



You Build, We Protect!

NEWSLETTER

HEGGEL® Fix 831

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Innovative Repair & Refurbishment Technology

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Critical Industrial Components

Brief on Common Defects

There are numerous key components arrayed in various sectors throughout industry, operating with distinguished features. To ensure that equipment's function comply with industry standards safely and free of faults, precautionary measures in design and material selection should be considered. However, due to the strong influence of destructive processes on industrial parts, e.g., aggressive environment, friction, high temperature, wear, heavy loads, etc., unexpected failures could still occur at times.

Just as other industrial constituents i.e., pipelines, tanks, containers, etc., mechanical components such as flanges, shafts, rollers, pumps and valves can also undergo failure or defects for a variety of reasons resulting in material loss, degraded performance and finally decommissioning.

Continuous threat of corrosion, wear, erosion, overload and other mechanical or chemical influences may give rise to loss of functionality in various industrial assets. Therefore, diagnosing the root cause of such damages is crucial to determine the best techniques of industrial repair/renovation to maintain functionality.



Current Solutions

Solutions to resolve these challenges are highly dependent on the extent of caused defects. In the worst-case scenario, when repair of the part is not possible, the failed component must be entirely removed. While increasing downtime, replacement process may demand huge expenditures and workforce.

On-site machining could be another repair option; although it can be easily applied to most materials, lower dimensional accuracy and increased wear are some of main disadvantages of this maintenance approach.



Welding is also a common method to add material to worn out parts while improving obvious material loss. However, welding is itself a demanding process, the parameters of which must be intensely considered. Also, preheating temperature, interpass, post-heating, cooling conditions, chemical reactions and compositions are influential factors for a successful welding renovation/repair. In case welding or brazing processes are not completed as per requirements, welding cracks, seams, porosities, etc. can even accelerate the destruction of parts.

Repairing Mortars are also designed to restore the original profile and maintain the functionality of industrial assets by improving structural integrity with durable repair and long-lasting performance.

HEGGEL® Fix 831

High Abrasion Metal-building Repair Filler

Depending on the nature of each industrial deficiency, there are actions to be taken in order to avoid problems raised in services or prevent defects from escalating. In this regard, choosing an optimized repair technology is of great importance.



HEGGEL Fix 831 is an ideal option to patching and repairing defects of various industrial parts. Minimizing effects of corrosion and erosion, it significantly improves long-term performance and reliability of existing equipment. It is commonly applied for re-filling of damages, cracks, corrosion defects including pitting & holes as well as fixing breakages, metal build-ups, rebuilding of worn parts, renovation of cast parts or as a filler to do repairs under emergency conditions. The product is innovatively formulated to restore damaged industrial parts to their original integrity, extending in-process service life and ensuring continuous flawless operation.



As an alternative method to welding processes, **HEGGEL Fix 831** is a repair/restoration putty which greatly decreases the risk of negative chemical or mechanical changes (mostly caused by heat affected zones (HAZ)) to the base materials, offering strong bonding and a clean result.

HEGGEL Fix 831 displays excellent physical and mechanical properties. Its outstanding compressive strength makes it an applicable repair material that withstands fatigue failures where there is a load applied repeatedly over many cycles; it also suitable for refurbishment of other load-bearing components.



Technical Advantages

When it comes to overload damages caused by forces exceeding the yield strength of substrate material, **HEGSEL Fix 831** with superior tensile strength is an effective solution. The intrinsic capacity of shear strength and flexural strength of **HEGSEL Fix 831** to resist failure can considerably enhance productivity of repair procedure.

Due to machinability and strong mechanical properties, **HEGSEL Fix 831** is also applied to reinforce ductile components, prevent propagation of discernable damages including cracks, fix the equipment design bugs and optimally manipulate surface corrections to increase precision of the parts after machining processes.

HEGSEL Fix 831 demonstrates superior features in various applications in rehabilitation processes including bonding, forming, rebuilding, wrapping, patching, filling, etc. Due to its very high abrasion resistance against wear and erosion exposures, this product is specifically recommended for reinforcement and refilling applications; while it can be applied up to high thicknesses in a single coat.

Furthermore, down-time reduction due to the rapid-mixing of the product, easy application and short curing, make it possible to have the equipment back in service quickly. Considerable temperature resistance of **HEGSEL Fix 831** also obviates the need for the application of costly high-tech coatings to meet thermal resistance requirements.

