

# DATA SHEETS

## Aluminum



New Material:

# FORMODAL<sup>®</sup> 023

cast plates

Specially for:

- tool making, mold making, model making



ALUMINUM

COPPER

BRASS

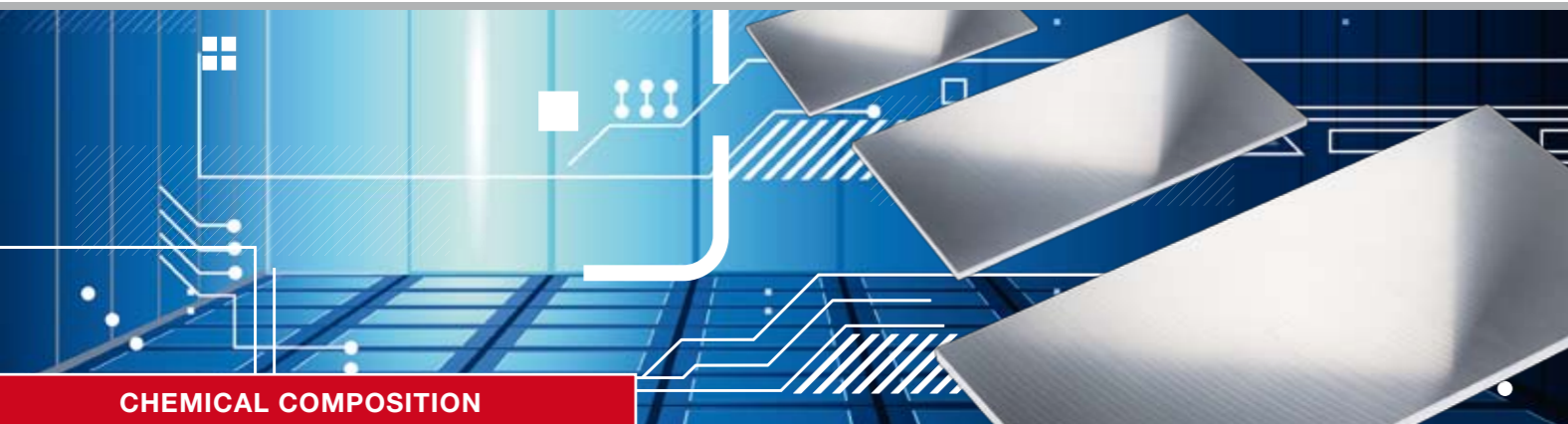
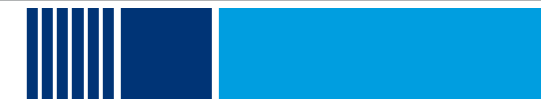
BRONZE

BIKAR METAL - NORTH AMERICA

11224 Beaver Trail Ct. #5 • Reston, VA 20191 • phone: (703) 859-8737

ben.chisholm@bikar.com • www.bikarmetal.com

**BIKAR**  
**METAL**  
NORTH AMERICA



## CHEMICAL COMPOSITION

### Aluminum and aluminum alloys

Specially for tool making, mold making and model making cast



#### 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 [lb./in³]	0.0961	
Modulus of Elasticity	1015 ksi	
Thermal conductivity	63.5 – 80.7 Btu/ft x h x °F	
Coeff. of Thermal Exp.	-58°F – -4°F	12.78 x 10-6
	68°F – 212°F	
	68°F – 392°F	
	68°F – 572°F	
Specific heat	167 ft lbf / lb °F	
Electrical conductivity	30 IACS	

#### Chemical composition\* (EN 573-3):

Specifications in % Remainder: Aluminum												Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total <sup>2</sup>
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

<sup>x</sup> Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.  
<sup>2</sup> 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, mold making and model making
- Blow molds and injection molds
- Laminating 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 - 122 °F/h

#### 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) <sup>EQ</sup>	-
Anodizing - 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	-

#### Hardening

Solution annealing	-
Quenching	-
Natural aging treatment	-
Artificial aging 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 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®023 cast



## MECHANICAL PROPERTIES

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### Typical mechanical properties:

Delivery condition	Nominal thickness in.		Typical Tensile Strength ksi		0.2% Yield Strength ksi		Typical Elongation	Bending radius <sup>9</sup>		Hardness <sup>9</sup> HBW
	over	to	min.	max.	min.	max.		180°	90°	
O3	0.236	40	35	41	16	19	16 %			70 – 80
<sup>9</sup>	For information only									

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

Thickness inches	Length x Width inches	Length x Width inches	Length x Width inches
0.2" - 23.6"	142" x 56"	158" x 87"	237" x 87"
23.6" - 40"	142" x 56"		

### Available forms:

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