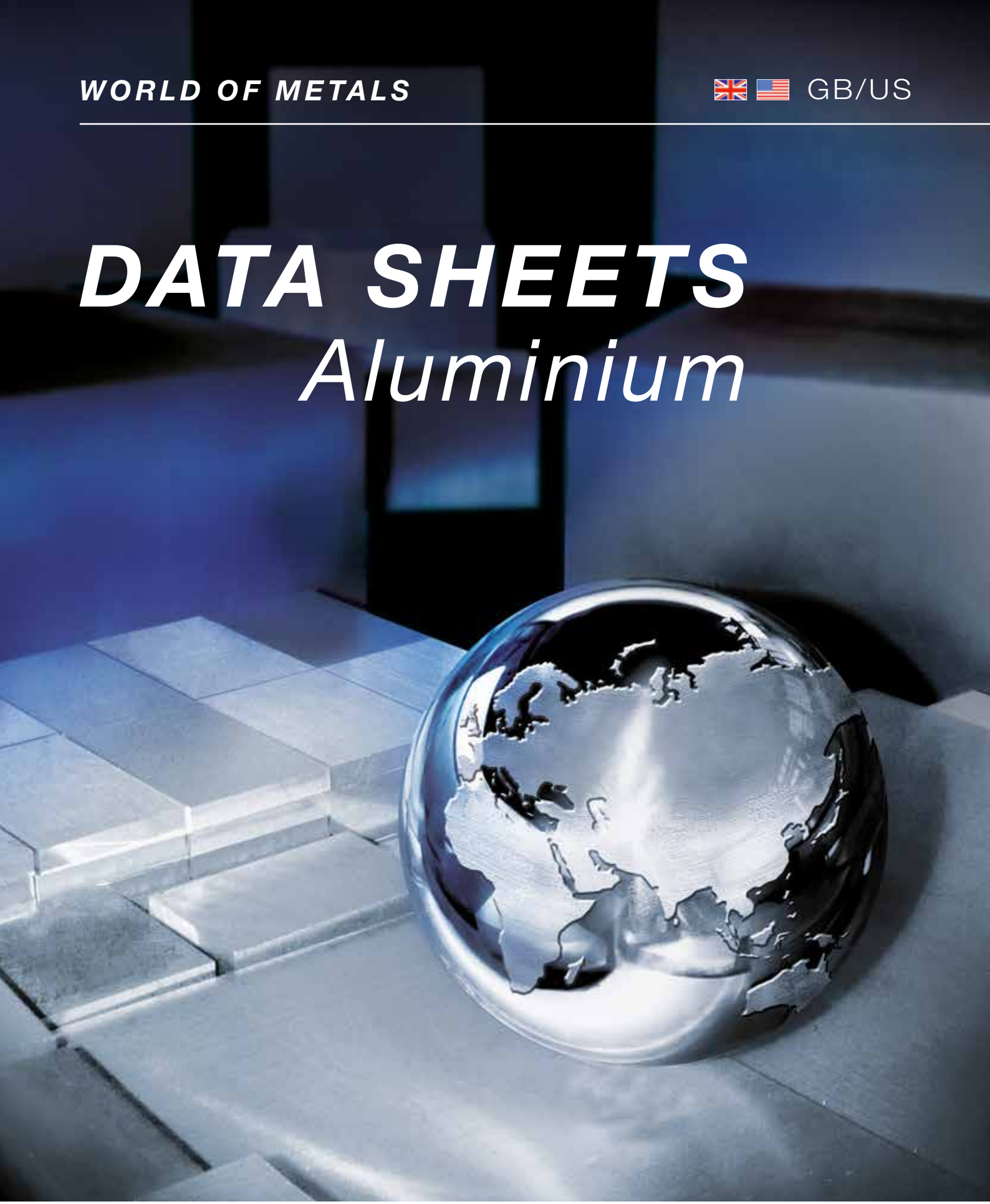
WORLD OF METALS

GB/US

DATA SHEETS
Aluminium



ALUMINIUM | COPPER | BRASS | BRONZE

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BIKAR METALLE

WELCOME TO THE WORLD OF METALS

Dear business partner,

BIKAR is a leading German Metal Trader on the market of non-ferrous metals. Our customers often ask us if they can get technical information about the alloy components or mechanical properties of a certain material. For this reason, we have summarised the most important alloys for you here.

The data specified has been listed to the best of our knowledge for informational purposes. There shall be no legal claim to correctness here. Detailed information about this and other alloys can be obtained from:

Beuth Verlag GmbH, Berlin www.beuth.de

If you have any questions regarding material properties, we are at your disposal.

Your BIKAR-METALLE Team

BIKAR METALLE

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CHEMICAL COMPOSITION

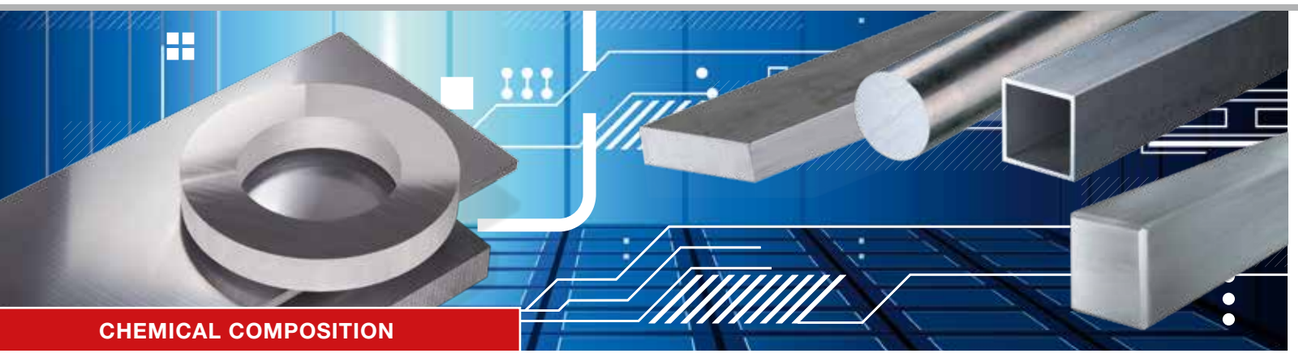
• = Specially for tool making, mould making and model making

MECHANICAL PROPERTIES

WORLD OF METALS

BIKAR METALLE

EN AW-1050A



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al 99,5
Old designation	Al 99,5
Material no. according to DIN	3.0255
Great Britain BS	1B
Italy UNI	9001/2
Spain	L-3051
Sweden	144007
Norway	17010
France AFNOR	A5
Colour code	RAL 9004 Signal black / RAL 3020 Traffic red

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		69
Thermal conductivity [W/m*K]		210 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,7
	20°C – 100°C	23,5
	20°C – 200°C	24,4
	20°C – 300°C	25,4
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		34 – 36
Shear modulus [GPa]		25,9

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,25	0,40	0,05	0,05	0,05	-	-	0,07	0,05	-	-	-	0,03	-

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good welding properties
- Very good corrosion resistance to a normal atmosphere
- Very high electrical conductivity as well as thermal conductivity
- Very good anodising properties, also decorative
- Very good malleability

Applications:

- Deep drawn parts, moulded pressure parts and sheet metal parts
- Parts with a decorative surface
- Automotive parts
- Panelling in machine construction and plant construction
- Food industry

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	320°C – 350°C
Heating-up time	0,5 – 2 hours
Cooling conditions	uncontrolled

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	4 – 5
Work-hardened	3
Heat-treated	-
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	1
Anodising - decorative	2
Painting / coating	1
Polishing	1 – 2

Welding

		Filler metal
Gas	2	SG-Al 99,5 SG-Al 99,5 Ti
WIG	2	
MIG	2 – 3	
Resistance welding	4	

Solder

Brazing with flux	1
Brazing without flux	1
Abrasion soldering	1
Soft soldering with flux	1

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	2 – 3

Metal forming

Cold forming		Delivery condition
Bending	1	
Pressure forming	1	
Deep drawing (condition-based)	1	H14
Upsetting (condition-based)	1	H12
Impact extrusion	1	

Hot forming	
Drop forging	1
Extrusion moulding	1
Hammer forging	-

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 62 - 63, bars - round: p. 86, square bars - flat - hexagonal: p. 102, tubes p. 120, profiles: p. 134**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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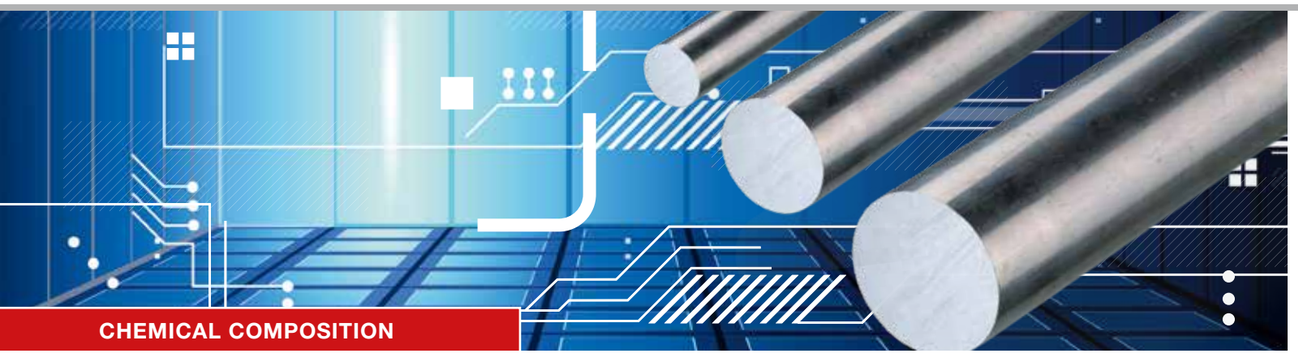
BIKAR METALLE

EN AW-1350A



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	E Al99,5(A)
Old designation	E-Al 99,5 A
Material no. according to DIN	3.0257
Great Britain BS	-
Italy UNI	9001/5
Spain	-
Sweden	-
Norway	17011
France AFNOR	-
Colour code	-

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		230
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		34,5 – 35,5
Shear modulus [GPa]		

Chemical composition[x] (EN 573-3):

Specifications in % Aluminium: mind. 99,5												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,25	0,40	0,02	-	0,05	-	-	0,05	-	-	-	0,03 Cr+Mn+Ti+V	0,03	-

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Good welding properties
- Good corrosion resistance to a normal atmosphere
- Very high electrical conductivity as well as thermal conductivity
- Very good anodising properties, also decorative
- Very good malleability

Applications:

- Electrotechnology

Available forms:

Bars · Wires

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	340°C – 360°C
Heating-up time	0,5 – 2 hours
Cooling conditions	uncontrolled

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	4 – 5
Work-hardened	3
Heat-treated	-
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	1
Anodising - decorative	2
Painting / coating	1
Polishing	-

Welding

		Filler metal
Gas	2	
WIG	2	
MIG	3	
Resistance welding	4 – 5	

Solder

Brazing with flux	1
Brazing without flux	1
Abrasion soldering	1
Soft soldering with flux	1

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	3

Metal forming

Cold forming		Delivery condition
Bending	1	
Pressure forming	1	
Deep drawing (condition-based)	1	H14
Upsetting (condition-based)	1	H12
Impact extrusion	1	
Hot forming		
Drop forging	1	
Extrusion moulding	1	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **bars - round: p. 87, square bars - flat hexagonal: p. 103**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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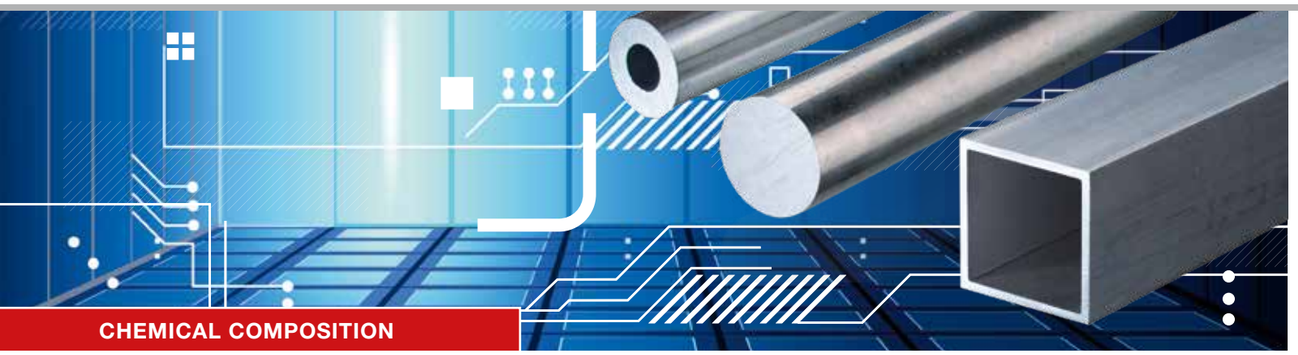
BIKAR METALLE

EN AW-2007



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Cu4 Pb Mg Mn
Old designation	Al Cu Mg Pb
Material no. according to DIN	3.1645
Great Britain BS	
Italy UNI	9002/8
Spain	
Sweden	
Norway	17110
France AFNOR	
Colour code	RAL 9004 Signal black

Typical physical properties:

Density [g/cm³]		2,85
Elastic modulus [GPa]		72,5
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,0
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		860
Electrical conductivity [m/Ω*mm²]		18 – 22
Shear modulus [GPa]		27,3

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,80	0,80	3,3 – 4,6	0,50 – 1,0	0,40 – 1,8	0,10	0,20	0,80	0,20	-	-	0,20 Bi • 0,80 – 1,5 Pb • 0,20 Sn	0,10	0,30

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Good machinability, short-chip drilling and turning quality (machining alloy)
- Curable
- Relatively high strength

Applications:

- Machine and fixture construction
- Turned and milled parts
- Screws, nuts

Available forms:

Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	480°C – 490°C
Quenching	water to 65°C
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	1
Dimensional stability	2
Erosion	1

Surface treatment

Anodising - (protective anodisation)	4 – 5
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	4
Polishing	3

Welding

		Filler metal
Gas	-	
WIG	-	
MIG	-	
Resistance welding	-	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	4 – 5
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	4 – 5
Sea water atmosphere	4 – 5

Metal forming

Cold forming		Delivery condition
Bending	4 – 5	
Pressure forming	-	
Deep drawing (condition-based)	-	
Upsetting (condition-based)	4 – 5	
Impact extrusion	-	
Hot forming		
Drop forging	-	
Extrusion moulding	4	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	no

The mechanical properties and dimensions available for this alloy can be found on the following pages: **bars- round: p. 87, square - bars - flat hexagonal: p. 103, tubes: p. 121, profiles: p. 134**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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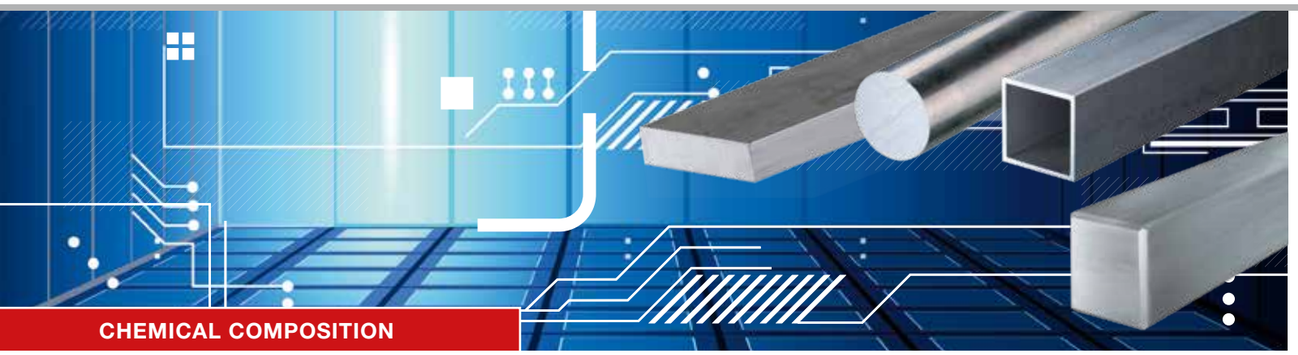
BIKAR METALLE

EN AW-2011



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Cu6 Bi Pb
Old designation	Al Cu Bi Pb
Material no. according to DIN	3.1655
Great Britain BS	FC1
Italy UNI	9002/5
Spain	L-3192
Sweden	144355
Norway	17107
France AFNOR	A-U5PbBi
Colour code	RAL 3020 Traffic red

Typical physical properties:

Density [g/cm³]		2,82
Elastic modulus [GPa]		72,5
Thermal conductivity [W/m*K]		170 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,4
	20°C – 100°C	23,4
	20°C – 200°C	24,0
	20°C – 300°C	25,0
Specific heat J/(kg * K)		864
Electrical conductivity [m/Ω*mm²]		24 – 32
Shear modulus [GPa]		27,3

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,70	5,0 – 6,0	-	-	-	-	0,30	-	-	-	0,20 – 0,60 Bi • 0,20 – 0,60 Pb	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Good machinability
- High strength
- High fatigue strength
- Curable

Applications:

- Machine construction
- Aerospace
- Military technology

Available forms:

Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	515°C – 525°C
Quenching	water to 65°C
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	165°C – 185°C, 8 – 16 h

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	1
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	4 – 5
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	-
Painting / coating	4
Polishing	3

Welding

	Filler metal
Gas	-
WIG	5
MIG	5
Resistance welding	5

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	4
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	4
Sea water atmosphere	5

Metal forming

Cold forming		Delivery condition
Bending	-	
Pressure forming	-	
Deep drawing (condition-based)	-	
Upsetting (condition-based)	3	
Impact extrusion	-	

Hot forming	
Drop forging	-
Extrusion moulding	4
Hammer forging	-

Suitable for food industry according to DIN EN 602	no

The mechanical properties and dimensions available for this alloy can be found on the following pages: **bars - round: p. 88, square bars - flat hexagonal: p. 104, tubes p. 122**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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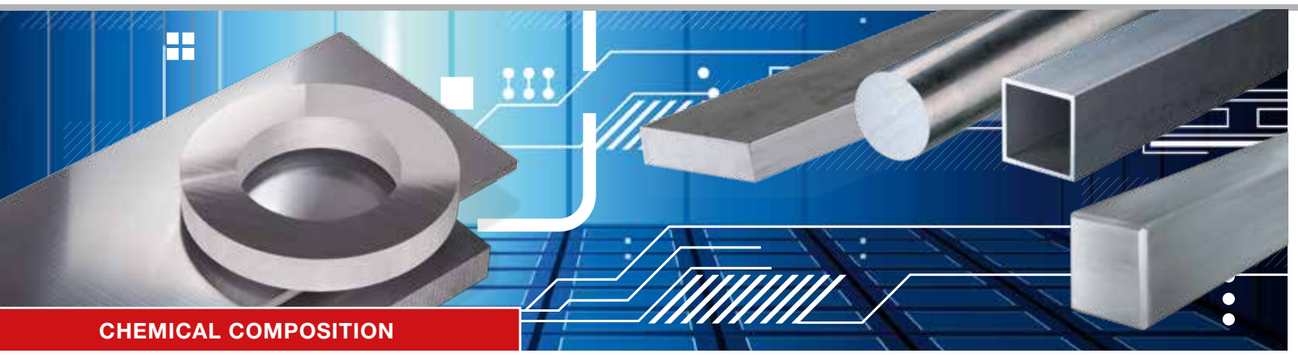
BIKAR METALLE

EN AW-2017A



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Cu4 Mg Si(A)
Old designation	Al Cu Mg1
Material no. according to DIN	3.1325
Great Britain BS	-
Italy UNI	9002/2
Spain	L-3120
Sweden	-
Norway	-
France AFNOR	A-U4G
Colour code	RAL 6002 Leaf Green

Typical physical properties:

Density [g/cm³]		2,80
Elastic modulus [GPa]		72,5
Thermal conductivity [W/m*K]		130 – 200
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,0
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		18 – 28
Shear modulus [GPa]		27,2

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,20 – 0,80	0,70	3,5 – 4,5	0,40 – 1,0	0,40 – 1,0	0,10	-	0,25	-	-	-	0,25 Zr+Ti	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good machinability
- High strength
- High fatigue strength
- Curable

Applications:

- Machine construction
- High-strength constructions
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	495°C – 505°C
Quenching	water
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	4
Work-hardened	3
Heat-treated	1 – 2
Dimensional stability	4
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding		**Filler metal**
Gas	5	
WIG	5	
MIG	5	
Resistance welding	1	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	3
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	4
Sea water atmosphere	4 – 5

Metal forming

Cold forming		Delivery condition
Bending	2	O
Pressure forming	3	O
Deep drawing (condition-based)	3	O
Upsetting (condition-based)	3	O
Impact extrusion	3	O
Hot forming		
Drop forging	3	
Extrusion moulding	4	
Hammer forging	3	

Suitable for food industry according to DIN EN 602	no
Working temperatures	approx. 135 °C – 145 °C (long-term), approx. 180 °C – 190 °C (short-term)

Legend:

1	very good
2	good
3	moderate
4	poor
5	unsuited
EQ	anodising quality must be ordered separately and confirmed

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 63, bars - round: p. 89, square bars - flat - hexagonal: p. 105, tubes: p. 123, profiles: p. 135**

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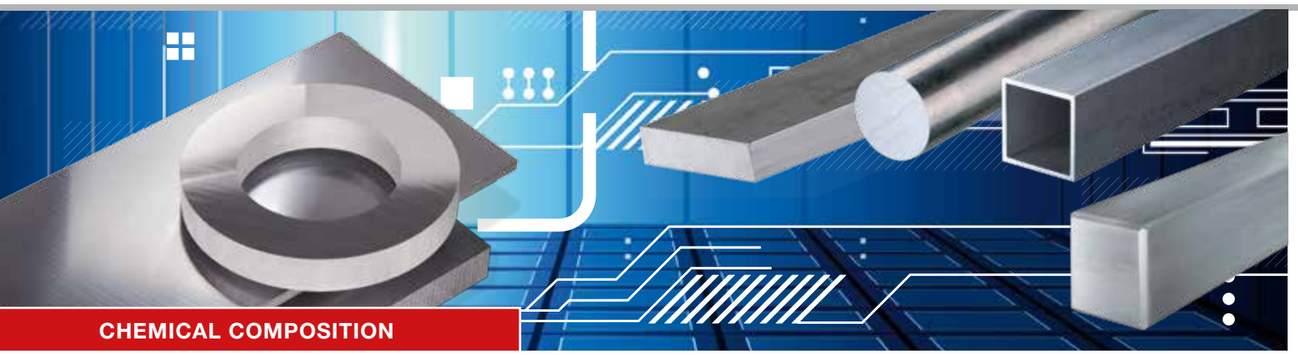
EN AW-2024



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Cu4 Mg1
Old designation	Al Cu Mg2
Material no. according to DIN	3.1355
Great Britain BS	L97
Italy UNI	9002/4
Spain	L-3140
Sweden	
Norway	
France AFNOR	A-U4G1
Colour code	RAL 2004 Pure Orange

Typical physical properties:

Density [g/cm³]		2,77
Elastic modulus [GPa]		73,0
Thermal conductivity [W/m*K]		130 – 150
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,1
	20°C – 100°C	22,9
	20°C – 200°C	23,8
	20°C – 300°C	24,7
Specific heat J/(kg * K)		875
Electrical conductivity [m/Ω*mm²]		18 – 21
Shear modulus [GPa]		27,4

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Zn	Ni	Ti	Ga	V	Note	Individual	Total[2]
0,50	0,50	3,8 – 4,9	0,30 – 0,90	1,2 – 1,8	0,10	0,25	-	0,15	-	-	[3]	0,05	0,15

[X] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

[3] *Sum for Zr+Ti max. 0,20. This applies to forged or extruded products when the value has been agreed upon between the customer and supplier.*

Special features of this material:

- Good machinability
- High strength
- Curable

Applications:

- Machine construction
- High-strength constructions
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	495°C – 505°C
Quenching	water
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	180 °C – 195 °C approx. 16 – 24 hours

Other data:

Processing / machinability

Soft annealed	3
Work-hardened	-
Heat-treated	2
Dimensional stability	4
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding

		Filler metal
Gas	5	
WIG	5	
MIG	5	
Resistance welding	1	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	3
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	4 – 5
Sea water atmosphere	4 – 5

Metal forming

Cold forming		Delivery condition
Bending	4	O
Pressure forming	3	O
Deep drawing (condition-based)	3	O
Upsetting (condition-based)	4	O
Impact extrusion	4	O

Hot forming	
Drop forging	4
Extrusion moulding	5
Hammer forging	3

Suitable for food industry according to DIN EN 602	no

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 64, bars - round: p. 90, square bars - flat - hexagonal: p. 106, tubes: p. 124**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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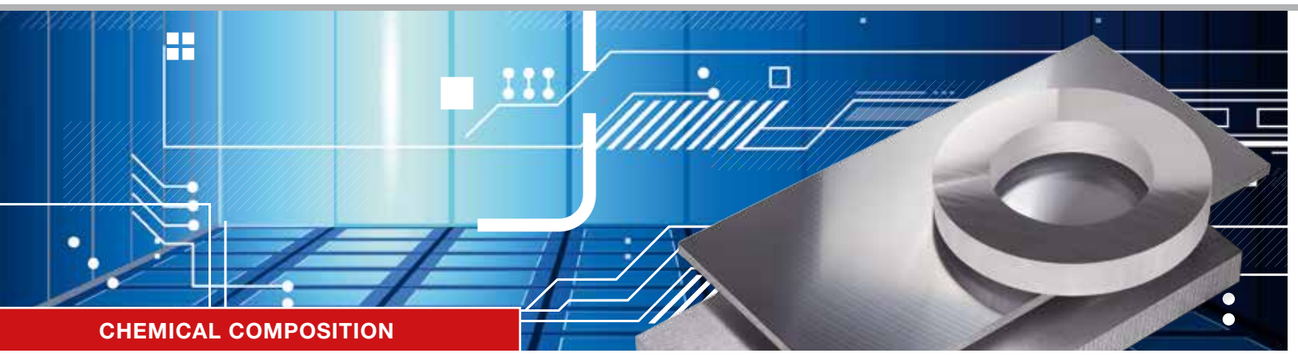
BIKAR METALLE

EN AW-5005A



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg1(C)
Old designation	Al Mg1
Material no. according to DIN	3.3315
Great Britain BS	N41[1]
Italy UNI	9005/1[1]
Spain	L-3350[1]
Sweden	144106[1]
Norway	
France AFNOR	A-G0,6[1]

1= similar

Typical physical properties:

Density [g/cm³]		2,69
Elastic modulus [GPa]		69,5
Thermal conductivity [W/m*K]		160 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,8
	20°C – 100°C	23,6
	20°C – 200°C	24,5
	20°C – 300°C	25,5
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		23 – 31
Shear modulus [GPa]		26,1

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,30	0,45	0,05	0,15	0,70 – 1,1	0,10	-	0,20	-	-	-	-	0,05	0,15

x Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.

