



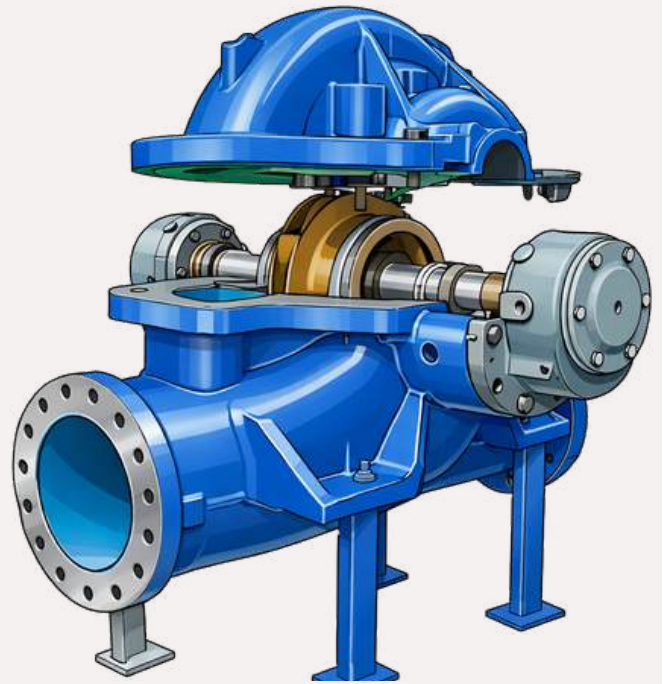
*High-Performance Protective Coatings for
Industrial Pumps*



Introduction

Industrial pumps used in power plants, oil & gas, mining, and chemical industries operate under severe conditions including corrosion, abrasion, and chemical exposure. These harsh environments cause rapid wear of critical pump components such as impellers, casings, and volutes, leading to efficiency loss, frequent maintenance, and reduced equipment life.

Arudra Engineers Pvt Ltd, in technical collaboration with Duromar Inc. (USA), is a licensed Manufacturer, Distributor, and Applicator of the Duromar® range of products. These high-performance epoxy and abrasion-resistant systems protect and restore pump components by forming a durable barrier against corrosion, erosion, and chemical attack, improving pump reliability and extending service life.



Major Industries We Serve



Power Generation



Oil & Gas



Chemical & Petrochemical



Water & Wastewater Treatment



Mining & Mineral Processing



Pulp & Paper Industry



Steel & Metallurgical Industry



Cement Industry

Complication:

Industrial pumps operating in aggressive service conditions often face multiple degradation mechanisms that affect performance and reliability. Chemical corrosion caused by acidic or alkaline media, chlorides, H_2S , CO_2 , and low-pH fluids attacks metallic surfaces, leading to material deterioration. In addition, erosion from abrasive particles such as slurries, fly ash, sand, or catalyst fines results in progressive material loss, particularly in high-velocity zones of the pump.

These issues are further intensified by erosion-corrosion synergy, where mechanical wear removes the protective passive film and accelerates electrochemical corrosion. Cavitation damage caused by the collapse of vapor bubbles produces pitting, micro-jetting, and surface fatigue on pump components. Galvanic corrosion can also occur when dissimilar metals are present in wetted assemblies, causing preferential metal attack. Moreover, under-deposit and crevice corrosion may develop in stagnant areas behind gaskets or seals, leading to localized corrosion and premature component failure.

