60)	150 – 210 (150)	9 – 15 (8)	45 – 60 (45)	85 – 100
			K F	80 – 150 (80)	170 – 240 (160)	7 – 16 (6)	45 – 60 (45)	70 – 90
			K O	60 – 120 (60)	180 – 240 (160)	10 – 18 (10)	45 – 65 (45)	90 – 110
Silafont-20	44000	AlSi11Mg	S F	80 – 140 (70)	170 – 220 (170)	2 – 4 (1,5)	50 – 60 (50)	65 – 75
			S T6	120 – 300 (110)	200 – 320 (200)	1 – 3 (0,5)	65 – 120 (55)	90 – 120
			K F	80 – 130 (80)	180 – 230 (180)	3 – 16 (3)	55 – 75 (55)	80 – 100
			K T6	125 – 320 (120)	210 – 350 (210)	4 – 15 (3)	70 – 125 (70)	100 – 120
Silafont-70	48000	AlSi12CuNiMg	S F	120 – 170 (110)	130 – 180 (120)	0,5 – 1,5 (0,5)	80 – 90 (80)	75 – 85
			K F	190 – 260 (180)	200 – 270 (190)	1,0 – 2,5 (0,5)	90 – 105 (90)	80 – 90
			K T6	320 – 390 (280)	350 – 400 (300)	0,5 – 2,0 (0,5)	135 – 160 (130)	100 – 110
			K T5	185 – 210 (150)	200 – 230 (180)	0,5 – 2,0 (0,5)	90 – 110 (90)	
Silafont-90		AlSi17Cu4Mg	K F	170 – 225 (160)	180 – 235 (170)	0,4 – 0,9 (0,3)	110 – 120 (110)	
			K T5	160 – 225 (160)	165 – 230 (165)	0,4 – 0,8 (0,3)	105 – 115 (110)	
			K T6	270 – 360 (260)	280 – 370 (270)	0,2 – 0,5 (0,2)	140 – 160 (130)	
			D T5	220 – 265	230 – 295	0,5 – 1,0	110 – 120	
Castaman-35	43500	AlSi10MnMg	D T7	110 – 150	190 – 230	8 – 13	60 – 75	

Metal impurities – particularly elevated iron content – influence the properties of AlSi aluminum casting alloys. The primary alloys supplied by RHEINFELDEN ALLOYS contain less than 0.15% Fe unless higher values are necessary. The narrow alloying limits of our alloys assure stable casting behavior and other properties.

The details relating to the casting method use the following abbreviations:
S Sand casting K Gravity die casting D High pressure die casting