2 Includes all items listed for which no limit values are specified.

Special features of this material:

- Very suitable for decorative anodising for EQ
- Very good corrosion resistance to a normal atmosphere
- Good formability
- Good welding properties

Applications:

- Food industry (containers · boxes · packaging)
- Building industry (panelling · roofing)
- Furniture industry
- Refrigeration and air conditioning systems

Available forms:

Sheets · Cuttings · Circular blanks · Rings · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	360°C – 380°C
Heating-up time	1 – 2 hours
Cooling conditions	kiln - uncontrolled

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	4
Work-hardened	2
Heat-treated	-
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	1
Anodising - decorative	2 – 3
Painting / coating	1 – 2
Polishing	2

Welding

		Filler metal
Gas	2	SG-Al Mg3
WIG	2	
MIG	2	
Resistance welding	3	

Solder

Brazing with flux	5
Brazing without flux	4
Abrasion soldering	2
Soft soldering with flux	3

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	2

Metal forming

Cold forming		Delivery condition
Bending	2	
Pressure forming	3	
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	O
Impact extrusion	3	
Hot forming		
Drop forging	-	
Extrusion moulding	2	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/ plates: p. 65, bars - round: p. 91, square bars - flat - hexagonal: p. 107, tubes: p.125, profiles: p. 135**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

The specifications in our data sheets are subject to correction and are only valid as references. Liability is excluded in this regard. We reserve the right to make changes to the standards and informative values. The agreements of our order confirmation are always authoritative. With regard to anodic oxidisability, we point out that we accept no liability for the anodisation result and the colour formation for decorative applications. The same applies to the corrosion resistance. Special arrangements must be made in writing.

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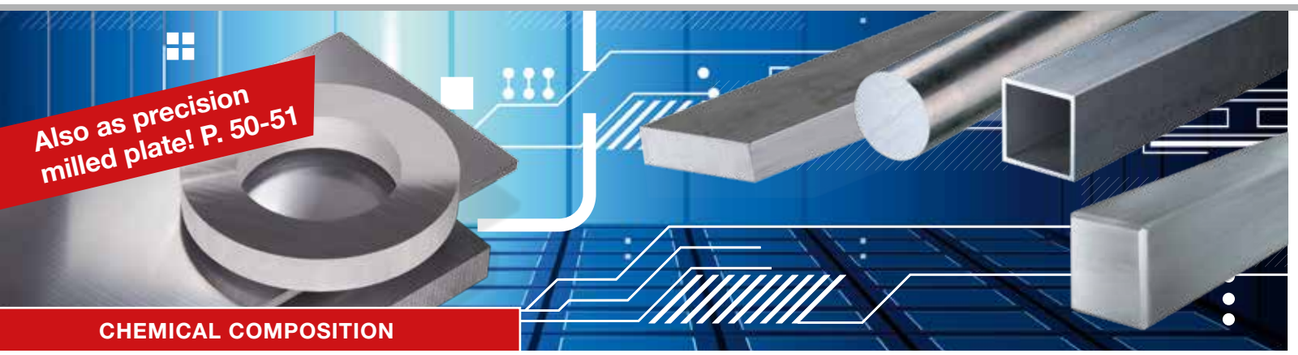
BIKAR METALLE

EN AW-5083



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg4,5 Mn0,7
Old designation	Al Mg4,5 Mn
Material no. according to DIN	3.3547
Great Britain BS	N8
Italy UNI	9005/5
Spain	L-3321
Sweden	144140
Norway	17215
France AFNOR	A-G4,5MC
Colour code	RAL 8002 Signal Brown

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		71
Thermal conductivity [W/m*K]		110 – 140
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	22,3
	20°C – 100°C	24,2
	20°C – 200°C	25,0
	20°C – 300°C	26,0
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		16 – 19
Shear modulus [GPa]		26,8

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	-	0,25	0,15	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good welding properties
- Very good corrosion resistance to sea water and a normal atmosphere
- Good strength properties
- Cold forming in the O state (Soft annealed)
- Relatively low internal stresses
- Relatively good core strength values even with large dimensions

Applications:

- Tool making, mould making and model making
- Machine and fixture construction
- Tank and apparatus construction
- Shipbuilding
- Automobile components
- Railed vehicles
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	30°C/h - 50°C/h

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	3
Work-hardened	2
Heat-treated	-
Dimensional stability	2
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	4
Painting / coating	4
Polishing	2

Welding

		Filler metal
Gas	3 – 4	SG-Al 5183 SG-Al 5356 SG-Al 5087
WIG	2	
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	4 – 5
Brazing without flux	4 – 5
Abrasion soldering	3
Soft soldering with flux	4 – 5

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1

Metal forming

Cold forming		Delivery condition
Bending	2	
Pressure forming	4	
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2 – 3	O
Impact extrusion	4	
Hot forming		
Drop forging	4 – 5	
Extrusion moulding	4	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	yes
Working temperatures	approx. 135 °C – 145 °C (long-term), approx. 180 °C – 190 °C (short-term)

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 66, bars - round: p. 92, square bars - flat - hexagonal: p. 108, tubes: p. 126, profiles: p. 136**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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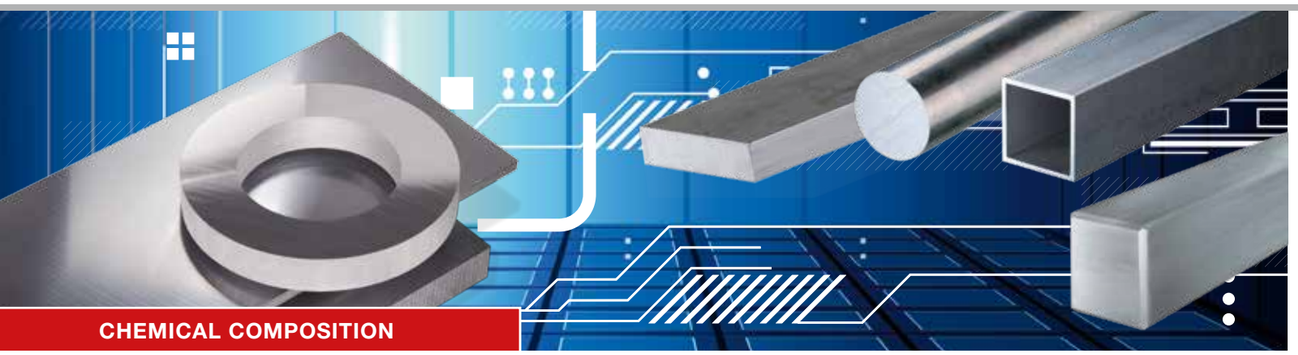
BIKAR METALLE

EN AW-5754



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg3
Old designation	Al Mg3
Material no. according to DIN	3.3535
Great Britain BS	
Italy UNI	
Spain	L-3390
Sweden	144133
Norway	
France AFNOR	A-G3M
Colour code	RAL 1023 Traffic Yellow

Typical physical properties:

Density [g/cm³]		2,67
Elastic modulus [GPa]		70,5
Thermal conductivity [W/m*K]		140 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,9
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		20 – 23
Shear modulus [GPa]		26,5

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,50	2,6 – 3,6	0,30	-	0,20	0,15	-	-	0,10 – 0,60 Mn+Cr	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good welding properties
- Very good corrosion resistance
- Very good anodising properties for EQ
- Good formability

Applications:

- Container and apparatus construction
- Tank and boiler construction
- Shipbuilding
- Panelling

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	360°C – 380°C
Heating-up time	1 – 2 hours
Cooling conditions	kiln - uncontrolled

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	3
Work-hardened	2
Heat-treated	-
Dimensional stability	3
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	1
Anodising - decorative	2
Painting / coating	3
Polishing	1 – 2

Welding

		Filler metal
Gas	2	SG-Al Mg3 SG-Al Mg5
WIG	1	
MIG	1	
Resistance welding	3	

Solder

Brazing with flux	4 – 5
Brazing without flux	4
Abrasion soldering	3
Soft soldering with flux	4 – 5

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1 – 2

Metal forming

Cold forming		Delivery condition
Bending	2	
Pressure forming	3	
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	H12
Impact extrusion	4	
Hot forming		
Drop forging	3	
Extrusion moulding	4	
Hammer forging	2	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/ plates: p. 67, bars - round: p. 93, square bars - flat - hexagonal: p. 109, tubes: p. 127, profiles: p. 136**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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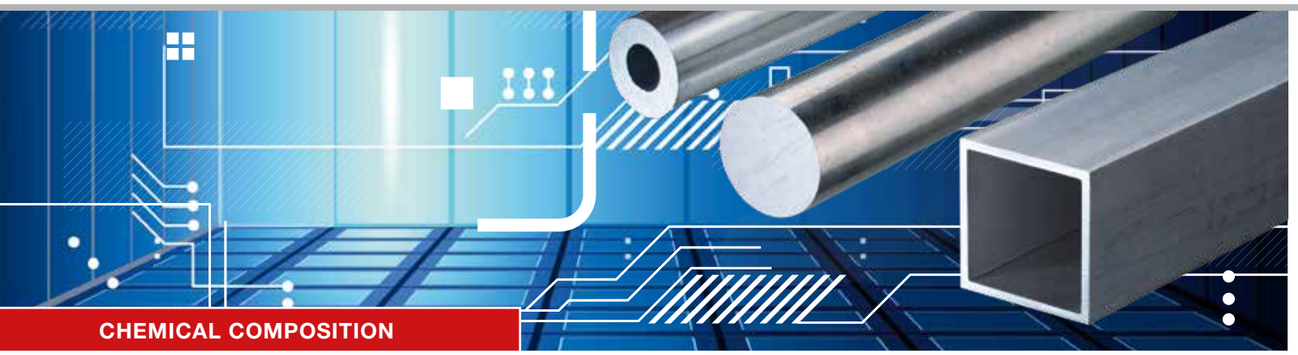
BIKAR METALLE

EN AW-6012



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg Si Pb
Old designation	Al Mg Si Pb
Material no. according to DIN	3.0615
Great Britain BS	
Italy UNI	
Spain	
Sweden	
Norway	
France AFNOR	A-SG0,5
Colour code	RAL 9010 Pure White

Typical physical properties:

Density [g/cm³]		2,75
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		170 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,4
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		24 – 32
Shear modulus [GPa]		

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,60 – 1,4	0,50	0,10	0,40 – 1,0	0,60 – 1,2	0,30	-	0,30	0,20	-	-	0,70 Bi • 0,40 – 2,0 Pb	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good turning and drilling quality (lathe quality)
- Good machinability

Applications:

- Turned parts
- Machine construction

Available forms:

Bars · Tubes

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	360°C – 400°C
Heating-up time	1 – 2 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	520°C – 530°C
Quenching	water to 65°C
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	155°C – 190°C · 4 – 16 hours

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	3
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	2
Polishing	2 – 3

Welding

		Filler metal
Gas	-	
WIG	5	
MIG	5	
Resistance welding	4	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	3
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	3

Metal forming

Cold forming		Delivery condition
Bending	3	
Pressure forming	-	
Deep drawing (condition-based)	-	
Upsetting (condition-based)	-	
Impact extrusion	-	
Hot forming		
Drop forging	-	
Extrusion moulding	2	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	no

The mechanical properties and dimensions available for this alloy can be found on the following pages: **bars - round: p. 94, square bars - flat - hexagonal: p. 110, tubes: p. 128, profiles: p. 137**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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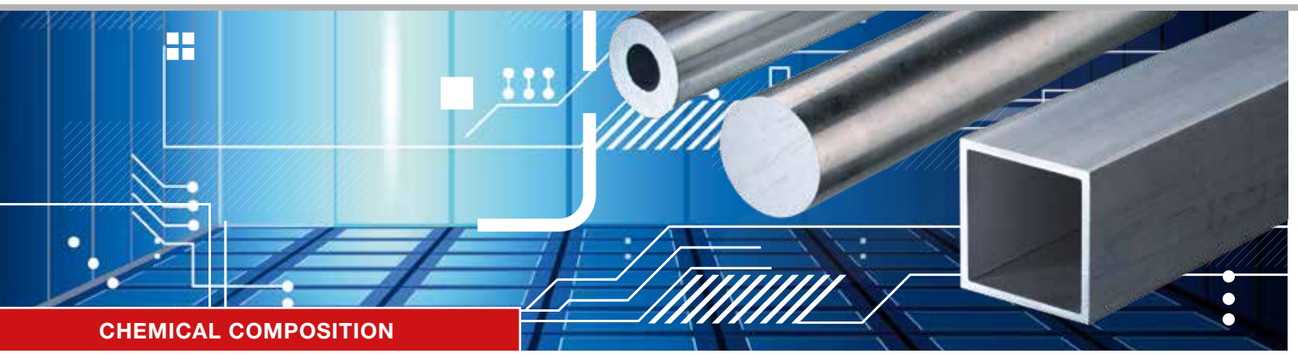
BIKAR METALLE

EN AW-6060



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg Si
Old designation	Al Mg Si0,5
Material no. according to DIN	3.3206
Great Britain BS	
Italy UNI	9006/1
Spain	L-3442
Sweden	144103
Norway	17310
France AFNOR	A-GS
Colour code	neutral

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		69,5
Thermal conductivity [W/m*K]		200 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,8
	20°C – 100°C	23,4
	20°C – 200°C	24,5
	20°C – 300°C	25,6
Specific heat J/(kg * K)		898
Electrical conductivity [m/Ω*mm²]		34 – 38
Shear modulus [GPa]		26,1

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,30 – 0,60	0,10 – 0,30	0,10	0,10	0,35 – 0,60	0,05	-	0,15	0,10	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good welding properties
- Very good corrosion resistance to sea water and a normal atmosphere
- Good cold forming ability in the T4 condition

Applications:

- Architecture
- Profiles of all kinds
- Air conditioning
- Trade fair construction
- Truck superstructure
- Piping

Available forms:

Bars · Tubes · Profiles · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	360°C – 400°C
Heating-up time	1 – 2 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	525°C – 540°C
Quenching	water · air
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	155°C – 190°C · 4 – 16 hours

Other data:

Processing / machinability

Soft annealed	3 – 4
Work-hardened	-
Heat-treated	2
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	1
Anodising - decorative	1 – 2
Painting / coating	1
Polishing	1

Welding

		Filler metal
Gas	3	SG-Al Mg5 SG-Al Si SG-Al Mg3
WIG	2	
MIG	2	
Resistance welding	-	

Solder

Brazing with flux	1 – 3
Brazing without flux	2
Abrasion soldering	1
Soft soldering with flux	1

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	2

Metal forming

Cold forming		Delivery condition
Bending	3	T3 · T4
Pressure forming	-	
Deep drawing (condition-based)	-	
Upsetting (condition-based)	2	O
Impact extrusion	2	O
Hot forming		
Drop forging	1	
Extrusion moulding	1	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **bars - round: p. 95, square bars - flat - hexagonal: p. 111, tubes: p. 128 - 129, profiles: p. 137**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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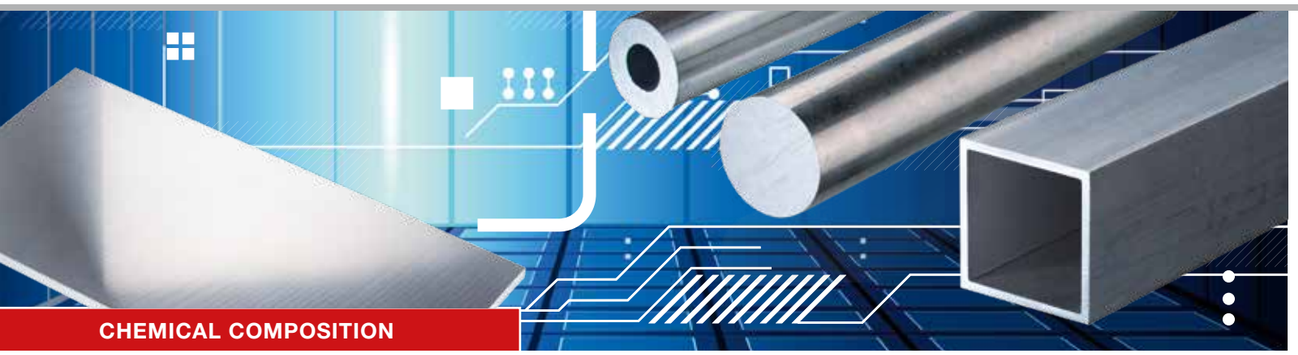
BIKAR METALLE

EN AW-6061



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Mg1 Si Cu
Old designation	Al Mg1 Si Cu
Material no. according to DIN	3.3211
Great Britain BS	H20
Italy UNI	9006/2
Spain	L-3420
Sweden	
Norway	
France AFNOR	A-GSUC
Colour code	

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		70,0
Thermal conductivity [W/m*K]		170 – 200
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,0
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		22 – 30
Shear modulus [GPa]		26,3

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40 – 0,80	0,70	0,15 – 0,40	0,15	0,80 – 1,2	0,04 – 0,35	-	0,25	0,15	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Good corrosion resistance
- Good welding properties
- Curable alloy
- Good machinability

Applications:

- Shipbuilding
- Railed vehicles
- Boiler and container construction
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	525°C – 540°C
Quenching	water
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	155°C – 190°C · 4 – 16 hours

Other data:

Processing / machinability

Soft annealed	4
Work-hardened	-
Heat-treated	2
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	3
Painting / coating	2
Polishing	1 – 2

Welding

		Filler metal
Gas	3	SG-Al Mg4 SG-Al Mg4,5 Mn SG-Al Si5
WIG	2	
MIG	1	
Resistance welding	3	

Solder

Brazing with flux	3 – 5
Brazing without flux	4
Abrasion soldering	2
Soft soldering with flux	3

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	2 – 3

Metal forming

Cold forming		Delivery condition
Bending	3	T3 · T4
Pressure forming	2	O
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	O
Impact extrusion	2	O
Hot forming		
Drop forging	2	
Extrusion moulding	2	
Hammer forging	2	

Suitable for food industry	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 68, bars - round: p. 96, square bars - flat - hexagonal: p. 112, tubes: p. 129, profiles: p. 138**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

The specifications in our data sheets are subject to correction and are only valid as references. Liability is excluded in this regard. We reserve the right to make changes to the standards and informative values. The agreements of our order confirmation are always authoritative. With regard to anodic oxidisability, we point out that we accept no liability for the anodisation result and the colour formation for decorative applications. The same applies to the corrosion resistance. Special arrangements must be made in writing.

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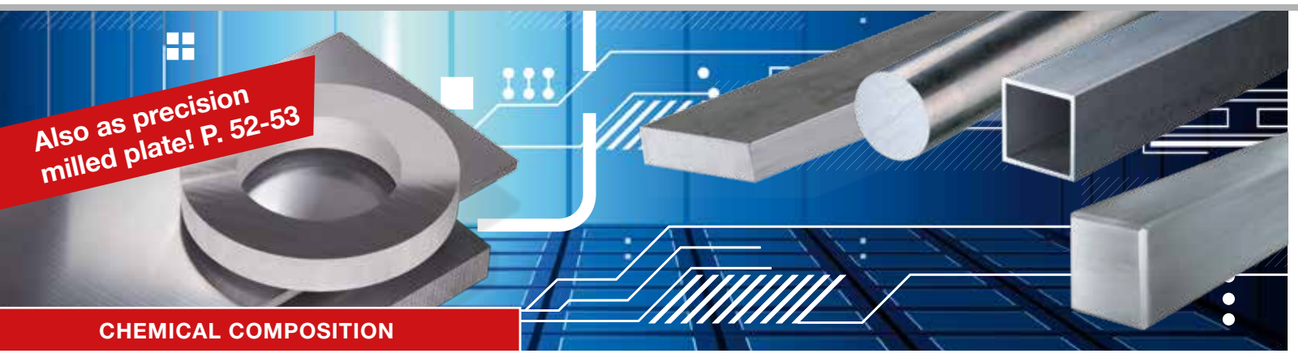
BIKAR METALLE

EN AW-6082



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Si1 Mg Mn
Old designation	Al Mg Si1
Material no. according to DIN	3.2315
Great Britain BS	H30
Italy UNI	9006/4
Spain	L-3453
Sweden	144212
Norway	
France AFNOR	A-SGM0,7
Colour code	RAL 5010 Gentian Blue

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		70,0
Thermal conductivity [W/m*K]		170 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,4
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		896
Electrical conductivity [m/Ω*mm²]		24 – 32
Shear modulus [GPa]		26,4

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,70 – 1,3	0,50	0,10	0,40 – 1,0	0,60 – 1,2	0,25	-	0,20	0,10	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Good corrosion resistance
- Good welding properties
- Curable alloy
- Good machinability

Applications:

- Shipbuilding
- Railed vehicles
- Boiler and container construction
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	≤ 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	525°C – 540°C
Quenching	water · air
Natural ageing treatment	5 – 8 days
Artificial ageing treatment	155°C – 190°C · 4 – 16 hours

Other data:

Processing / machinability

Soft annealed	4
Work-hardened	-
Heat-treated	2
Dimensional stability	3 – 4
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	3
Painting / coating	2
Polishing	1 – 2

Welding

		Filler metal
Gas	3	SG-Al Mg4 SG-Al Mg4,5 Mn SG-Al Si5
WIG	2	
MIG	1	
Resistance welding	3	

Solder

Brazing with flux	3 – 5
Brazing without flux	4
Abrasion soldering	2
Soft soldering with flux	3

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	2

Metal forming

Cold forming		Delivery condition
Bending	3	T3 · T4
Pressure forming	2	O
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	O
Impact extrusion	2	O
Hot forming		
Drop forging	2	
Extrusion moulding	2	
Hammer forging	2	

Suitable for food industry according to DIN EN 602	yes
Working temperatures	Long-term approx. 120°C – 135°C, Short-term approx. 155°C – 170°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 69, bars - round: p. 97, square bars - flat - hexagonal: p. 113, tubes: p. 130**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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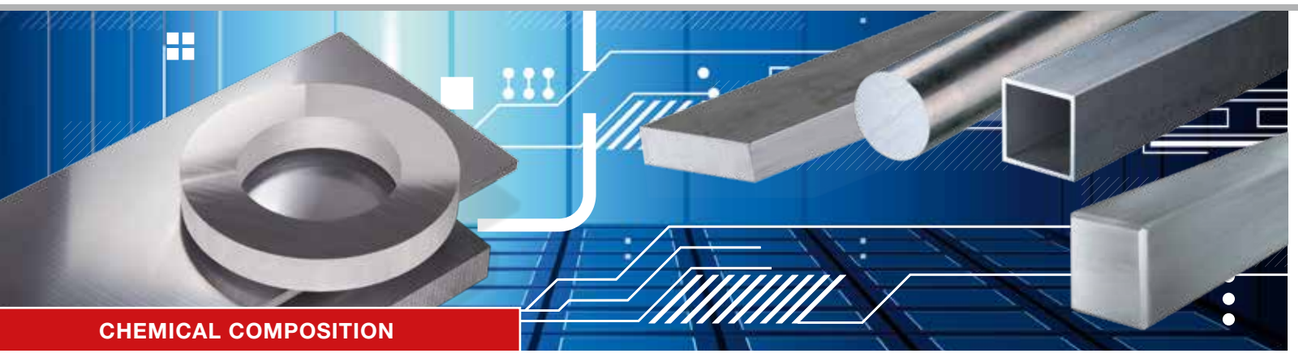
BIKAR METALLE

EN AW-7020



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Zn4,5 Mg1
Old designation	Al Zn4,5 Mg1
Material no. according to DIN	3.4335
Great Britain BS	H17
Italy UNI	9007/1
Spain	L-3741
Sweden	144425
Norway	17410
France AFNOR	A-Z5G
Colour code	RAL 3015 Light Pink

Typical physical properties:

Density [g/cm³]		2,77
Elastic modulus [GPa]		70,0
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,4
	20°C – 100°C	23,1
	20°C – 200°C	24
	20°C – 300°C	25
Specific heat J/(kg * K)		875
Electrical conductivity [m/Ω*mm²]		19 – 23
Shear modulus [GPa]		26,4

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,35	0,40	0,20	0,05 – 0,50	1,0 – 1,4	0,10 – 0,35	-	4,0 – 5,0	-	-	-	0,08 – 0,25 Zr + Ti	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Curable
- Good welding properties
- High strength
- High fatigue strength

Applications:

- Railed vehicles
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	400°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	≤ 30°C/h to 250°C + 3 – 5 hours hold time, below 250°C in air

Hardening	
Solution annealing	460°C – 485°C
Quenching	air
Natural ageing treatment	min. 90 days
Artificial ageing treatment	1. stage 90°C – 110°C · 8 – 12 hours 2. stage 140 °C– 160°C · 16 – 24 hours

Other data:

Processing / machinability

Soft annealed	3
Work-hardened	-
Heat-treated	2
Dimensional stability	-
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	3
Painting / coating	2
Polishing	-

Welding

		Filler metal
Gas	3	SG-Al Mg4,5 Mn SG-Al Mg4,5 Mn Zr SG-Al Mg5
WIG	2	
MIG	1	
Resistance welding	5	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	3
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	3
Sea water atmosphere	4

Metal forming

Cold forming		Delivery condition
Bending	2	O
Pressure forming	3	O
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	O
Impact extrusion	3	O
Hot forming		
Drop forging	2	
Extrusion moulding	2	
Hammer forging	2	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term approx. 90°C Short-term approx. 110°C – 125°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 70, bars - round: p. 98, square bars - flat - hexagonal: p. 114, tubes: p. 131, profiles: p. 138**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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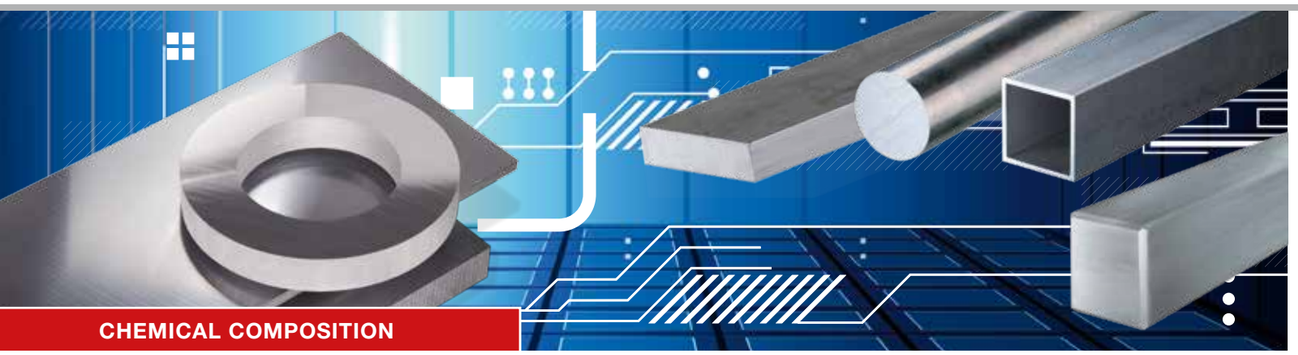
BIKAR METALLE

EN AW-7022



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Alloy designation:

EN AW	Al Zn5 Mg3 Cu
Old designation	Al Zn Mg Cu0,5
Material no. according to DIN	3.4345
Great Britain BS	
Italy UNI	
Spain	
Sweden	
Norway	
France AFNOR	A-Z5GU0,6
Colour code	RAL 7035 Light Grey

Typical physical properties:

Density [g/cm³]		2,78
Elastic modulus [GPa]		70,0
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,6
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		18 – 22
Shear modulus [GPa]		

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium											Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,50	0,50	0,50 – 1,0	0,10 – 0,40	2,6 – 3,7	0,10 – 0,30	-	4,3 – 5,2	-	-	-	Ti + Zr 0,20	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Curable alloy with very high strength
- Very high fatigue strength
- Good machinability

