



PTT Exploration and Production Public Company Limited

PTTEP Engineering General Specification
(Engineering and Development Group)

Standard

Internal Coating of Pressure Vessels and Tanks

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1.0 INTRODUCTION

PEGS (PTTEP Engineering General Specification) is the PTT Exploration and Production PCL internal publishes standard. The objective of PEGS is to promote the best practices collecting from all PTTEP execution projects and to standardize those best practice to the future projects.

Every 5 years or upon request by the internal user, PEGS will be reviewed by related subject experts to reach decisions/agreements, then the document will be updated and publish to PTTEP intranet website. This is to ensure that all lesson learns from users can be applied to the future projects as the benefit to PTTEP.

2.0 PURPOSE

The purpose of this PTTEP Engineering General Specifications (PEGS) is to provide general technical guidance for the activities associated with engineering, procurement, construction and installation (EPCI) projects, to achieve fitness of purpose, technical integrity and optimum life cycle cost for constructing PTTEP facilities

3.0 SCOPE

This specification covers the selection, application, inspection and testing of high quality anti-corrosion coatings for the internal protection of pressure vessels and tanks.

4.0 RESPONSIBLE ACTION PARTIES

N/A

5.0 DEFINITIONS

A number of different terms are commonly used to describe the work stages, processes, and approvals which take place during the early stages of a development. This can often be a source of confusion so the following section is intended to show the PTTEP preferred terminology as used in this document.

5.1 LANGUAGE

In this document, the words should and shall have the following meanings:

Shall	Indicates a course of action with a mandatory status. The term “shall” shall be used if a requirement is considered to be necessary to claim compliance with a PEGS document.
Should	Indicates a preferred course of action. Should is a non-mandatory word and is not forbidden, but use in the body of the text should be the exception. Where none mandatory terms are used, each paragraph within these clauses shall also have an associated commentary paragraph that provides the rationale for why the stated choices and modifications are appropriate and circumstance under which the stated choices and modifications might be different.

5.2 TERMINOLOGY

Terminology	Description
Approval	The authorization in writing given by the COMPANY to the Contractor to proceed the work without releasing in any way the Contractor from any of his obligations to conform with the technical specifications, requisitions, etc. The words “Approve”, “Approved” and “Approval” shall be construed accordingly
Company	PTT Exploration and Production Public Company Limited and affiliates.
Contract Documents	The material requisitions, material specifications, etc. issued by the COMPANY and attached to the Contract or the Purchase Order
Contractor	Per contract: Contractor – ‘The contractor who is a PARTY to this CONTRACT and where the context so requires including, SUBCONTRACTORS utilized by CONTRACTOR for the performance of the WORK’
Manufacturer	The company or its sub-contractors selected by the COMPANY or the Contractor or the Supplier (as applicable) as the Manufacturer of the said material.
PPS	Designates Project Particular Specification detailing the additional tests and requirements or the possible modifications to the present specification, based on the particular design conditions or the local legislation of the project
Purchaser	The COMPANY or the Contractor or the Supplier (as applicable) which have placed the Purchase Order to the Supplier/Vendor/Manufacturer.
Purchase Order	The order issued by Purchaser consisting Terms and Conditions and attachments thereto including but not limited to Data Sheets and Drawings, Specifications including referenced documentation therein, and all other documents and attachments
Purchaser	The COMPANY or the Supplier (as applicable) which have placed the Purchase Order to the Manufacturer
Residual Corrosivity	Corrosivity of the effluent after application of the preventive actions

Terminology	Description
Supplier/Vendor	The company designed on the Purchase Order form or Contract as being the selected supplier of the said materials.
Well Flow Line	Piping between the X-Mas tree and manifold

5.3 COMMON ACRONYMS

Set out below in alphabetical order are common acronyms as found within this document:

Reference	Description
ACQPA	Association of Certification and Qualification for Paint Anticorrosion
CA	Certifying Agent
DFT	Dry Film Thickness
EP	Epoxy
EPGF	Glass Flake Epoxy
EPM	Modified Epoxy
EPN	Novolac Epoxy
EPPH	Phenolic Epoxy
ESI	Zinc Ethyl Silicate
FROSIO	The Norwegian Professional Council for Education and Certification of Inspectors for Surface Treatment
NACE	National Association of Corrosion Engineers
PUR	Polyurethane
SSPC	Society for Protective Coatings
UV	Ultra-Violet
VY	Vinyl Ester

6.0 REFERENCES

The reference documents listed below, including Industry Codes and Standards and COMPANY specifications, form an integral part of this Engineering General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of a contract.

The overall order of precedence of the applicable documents shall be:

1. Applicable Laws, Rules and Regulations of the country in which the system/equipment will be operated (if any);
2. Purchase Order/ Service Order/ Contract Documents (Only applicable for direct purchase by COMPANY);
3. Project Particular Specification (PPS), and relevant data sheet(s) if any;
4. COMPANY General Specification;
5. Codes and Standards in reference.

