





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

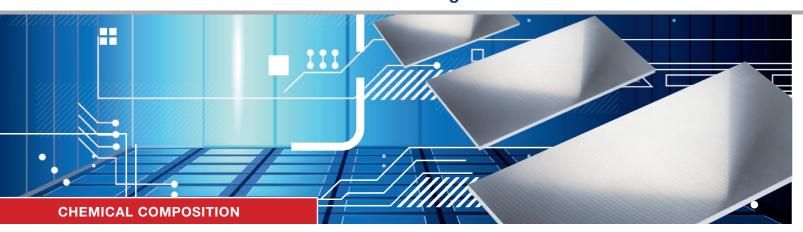
BRONZE



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# 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
Old designation	in the EN standard.
Material no. according to D	
Great Britain BS	developed specifically for the high require-
Italy UNI	ments standards in tool
Spain	making, mold making
Sweden	and model making and is very suitable for
Norway	long-term use at high
France AFNOR	temperatures up to
Color code	392 °F!

Typical physical properties:

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

# Chemical composition<sup>x</sup>:

Specifications in % Remainder: Aluminum							Other						
Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Note	Individual	Total <sup>2</sup>
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.													
Chemical specifications as perc. of weight. If no ranges are specified, the alloy content has the maximum value.  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



**FORMODAL** 

# Homogenization:

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

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

# 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

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

# Solder

Ooldoi	
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	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 b)		

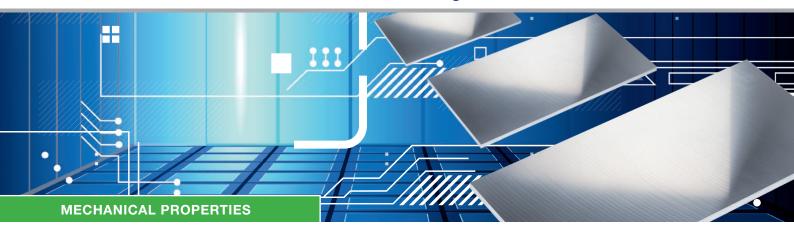
# Legend:

- 1 very good
- 2 good
- 3 moderate
- 4 poor
- 5 unsuited
- The anodizing operation should be referred to the high Cu content!
   Different colorations occur on the welded materials after anodizing.
- 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

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



# 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
T851 T852	over	to	min.	max.	min.	max.	A1.97"	Α	180°	90°	
	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	-	-	-	
9	For inform	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:**

 $\textbf{Sheets} \cdot \textbf{Plates} \cdot \textbf{Cuttings} \, \cdot \textbf{Circular blanks} \cdot \textbf{Rings} \cdot \textbf{Parts from drawings}$ 



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