Applications:

- Tool making, mould making and model making
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	≤ 30°C/h to 230°C + 3–5 hours hold time, below 230°C in air

Hardening	
Solution annealing	470°C – 480°C
Quenching	water
Natural ageing treatment	Artificial ageing is usual
Artificial ageing treatment	1. stage 110°C –125°C · 12 – 24 hours 2. stage 165°C –180°C · 4 – 6 hours

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding

		Filler metal
Gas	5	
WIG	5	
MIG	5	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	5
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	4
Sea water atmosphere	4 – 5

Metal forming

Cold forming		Delivery condition
Bending	4 – 5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	4	
Extrusion moulding	4	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	no

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 71, bars - round: p. 99, square bars - flat - hexagonal: p. 115, tubes: p. 132, profiles: p. 139**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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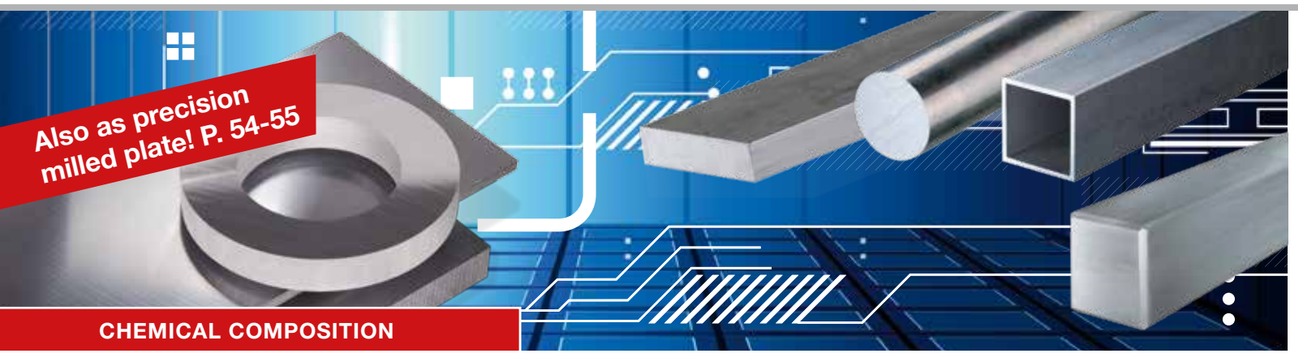
BIKAR METALLE

EN AW-7075



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

rolled • surface machined • PVC coated

Alloy designation:

EN AW	Al Zn5,5 Mg Cu
Old designation	Al Zn Mg Cu1,5
Material no. according to DIN	3.4365
Great Britain BS	2L95
Italy UNI	9007/2
Spain	
Sweden	
Norway	
France AFNOR	A-Z5GU
Colour code	RAL 4005 Blue Lilac

Typical physical properties:

Density [g/cm³]		2,80
Elastic modulus [GPa]		72
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,6
	20°C – 100°C	23,4
	20°C – 200°C	24,3
	20°C – 300°C	25,2
Specific heat J/(kg * K)		862
Electrical conductivity [m/Ω*mm²]		19 – 23
Shear modulus [GPa]		27,1

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium											Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,50	1,2 – 2,0	0,30	2,1 – 2,9	0,18 – 0,28	-	5,1 – 6,1	0,20	-	-	[3]	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

[3] *Sum for Zr+Ti max. 0,25. This applies to forged or extruded products when the value has been agreed upon between the customer and supplier.*

Special features of this material:

- Surface machined plates
- Heat treatable alloy
- Very high strength
- Good machinability

Applications:

- Tool making, mould making and model making
- Aerospace
- Military technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Bars · Tubes · Wires · Parts from drawings

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	2 – 3 hours
Cooling conditions	≤ 30°C/h to 230°C + 3 – 5 hours hold time, below 230°C in air

Hardening	
Solution annealing	470°C – 480°C
Quenching	water
Natural ageing treatment	Artificial ageing is usual
Artificial ageing treatment	1. stage 110°C – 125°C · 12 – 24 hours 2. stage 165°C – 180°C · 4 – 6 hours

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	4 – 5
Erosion	1

Surface treatment

Anodising - (protective anodisation)	3
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding		Filler metal
Gas	5	
WIG	5	
MIG	5	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	5
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	4
Sea water atmosphere	4

Metal forming

Cold forming		Delivery condition
Bending	4	O
Pressure forming	5	
Deep drawing (condition-based)	4 – 5	O
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	4	
Extrusion moulding	4 – 5	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term approx. 90°C Short-term approx. 110°C – 125°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: 72 - 73, bars - round: p. 100, square bars - flat - hexagonal: p. 116, tubes: p. 133, profiles: p. 139**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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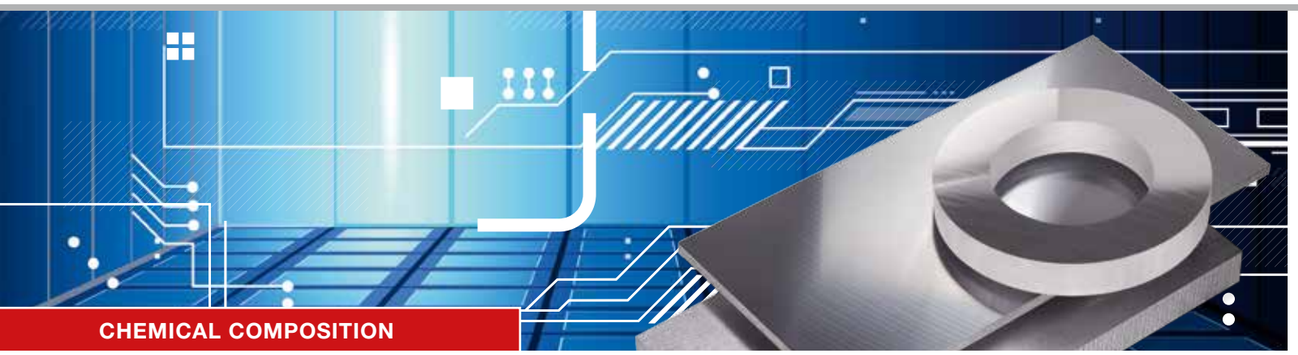
BIKAR METALLE



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Specially for tool making, mould making and model making
cast plates

Alloy designation:

EN AW	5083
EN AW	Al Mg4,5 Mn0,7
Old designation	Al Mg4,5 Mn
Material no. according to DIN	3.3547
Great Britain BS	N8
Italy UNI	7790
Spain	L-3321
Sweden	144140
Norway	17215
France AFNOR	A-G4,5MC
Colour code	RAL 8002 Signal Brown

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		110 – 140
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		16 – 18

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	-	0,25	0,15	-	-	-	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Cast plates
- Very good machinability
- Excellent corrosion resistance
- Good welding properties
- Low stress and dimensionally stable

Applications:

- Tool making, mould making and model making
- Blow moulds and injection moulds
- Laminating tools
- Moulds for elastomer materials
- Moulds and heat-stressed parts
- Moulds with welded construction
- Refrigeration technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	0,5 – 3 hours
Cooling conditions	30°C/h - 50°C/h

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Homogenised and stress relieved	1 – 2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	4
Polishing	2 – 3

Welding

		Filler metal
Gas	4	S-Al 5183 S-Al 5356 S-Al 5087
WIG	2	
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	-
Brazing without flux	-
Abrasion soldering	-
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	

Hot forming	
Drop forging	-
Extrusion moulding	-
Hammer forging	-

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 73**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

The specifications in our data sheets are subject to correction and are only valid as references. Liability is excluded in this regard. We reserve the right to make changes to the standards and informative values. The agreements of our order confirmation are always authoritative. With regard to anodic oxidisability, we point out that we accept no liability for the anodisation result and the colour formation for decorative applications. The same applies to the corrosion resistance. Special arrangements must be made in writing.

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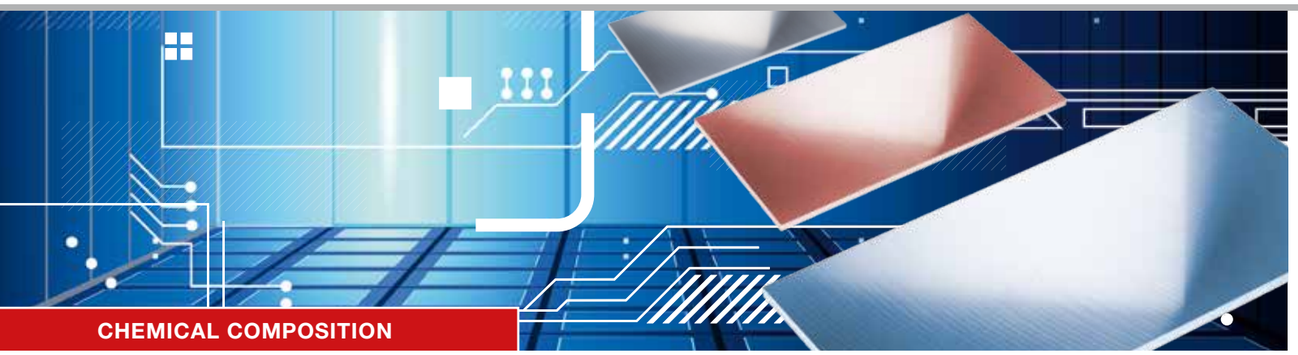

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Special alloy with improved anodising ability
cast plates · precision milled or rough sawn

FORMODAL®

Alloy designation:

EN AW	5083
EN AW	Al Mg4,5 Mn0,7
Old designation	Al Mg4,5 Mn
Material no. according to DIN	3.3547
Great Britain BS	N8
Italy UNI	7790
Spain	L-3321
Sweden	144140
Norway	17215
France AFNOR	A-G4,5MC
Colour code	RAL 8002 Signal Brown

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		110 – 140
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		16 – 18

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	-	0,25	0,15	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Very good machinability
- Excellent corrosion resistance
- Good welding properties
- Low stress and dimensionally stable
- Improved anodising ability through optimised casting process and special homogenisation
- Very good polishing
- Very fine-grained structure

Applications:

- Tool making, mould making and model making
- Laser technology
- Cover plates
- Printing technology
- Fixture construction
- Electronics and optical industry
- Packaging technology
- Medical technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Special homogenisation technique according to BIKAR specification.

Other data:

Processing / machinability

Homogenised and stress relieved	1 – 2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Anodising - decorative	2 *
Painting / coating	4
Polishing	2 – 3

Welding

		Filler metal
Gas	4	S-Al 5183 S-Al 5356 S-Al 5087
WIG	2	
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	-
Brazing without flux	-
Abrasion soldering	-
Soft soldering with flux	-

**: For physical reasons we can't guarantee the color finish.*

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/ plates: p. 74**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited

The specifications in our data sheets are subject to correction and are only valid as references. Liability is excluded in this regard. We reserve the right to make changes to the standards and informative values. The agreements of our order confirmation are always authoritative. With regard to anodic oxidisability, we point out that we accept no liability for the anodisation result and the colour formation for decorative applications. The same applies to the corrosion resistance. Special arrangements must be made in writing.

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BIKAR METALLE

FORMODAL ® 025 X cast · ultra fine metal structure

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Specially for the semiconductor industry, vacuum technology, solar industry, tool making, mould making and model making. This alloy is under special manufacturing and testing technologies

FORMODAL®

Alloy designation:

Special type:	AA 5083
Special type:	Al Mg4,5 Mn0,7

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		110 – 140
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		16 – 18

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium											Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	-	0,25	0,15	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Reduced and controlled hydrogen content
- Ultra fine metal structure
- Very good machinability
- Excellent corrosion resistance
- Good welding properties
- Low stress and dimensionally stable

Applications:

- Semiconductor industry
- Vacuum technology
- Solar industry
- Tool making, mould making and model making
- Blow moulds and injection moulds
- Coating tools
- Moulds for elastomer materials
- Moulds and heat-stressed parts
- Moulds with welded construction
- Refrigeration technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	0,5 – 3 hours
Cooling conditions	30°C/h - 50°C/h

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Homogenised and stress relieved	1 – 2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	4
Polishing	2 – 3

Welding

		Filler metal
Gas	4	
WIG	2	S-Al 5183 S-Al 5356 S-Al 5087
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	-
Brazing without flux	-
Abrasion soldering	-
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/ plates: p. 75**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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BIKAR METALLE

FORMODAL ® 030 cast · surface machined

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Specially for tool making, mould making and model making
cast · surface machined · PVC coated on both sides

Alloy designation:

EN AW	5083
EN AW	Al Mg4,5 Mn0,7
Old designation	Al Mg4,5 Mn
Material no. according to DIN	3.3547
Great Britain BS	N8
Italy UNI	7790
Spain	L-3321
Sweden	144140
Norway	17215
France AFNOR	A-G4,5MC
Colour code	RAL 8002 Signal Brown

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		110 – 140
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		16 – 18

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium											Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 – 1,0	4,0 – 4,9	0,05 – 0,25	-	0,25	0,15	-	-	-	0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Surface machined cast plates
- Very good machinability
- Excellent corrosion resistance
- Good welding properties
- Low stress and dimensionally stable

Applications:

- Tool making, mould making and model making
- Blow moulds and injection moulds
- Laminating tools
- Moulds for elastomer materials
- Moulds and heat-stressed parts
- Moulds with welded construction
- Refrigeration technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	0,5 – 3 hours
Cooling conditions	30°C/h - 50°C/h

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Homogenised and stress relieved	1 – 2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	4
Polishing	2 – 3

Welding

		Filler metal
Gas	4	S-Al 5183 S-Al 5356 S-Al 5087
WIG	2	
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	-
Brazing without flux	-
Abrasion soldering	-
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	1

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	yes

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 76**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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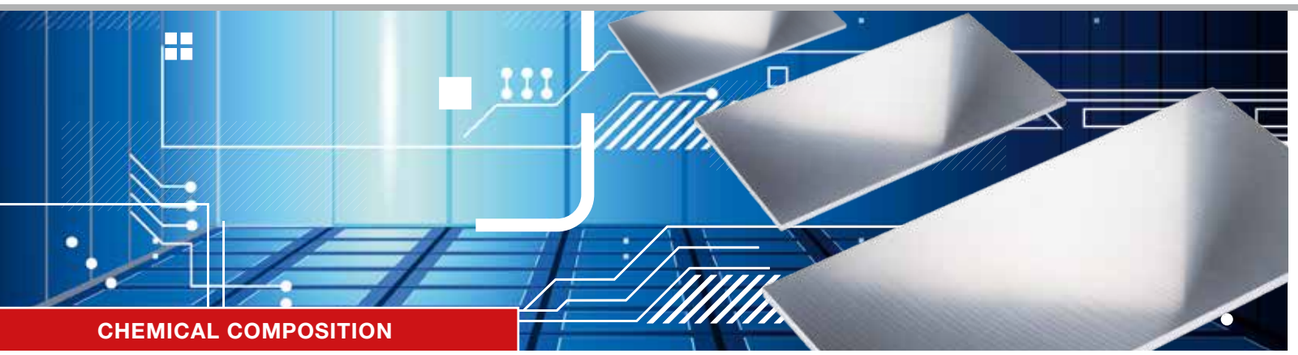
FORMODAL ® 036 high-strength • heat-treated



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

High-strength aluminium cast plates
precision milled or rough sawn

Alloy designation:

Type - 7021
Heat-treated and stress relieved annealed

Typical physical properties:

Density [g/cm³]	2,78
Elastic modulus [GPa]	72
Thermal conductivity [W/m*K]	150
Thermal expansion coefficient +20°C [$K^{-1}*10^{-6}$]	23,7
Specific heat J/(kg * K)	-
Electrical conductivity [m/Ω*mm²]	19 - 23

Special features of this material:

- High-strength aluminum cast plates
- Surface machined and PVC coated or rough sawn
- Very good dimensional stability
- Low internal stresses
- Good welding properties
- Good corrosion resistance

Applications:

- Tool making, mould making and model making
- Injection moulds[1]
- Machine and fixture construction
- Base plates, table tops and mounting plates

[1] FORMODAL® 036 can be used for injection moulds. Complex geometries (sharp radiusses, cores with higher slender ratios) or moving elements have to be avoided. For such applications, wrought products are recommended.

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	-
Heating-up time	-
Cooling conditions	-

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	1
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	-
Polishing	-

Welding

		Filler metal
Gas	5	AA-5183
WIG	2	
MIG	5	
Resistance welding	1	

Solder

Brazing with flux	-
Brazing without flux	-
Abrasion soldering	-
Soft soldering with flux	-

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	4 – 5

Metal forming

Cold forming		Delivery condition
Bending	-	
Pressure forming	-	
Deep drawing (condition-based)	-	
Upsetting (condition-based)	-	
Impact extrusion	-	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	no

Heating the alloy can result in loss of strength of properties or of capability for fabrication, assembly or application in a particular case. Whenever a new application of this alloy is contemplated, and if this application involves special properties such as corrosion resistance, toughness, fatigue strength, it is strongly recommended that the user should consult the producer in order to make a precise and appropriate selection of the material.

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 77**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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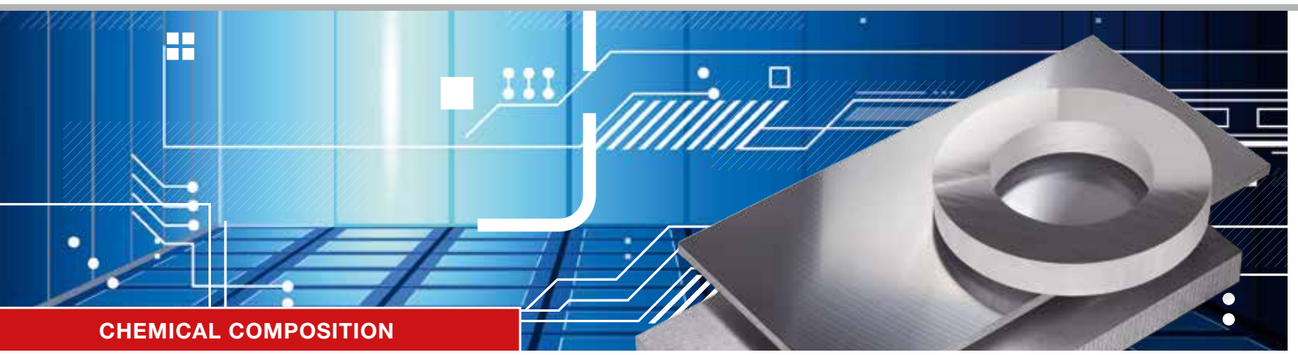
FORMODAL ® BM-400 rolled · forged



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

High-strength rolled plates

Size range up to a thickness of 700 mm

Alloy designation:

EN AW	Material is not included in the EN standard. The material was developed specifically for the high require-ments standards in tool making, mould making and model making and is very suitable for long-term use at high temperatures up to 200 °C!
Old designation	
Material no. according to DIN	
Great Britain BS	
Italy UNI	
Spain	
Sweden	
Norway	
France AFNOR	
Colour code	

Typical physical properties:

Density [g/cm³]		2,84
Elastic modulus [GPa]		73,8
Thermal conductivity [W/m*K]		130
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	22,5
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		864
Electrical conductivity [m/Ω*mm²]		17,4

Chemical composition[x]:

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,30	0,40	5,8 – 6,8	0,20 – 0,40	0,10	0,05	-	0,10	0,02 – 0,10	-	-	-	0,05	0,15

x Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.

2 Includes all items listed for which no limit values are specified.

Special features of this material:

- Plates: according to thickness rolled, stretched, forged, compressed
- Very high strength values - for thick plates and also tool making, mould making and model making in the core area
- Very good machinability
- Very good welding properties
- Good corrosion resistance
- Size range up to a thickness of 700 mm

Applications:

- Tool making, mould making and model making
- Blow moulds and injection moulds
- Laminating tools
- Moulds for elastomer materials
- Moulds and heat-stressed parts
- Moulds with welded construction
- Refrigeration technology

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	-
Heating-up time	-
Cooling conditions	-

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	2
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2[a)]
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	-
Polishing	2

Welding

		Filler metal
Gas	-	
WIG	2	S Al 2319 S Al Cu6 Mn ZrTi
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	-
Soft soldering with flux	4

Legend:

1	very good
2	good
3	moderate
4	poor
5	unsuited
a)	The anodising operation should be referred to the high Cu content! Different colourations occur on the welded materials after anodising.
b)	The highest strength values compared with other forms of construction materials at temperatures up to a max. 200 °C
EQ	anodising quality must be ordered separately and confirmed

Corrosion resistance

In a normal atmosphere/ weather conditions	3
Sea water atmosphere	3

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	5	
Extrusion moulding	5	
Hammer forging	5	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term to 200°C [b)]

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 78**

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FORMODAL® BM-5083 rolled · precision milled on both sides · PVC coated

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

rolled · precision milled on both sides · PVC coated

Alloy designation:

EN AW	Al Mg4,5 Mn0,7
Old designation	Al Mg4,5 Mn
Material no. according to DIN	3.3547
Great Britain BS	N8
Italy UNI	9005/5
Spain	L-3321
Sweden	144140
Norway	17215
France AFNOR	A-G4,5MC
Colour code	RAL 8002 Signal brown

Typical physical properties:

Density [g/cm³]		2,66
Elastic modulus [GPa]		71
Thermal conductivity [W/m*K]		105 – 120
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,8
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		900
Electrical conductivity [m/Ω*mm²]		15 – 17
Shear modulus [GPa]		26,8

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,40	0,10	0,40 - 1,0	4,0 - 4,9	0,05 - 0,25	-	0,25	0,15	-	-		0,05	0,15

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Precision milled plates
- Very good corrosion resistance in a normal atmosphere
- Good strength properties
- Cold forming in the O state (Soft annealed)
- Relatively low internal stresses
- Relatively good core strength values even with large dimensions

Applications:

- Tool making, mould making and model making
- Machine and fixture construction
- Tank and apparatus construction
- Shipbuilding
- Automobile components
- Railed vehicles
- Military technology

Available forms:

Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	30°C/h - 50°C/h

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	3
Work-hardened	2
Heat-treated	-
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	2 – 3
Painting / coating	4
Polishing	2

Welding

		Filler metal
Gas	1	SG-Al 5183 SG-Al 5356 SG-Al 5087
WIG	1	
MIG	1	
Resistance welding	1	

Solder

Brazing with flux	4 – 5
Brazing without flux	4 – 5
Abrasion soldering	3
Soft soldering with flux	4 – 5

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	2 – 3

Metal forming

Cold forming		Delivery condition
Bending	2	
Pressure forming	4	
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2 – 3	O
Impact extrusion	4	
Hot forming		
Drop forging	4 – 5	
Extrusion moulding	4	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	yes
Working temperatures	Long-term approx. 135°C – 145°C Short-term approx. 180°C – 190°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 75**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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FORMODAL® BM-6082 rolled · precision milled on both sides · PVC coated

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

rolled · precision milled on both sides · PVC coated

Alloy designation:

EN AW	Al Si1 Mg Mn
Old designation	Al Mg Si1
Material no. according to DIN	3.2315
Great Britain BS	H30
Italy UNI	9006/4
Spain	L-3453
Sweden	144212
Norway	
France AFNOR	A-SGM0,7
Colour code	RAL 5010 Gentian blue

Typical physical properties:

Density [g/cm³]		2,70
Elastic modulus [GPa]		70
Thermal conductivity [W/m*K]		170 – 220
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,4
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		896
Electrical conductivity [m/Ω*mm²]		24 – 32
Shear modulus [GPa]		26,4

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,70 – 1,3	0,50	0,10	0,40 – 1,0	0,60 – 1,2	0,25	-	0,20	0,10	-	-	-	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Precision milled plates
- Good corrosion resistance
- Good welding properties
- Curable alloy
- Good machinability

Applications:

- Shipbuilding
- Railed vehicles
- Boiler and container construction
- Aerospace
- Military technology

Available forms:

Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	380°C – 420°C
Heating-up time	1 – 2 hours
Cooling conditions	≤ 30°C/h to 230°C + 3 – 5 hours hold time, below 230°C in air

Hardening	
Solution annealing	470°C – 480°C
Quenching	water
Natural ageing treatment	Artificial ageing is usual
Artificial ageing treatment	1. stage 110°C – 125°C · 12 – 24 hours 2. stage 165°C – 180°C · 4 – 6 hours

Other data:

Processing / machinability

Soft annealed	4
Work-hardened	-
Heat-treated	2
Dimensional stability	3 – 4
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	3
Painting / coating	2
Polishing	1 – 2

Welding

		Filler metal
Gas	3	SG-Al Mg4 SG-Al Mg4,5Mn SG-Al Si5
WIG	2	
MIG	1	
Resistance welding	3	

Solder

Brazing with flux	3 – 5
Brazing without flux	4
Abrasion soldering	2
Soft soldering with flux	3

Corrosion resistance

In a normal atmosphere/ weather conditions	1
Sea water atmosphere	2

Metal forming

Cold forming		Delivery condition
Bending	3	T3 · T4
Pressure forming	2	O
Deep drawing (condition-based)	2	O
Upsetting (condition-based)	2	O
Impact extrusion	2	O
Hot forming		
Drop forging	2	
Extrusion moulding	2	
Hammer forging	2	

Suitable for food industry according to DIN EN 602	yes
Working temperatures	Long-term approx. 120°C – 135°C Short-term approx. 155°C – 170°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 80**

Legend:

1	very good
2	good
3	moderate
4	poor
5	unsuited
EQ	anodising quality must be ordered separately and confirmed

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BIKAR METALLE

FORMODAL® BM-7075 rolled · precision milled on both sides · PVC coated

CHEMICAL COMPOSITION

Aluminium and aluminium alloys

rolled · precision milled on both sides · PVC coated

Alloy designation:

EN AW	Al Zn5,5 Mg Cu
Old designation	Al Zn Mg Cu1,5
Material no. according to DIN	3.4365
Great Britain BS	2L95
Italy UNI	9007/2
Spain	
Sweden	
Norway	
France AFNOR	A-Z5GU
Colour code	RAL 4005 Blue Lilac

Typical physical properties:

Density [g/cm³]		2,80
Elastic modulus [GPa]		72
Thermal conductivity [W/m*K]		130 – 160
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	21,6
	20°C – 100°C	23,4
	20°C – 200°C	24,3
	20°C – 300°C	25,2
Specific heat J/(kg * K)		862
Electrical conductivity [m/Ω*mm²]		19 – 23
Shear modulus [GPa]		27,1

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium											Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,40	0,50	1,2 – 2,0	0,30	2,1 – 2,9	0,18 – 0,28	-	5,1 – 6,1	0,20	-	-	[3]	0,05	0,15

[x] *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

[2] *Includes all items listed for which no limit values are specified.*

[3] *Sum for Zr+Ti max. 0,25. This applies to forged or extruded products when the value has been agreed upon between the customer and supplier.*

Special features of this material:

- Precision milled plates
- Heat treatable alloy
- Very high strength
- Good machinability

Applications:

- Tool making, mould making and model making
- Aerospace
- Military technology

Available forms:

Plates · Cuttings · Circular blanks · Rings · Parts from drawings

FORMODAL® is a trademark of BIKAR

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	-
Heating-up time	-
Cooling conditions	-

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	2
Dimensional stability	4 – 5
Erosion	1

