



# DATA SHEETS

## Aluminum

Special Material:

### FORMODAL® BM-400

high-strength rolled plates

Applications:

- tool making, mold making, model making
- blow molds and injection molds
- laminating tools
- molds for elastomer materials
- molds and heat-stressed parts
- molds with welded construction
- refrigeration technology



ALUMINUM

COPPER

BRASS

BRONZE

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



CHEMICAL COMPOSITION

Aluminum and aluminum alloys

High-strength rolled plates  
Size range up to a thickness of 27.56"



Alloy designation:

EN AW	Material is not included in the EN standard. The material was developed specifically for the high requirements standards in tool making, mold making and model making and is very suitable for long-term use at high temperatures up to 392 °F!
Old designation	
Material no. according to DIN	
Great Britain BS	
Italy UNI	
Spain	
Sweden	
Norway	
France AFNOR	
Color code	

Typical physical properties:

Density [lb./in³]		0.1026
Modulus of Elasticity		10704 ksi
Thermal conductivity		75.1 Btu/ft x h x °F
Coeff. of Thermal Exp.	-58°F – 68°F	12.22
	68°F – 212°F	
	68°F – 392°F	
	68°F – 572°F	
Specific heat		161 ft lbf / lb °F
Electrical conductivity		30 IACS

Chemical composition\* :

Specifications in %												Remainder: Aluminum		Other	
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total²		
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		
<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:

- Plates: according to thickness rolled or forged
- Very high strength values - for thick plates also in the core area
- Very good machinability
- Very good welding properties
- Good corrosion resistance
- Size range up to a thickness of 27.56"

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	-
Heating-up time	-
Cooling conditions	-

Other data:

Processing / machinability

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

Surface treatment

Anodizing - (protective anodization)	2 <sup>a)</sup>
Special anodizing quality (EQ) <sup>EQ</sup>	-
Anodizing - decorative	5
Painting / coating	-
Polishing	2

Welding

		Filler metal
Gas	-	S Al 2319 S Al Cu6 Mn ZrTi
WIG	2	
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 anodizing operation should be referred to the high Cu content! Different colorations occur on the welded materials after anodizing.
- b) The highest strength values compared with other forms of construction materials at temperatures up to a max. 392°F
- EQ anodizing quality must be ordered separately and confirmed

Hardening

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

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 molding	5	
Hammer forging	5	

Suitable for food industry according to DIN EN 602	no
Working temperatures	Long-term to 392°F <sup>b)</sup>

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® BM-400 rolled · forged

## MECHANICAL PROPERTIES

### Aluminum and aluminum alloys

High-strength rolled plates

Size range up to a thickness of 27.56"



### 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.	A1.97"	A	180°	90°	
T851 T852	3.94"	7.87"	60.2	66.3	44.2	51.2	5 - 7.5	-	-	-	130
	7.87"	11.81"	53.7	64.0	39.2	48.7	3 - 6.5	-	-	-	
	11.81"	15.75"	49.3	59.2	34.8	46.7	1.5 - 3.5	-	-	-	
	15.75"	19.69"	46.4	53.4	34.8	44.8	1.5 - 2.5	-	-	-	
	19.69"	23.62"	45.0	50.3	33.4	43.1	0.5 - 1.5	-	-	-	
	23.62"	27.56"	-	57.9	-	46.3	1.5 - 3.5	-	-	-	

<sup>9</sup>

For information only

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

Thickness in.	Length x Width in.
3.94" - 27.56"	118.90" x 59.84"

### Available forms:

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