



**HEGGEL®**

**You Build, We Protect!**

# NEWSLETTER

**HEGGEL® Fix 811**

April 2022



**INSIDE THIS ISSUE:**

## **Rubber Lining Uniform Repairing Mortar**

- ◆ **Rubber Lining Considerations**
- ◆ **Defects in Rubber-Lined Equipment**
- ◆ **Extent of Repair**
- ◆ **High-Tech Repair Mortar**
- ◆ **Features and Benefits**

# Rubber Lining



Rubber has long been used as corrosion mitigating lining for metallic surfaces with a broad range of compositions to meet technical requirements for durable resistance to chemicals, abrasive mediums, impact and elevated temperatures.

Available in natural and various synthetic grades, prefabricated rubber sheets have been used as a flexible lining material, very well accommodating expansion and contraction, holding up over time to protect industrial assets against ever changing service conditions.

With excellent chemical and mechanical resistance, there are a variety of different blends and configurations of rubber, successfully utilized as lining material for corrosion protection in severe chemicals and abrasive environments in storage tanks, pipelines, scrubbers, valves, pressure vessels, pumps, FGD units, condensers, etc. throughout oil and gas industry, petrochemical, refineries, metal processing, power generation sectors, drinking water facilities, food and pharmaceutical industries, etc.

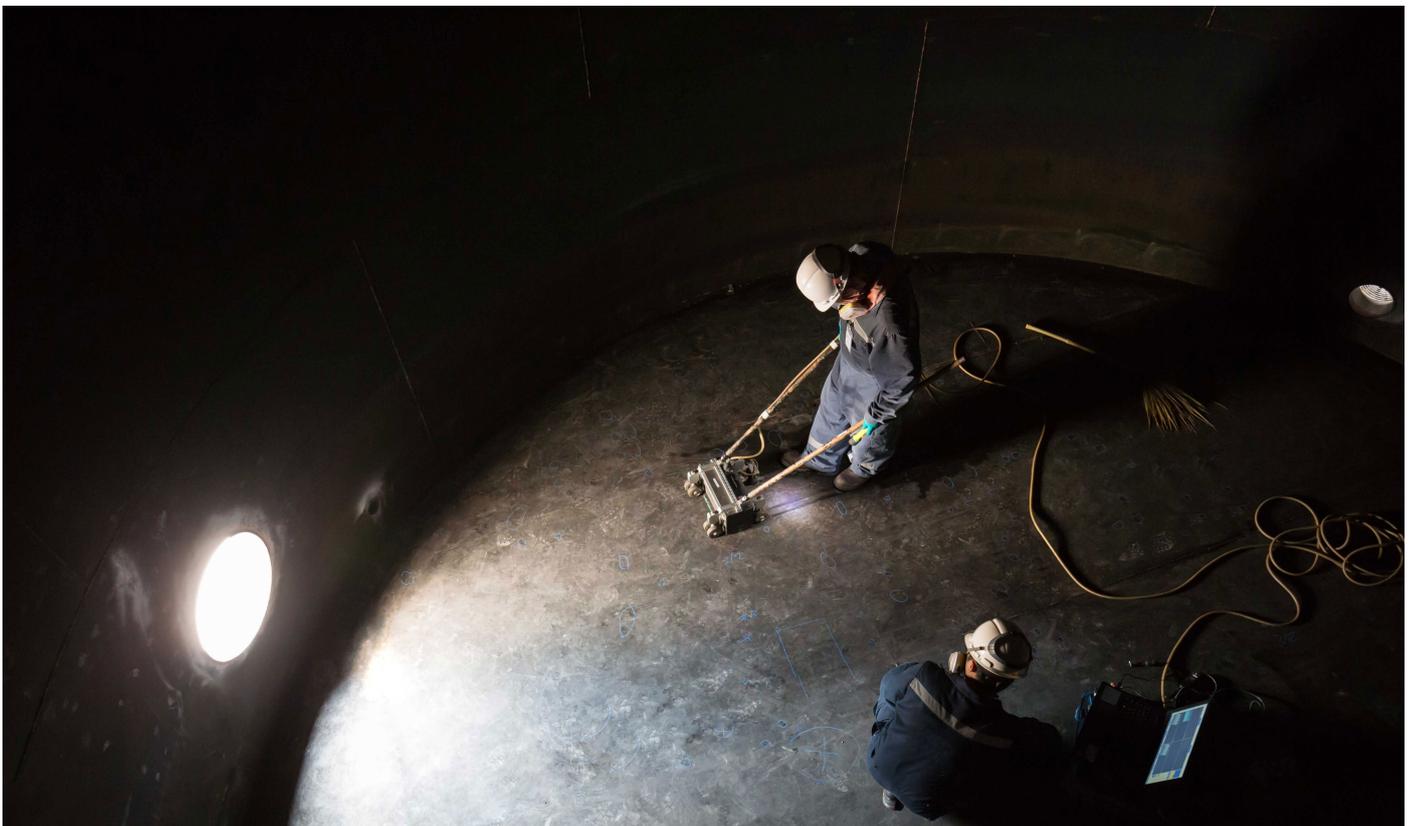
Rubber linings are also vastly applied as protective membranes where thermal and abrasion processes require extra protection.