Surface treatment

Anodising - (protective anodisation)	3
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	3
Polishing	1

Welding

		Filler metal
Gas	5	
WIG	5	
MIG	5	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	5
Soft soldering with flux	5

Corrosion resistance

In a normal atmosphere/ weather conditions	3
Sea water atmosphere	4

Metal forming

Cold forming		Delivery condition
Bending	4	O
Pressure forming	5	
Deep drawing (condition-based)	4 – 5	O
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	4	
Extrusion moulding	4 – 5	
Hammer forging	4	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term approx. 90°C Short-term approx. 110°C – 125°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 81**

Legend:

1	very good
2	good
3	moderate
4	poor
5	unsuited
EQ	anodising quality must be ordered separately and confirmed

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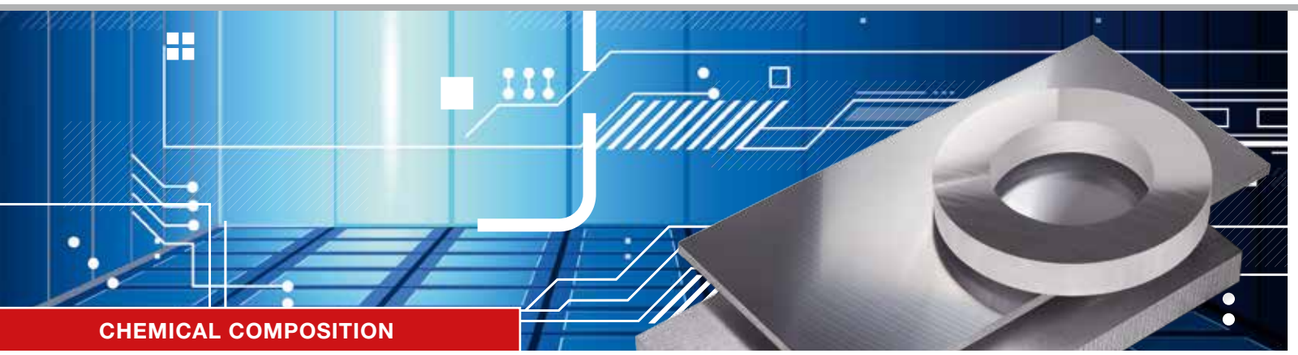
BIKAR METALLE



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Specially for tool making, mould making and model making
rolled · forged

Alloy designation:

Special type	AA 7122
Old designation	Al Zn5 Mg3 Cu (Special type)
Special type: optimised for high core strength and optimal dimensional stability for higher strengths	

Typical physical properties:

Density [g/cm³]		2,76
Elastic modulus [GPa]		72
Thermal conductivity [W/m*K]		120 – 150
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,6
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		18 – 22
Shear modulus [GPa]		

Chemical composition[x] (EN 573-3):

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,50	0,50	0,50 – 1,0	0,10	2,6 – 3,7	0,10	-	4,3 – 5,2	-	-	-	Ti + Zr 0,25	-	-

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Optimised for high core strength and optimal dimensional stability for higher strengths
- Very good machinability

Applications:

- Tool making, mould making and model making
  - Blow moulds, injection moulds, die casting moulds and vacuum tools
  - Laminating tools
- Pressing technique
  - Anvil cap and stamp holder
- Machine construction
  - Structures with high strength requirements

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

CERTAL®is a trademark of CONSTELLIUM Constellium

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	420°C – 450°C
Heating-up time	0,5 – 1 hours
Cooling conditions	slowly up to 250°C, 6 hours hold time then any cooling to room temperature

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	1
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	2
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	5
Painting / coating	1
Polishing	1

Welding

		Filler metal
Gas	-	S-Al 5183 S-Al 5356
WIG	2 – 3[a]	
MIG	2 – 3[a]	
Resistance welding	2 – 3	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	-
Soft soldering with flux	4

Corrosion resistance

In a normal atmosphere/ weather conditions	3
Sea water atmosphere	5

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	O
Upsetting (condition-based)	5	O
Impact extrusion	5	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term to 110°C

Legend:

1	very good
2	good
3	moderate
4	poor
5	unsuited
EQ	anodising quality must be ordered separately and confirmed
a	Welding for repair or modification of tools possible with local influence on the strength and hardness
	Unsuitable for mechanically stressed connection welds

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 82**

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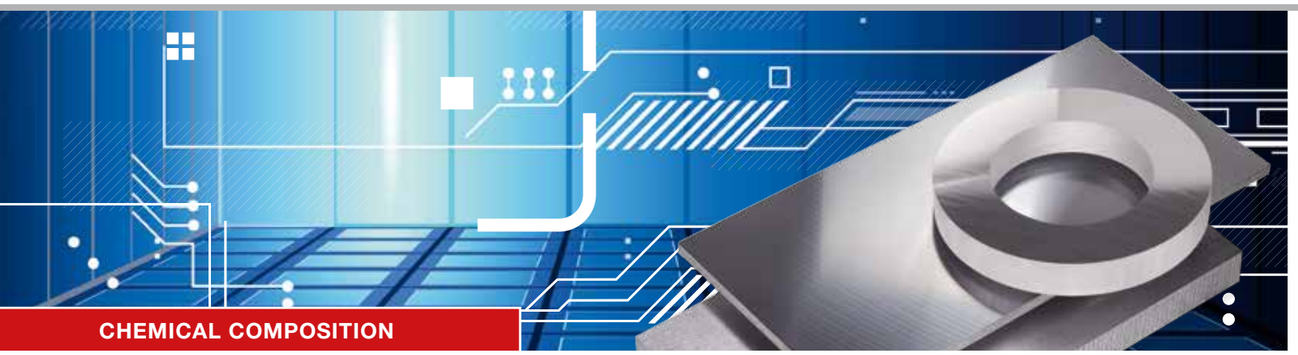
BIKAR METALLE

UNIDAL® AW7019 rolled · surface machined



CHEMICAL COMPOSITION

Aluminium and aluminium alloys

Specially for tool making, mould making and model making
rolled · surface machined

Alloy designation:

Special type	Al Zn4 Mg2 Mn
Special type	Al Zn4,5 Mg1
Material no. according to DIN	3.4325 (Special type)

Special features :

Thanks to a sophisticated manufacturing process, UNIDAL® offers a unique combination of high strength properties and excellent dimensional stability. The very low internal stresses limit the distortion of the plates during and after processing. Pre-milling and refinishing as well as reworking are not necessary. The high strength saves the use of threaded inserts for screw elements. UNIDAL ® is a hot rolled aluminium plate with coplanar milling on both sides.

Typical physical properties:

Density [g/cm³]		2,75
Elastic modulus [GPa]		71
Thermal conductivity [W/m*K]		135 – 150
Thermal expansion coefficient[$K^{-1}*10^{-6}$]	-50°C – 20°C	
	20°C – 100°C	23,6
	20°C – 200°C	
	20°C – 300°C	
Specific heat J/(kg * K)		
Electrical conductivity [m/Ω*mm²]		19 – 23
Shear modulus [GPa]		

Chemical composition[x]:

Specifications in % Remainder: Aluminium												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total[2]
0,35	0,45	0,20	0,15 – 0,50	1,5 – 2,5	0,20	-	3,5 – 4,5	-	-	-	Ti + Cr 0,10 – 0,40		

x *Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.*

2 *Includes all items listed for which no limit values are specified.*

Special features of this material:

- Surface machined plates
- High strength
- Very good dimensional stability
- Low internal stresses
- Good welding properties
- Good corrosion resistance
- Good anodising properties

Applications:

- Tool making
- Machine and fixture construction
- Welded constructions
- Base plates, table tops and mounting plates

Available forms:

Sheets · Plates · Cuttings · Circular blanks · Rings · Parts from drawings

UNIDAL®is a trademark of CONSTELLIUM

Heat treatment:

Soft annealing / recrystallisation annealing	
Annealing temperature	350°C
Heating-up time	0,5 hours
Cooling conditions	Cooling conditions 30°C/h to 250°C, below 250°C in air

Hardening	
Solution annealing	-
Quenching	-
Natural ageing treatment	-
Artificial ageing treatment	-

Other data:

Processing / machinability

Soft annealed	-
Work-hardened	-
Heat-treated	1 – 2
Dimensional stability	1
Erosion	1

Surface treatment

Anodising - (protective anodisation)	1
Special anodising quality (EQ)[EQ]	-
Anodising - decorative	2
Painting / coating	1
Polishing	1

Welding

		Filler metal
Gas	-	S-Al 5183 S-Al 5356
WIG	2	
MIG	2	
Resistance welding	2	

Solder

Brazing with flux	5
Brazing without flux	5
Abrasion soldering	-
Soft soldering with flux	4

Corrosion resistance

In a normal atmosphere/ weather conditions	2
Sea water atmosphere	3

Metal forming

Cold forming		Delivery condition
Bending	5	
Pressure forming	5	
Deep drawing (condition-based)	5	
Upsetting (condition-based)	5	
Impact extrusion	5	
Hot forming		
Drop forging	-	
Extrusion moulding	-	
Hammer forging	-	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term to 110°C

The mechanical properties and dimensions available for this alloy can be found on the following pages: **sheets/plates: p. 83**

Legend:

1 very good
2 good
3 moderate
4 poor
5 unsuited
EQ anodising quality must be ordered separately and confirmed

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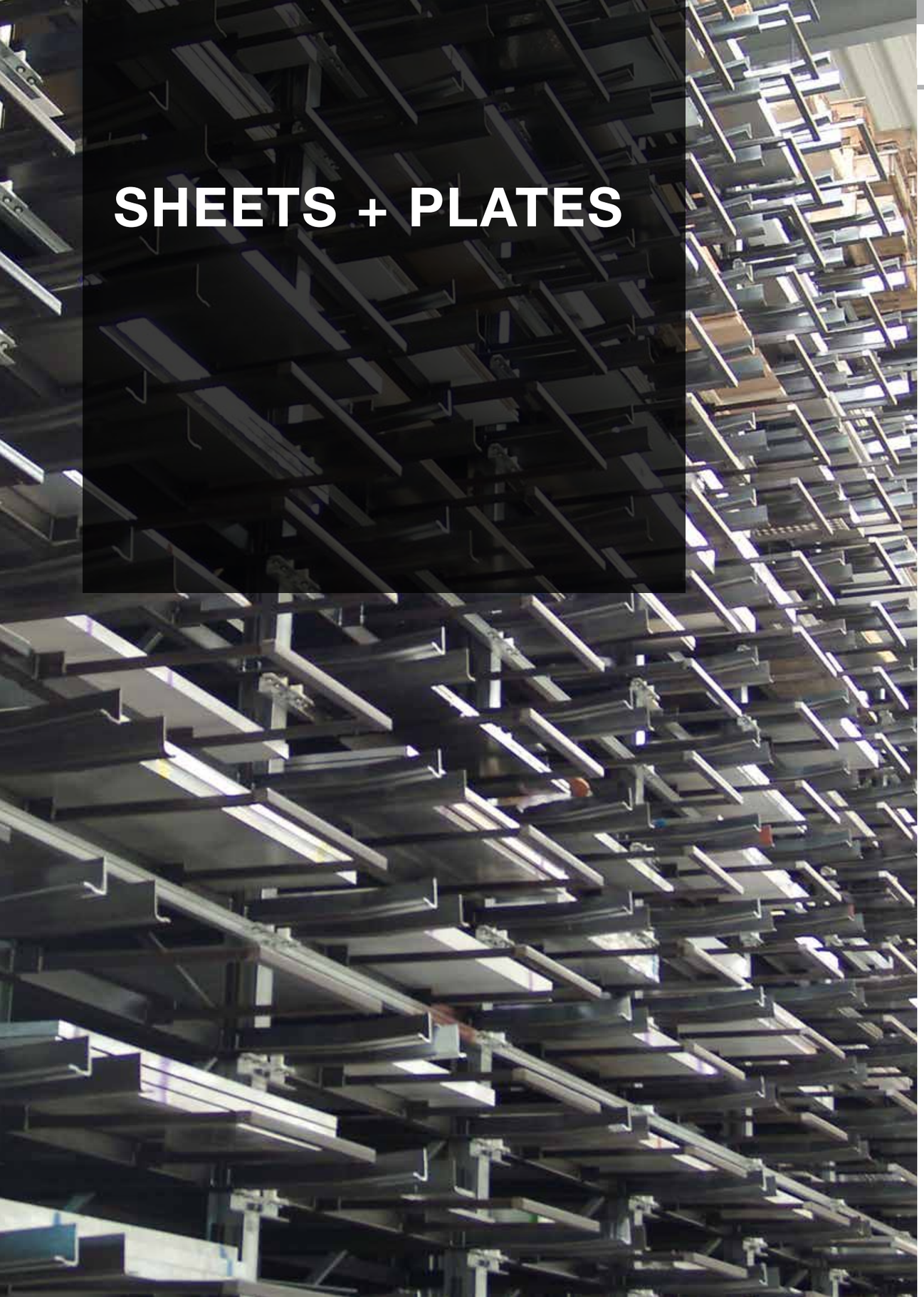

SHEETS + PLATES

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-1050A Al99,5

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
H14	0,2	0,5	105	145	85	-	2	-	1,0 t	0 t	34
	0,5	1,5	105	145	85	-	2	-	1,0 t	0,5 t	34
	1,5	3,0	105	145	85	-	4	-	1,0 t	1,0 t	34
	3,0	6,0	105	145	85	-	5	-	-	1,5 t	34
	6,0	12,5	105	145	85	-	6	-	-	2,5 t	34
	12,5	25,0	105	145	85	-	-	6	-	-	34
H24	0,2	0,5	105	145	75	-	3	-	1,0 t	0 t	33
	0,5	1,5	105	145	75	-	4	-	1,0 t	0,5 t	33
	1,5	3,0	105	145	75	-	5	-	1,0 t	1,0 t	33
	3,0	6,0	105	145	75	-	8	-	1,5 t	1,5 t	33
	6,0	12,5	105	145	75	-	8	-	-	2,5 t	33
O / H111	0,2	0,5	65	95	20	-	20	-	0 t	0 t	20
	0,5	1,5	65	95	20	-	22	-	0 t	0 t	20
	1,5	3,0	65	95	20	-	26	-	0 t	0 t	20
	3,0	6,0	65	95	20	-	29	-	0,5 t	0,5 t	20
	6,0	12,5	65	95	20	-	35	-	1,0 t	1,0 t	20
	12,5	80,0	65	95	20	-	-	32	-	-	20
H112	≥ 6,0	12,5	75	-	30	-	20	-	-	-	23
	12,5	80,0	70	-	25	-	-	20	-	-	22

[5] *Other possible delivery conditions for this alloy: H12 · H16 · H18 · H19 · H22 · H26 · H28*

[9] *For information on*

Available dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
0,1 – 8	2.000 x 1.000	2.500 x 1.250	3.000 x 1.500
10 – 100	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 6 – 7**

EN AW-2017A Al Cu4 Mg Si(A)

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T4 T451	≥ 0,4	1,5	390	-	245	-	14	-	3,0 t[8]	3,0 t[8]	110
	1,5	6,0	390	-	245	-	15	-	5,0 t[8]	5,0 t[8]	110
	6,0	12,5	390	-	260	-	13	-	-	8,0 t[8]	111
	12,5	40,0	390	-	250	-	-	12	-	-	110
	40,0	60,0	385	-	245	-	-	12	-	-	108
	60,0	80,0	370	-	240	-	-	7	-	-	-
	80,0	120,0	360	-	240	-	-	6	-	-	105
	120,0	150,0	350	-	240	-	-	4	-	-	101
	150,0	180,0	330	-	220	-	-	2	-	-	-
	180,0	200,0	300	-	200	-	-	2	-	-	-

[5] *Other possible delivery conditions for this alloy: O · T42 · T452*

[8] *Considerably lower bending radii can be obtained immediately after solution annealing.*

[9] *For information only*

We supply aluminium sheets and plates of alloy EN AW-2017A · Al Cu4 Mg Si(A) in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
0,4 – 5	2.000 x 1.000		
6 – 150	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 14 – 15**

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MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2024 Al Cu4 Mg1

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T351	≥ 0,4	1,5	435	-	290	-	12	-	4,0 t[8]	4,0 t[8]	123
	1,5	3,0	435	-	290	-	14	-	4,0 t[8]	4,0 t[8]	123
	3,0	6,0	440	-	290	-	14	-	5,0 t[8]	5,0 t[8]	124
	6,0	12,5	440	-	290	-	13	-	-	8,0 t[8]	124
	12,5	40,0	430	-	290	-	-	11	-	-	122
	40,0	80,0	420	-	290	-	-	8	-	-	120
	80,0	100,0	400	-	285	-	-	7	-	-	115
	100,0	120,0	380	-	270	-	-	5	-	-	110
	120,0	150,0	360	-	250	-	-	5	-	-	104

5	*Other possible delivery conditions for this alloy: O · T3 · T4 · T42 ·T62 ·T8 · T851*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*
9	*For information only*

We supply aluminium sheets and plates of alloy EN AW-2024 · Al Cu4 Mg Si(A) in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
< 9,9	2.000 x 1.000	2.500 x 1.250	3.000 x 1.500
Super formats:	4.000 x 2.000	6.000 x 2.500	8.000 x 2.500

The specifications for the chemical composition of this alloy can be found **on page 16 – 17**

EN AW-5005A Al Mg1(C)

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
H14	0,2	0,5	145	185	120	-	2	-	2,0 t	0,5 t	48
	0,5	1,5	145	185	120	-	2	-	2,0 t	1,0 t	48
	1,5	3,0	145	185	120	-	3	-	2,5 t	1,0 t	48
	3,0	6,0	145	185	120	-	4	-	-	2,0 t	48
	6,0	12,5	145	185	120	-	5	-	-	2,5 t	48
H24/H34	0,2	0,5	145	185	110	-	3	-	1,5 t	0,5 t	47
	0,5	1,5	145	185	110	-	4	-	1,5 t	1,0 t	47
	1,5	3,0	145	185	110	-	5	-	2,0 t	1,0 t	47
	3,0	6,0	145	185	110	-	6	-	-	2,0 t	47
	6,0	12,5	145	185	110	-	8	-	-	2,5 t	47

5	*Other possible delivery conditions for this alloy: F · O/H111 · H12 · H16 · H18 · H19 · H22/H32 · H26/H36 · H28/H38*
9	*For information only*

The specifications for the chemical composition of this alloy can be found **on page 18 – 19**

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-5083 Al Mg4,5 Mn

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
O H111	0,2	0,5	275	350	125	-	11	-	1,0 t	0,5 t	75
	0,5	1,5	275	350	125	-	12	-	1,0 t	1,0 t	75
	1,5	3,0	275	350	125	-	13	-	1,5 t	1,0 t	75
	3,0	6,3	275	350	125	-	15	-	-	1,5 t	75
	6,3	12,5	270	345	115	-	16	-	-	2,5 t	75
	12,5	50,0	270	345	115	-	-	15	-	-	75
	50,0	80,0	270	345	115	-	-	14	-	-	73
	80,0	120,0	260	-	110	-	-	12	-	-	70
	120,0	200,0	255	-	105	-	-	12	-	-	69
	200,0	250,0	250	-	95	-	-	10	-	-	69
	250,0	300,0	245	-	90	-	-	9	-	-	69

5 *Other possible delivery conditions for this alloy: F · H12 · H14 · H16 · H22/H32 · H24/H34 · H26/H36 · H112 · H116 · H321*

9 *For information only*

We supply aluminium sheets and plates of alloy EN AW-5083 · Al Mg4,5 Mn in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
1 – 6	2.000 x 1.000	2.500 x 1.250	3.000 x 1.500
8 – 300	2.020 X 1.020	2.520 x 1.270	3.020 x 1.520
Super formats	4.020 x 2.520	5.020 x 2.520	6.020 x 2.520

The specifications for the chemical composition of this alloy can be found **on page 20 – 21**

EN AW-5754 Al Mg3

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
O H111	0,2	0,5	190	240	80	-	12	-	0,5 t	0 t	52
	0,5	1,5	190	240	80	-	14	-	0,5 t	0,5 t	52
	1,5	3,0	190	240	80	-	16	-	1,0 t	1,0 t	52
	3,0	6,0	190	240	80	-	18	-	1,0 t	1,0 t	52
	6,0	12,5	190	240	80	-	18	-	-	2,0 t	52
	12,5	100,0	190	240	80	-	-	17	-	-	52

5 *Other possible delivery conditions for this alloy: F · H112 · H12 · H14 · H16 · H18 · H22 · H24/H34 · H26/H36 · H28/H38*

9 *For information only*

We supply aluminium sheets and plates of alloy EN AW-5754 · Al Mg3 in the following dimensions:

Tolerances			
Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
0,2 – 6	2.000 x 1.000	2.500 x 1.250	3.000 x 1.500
8 – 150	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520
Super formats	4.020 x 2.520	5.020 x 2.520	6.020 x 2.520

The specifications for the chemical composition of this alloy can be found **on page 22 – 23**

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6061 Al Mg1 Si Cu

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
			min.	max.	min.	max.	A50 mm	A	180°	90°	
T651	≥ 0,4	1,5	290	-	240	-	6	-	-	2,5 t[8]	88
	1,5	3,0	290	-	240	-	7	-	-	3,5 t[8]	88
	3,0	6,0	290	-	240	-	10	-	-	4,0 t[8]	88
	6,0	12,5	290	-	240	-	9	-	-	5,0 t[8]	88
	12,5	40,0	290	-	240	-	-	8	-	-	88
	40,0	80,0	290	-	240	-	-	6	-	-	88
	80,0	100,0	290	-	240	-	-	5	-	-	88
	100,0	150,0	275	-	240	-	-	5	-	-	84
	150,0	250,0	265	-	230	-	-	4	-	-	81
	250,0	350,0	260	-	220	-	-	4	-	-	80
	350,0	400,0	260	-	220	-	-	2	-	-	80

5	*Other possible delivery conditions for this alloy: 0, T4, T451, T42, T6, T62*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*

The specifications for the chemical composition of this alloy can be found **on page 28 – 29**

EN AW-6082 Al Si1 Mg Mn

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T6 T62 T651	0,4	1,5	310	-	260	-	6	-	-	2,5 t[8]	94
	1,5	3,0	310	-	260	-	7	-	-	3,5 t[8]	94
	3,0	6,0	310	-	260	-	10	-	-	4,5 t[8]	94
	6,0	12,5	300	-	255	-	9	-	-	6,0 t[8]	91
	12,5	60,0	295	-	240	-	-	8	-	-	89
	60,0	100,0	295	-	240	-	-	7	-	-	89
	100,0	150,0	275	-	240	-	-	6	-	-	84
	150,0	175,0	275	-	230	-	-	4	-	-	83
	175,0	350,0	260	-	220	-	-	2	-	-	-

5	*Other possible delivery conditions for this alloy: O · T4 · T42 · T451 · T61 · T6151*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*
9	*For information only*

We supply aluminium sheets and plates of alloy EN AW-6082 · Al Si1 Mg Mn in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
0,5 – 4	2.000 x 1.000		
5 – 6	2.000 x 1.000	2.500 x 1.250	3.000 x 1.500
8 – 200	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 30 – 31**

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7020 Al Zn4,5 Mg1

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	A	min.	max.	A50 mm	A	180°	90°	
T6 T62 T651	≥ 0,4	1,5	350	-	280	-	7	-	-	3,5 t[8]	104
	1,5	3,0	350	-	280	-	8	-	-	4,0 t[8]	104
	3,0	6,0	350	-	280	-	10	-	-	5,5 t[8]	104
	6,0	12,5	350	-	280	-	10	-	-	8,0 t[8]	104
	12,5	40,0	350	-	280	-	-	9	-	-	104
	40,0	100,0	340	-	270	-	-	8	-	-	101
	100,0	150,0	330	-	260	-	-	7	-	-	98
	150,0	175,0	330	-	260	-	-	6	-	-	98
	175,0	250,0	330	-	260	-	-	5	-	-	-

5	*Other possible delivery conditions for this alloy: O · T4 · T451*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*
9	*For information only*

We supply aluminium sheets and plates of alloy EN AW-7020 · Al Zn4,5 Mg1 in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
1,5 – 4	2.000 x 1.000		
5 – 150	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 32 – 33**

EN AW-7022 Al Zn5 Mg3 Cu

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	A	min.	A	A50 mm	A	180°	90°	
T651	≥ 3,0	12,5	450	-	370	-	8	-	-	-	133
	12,5	25,0	450	-	370	-	-	8	-	-	133
	25,0	50,0	450	-	370	-	-	7	-	-	133
	50,0	100,0	430	-	350	-	-	5	-	-	127
	100,0	200,0	410	-	330	-	-	3	-	-	121

5	*Other possible delivery conditions for this alloy: T6*
9	*For information only*

We supply aluminium sheets and plates of alloy EN AW-7022 · Al Zn5 Mg3 Cu in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
5 – 8	2.020 x 1.020		
10 – 150	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 34 – 35**

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MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 485-2 Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T6 T651	≥ 0,4	0,8	525	-	460	-	6	-	-	4,5 t[8]	157
	0,8	1,5	540	-	460	-	6	-	-	5,5 t[8]	160
	1,5	3,0	540	-	470	-	7	-	-	6,5 t[8]	161
	3,0	6,0	545	-	475	-	8	-	-	8,0 t[8]	163
	6,0	12,5	540	-	460	-	8	-	-	12,0 t[8]	160
	12,5	25,0	540	-	470	-	-	6	-	-	161
	25,0	50,0	530	-	460	-	-	5	-	-	158
	50,0	60,0	525	-	440	-	-	4	-	-	155
	60,0	80,0	495	-	420	-	-	4	-	-	147
	80,0	90,0	490	-	390	-	-	4	-	-	144
	90,0	100,0	460	-	360	-	-	3	-	-	135
	100,0	120,0	410	-	300	-	-	2	-	-	119
	120,0	150,0	360	-	260	-	-	2	-	-	104
	150,0	200,0	360	-	240	-	-	2	-	-	-
	200,0	300,0	360	-	220	-	-	1	-	-	-
T652	200,0	600,0	360	-	260	-	-	1	-	-	-

5	*Other possible delivery conditions for this alloy: O · T73 · T7351 · T76 · T7651*
8	*Considerably lower bending radii can be obtained immediately after solution annealing.*
9	*For information only*

We supply aluminium sheets and plates of alloy EN AW-7075 · Al Zn5,5 Mg Cu in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
1 – 4	2.000 x 1.000	2.020 x 1.020	
5 – 250	2.020 x 1.020	2.520 x 1.270	3.020 x 1.520
Super formats	4.020 x 2.520		

The specifications for the chemical composition of this alloy can be found **on page 36 – 37**

FORMODAL® 023 Al Mg4,5 Mn0,7

Mechanical properties:

Delivery condition[5]	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A10 mm	A	180°	90°	
O3	6	1000	230	290	110	130	15	-			70 – 80

9	*For information only*

We supply aluminium sheets and plates of alloy FORMODAL® 023 in the following dimensions:

Thickness mm	Length x Width mm
5 - 570	3.020 x 1.520
5 - 1.070	3.200 x 1.730
5 - 570	3.670 x 1.570
5 - 800	4.000 x 1.570
10 - 570	4.000 x 2.160
10 - 570	6.000 x 2.160
10 - 470	6.100 x 1.520

Tolerances:

Thickness: -0/+3 mm
Length x Width: -0/+3 mm

The specifications for the chemical composition of this alloy can be found **on page 38 – 39**

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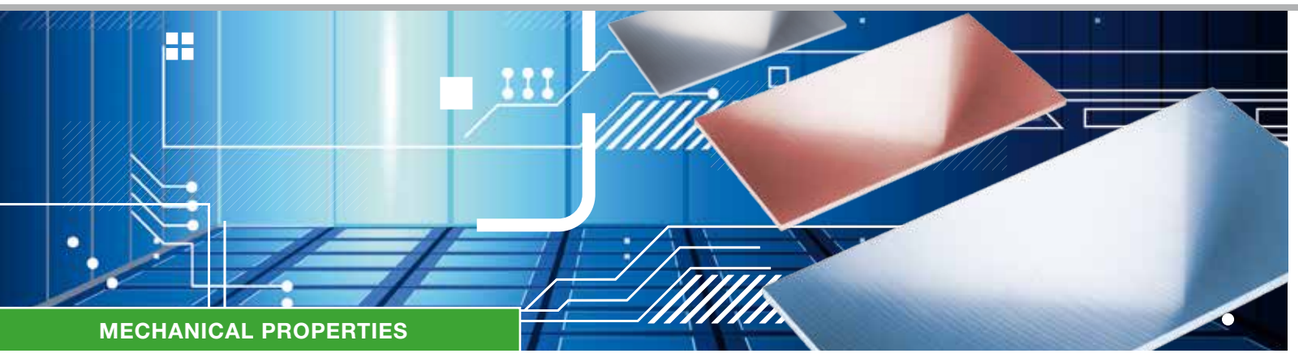


MECHANICAL PROPERTIES

Aluminium and aluminium alloys

FORMODAL®

FORMODAL® 024 elox Al Mg4,5 Mn0,7

Typical mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A10 mm	A	180°	90°	
O3	5	500	230	290	110	130	15	-			70 – 80

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® 024 elox in the following dimensions:

Thickness mm	Length x Width mm
5* – 500	3.025 x 1.550

* Precision milled plates available from 10 mm

Anodising ability of alloy:

With **FORMODAL® 024 elox**, the physical limits of the anodising ability are exploited with an optimised casting process and special homogenisation.

