



ToughMet® 3 AT Alloy Rod, Tube & Forged Rings Data Sheet

ToughMet 3 AT alloy is a wrought, spinodally hardened copper alloy engineered for high strength and hardness. It resists mechanical wear, galling, stress relaxation, corrosion and erosion. ToughMet 3 alloy retains its strength at elevated temperature. It is non-magnetic and easy to machine into complex components.

CHEMICAL COMPOSITION (weight percent)

Nickel	Tin	Copper
15	8	Balance

PHYSICAL PROPERTIES

Elastic Modulus	Poisson's Ratio	Electrical Conductivity	Thermal Conductivity	Coefficient of Thermal Expansion	Density	Magnetic Permeability
21 x 10 ⁶ psi 144 kN/mm ²	0.33	<7% IACS <4 MS/m	22 Btu/ft/hr/°F 38 W/m/°C	9.1 x 10 ⁻⁶ in/in/°F 16.4 x 10 ⁻⁶ m/m/°C	0.325 lb/in ³ 9.00 g/cm ³	<1.001

MINIMUM MECHANICAL PROPERTIES

Form	Temper	Diameter		0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness
		inch	mm	ksi	N/mm ²	ksi	N/mm ²	%(in 4D)	HRC
Rod	AT90	1 - 3.9	25.4 - 101.5	90	620	110	760	15	26
		4 - 9	101.6 - 228.6	90	620	110	760	12	26
	AT110	0.500 - 3.9	15.1 - 101.5	110	760	132	910	10	30
		4 - 9	101.6 - 228.6	110	760	127	875	6	30
Tube	AT90	1.625 - 3.9	41 - 101.5	90	620	110	760	15	22
		4 - 6.4	101.6 - 164	90	620	110	760	12	22
		6.5 - 8	165 - 203	90	620	110	760	12	22
	AT110	1.625 - 3.9	41 - 101.5	110	760	130	895	10	30
		4 - 7.9	101.6 - 203	110	760	130	895	6	30
		8 - 13	203.2 - 330	110	760	130	895	5	30
Rings	AT	15 - 80	380 - 2032	105	724	110	758	4	28

STANDARD TOLERANCES ROD

Form	Temper	Diameter		Diameter Tolerance ²		Length ¹	
		inch	mm	inch	mm	inch	mm
Rod	AT90, AT110	0.500 - 1	15.1 - 25	+0.040/-0	+1.0/-0	72-162	1829- 4115
		1.1 - 2	26 - 50	+0.060/-0	+1.5/-0		
		2.1 - 3	51 - 75	+0.100/-0	+2.5/-0		
		3.1 - 3.5	76 - 90	+0.140/-0	+3.5/-0		
		3.6 - 4	91 - 100	+0.240/-0	+6.0/-0		
		4.1 - 9	101 - 229	+0.240/-0	+6.0/-0		

STANDARD TOLERANCES TUBE

Form	Temper	Outside Diameter		Inner Diameter		Diameter Tolerance ²		Length ¹	
		inch	mm	inch	mm	inch	mm	inch	mm
Tube	AT90	1.625 - 2.5	41 - 63.5	Wall thickness 10-20% of Outside Diameter ⁴		+/- 0.030	+/-0.75	72-162	1829-4115
		2.6 - 8	64 - 203			+/- 0.060	+/-1.50		
	AT110	1.625 - 2.5	41 - 63.5			+/- 0.030	+/-0.75		
		2.6 - 7.9	64 - 203			+/- 0.060	+/-1.50		
		8-13	203-330			+/- 0.060	+/-1.50		
Ring ³	AT	15-80	380-2032	13 min	330 min	Machined Tolerance		9 max	229 max

1. Check with mill for special length requests
2. Check with mill for tighter tolerance
3. Rings are constrained by a 10,000 lb (4535 kg) maximum weight
4. This is just a guideline. Check with mill if this does not meet your requirement

SURFACE AND FINISHING

Surface: Mill hardened finish.

SPECIFICATIONS AND STANDARDS

UNS C72900, AMS 4596, AMS4598

CONTACT INFORMATION

North American Service Centers – Sales Inquiries

For strip under 0.062" (1.57mm) thickness, wire and rod under 0.4" (10 mm) diameter

Elmhurst, IL

TOLL FREE: 800.323.2438
LOCAL: +(1) 630.832.9650
FAX: +(1) 630.832.9657

For tube, bar, rod 0.4" (10 mm) diameter and over, plate 0.062" (1.57 mm) thickness and over

Warren, MI

TOLL FREE: 800.521.8800
LOCAL: +(1) 586.772.2700
FAX: +(1) 586.772.2472



Materion Performance Alloys
6070 Parkland Boulevard
Mayfield Heights, OH 44124 USA
phone: 216.383.6800 fax:216.383.4005
email: BrushAlloys-info@materion.com

MATERION CORPORATION

www.materion.com/alloys

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International Sales Offices

JAPAN

TEL: + (81) 33-230-2961

brushalloysJP-info@materion.com

CHINA/HONG KONG

TEL: + (852) 2318-1960 / 1907

brushalloysHK-info@materion.com

CHINA/SHANGHAI

TEL: + (86) 21-5237-2328

brushalloysCN-info@materion.com

REPUBLIC OF KOREA

TEL: + (82) 2 702-2961

brushalloysKR-info@materion.com

SINGAPORE/ASEAN

TEL: + (65) 6842-4456

brushalloysSG-info@materion.com

TAIWAN, R.O.C.

TEL: + (886) 2-2747-8800 x-121

brushalloysTW-info@materion.com

UNITED KINGDOM & IRELAND

TEL: + (44) 118-930-3733

brushalloysUK-info@materion.com

GERMANY

TEL: + (49) 711-830-930

brushalloysDE-info@materion.com

NORTH AMERICA

TEL: + (800)323-2438

brushalloys-Sales@materion.com

**International Sales
Worldwide Distribution**

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Materion Performance Alloys
6070 Parkland Boulevard
Mayfield Heights, OH 44124 USA
phone: 216.383.6800 fax:216.383.4005
email: BrushAlloys-info@materion.com

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