1) Long-term aged; tested at temperature

Alloy brand name	Numerical denomination	Chemical denomination	Casting process / Treatment state	0.2%-yield tensile strength $R_{p0.2}$ MPa	Ultimate tensile strength R_m MPa	Elongation **A** %	Brinell hardness **HBW** 5/250 – 30	Fatigue strength σ_{bw} MPa
Castasil-37		AlSi9MnMoZr	D 2–3 mm F	120 – 150	260 – 300	10 – 14	60 – 75	
			D 3–5 mm F	100 – 130	230 – 280	10 – 14	60 – 75	80 – 95
			D 5–7 mm F	80 – 110	200 – 250	10 – 14	60 – 75	
Castasil-21		AlSi9SrE	D F	85 – 100	200 – 230	6 – 9	60 – 70	
			D O	80 – 100	170 – 200	9 – 15	55 – 65	
Unifont-90	71100	AlZn10Si8Mg	S T1	190 – 230 (170)	220 – 250 (180)	1 – 2 (1)	90 – 100 (90)	80 – 100
			K T1	220 – 250 (220)	280 – 320 (230)	1 – 4 (1)	95 – 120 (95)	90 – 110
Unifont-94		AlZn10Si8Mg	D T1	230 – 280	300 – 350	1 – 4	105 – 120	70 – 90
Castadur-30		AlZn3Mg3Cr	K T1	140 – 160	260 – 290	10 – 20	75 – 85	
Castadur-50		AlZn5Mg	S T1	160 – 200	220 – 280	5 – 10	75 – 85	
Peraluman-30	51100	AlMg3	S F	70 – 100 (60)	170 – 190 (140)	4 – 8 (4)	50 – 60 (45)	70 – 80
			S T6	140 – 160 (110)	200 – 240 (160)	6 – 8 (5)	65 – 75 (60)	75 – 85
			K F	70 – 100 (70)	170 – 210 (150)	9 – 16 (6)	50 – 60 (50)	90 – 100
			K T6	140 – 160 (110)	240 – 260 (180)	15 – 20 (12)	70 – 80 (70)	100 – 110
Peraluman-36		AlMg3Si	S F	80 – 100 (70)	140 – 190 (130)	3 – 8 (3)	50 – 60 (45)	60 – 65
			S T6	160 – 220 (140)	220 – 280 (180)	2 – 8 (2)	70 – 90 (65)	75 – 80
			K F	70 – 100 (70)	160 – 210 (160)	6 – 14 (5)	50 – 65 (50)	70 – 80
			K T6	160 – 220 (150)	250 – 300 (220)	5 – 15 (5)	75 – 90 (75)	80 – 90
Peraluman-50	51300	AlMg5	S F	100 – 120 (90)	190 – 250 (170)	10 – 15 (8)	55 – 70 (50)	60 – 80
			K F	100 – 140 (100)	200 – 260 (180)	10 – 25 (8)	60 – 75 (55)	70 – 80
Peraluman-56	51400	AlMg5Si	S F	110 – 130 (100)	160 – 200 (140)	3 – 4 (2)	60 – 80 (55)	60 – 80
			S T6	140 – 160 (110)	180 – 220 (160)	3 – 4 (2)	70 – 80 (65)	70 – 90
			K F	110 – 150 (100)	180 – 240 (150)	3 – 5 (3)	65 – 85 (60)	70 – 80
			K T6	140 – 160 (110)	210 – 260 (200)	3 – 14 (5)	75 – 85 (70)	70 – 90