This produces optimum anodising results for this alloy.

However, for physical reasons (magnesium content), deviations in the anodised finish can occur, for which BIKAR is unable to accept any liability.

The specifications for the chemical composition of this alloy can be found **on page 40 – 41**

FORMODAL® 025X Al Mg4,5 Mn0,7 (special type)

Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A10 mm	A	180°	90°	
O3	6	1000	230	290	110	130	15	-			70 – 80

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® 025X in the following dimensions:

Thickness mm	Length x Width mm	Length x Width mm	Length x Width mm
5 – 600	3.050 x 1.550	3.600 x 1.650	4.000 x 2.200
5 – 600	5.000 x 2.930	6.000 x 2.200	

Material attributes:

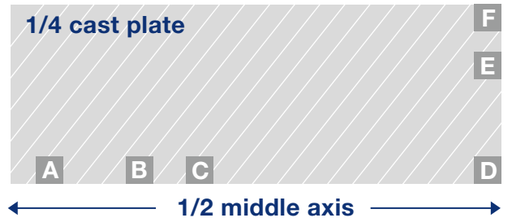
Hydrogen content	Max. 0.18 ml H_2/100 g Aluminium
Grain size	Edge: max. 80 µm; core: max. 120 µm
Pore size	Single pore max. 50 µm, cluster size max. 250 µm
Porosity	Average porosity in % at position A-F (sketch); max. average porosity 0.15%

Sampling:

Position of sample:

A ≈ 50 mm, B ≈ 200 mm, C ≈ 300 mm (A-C) from the end side

D ≈ middle, E ≈ 100 mm, F ≈ 0-30 mm from the longitudinal side



The specifications for the chemical composition of this alloy can be found **on page 42 – 43**

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

FORMODAL®

FORMODAL® 030 Al Mg 4,5 Mn 0,7

Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A10 mm	A	180°	90°	
O3	6	160	230	290	110	130	15	-	-	-	70-80

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® 030 in the following dimensions:

Thickness mm	Length x Width mm
5 - 160	3.020 x 1.520
5 - 160	3.670 x 1.570
10 - 160	4.000 x 2.160
10 - 85	6.000 x 2.160
10 - 120	6.100 x 1.520

Tolerances:

Thickness mm	Flatness mm[1]	Thickness tolerance mm
≥ 5 - ≤ 6	≤ 0,85	± 0,1
≥ 6 - ≤ 13	≤ 0,44	± 0,1
≥ 13	≤ 0,14	± 0,1

Other dimensions on request.

[1] This specification refers to the total area; not only to sections of a plate or a pre-cut part.
By dividing the surface, the flatness is not reduced proportionately.

- The plates are plain-milled and foiled on both sides for tool making!
- Casting alloys can contain micro pores, which particularly appear during coloured surface treatment or polishing. This is especially true for dark colours.

Surface roughness:	R_a 0,2 - 0,4 µm

The specifications for the chemical composition of this alloy can be found **on page 44 – 45**

FORMODAL® 036

Typical mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa	Elastic limit $R_{p0.2}$ MPa	Elongation % min.	Hardness[9] HBW
	over	to			A50	
T6	10	600	Surface: 335 - 355 1/4 Thickness: 345 - 360 1/2 Thickness: 325 - 335	Surface: 290 - 315 1/4 Thickness: 305 - 330 1/2 Thickness: 300 - 310	Surface: 6 - 8 1/4 Thickness: 3,5 - 4,5 1/2 Thickness: 1,5 - 3	149 - < 400: 135 > 400: 130

[9] *For information only*

Tolerances:

Available from 10 mm thickness
Rough sawn: -0 +3 mm
Surface machined plates are also available.

Machined plates:

thickness mm	flatness[1] mm	thickness mm
> 15	< 0,25	± 0,1

Other dimensions on request.

[1] This specification refers to the total area; not only to sections of a plate or a pre-cut part.
By dividing the surface, the flatness is not reduced proportionately.

Surface roughness:	R_a 0,4 µm

We supply aluminium sheets and plates of alloy FORMODAL® 036 in the following dimensions:

- 2.520 x 1.450 x 600 mm
- 3.020 x 2.020 x 500 mm
- 3.520 x 1.450 x 600 mm

From this material, we can cut to your exact size requirements.

The specifications for the chemical composition of this alloy can be found **on page 46 – 47**

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BIKAR METALLE

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

FORMODAL®

FORMODAL® BM-400

Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50 mm	A	180°	90°	
T851 T852	100	200	415	457	305	353	5,0-7,5	-	-	-	130
	200	300	370	441	270	336	3,0-6,5	-	-	-	
	300	400	340	408	240	322	1,5-3,5	-	-	-	
	400	500	320	368	240	309	1,5-2,5	-	-	-	
	500	600	310	347	230	297	0,5-1,5	-	-	-	
	600	700	-	399	-	319	1,5-3,5	-	-	-	

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® BM-400 in the following dimensions:

Thickness mm	Length x Width mm
100 – 700	3.020 x 1.520

The specifications for the chemical composition of this alloy can be found **on page 48 – 49**

FORMODAL® BM-5083 Al Mg4,5 Mn0,7

EN 485-2 Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	min. A 50mm	A	180°	90°	
O H111	6,0	15,0	270	345	115	-	16	-	-	-	-
	15,0	60,0	270	345	115	-	15	-	-	-	-
	60,0	80,0	270	345	115	-	14	-	-	-	-

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® BM-5083 in the following dimensions:

3.020 x 1.520 mm

Tolerances:

	Thickness tolerance	Flatness tolerance[1]
6-20 mm	±0,1 mm	max. 0,35 mm
20-80 mm	±0,1 mm	max. 0,15 mm

Other dimensions on request.

[1] This specification refers to the total area; not only to sections of a plate or a pre-cut part. By dividing the surface, the flatness is not reduced proportionately.

Surface roughness:	R_a 0,4 µm

The specifications for the chemical composition of this alloy can be found **on page 50 – 51**

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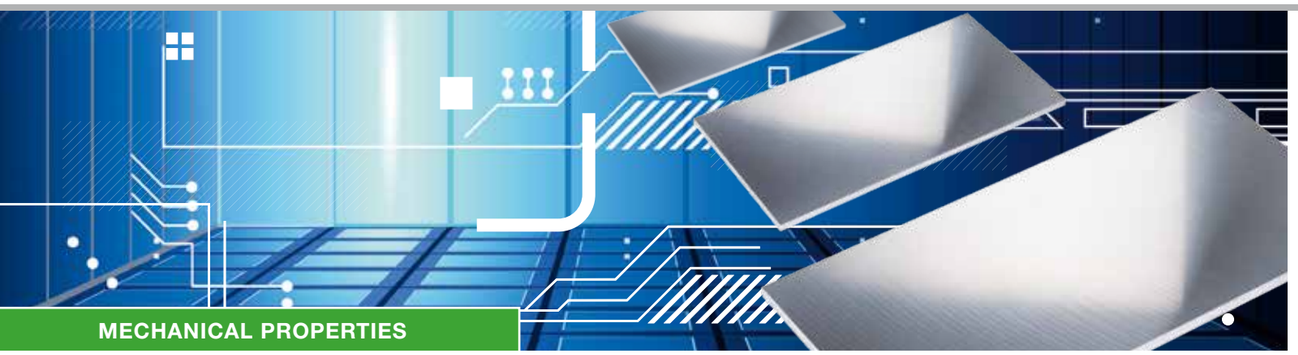

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

FORMODAL®

FORMODAL® BM-6082 Al Si1 Mg Mn

EN 485-2 Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % A50mm		Bending radius[9]		Hardness[9] HBW
	over	to	min.	typical	min.	typical	min.	typical	180°	90°	
T651	8,0	12,5	300	350	255	305	9	11	-	-	105
	12,5	25,0	295	350	240	305	8	11	-	-	105
	25,0	60,0	295	350	240	310	8	11	-	-	105
	60,0	100,0	295	350	240	310	7	11	-	-	105
	100,0	140,0	275	350	240	310	6	11	-	-	105

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® BM-6082 in the following dimensions:

3020 x 1520 mm

Tolerances:

	Thickness tolerance	Flatness tolerance[1]
8-15 mm	±0,1 mm	max. 0,50 mm
15-140 mm	±0,1 mm	max. 0,35 mm

Other dimensions on request.

[1] This specification refers to the total area; not only to sections of a plate or a pre-cut part. By dividing the surface, the flatness is not reduced proportionately.

Surface roughness:	R_a 0,4 µm

The specifications for the chemical composition of this alloy can be found **on page 52 – 53**

FORMODAL® BM-7075 Al Zn5,5 Mg Cu

EN 485-2 Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation %		Bending radius[9]		Hardness[9] HBW
	over	to	min.	max.	min.	max.	A50mm	A	180°	90°	
T7351	8,0	12,5	475	-	390	-	7	-	-	-	140
	12,5	25,0	475	-	390	-	-	6	-	-	140
	25,0	50,0	475	-	390	-	-	5	-	-	140
	50,0	60,0	455	-	360	-	-	5	-	-	133
	60,0	80,0	440	-	340	-	-	5	-	-	129
	80,0	100,0	430	-	340	-	-	5	-	-	126

[9] *For information only*

We supply aluminium sheets and plates of alloy FORMODAL® BM-7075 in the following dimensions:

3020 x 1520 mm

Tolerances:

	Thickness tolerance	Flatness tolerance[1]
10-15 mm	±0,1 mm	< 0,8 mm
16-90 mm	±0,1 mm	< 0,5 mm

Other dimensions on request.

[1] This specification refers to the total area; not only to sections of a plate or a pre-cut part. By dividing the surface, the flatness is not reduced proportionately.

Surface roughness:	R_a 0,4 µm

The specifications for the chemical composition of this alloy can be found **on page 54 – 55**

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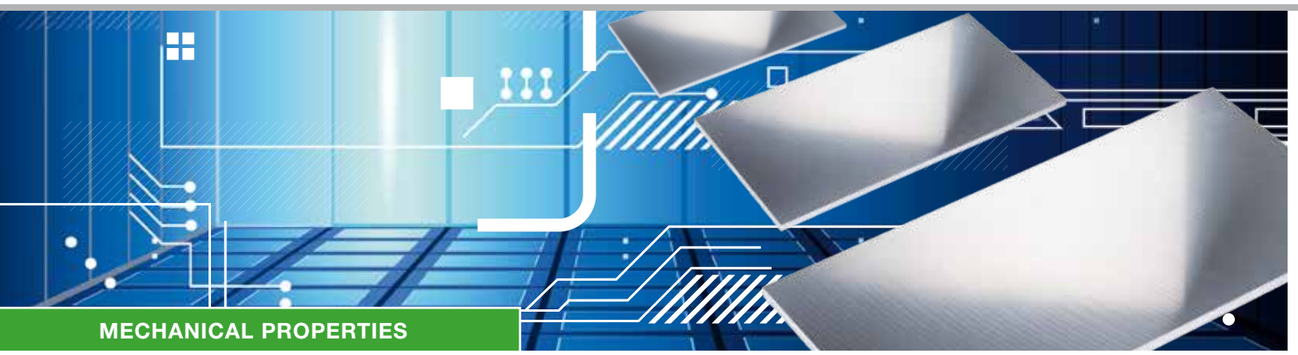

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

CERTAL® SPC Al Zn5 Mg3 Cu

Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	typical	min.	typical	A50 mm	A	180°	90°	
T652	140	300[6]	490	540	430	480	6,0	8,0	-	-	160
	300	400[7]	475	525	400	445	5,0	6,0	-	-	160
	400	500[7]	445	490	360	400	4,0	5,0	-	-	155
	500	700[7]	400	420	310	330	3,5	4,0	-	-	140

Info - Nominal thickness	*6 = upset* *7 = forged – upset* *6 + 7 = Overlap marks of the upset stages max. 3.00 mm*
9	*For information only*

We supply aluminium sheets and plates of alloy AA 7122 · CERTAL® SPC in the following dimensions:

Thickness mm	Length x Width mm
140 – 300	3.020 x 1.520
350	2.800 x 1.200
400	2.500 x 1.200
450	2.200 x 1.200
500	2.000 x 1.200
600	2.000 x 1.050
700	2.000 x 900

The specifications for the chemical composition of this alloy can be found **on page 52 – 53**

UNIDAL® AW7019 Al Zn4 Mg2 Mn (Special type)

Mechanical properties:

Delivery condition	Nominal thickness mm		Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Bending radius[9]		Hardness[9] HBW
	over	to	min.	typical	min.	typical	min. A50 mm	typical A50 mm	180°	90°	
T651	7,9	15,0	410	420	350	370	8	13,0	-	-	125
	15,0	35,0	400	410	340	355	8	12,5	-	-	125
	35,0	60,0	400	415	340	365	8	12,0	-	-	130
	60,0	80,0	390	410	330	360	8	10,5	-	-	125

9	*For information only*

We supply aluminium sheets and plates of alloy UNIDAL® in the following dimensions:

Thickness mm	Thickness tolerance	Length x Width mm	Transverse and longitudinal tolerance	Roughness R_a
8 – 15	all thicknesses +/- 0,1 mm	3.020 x 1.520	max. 0,50 mm/m	all thicknesses max. 0,40 µm
15,1 – 80			max. 0,25 mm/m	
Other thicknesses up to 120 mm on request.				

The specifications for the chemical composition of this alloy can be found **on page 58 - 59**

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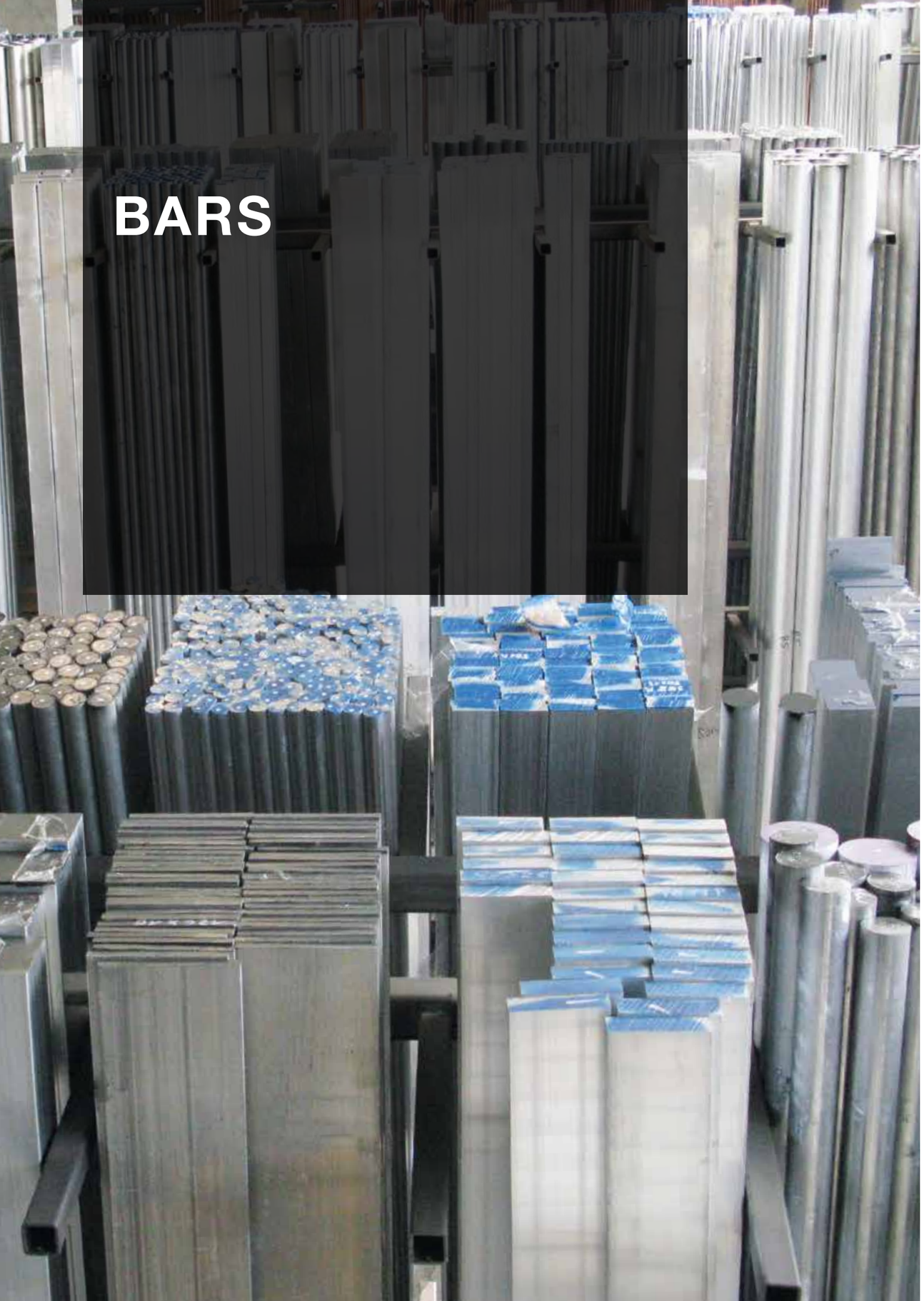

BARS

Bars			
Shape	**Alloy**		**Page**
Round bars	1050A	Al99,5	86
	1350A	E Al99,5(A)	87
	2007	Al Cu4 Pb Mg Mn	87
	2011	Al Cu6 Bi Pb	88
	2017A	Al Cu4 Mg Si (A)	89
	2024	Al Cu4 Mg1	90
	5005A	Al Mg1(C)	91
	5083	Al Mg4,5 Mn0,7	92
	5754	Al Mg3	93
	6012	Al Mg Si Pb	94
	6060	Al Mg Si	95
	6061	Al Mg1 Si Cu	96
	6082	Al Si1 Mg Mn	97
	7020	Al Zn4,5 Mg1	98
	7022	Al Zn5 Mg3 Cu	99
	7075	Al Zn5,5 Mg Cu	100
Bars **square / flat / hexagonal**	1050A	Al99,5	102
	1350A	E Al99,5(A)	103
	2007	Al Cu4 Pb Mg Mn	103
	2011	Al Cu6 Bi Pb	104
	2017A	Al Cu4 Mg Si (A)	105
	2024	Al Cu4 Mg1	106
	5005A	Al Mg1(C)	107
	5083	Al Mg4,5 Mn0,7	108
	5754	Al Mg3	109
	6012	Al Mg Si Pb	110
	6060	Al Mg Si	111
	6061	Al Mg1 Si Cu	112
	6082	Al Si1 Mg Mn	113
	7020	Al Zn4,5 Mg1	114
	7022	Al Zn5 Mg3 Cu	115
	7075	Al Zn5,5 Mg Cu	116

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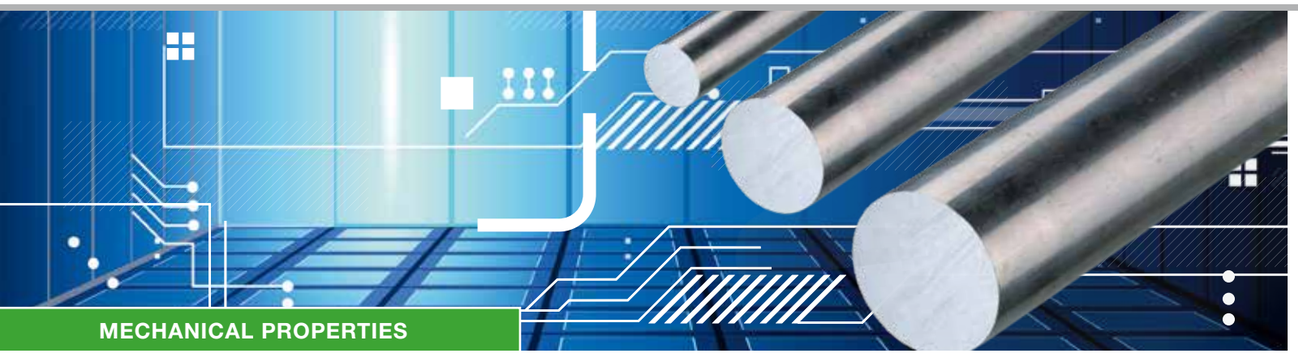

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-1050A Al 99,5

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 80	60	95	-	-	22	25	20
H14	≤ 40	100	135	70	-	5	6	30
H16	≤ 15	120	160	105	-	3	4	35
H18	≤ 10	145	-	125	-	3	3	43

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	all dimensions	60	95	20	-	23	25	20
F / H112		60	-	20	-	23	25	20

[9] *For information only*

We supply aluminium round bars of alloy 1050A in the following dimensions:

Thickness mm	drawn: 2 - 18

The specifications for the chemical composition of this alloy can be found **on page 6 – 7**

EN AW-1350A E Al99,5(A)

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
H14	18	100	135	70	-	-	6	-
H16	16	120	160	105	-	-	4	-
H18	14	145	-	125	-	-	3	-

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 8 – 9**

EN AW-2007 Al Cu4 Pb Mg Mn

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 30	370	-	240	-	5	7	95
	> 30 to ≤ 80	340	-	220	-	-	6	95
T351	≤ 80	370	-	240	-	3	5	95

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 T4510 T4511	≤ 80	370	-	250	-	6	8	95
	> 80 to ≤ 200	340	-	220	-	-	8	95
	> 200 to ≤ 250	330	-	210	-	-	7	95

[9] *For information only*

We supply aluminium round bars of alloy 2007 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 500

The specifications for the chemical composition of this alloy can be found **on page 10 – 11**

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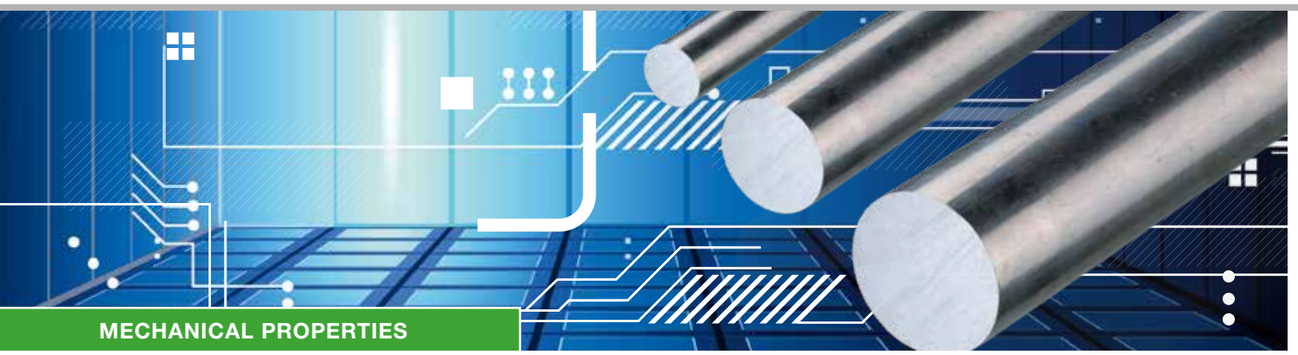

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2011 Al Cu6 Bi Pb

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 40	320	-	270	-	8	10	90
	> 40 to ≤ 50	300	-	250	-	-	10	90
	> 50 to ≤ 80	280	-	210	-	-	10	90
T8	≤ 80	370	-	270	-	6	8	115

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 200	275	-	125	-	12	14	95
T6	≤ 75	310	-	230	-	6	8	110
	> 75 to ≤ 200	295	-	195	-	-	6	110

The specifications for the chemical composition of this alloy can be found **on page 12 – 13**

EN AW-2017A Al Cu4 Mg Si(A)

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 80	400	-	250	-	8	10	105
T351	≤ 80	400	-	250	-	6	8	105

5 *Other possible delivery conditions for this alloy: 0, H111*

9 *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 T4510 T4511	≤ 25	380	-	260	-	10	12	105
	> 25 to ≤ 75	400	-	270	-	-	10	105
	> 75 to ≤ 150	390	-	260	-	-	9	105
	> 150 to ≤ 200	370	-	240	-	-	8	105
	> 200 to ≤ 250	360	-	220	-	-	7	105

5 *Other possible delivery conditions for this alloy: 0, H111*

9 *For information only*

We supply aluminium round bars of alloy 2017A in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 450

The specifications for the chemical composition of this alloy can be found **on page 14 – 15**

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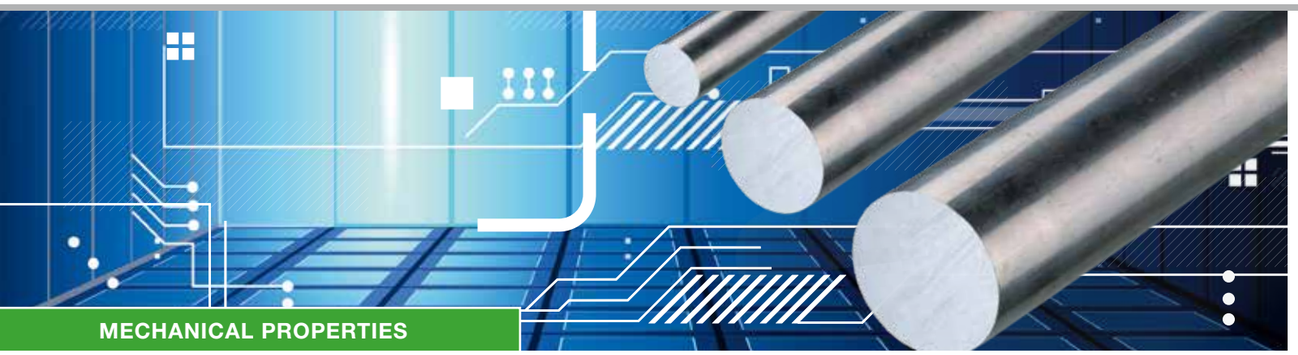


MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2024 Al Cu4 Mg1

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 10	425	-	310	-	8	10	120
	> 10 to ≤ 80	425	-	290	-	7	9	120
T351	≤ 80	425	-	310	-	6	8	120
5	*Other possible delivery conditions for this alloy: 0, H111, T6, T651, T8, T851*							
9	*For information only*							

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3 T3510 T3511	≤ 50	450	-	310	-	6	8	120
	> 50 to ≤ 100	440	-	300	-	-	8	120
	> 100 to ≤ 200	420	-	280	-	-	8	120
	> 200 to ≤ 250	400	-	270	-	-	8	120
5	*Other possible delivery conditions for this alloy: 0, H111, T6, T651, T8, T851*							
9	*For information only*							

We supply aluminium round bars of alloy 2024 in the following dimensions:

Thickness mm	drawn: 2 - 18	pressed: 12 -350

The specifications for the chemical composition of this alloy can be found **on page 16 – 17**

EN AW-5005A Al Mg1(C)

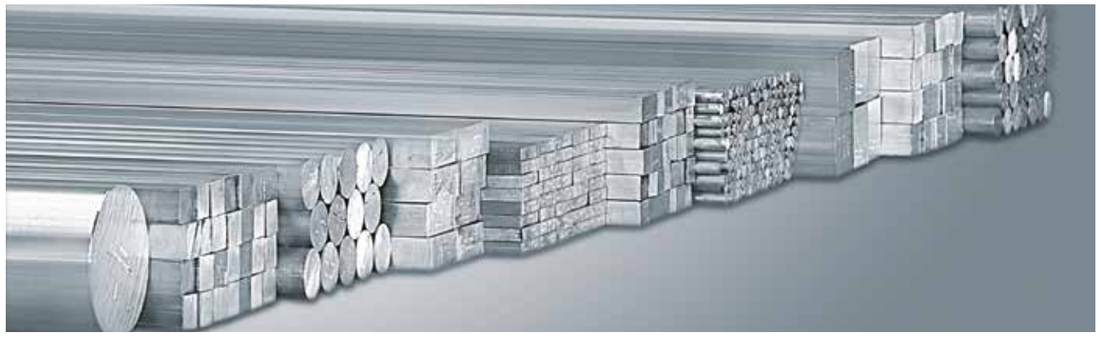
EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 80	100	145	40	-	16	18	30
H 14	≤ 40	140	-	110	-	4	6	45
H18	≤ 15	185	-	155	-	2	4	55
9	*For information only*							

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112 O / H111	all dimensions	100	-	40	-	16	18	30
	≤ 80	100	150	40	-	16	18	30
9	*For information only*							

The specifications for the chemical composition of this alloy can be found **on page 18 – 19**



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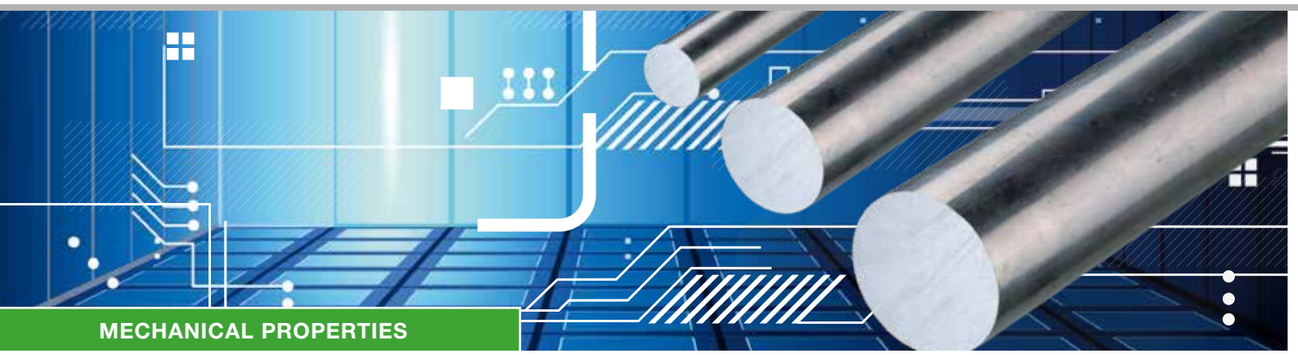

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-5083 Al Mg4,5 Mn0,7

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 80	270	350	110	-	14	16	70
H 12 / H 22 / H 32	≤ 30	280	-	200	-	4	6	90
[9]	*For information only*							

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F	≤ 200	270	-	110	-	10	12	70
	> 200 to ≤ 250	260	-	100	-	-	12	70
O / H111	≤ 200	270	-	110	-	10	12	70
H112	≤ 200	270	-	125	-	10	12	70
[9]	*For information only*							

We supply aluminium round bars of alloy 5083 in the following dimensions:

Thickness mm	drawn: 12 - 60	pressed: 8 - 530

The specifications for the chemical composition of this alloy can be found **on page 20 – 21**

EN AW-5754 Al Mg3

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 80	180	250	80	-	14	16	45
H14 / H24 / H34	≤ 25	240	290	180	-	3	4	75
H18 / H28 / H38	≤ 10	280	-	240	-	2	3	88
[9]	*For information only*							

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	≤ 150	180	-	80	-	12	14	47
	> 150 to ≤ 250	180	-	70	-	-	13	47
O / H111	≤ 150	180	250	80	-	15	17	45
[9]	*For information only*							

We supply aluminium round bars of alloy 5754 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 530

The specifications for the chemical composition of this alloy can be found **on page 22 – 23**

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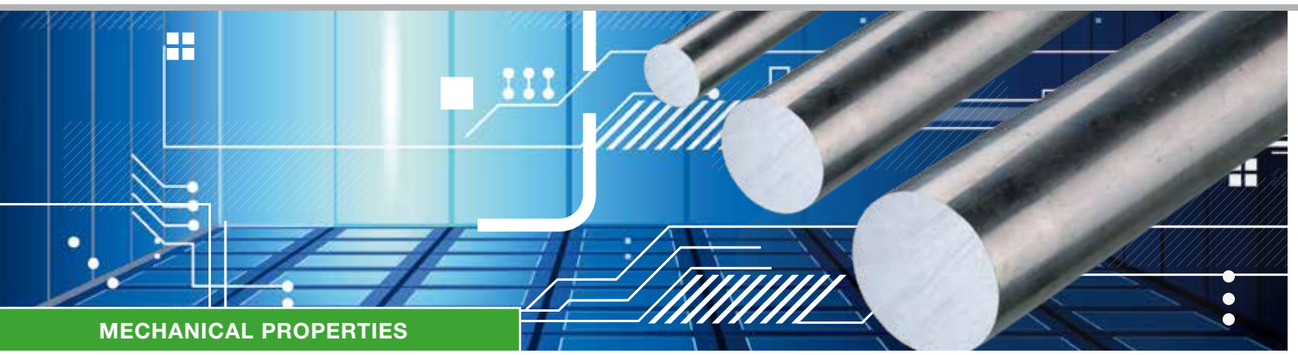

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6012 Al Mg Si Pb

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	200	-	100	-	8	10	-
T6	≤ 80	310	-	260	-	6	8	105

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 150	310	-	260	-	6	8	105
	> 150 to ≤ 200	260	-	200	-	-	8	105

[9] *For information only*

We supply aluminium round bars of alloy 6012 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 120

The specifications for the chemical composition of this alloy can be found **on page 24 – 25**

EN AW-6060 Al Mg Si

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition [5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	215	-	160	-	10	12	75

[5] *Other possible delivery conditions for this alloy: T4*

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition [5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 150	190	-	150	-	6	8	70
T66	≤ 150	215	-	160	-	6	8	75

[5] *Other possible delivery conditions for this alloy: T4, T5, T64*

[9] *For information only*

We supply aluminium round bars of alloy 6060 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 120

The specifications for the chemical composition of this alloy can be found **on page 26 – 27**

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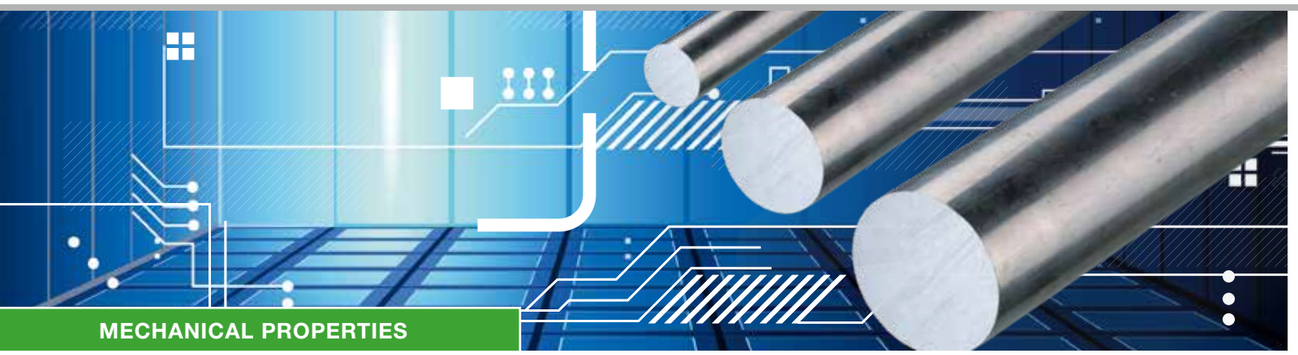

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6061 Al Mg1 Si Cu

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	180	-	110	-	13	15	65
T6	≤ 80	260	-	240	-	6	8	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 200	-	150	-	110	14	16	30
T6	≤ 200	260	-	110	-	13	15	65

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

We supply aluminium round bars of alloy 6061 in the following dimensions:

Thickness mm	drawn: 2 - 18	pressed: 12 - 530

The specifications for the chemical composition of this alloy can be found **on page 28 – 29**

EN AW-6082 Al Si1 Mg Mn

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	205	-	110	-	12	14	70
T6	≤ 80	310	-	255	-	9	10	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 200	205	-	110	-	12	14	70
T6	≤ 20	295	-	250	-	6	8	95
	> 20 to ≤ 150	310	-	260	-	-	8	95
	> 150 to ≤ 200	280	-	240	-	-	6	95
	> 200 to ≤ 250	270	-	200	-	-	6	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

We supply aluminium round bars of alloy 6082 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 530

The specifications for the chemical composition of this alloy can be found **on page 30 – 31**

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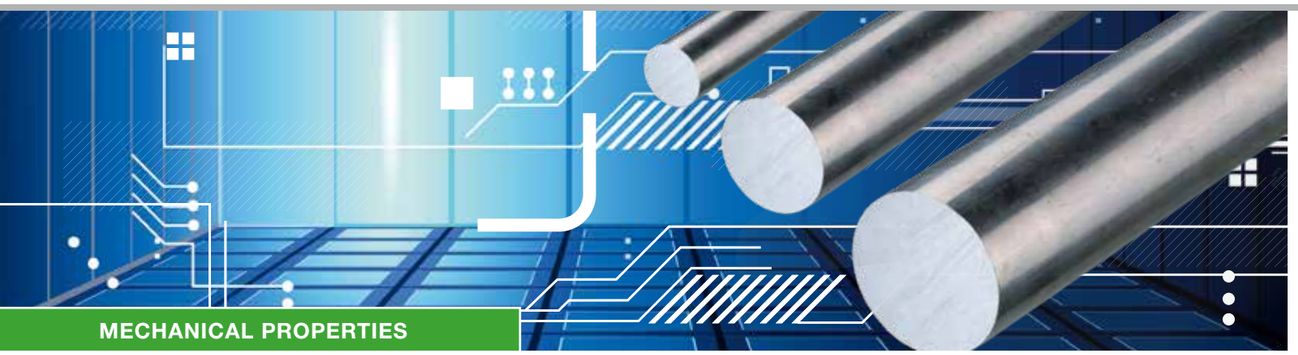

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7020 Al Zn4,5 Mg1

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	350	-	280	-	8	10	110

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 50	350	-	290	-	8	10	110
	> 50 to ≤ 200	340	-	275	-	-	10	110

[9] *For information only*

We supply aluminium round bars of alloy 7020 in the following dimensions:

Thickness mm	drawn: 2 - 18	pressed: x

The specifications for the chemical composition of this alloy can be found **on page 32 – 33**

EN AW-7022 Al Zn5 Mg3 Cu

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	460	-	380	-	6	8	133

[9] *For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 80	490	-	420	-	5	7	133
	> 80 to ≤ 200	470	-	400	-	-	7	133

[9] *For information only*

We supply aluminium round bars of alloy 7022 in the following dimensions:

Thickness mm	drawn: 12 - 60	pressed: 8 - 160

The specifications for the chemical composition of this alloy can be found **on page 34 – 35**

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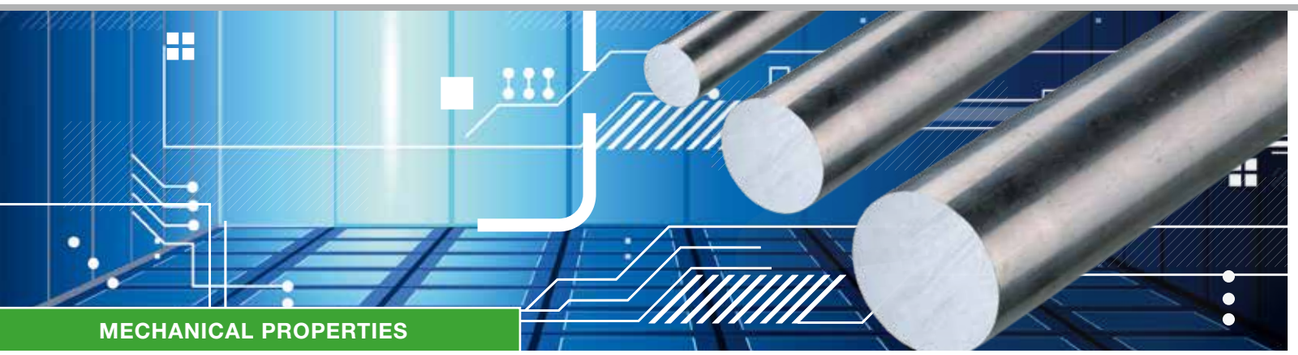

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: round bars – drawn

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	540	-	485	-	6	7	150
T651	≤ 80	540	-	485	-	4	5	150
T73	≤ 80	455	-	385	-	8	10	135
T7351	≤ 80	455	-	385	-	6	8	135

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

EN 755-2 Mechanical properties: round bars – pressed

Delivery condition[5]	Dia. mm.	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 25	540	-	480	-	5	7	150
	> 25 to ≤ 100	560	-	500	-	-	7	150
	> 100 to ≤ 150	530	-	470	-	-	6	150
	> 150 to ≤ 200	470	-	400	-	-	5	150
T73 T73510 T73511	≤ 25	485	-	420	-	5	7	135
	> 25 to ≤ 75	475	-	405	-	-	7	135
	> 75 to ≤ 100	470	-	390	-	-	6	135
	> 100 to ≤ 150	440	-	360	-	-	6	135

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

We supply aluminium round bars of alloy 7075 in the following dimensions:

Thickness mm	drawn: 2 - 60	pressed: 8 - 500

The specifications for the chemical composition of this alloy can be found **on page 36 – 37**

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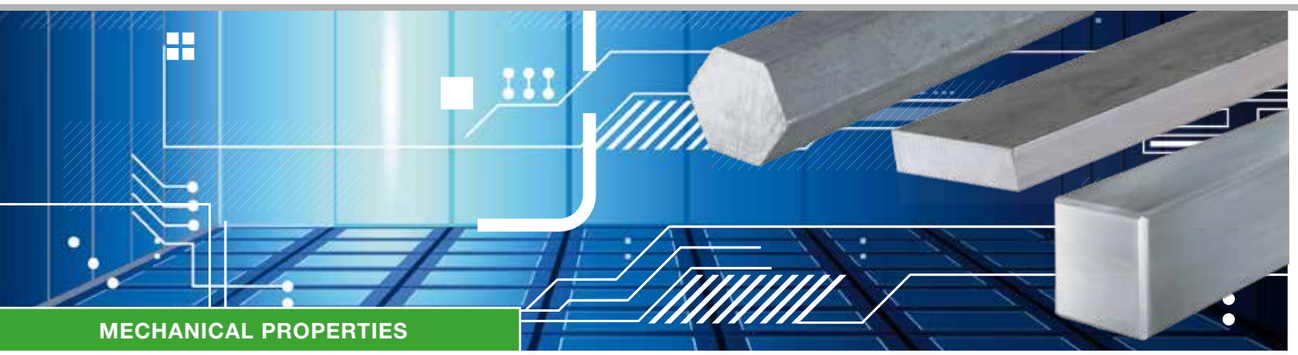

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-1050A Al 99,5

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9]
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 60	60	95	-	-	22	25	20
H14	≤ 10	100	135	70	-	5	6	30
H16	≤ 5	120	160	105	-	3	4	35
H18	≤ 3	145	-	125	-	3	3	43

9 *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9]
		min.	max.	min.	max.	A50 mm	A	
O / H111	all dimensions	60	95	20	-	23	25	20
F / H112	all dimensions	60		20	-	23	25	20

9 *For information only*

The specifications for the chemical composition of this alloy can be found **on page 6 – 7**

EN AW-1350A E Al99,5(A)

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
H14	14	100	135	70	-	-	6	-
H16	12	120	160	105	-	-	4	-
H18	10	145	-	125	-	-	3	-

9 *For information only*

The specifications for the chemical composition of this alloy can be found **on page 8 – 9**

EN AW-2007 Al Cu4 Pb Mg Mn

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 30	370	-	240	-	5	7	95
	> 30 to ≤ 80	340	-	220	-	-	6	95
T351	≤ 80	370	-	240	-	3	5	95

9 *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 T4510 T4511	≤ 80	370	-	250	-	6	8	95
	> 80 to ≤ 200	340	-	220	-	-	8	95
	> 200 to ≤ 250	330	-	210	-	-	7	95

9 *For information only*

We supply bars of alloy 2007 in the following dimensions:

Thickness mm	4 point pressed: 8 x 8 - 300 x 300	6 point pressed: wrench size 6 - 80

The specifications for the chemical composition of this alloy can be found **on page 10 – 11**

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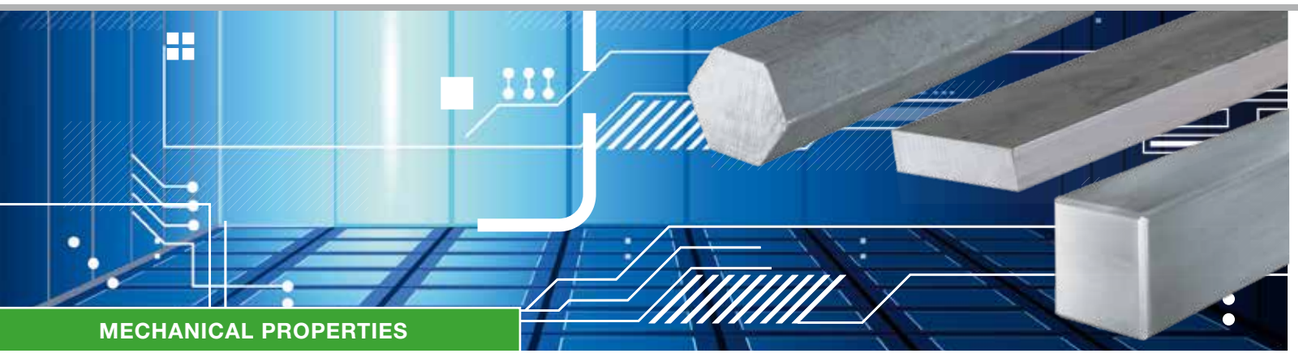

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2011 Al Cu6 Bi Pb

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 40	320	-	270	-	8	10	90
	> 40 to ≤ 50	300	-	250	-	-	10	90
	> 50 to ≤ 80	280	-	210	-	-	10	90
T8	≤ 80	370	-	270	-	6	8	115

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 60	275	-	125	-	12	14	95
T6	≤ 60	310	-	230	-	6	8	110

[9] *For information only*

We supply aluminium bars of alloy 2011 in the following dimensions:

Thickness mm	4-pt pressed: 10 x 10 - 100 x 100

The specifications for the chemical composition of this alloy can be found **on page 12 – 13**

EN AW-2017A Al Cu4 Mg Si(A)

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 80	400	-	250	-	8	10	105
T351	≤ 80	400	-	250	-	6	8	105

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 T4510 T4511	≤ 25	380	-	260	-	10	12	105
	> 25 to ≤ 75	400	-	270	-	-	10	105
	> 75 to ≤ 150	390	-	260	-	-	9	105
	> 150 to ≤ 200	370	-	240	-	-	8	105
	> 200 to ≤ 250	360	-	220	-	-	7	105

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 14 – 15**

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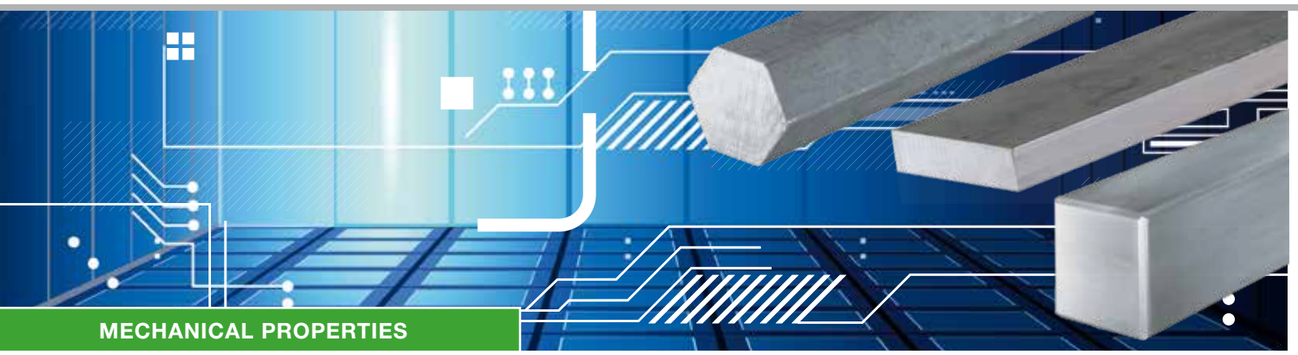

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2024 Al Cu4 Mg1

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 10	425	-	310	-	8	10	120
	> 10 to ≤ 80	425	-	290	-	7	9	120
T351	≤ 80	425	-	310	-	6	8	120

[5] *Other possible delivery conditions for this alloy: O, H111, T6, T651, T8, T851*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3 T3510 T3511	≤ 50	450	-	310	-	6	8	120
	> 50 to ≤ 100	440	-	300	-	-	8	120
	> 100 to ≤ 200	420	-	280	-	-	8	120
	> 200 to ≤ 250	400	-	270	-	-	8	120

[5] *Other possible delivery conditions for this alloy: O, H111, T8, T8510, T8511*

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 16 – 17**

EN AW-5005A Al Mg1(C)

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 60	100	145	40	-	16	18	30
H 14	≤ 10	140	-	110	-	4	6	45
H18	≤ 2	185	-	155	-	2	4	55

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	≤ 100	100	-	40	-	16	18	30
O / H111	≤ 60	100	150	40	-	16	18	30

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 18 – 19**

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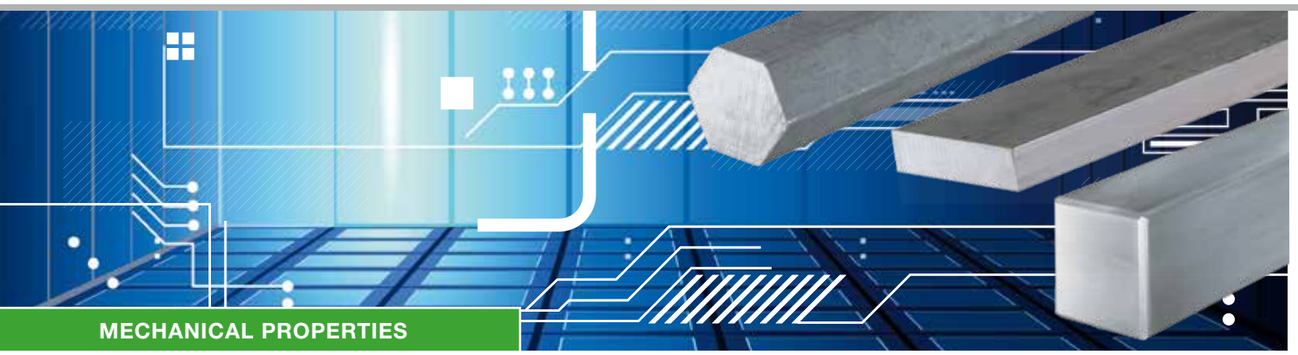

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-5083 Al Mg4,5 Mn0,7

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition [5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 60	270	350	110	-	14	16	70

[5] *Other possible delivery conditions for this alloy: H12,H22,H32*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
F	≤ 200	270	-	110	-	10	12	70
	> 200 to ≤ 250	260	-	100	-	-	12	70
O / H111	≤ 200	270	-	110	-	10	12	70
H112	≤ 200	270	-	125	-	10	12	70

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 20 – 21**

EN AW-5754 Al Mg3

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 60	180	250	80	-	14	16	45
H 14 / H 24 / H 34	≤ 5	240	290	180	-	3	4	75
H 18 / H 28 / H 38	≤ 3	280	-	240	-	2	3	88

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness [9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	≤ 150	180	-	80	-	12	14	47
	> 150 to ≤ 250	180	-	70	-	-	13	47
O / H111	≤ 150	180	250	80	-	15	17	45

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 22 – 23**

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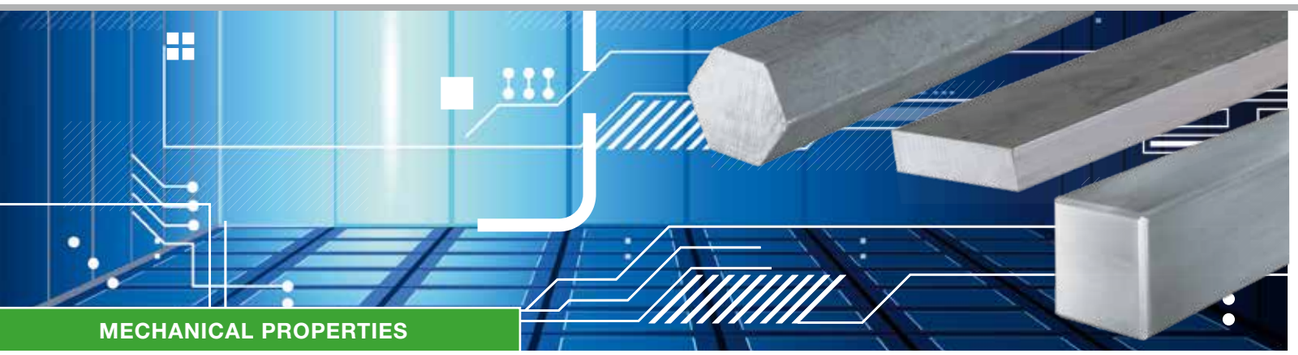