# Critical Considerations in Rubber-Lined Equipment

Rubber formed as sheets and membranes is practically the barrier between corrosive media and substrates to provide a protective guard against destructive attacks of chemicals and abrasive conditions to efficiently extend equipment longevity.

However, in rubber lining there are aspects needing consideration to prevent failure in corrosion protection, and some are as follows:

- ✓ Rapid degradation in extreme conditions
- ✓ Brittleness at sub-zero temperatures
- ✓ Aging
- ✓ Loose sections and deep damages caused by improper material selection, installation process, incidents and deep-rooted corrosion
- ✓ Inadequate resistance to heat, light (UV exposure), ozone, concentrated acids, halogenated solvents, oil, gasoline, aromatic and aliphatic hydrocarbons, etc.
- ✓ Sensitivity to certain substrates
- ✓ Prevalent cracks in rubber-lined tanks being left empty for an extended period
- ✓ Limitations in adhesion and reliable bonding
- ✓ Long curing time at high temperatures
- ✓ Lining challenges for the newly attached equipment



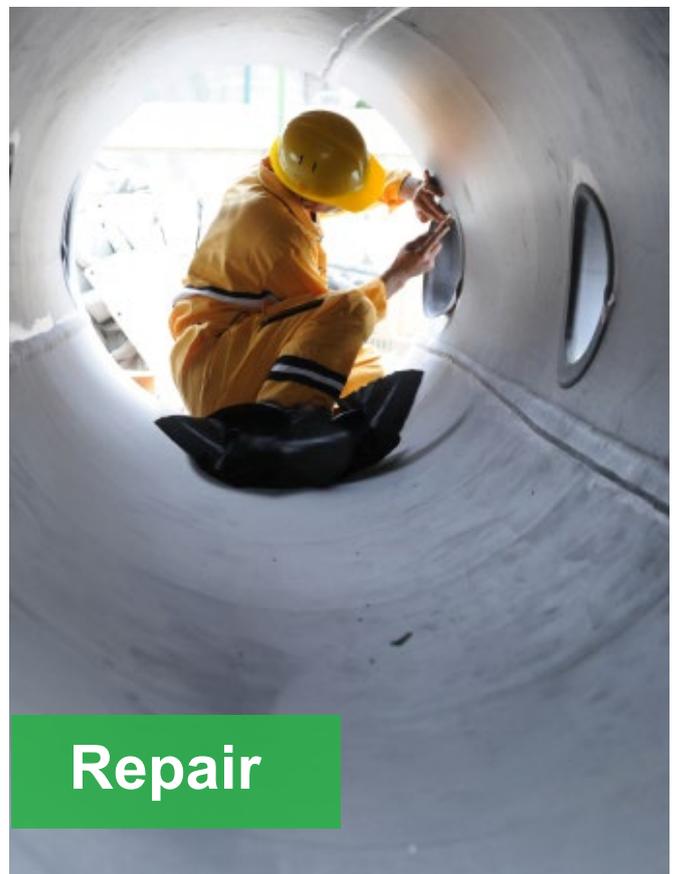
# Rubber Lining Defects



Disregarding critical considerations in the long run may result in the failure of rubber-lined infrastructures. Even the best rubber linings could be damaged to some extent. Having been used for decades as a traditional corrosion protection method, the rubber lining of industrial assets has now encountered aging defects due to the long service life after being first installed. Moreover, problems with rubber-lined equipment may range from small blistering on the surface to large zones of delamination, dislocation, seam lift on corners / edges and eventual separation from the metal substrates. Damages caused by inadvertence in operational/mechanical processes as well as deep or surface effects of corrosion and erosion are among other defects. The situation is even more exacerbated through dynamic environments when the separated rubber from blistered or loose parts becomes abraded and causes major difficulties with industrial operations. Inspections should be regularly carried out to schedule maintenance operations in order to hinder the destructive consequences of corrosion.

