



INNOVATION IN EVERY COAT.™

PERMA-SHIELD®

CONTINUOUS CORROSION PROTECTION
FOR WASTEWATER FACILITIES



LININGS DESIGNED TO SHIELD WASTEWATER STRUCTURES

For wastewater to become clean water, your infrastructure needs to be protected. Built to shield wastewater facilities against corrosion, Tnemec's series of Perma-Shield linings for concrete, steel and ductile iron, offer the best protection in the industry. Tnemec specifically designed these fluid-applied coatings to match PVC liners' ability to resist the threat of hydrogen sulfide (H₂S) gas permeation, but without the seams and other hassles.

Manufactured by a leader in the wastewater industry for more than 50 years, these products offer your facility the ultimate defense against corrosion, extending your infrastructure's life and protecting your investment.

431 DATASHEET

435 DATASHEET

434 DATASHEET

436 DATASHEET

THE PERMA-SHIELD PRODUCTS

Designed to resist the biological and chemical components typically found in wastewater streams, Series 431 Perma-Shield PL, Series 434 Perma-Shield H₂S, Series 435 Perma-Glaze and Series 436 Perma-Shield FR – all 100% solids hybrid epoxies – are derived from modern coatings technology, but offer various options for protecting your facility.

These products are ideal for grit chambers, wet wells, lift stations, steel and ductile iron pipes, aeration basins, launderers, digesters, headworks, clarifiers and other areas prone to sulfide corrosion.



FEATURES AND BENEFITS

- H₂S permeation resistant
- Sulfuric acid resistant
- Abrasion, chemical and sewage resistant
- Increased film thickness
- Rapid return-to-service
- 100% solids hybrid epoxies
- Trowel or spray application options



SERIES 431 PERMA-SHIELD PL is a spray-applied epoxy lining for the interior or exterior of ductile iron and steel pipe exposed to severe wastewater or corrosive soil conditions. This high-build lining is loaded with ceramic microspheres for added abrasion- and chemical-resistance and can be applied in one or two coats allowing for efficient through-put of sewer pipes and fittings.

SERIES 434 PERMA-SHIELD H₂S is an aggregate-reinforced mortar designed to reduce permeability and provide an impenetrable system to H₂S gas. Since it is specifically formulated to withstand harsh wastewater environments, its resistance to abrasion, corrosion and impact allows facilities to not only last longer but perform better and avoid costly downtime as well. Series 434 is especially useful on rehab projects where substantial substrate loss has occurred.

SERIES 435 PERMA-GLAZE is a spray-applied epoxy coating that can be used alone as a high-build protective liner, a thin-film coating or as the chemical- and permeation-resistant glaze coat over Series 434 Perma-Shield H₂S or Series 436 Perma-Shield FR.

SERIES 436 PERMA-SHIELD FR is a spray-applied liner with fiberglass reinforcement, which allows for higher film build. It's ideal for protection against corrosion in new construction and concrete rehabilitation projects. The reinforcing fiberglass also dissipates curing and impact stresses that typically develop in high-build liners, leading to better film integrity and a longer service life.

PALM BEACH COUNTY, FL • In 2019, Palm Beach County upgraded its treatment process to include anaerobic digestion and began by converting existing tanks to aerated waste activated sludge (WAS) storage tanks and centrate EQ tanks. The concrete tank interiors were repaired using Tnemec resurfacing materials and followed by a coat of the high-build, 100% solids epoxy lining, Series 434 Perma-Shield H₂S. The tanks were finished with a coat of Series 435 Perma-Glaze for extra chemical resistance and protection against microbiologically influenced corrosion (MIC) and H₂S gases.



PERMA-SHIELD PERFORMANCE

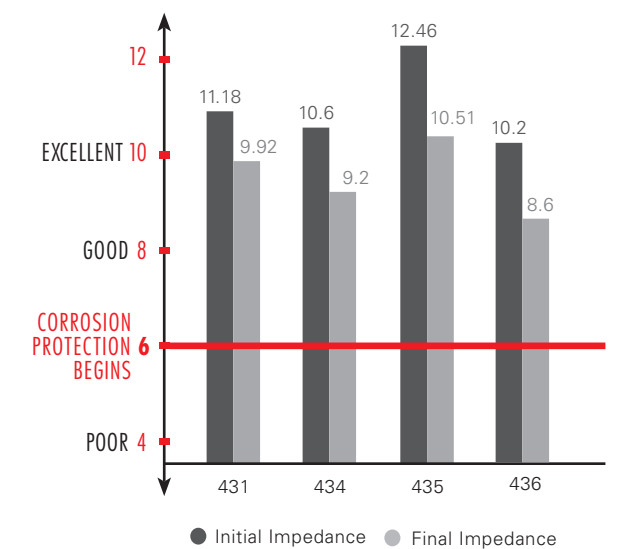
ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY (EIS),

a component of the S.W.A.T. test, is a method that uses electrical current to determine the level of coating degradation after exposure to a testing environment. Measuring a coating's resistance as impedance to an electrical current before, during and after provides a correlation to its overall performance. The higher the resistance, the lower its permeability to gases, liquids, chlorides and ions, thus the more protection it offers.