Any conflict between any of the Contract Documents, or between this specification and any other Contract Documents, shall be reported to COMPANY for decision. In such a case, and unless otherwise agreed or decided by COMPANY, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by COMPANY. For this purpose, requests for substitutions or changes of any kind shall be completed with all pertinent information required for COMPANY assessment. COMPANY's approval, nevertheless, will not, in any way, relieve the responsibility of the Contractor to meet the requirements of the industry Codes and Standards referred to and amended herein, in the event of conflict.

6.1 PTTEP INTERNAL REFERENCES

Internal documents applicable to this document are indicated in the table below.

Document Number	Document Title
ARIM-0842-STD-009	Corrosion Management Standard (Project)
10008-STD-6-INT-001	Inspection and Testing Requirements
10008-STD-6-COR-024	Design of Internal Cathodic Protection of Pressure vessels and Tanks

6.2 INTERNATIONAL STANDARDS

International standards applicable to this document are indicated in the table below i.e. ISO, IEC or ITU.

Document Number	Document Title
ISO 8501-1 to 3	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness.
ISO 8502-1 to 4	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness
ISO 8502-6	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness: extraction of soluble contaminants for analysis
ISO 8502-9	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness: Field method for conductometric determination of water-soluble salts.
ISO 8503-1 to 4	Preparation of steel substrates before application of paints and related products. Surface profile of abrasive blast-cleaned steel
ISO 8504-1 to 3	Preparation of steel substrates before application of paints and related products. Methods for surface preparation
ISO 12944-1 to 8	Paints and varnishes-Corrosion protection of steel structures by paint systems
ISO 11124-2 to 4	Preparation of steel substrates before application of paints and related products. Specifications for metallic blast-cleaning abrasives
ISO 11125-1 to 7	Preparation of steel substrates before application of paints and related products. Methods for testing metallic blast-cleaning abrasives
ISO 11126-3,6,7,8	Preparation of steel substrates before application of paints and related products. Specifications for non-metallic blast-

Document Number	Document Title
	cleaning abrasives: copper refinery slug, iron furnace slug, fused aluminium oxide, olivine sand.
ISO 11127-1 to 7	Preparation of steel substrates before application of paints and related products. Methods for testing non-metallic blast-cleaning abrasives
ISO 1513	Paints and varnishes. Examination and preparation of samples for testing
ISO 4578	Adhesives. Determination of peel resistance of high-strength adhesive bonds
ISO 19840: 2012	Paints and Varnishes-Corrosion Protection of Steel Structures by Protective Paint Systems. Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.
ISO 2409	Paints and varnishes. Cross-cut test
ISO 4624	Paints and varnishes. Pull-off test
ISO 4628-1 to 6	Evaluation of paint and varnish defects. Designation of intensity, quantity and size of common types of defects
ISO 9223	Corrosion of metals and alloys. Atmospheres' Corrosivity Classification
ISO 7253	Paints and varnishes. Determination of resistance to neutral salt spray
ISO 787-10	General methods of test for pigments and extenders - Part 10: Determination of density using Pyknometer method
ISO 2812-1	Paints and varnishes - Determination of resistance to liquids Part 1: General method
ISO 2812-2	Paints and varnishes - Determination of resistance to liquids Part 2: Water immersion method
ISO 6270	Paints and varnishes - Determination of resistance to damp (continuous condensation)
ISO 3678	Paints and varnishes. Print-free test
ISO 7724-1 to 3	Paints and varnishes. Determination of color and color difference
NF A 49 711	External triple layer polypropylene based coating - Appendix K: Test for evaluating delamination resistance under negative polarization

Document Number	Document Title
NACE RP 0178	Fabrication details, surface finish requirements, and proper design considerations for tanks and vessels to be lined for immersion service
NF T 34 550	Paints and varnishes- Corrosion protection of steel structures by protective paint systems - Specifications
NF T 30-125	Paints. Determination of wet film thickness
ASTM D 4752	Standard test method for measuring MEK resistance of ethyl silicate (inorganic) Zinc-rich primer by solvent rub
ASTM D 4940	Standard test method for conductimetric analysis of water soluble ionic contamination of blasting abrasives
ACQPA	"Association pour la Certification et la Qualification en Peinture Anticorrosion"
SSPC-SP 1	Solvent Cleaning
SSPC-SP 16	Brush-off Blast Cleaning of Non-Ferrous Metals

6.3 CODE AND OTHER STANDARDS

Codes, standards and regional legislation applicable to this document are indicated in the table below.

Document Number	Document Title
-	-

7.0 REQUIREMENTS OF INTERNAL COATING FOR PRESSURE VESSELS AND TANKS

7.1 INTERNAL PROTECTION OF PRESSURE VESSELS AND TANKS

As the internal coatings are subjected to some degradation in time, the internal coating may be associated to the cathodic protection by sacrificial anode for the internal protection of the pressure vessels and tanks. Consequently, the internal coating system shall have sufficient resistance to cathodic disbonding under the service conditions.