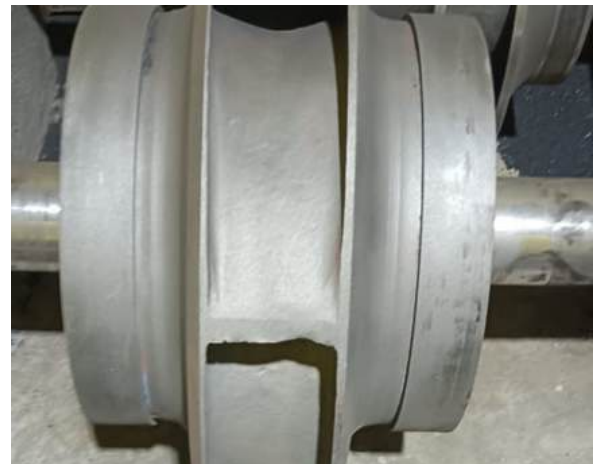
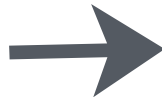


Solution:

Severe corrosion, erosion, and cavitation damage in the pump components are addressed using Duromar® high-performance protective coating systems. The internal surfaces of the pump, including the impeller, casing, and volute, were inspected and prepared to ensure effective coating performance and long-term protection.

Surface Preparation

- Pump components such as impellers, casings, and volutes were inspected for corrosion, erosion, and cavitation damage.
- Internal surfaces were abrasive blasted to SA 2.5 standard to remove rust, old coatings, and contaminants.
- Carbon Steel MOC surfaces were blasted using copper slag, while Stainless Steel MOC surfaces were blasted using aluminium oxide.
- A surface anchor profile of 80–100 microns was achieved to ensure strong coating adhesion.
- Proper surface preparation ensured optimal bonding and long-term durability of the protective lining system.



Application:

- Damaged and worn areas were rebuilt using Duromar® high-build repair coatings to restore the original hydraulic geometry of the pump.
- Duromar® 100% solids (Zero VOC) epoxy coating systems, including Duromar® HPL-2510 PW, were then applied to protect pump components from corrosion, abrasion, and chemical attack in aggressive operating environments, with suitability for potable and process water service.
- Based on service conditions, engineered systems were selected: Duromar® SAR + EAC (or EAC-LV) at ~1 mm thickness for corrosion protection, and Duromar® HAR or UltraBuild with EAC topcoat at 1.0–1.5 mm thickness for severe abrasion or slurry service.
- The Duromar® EAC-LV topcoat provides a smooth, glossy finish, improving fluid flow and enhancing hydraulic efficiency within the pump.
- The dual protection system of a ceramic repair layer and epoxy lining—including HPL-2510 PW where required—forms a dense, impermeable barrier that prevents corrosion promoters such as oxygen and moisture from reaching the metal surface.
- This engineered coating system significantly reduces corrosion, erosion, and cavitation damage, extending pump service life and minimizing maintenance requirements.



Product Details:



Duromar® SAR

DUROMAR® SAR is a versatile easy-to-use rebuilding putty with excellent abrasion and chemical resistance. This product is heavily filled with aluminum oxide and can be built up to an inch in thickness or more. Typical applications are for rebuilding of pump casings, slurry tanks, weld seams or anywhere requiring the restoration of metal components.



Duromar® EAC-LV

DUROMAR® EAC-LV is a brushable, flexible ceramic coating designed to provide a smooth, abrasion- and impact-resistant surface. It enhances fluid flow while resisting cavitation, making it ideal for areas where moderate abrasion and chemical resistance are required. EAC-LV ensures long-term durability in industrial and marine environments.



Duromar® UltraBuild

DUROMAR® ULTRA-BUILD is a rugged, durable, trowel grade product filled with ceramic beads and other abrasion resistant fillers. It is used primarily in areas where abrasion resistance to both small and coarse slurries are required over large areas. It is typically used in the mining industry on chutes, hoppers, classifiers or mills. It can be built up to 2" in thickness or more in a single coat.



Duromar® HPL-2510 PW

DUROMAR® HPL-2510-PW is an easy to apply, 100% Solids, Zero VOC epoxy coating system. It is designed for use in drinking water applications requiring certification to WRAS. This immersion grade lining system may be used on both concrete and steel surfaces.

KEY FEATURES



Superior Corrosion Resistance – Protects against acids, chlorides, H₂S, CO₂, and aggressive process fluids.



