Tank maintenance

Our guide to the economical repair of corroded tank bottoms

Maintain your investment with our pioneering and reliable tank lining solutions.

Maintaining your investment

PPG is widely recognised as a pioneer of protective coatings for the internal lining of storage tanks.

Over the past 40 years, we have developed an extensive portfolio with tank lining solutions for virtually every type of cargo and stored product – from crude oil to chemicals and potable water. We continue to invest and innovate within this field with the objective of providing the most reliable and cutting edge technology to maintain your investment.

Our products are widely used at the new-build stage where they extend the service life of tanks in power, offshore and civil infrastructure industries. They also provide effective remedial solutions for the repair of damaged tank bottoms.

All our coatings are backed by the support of highly experienced technical teams who operate worldwide and who advice our customers on choosing the best solution for each repair.

Repairing corroded tanks bottoms

The degree of corrosion that can occur within storage tanks, especially those used for the storage of crude oil, is often underestimated. We see this reflected in the large number of serious corrosion problems encountered at various tank farms for crude oil storage.

Storage tanks that have not been adequately protected by effective coating systems show extreme corrosion, particularly on tank bottoms and lower sections of sidewalls. During continuous crude oil service, inspection programs will highlight incidences of severe pitting and steel loss.

Types of corrosion and pitting

Open pitting (easy to fill)

Omega pitting (difficult to fill)

If left untreated, severe pitting corrosion may develop into localized perforation. This situation demands special attention as serious soil contamination and environmental damage will occur through cargo leakage, leading to considerable financial loss.

When faced with such serious damage to the bottoms of crude oil storage tanks, many tank farm owners realize that adequate maintenance is needed to prolong the service life of these tanks. This is where our experience and expertise proves invaluable.

Tank bottom repair using chopped glass fiber

If corrosion is so severe that perforation has already occurred and the general steel thickness is below the recommendations of the API standard, then the tank bottom will have to be replaced.

However, for minor localized perforations, a coating system with chopped fiber is generally able to bridge holes. For all other pitting where a coating system alone is not sufficient, inclusion of chopped glass fiber with our solvent-free tank linings is the ideal solution. The following will guide you through the process.

Step 1: Repairing of pits
Pitting can be repaired in different ways: by means of welding steel plates or using the PPG SIGMAGUARD™ CSF 650, PPG NOVAGUARD™ 650, PPG NOVAGUARD 615, PPG NOVAGUARD 840, or PPG NOVAGUARD 890 products as spray-able pit fillers.

These products are all solvent-free and self-caulking, offering high-build protection over critical areas and zero shrinkage in filled pits. The coating gradually penetrates the pitting and after 5 to 10 minutes, depending on the depth of pitting and ambient conditions, the excess surface material can be scraped off using a squeegee.

Caulking compound / stripe coat

Tank lining

Step 2: Repairing uneven areas
In some situations, even after filling the pits, a caulking compound may be required to level the uneven areas. Our PPG NOVAGUARD 830 coating can be applied to all weld seams, lap joints, shell side joints or other surface projections to provide a smooth surface transition.

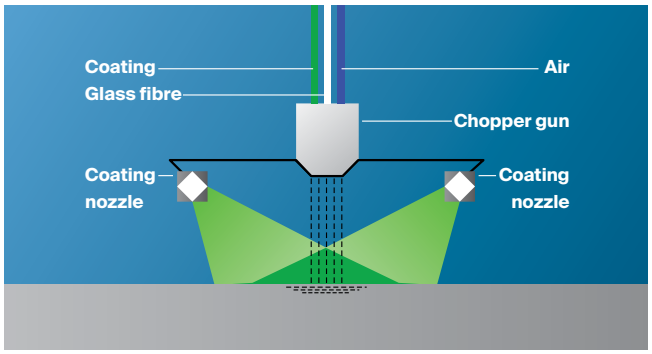
It is important that an even surface is provided by the caulking compound to assist in the application of the chopped fiber laminate to the tank bottom and joint areas.

Step 3: Repairing of the tank bottom with a reinforced system
After applying a primer (optional), filling the pits, leveling uneven areas with caulking compound and stripe coating the weld seams, the tank bottom is ready for the application of the chopped fiber system.

Glass roving is fed into the rear end of a chopper gun that cuts the roving into short pieces to about 2.54 cm (1 inches) in length. The special spray apparatus ensures that the chopped fiber passes through the dual spray fans so that the fiber is encapsulated by the solvent-free coating before it lands on the steel surface.

To consolidate the glass fiber laminate, any trapped air is removed by rolling the coatings soon after application with a split-washer roller. After completion of the chopped fiber application, a final full coat of solvent-free finish, without chopped fiber, is applied to seal the laminate and give a smooth, easy-to-clean surface.

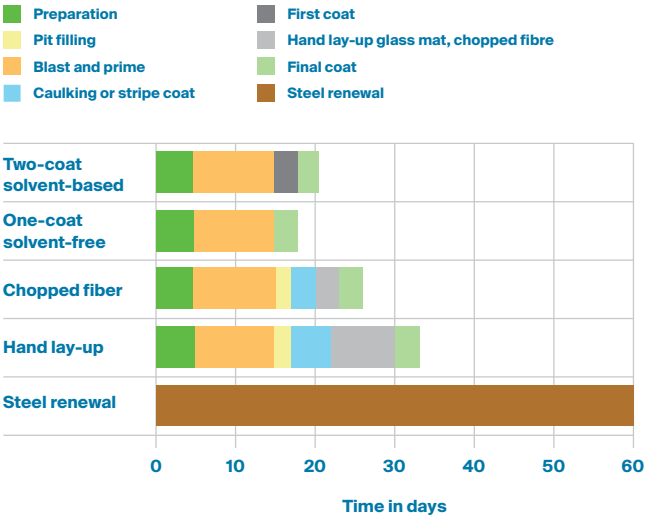
Chopped fiber application



Saving time and material costs

Compared to the amount of time the tank is out of service for various maintenance options, it is clear that repairing tank bottoms with a sprayed chopped fiber laminate is extremely economical, as demonstrated in the comparison below:

Time for maintenance: 2,750 m^2 (9,022 ft^2) tank 30m (98.4 ft) diameter.



The above clearly shows at least 50% saving in time when using our chopped fiber system, compared to steel renewal. Moreover, the material and application of our chopped fiber system is cheaper, resulting in further cost savings for tank farm operators.

Our tank maintenance products

The PPG SIGMAGUARD CSF 650, PPG NOVAGUARD 650, PPG NOVAGUARD 615, PPG NOVAGUARD 840 and PPG NOVAGUARD 890 products can all be used as pit fillers and for the chopped fiber system. Refer to information sheet 1701L1 for using silica sand/solvent free lining as caulking compound.

Depending on cargo storage, the appropriate tank lining must be selected. For more detailed information on the chemical resistance of our coatings you can use our online TankSelect tool (http://tankselect.sigmacoatings.com).

Please note that it is very important to apply the selected tank coating in accordance with the relevant product datasheet, which you can download from our website.

We also provide a comprehensive Tank Maintenance Manual, which is available on request by email or telephone. You can also contact your local sales representative who will be able to provide any additional advice and support you may require.

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