Magsimal-59	51500	AlMg5Si2Mn	D 2–4 mm F	160 – 220	310 – 340	11 – 22	85 – 105	90 – 100
			D 4–6 mm F	140 – 170	250 – 320	9 – 14	80 – 90	
			D 6–12 mm F	120 – 145	220 – 260	8 – 12	75 – 85	
Magsimal-plus		AlMg6Si2MnZr	D 2–3 mm F	200 – 220	340 – 360	9 – 12	85 – 105	100 – 110
			D 2–3 mm T5	230 – 250	350 – 380	8 – 12	85 – 110	
Castaduct-42		AlMg4Fe2	D 2–4 mm F	120 – 150	240 – 280	10 – 22	65 – 75	90 – 100
Castaduct-18		AlMg4Zn3Fe2	D 2–10 mm T1	150 – 190	280 – 320	7 – 10	85 – 95	110 – 120
Alufont-47	21000	AlCu4MgTi	S T4	220 – 280 (180)	300 – 400 (240)	5 – 15 (3)	90 – 115 (85)	80 – 100
			S T6	240 – 350 (220)	350 – 420 (280)	3 – 10 (1)	95 – 125 (90)	80 – 100
			K T4	220 – 300 (200)	320 – 420 (280)	8 – 18 (5)	95 – 115 (90)	100 – 110
Alufont-48		AlCu4MgAgTi	S T64	200 – 270 (180)	370 – 430 (320)	14 – 18 (7)	105 – 120 (100)	
			S T6	410 – 450 (320)	460 – 510 (380)	3 – 7 (2)	130 – 150 (125)	80 – 100
			K T6	410 – 460 (340)	460 – 510 (440)	5 – 8 (3)	130 – 150 (130)	100 – 110
Alufont-52	21100	AlCu4Ti	S T64	210 – 240 (180)	300 – 360 (260)	8 – 15 (4)	90 – 100 (90)	80 – 100
			S T6	300 – 420 (280)	400 – 475 (350)	3 – 4 (2)	125 – 145 (120)	80 – 100
			K T64	210 – 250 (190)	360 – 400 (300)	12 – 20 (10)	90 – 120 (90)	100 – 110
			K T6	310 – 400 (300)	420 – 475 (400)	7 – 16 (4)	130 – 145 (130)	100 – 110
Alufont-60		AlCu5NiCoSbZr	S T7	145 – 165 (140)	180 – 220 (180)	1 – 1,5 (1)	85 – 95 (85)	90 – 100
			S O	160 – 180 (160)	180 – 200 (180)	1 – 1,5 (1)	80 – 90 (80)	90 – 100
Thermodur-72		AlMg7Si3Mn	D F	190 – 220	350 – 380	7 – 10	80 – 100	
			D 150 °C/500 h[1]	220 – 245	260 – 290	< 15		
			D 225 °C/500 h[1]	150 – 175	180 – 205	< 20		
Thermodur-73		AlSi11Mg2Cu2Ni2	D T5	270 – 300	300 – 320	< 1	130 – 150	
			D 150 °C/500 h[1]	280 – 310	330 – 355	< 1		
			D 225 °C/500 h[1]	130 – 155	250 – 280	1 – 2		
Rotoren-Al99.7		99.7E	D F	20 – 40	80 – 120	10 – 25	15 – 25	
Aluman-16		AlMn1.6	S F	80 – 100	130 – 160	4 – 8	40 – 50	
			D F	90 – 120	160 – 180	8 – 15	40 – 60	