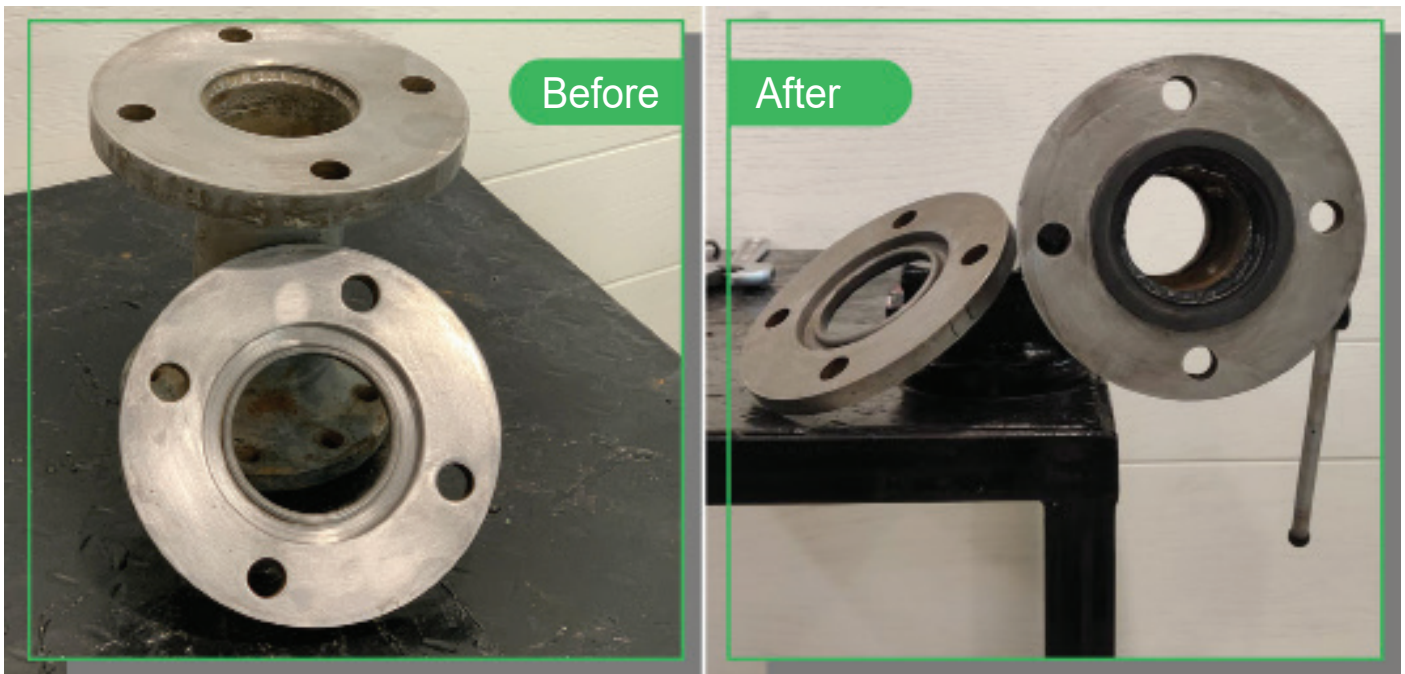
HEGSEL Fix 831 is an efficient and reliable approach to improve service intervals by reducing industrial maintenance and running costs, eliminating huge expenditures for upgrading or replacement of equipment while increasing its lifespan.

Application Scope

Together with enhanced mechanical and corrosion resistance characteristics, **HEGSEL Fix 831** has been exclusively designed to deliver a comprehensive protective repair solution for industries, leading to durability of industrial parts and facilities. Renovating process by **HEGSEL Fix 831** can be carried out on numerous industrial properties where the performed repairs effectively minimize the risk of failure.

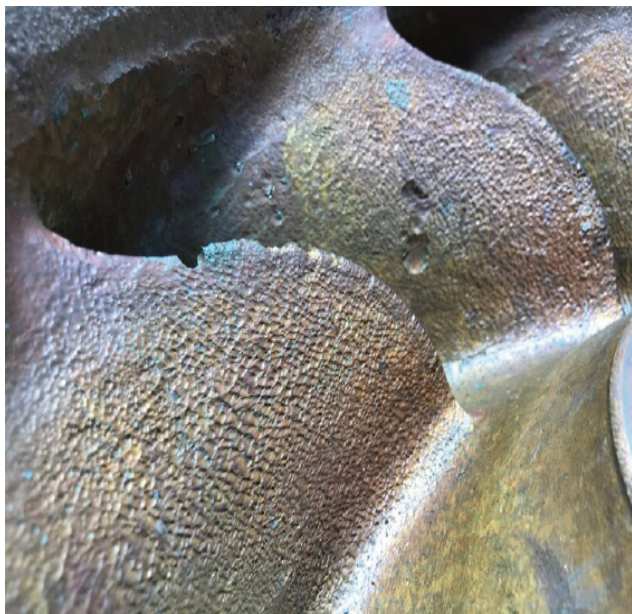
For instance:

