

DATA SHEETS

Aluminium



Special Material:

FORMODAL[®] 025X

cast plates · ultra fine metal structure

Applications:

- tool making, mould making, model making
- semiconductor industry
- vacuum technology
- solar industry



ALUMINIUM

COPPER

BRASS

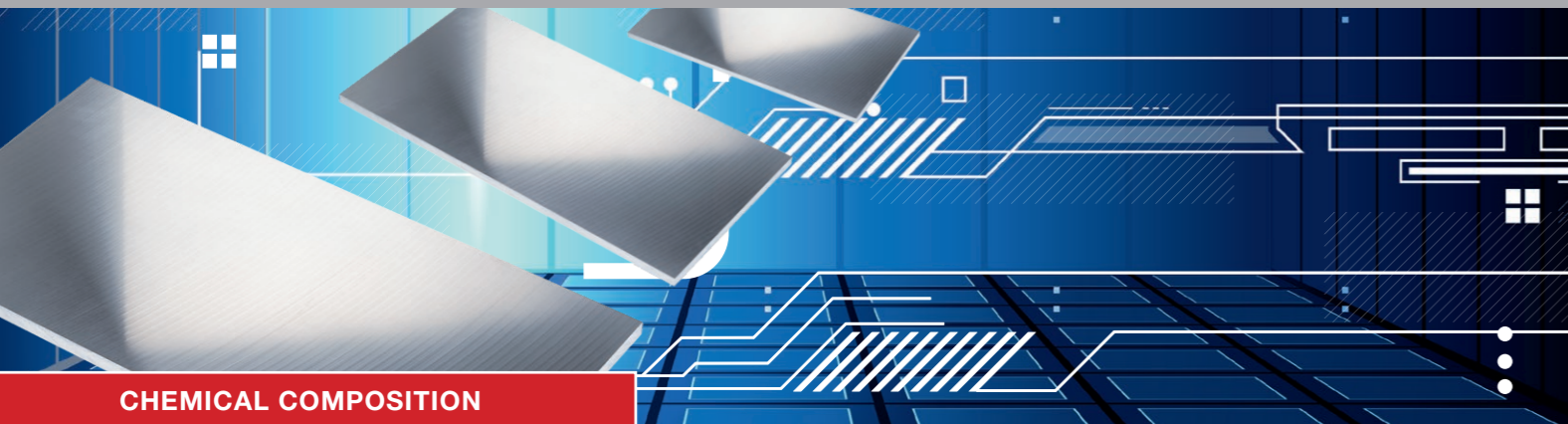
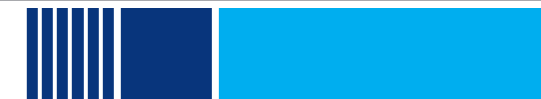
BRONZE

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BIKAR
METALLE



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



Alloy designation:

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

Typical physical properties:

Density [g/cm ³]	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*mm ²]	16 – 18	

Chemical composition* (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

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
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
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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.

FORMODAL® 025X cast · ultra fine metal structure



MECHANICAL PROPERTIES

Aluminium and aluminium alloys

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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	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



Available forms:

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