



You Build, We Protect!

NEWSLETTER

HEGGEL® FRP 333

February 2022



INSIDE THIS ISSUE:

Glass Fiber Reinforced Furan Lining System

- Industrial Effluents
- Steel & Concrete against Wastewater
- A System for Complex Corrosion
- Diverse Advantages

Industrial Effluents



Wastewater is an inevitable by-product in almost all phases of manufacturing processes of numerous commercial products across every industrial activity.

The wastewater could be sludge containing dissolved metals and metal hydroxides produced by metal finishing industry, or filled with greasy ingredients, abrasive sands and grit, heavy metals and VOCs generated in Industrial Laundries.

Wastewaters discharged at petroleum refineries, chemical manufacturing units, and petrochemical plants contain multiple pollutants such as oil, suspended solid particles, ammonia, chromium, phenols and sulfides, highly salty liquids, high concentrations of corrosive substances like chloride and sulfate mixed with other industrial chemicals; all are instances of industrial effluent produced in oil and gas industry.

Moreover, mixtures of water with finely ground rock, sand, silt, clay and other residuals could be accumulated in tailing ponds as wastewaters of mining industrial operations.

Waste streams in steel/iron production with harsh materials like ammonia, acidic rinse waters together with waste acid, phenols and contaminations like hydraulic oil are also among industrial wastewaters.

Power plants are a major source of industrial wastewater, transferring significant levels of destructive materials to the wastewater stream.

Waters filled with high loads of particulate stuff, soluble organic/inorganic runoff and harsh chemicals resulted from food processing and agriculture industries are other examples of industrial wastewaters.

To comply with existing environmental regulations, industrial effluents need to be treated prior to being reused in industrial operations or discharged in the environment whether into soil or water.

In this regard, wastewater treatment structures including effluent ponds have been constructed across a broad range of industries for effluent accumulation to serve various purposes including on-site wastewater treatment.



Harsh Environments, Tough on Steel and Concrete



Corrosion affects different structures in contact with industrial wastewater and effluent streams, specifically the ones with continually varying liquid levels, such as ponds and storage areas, leaving damp surfaces exposed to sunlight and oxygen in open air. The presence of corrosive by-products, specifically hydrogen sulfide, would also gradually deteriorate surfaces made of concrete, iron, steel, etc., resulting in wall thickness loss and finally collapse of infrastructures.

Reacting with moisture and dissolved oxygen on surfaces in contact with wastewaters, hydrogen sulfide converts to sulfuric acid, severely corroding concrete and metal structures. Furthermore, acids formed by bacteria aggressively destroy the cement in concrete surfaces. As the time goes by, the situation could even be exacerbated with increase in hydrogen sulfide levels.

Additional factors including humidity, erosion, abrasion and chemical attacks are responsible for spurring corrosion. Moreover, temperature, wind intensity and direction and also UV exposures are of exterior variables effective in corrosion progress.

HEGGEL® FRP 333

Glass Mat Reinforced Furan Lining System
Perfect Solution for Extreme Environments

Structures in contact with industrial wastewaters such as industrial effluent ponds are subjected to a complex series of aggressive physical and chemical effects; this makes protective coatings essential for corrosion protection to reliably withstand these extreme conditions.



Due to a wide range of corrosive agents with various degrees of destructive effects found in industrial wastewaters and effluents, considering a protective coating that is effectively resistant to more diverse corrosive chemicals is a matter of paramount importance.

HEGGEL FRP 333 is a composite lining system based on advanced furan resin, reinforced with glass mats to demonstrate improved mechanical properties. The polymer has also excellent chemical resistance and is particularly high-performing in handling solvents and aggressive environments.

Resistant Against Complex Corrosion Process

HEGSEL FRP 333 combines unique application and performance properties by implementing both mineral and organic molecular structure. It is extremely resistant against general corrosion and also extreme corrosion originating from acids, alkalis, solvents and their various combinations.

Sustainably effective by its interpenetrating network, i.e., high-performance resin with fiber reinforced structure, **HEGSEL FRP 333** offers an impermeable uniform surface level which provides long-term protection against corrosive media, and its strong mechanical properties greatly prevent physical damages to the surface.

The excellent adhesion strength of **HEGSEL FRP 333**, both to steel and concrete surfaces, makes it ideal for anticorrosion applications: More specifically, its adhesion strength to concrete is more than the inherent tensile strength of concrete itself.



