



## Mechanical Properties of ToughMet® Rod and Tube

Materion Brush Performance Alloys' ToughMet® is a spinodal copper nickel tin alloy designed for use in applications demanding wear resistance, high bearing performance, resistance to salt water corrosion and good ductility.

### MECHANICAL PROPERTIES OF TOUGHMET ROD

Alloy	Description	Temper	Outside Diameter	Yield Strength (min)	Ultimate Tensile Strength (min)	Elongation in 2" (min)	Hardness (min)
ToughMet 2	Cast and Spinodally Hardened	CX 90	2 – 12" 51 – 305 mm	90 ksi 620 MPa	105 ksi 720 MPa	3%	HRC 27
ToughMet 3	Cast and Spinodally Hardened	CX 90	1.5 – 4" 38.1 – 101.8 mm	90 ksi 620 MPa	105 ksi 720 MPa	6%	HRC 27
		CX 105	1.5 – 4" 38.1 – 101.8 mm	105 ksi 720 MPa	110 ksi 760 MPa	4%	HRC 30
ToughMet 3	Hot Worked and Spinodally Hardened	AT 90	1 – < 4" 25.4 – <101.6 mm	90 ksi 620 MPa	110 ksi 760 MPa	15%	HRC 26
			4 – 9" 101.6 – 228.6 mm	90 ksi 620 MPa	110 ksi 760 MPa	12%	HRC 26
		AT 110	0.595 – < 4" 15.1 – < 101.6 mm	110 ksi 760 MPa	132 ksi 910 MPa	10%	HRC 30
			4 – 9" 101.6 – 228.6 mm	110 ksi 760 MPa	127 ksi 875 MPa	6%	HRC 30
ToughMet 3	Cold Worked and Spinodally Hardened	TS120 U	0.5 – 3.25" 19 – 82 mm	110 ksi 755 MPa	120 ksi 825 MPa	15%	HRC 23
			TS 160U	0.125 – < 0.25" 3.175 – < 6.35 mm	150 ksi 1035 MPa	160 ksi 1100 MPa	5%
		0.25 – < 0.4" 6.35 – < 10 mm		150 ksi 1035 MPa	160 ksi 1100 MPa	7%	HRC 32
		0.4 – < 0.75" 10 – < 19 mm		150 ksi 1035 MPa	165 ksi 1140 MPa	7%	HRC 36
		0.75 – < 1.6" 19 – < 41 mm		150 ksi 1035 MPa	165 ksi 1140 MPa	5%	HRC 34
		1.6 – 3.25" 41 – 82 mm	150 ksi 1035 MPa	160 ksi 1100 MPa	3%	HRC 34	

## MECHANICAL PROPERTIES OF TOUGHMET TUBE

Alloy	Description	Temper	Outside Diameter *	Yield Strength (min)	Ultimate Tensile Strength (min)	Elongation in 2" (min)	Hardness (min)
ToughMet 2	Cast and Spinodally Hardened	CX 90	1 – 15" 25.4 – 381 mm	90 ksi 620 MPa	105 ksi 720 MPa	3%	HRC 27
ToughMet 3	Cast and Spinodally Hardened	CX90	1 – 15" 25.4 – 381 mm	90 ksi 620 MPa	105 ksi 720 MPa	6%	HRC 27
		CX 105	1 – < 4" 25.4 – < 101.6 mm	105 ksi 720 MPa	110 ksi 760 MPa	4%	HRC 30
			4 – 15" 101.6 – 381 mm	94.5 ksi 650 MPa	99 ksi 680 MPa	4%	HRC 30
ToughMet 3	Hot Worked and Spinodally Hardened	AT 90	1.625 – < 4" 41 – < 101.6 mm	90 ksi 620 MPa	110 ksi 760 MPa	15%	HRC 22
			4 – < 6.5" 101.6 – < 165 mm	90 ksi 620 MPa	110 ksi 760 MPa	12%	HRC 22
			6.5 – 8" 165 – 203 mm	90 ksi 620 MPa	110 ksi 760 MPa	12%	HRC 22
		AT 110	1.625 – < 4" 41 – <101.6 mm	110 ksi 760 MPa	130 ksi 860 MPa	10%	HRC 30
			4 – < 6.5" 101.6 – <165 mm	110 ksi 760 MPa	125 ksi 860 MPa	6%	HRC 30
			6.5 – < 8" 165 – < 203 mm	110 ksi 755 MPa	125 ksi 860 MPa	6%	HRC 30
			8 – 13" 206 – 330 mm	110 ksi 755 MPa	128 ksi 880 MPa	5%	HRC 30
ToughMet 3	Cold Worked and Spinodally Hardened	TS 150	1.63 – 2.4" 41 – 61 mm	150 ksi 1035 MPa	158 ksi 1089 MPa	5%	HRC 36
		TS 160U	6.25" Max 159 mm Max	150 ksi 1035 MPa	160 ksi 1103 MPa	3%	HRC36

\* Available wall thicknesses are approximately 10-20% of the outside diameter.

### RELATED INFORMATION

Additional information on ToughMet® 2 and 3 rod and tube can be obtained by calling 800-375-4205.



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**AD0016\_0511**

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