



HEGGEL®

You Build, We Protect!

NEWSLETTER

HEGGEL® FRP 321

May 2022



INSIDE THIS ISSUE:

Glass Mat Reinforced Phenol Lining System

-  **Chemical Containment/Corrosion Control**
-  **Containment Dike Lining**
-  **Critical Exposures**
-  **High-Performance Phenolic FRP**
-  **Applications**

Containment Dikes

► Chemical Containment and Corrosion Control

Industries dealing with chemicals are continuously challenged to maintain reliable facilities while preserving the environment against multiple exposures of surfaces to hazardous and corrosive substances. Chemical splashes, spillage of acids and alkalis and surface contaminations caused by petroleum products and other harsh elements severely increase the risk of failure in industrial infrastructures.

Diking is one of the most common types of containments, constructed for above-ground facilities such as storage tanks, to efficiently prevent chemical pollution and the spread of spilled corrosive materials.

Uncontrolled discharge of chemicals can lead to far-reaching environmental and financial costs; therefore, a containment system is mandated to be put in place to prevent and mitigate the failure of industrial components processing hazardous substances such as hydrocarbons and chemicals. In addition, containment dikes introduce general and specific measures in:

- ✓ Prevention of contaminations of soil, surface water and surrounding ecosystems
- ✓ Prevention of contact between equipment and reactive materials in case of leakage or spills
- ✓ Limiting the spread of burning liquid in case of ignition



► Considerations

The diking constructions should be made of or protected with materials comprised of sufficient corrosion and abrasion resistant characteristics to withstand the chemical splashes and spill of acids, petroleum products and other damaging substance flows.

Bare concrete diking surfaces are porous and permeable to water or any other aqueous chemical. Despite precautionary measures, cracks specifically in concrete walls, floors and hole passages of the pipes occur frequently.

Moreover, thermal expansions, plastic shrinkage and the following stress result in cracking. This would allow the spilled material to flow out of the dike area while exacerbating the ingress of chemicals. An increase in the porosity or the crack growth in depth and length leads to deeper penetration of chemicals, destructing the monolithic properties of the concrete wall and eventually engulfing the whole plant.



Containment Dike Lining

Surfaces underlying containers, storage tanks, pipework, etc, in diking areas should be free of gaps and adequately impervious to hold accumulated spills, leaks and precipitations of chemicals until they are detected and fully removed.

To eliminate the possibility of extremely hazardous events, containment dike constructions must be lined with compatible materials resistant against long-term contact with corrosive chemicals so that adequate protection is provided to maintain concrete substrates from deterioration.

Furthermore, sufficient strength and thickness of the lining system to withstand pressure gradients, atmospheric variations and the mechanical stress caused by daily operation are of paramount importance.

The resistance to UV depredating effects and the capability to hold up thermal expansion and contraction are of essential requirements when it comes to a standard lining system for outdoor dike zones.

Although anti-acid tile/brick linings can be an effective protective method to sustain severe chemical exposures and heavy mechanical loads in various service conditions at different temperatures, state-of-the-art corrosion resistant linings have been innovatively designed to provide more versatile and cost-effective means of achieving plant safety and integrity, while competing well with conventional corrosion protection lining systems.

Glass fiber-reinforced corrosion resistant materials, also known as laminates, have emerged as a sophisticated solution to a broad range of industrial challenges.

HEGSEL FRP category is exclusively designed based on novel synthesized resins, representing corrosion resistant, durable and high strength laminate systems suitable for a variety of applications.



Critical Exposures

Conventional repairs of rubber Prevalent industrial application of strategic chemicals such as sulfuric acid, hydrochloric acid, hydrofluoric acid, sodium hydroxide, etc. specially in high concentrations demand proper storage equipment. Chemical tanks, containers and the connecting network of pipes are among the main storage facilities in various industrial sectors.

Containment dikes surrounding the storage equipment designed to confine the spills or leakages could be directly in short or long-term contact with destructive chemical substances and therefore, vulnerable surfaces should be protected with a robust and lasting lining in the presence of the harshest and most corrosive environments.

HEGSEL FRP 321 is a well customized laminate system formulated based on a special phenolic resin, characterized for corrosion control, and capable of withstanding chemical attacks from various aggressive media to enable effective containment and controlled discharge of spilled deteriorative materials.

