

AR[®]1 BEARINGS UPGRADE COOLING WATER PUMPS

Composite Materials Help Refineries Comply with Environmental Regulations

CUSTOMER GOALS

A German syndicate refinery owned by international mineral oil companies wanted to upgrade its old cooling water pumps to guarantee environmental security and to comply with environment protection regulations. The solution had to increase the lifetime of the pumps over the next five years without risking the environment or the operating system itself.

APPLICATION

The cooling water pump was located in a cooling station of a crack and aromatic complex of a refinery. In this complex crude oil is cracked into semi-finished products such as ethylene, propylene and benzene.

CHALLENGE

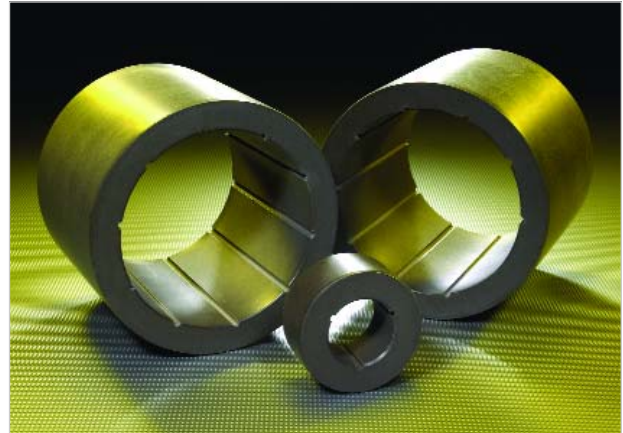
- Customer needed to replace existing grease lubricated bronze bearing to reduce a possible negative impact on the environment. The amount of grease in the oil separator directly correlates to the amount of maintenance work necessary. The oil separator prevents grease from entering the river through the cooling circuit.
- Current pump suffered from low operation time and high wear and tear of the used bronze bearings as well as corrosion problems.



Middle part of the pump bearing



AR1 in center of shaft construction



SOLUTION

- The German Service Center, based on their long work experience with GT composite materials in retrofitting pumps, recommended that the bronze bearings be replaced by AR[®]1 bearings.
- The recommendation came from the head of the Service Center who remarked that AR1 bearings were “Good functional bearings, easy to machine and to install.”

AR1 Bearings Upgrade Cooling Water Pumps—Technical Data

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| Pump: | Cooling water pump; single stage vertical tubular casing pump with semi-axial impeller |
| Capacity: | 4000m ³ /h |
| Power: | 800 kW, r.p.m.: 980U/min |
| Media: | Water, sometimes particles |
| Temperature: | 59°F to 86°F (15°C to 30°C) |
| Pressure: | Between 4-8 bar |
| GT Product: | AR1 bearings Size: 160 mm (OD) x 130 mm x 130 mm (ID) |
| Clearance: | Bronze material: 0.8 mm GT/AR1 material: 0.4 mm |



BENEFITS

Material

- AR® is a high strength material with nongalling and nonseizing characteristics. It allows the use of closer running clearances so internal re-circulation is restricted and pump performance improved.
- AR thermoplastic composites have excellent wear, abrasive and self-lubricating properties to withstand intermittent dry run conditions.
- The combination of closer clearances and the unique properties of AR reduce vibrations and dramatically decrease repair cost.

Environment

- The material upgrade complied with environmental regulations and helped improve security vs. the old solution.

Service/Quick response

- GT met this request with a delivery time between one – two weeks.

RESULTS

Because of AR1's exceptional performance the Sulzer Service Center will fit 12 more pumps with the composite material.




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