



CDI ENERGY PRODUCTS

CASE STUDY – JANUARY 2020

dures® A451 wear rings and bushings installed in lean carbonate circulation pump resulted in an \$800,000 increase in yearly production



CDI
ENERGY
PRODUCTS®
A Michelin Group Company

PROBLEM IDENTIFIED

Process Information

Plant: Hydrogen
Service: Hydrogen Make Up
Pump Duty: Lean Carbonate Circulation

After a debottlenecking project in a hydrogen manufacturing plant, adequate lean carbonate circulation could not be maintained for maximum feed rates. The 4 stage 1500 HP pump was being driven by a power recovery turbine, but the flow rate was insufficient for the process. Two paths were identified to solve the problem: purchase a larger capacity pump *or* maximize the efficiency of the existing equipment.

TECHNICAL SOLUTION

CDI, operating at the time as EGC Critical Components, was brought in to discuss the situation. Our technical team recommended dures A451 modified PEEK material to replace the existing wear rings and bushings. This material is enhanced with chopped carbon fiber which gives the material superior non-galling characteristics, as well as impact and thermal shock resistance. Dures A451 is one of our materials which meets the API 610 standard.

- Clearances were tightened to reduce vibration and improve efficiency during operation.
- These tighter clearances are possible with dures A451 because of the non-galling nature of the material, resulting in lower frictional heat buildup during intermittent service



Replacing only the wear components decreases overall repair cost and Lifecycle Cost (LCC).

STUDY RESULTS

In addition to an increase in production, repair costs have decreased and Mean Time Between Repair (MTBR) has increased from 4.1 to 6.4 years. Since the program was implemented, approximately 1,100 pumps have been retrofitted with dures A451 components. The plant reports significant gains in centrifugal pump performance, reliability and efficiency. In addition, assuming these pumps average 50 HP at a rate of \$400 per year, annual savings is estimated at \$1.3 million.

FURTHER INFORMATION

To learn how CDI Energy Products can improve performance in your operations, please visit our website at: cdiproducts.com.

The descriptions, design and performance information, and recommended uses for the products described herein are based generally on our design and manufacturing experience, product testing in specific conditions, and industry standards. The foregoing information is for general guidance only and does not constitute a guaranty or warranty of design or warranty of performance. Every effort has been made to ensure the information provided is accurate and up to date. However, the information provided herein is provided "as-is" and we make no representations or warranties of any kind, express or implied, with respect to the information provided. We reserve the right to make product changes from time to time, without prior notification, which may change some of the information provided herein. All warranties regarding the products described herein will be given in writing at the time of sale of such products. Each purchaser of such products must decide if the products are suitable to the intended use of such purchaser.

BETTER SCIENCE. BETTER SERVICE. BETTER SOLUTIONS.

- In pursuit of Better Science, our team replaced the competition's material with our dures® A451 bearing grade material, which has extreme abrasion resistance up to 250°F.
- In pursuit of Better Service, our technical team stepped in to provide the sustained technical and engineering support our customer had been unable to receive while working with another vendor.
- In pursuit of Better Solutions, we looked at the process issues and collaborated with our materials team to match the right compound with the process. We chose dures A451 due to the low friction and excellent wear properties.