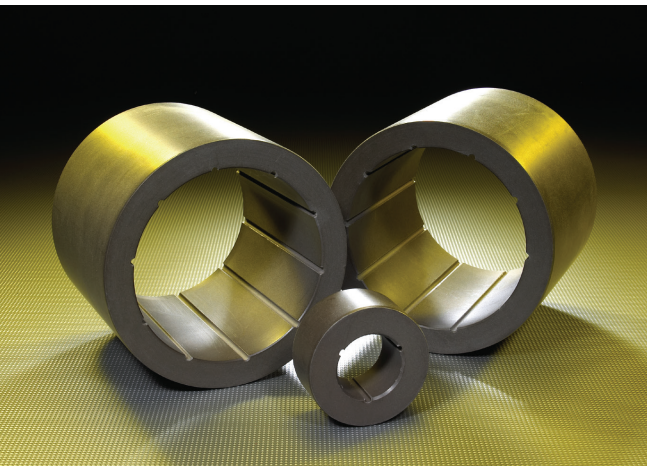




AR[®]1 Bushings

Increases Reliability of Screen Vertical Mixed Flow Pumps for Seawater Application



Customer

Vertical mixed flow pumps are used worldwide as cooling water pumps in power stations, brine recirculating pumps in sea water desalination plants, vaporizing, irrigation or dewatering pumps, and sea water intake pumps in water works. A leading Japanese pump OEM specializing in vertical mixed flow pumps for seawater applications was having difficulty in a steel production facility in Brazil.

Customer Goals

- Improve pump performance (quality)
- Double MTBF (mean time between failure) by reducing repairs from two to four years (minimum)
- Minimize vibrations and shaft runouts
- Reduce overall running costs/save energy

Challenge

The challenge was with vertical mixed flow pumps located (partially) subsea in saltwater with sludge at a temperature of 95°F (35°C). The customer experienced shaft runouts, heavy vibrations, and the short life cycle of bearings in his vertical mixed flow pumps. The customer was using PTFE slats molded in an elastomer material and encased in a steel housing.

Solution

Based on the performance results of AR[®] in-house testing conducted by the customer it was decided to replace the previous PTFE rubber material with AR[®]1 bushings. AR[®] outperforms metallic, carbon, graphite, and rubber cutlass products in seawater, river water, and some slurry services. It can be used for bushings and bowl rings in sump applications.

Technical Data	
Pump Head	Between 9.8' and 328.1' (3 – 100 m); actual case: 108.7' (33 m)
Capacity of Pump	Between 600 – 78,000 m ³ /h (2,642 to 343,424 GPM.) : actual case: 3,200 m ³ /h
Bore	15.75" – 118.1" (400 – 3,000 mm); actual case: 47.2" (1,200 mm) bore/bell bottom of the pump with 7.1" (180 mm) IDØ bushing installed in the top and middle bearing
Media	Abrasive media with sludge



Benefits

Improved Abrasion Resistance - AR[®] material is perfect for use in bearings that often come into contact with seawater and sludge.

Less Vibration - AR[®] materials allow pump users to operate their equipment at tighter running clearances than the previous PTFE rubber bearings (now: .011" – .013"/0.28 mm – .033 mm, before: .022" – .031"/0.56 mm – .080 mm). This reduced vibration amplitude and increased rotor stability. The combination of closer clearances and the excellent intermittent dry run capability of AR[®] composites improves process reliability.

Intermittent Dry-Run Protection - The lower coefficient of friction and the non-galling/non-seizing properties aid survival in "dry-run" pump conditions better than traditional materials. No in-feed of water is necessary (in the case of the original rubber bearings) nor increased clearances (for the later fitted PTFE rubber bearings) are needed to prevent dry running.

AR[®] outperforms metallic, carbon, graphite, and rubber cutlass products in seawater, river water and some slurry services.



Results

- **Improved Reliability/MTBF** - The pump's MTBF increased from two to 4.5 years and continues to run without problems.
- **Reduced Running Cost** - AR[®] materials contributed to reducing overall running cost less than half of the former material (customer).

Greene Tweed

1930 Rankin Road | Houston TX 77073 USA | Phone: (+1) (281) 765-4500 | www.gtweed.com