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6012 Al Mg Si Pb

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	200	-	100	-	8	10	-
T6	≤ 80	310	-	260	-	6	8	105

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 150	310	-	260	-	6	8	105
	> 150 to ≤ 250	260	-	200	-	-	8	105

[9] *For information only*

We supply aluminium bars of alloy 6012 in the following dimensions:

Thickness mm	Hexagonal pressed: wrench size 8 - 41

The specifications for the chemical composition of this alloy can be found **on page 24 – 25**

EN AW-6060 Al Mg Si

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	215	-	160	-	10	12	75

[5] *Other possible delivery conditions for this alloy: T4*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 150	190	-	150	-	6	8	70
T66	≤ 150	215	-	160	-	6	8	75

[5] *Other possible delivery conditions for this alloy: T4, T5, T64*

[9] *For information only*

We supply aluminium bars of alloy 6060 in the following dimensions:

Thickness mm	Square pressed: 6 x 6 – 100 x 100

The specifications for the chemical composition of this alloy can be found **on page 26 – 27**

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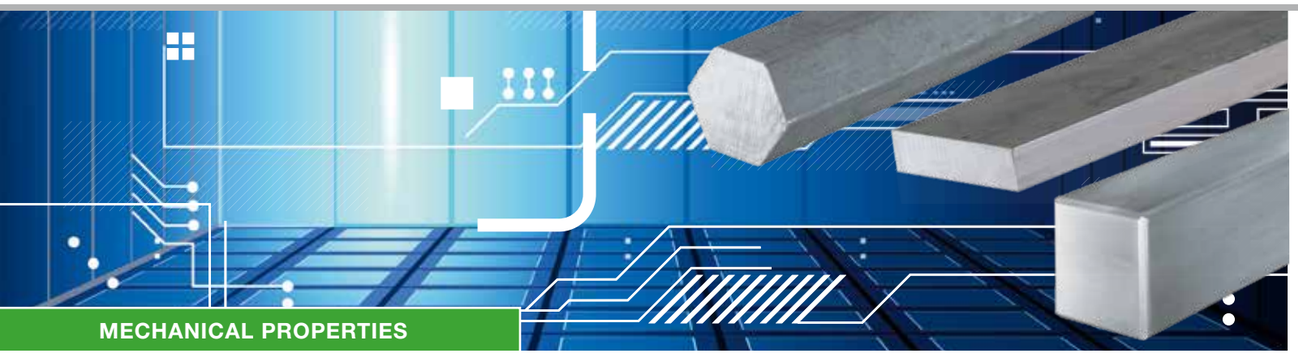

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6061 Al Mg1 Si Cu

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	205	-	110	-	14	16	65
T6	≤ 80	290	-	240	-	8	10	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 200	180	-	110	-	13	15	65
T6	≤ 200	260	-	240	-	6	8	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 28 – 29**

EN AW-6082 Al Si1 Mg Mn

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 80	205	-	110	-	12	14	70
T6	≤ 80	310	-	255	-	9	10	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 200	205	-	110	-	12	14	70
T6	≤ 20	295	-	250	-	6	8	95
	> 20 to ≤ 150	310	-	260	-	-	8	95
	> 150 to ≤ 200	280	-	240	-	-	6	95
	> 200 to ≤ 250	270	-	200	-	-	6	95

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

Aluminium – We supply bars of alloy 6082 in the following dimensions:

Thickness mm	Square pressed: 8 x 8 - 120 x 120

The specifications for the chemical composition of this alloy can be found **on page 30 – 31**

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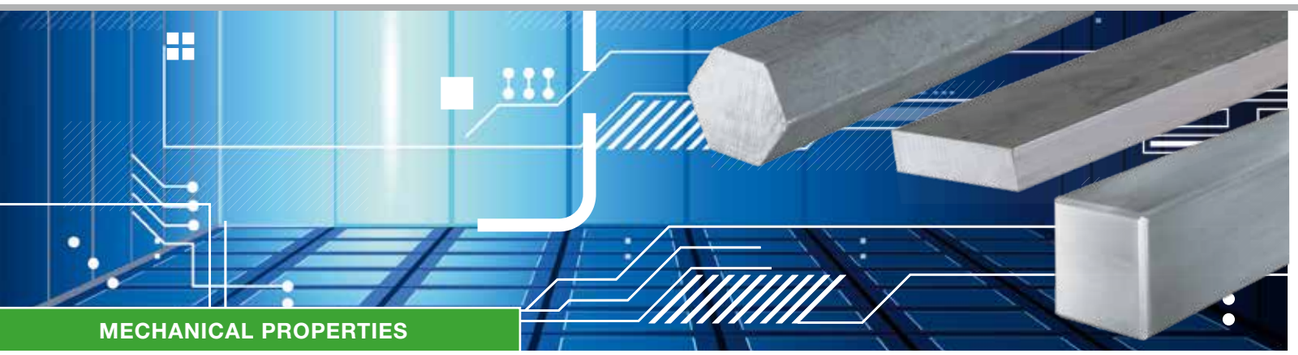

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7020 Al Zn4,5 Mg1

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 50	350	-	280	-	8	10	110

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 50	350	-	290	-	8	10	110
	> 50 to ≤ 200	340	-	275	-	-	10	110

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 32 – 33**

EN AW-7022 Al Zn5 Mg3 Cu

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	460	-	380	-	6	8	133

[9] *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 80	490	-	420	-	5	7	133
	> 80 to ≤ 200	470	-	400	-	-	7	133

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 34 – 35**

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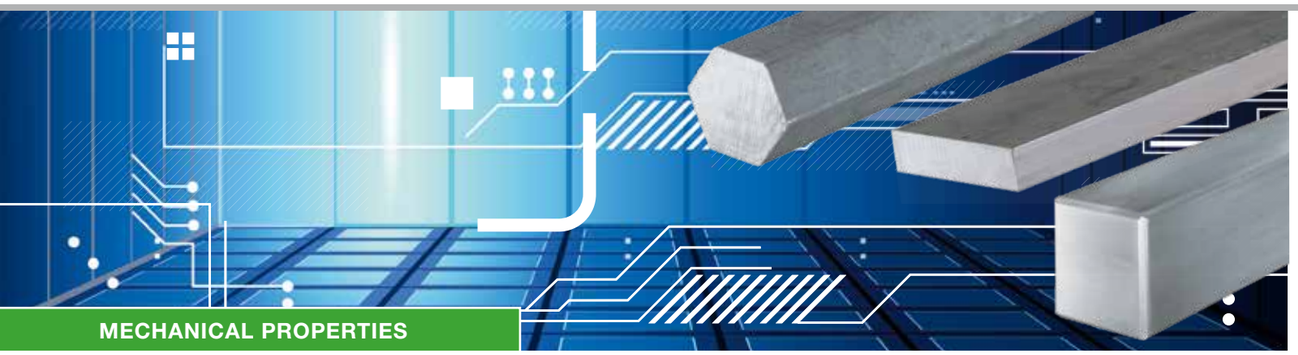

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: Bars – drawn square · flat · hexagonal

Delivery condition[5]	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 80	540	-	485	-	6	7	150
T651	≤ 80	540	-	485	-	4	5	150
T73	≤ 80	455	-	385	-	8	10	135
T7351	≤ 80	455	-	385	-	6	8	135

5 *Other possible delivery conditions for this alloy: O, H111*

9 *For information only*

EN 755-2 Mechanical properties: Bars – pressed square · flat · hexagonal

Delivery condition	Thickness for flat 4 + 6 pt: wrench size	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 25	540	-	480	-	5	7	150
	> 25 to ≤ 100	560	-	500	-	-	7	150
	> 100 to ≤ 150	530	-	470	-	-	6	150
	> 150 to ≤ 200	470	-	400	-	-	5	150
T73 T73510 T73511	≤ 25	485	-	420	-	5	7	135
	> 25 to ≤ 75	475	-	405	-	-	7	135
	> 75 to ≤ 100	470	-	390	-	-	6	135
	> 100 to ≤ 150	440	-	360	-	-	6	135

9 *For information only*

The specifications for the chemical composition of this alloy can be found **on page 36 – 37**

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TUBES + PROFILES

Tubes / profiles			
Shape	**Alloy**		**Page**
Tubes	1050A	Al99,5	120
	2007	Al Cu4 Pb Mg Mn	121
	2011	Al Cu6 Bi Pb	122
	2017A	Al Cu4 Mg Si (A)	123
	2024	Al Cu4 Mg1	124
	5005A	Al Mg1(C)	125
	5083	Al Mg4,5 Mn0,7	126
	5754	Al Mg3	127
	6012	Al Mg Si Pb	128
	6060	Al Mg Si	128 - 129
	6061	Al Mg1 Si Cu	129
	6082	Al Si1 Mg Mn	130
	7020	Al Zn4,5 Mg1	131
	7022	Al Zn5 Mg3 Cu	132
	7075	Al Zn5,5 Mg Cu	133
Profiles	1050A	Al99,5	134
	2007	Al Cu4 Pb Mg Mn	134
	2017A	Al Cu4 Mg Si (A)	135
	5005A	Al Mg1(C)	135
	5083	Al Mg4,5 Mn0,7	136
	5754	Al Mg3	136
	6012	Al Mg Si Pb	137
	6060	Al Mg Si	137
	6061	Al Mg1 Si Cu	138
	7020	Al Zn4,5 Mg1	138
	7022	Al Zn5 Mg3 Cu	139
	7075	Al Zn5,5 Mg Cu	139

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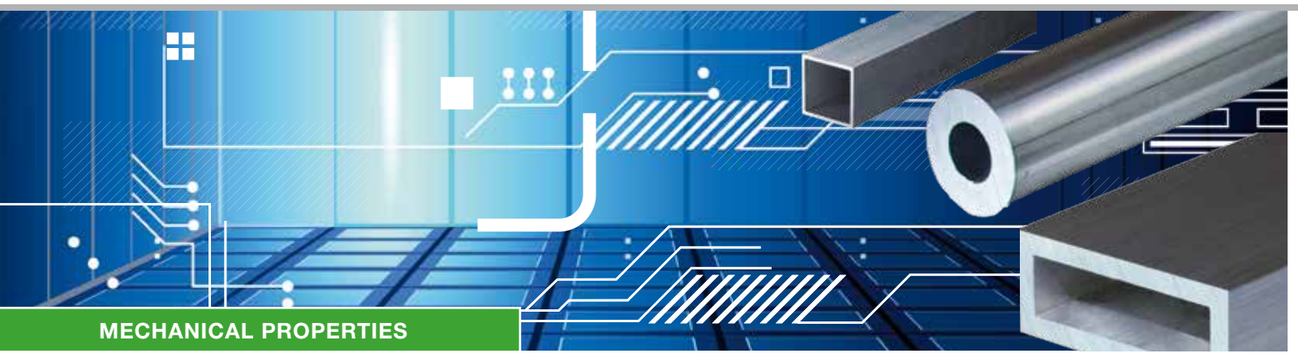

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-1050A Al99,5

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 20	60	95	-	-	22	25	20
H14	≤ 10	100	135	70	-	5	6	30
H16	≤ 5	120	160	105	-	3	4	35
H18	≤ 3	145	-	125	-	3	3	43

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	all dimensions	60	95	20	-	23	25	20
F / H112		60		20	-	23	25	20

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 6 – 7**

EN AW-2007 Al Cu4 Pb Mg Mn

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 20	370	-	250	-	5	7	95
T3510 / T3511	≤ 20	370	-	240	-	3	5	95

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 / T4510 / T4511	≤ 25	370	-	250	-	6	8	95

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 10 – 11**

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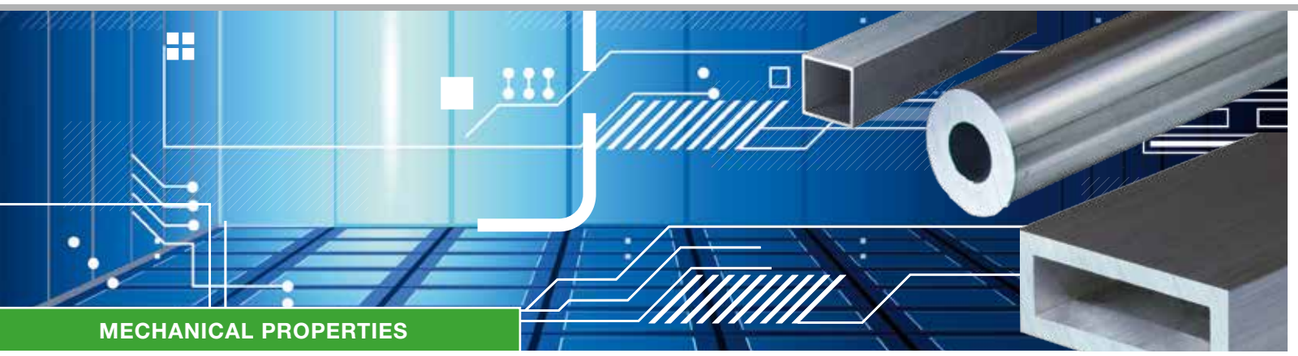

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2011 Al Cu6 Bi Pb

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 5	310	-	260	-	8	10	90
	> 5 to ≤ 20	290	-	240	-	6	8	90
T8	≤ 20	370	-	275	-	6	8	115

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 25	310	-	230	-	4	6	110

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 12 – 13**

EN AW-2017A Al Cu4 Mg Si(A)

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 20	400	-	250	-	8	10	105
T3510 / T3511	≤ 20	400	-	250	-	6	8	105

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 / T4510 T4511	≤ 10	380	-	260	-	10	12	105
	> 10 to ≤ 75	400	-	270	-	8	10	105

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 14 – 15**

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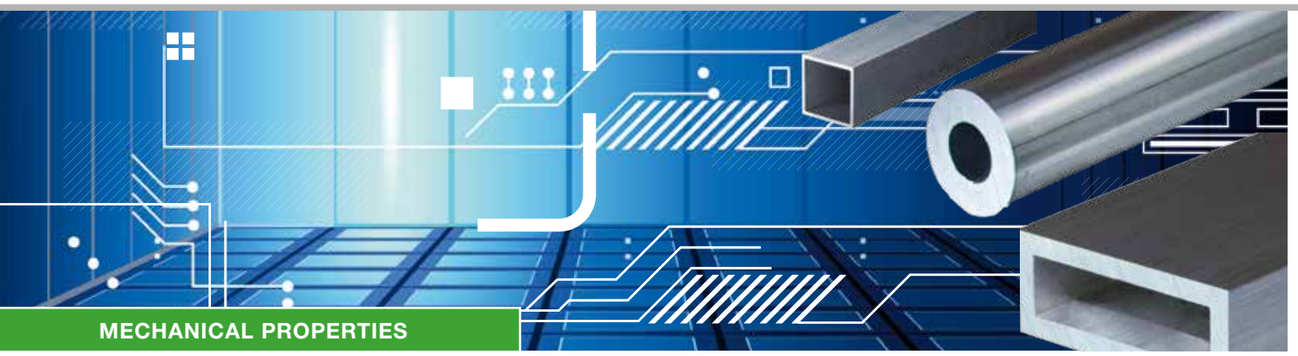

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-2024 Al Cu4 Mg1

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3	≤ 5	440	-	290	-	8	10	120
	> 5 to ≤ 20	420	-	270	-	8	10	120

5	*Other possible delivery conditions for this alloy: O, H111, T3510, T3511*
9	*For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T3 T3510/T3511	≤ 30	420	-	290	-	6	8	120

5	*Other possible delivery conditions for this alloy: O, H111, T8, T8510, T8511*
9	*For information only*

The specifications for the chemical composition of this alloy can be found **on page 16 – 17**

EN AW-5005A Al Mg1(C)

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 20	100	145	40	-	16	18	30
H14	≤ 5	140	-	110	-	4	6	45
H18	≤ 3	185	-	155	-	2	4	55

9	*For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	all dimensions	100	-	40	-	16	18	30
O / H111	≤ 20	100	150	40	-	18	20	30

9	*For information only*

The specifications for the chemical composition of this alloy can be found **on page 18 – 19**

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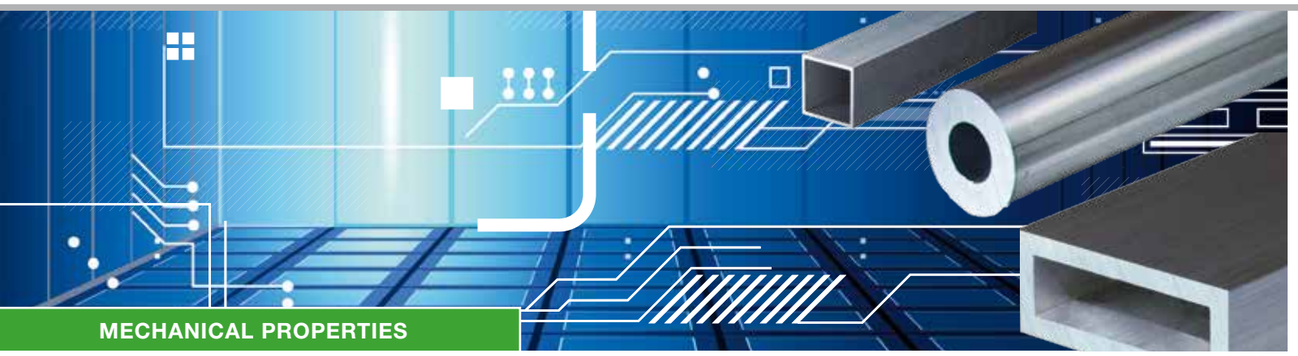

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-5083 Al Mg4,5 Mn0,7

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 20	270	350	110	-	14	16	70
H12/H22/H32	≤ 10	280	-	200	-	4	6	90
H14/H24/H34	≤ 5	300	-	235	-	3	4	100
[9]	*For information only*							

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F	all dimensions	270	-	110	-	10	12	70
O / H111	all dimensions	270	-	110	-	10	12	70
H112	all dimensions	270	-	125	-	10	12	70
[9]	*For information only*							

The specifications for the chemical composition of this alloy can be found **on page 20 – 21**

EN AW-5754 Al Mg3

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
O / H111	≤ 20	180	250	80	-	14	16	45
H14 / H24 / H34	≤ 10	240	290	180	-	3	4	75
H18 / H28 / H38	≤ 3	280	-	240	-	2	3	88
[9]	*For information only*							

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	≤ 25	180	-	80	-	12	14	47
O / H111	≤ 25	180	250	80	-	15	17	45
[9]	*For information only*							

The specifications for the chemical composition of this alloy can be found **on page 22 – 23**

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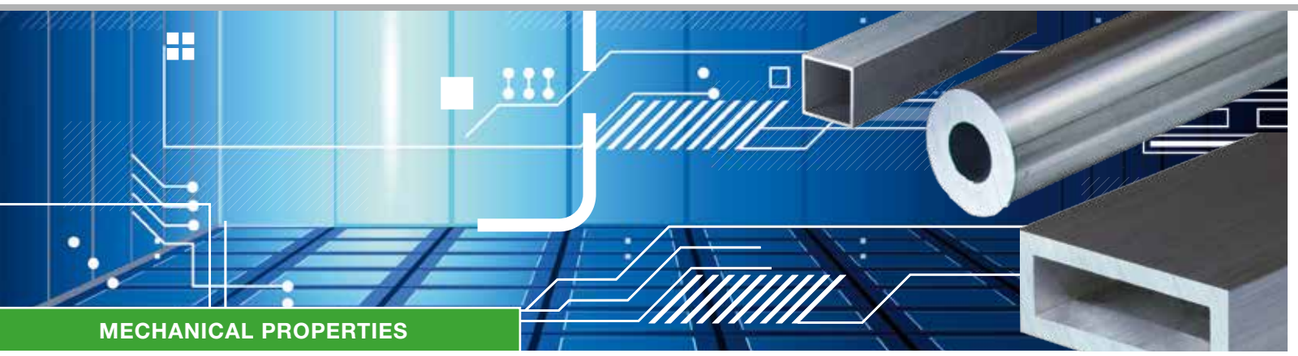

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6012 Al Mg Si Pb

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 20	200	-	100	-	8	10	-
T6	≤ 20	310	-	260	-	6	8	105
9	*For information only*							

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 30	310	-	260	-	6	8	105
9	*For information only*							

The specifications for the chemical composition of this alloy can be found **on page 24 – 25**

EN AW-6060 Al Mg Si

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 20	215	-	160	-	10	12	75
5	*Other possible delivery conditions for this alloy: T4*							
9	*For information only*							

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 15	190	-	150	-	6	8	70
T66	≤ 15	215	-	160	-	6	8	75
5	*Other possible delivery conditions for this alloy: T4, T5, T64*							
9	*For information only*							

We supply aluminium tubes of alloy 6060 in the following dimensions:

Thickness mm	4-pt pressed: 6 x 6 - 100 x 100

The specifications for the chemical composition of this alloy can be found **on page 26 – 27**

EN AW-6061 Al Mg1 Si Cu

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 20	205	-	110	-	14	16	65
T6	≤ 20	290	-	240	-	8	10	95
5	*Other possible delivery conditions for this alloy: O, H111*							
9	*For information only*							

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 25	180	-	110	-	13	15	65
T6	≤ 5	260	-	240	-	6	8	95
	> 5 to ≤ 25	260	-	240	-	8	10	95
5	*Other possible delivery conditions for this alloy: O, H111*							
9	*For information only*							

The specifications for the chemical composition of this alloy can be found **on page 28 – 29**

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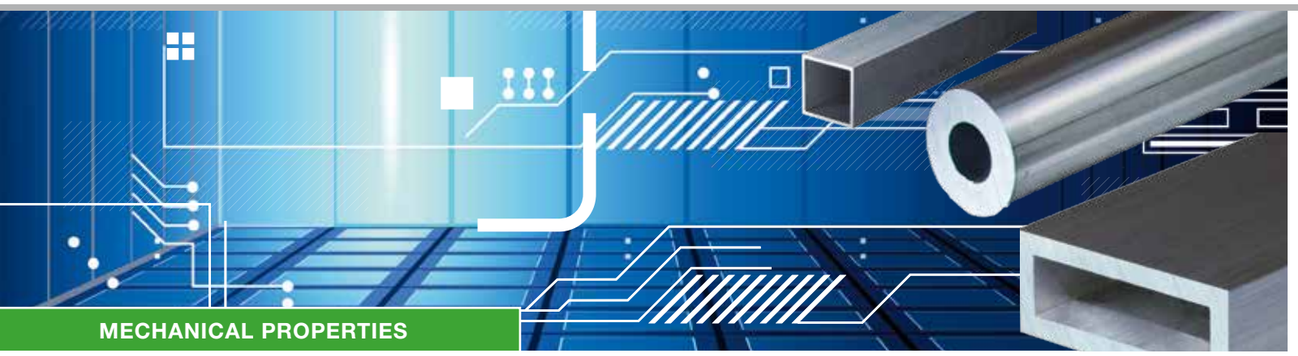

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6082 Al Si1 Mg Mn

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 20	205	-	110	-	12	14	70
T6	≤ 5	310	-	255	-	7	8	95
	> 5 to ≤ 20	310	-	240	-	9	10	95

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 25	205	-	110	-	12	14	70
T6	≤ 5	290	-	250	-	6	8	95
	> 5 to ≤ 25	310	-	260	-	8	10	95

5	*Other possible delivery conditions for this alloy: O, H111*
9	*For information only*

The specifications for the chemical composition of this alloy can be found **on page 30 – 31**

EN AW-7020 Al Zn4,5 Mg1

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 20	350	-	280	-	8	10	110

9	*For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 15	350	-	290	-	8	10	110

9	*For information only*

The specifications for the chemical composition of this alloy can be found **on page 32 – 33**

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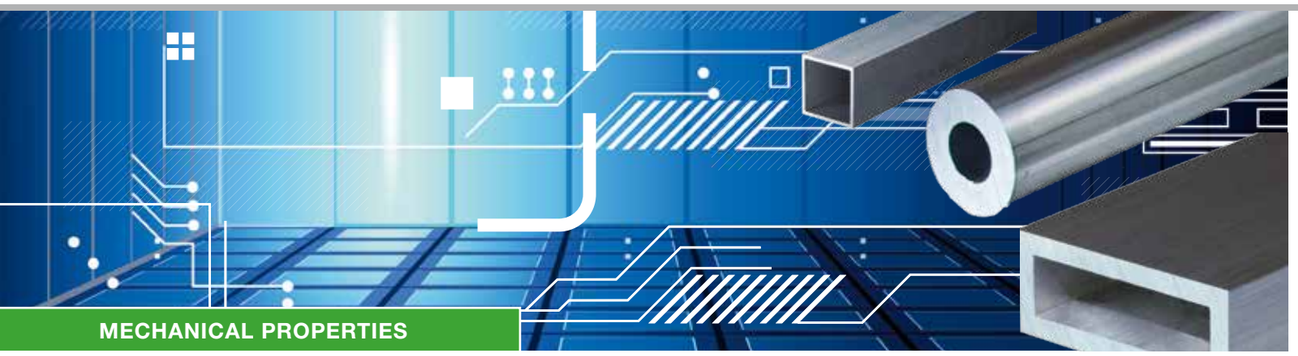

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-7022 Al Zn5 Mg3 Cu

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 20	460	-	380	-	6	8	133

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 30	490	-	420	-	5	7	133

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 34 – 35**

EN AW-7075 Al Zn5,5 Mg Cu

EN 754-2 Mechanical properties: tubes – drawn

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 20	540	-	485	-	6	7	150
T6510 / T6511	≤ 20	540	-	485	-	4	5	150
T73	≤ 20	455	-	385	-	8	10	135
T73510 / T73511	≤ 20	455	-	385	-	6	8	135

[9] *For information only*

EN 755-2 Mechanical properties: tubes – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 T6510 T6511	≤ 5	540	-	485	-	6	8	150
	> 5 to ≤ 10	560	-	505	-	5	7	150
	> 10 to ≤ 50	560	-	495	-	4	6	150
T73 T73510 T73511	≤ 5	470	-	400	-	5	7	135
	> 5 to ≤ 25	485	-	420	-	6	8	135
	> 25 to ≤ 50	475	-	405	-	-	8	135

[5] *Other possible delivery conditions for this alloy: O, H111*

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 36 – 37**

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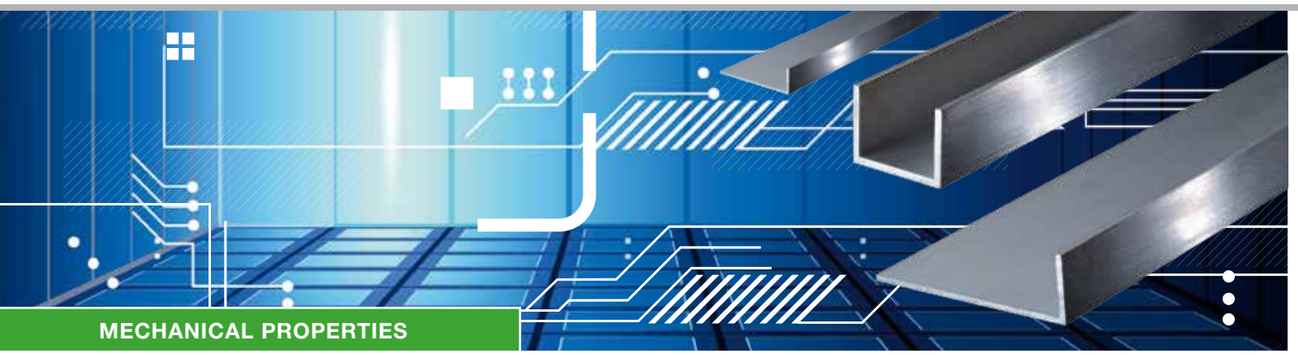

