ToughMet® 3 (C72900)

Smiths High Performance

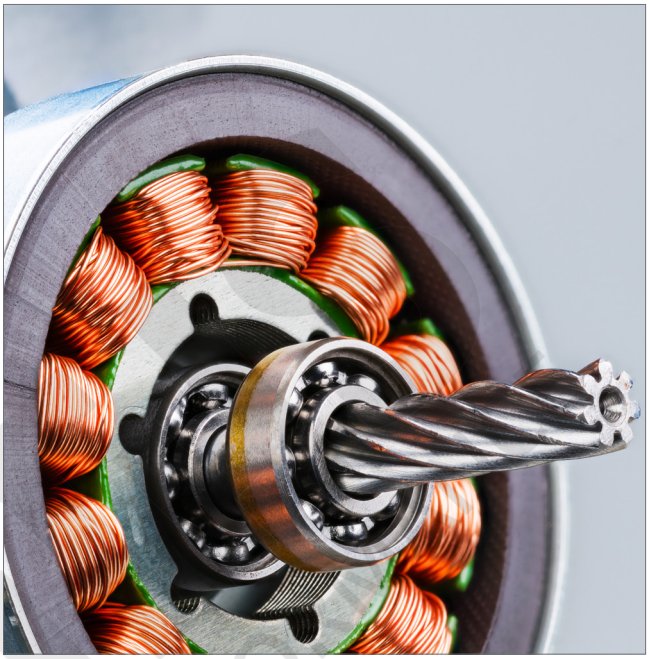
Copper Nickel Tin Alloy

ToughMet® 3 is a wrought copper-nickel-tin alloy, which is similar to beryllium copper alloys.

The fundamental difference is that ToughMet® 3 has reduced conductivity compared to its beryllium copper counterparts. However, it performs similarly to beryllium copper alloys but does not contain beryllium.

The alloy is non-magnetic and thermally strengthened using a heat treatment process called spinodal decomposition. Improvements in this heat treatment process have resulted in an end product aged to a much higher strength level. The alloy offers numerous performance benefits with a combination of high toughness and high strength, which is resistant to dynamic impact loading. The product also provides galling and high bearing resistance and is suitable for saltwater and sour service environments. Its high strength and low coefficient of friction make it well-suited for use as a bushing and bearing material. The alloy also outperforms many nickel and copper alloys in corrosive environments.

Traditionally used in bushings and bearings, particularly in aircraft, ToughMet® 3 has also become popular in oil and gas applications due to its performance in sour service.



SCAN ME

Availability:

Bar, plate and wire

Weldability:

The product benefits from excellent machinability and can be used to produce intricate parts. The material can be machined at extremely high speeds with carbide tooling, although generous amounts of coolant should be applied. Generally, ToughMet® 3 machines very well, especially with a chip breaker, to control cutting resistance.

About Smiths High Performance

Smiths High Performance is a leading stockholder and supplier of high-performance engineering materials. We are material supply chain partners supporting **high-technology market sectors**.

Motorsport Applications:

- Automotive powertrains
- Valve retainer springs
- Gearbox thrust washers
- Engine and generator bearings
- Racing valve guides and seats
- Camshaft bearings
- Brake calliper bushings
- Steering bushings
- Bearings

Further technical data available on the reverse of this Datasheet

ToughMet® 3 (C72900)

Smiths High Performance

Chemical Composition (weight, %, nominal values)

Ni	Sn	Copper
15.00	8.00	Balance

Physical Properties

Elastic Modulus	Poisson's Ratio	Electrical Conductivity	Thermal Conductivity	Coefficient of Thermal Expansion	Density	Magnetic Permeability
24 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

Mechanical Properties (minimum)

Temper	Diameter		0.2% Offset Strength		Ultimate Tensile Strength		Elong .	Hardness	Avg CVN Impact Toughness	
	inch	mm	ksi	N/mm^2	ksi	N/mm^2	% in 4D	HRC	ft-lbs	J
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*
	0.75 - 1.59	19 - 40.9	110	755	120	825	15	24	15	20
TS 120U	1.6 - 3.25	41 - 82	110	755	120	825	15	24	12	16
	3.26 - 6.00	83 - 152.4	110	755	120	825	15	22	11**	14**
ROD TS 130	0.75 - 6.00	19 - 152.4	130	895	140	965	10	24		
	0.25	<6.35	150	1035	160	1100	5	32		
	0.26 - 0.4	6.35 - 1.0	150	1035	160	1100	7	32		
TS 160U	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		
	3.26 - 6.00	83 - 152.4	148	1020	160	1100	3	32		
WIRE TS 160U	<0.252	<6.35	150	1035	160	1105	5	32		
	0.26 - 0.4	6.35 - 10	150	1035	160	1105	7	32		
TS 105	1.50 - 3.05 (OD) <0.4 wall	38 - 77 (OD) <10 wall	105	725	120	830	15	22		
	1.50 - 3.05 (OD) >0.4 wall	38 - 77 (OD) >10 wall	105	725	120	830	16	22	14***	19***
TUBE TS 150	1.3 - 3.00 (OD)	33 - 76 (OD)	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

...where performance matters...

When you purchase high-performance materials from **Smiths High Performance**, you will join some of the biggest and best global engineering companies. We are a Tier 1 supply chain partner to the world's leading motorsport companies. Our unique business structure and ethos allow us to offer services otherwise unavailable in this market sector.

Unit 3, Juno Place
Stratton Business Park
Biggleswade SG18 8XP
Tel: +44 (0)1767 604 708

AS/EN 9120 Aviation Space and Defence CERTIFIED

UKAS TESTING 1930