PPG Petrochemical Storage Tank Solutions

Durable protection from the inside out

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Durable protection from the inside out

PPG is a world leader in protective and marine coatings.

Our global capabilities and respected protective coatings solutions enable us to provide our customers with exceptional performance. Our proven and trusted coating solutions protect a wide range of assets for the most demanding markets and environments, including:

- Civil Infrastructure
- Marine
- Mining
- Offshore
- Petrochemical
- Power
- Rail

PPG has the scale and resources to deliver outstanding support with well-established operations in over 60 countries. Continuous development ensures that we provide optimum solutions for asset owners, contractors, fabricators and applicators across the globe, helping our customers to meet the challenges they face today and tomorrow.

Experience, innovation and integrity – that is what makes PPG the ideal coatings partner.

PPG is a leader in storage tank coatings and linings, offering protection against corrosion while minimizing tank maintenance.

Tank linings – proven to protect tank integrity for more than 20 years of track record

Our tank lining range includes solvent-free and solvent-based epoxy and phenolic epoxy coatings, and zinc silicate tank coatings. Our lining series protect tank integrity and guard against product contamination for a wide range of products.

Tank exterior finishing – proven to protect against corrosion forces and weathering

Aggressive conditions such as chemical spillage, atmospheric pollution, high humidity and ultraviolet radiation present severe challenges to corrosion prevention. Our full range of polysiloxane and polyurethane coating systems, such as the PPG PSX® and PPG SIGMADUR™ coatings are designed to protect tank exteriors against various forms of corrosion. These durable finishing systems exhibit excellent gloss and color retention to keep tanks in good condition over a long period of time.

PPG is your trusted tank coating provider for excellent protection and maximum performance!

PPG tank linings

Solvent-free ranges

The PPG SIGMAGUARD™ CSF range and PPG NOVAGUARD™ 600 series, are cold and solvent-free epoxy tank linings and have been in extensive use throughout the petrochemical industry for 25 years.

The PPG NOVAGUARD 800 series use our novolac technology and the PPG NOVAGUARD 4801 coating uses vinylester technology. All offer excellent resistance to a wide range of chemicals.

PPG's solvent-free ranges are ideal for both new construction and maintenance projects. They ensure safe storage against the a wide range of products even for the most aggressive biodiesel and bioethanol blends. The pit-filling property of the linings makes our solvent-free tank linings the better choice for tank bottom maintenance instead of traditional steel renewal or thin-film, solvent-based epoxy coating solutions. In addition, their solvent-free nature considerably improves working conditions during application.

