

ToughMet® 3 TS Rod, Tube & Wire Data Sheet

ToughMet 3 TS Alloy is a cold worked, spinodally hardened alloy designed to provide high strength for the most demanding static structural loads and pressures. It provides high toughness combined with high strength to resist dynamic impact loading. ToughMet 3 TS provides galling resistance, high bearing performance and compatibility with many sour environments or salt water. It is non-magnetic and very 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

Temper		Diameter		0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness	Average CVN Impact Toughness	
		inch	mm	ksi	N/mm ²	ksi	N/mm ²	% (in 4D)	HRC	ft-lbs	J
Rod	TS 95	0.75 - 3.25	19 - 82	95	655	106	730	18	93 HRB	30*	40*
		3.26 - 6.00	83 - 152.4	95	655	105	725	18	93 HRB	30*	40*
	TS 120U	0.75 - 1.59	19 - 40.9	110	755	120	825	15	24	15	20
		1.6 - 3.25	41 - 82	110	755	120	825	15	24	12	16
	TS130	3.26 - 6.00	83 - 152.4	110	755	120	825	15	22	11**	14**
		0.75 - 6.00	19 - 152.4	130	895	140	965	10	24		
	TS160U	0.25	<6.35	150	1035	160	1100	5	32		
		0.26 - 0.4	6.35 - 10	150	1035	160	1100	7	32		
		0.41 - 0.75	10.1 - 19	150	1035	165	1140	7	36		
		0.76 - 1.6	19.1 - 41	150	1035	165	1140	5	34		
1.61 - 3.25		41.1 - 82	150	1035	160	1105	3	34			
Wire	TS160U	3.26 - 6.00	83 - 152.4	148	1020	160	1100	3	32		
		<0.25	< 6.35	150	1035	160	1105	5	32		
Tube	TS 105	0.26 - 0.4	6.35 - 10	150	1035	160	1105	7	32		
		1.50-3.05.(O.D.) <0.4 wall	38- 77 (O.D.) <10 wall	105	725	120	830	15	22		
	TS 150	1.50-3.05.(O.D.) >0.4 wall	38- 77 (O.D.) >10 wall	105	725	120	830	16	22	14***	19***
		1.30-3.00.(O.D.)	33- 76.(O.D.)	150	1035	158	1090	5	36		

* no single value less than 24 ft-lbs (32 J) **no single value less than 10 ft-lbs (13.5 J)

***no single value less than 12 ft-lbs (16 J); (10mm width x 10mm thickness) CVN specimens only

STANDARD TOLERANCES ROD/WIRE

Temper	Form	Diameter		Diameter Tolerance		Straightness Tolerance	
		inch	mm	inch	mm	inch	Mm
TS160U	Rod	0.25 -0.39	6.35 – 9.9	+/- 0.002	+/- 0.05	<0.25 inches deviation in 10 ft. length	<6.35 mm deviation in 3048 length
		0.4 - 0.74	10 – 18.9	+0.005/-0	+0.13/-0		
TS 95, TS120U, TS130, TS160U	Rod	0.75 -1.6	19 – 40.9	+0.02/+0.08	+0.5/+2.0	<0.5 inches deviation in 10 ft. length	<12 mm deviation in 3048 mm length
		1.61 -2.75	41 - 70	+0.02/+0.10	+0.5/+2.5		
		2.76 - 3.25	70.1 - 82	+0.02/+0.145	+0.5/+3.7		
		3.26 – 6.00	83 – 152.4	+0.02/+0.187	+0.5/+4.75		
TS160U	Wire	<0.4	<10	+/- 0.002	+/- 0.05		

STANDARD TOLERANCES TUBE

Temper	Outside Diameter		Inside Diameter	Diameter Tolerance		Straightness Tolerance	
	inch	mm		inch	mm	inch	mm
TS105	1.50 – 1.99	38 – 50	Wall thickness 10-20% of OD*	+/-0.010	+/-0.25	<0.5 inches deviation in 10 ft length**	<12 mm deviation in 3048 mm length
	2.00 – 3.050	51 – 76	Wall thickness 10-20% of OD*	+/-0.012	+/-0.30		
TS150	1.30-1.99	33-52	Wall thickness 8-20% of OD*	+/- 0.008	+/- 0.20	<0.5 inches deviation in 10 ft length**	<12 mm deviation in 3048 mm length
	2.00-3.00	53-79	Wall thickness 6-10% of OD*	+/-0.010	+/-0.25		

* This is only a guideline. Check with mill with actual required dimensions

**Tighter straightness tolerance may be available

STANDARD AVAILABILITY

Rod: Nominal 6-12 ft (1829-3658 mm) random mill lengths

Wire: Coil size up to 300 lbs (136 kg)

Surface: Mill hardened finish

SPECIFICATIONS AND STANDARDS

UNS C72900, AMS 4597

CONTACT INFORMATION

North American Sales	Pricing, availability, tolerances, etc	800-521-8800
Technical Service	Properties, application and design assistance, fabrication and processing assistance, etc.	800-375-4205 +(1) 216-692-3108
International Sales World-wide Distribution	Link to US and international distributors and international sales offices	



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