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NEWSLETTER

HEGGEL® Fix 833

January 2023

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The industrial operating conditions typically expose equipment to a combination of aggressive circumstances resulting in different forms of corrosion, material loss and the eventual failure of critical assets.

Deteriorating effects range from chemical attacks and/or temperature, to various mechanical damages including impact wear caused by falling, erosive wear generally caused by a wet slurry and importantly, abrasion wear generally caused by the movement of dry material over the surface.

Abrasion

As a highly aggressive type of wear, abrasion is the friction process that can be imposed incidentally or purposefully in a controlled track through scuffing, wearing down, damaging, scratching or even simply rubbing away in normal applications and exposures.

Abrasion is very commonplace in a variety of industrial applications, specifically where particulates are involved, such as oil and gas and marine industry.

Abrasion induced damages in industrial settings may generally occur as high-stress, low-stress, impact and gouging types.

Abrasion is affected by multiple factors including the shape of the equipment, aggregate hardness, velocity of the contact flows, etc. Wear mechanisms caused by abrasive/hard particles that are stuck or freely moving between sliding and/or rolling surfaces remove the material, and lead to various damages such as notable grooves and activation of catastrophic mechanisms of fatigue and indentation processes, where the subsequent cracks can propagate and quickly cause the equipment failure.

Corrosion-Abrasion

Corrosive applications are typically found in every industry. Chemical and electrochemical reactions occurring between the corrosive/abrasive materials being moved and the surface of the processing equipment result in corrosion-abrasion wear of the surface.

Corrosion-abrasion removes the material of the substrates considerably; while the indicators of corrosion demonstrate even wear, abrasion creates uneven wear in mechanical instrumentations. Corrosion-Abrasion majorly contributes to the failure of tribological systems; although mechanical forces such as shear stress are detrimental, most of the corrosion-abrasion defects specifically in oil and gas industry are due to the suspended solids in contact fluids.

The combined destructive effects of abrasion and corrosion generate severe damages and diminish the longevity of industrial components significantly. Among instances of industrial facilities exposed to corrosion-abrasion phenomena pumps, valves, piping systems, blowers, condensers, nozzles, tubular heat exchangers, blades and impellers could be named.

Impellers

Optimized performance of industrial plants is dependent on the efficiency of the subset processes, and impellers are among essential components that maintain the integrity and productivity of industrial operations over time.

Impellers are rotating components and an inseparable part of many of the key equipment in turbomachinery such as centrifugal pumps. Also known as agitators, impellers perform mixing, aeration, increasing the pressure of the fluids and the flow rates, transferring fluids, gases and heat, etc. Impellers are equipped with blades or vanes to convert mechanical energy into power input for effective function of involved parts.

The functionality of the impellers is extremely influenced by severely destructive defects below:

Cavitation

While the impellers are operating, the velocity of the fluid is accelerated; as a result of the rapid change in pressure, when the fluid's pressure suddenly falls and the local pressure drops below the saturation pressure, the liquid is transformed to vapor and bubbles i.e., small vapor-filled cavities start to form within the contact liquid at regions with relatively low pressure.

At higher pressures, the created cavities collapse and the generated strong shock waves can seriously damage the equipment. The repeated implosions of the cavities exacerbate the destruction through internal cavitation process when the subsequent cyclic stress and the surface fatigue occurs.

Abrasion-Erosion

Impellers are commonly in contact with small size hard/abrasive particles, affecting the impellers entirely over time. Abrasive particles such as sands gradually wear down the substrates and result in material loss and the eventual failure of the impeller. Although the flow rate's reduction or modifications in impeller's design are effective methods to ameliorate the destructive effects, erosion could not be totally prevented.

Corrosion

Deteriorating effects of the corrosion essentially appear over time, outspreading to deep-rooted damages within the impellers, aggravate material loss and result in disintegration of the equipment. In spite of controlling solutions for corrosion prevention, from frequent monitoring to suitable design parameters and the proper material selection, the impellers would still be significantly damaged in case of contact with the low pH media or caustic fluids.

Solutions

Typical industrial operating conditions are a combination of different influences including temperature exposures, corrosion, abrasion, erosion and impact, which result in excessive wear.