Chemical compositions

RHEINFELDEN
Solutions thru Innovation

Alloys of a consistently high purity are the key to producing high-quality casts. The RHEINFELDEN ALLOYS quality system allows this level of purity to be met.

The main alloy components are printed in bold. Individual values in the table are the maximum contents of alloy and accompanying elements. The alloys which RHEINFELDEN ALLOYS supplies sometimes have narrower alloy component ranges and a lower content of impurity than stipulated in the standard. This ensures good uniformity in the casting process and other properties.

European standard EN 1676 for alloyed aluminum in ingots applies. The numerical alloy denomination is based on the European standard (EN). Alloys without these denominations are not included in the EN or have wider limits in composition.

Alloys with special compositions can be produced by agreement.

In the case of AlSi alloys, on request a modified microstructure with sodium (modified subsequently or in advance) or strontium (permanently modified) can be set rather than the granular microstructure. This choice is indicated by the denomination (Na/Sr) in the last column.

Alloy brand name	Chemical denomination	Numerical denomination	Composition [% of mass]							
			Si	Fe	Cu	Mn	Mg	Zn	Ti	other
Anticorodal-04	AlSi0.5MgE		**0.3 – 0.6**	**0.8**	0.01	0.01	**0.3 – 0.6**	0.07	**0.01**	
Anticorodal-50	AlSi5Mg		**5.0 – 6.0**	0.15	0.02	0.10	**0.4 – 0.8**	0.10	**0.20**	
Anticorodal-70	AlSi7Mg0.3	42100	**6.5 – 7.5**	0.15	0.02	0.10	**0.30 – 0.45**	0.07	**0.18**	**(Na/Sr)**
Anticorodal-78dv	AlSi7Mg0.3	42100	**6.5 – 7.5**	0.12	0.02	0.05	**0.30 – 0.45**	0.07	**0.18**	**Sr**
Anticorodal-71	AlSi7Mg0.3E		**6.5 – 7.5**	0.15	0.01	0.01	**0.30 – 0.45**	0.07	**0.01**	**(Na/Sr)**
Anticorodal-72	AlSi7Mg0.6	42200	**6.5 – 7.5**	0.15	0.02	0.05	**0.50 – 0.70**	0.07	**0.18**	**(Na/Sr)**
Silafont-30	AlSi9Mg	43300	**9.0 – 10.0**	0.15	0.02	0.05	**0.30 – 0.45**	0.07	**0.15**	**(Na/Sr)**
Silafont-36	AlSi10MnMg	43500	**9.5 – 11.5**	0.15	0.03	**0.5 – 0.8**	**0.1 – 0.5**	0.07	**0.04 – 0.15**	**Sr**
Silafont-38	AlSi9MnMgZn		**8.5 – 10.0**	0.15	**0.1 – 0.4**	**0.4 – 0.8**	**0.3 – 0.4**	**0.1 – 0.3**	0.15	**Mo; Zr; Sr**
Silafont-09	AlSi9	44400	**9.5 – 10.6**	**0.4**	0.02	**0.4**	0.05	0.10	0.10	
Silafont-13	AlSi11		**10.0 – 13.5**	0.15	0.02	0.05	0.05	0.07	0.15	**(Na/Sr)**
Silafont-20	AlSi11Mg	44000	**10.0 – 11.8**	0.15	0.02	0.05	**0.10 – 0.45**	0.07	0.15	**(Na/Sr)**