PPG solvent-free tank linings

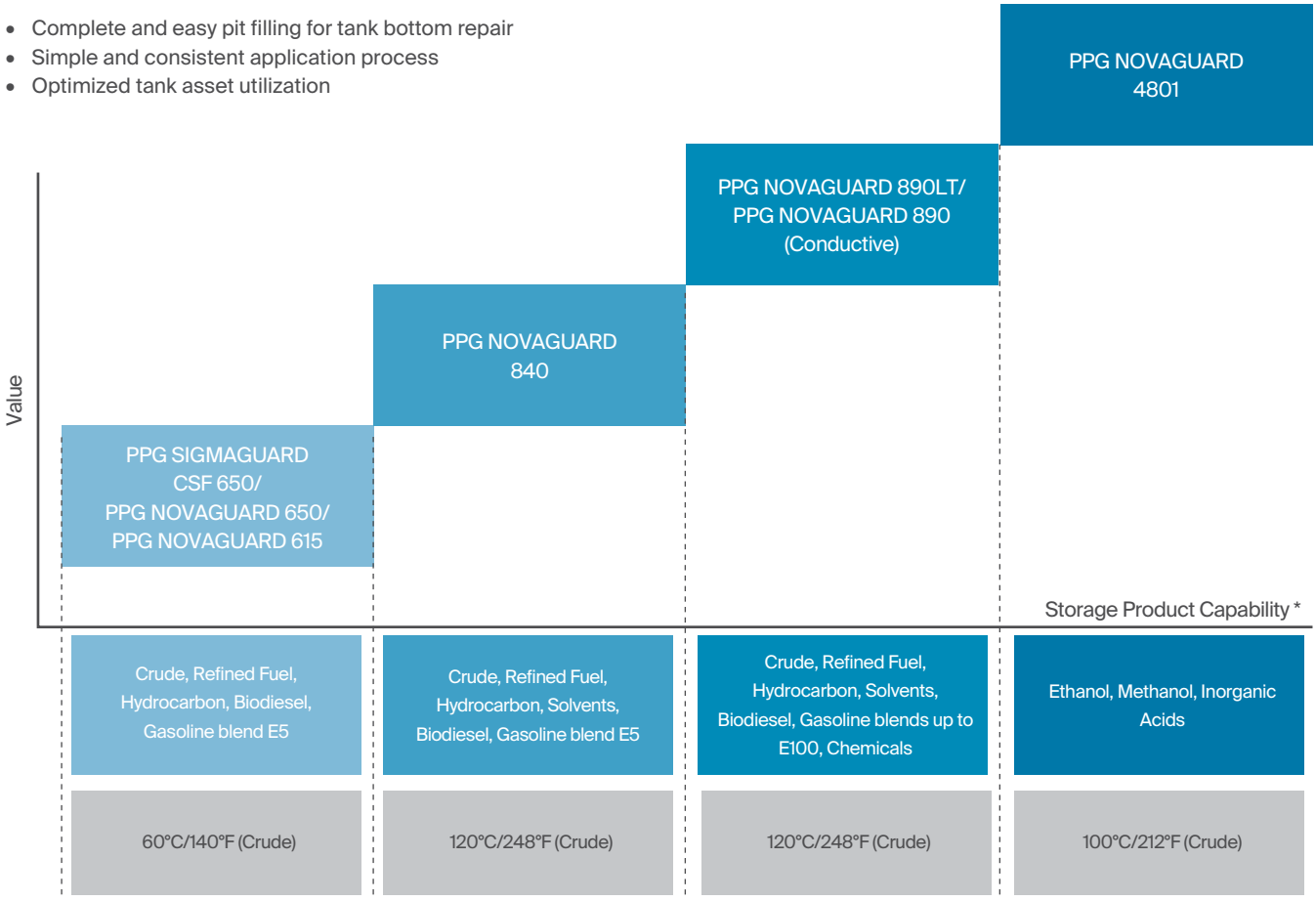
Our leading epoxy solvent-free tank linings deliver a range of key benefits:

- Complete and easy pit filling for tank bottom repair
- Simple and consistent application process
- Optimized tank asset utilization

Types of corrosion pitting

Open pitting (easy to fill)

Omega pitting (difficult to fill)



* For detailed information on resistance and resistance notes, please refer to your PPG representative.

** Holding primer information: PPG SIGMAGUARD CSF 650, PPG NOVAGUARD 650 and PPG NOVAGUARD 615 are direct-to-metal (DTM) and do not need a holding primer, but use PPG SIGMACOVER 280 when needed. For PPG NOVAGUARD 840/890, use PPG NOVAGUARD 260 or PPG PHENGUARD 965 as a holding primer. PPG NOVAGUARD 4801 is direct-to-metal (DTM) for steel substrate; for concrete, use PPG NOVAGUARD 4701 vinylester penetrating primer.

Featured products

Products listed by alphabetical order.

PPG NOVAGUARD 840

The PPG NOVAGUARD 840 tank lining provides excellent resistance to crude oil up to 120°C. This two-component, solvent-free phenolic epoxy coating also offers outstanding resistance to a variety of unleaded gasolines, chemicals, and solvents.

Benefits

- One-coat system directly to steel
- Can be used as a pit filler in crude oil storage tanks
- Light color with smooth and glossy appearance enhancing cleaning and inspection
- Allows reinforcing with chopped glass fiber or glass mat
- Approved to E1541 section 2.2 for the storage of jet fuels

PPG NOVAGUARD 890

PPG NOVAGUARD 890 is a two-component solvent-free novolac tanklining to be used on refurbishments or new tanks. It is formulated to protect the steel to a wide range of cargos, including biodiesel and ethanol blends up to 100%.

A low-temperature cure version, as well as a electrically conductive version are available at request.

