

DATA SHEETS

Aluminum



Special Material:

FORMODAL® 025X

cast plates • ultra fine metal structure

Applications:

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



ALUMINUM

COPPER

BRASS

BRONZE

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BIKAR
METAL
NORTH AMERICA



Aluminum and aluminum alloys

Specially for the semiconductor industry, vacuum technology, solar industry, tool making, mold 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 [lb./in³]		0.0961
Modulus of Elasticity		10.153 ksi
Thermal conductivity		63.6 - 80.9 Btu/ft x h x °F
Coeff. of Thermal Exp.	-58°F – 68°F	
	68°F – 212°F	12. 78
	68°F – 392°F	
	68°F – 572°F	
Specific heat		167 ft lbf / lb °F
Electrical conductivity		27 - 31 IACS

Chemical composition* (EN 573-3):

Specifications in % Remainder: Aluminum												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total²
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, mold making and model making
- Blow molds and injection molds
- Coating tools
- Molds for elastomer materials
- Molds and heat-stressed parts
- Molds with welded construction
- Refrigeration technology

Available forms:

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

Homogenization:

Soft annealing / recrystallization annealing	
Annealing temperature	716°F - 788°F
Heating-up time	0.5 – 3 hours
Cooling conditions	86°F/h - 122°F/h

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

Other data:

Processing / machinability

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

Surface treatment

Anodizing - (protective anodization)	2
Special anodizing quality (EQ) ^{EQ}	-
Anodizing - 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 molding	-	
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 anodizing 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 anodization result and the color 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

Aluminum and Aluminum alloys

This alloy is under special manufacturing and testing technologies



Mechanical properties:

Delivery condition	Nominal thickness		Typical Tensile Strength ksi		0.2% Yield Strength ksi		Typical Elongation		Bending radius ⁹		Hardness ⁹ HBW
	over	to	min.	max.	min.	max.	A10 mm	A	180°	90°	
O3	0.236	39.4	33.4	42.1	16	18.9	15	-			70 – 80

⁹

For information only

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

Thickness inches	Length x Width inches	Length x Width inches	Length x Width inches
0.197 - 23.62	120.08 x 61.02	141.73 x 64.96	157.48 x 86.61
0.197 - 23.62	196.85 x 115.35	236.22 x 86.61	

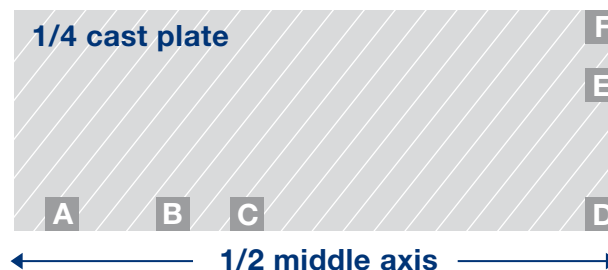
Material attributes:

Hydrogen content	Max. 0.18 ml H ₂ /100 g Aluminum
Grain size	Edge: max. 3.15 mil; core: max. 4.72 mil
Pore size	Single pore max. 1.97 mil, clustersize max. 9.84 mil
Porosity	Average porosity in % at position A-F (sketch); max. average porosity 0.15%

Sampling:

Position of sample:

A ≈ 1.97", B ≈ 7.87", C ≈ 11.81" (A-C) from the end side
D ≈ middle, E ≈ 3.94", F ≈ 0 - 1.18" from the longitudinal side



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