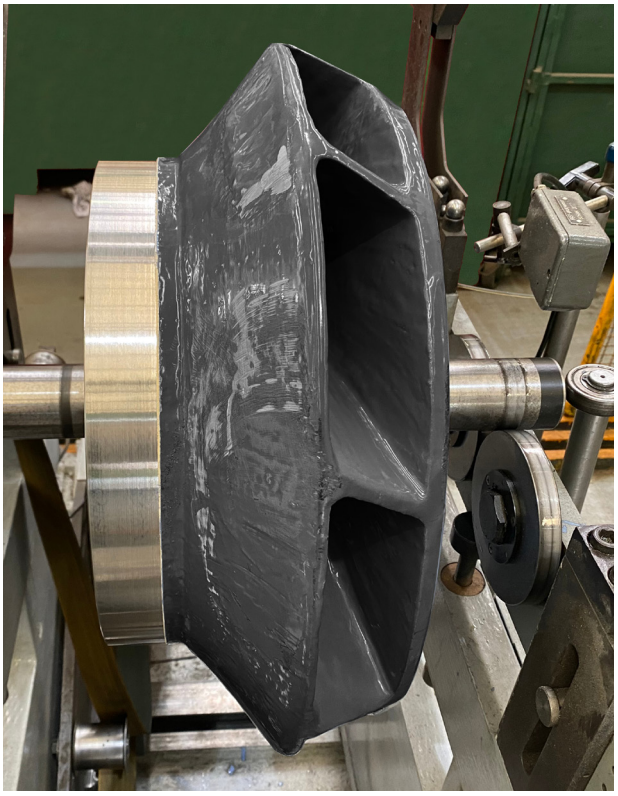
Therefore, protective and repair solutions are essential to relieve the aggressive service conditions and maintain the lifetime and efficiency of systems.

Since each condition requires a specific approach to deal with, it is very important to comprehend the root cause of the damage for the first step, and then recognize the type of the deterioration that the equipment is encountering.

As discussed, although basic solutions such as proper material selection, correct design or altering the process variables are effective in the prevention of equipment's failure, they are not adequate in the long run to fully meet the protection requirements once the service conditions get more aggressive.

Protective Coatings

Offering excellent advantages over other solutions, protective coatings are capable of increasing the service life against the most severe problems, whether it is mechanical wear caused by abrasion, erosion and impact, or chemically-induced wear and corrosion defects.



Protective coatings withstand both environmental and process conditions; by providing durable protection, they reduce the downtimes and effectively maintain the continued operation.

Resistant properties developed by coatings for a specific application depend on the type of damage that the equipment is most exposed to; for instance, abrasion resistant coatings offer superior hardness and excellent surface finish to resist wear.

HEGGEL Fix 833 is a heavy-duty product providing both chemical and abrasion resistance, ensuring high performance protection for the equipment and/or structures exposed to extreme abrasion and wear.

HEGGEL® Fix 833

Two-Component Multipurpose Composite

HEGGEL Fix 833 is an advanced coating providing a guaranteed solution specifically against very high abrasion in areas exposed to erosion and wear. The hand-applied coating combats abrasive wear imposed by impacting particles, and offers an outstanding resistance when abrasion caused by fine and/or coarse-particles is the major issue.

Capable to be applied across multiple areas, **HEGGEL Fix 833** compensate the material loss and adds to the thickness up to 15 mm in restoration/rebuilding processes.

With the combination of both urethane and epoxy technology, **HEGGEL Fix 833** demonstrates distinctive chemical resistance features and excellently withstands the combined effects of chemical attacks and corrosive wear.

HEGGEL Fix 833 shows an outstanding performance against cavitation at low-pressure areas where the fluids are moving in altering directions at high velocities to prevent wear damages. With the extremely smooth and glossy surface finish, **HEGGEL Fix 833** is suitable for any substrate prone to abrasion.

HEGGEL Fix 833 is highly recommended for protection against cavitation erosion, as is the case in industrial impellers due their constant exposures to high fluid flow.

Characteristics

- Self-priming
- Solvent free
- Excellent adhesion to metal rubber, urethane and concrete surfaces
- Outstanding sliding abrasion and wear resistance
- Very high impact resistance
- Easy application and effective repair
- Very high flexibility and elongation properties useful in crack bridging
- Cavitation resistance
- Resistance against typical service temperatures in the range –30 to 80°C
- Excellent resistance to impact from impinging particles either dry or within fluid

Application Areas

- Coal bunkers
- Ash handling systems
- Mineral storage / clinker silos
- Pulverised fuel lines
- Cyclones
- Conveyor belts
- Pumps
- Impellers

Chemical Resistance

- Crude Oil (Sweet or Sour)
- Kerosene
- Sulphuric Acid (10%)
- Hydrochloric Acid (10%)
- Demineralised Water
- Nitric Acid (5%)
- Sodium Hydroxide (50%)
- Sodium Hypochlorite (15%)
- Methanol
- Sea Water

Technical Features

Technical Data	Standard
Abrasion Resistance	Taber H-18/1kg/1000 cycles 60 mg weight loss
Impact Resistance	BS 3900 Part E3 1973 Forward: 25 Joules Reverse: 15 Joules
Adhesion Strength	BS 3900 Part E10 20.1 MPa (cohesive failure)
Elongation to Break	BS 6319 Part 7 1985 200 %
Barcol Hardness	ASTM D-2583 40
Tensile Strength	BS 6319 Part 7 1985 20.6 MPa