Benefits

- One-coat system directly to steel
- No hot-cure required when gasoline blends with ethanol are stored
- Resistant to crude oil up to 120°C
- Light color with a smooth and glossy appearance enhancing cleaning and inspection
- Allows reinforcing with chopped glass fiber or glass mat
- Approved EI1541 section 2.2 for the storage of jet fuels
- Minimum surface temperature during application : -5°C (Low Temperature version)
- Minimum curing temperature : -10°C (Low Temperature)
- Conductive version available

Successful track record of 25+ years

PPG SIGMAGUARD CSF 650

- No degradation
- No blistering
- No cracking
- No discoloration
- No softening
- Excellent adhesion

Cleaned and evaluated

PPG NOVAGUARD 4801

The PPG NOVAGUARD 4801 product is a highly chemical- and acid-resistant glass-flake vinylester coating suitable for concrete and steel substrate for both new and old steel. It provides excellent resistance to “organic and inorganic” acids and a wide range of solvents. The coating also offers outstanding resistance to temperature and provides excellent adhesion in dry and immersion conditions, combined with ease of application (single-feed airless spray).

Benefits

- Excellent resistance to chemicals at high temperatures
- Excellent resistance to (in)organic acids
- Suitable for high temperature immersion
- Suitable for application on concrete

PPG SIGMAGUARD CSF 650/PPG NOVAGUARD 650/ PPG NOVAGUARD 615

The PPG SIGMAGUARD CSF 650/PPG NOVAGUARD 650/ PPG NOVAGUARD 615 are one-coat, anticorrosive tank linings for crude oil and aliphatic petroleum products. These two-component, solvent-free epoxy coatings provide exceptional pit-filling properties with no shrinkage at high-film thickness. The PPG SIGMAGUARD CSF650 tank lining has been used throughout the petrochemical industry for 20 years and has been inspected after prolonged hydrocarbon immersion services with outstanding results - no corrosion, blistering or softening.

* PPG NOVAGUARD 615 is phenolic epoxy.

Benefits

- PPG NOVAGUARD 615 is phenolic epoxy
- One-coat system directly to steel
- Can be used as a pit filler in crude oil storage tanks
- Light color with a smooth and glossy appearance enhancing cleaning and inspection
- Allows reinforcing with chopped glass fiber or glass mat
- Approved according to EI1541 section 2.2 for the storage of jet fuels

Oiltanking Stolthaven Terminal Antwerp - Tank Internal (Year: 2018)

PPG NOVAGUARD 890LT
2 x 300 µm DFT

Vopak Westpoort Amsterdam Terminal (Year: 2013)

