MATERION

TOUGHMET®

ToughMet® 3CX105

There's nothing else like it for bushings

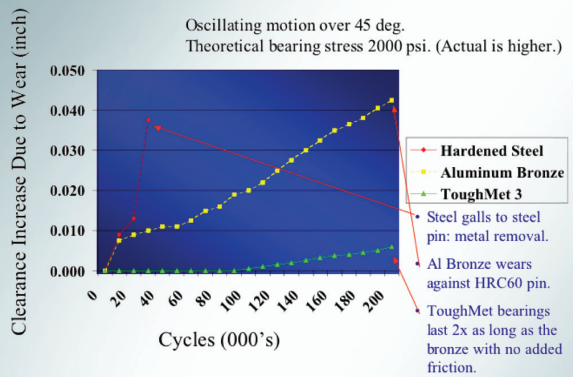
ToughMet:

- Lasts longer
- Carries heavier loads
- Needs less maintenance
- Protects against unplanned down time

ToughMet Resists:

- Abrasive wear (scratching)
- Adhesive wear (galling)
- Corrosion
- Deformation

ToughMet® Outlasts Steel and Aluminum Bronze



Typical mechanical properties of ToughMet and other materials:

Material	UNS Number	Chemical Composition %	Yield Strength		Tensile Strength		Elongation (%)	Hardness	Modulus of Elasticity		Fatigue Strength (10^3 cycles)	
			(ksi)	(MPa)	(ksi)	(MPa)			(10^3ksi)	(10^3MPa)	(ksi)	(MPa)
ToughMet® 3	C96900	15 Ni, 8 Sn, Balance Cu	105	735	110	770	2 - 6	HRC 30-34	18.5	128	40	275
Manganese Bronze	C86300	22-28 Zn, 2-4 Fe, 5-8 Al, 2.5-5 Mn, 1 Ni, 60-66 Cu	60	415	110	760	12	HRB 90	14.2	98	25	170
Aluminum Bronze	C95400	3-5 Fe, 10-11.5 Al, 1.5 Ni, .5 Mn, 83 Min Cu	30	205	75	515	12	BHN 150	15.5	105	28	195
Leaded Tin Bronze	C93200	6.3-7.5 Sn, 6-8 Pb, 1-4 Zn, 81-85 Cu	14	95	30	205	10	BHN 65	14.5	100	10	70

MATERION

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Field test results – excavator bucket bushings

Total cost savings per bushing when ToughMet was used to replace steel bushings **= $2,663 at 8,100 hours.** Steel bushing was replaced every 3,500 hours. ToughMet bushing was put back in service at 8,100 hours.

NEW

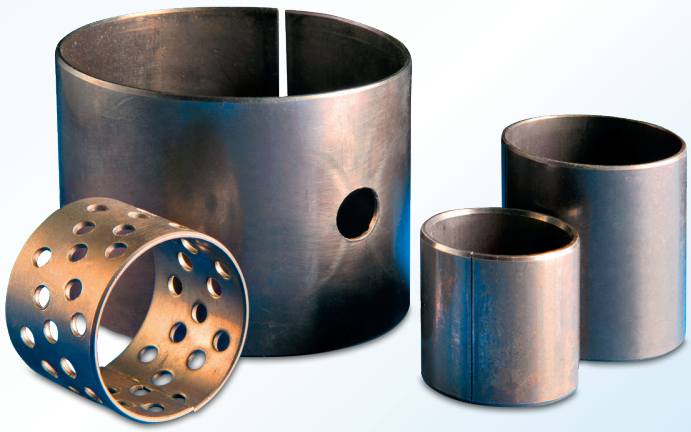
Heavy Duty BOWMET® Bearings

Wrapped Bearings Made of ToughMet High Performance Alloy

Bowman International has launched BowMet, a new line of thin walled, wrapped bearings that outperform steel, bronze and other materials, even under severe conditions.

BowMet heavy duty bearings are ideal for:

- Construction equipment
- Aggregate equipment
- Off road & military vehicles
- Racing engines
- Agricultural equipment
- Marine applications
- Oilfield equipment
- And more



Until now, thin-walled bearings made of ToughMet had to be custom machined from solid bar or thick walled tube. Up to 75 percent of the material was wasted, making ToughMet less cost-effective for wrapped bearing applications.

With a new process, the waste has been eliminated and production costs significantly reduced, making ToughMet a viable upgrade over other types of bearing materials.

BOWMAN