High Abrasion & Erosion Resistance – Withstands slurry, sand, fly ash, and high-velocity particle impact.

100%

100% Solids, Zero VOC System – Environmentally friendly with no solvent emissions and high build capability.



Restores Hydraulic Efficiency – Smooth coating surface reduces friction and improves pump performance.



Cavitation Protection – Resists pitting and surface fatigue caused by vapor bubble collapse.



Strong Adhesion & Cohesive Strength – Ensures long-term bonding even in severe operating conditions.

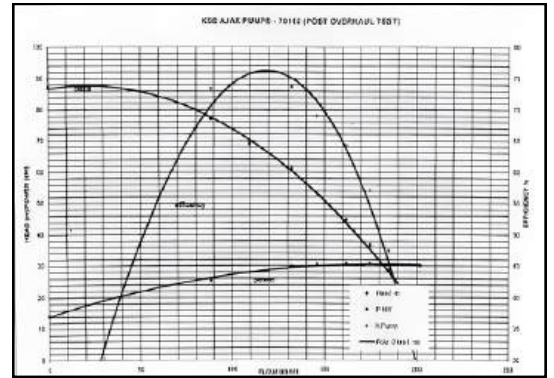
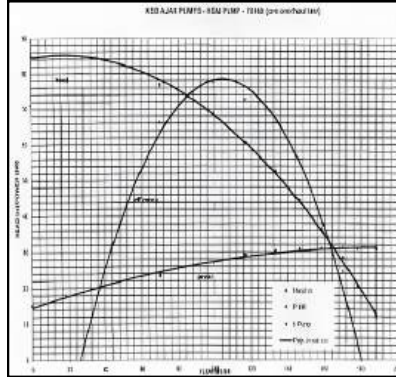
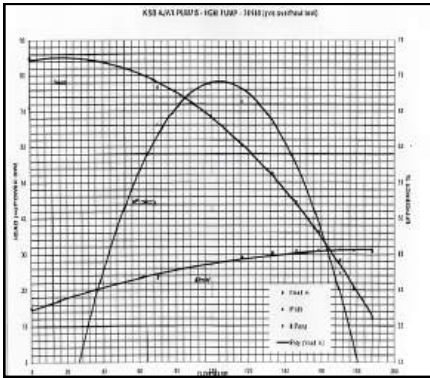


Cost-Effective Asset Rehabilitation – Enables in-situ repair, avoiding expensive OEM replacements.



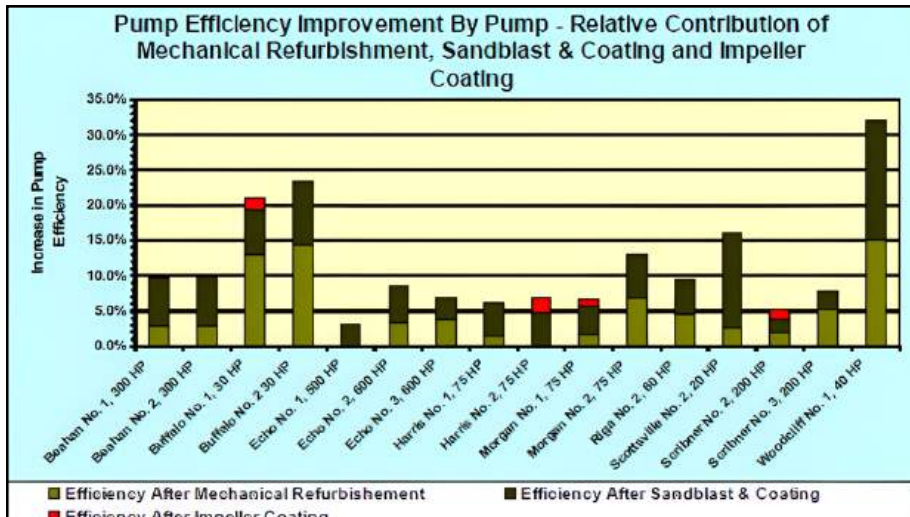
Extended Service Life – Minimizes maintenance frequency, downtime, and lifecycle costs.