PPG NOVAGUARD 890
2 x 300 µm DFT

PPG tank linings

Solvent-borne ranges

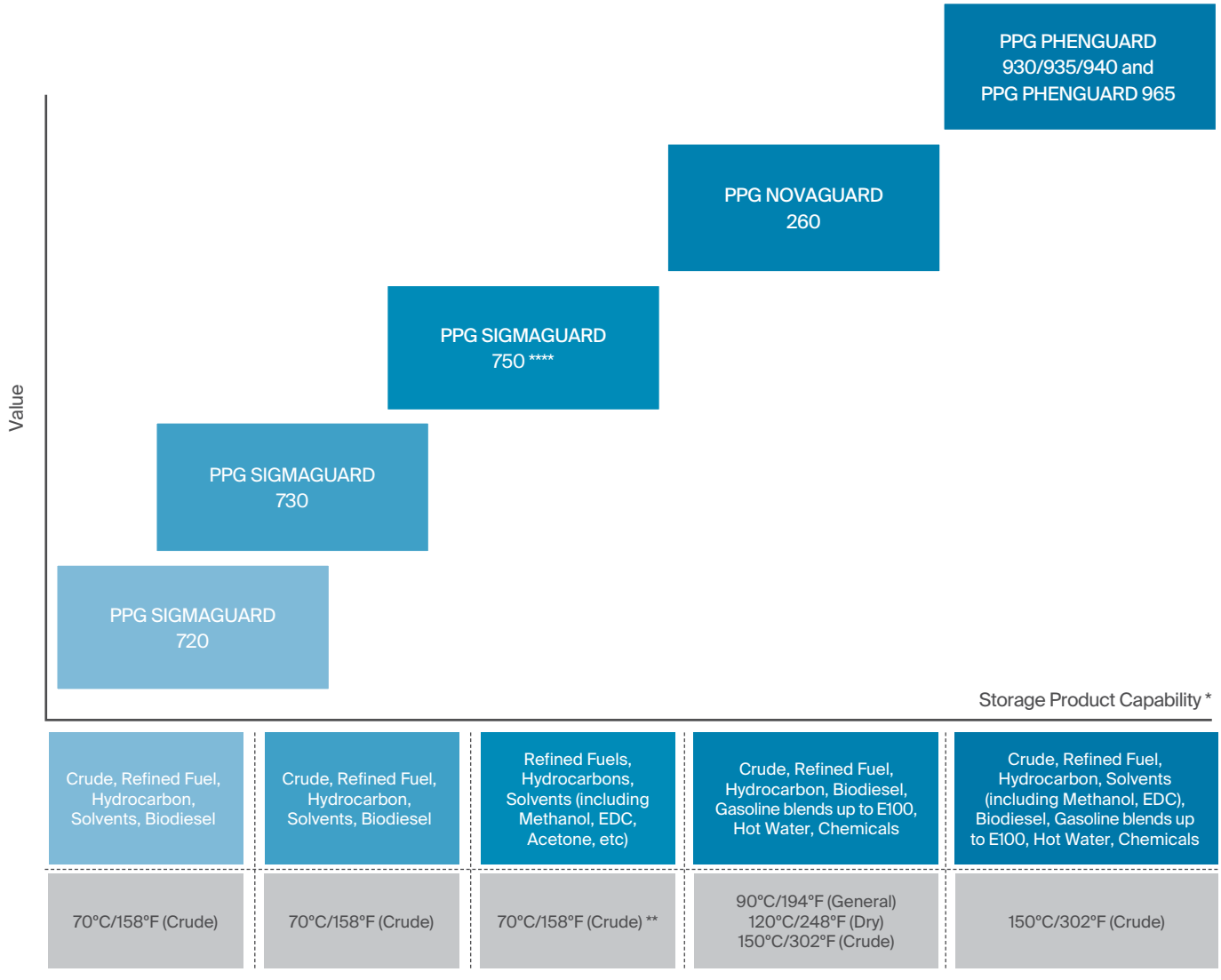
For extremely challenging applications, only the robust chemical resistance provided by solvent-borne tank coatings will provide the most effective protection.

Over the past 40 years, PPG has developed a complete portfolio of solvent-borne tank linings. The PPG PHENGUARD™ range was the first phenolic epoxy amine coating to have the widest range of chemical resistance for the most corrosive and extreme conditions. PPG SIGMAGUARD tank linings are designed to provide ultimate protection against harsh and highly corrosive chemicals, and acidic products.

PPG solvent-borne tank linings

Our solvent-borne tank linings offer proven performance to protect your tank assets and chemical products. All linings have an extensive track record and deliver a range of key benefits:

- Recognized corrosion control coating (Lloyd's register)
- Simple and consistent application process
- Optimized tank asset utilization



* For detailed information on resistance and resistance notes, please refer to the latest issue of the TankSelect.

** For limitation information, please refer to TankSelect (tankselect.sigmacoatings.com).

*** Holding primer information: PPG SIGMAGUARD 750 and the PPG PHENGUARD 930/940/935 system do not require a holding a primer. PPG SIGMAGUARD 720 and 730 do not need a holding primer but use PPG SIGMACOVER 280 as an optional holding primer when needed.

**** In some areas, PPG DIMETCOTE 9 may be offered instead. Chemical resistance requirements should be discussed with PPG technical representative.

Featured products

Products listed by alphabetical order.

PPG NOVAGUARD 260

The PPG NOVAGUARD 260 tank lining provides extremely good protection against a wide range of chemicals. The high quality two-coat system serves as an effective holding primer that makes it easy to apply two coats of Novolac phenolic epoxy systems.

Benefits

- Excellent resistance to alcohols, hot and sour crude as well as refined products.
- Resistant to hot water (90°C)
- Cures down to 5°C
- Good abrasion resistance

PPG PHENGUARD 930/935/940 and PPG PHENGUARD 965

The PPG PHENGUARD tank lining range provides excellent resistance to organic acids, alcohols, vegetable oils, fats, and solvents. The system consists of three high-build Novolac phenolic epoxy coatings and offers the perfect solution for high resistance to organic acids, alcohols, vegetable oils, fats and solvents.