Silafont-70	AlSi12CuNiMg	48000	**11.0 – 13.5**	0.15	**0.8 – 1.3**	0.05	**0.9 – 1.3**	0.10	0.10	**0.8–1.3 Ni**
Silafont-90	AlSi17Cu4Mg		**16.0 – 18.0**	0.3	**4.0 – 5.0**	0.15	**0.5 – 0.6**	0.10	0.20	
Castaman-35	AlSi10MnMg	43500	**9.5 – 11.0**	0.2	0.03	**0.5 – 0.8**	**0.2 – 0.5**	0.10	0.15	**Sr**
Castasil-37	AlSi9MnMoZr		**8.5 – 10.5**	0.15	0.05	**0.35 – 0.6**	**0.06**	0.07	0.15	**0.1–0.3 Mo 0.1–0.3 Zr**
Castasil-21	AlSi9SrE		**8.0 – 9.0**	**0.5 – 0.7**	0.02	**0.01**	0.03	0.07	**0.01**	**Sr**
Unifont-90	AlZn10Si8Mg	71100	**8.5 – 9.3**	0.15	0.03	0.10	**0.3 – 0.5**	**9.0 – 10.0**	0.15	**(Na/Sr)**
Unifont-94	AlZn10Si8Mg		**8.5 – 9.5**	**0.4**	0.03	**0.4**	**0.3 – 0.5**	**9.0 – 10.0**	0.10	
Castadur-30	AlZn3Mg3Cr		0.15	0.2	0.05	**0.1 – 0.2**	**2.5 – 3.0**	**2.2 – 2.8**	**0.03 – 0.15**	**0.2–0.4 Cr; Be**
Castadur-50	AlZn5Mg		0.15	0.2	0.05	**0.1 – 0.2**	**0.4 – 0.8**	**4.9 – 5.8**	**0.03 – 0.15**	**0.2–0.4 Cr**
Peraluman-30	AlMg3	51100	0.45	0.15	0.02	**0.01 – 0.4**	**2.7 – 3.5**	0.10	**0.01 – 0.15**	**Be**
Peraluman-36	AlMg3Si		**0.9 – 1.3**	0.15	0.02	**0.01 – 0.4**	**2.7 – 3.5**	0.10	**0.01 – 0.15**	**Be**
Peraluman-50	AlMg5	51300	0.30	0.15	0.02	**0.01 – 0.4**	**4.8 – 5.5**	0.10	**0.01 – 0.15**	**Be**
Peraluman-56	AlMg5Si	51400	**0.9 – 1.3**	0.15	0.02	**0.01 – 0.4**	**4.8 – 5.5**	0.10	**0.01 – 0.15**	**Be**
Magsimal-59	AlMg5Si2Mn	51500	**1.8 – 2.6**	0.20	0.03	**0.5 – 0.8**	**5.0 – 6.0**	0.07	0.20	**Be**
Magsimal-plus	AlMg6Si2MnZr		**2.1 – 2.6**	0.15	0.05	**0.5 – 0.8**	**6.0 – 6.4**	0.07	0.05	**Mo; Zr; Be**
Castaduct-42	AlMg4Fe2		0.2	**1.5 – 1.7**	0.2	0.15	**4.0 – 4.6**	0.3	0.2	**Be**
Castaduct-18	AlMg4Zn3Fe2		0.2	**1.4 – 1.7**	0.05	0.15	**4.0 – 4.5**	**3.3–3.6**	0.2	**Be**; Cr
Alufont-47	AlCu4TiMg	21000	0.15	0.15	**4.2 – 5.0**	0.10	**0.20 – 0.35**	0.07	**0.15 – 0.25**	
Alufont-48	AlCu4TiMgAg		0.05	0.10	**4.0 – 5.0**	**0.01 – 0.5**	**0.15 – 0.35**	0.05	**0.15 – 0.35**	**0.4–1.0 Ag**
Alufont-52	AlCu4Ti	21100	0.15	0.15	**4.2 – 5.2**	**0.01 – 0.5**	0.03	0.07	**0.15 – 0.25**	
Alufont-60	AlCu5NiCoSbZr		0.20	0.30	**4.5 – 5.2**	**0.1 – 0.3**	0.10	0.10	**0.15 – 0.30**	**1.3–1.7 Ni 0.10–0.40 Co 0.10–0.30 Zr&Sb**
Thermodur-72	AlMg7Si3Mn		**3.0 – 3.8**	0.15	0.05	**0.5 – 0.8**	**7.0 – 8.0**	0.10	0.20	**Be**
Thermodur-73	AlSi11Cu2Ni2Mg2		**10.0 – 11.8**	0.15	**1.8 – 2.3**	**0.8**	**1.8 – 2.3**	0.10	0.10	**1.8–2.3 Ni; Sr**
Rotoren-Al99.7	Al99.7E		**0.20**	**0.25**	0.01	0.02	0.02	0.07	**0.02**	Mn + Ti + V + Cr max 0.020%
Aluman-16	AlMn1.6		0.15	**0.2 – 0.9**	0.03	**1.4 – 1.6**	0.05	0.10	0.15	