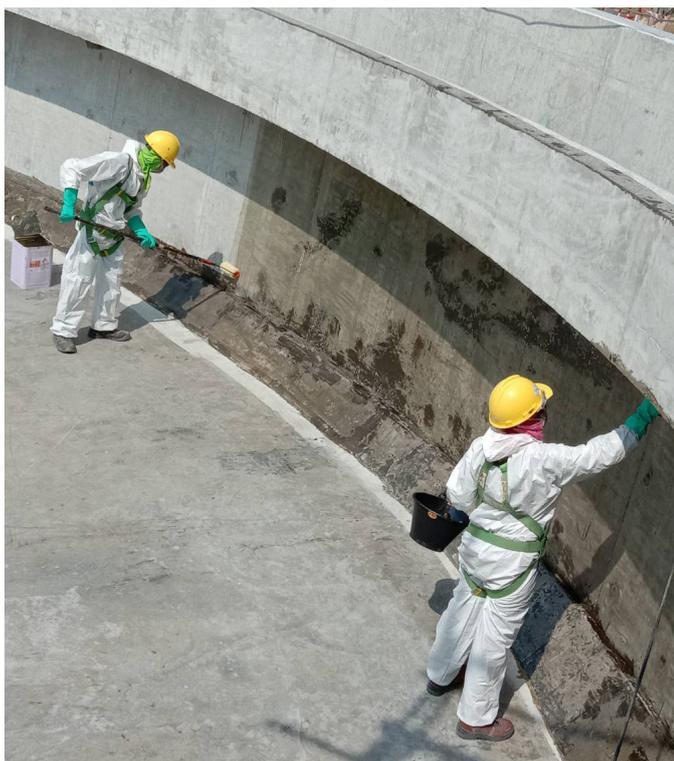
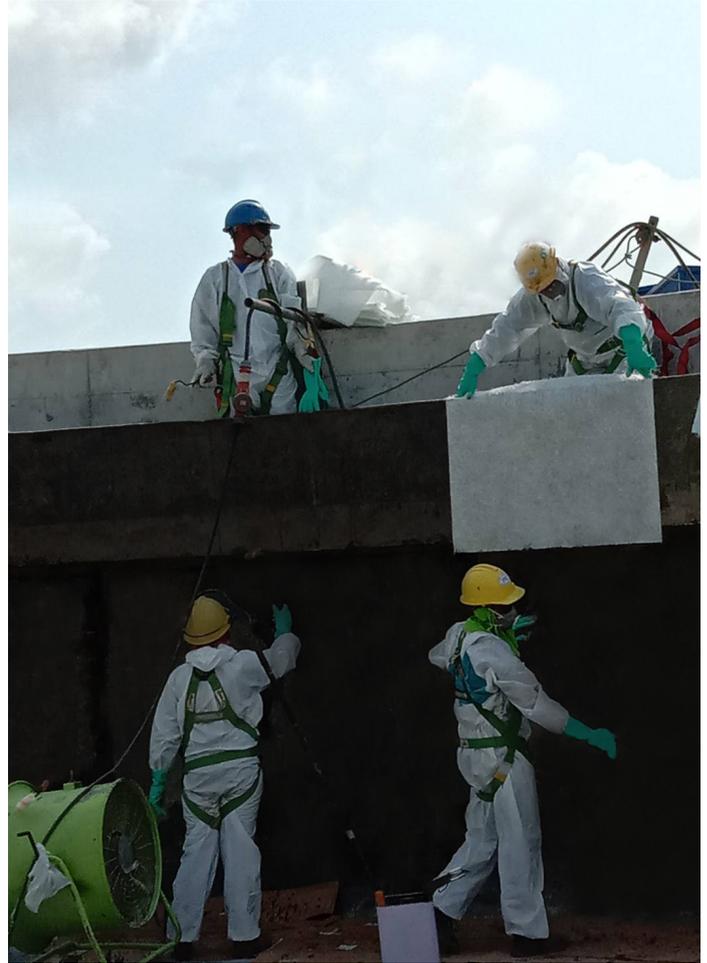


HEGSEL® FRP 321

Enhanced Durability by High-Performance Reinforced Synthetic Phenol Resin System

HEGSEL FRP 321 is a high-tech laminate system composed of phenol-based resin coating, incorporated with glass fibers for enhanced durability to suit a wide range of chemical resistance and anti-corrosion requirements. **HEGSEL FRP 321** is not only a reliable choice to ensure newly fabricated substrates remain defect-free, but also it can be applied to existing constructions to maintain the preliminary surface characteristics.

Innovatively formulated fiber-reinforced polymer product of **HEGSEL FRP 321** is a cost-effective, fast-curing and long-lasting solution for secondary containment structures designed to resist occasional chemical splashes and spills. With exceptional efficiency in corrosion protection, requiring minimum maintenance, **HEGSEL FRP 321** is an optimal choice with easy installation, specially where the simultaneous presence of strong acids and alkalis has made the selection of a proper surface/floor protection challenging.



The impermeable lining system, **HEGSEL FRP 321**, also helps to preserve industrial assets against exposure to corrosive chemicals and concentrated acids such as sulfuric acid, hydrochloric acid, hydrofluoric acid and sodium hydroxide in containment areas, dikes, chemical collection trenches, sumps, etc.

HEGSEL FRP 321 demonstrates considerable mechanical strength, enduring mechanical stresses excellently. Moreover, depending on the service conditions including the imposed mechanical loads, **HEGSEL FRP 321** is suited to be customized with a selection of differing fiber weights, number of layers and material consumption to construct a well-reinforced system which fully meets the technical requirements of every project.

Characteristics

- ✓ Excellent chemical resistance specially against concentrated acids and solvents
- ✓ High temperature resistance up to +90°C(dry)
- ✓ Electrically conductivity
- ✓ Cost effectiveness
- ✓ Easy and time-saving installation
- ✓ Customizable thickness
- ✓ Superior mechanical properties



Application Areas

- ✓ Containment dikes
- ✓ Ditches
- ✓ Trenches
- ✓ Rail cars areas
- ✓ Above-ground storage tanks areas
- ✓ Aircraft hangars
- ✓ Sumps
- ✓ Hazardous material work areas
- ✓ Process/ treatment sites
- ✓ Waste runoff ditches/ dikes

Technical Data	Standard	Unit	Value
Resistance to Ground	DIN EN 14879	Ω	$\leq 1 \times 10^{8*}$
Density (Mixture)	EN ISO 2811 (ASTM D1475)	g/cm ³	1.20
Adhesion Strength Concrete	EN ISO 4624	N/mm ²	Own tensile strength
Hardness Shore D	-	-	> 60
Max. Operating Temperature Dry	-	°C	+ 90

Note: The indicated temperatures are dependent on the present load and may vary

* When using the 290 g/m² hybrid fleece