Flanges, used to connect pipes, valves, pumps, etc, are indispensable part of different segments. Given the extreme conditions that process facilities often encounter, flanges are exposed to a variety of defects including corrosion, pitting, denting, gouging, etc. Such defects may result in flange leaks and in case of more severe damages, creating hazard and eventually unplanned shutdown. To fix defects like corrosion damages on flange face **HEGSEL Fix 831** is a proven solution by which restoration of corroded parts is achieved and strong sealing is provided.



Rollers in different types are utilized to facilitate movement, while providing support and transportation to various industrial appliance/equipment. The work surface of the rollers is usually subjected to cyclic stress. In case of corrosive environments, pits could form, serving as the origin for fatigue induced cracks. Fatigue finally causes the material layers to separate. Abrasive residuals and corrosion products can also groove roller surfaces, and friction would peel roller material near the cracks. The situation would be exacerbated during high-temperature operations. To rebuild worn rollers with cracks and unacceptable wear-induced deformation, **HEGSEL Fix 831** is a versatile option to get damaged components back to service.

Shafts are crucial components in machines and devices with several important uses in high-performing industrial applications, generating force in a broad range of mechanical equipment. They are extensively subjected to deteriorating mechanisms including corrosion, wear, overload and fatigue leading to cracks, brittleness, ratchet marks, etc., causing considerable material loss and overall reduction of shaft diameter. Also, crack growth induced by pitting corrosion and material defects would contribute to shaft failure. **HEGGEL Fix 831** can successfully build up the material loss and with superior mechanical strength, reliably repair extreme corrosion defects.



Pumps are required mechanical pieces for a wide range of tasks. Galvanic interactions, Flow Accelerated Corrosion (FAC), erosion, transferring fluids containing abrasive substances, erosion-corrosion, cavitation, pitting and crevice corrosion are main destructive elements damaging pumps. Usually initiating from small portion of pump's internal components, defects would expand into large localized damages and in the long run result in pump failure. In abrasive-cavitation and highly corrosive environments, impellers and propellers of the pumps are prone to deterioration. Tear of pump casing is another consequence of heavy corrosion. The application of **HEGGEL Fix 831** alone can successfully

repair minor to medium damages, and in case of severe damages, it can be reinforced with appropriate metallic fabric tapes to restore severely destroyed areas.

In addition, on the body of tanks or pipeline walls where welding has been used to join metal pieces, **weld seams** are vulnerable zones vigorously affected by corrosion. Therefore, chemicals stored in tanks or flowing through the pipes can penetrate weld seams & micro-cracks, aggravating corrosion and consequent defects. The application of **HEGGEL Fix 831**, with its enhanced mechanical properties, can provide mechanical and corrosion resistant support to fragile, failure-exposed sections for complete protection.

Cast parts are widely utilized in various industries since they can remain unused for extended periods of time and still show peak performance. Design flexibility and wide temperature resistance are among other interesting aspects of industrial applications of cast parts. However, casting defects such as misruns and cold shuts, unfilled sections, porosities, mocks, holes, cavities, shrinkages and crushes, are major points of concern. Here, **HEGSEL Fix 831** is also the applicable repair material to fully resolve these deficiencies.



HEGSEL® Fix 831 in Surface Preparation

Due to the superior mechanical properties of **HEGSEL Fix 831**, it is a cost-effective solution to repair/rebuild damaged parts in industrial applications. Moreover, since it is very robust and resistant to many chemicals, it can be widely used in surface preparation processes, eliminating substrate defects such as pitting, cracks, etc. In order to increase corrosion resistance of the repaired parts, **HEGSEL Coat** and **HEGSEL Corr** products with advanced corrosion resistant properties are particularly used to fortify regions susceptible to corrosion in a combined protective system.

Physical Properties	Value
Abrasion Resistance ASTM D 4060 (Tabor CS-17/1kg/1000 cycles)	12 mg weight loss
Barcol Hardness ASTM D-2583	52
Adhesive Strength ASTM D4541	23 MPa (cohesive failure)
Tensile Strength BS 6319 Part 7 1985	34.3 MPa
Compressive Strength BS6319 Part 2 1983	79.8 MPa
Temperature Resistance NACE TM0174	+90°C Immersed +150°C Non-Immersed