

# ToughMet® 3 AT Temper

ToughMet® is Brush Wellman's solution to your severe service material problems. By applying our EquaCast® process, tailored alloying additions and spinodal hardening technology, we have engineered ToughMet® to provide attributes beyond those typically found in a high-strength copper alloy.

- Exceptional resistance to corrosion and cavitation
- Outstanding lubricity and durability in demanding applications
- Highly uniform composition in all product forms
- Uniform microstructure in a variety of wrought shapes and sizes

ToughMet® 3 in the wrought and spinodally hardened (AT) condition exhibits tensile strength up to 140 ksi and hardness up to HRC 34 in a Copper-15% Nickel-8%Tin alloy with excellent machinability.

## MECHANICAL PROPERTIES

Temper	Outside Diameter	Yield Strength 0.2% offset (ksi)	Ultimate Tensile Strength (ksi)	Elongation (%)	Hardness (HRC*)
T3 AT110	< 4"	110	130	10	30
T3 AT110	≥ 4"	110	125	6	30
T3 AT90	< 4"	90	110	15	260 HBN*
T3 AT90	≥ 4"	90	110	12	260 HBN*

Typical minimum values. Other tempers/property sets are available. Consult your Brush Wellman representative to review your application requirements.

\* Hardness values for T3 AT90 are measured and certified in Brinell (3000kg, 10mm ball).

## PHYSICAL PROPERTIES

Young's Modulus	18.5 x 10 <sup>6</sup> psi
Poisson's Ratio	0.33
Electrical Conductivity	9% IACS
Thermal Conductivity	22 Btu/ft/hr/°F
CTE (70 – 215 °F)	8.9 x 10 <sup>-6</sup> /°F
Density	0.323 lb/in <sup>3</sup>
Fatigue Limit	60 ksi at R= -1*
Magnetic Permeability	< 1.001

\*Fatigue at 10<sup>6</sup> cycles, 105 ksi YS.

## AVAILABILITY

**Rod:** 1 - 9 inch diameter

Tube		
OD	Min. Wall	Min. ID
1 <sup>5</sup> / <sub>8</sub> " - 4"	¼"	1"
>4" - 6½"	¼"	1" - 3"*
>6½" - 8"	¼"	4 ¾" - 6½"

Rotary straightened mill finishes available. Tolerances per ASTM B249.

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