Even in the best run and optimized industrial procedures, detriments to rubber-lined equipment are inevitable. Therefore, proper repair practices must be performed. The repair process is mainly defined by the rubber type of the original lining, the extent of damages and accessibility. When a major repair is required, a rubber treatment is done by covering the damaged area with the same type of lining used for the original installation and giving a full cure. For extreme occasions, repair would be to completely remove the worn-out rubber and replace it with a new rubber sheet.

Due to concerns related to long downtimes, huge expenses, safety issues and other inconveniences, it is not always possible to execute rubber replacements or recuring processes. In these cases, alternative methods justified by cost and time, must be chosen to maximize the lining's longevity and avoid costly shutdowns.



# High-Tech Mortars

Conventional repairs of rubber linings typically involve time consuming chemical curing processes, the application of inconvenient flammable adhesives and tough installation procedures leading to long down time and extra costs.

Innovatively developed repair mortars are a reliable alternative solution to other complicated methods in rubber lining maintenance services with well-founded results.

Depending on chemical loads, mechanical requirements and operation temperature, advanced repair mortars serve as a long-lasting solution for effective corrosion protection.

Considering the original type of the rubber compound and the extent of the required repair, various grades of high-tech putties in different thicknesses are suitable options to provide durable and quick protection to the damaged parts of rubber lining while maintaining the structural integrity of the equipment.

Here, offering exceptional all-round performance, **HEGSEL Fix 811** is a state-of-the-art repairing mortar that efficiently guarantees the added values to critical industrial assets, offering clear benefits.

## Advantages

- ✓ Quick on-site local repairs
- ✓ Safe and easy maintenance
- ✓ Long-term chemical, corrosion, erosion resistance
- ✓ Excellent mechanical properties and impermeability
- ✓ Suitable for major and minor refurbishments
- ✓ Easy application even in narrow and hard to access areas
- ✓ Applicable for internal and external applications
- ✓ Simple curing process at ambient temperatures
- ✓ Time saving
- ✓ Cost effective



# HEGSEL<sup>®</sup> Fix 811

**HEGSEL Fix 811** is an advanced repairing mortar derived from a novel technology that combines, on a molecular level, both organic and inorganic molecules to provide a thermally stable, highly crosslinked structure.

Compared to other repairing products, **HEGSEL Fix 811** offers a superior broad range of chemical resistance from sub-ambient to elevated temperatures in excess of 225°C, after being fully cured at ambient temperatures.

**HEGSEL Fix 811** is characterized by high abrasion resistance and a particularly smooth surface, improving fluid flow and sludge accumulation. The putty is also well designed to repair a broad range of soft/ hard rubber compounds used in the lining of vessels, tanks, etc., and to fill in surface defects of the previously coated areas.

The simple curing process of **HEGSEL Fix 811** at ambient temperature is among this product other advantages compared to the complex, time consuming procedures of conventional repair using rubber sheets implemented at high temperatures.

With versatile properties innovated by modern polymer technology, **HEGSEL Fix 811** is compatible with different rubber compounds and well accommodating to various substrates for an outstanding adhesion strength.

When resistance to permeation is crucial to be taken into consideration, **HEGSEL Fix 811** reliably withstands a variety of high-concentration acids and is the optimum choice for aggressive and abrasive environments.

**HEGSEL Fix 811** chemical and mechanical attributes best meet technical requirements for corrosion and abrasion resistance to ensure safety and loss prevention. Easy application along with other enhanced characteristics, make **HEGSEL Fix 811** an excellent repair solution to have a longer service life and increased durability in maintenance operations.



## Physical Properties

<b>Abrasion Resistance</b>	ASTM D 4060 20 mg weight loss (Tabor CS-17/1kg/1000 cycles)
<b>Impact Resistance</b>	ASTM G14 Forward: 13 Joules Reverse: 3 Joules
<b>Adhesives Strength</b>	ASTM D4541 > 25 MPa (cohesive failure)
<b>Elongation to break</b>	BS 6319 Part 7 1985 1.8 %
<b>Temperature Resistance</b>	NACE TM0174 +225°C Immersed +280°C Non-Immersed

## Application Areas

- ✓ Chemical tanks
- ✓ Hydrocarbon pressure vessels
- ✓ Amine Molten Sulphur recovery tanks
- ✓ Condensers
- ✓ Distillation units
- ✓ Autoclaves
- ✓ Heat exchangers
- ✓ Evaporators
- ✓ Scrubber units
- ✓ Process vessels