Benefits

- Excellent chemical resistance against methanol and resistant to hot water
- Low cargo absorption
- Light color with a smooth and glossy appearance enhances cleaning and inspection
- Proven performance with an extensive track record
- PPG PHENGUARD 965 assists in quick return-to-service. It cures down to 5°C

PPG SIGMAGUARD 720

The PPG SIGMAGUARD 720 tank lining delivers good resistance against a wide range of chemicals and for use at low temperatures. The two-component, high-solids coating product is also fast curing, which helps customers to reduce labor time.

Benefits

- Easy to apply with short curing times
- Cost effective and economic
- Good low-temperature cure
- Light color with a smooth and glossy appearance enhances cleaning and inspection

PPG SIGMAGUARD 730

The PPG SIGMAGUARD 730 tank lining provides excellent resistance to a wide range of chemicals and performs well at low temperatures. The two-component, high-solids phenolic epoxy product is also fast curing, which helps customers to reduce labor time.

Benefits

- Easy to apply with short curing times
- Good low-temperature cure
- Cost effective and economic
- Light color with a smooth and glossy appearance enhances cleaning and inspection

PPG SIGMAGUARD 750

The PPG SIGMAGUARD 750 tank lining provides outstanding resistance to a wide range of alcohols and to high- and low temperatures. The product is a two-component zinc-rich (ethyl) silicate coating and can be used either as a tank coating or as a system primer in various paint systems. It also provides excellent chemical resistance at both high- and low temperatures.

Benefits

- One-coat solution, quick, easy and directly applied to steel
- Provides excellent chemical resistance to a wide range of alcohols, including phenols, cresols and methanol
- No hot-cure required
- Proven performance with an extensive track record
- Recognized corrosion control coating (Lloyd's register)

PPG tank exterior coatings

Solutions for non-insulated and insulated tanks

PPG offers effective exterior tank solutions for a high-gloss finish with exceptional color- and gloss retention to protect your asset where protection and total operational cost criteria are essential. Our high-performance tank exterior systems provide value for long-lasting protection, outstanding appearance and reduced routine maintenance.

Typical tank exterior coating system*

Application	New Construction/Full Blasting	Maintenance and Repair
<120°C/248°F (No Insulation)	**Primer:** PPG SIGMAZINC 68SP (or) PPG DIMETCOTE 9 (or) PPG SIGMAFAST 278 **Buildcoat:** PPG SIGMACOVER 410/MIO (or) PPG SIGMAFAST 278 **Finish coat ** :** PPG SIGMADUR 550H	**Primer:** PPG SIGMAPRIME 700 (or) PPG SIGMACOVER 350ALU **Buildcoat:** PPG SIGMACOVER 350 **Finish coat ** :** PPG SIGMADUR 550H
<200°C/392°F (Insulated and Uninsulated *)**	PPG AMERLOCK 400GF/PPG SIGMASHIELD 400 (or) PPG SIGMATHERM 230 (or) PPG HI-TEMP 222G	PPG AMERLOCK 400GF/PPG SIGMASHIELD 400 (or) PPG SIGMATHERM 230 (or) PPG HI-TEMP 222G
<650°C/1202°F (for CUI-Corrosion Under Insulation)	PPG HI-TEMP 1027 (or) PPG HI-TEMP 900	PPG HI-TEMP 1027 (or) PPG HI-TEMP 900
Tank Roof	PPG SIGMASHIELD 880	PPG SIGMASHIELD 880
Tank Insulation	**Primer:** PPG AMERLOCK 400GF/PPG SIGMASHIELD 400 (or) PPG SIGMATHERM 230 **Insulation:** PPG HI-TEMP 707HB****	**Primer:** PPG AMERLOCK 400GF/PPG SIGMASHIELD 400 (or) PPG SIGMATHERM 230 **Insulation:** PPG HI-TEMP 707HB****

* The specifications are intended as a guide only. Please contact your local PPG representative for specific project information.

** For extended weather resistance, PPG PSX 700 is the best option. (Buildcoat is not needed.)

*** For non-insulated areas, high-temperature topcoats are recommended depending on the service area temperature. Consult your PPG representative for specific project requirements.

**** Depending on exposure, a topcoat may be advised.

Featured products

Products listed by alphabetical order.

