

Alloys 25 (C17200) and 165 (C17000) Forgings and Extrusions

Alloy 25 from Materion Brush Performance Alloys provides the highest strength of any copper alloy, with electrical and thermal conductivity considerably greater than other high strength copper alloys. Alloy 165 provides strength close to that of Alloy 25, with slightly lower beryllium content. These alloys feature high fatigue strength and resistance to wear, corrosion, galling, and stress relaxation. Typical applications for parts finished by forging or extrusion of these alloys include undersea instrument and repeater housings, generator rings, and resistance welding components.

CHEMICAL COMPOSITION (weight percent)

Alloy	Beryllium	Nickel + Cobalt	Nickel + Cobalt + Iron	Copper
25 (C17200)	1.80 – 2.00	0.20 min.	0.6 max.	Balance
165 (C17000)	1.60 – 1.85	0.20 min.	0.6 max.	Balance

PHYSICAL PROPERTIES*

Alloy	Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)
25	19,000 ksi 131 GPa	1600°F 870°C	22-28% IACS 6.2-7.8 μΩ-cm	0.302 lb/in ³ 8.36 g/cm ³	9.7x10 ⁻⁶ in/in °F 17.0x10 ⁻⁶ m/m °C	60 BTU/ft hr °F 105 W/m K
165	19,000 ksi 131 GPa	1600°F 870°C	22-28% IACS 6.2-7.89 μΩ-cm	0.304 lb/in ³ 8.41 g/cm ³	9.7x10 ⁻⁶ in/in °F 17.0x10 ⁻⁶ m/m °C	60 BTU/ft hr °F 105 W/m K

*Properties specified for the precipitation age hardened (heat treated) condition

** Density in the un-heat treated condition is 0.300 lbs/in³ (8.30 g/cm³) for Alloy 25 and 0.302 lbs/in³ (8.36 g/cm³) for Alloy 165

MECHANICAL PROPERTIES*

Alloy	Temper*	Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness
			ksi	MPa	ksi	MPa		
		625 °F 330 °C					Percent	HRB or HRC
25	A (TB00)	3 hours	20-40	130-280	60-85	410-590	35-60	B45-B85
25	AT (TF00)	-	130-175	890-1200	165-200	1140-1380	3-10	C36-C42
165	A (TB00)	3 hours	20-40	130-280	60-85	410-590	35-60	B45-B85
165	AT (TF00)	-	120-155	830-1070	150-190	1030-1310	3-10	C32-39

*Properties may vary by size

FORMS AVAILABLE

Please contact Materion Brush Performance Alloys Custom Fabrication department at +1.216.486.4200, or your local sales representative for more information or to discuss your requirements.

SPECIFICATIONS

Alloy 25 - C17200, ASTM B 570, AMS 4650, SAE J 461, SAE J 463, EN12153, EN 12420, RWMA Class 4
Alloy 165 - C17000, ASTM B 570, SAE J 461, SAE J 463, RWMA Class 4

RELATED INFORMATION

Additional information on parts extruded or forged from Alloy 25 or 165 may be obtained by phoning 800-375-4205, or one of the numbers below.

North American Service Centers – Sales Inquiries

For strip and small diameter rod and wire:
Elmhurst, IL
TOLL FREE: 800-323-2438
LOCAL: +(1) 630-832-9650
FAX: +(1) 630-832-9657

For Rod, bar, tube and plate:
Warren, MI
TOLL FREE: 800-521-8800
LOCAL: +(1) 586-772-2700
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International Sales Offices

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