



AR[®] 1

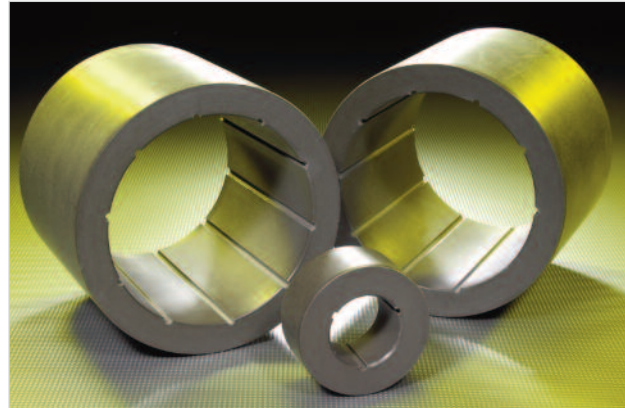
ABRASIVE-RESISTANT THERMOPLASTICS

Sand and other abrasives are often a challenge for pump users in the power industry. Clearances on line shaft bearings and bowl wear rings open up, increasing pump vibrations and reducing pump efficiency. Greene, Tweed's proprietary AR[®] thermoplastic materials exhibit outstanding wear characteristics in media containing solids.

AR1 offers excellent abrasive resistance as well as chemical resistance approaching that of PTFE. AR1 is rated from ambient to 120°F (50°C). AR1 is easy to machine, and clearance requirements are easily determined. AR1 works well in a variety of pumps in the power industry including those working with circulating water, open and closed cooling water and river water as well as screen wash pumps. AR materials have performance characteristics that exceed traditional technologies such as cutlass rubber, bronze and carbon materials.

FEATURES & BENEFITS

- Improvement of pump reliability over traditional bearing materials due to lower wear in abrasive media
- Nongalling and nonseizing properties help avoid unplanned shutdowns due to pump failures caused by excessive vibration or dry-run startup
- Extends lifetime and operation of mechanical seals and pumps due to excellent vibration dampening characteristics
- Lower coefficient of friction aids survival in "off design" pump conditions, such as intermittent dry run, better than traditional materials like cutlass rubber
- Easy to machine and install to exact finished dimensions, reducing pump repair turnaround times and lowering repair costs
- Low hydrolysis or swell makes designing parts easier and helps maintain their physical properties in water applications
- Very good physical properties allow the bearings to receive impact from the shaft or shaft sleeve without breaking or cracking during operation



APPLICATIONS

- Circulating water pumps
- Open and closed cooling water pumps
- River water pumps
- Screen wash pumps
- Sump pumps

AVAILABILITY

Greene, Tweed manufactures AR1 machined components worldwide at our own QRCs (Quick Response Centers), dedicated machine centers, making them readily available in short-lead times. Greene, Tweed's on-site manufacturing capabilities allow us to produce simple or complex parts to our customers' specifications. Billet sizes range from diameters of 1 in. to 30 in. (2.5 cm to 76 cm) with lengths up to 9 in. (22.85 cm) (depending on diameter and wall thickness).

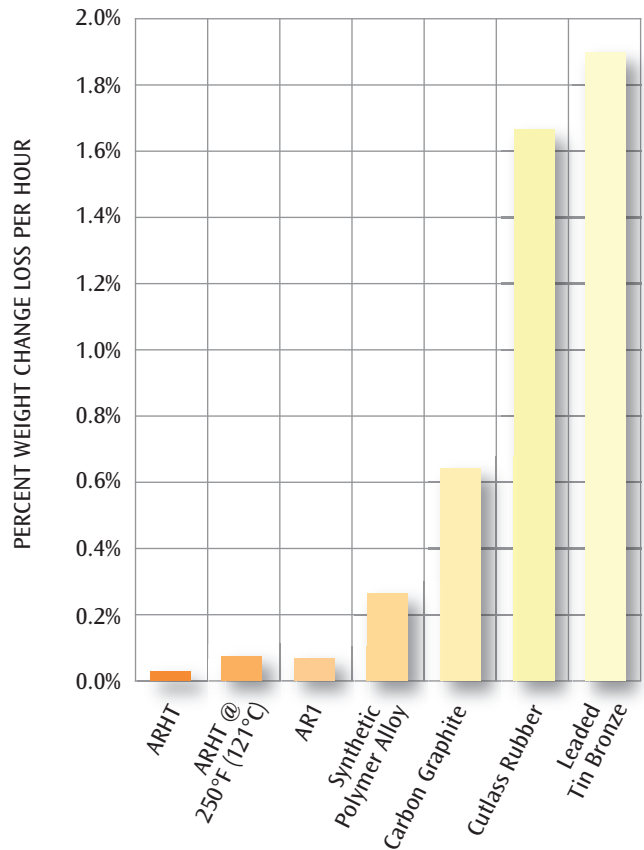


TYPICAL PROPERTIES		
Physical Properties	ASTM Method	Typical Value
Color		Brown
Specific Gravity	D1457	2.00
Hardness, Shore D, Points	D2240	65
Mechanical		
Compressive Modulus, psi (MPa)	D695	139,000 (960)
Compressive Yield Strength, psi (MPa)	D695	2,700 (19)
Elongation @ Break, %	D1457	300
Flexural Modulus, psi (MPa)	D790	157,000 (1,080)
Flexural Strength @ 5% Strain, psi (MPa)	D790	2,790 (19)
Tensile Modulus, psi (MPa)	D638	165,000 (1,140)
Tensile Strength, psi (MPa)	D4745	2,270 (16)
Thermal		
Coefficient of Thermal Expansion, in/in/°F (mm/mm/°C), (0°F to 105°F/-18°C to 41°C)	—	60 x 10 ⁻⁶ (108 x 10 ⁻⁶)
Service Temperature Range*, °F (°C)		60°F to 120°F (15°C to 50°C)

*For applications outside the suggested temperature range please contact GT engineering for further design assistance.

GREENE, TWEED AR[®] SERIES VS. TRADITIONAL MATERIALS

The chart shows percent weight change (loss) per hour of Greene, Tweed's AR materials compared to traditional materials.



Note: Bearings made from each of the materials (size: 2 in. x 1.5 in. x 1.5 in./ 5.1 cm x 3.8 cm x 3.8 cm) were tested at 900 rpm under 25 psi (0.17 MPa). The run time of the test was eight hours. The test was conducted on 300 series SS shaft, in 95 percent water and 5 percent silica sand. All materials were tested at 70°F (20°C). Additionally, ARHT was tested at 250°F (120°C) in ethylene glycol.

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