PPG durable finish solutions

PPG PSX 700

The PPG PSX 700 exterior finish protects storage tanks against corrosion and weathering factors with a 20-year proven track record. This advanced system features our patented engineered epoxy polysiloxane, which provides corrosion resistance as good as an epoxy. It also offers exceptional color- and gloss retention that outperforms the best polyurethane on the market.

Benefits

- Can be applied directly over inorganic zinc
- High gloss, high solids, VOC compliant
- Low-surface energy – no mold or dirty stripes
- Good resistance to splash and spillage of chemicals
- Extended service life
- Reduced recoating frequency
- Unlimited recoatability

PPG SIGMADUR 550H

The PPG SIGMADUR 550H system offers exceptional, long-lasting cosmetics and protection. This finish coating is a two-component, aliphatic acrylic polyurethane topcoat that provides excellent resistance to atmospheric exposure conditions.

Benefits

- High-gloss retention with up to 10-year durability
- Less maintenance cost
- Easier to clean
- No chalking, no yellowing
- Cures at temperatures down to -5°C (23°F)
- Resistant to splash and spillage of chemicals
- Unlimited recoatability
- ISO 12944, ISO 20340 and NORSOK M501 approved

Total Refinery Antwerp
Tankshell Internal, Antwerp, Belgium

PPG NOVAGUARD 890LT 2 x 300 µm DFT

Tank 441 has a diameter of 43,89 meters, a height of 16,70 meters, and is equipped with a floating roof. PPG NOVAGUARD 890LT system was selected for the internal shell of this tank to ensure effective corrosion protection in combination with durable abrasion resistance.

Calumet Oil Storage Tanks
Shreveport, LA, USA

After 17 years, the PPG PSX 700 coating system continues to protect the Calumet oil storage tanks against corrosion.

No dirty stripes: the PPG PSX 700 topcoat reduces low-surface energy that helps to shield against dirt and chemicals that could create corrosion problems.

Significant cost savings: compared to traditional urethane systems, the PPG PSX system extended the service life of the tank, which resulted in reduced recoating frequency.

PPG tank exterior coatings

Solutions for non-insulated and insulated tanks

Products listed by alphabetical order.

PPG primer and buildcoat solutions

PPG DIMETCOTE® 9

The PPG DIMETCOTE 9 product is a two-component, inorganic zinc silicate primer. It delivers long-term protection with good impact- and abrasion resistance and good, low-temperature curing.

Benefits

- Withstands substrate temperatures from -90°C up to 400°C under normal atmospheric conditions
- Balanced zinc level
- Long-term protection
- Ideal for atmospheric exposure conditions
- Meets NORSOK M501 and ISO 12944

PPG SIGMACOVER 350/PPG SIGMACOVER 350ALU

The PPG SIGMACOVER 350/PPG SIGMACOVER 350ALU products are two-component, surface-tolerant, high-build, polyamine-cured epoxy primers. These aluminum epoxy primers are suitable for use on clean, aged, intact coatings with minimal surface preparation. Both offer excellent corrosion resistance.

Benefits

- Good impact- and abrasion resistance
- Compatible with various aged coatings
- Excellent corrosion resistance
- Resistant to splash and spillage of a wide range of chemicals

PPG SIGMACOVER 410/PPG SIGMACOVER 410 MIO

The PPG SIGMACOVER 410/PPG SIGMACOVER 410 MIO coating is a general-purpose epoxy buildcoat used in protective coating systems for steel and concrete structures.

Benefits

- Excellent durability
- Can be recoated with various two-component and conventional coatings
- Easy application by airless spray
- Available in MIO or conventional pigmented grade

PPG SIGMAFAST™ 278

The PPG SIGMAFAST 278 coating is a low-VOC (Directive 1999/13/EC,SED: max.153.0g/kg) , fast-drying product with high-volume solids (80%), which is equipped with phenol-aldehyde amine technology. It provides excellent corrosion resistance in atmospheric exposure conditions.

Benefits

- Speed curing in steel fabrication
- Cures at temperatures down to -5°C (23°F)
- Easy application by airless spray
- Wide application range

PPG SIGMAPRIME 700

70% high-solids, two-component, multi-purpose, anticorrosive epoxy system. It provides excellent anticorrosive and adhesion performance.