THE TEST In order to evaluate coating performance, Series 431, 434, 435 and 436 underwent the Severe Wastewater Analysis Test (S.W.A.T.) per ASTM Standard G210. This accelerated wastewater corrosion-testing program was developed by Tnemec – with help from leading engineers, municipalities and testing laboratories – to test a coating's resistance to H₂S permeation, which is the leading cause of coating failure within wastewater facilities. Out of the hundreds of coatings tested, the Perma-Shield linings tested excellent for permeation resistance, adhesion and visual inspection, making them the best long-term wastewater protection – and the only protection on which you can rely for your own facility's needs.

ASTM G210 S.W.A.T. EIS ANALYSIS: PERMEATION

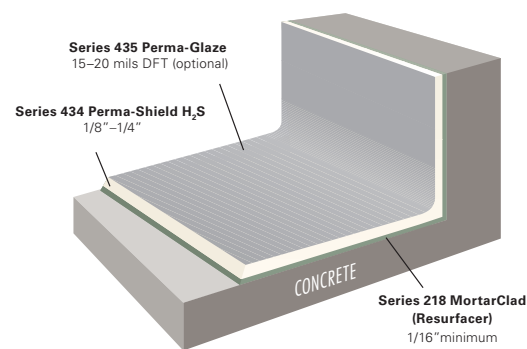
Coating Impedance, Log Z @ 0.01 Hz (ohms cm²)



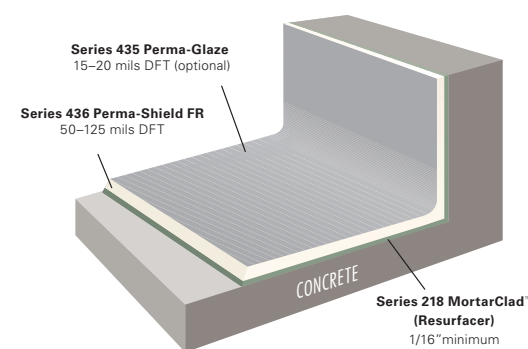
Note: For complete testing results, contact your local Tnemec representative.

THE VERSATILITY OF PERMA-SHIELD

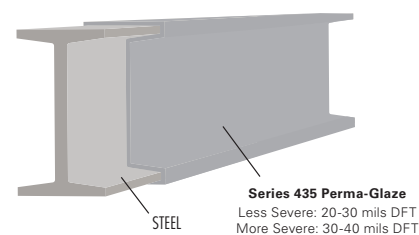
MORTAR AND OPTIONAL GLAZE COAT



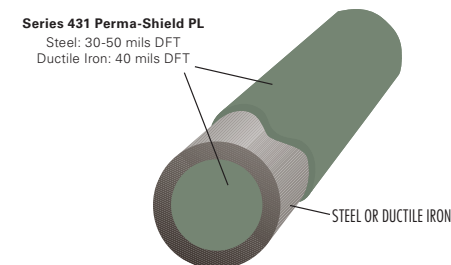
FIBER-REINFORCED HIGH-BUILD LINER AND OPTIONAL GLAZE COAT



HIGH-BUILD LINER



THIN-FILM COATING



RICHMOND, VA • When the largest wastewater plant in Virginia needed to resurface and line their filter tanks, they reached out to their local Tnemec representative for a high-performance lining system recommendation. Based on product performance and successful case histories, the project team decided to specify and apply a Perma-Shield system, including the versatile, aggregate-reinforced wastewater lining, Series 434 Perma-Shield H₂S. After more than five years in service, the Tnemec-lined tanks continue to perform while the City of Richmond continues treating more than 70 million gallons a day of sanitary sewage and stormwater.



LOOKING FOR MORE INFORMATION ABOUT PERMA-SHIELD?

Contact your local Tnemec
representative at [tnemec.com](https://www.tnemec.com).

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Published technical data, instructions and pricing are subject to change without notice. Contact your Tnemec technical representative for current technical data, instructions and pricing. Warranty information: The service life of Tnemec's coatings will vary. For warranty, limitation of seller's liability and product information, please refer to Tnemec Product Data Sheets at [tnemec.com](https://www.tnemec.com) or contact your Tnemec technical representative. © Tnemec Company, Inc. 2022 BROPS