Physical properties

RHEINFELDEN
Solutions thru Innovation

The details of physical properties relate to heat-treatable alloys in this heat-treated state. They are heavily influenced by fluctuations in the alloy composition and for the AlSi alloys with the microstructure state.

The details for the melt and solidification ranges take into account the initial signs of partial melting resulting from segregation in the cast structure, which may occur in particular when heating up quickly at far below the theoretical equilibrium temperature.

Density (approximate value)	Young's modulus	Linear thermal expansion coeffizient 20–200 °C	Thermal conductivity 20–200 °C	Electrical conductivity		Linear shrinkage			Melting and solidification range
						Sand casting	Gravity die casting	High pressure die casting	
kg/dm³	GPa	$\frac{1}{K} \times 10^{-6}$	$\frac{W}{K \times cm}$	MS/m or m/(Ω × mm²)	% IACS	%	%	%	°C
2.67	66 – 73	23	2.0	29 – 31.5	50.0 – 54.0	1.1 – 1.2	0.8 – 1.1	0.5 – 1.0	600 – 650
2.67	65 – 75	23	1.5	21 – 26	36.0 – 45.0	1.1 – 1.2	0.8 – 1.1		550 – 625
2.66	69 – 75	22	1.6	21 – 27	36.0 – 46.5	1.1 – 1.2	0.8 – 1.1		550 – 625
2.66	69 – 75	22	1.6	21 – 27	36.0 – 46.5	1.1 – 1.2	0.8 – 1.1		550 – 625
2.66	69 – 75	22	1.8	27 – 29	46.5 – 50.0	1.1 – 1.2	0.8 – 1.1		550 – 625
2.66	71 – 75	22	1.5	20 – 26	34.5 – 45.0	1.1 – 1.2	0.8 – 1.1		550 – 625
2.65	74 – 83	21	1.5	21 – 26	36.0 – 45.0	1.0 – 1.1	0.7 – 1.0		550 – 600
2.68	74 – 83	21	1.5	21 – 26	36.0 – 45.0			0.4 – 0.6	550 – 590
2.69	74 – 83	21	1.5	21 – 24	36.0 – 41.5			0.4 – 0.6	550 – 585
2.65	62 – 78	21	1.4	18 – 24	31.0 – 41.5			0.4 – 0.6	550 – 595
2.64	65 – 81	21	1.4	17 – 27	29.5 – 46.5	1.0 – 1.1	0.7 – 1.0		565 – 585
2.64	76 – 83	21	1.4	18 – 26	31.0 – 45.0	1.0 – 1.1	0.7 – 1.0		565 – 585
2.68	77 – 83	21	1.2	16 – 22	27.5 – 38.0	1.0 – 1.1	0.7 – 1.0	0.4 – 0.6	545 – 600
2.73	77 – 83	18	1.1	14 – 17	24.0 – 29.5	0.6 – 0.8	0.4 – 0.6	0.3 – 0.5	510 – 650
2.68	74 – 83	21	1.4	21 – 26	36.0 – 45.0			0.4 – 0.6	550 – 590
2.69	68 – 75	22	1.4	18 – 22	31.0 – 38.0			0.4 – 0.6	550 – 600
2.69	62 – 75	22	1.9	25 – 28	43.0 – 48.5			0.4 – 0.6	550 – 595
2.85	74 – 80	21	1.2	16 – 20	27.5 – 34.5	1.1 – 1.2	0.8 – 1.1		550 – 595
2.85	74 – 80	21	1.1	14 – 18	24.0 – 31.0			0.5 – 0.8	550 – 595
2.74	70 – 72	24	1.2	17 – 20	29.5 – 34.5	1.0 – 1.4	0.7 – 1.1		555 – 650
2.78	71 – 74	24	1.3	18 – 21	31.0 – 36.0	1.0 – 1.4			555 – 655
2.66	63 – 73	24	1.3	16 – 23	27.5 – 39.5	1.1 – 1.5	0.8 – 1.2		560 – 650
2.66	66 – 74	24	1.2	15 – 23	26.0 – 39.5	1.1 – 1.5	0.8 – 1.2		560 – 650
2.63	63 – 73	24	1.2	15 – 21	26.0 – 36.0	1.0 – 1.4	0.7 – 1.1		545 – 645
2.63	68 – 75	24	1.1	14 – 21	24.0 – 36.0	1.0 – 1.4	0.7 – 1.1		545 – 645
2.65	70 – 80	24	1.1	14 – 16	24.0 – 27.5			0.6 – 1.1	580 – 620
2.66	70 – 80	24	1.1	14 – 16	24.0 – 27.5			0.6 – 1.1	575 – 620
2.67	68 – 75	25	1.4	14 – 17	24.0 – 29.5			0.5 – 0.9	580 – 635
2.73	68 – 75	25	1.2	13 – 16	22.0 – 27.5			0.5 – 0.9	580 – 630
2.79	65 – 72	23	1.3	17 – 23	29.5 – 39.5	1.3 – 1.5	0.8 – 1.2		540 – 650
2.80	65 – 72	23	1.3	17 – 23	29.5 – 39.5	1.3 – 1.5	0.8 – 1.2		525 – 645
2.79	65 – 73	23	1.3	17 – 23	29.5 – 39.5	1.3 – 1.5	0.8 – 1.2		540 – 650
2.84	72 – 76	22.5	1.2	17 – 21	29.5 – 36.0	1.3 – 1.5			545 – 650
2.61	75 – 85	24					0.7 – 1.2	0.6 – 1.1	
2.74	85 – 90	21				1.0 – 1.1	0.7 – 1.0	0.4 – 0.6	
2.67	65 – 70	24	2.3	34.5 – 36.5	59.5 – 63.0	1.5 – 1.8		1.0 – 1.4	655 – 660
2.73	65 – 72	24	1.5	20 – 26	34.5 – 45.0	1.2 – 1.5		0.8 – 1.2	645 – 660

Thermal treatment

RHEINFELDEN
Solutions thru Innovation

Casts cooled in permanent molds take the shortest annealing time. Those cooled in sand take the longest. For AlCu alloys, the annealing time figures apply to casts with wall thickness to 8 mm. Casts with thicker walls should be annealed at temperatures 10 °C lower for 12–18 hours.