Benefits

- Pure epoxy coating
- Can be specified up to 200µm (7.9mils) DFT in one single coat
- Reduced VOC emission
- Low temperature version available which provides excellent performance when applied down to -10°C (14°F)
- Proven crack resistance
- Enhanced edge coverage

PPG SIGMASHIELD™ 880

The PPG SIGMASHIELD 880 coating is a two-component, high-build, polyamine adduct-cured epoxy coating. This multipurpose epoxy is designed for severe environments. It has outstanding seawater resistance with excellent corrosion resistance and good abrasion resistance.

Benefits

- Excellent corrosion resistance
- Good abrasion resistance
- Long-term protection in a single-coat application
- Suitable on wet blast or ultra-high-pressure water (UHPWW)

PPG SIGMAZINC™ 68SP

The PPG SIGMAZINC 68SP product is a two-component, high-solids, polyamine adduct-cured, zinc-rich epoxy primer. It offers excellent anticorrosive properties and is suitable as the primer for various paint systems.

Benefits

- High solids, low VOC (Directive 1999/13/EC,SED: max. 106.0 g/kg)
- Excellent corrosion resistance
- Meets NORSOK M501 and ISO 12944
- cleaned substrates (wet or dry)

Featured products

Products listed by alphabetical order.

PPG AMERLOCK 400GF/PPG SIGMASHIELD 400

The PPG AMERLOCK 400GF/PPG SIGMASHIELD 400 product is a two-component, high-solids, glass-flake reinforced polyamine-cured epoxy coating for new-build, and maintenance and repair applications. It will prevent Corrosion Under Insulation (CUI) of carbon and stainless steel over a temperature range from -196°C to 200°C.

Benefits
- Prevents chloride-induced external stress corrosion cracking of stainless steel
- Surface tolerance
- Hot application substrates up to 150°C

PPG under insulation solutions

PPG HI-TEMP™ 222G

The PPG HI-TEMP 222G products is a one-component, high-build, multi-polymeric composite heat-resistant coating to prevent Corrosion Under Insulation (CUI) of carbon and stainless steel over a temperature from -196°C to 230°C.

Benefits
- Prevents chloride-induced external stress corrosion cracking of stainless steel
- Surface tolerance
- Hot application up to 204°C
- High build, one coat to required dry-film thickness (DFT)

PPG HI-TEMP 1027

The PPG HI-TEMP 1027 product is a one-component, high-build, heat-resistant inert multipolymeric matrix coating. It prevents Corrosion under Insulation (CUI) of carbon and stainless steel over an extreme temperature range from -196°C to 650°C.

Benefits
- Prevents chloride-inducted external stress corrosion cracking of insulated austenitic stainless steel
- Hot application up to 316°C
- Surface tolerance
- Excellent UV stability
- High build, one coat to achieve required dry-film thickness (DFT)

PPG SIGMATHERM™ 230

The PPG SIGMATHERM 230 product is a two-component, high-build, heat-resistant phenolic epoxy coating. It provides excellent protection under insulation up to 200°C in petrochemical installations.

Benefits
- Excellent anticorrosive properties
- Two-coat system that is easy to apply
- No post-curing required to obtain mechanical strength

PPG HI-TEMP 900

The PPG HI-TEMP 900 coating is a two-component, heat-resistant, amine-cured multipolymeric coating.

Benefits
- Prevents corrosion under insulation (CUI) on carbon steel and chloride induced stress corrosion cracking of insulated austinetic stainless steel
- Shop and field application
- Resistant to thermal shock, cycling and intermittent immersion in boiling water
- High build, one coat to achieve required dry-film thickness (DFT)

PPG insulation solutions

PPG HI-TEMP 707HB

One component proprietary waterborne liquid insulation that provides thermal resistance and personnel protection up to 177°C (350°F). Used to control and stabilize process temperatures for storage tanks, pipelines and vessels. Ideal for varying geometric shapes, such as spheres, valves and complex equipment.

Benefits
- 100% adherent, low permeability seamless composite insulation material
- Suitable for high build applications up to 1250 µm (50 mils) DFT per coat and up to 4 coats or 5000 µm (200 mils) for maximum thermal performance, reducing labor costs and increasing production rates
- Used to prevent or reduce condensation
- Able to withstand cyclic temperatures from -57°C (-70°F) to 177°C (350°F)

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We protect and beautify the world™