Past Pump Refurbishment Works Using Duromar Systems:

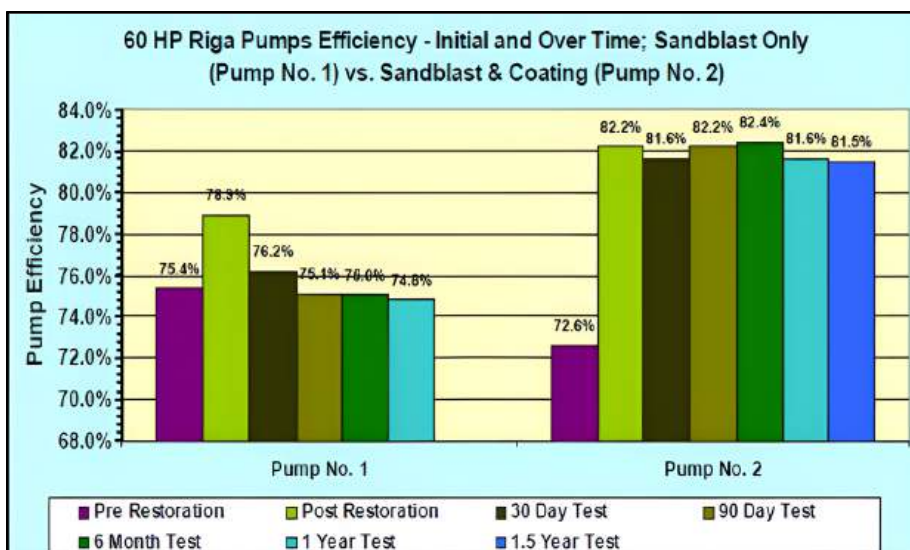


Pump showed the peak efficiency rising from 69% to almost 76% (an improvement of 10.1%), and at the duty point from 68% to 73%.

The maximum head improved and the input power for the pump output lowered.

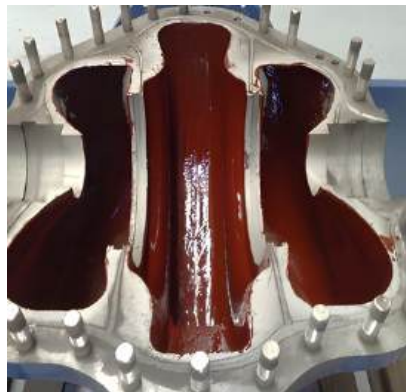
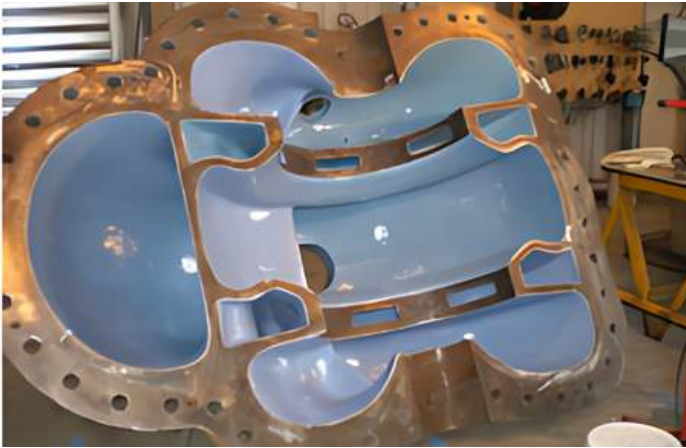


Efficiency Gain - 50% by Repair and 50% by High Performance Coating



During 1-year side-by-side comparison Uncoated Pump (Pump No. 1) lost roughly 4.5% efficiency points vs. Coated Pump (Pump No. 2) which only lost <1%

Proven Experience





Arudra

Coatings



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SCAN ME