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-1050A Al 99,5

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	all dimensions	60		20	-	23	25	20

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 6 – 7**

EN AW-2007 Al Cu4 Pb Mg Mn

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 / T4510 / T4511	≤ 30	370	-	250	-	6	8	95

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 10 – 11**

EN AW-2017A Al Cu4 Mg Si(A)

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4 / T4510 T4511	≤ 30	380	-	260	-	8	10	105

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 14 – 15**

EN AW-5005A Al Mg1(C)

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F / H112	all dimensions	100	-	40	-	16	18	30
O / H111	≤ 20	100	150	40	-	18	20	30

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 18 – 19**

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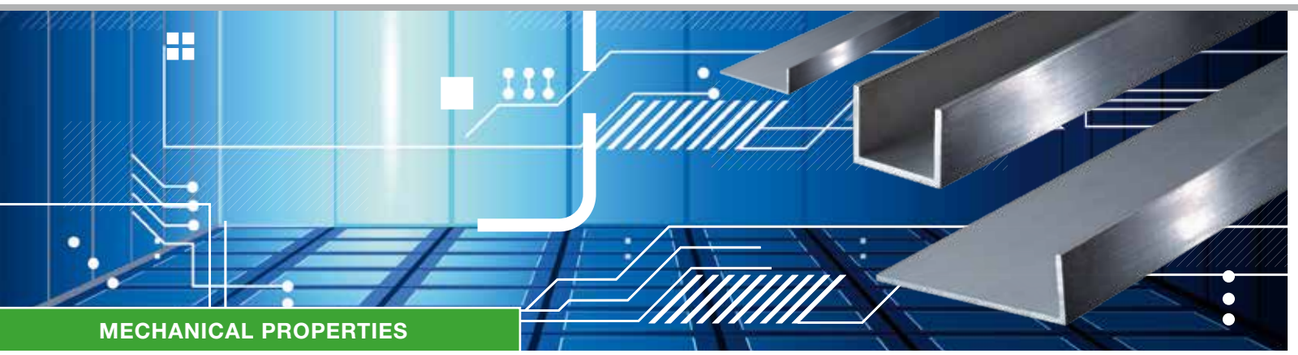

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-5083 Al Mg4,5 Mn0,7

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F	all dimensions	270	-	110	-	10	12	70
H112	all dimensions	270	-	125	-	10	12	70

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 20 – 21**

EN AW-5754 Al Mg3

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
F H112	≤ 25	180	-	80	-	12	14	47

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 22 – 23**

EN AW-6012 Al Mg Si Pb

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 30	310	-	260	-	6	8	105

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 24 – 25**

EN AW-6060 Al Mg Si

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition[5]	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 3	190	-	150	-	6	8	70
	> 3 to ≤ 25	170	-	140	-	6	8	70
T66	≤ 3	215	-	160	-	6	8	75
	> 3 to ≤ 25	195	-	150	-	6	8	75

[5] *Other possible delivery conditions for this alloy: T4, T5, T64*

[9] *For information only*

We supply aluminium profiles of alloy 6060 as L, T, U and Z profiles in various dimensions

The specifications for the chemical composition of this alloy can be found **on page 26 – 27**

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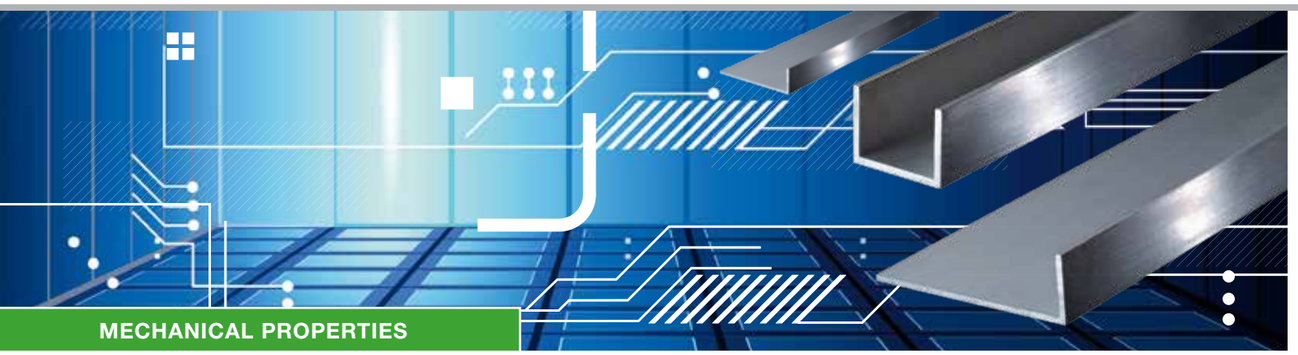

MECHANICAL PROPERTIES

Aluminium and aluminium alloys

EN AW-6061 Al Mg1 Si Cu

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T4	≤ 25	180	-	110	-	13	15	65
T6	≤ 5	260	-	240	-	7	9	95
	> 5 to ≤ 25	260	-	240	-	8	10	95

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 28 – 29**

EN AW-7020 Al Zn4,5 Mg1

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6	≤ 40	350	-	290	-	8	10	110

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 32 – 33**

EN AW-7022 Al Zn5 Mg3 Cu

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 30	490	-	420	-	5	7	133

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 34 – 35**

EN AW-7075 Al Zn5,5 Mg Cu

EN 755-2 Mechanical properties: profiles – pressed

Delivery condition	Wall thickness mm	Tensile strength R_m MPa		Elastic limit $R_{p0.2}$ MPa		Elongation % min.		Hardness[9] HBW
		min.	max.	min.	max.	A50 mm	A	
T6 / T6510 T6511	≤ 25	530	-	460	-	4	6	150
	> 25 to ≤ 60	540	-	470	-	-	6	150
T73 / T73510 T73511	≤ 25	485	-	420	-	5	7	135

[9] *For information only*

The specifications for the chemical composition of this alloy can be found **on page 36 – 37**

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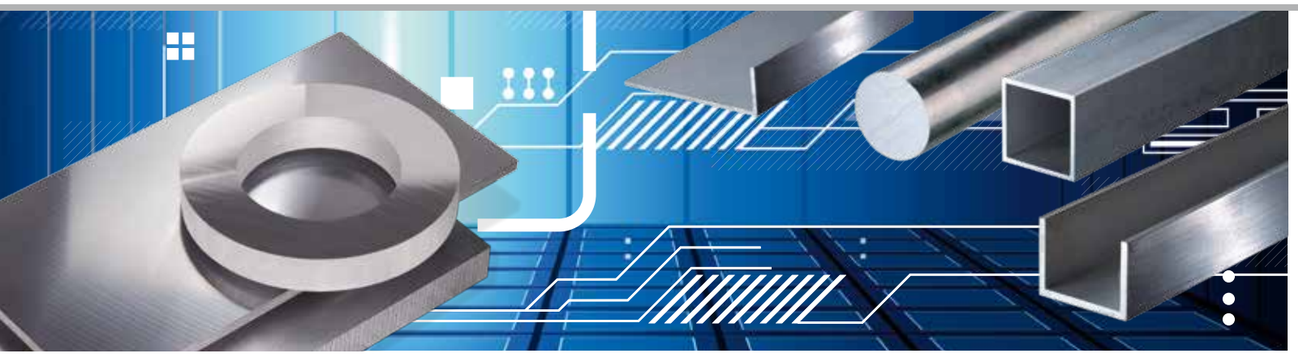
Delivery conditions



F	Production state (no limit values for mechanical properties defined).
H111	Annealed and slightly work-hardened by subsequent operations, e.g. stretching or adjustment (less than H11).
H112	Slightly work-hardened by hot forming or limited cold forming (with defined limit values of the mechanical properties).
H116	Applies to aluminium-magnesium alloys with a magnesium content > = 4% for which the limit values of the mechanical properties and the resistance to exfoliation corrosion are defined.
H12	Work-hardened - 1/4 hard.
H14	Work-hardened - 1/2 hard.
H16	Work-hardened - 3/4 hard.
H18	Work-hardened - 4/4 hard (fully through-hardened).
H19	Work-hardened - extra hard.
H22	Work-hardened and re-annealed - 1/4 hard.
H24	Work-hardened and re-annealed - 1/2 hard.
H26	Work-hardened and re-annealed - 3/4 hard.
H28	Work-hardened and re-annealed - 4/4 hard (fully through-hardened).
H32	Work-hardened and stabilised - 1/4 hard.
H34	Work-hardened and stabilised - 1/2 hard.
H36	Work-hardened and stabilised - 3/4 hard.
H38	Work-hardened and stabilised - 4/4 hard (fully through-hardened).
H42	Work-hardened and enamelled - 1/4 hard.
H44	Work-hardened and enamelled - 1/2 hard.
H46	Work-hardened and enamelled - 3/4 hard.
H48	Work-hardened and enamelled - 4/4 hard (fully through-hardened).
Hxx4	Applies to embossed or stamped metal sheets or strips, which are produced from the corresponding Hxx state.
Hxx5	Work-hardened - Applies for welded tubes.
O	Soft annealed - With the O state, products can be designated for which the required properties for the soft annealed state are achieved by the hot-forming process.
O1	Thermally treated almost at the solution annealing temperature and time and cooled slowly to room temperature (formerly known as T41).
O2	Thermomechanically treated to improve formability as required for Superplastic Forming (SPF), for example.
O3	Homogenised.
T1	Quenched from the hot forming temperature and naturally aged.
T2	Quenched from the hot forming temperature, cold formed and naturally aged.
T3	Solution annealed, cold formed and naturally aged.
T31	Solution annealed, about 1% cold formed and naturally aged.

T351	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and naturally aged. The products are not readjusted after stretching.
T3510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and naturally aged. The products are not readjusted after stretching.
T3511	As T3510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T352	Solution annealed, stress relief by 1% to 5% permanent upsetting and naturally aged.
T354	Solution annealed, stress relief by cold readjustment in the finisher and naturally aged.
T36	Solution annealed, about 6% cold formed and naturally aged.
T37	Solution annealed, about 7% cold formed and naturally aged.
T39	Solution annealed and a certain degree of cold forming to achieve the specified mechanical properties. Cold forming can be done before or after the natural ageing treatment.
T4	Solution annealed and naturally aged.
T42	Solution annealed and naturally aged. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T451	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and naturally aged. The products are not readjusted after stretching.
T4510	Solution annealed, stress relief by controlled stretching (stretching degree: 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and naturally aged. The products are not readjusted after stretching.
T4511	As T4510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T452	Solution annealed, stress relief by 1% to 5% permanent upsetting and naturally aged.
T454	Solution annealed, stress relief by cold readjustment in the finisher and naturally aged.
T5	Quenched from the hot forming temperature and artificially aged.
T51	Quenched from the hot forming temperature and not fully artificially aged to improve malleability.
T56	Quenched from the hot forming temperature and artificially aged - better mechanical properties than T5 by special process control (alloy of 6000 series).
T6	Solution annealed and artificially aged.
T61	Solution annealed and not fully artificially aged to improve malleability.
T6151	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates) and then not fully artificially aged to improve malleability. The products are not readjusted after stretching.
T62	Solution annealed and artificially aged. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T64	Solution annealed and then not fully artificially aged to improve malleability (between T6 and T61).
T651	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and artificially aged. The products are not readjusted after stretching.
T6510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and artificially aged. The products are not readjusted after stretching.
T6511	As T6510, but slight subsequent readjustment to comply with the specified limits of size allowed .
T652	Solution annealed, stress relief by 1% to 5% permanent upsetting and artificially aged.
T654	Solution annealed, stress relief by cold readjustment in the finisher and artificially aged.

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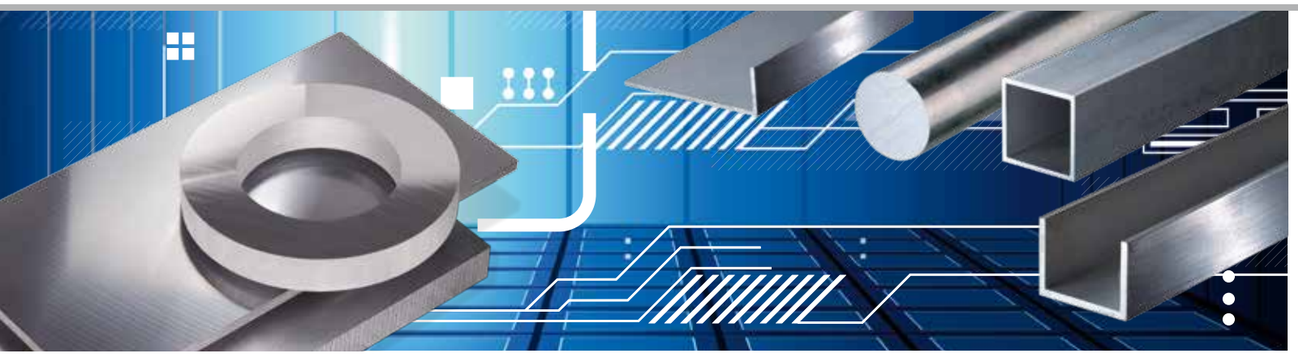
Delivery conditions



T66	Solution annealed and artificially aged - better mechanical properties than T6 by special control of the process (alloy of 6000 series).
T7	Solution annealed and overcured (artificially aged).
T73	Solution annealed and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T732	Solution annealed and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T7351	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. The products are not readjusted after stretching.
T73510	Solution annealed by stress relief by controlled stretching (stretching degree: 1% to 3% for extruded rods, profiles and pipes, 0.5% to 3% for drawn tubes) and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking. The products are not readjusted after stretching.
T73511	As T73510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7352	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T7354	Solution annealed, stress relief by cold readjustment in the finisher and overcured (artificially aged) to achieve an optimum resistance to stress corrosion cracking.
T74	Solution annealed and overcured (artificially aged) (between T73 and T76).
T7451	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) (between T73 and T76). The products are not readjusted after stretching.
T74510	Solution annealed, stress relief by controlled stretching (stretching degree; 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and overcured (artificially aged) (between T73 and T76). The products are not readjusted after stretching.
T74511	As T74510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7452	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) (between T73 and T76).
T7454	Solution annealed, stress relief by cold readjustment in finisher and overcured (artificially aged) (between T73 and T76).
T76	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T761	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion (applies to sheets and strips made of material 7475).
T762	Solution annealed and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. Applies to test materials that are heat-treated from the soft annealed or F state or for products that are heat-treated from any state by the consumer.
T7651	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. The products are not readjusted after stretching.
T76510	Solution annealed, stress relief by controlled stretching (stretching degree: 1% to 3% for extruded rods, profiles and pipes, 0.5% to 3% for drawn tubes) and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion. The products are not readjusted after stretching.
T76511	As T76510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T7652	Solution annealed, stress relief by 1% to 5% permanent upsetting and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T7654	Solution annealed, stress relief by cold readjustment in the finisher and overcured (artificially aged) to achieve a good resistance to exfoliation corrosion.
T79	Solution annealed and (very limitedly) overcured (artificially aged).
T79510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and (very limitedly) overcured (artificially aged). The products are not readjusted after stretching.
T79511	As T79510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T8	Solution annealed, cold formed and artificially aged.
T81	Solution annealed, about 1% cold formed and artificially aged.
T82	Solution annealed by the consumer stretched in a controlled manner by at least 2% and artificially aged (alloy 8090).
T832	Solution annealed stretched in a controlled manner to a certain degree and artificially aged (applies to drawn tubes made of material 6063)
T841	Solution annealed, cold formed and not fully artificially aged (applies to sheets and strips made of alloys 2091 and 8090).
T84151	Solution annealed, stress relief by controlled stretching with a stretching degree of 1.5% to 3% and not fully artificially aged (plates made of alloys 2091 and 8090).
T851	Solution annealed, stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings) and artificially aged. The products are not readjusted after stretching.
T8510	Solution annealed, stress relief by controlled stretching (stretching degree 1% to 3 % for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes) and artificially aged. The products are not readjusted after stretching.
T8511	As T8510, but slight subsequent readjustment to comply with the specified limits of size allowed.
T852	Solution annealed, stress relief by 1% to 5% permanent upsetting and artificially aged.
T854	Solution annealed, stress relief by cold readjustment in the finisher and artificially aged.
T86	Solution annealed, about 6% cold formed and artificially aged.
T87	Solution annealed, about 7% cold formed and artificially aged.
T89	Solution annealed and cold formed to a certain degree to achieve the specified mechanical properties and artificially aged.
T9	Solution annealed, cold formed and artificially aged.
W	Solution annealed (unstable state). The time span of natural ageing can also be specified (W2H. . .).
W51	Solution annealed (unstable state), stress relief by controlled stretching (stretching degree: 0.5% to 3% for sheets, 1.5% to 3% for plates, 1% to 3% for rolled or cold reshaped bars, 1% to 5% for forgings or forged and rolled rings). The products are not readjusted after stretching.
W510	Solution annealed (unstable state) and stress relief by controlled stretching (stretching degree 1% to 3% for extruded bars, profiles and tubes, 0.5% to 3 % for drawn tubes). The products are not readjusted after stretching.
W511	As W510, but slight subsequent readjustment to comply with the specified limits of size allowed.
W52	Solution annealed (unstable state) and stress relief by 1% to 5% permanent upsetting.
W54	Solution annealed (unstable state) and stress relief by cold readjustment in the finisher (forgings).

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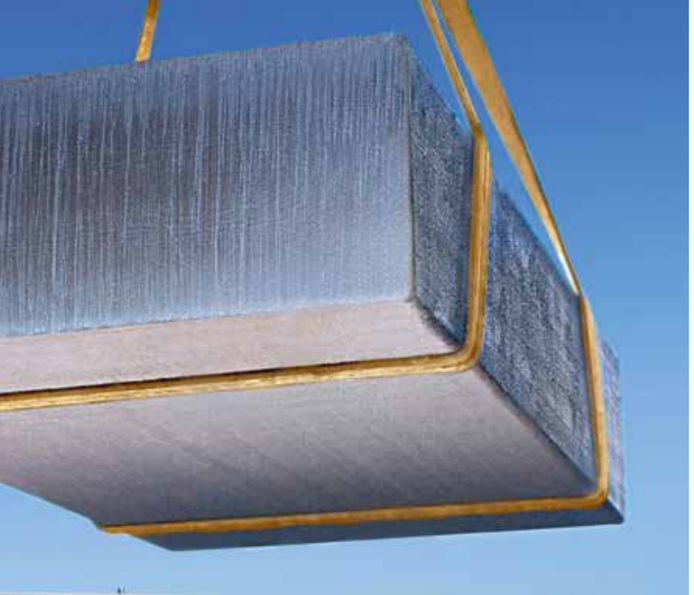

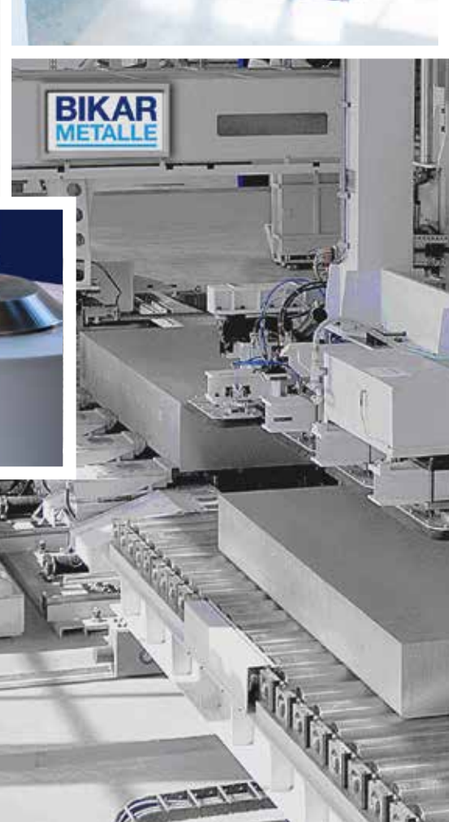

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A COMPANY THAT PROVIDES MORE!

High-tech technologies make us powerful, flexible and guarantee finest quality.

Computer-controlled high rack storage area

- *3 modern high rack storage areas*
- *storage capacity of 30.000 t*

Band saws

- *horizontal dimensions for sizes up to 6.020 x 3.020 x 1.150 mm*
- *vertical dimensions for sizes up to 4.020 x 2.300 x 1.150 mm*

Circular saws

- *sizes up to 4.300 x 4.300 x 200 and 6.050 x 6.050 x 170 mm*

Circular blank and ring saws

- *up to a diameter of 2.500 mm*

Contour cuttings

- *several contour cuttings on request*

Deep hole drilling

- *up to 1.100 mm deep*
- *max. thread 80 mm*
- *max. weight of cutting: 5,5 t*

Milling

- *precision portal milling machine - cutter head diam. 2.700 mm*
- *up to 6.000 x 2.500 x 5-150 mm*
- *portal milling machine for parts up to 1.000 x 800 x 300 mm*

Chamfer

- *45 ° up to 4 mm chamfer*

Usual sawing tolerances

- *band saws (sawing tolerances: +2 to 3/-0 mm)*
- *shaped blanks as per drawing (sawing tolerances +8 to 10 mm /-0 mm) – depending on cutting requirements*
- *precision circular saws (sawing tolerances depending on thickness: +-0,2 mm) – max. sawing height 170 mm*
- *Other tolerances on agreement.*

Certificates

- *We are long-time holders of DIN EN ISO 9001:2008, 14001:2009*
- *EN 9120:2016 aerospace certifications*

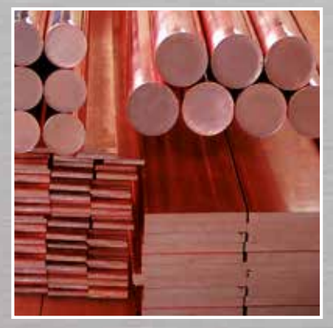
OUR DELIVERY PROGRAM

DIVERSITY FROM A SINGLE SOURCE

BIKAR has learned over many decades to adapt to the needs of its customers. And that‘s reflected in the diversity of our stocked and available products. You can only win with a strong partner.

ALUMINIUM

- Plates
- Sheets
- Bars
- Circular blanks
- Rings
- Profiles
- Cuttings
- Parts from drawings



COPPER

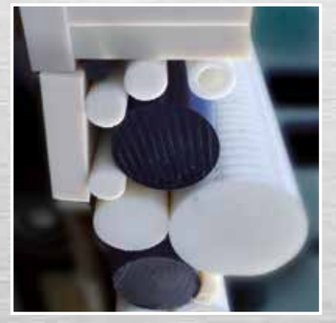
- Plates
- Sheets
- Bars
- Circular blanks
- Rings
- Profiles
- Cuttings
- Parts from drawings

BRASS

- Plates
- Sheets
- Bars
- Circular blanks
- Rings
- Profiles
- Cuttings
- Parts from drawings

BRONZE

- Bars
- Tubes
- Bushings
- Rings
- Circular blanks
- Cuttings
- Parts from drawings

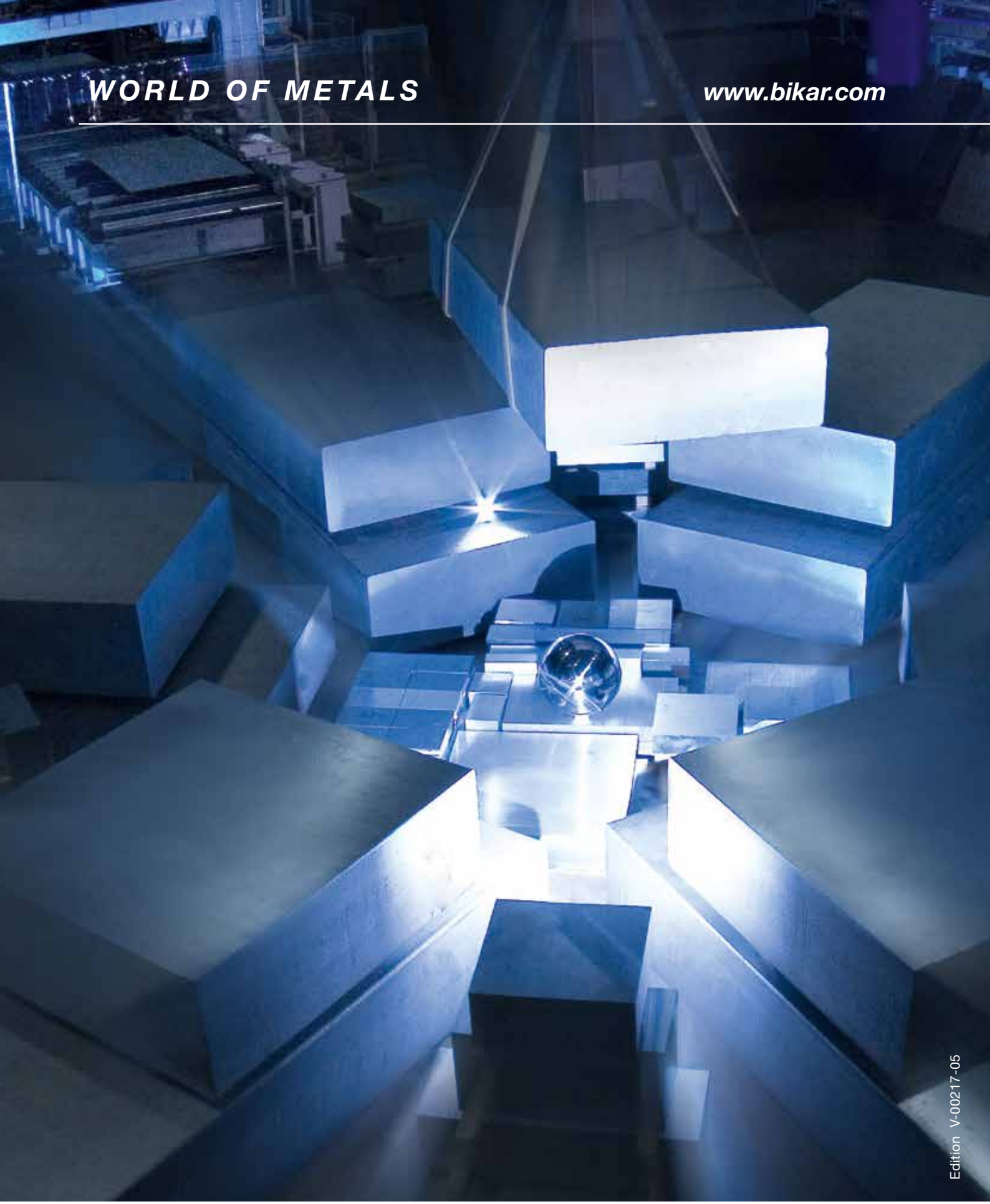


PLASTICS

- Bars
- Tubes
- Bushings
- Cuttings

WORLD OF METALS

www.bikar.com



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ALUMINIUM | COPPER | BRASS | BRONZE

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