Treatment state

F	as-cast state	**T5**	quenched and artificially aged
O	annealed	**T6**	artificially aged
T1	self-aged	**T64**	partially aged
T4	naturally aged	**T7**	overaged
T5	stabilized		

Alloy brand name	Chemical denomination	State	Solution heat treatment temperature °C	Solution heat treatment duration h	Quenching temperature (water) °C	Ageing temperature °C	Ageing duration h
Anticorodal-04	AlSi0.5MgE	T7	520 – 530	6 – 8	20	220 – 240	4 – 6
Anticorodal-50	AlSi5Mg	T6	520 – 535	4 – 8	20	155 – 160	7 – 9
		T4	520 – 535	4 – 8	20	15 – 30	120
Anticorodal-70	AlSi7Mg0.3	T6	520 – 545	4 – 10	20	155 – 165	6 – 8
		T64	520 – 545	4 – 10	20	150 – 160	2 – 3
Anticorodal-78dv	AlSi7Mg0.3	T6	520 – 545	4 – 20	20	145 – 160	2 – 15
Anticorodal-71	AlSi7Mg0.3E	T7	520 – 545	4 – 8	20	200 – 230	6 – 8
Anticorodal-72	AlSi7Mg0.6	T6	520 – 545	4 – 10	20	155 – 165	6 – 8
		T64	520 – 545	4 – 10	20	150 – 160	2 – 3
Silafont-30	AlSi9Mg	T6	520 – 535	6 – 10	20	160 – 170	6 – 8
		T5	–	–	Air	210 – 230	6 – 8
Silafont-36	AlSi10MnMg	T6	480 – 490	2 – 5	20/Air	155 – 170	2 – 6
		T7	480 – 490	1 – 5	20/Air	210 – 230	1 – 3
		T5	–	–	20	155 – 190	2 – 5
Silafont-38	AlSi9MnMgZn	Water-T6	470 – 490	1 – 3	20	155 – 190	1 – 3
		Air-T6	470 – 490	1 – 3	Air	155 – 210	1 – 3
Silafont-13	AlSi11	O	520 – 530	6 – 8	20	–	–
Silafont-20	AlSi11Mg	T6	520 – 535	6 – 10	20	130 – 170	6 – 8
		T5	–	–	Air	210 – 230	5 – 8
Silafont-70	AlSi12CuNiMg	T6	520 – 530	5 – 10	20 – 80	165 – 185	5 – 8
		T5	–	–	Air	210 – 220	10 – 12
Castaman-35	AlSi10MnMg	T7	480 – 490	2 – 5	20/Air	210 – 230	1 – 3
Castasil-21	AlSi9SrE	O	345 – 355	1 – 2	Air	–	–
Unifont-90	AlZn10Si8Mg	T1	–	–	Air	15 - 30	240
Magsimal-plus	AlMg6Si2Zr	T5	–	–	20/Air	170 - 250	0.5 – 1.5
Castaduct-18	AlMg4Zn3Fe2	T1	–	–	Air	15 - 30	480
Alufont-47	AlCu4TiMg	T4	520 – 530	8 – 16	20 – 80	15 – 30	120
Alufont-48	AlCu4TiMgAg	T6	525 – 530	8 – 16	20 – 80	160 – 180	6 – 7
Alufont-52	AlCu4Ti	T6	525 – 535	8 – 16	20 – 50	160 – 175	6 – 7
		T64	525 – 535	8 – 10	20 – 50	135 – 145	6 – 7
Alufont–60	AlCu5NiCoSbZr	T7	535 – 545	10 – 15	80	210 – 220	12 – 16
		O	345 – 355	5 – 10	Air	–	–
Thermodur–73	AlSi11Cu2Ni2Mg2	T5	–	–	Air	210 – 270	10 – 12

RHEINFELDEN
Solutions thru Innovation

RHEINFELDEN ALLOYS GmbH & Co. KG
A company of the ALUMINIUM RHEINFELDEN Group
Sales and Customer Support
Friedrichstraße 80
D-79618 Rheinfelden

Tel. +49 7623 93-490
Fax +49 7623 93-546

alloys@rheinfelden-alloys.eu
www.rheinfelden-alloys.eu

Edition 08/2018