Diverse Advantages

Stability combined with high temperature tolerance, furan-based laminate system of **HEGSEL FRP 333** exhibit a broad range of chemical resistance as well as excellent mechanical and physical properties.

The advanced technology utilized in the microstructural development of **HEGSEL FRP 333** results in the superior mechanical properties including tensile strength, high compressive and flexural strength. These enhanced properties considerably ameliorate impact resistance and increase material durability against stress imposed in shrinkage and expansion conditions of concrete.

Long shelf life of **HEGSEL FRP 333** makes it possible to store the product for minimum two years. While maintaining technical features, this shelf life could be extended, in case instructions on proper storage at ambient temperature, in dry environments deplete of direct sunlight are followed.

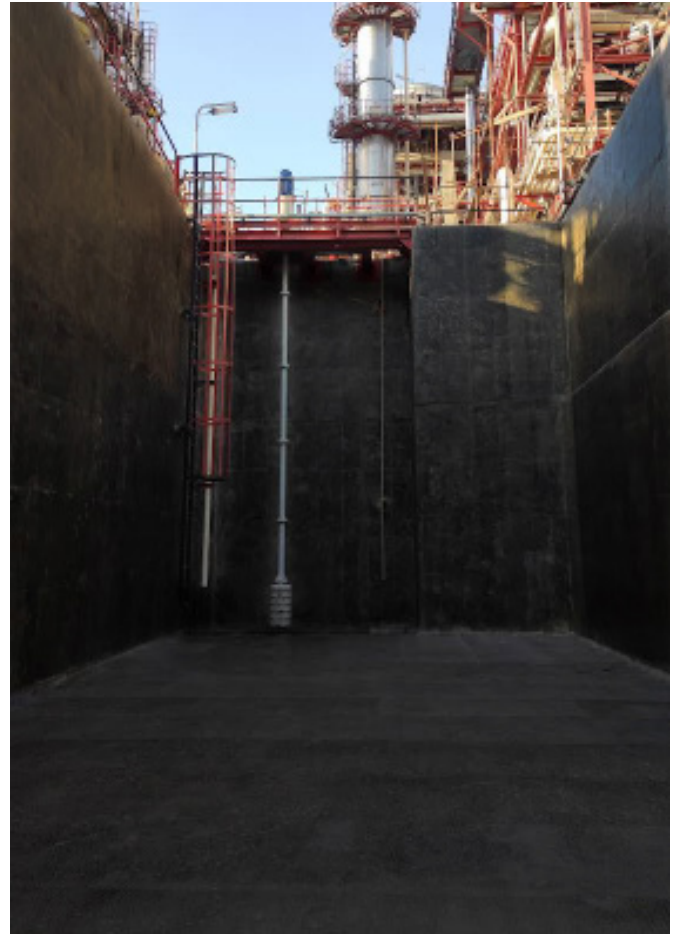


Due to the prolonged shelf-life, the material could be stored on-site and rapid, easy repair could be carried out if needed. The high storability makes it possible to implement the available material for repair and further damage prevention purposes on demand and very quickly.

Conforming with REACH European Regulation, **HEGSEL FRP 333** is quite environment friendly and provides high level of protection of human health against the risks that can be imposed by chemicals, compared to other resins in the market.

Contrary to other resins that may require several constituents for their curing process to be completed, **HEGSEL FRP 333** is a two-component system benefiting from a user-friendly application, just needing a mixing of the hardener part with the base material. Accordingly, the coating offers easy installation, repair and maintenance procedures.

HEGSEL FRP 333 is customized for particular industrial requirements to improve the condition of infrastructures, minimize the cost of replacing structures and equipment, and add years of service to their facilities.



Technical Data	Standard	Value
Adhesion Strength (Concrete/Screed)	DIN EN ISO 4624	>Inherent tensile strength (concrete) MPa
Adhesion Strength (Steel)	DIN EN ISO 4624	Approx. 4 MPa
Electrical Leakage Resistance (Electrically conductive variant)	DIN EN 14879-3 at a relative humidity of > 70 %, ASTM F 150/98	$\leq 1 \times 10^6 \Omega$
Hardness Shore D	DIN 53505, ASTM D 2240	> 60
Max. Operating Temperature Dry (Concrete/Steel)	-	+60 / +100°C