In many cases, internal coating, in association with corrosion allowance, is considered as a standalone anti-corrosion barrier and, consequently it shall perform under the operating condition. Nevertheless, coating repair has to be foreseen at each vessel internal inspection whether there is or not internal cathodic protection.

7.2 SELECTION OF COATING SYSTEMS

The selection of the internal coating shall be based on the maximum operating conditions (mainly pressure, temperature, nature of the effluent, quick depressurization), type of substrate and type of equipment. Cleaning method may also be considered during the selection of internal coating. The approved coating systems (including coating repair) and the approved Paint Manufacturers are detailed in Appendix 1. Specific requirements and/or tests may be requested by COMPANY depending on the criticality of the process.

Applicator or Paint Manufacturer may propose alternative coating systems subjected to approval by COMPANY. Nonetheless, the Applicator or Paint Manufacturer shall submit a prequalification dossier including laboratory test results, field application results, etc. to COMPANY for review and approval.

The actual maximum service temperature, pressure, etc. will be provided by COMPANY.

7.3 TECHNICAL CONTENT OF TENDERS

Tenders shall include the following information:

- 1) Proposed paint systems for each category / location of item to be painted
- 2) Product data sheets
- 3) Terms and conditions of guarantee
- 4) A statement showing that all parties involved (Contractor, Supplier, and Applicator) will be carrying out the work according to the present specification, or if relevant, to the project particular specification. This statement shall also show that the guarantee is jointly underwritten by all parties and specify the durations and performance levels of the guarantee.

This statement can consist in either a certificate of homologation by an approved organism or a letter signed by the head office of each party involved.

- 5) Maximum thickness tolerable for each coat and for the full system
- 6) Surface preparation and painting procedures
- 7) Inspection test plan with acceptance criteria and frequency of inspection
- 8) A list of inspection and painting equipment to be used
- 9) Colors to be used for each item of equipment and for the different coats, in accordance with the color chart chosen for the project by COMPANY
- 10) Methods of protection of items to be painted against adverse weather conditions,
- 11) Certificates (ACQPA, FROSIO, NACE, SSPC or equivalent) of operators and inspectors

7.4 CERTIFICATION OF PERSONNEL

Operators shall be individually certified by an approved organization (ACQPA, FROSIO, NACE, SSPC etc.). Inspectors shall be individually certified by an approved organization (ACQPA, FROSIO, SSPC, NACE minimum level 2 with peer review from the company representatives).

7.5 KICK OFF MEETING

A technical kick off meeting shall be organized by the Contractor in the presence of COMPANY.

Manufacturer and Applicator to define all the details regarding the work, application procedures, and inspection test plan. All the documentation shall be submitted to COMPANY for review prior to this meeting.

During this meeting, the Contractor shall provide the following:

- 1) Proposed coating system(s) for each piece of equipment to be coated (including the final color), product data sheets, maximum thickness tolerable for each coat and for the full system, approval certificates for coatings in contact with specific products such as food products, jet fuel, etc.
- 2) Storage, sampling of paint products and safety requirements
- 3) Methods of protection of items to be painted against adverse weather conditions
- 4) Surface preparation and painting procedures approved by the Paint Manufacturer
- 5) List of inspection and painting equipment to be used, inspection test plan detailing the acceptance criteria, type of inspection and testing to be performed, frequency of inspection and testing, reference documents, etc.

Manufacturer shall provide Applicator with technical assistance. All recommendations made by Manufacturer other than these outlined in datasheets or in the present specification shall be supported by a written statement from Manufacturer's head office and the same warrantee period as suggested in the present specification shall be provided.

7.6 PROCUREMENT AND STORAGE OF ABRASIVE AND COATING PRODUCTS

7.6.1 ABRASIVE

Abrasives shall be sealed in watertight packaging. Any product delivered in defective packaging shall be rejected.

Conductivity of abrasives shall be less than $150 \cdot 10^{-6}$ SIEMENS/cm as per ASTM D4940. The use of copper slag or silica sand is prohibited.

Metallic abrasives' specifications shall be in accordance to ISO 11124-2 to 4.

Non-metallic abrasives' specifications shall be in accordance to ISO 11126-7, 8 & 10.

Abrasives must be stored in such conditions as to avoid their degradation.

7.6.2 PAINTING PRODUCTS

The products shall be delivered in their original sealed packaging. The packaging shall be clearly marked with the product description, the batch number, the fabrication date and the expiry date.

The quantities of paint and thinners required to perform the entire job shall be procured before the work commences, except in cases where the shelf life of the product is less than the anticipated duration of the work or volume of the product is very important.

The expiry dates from the fabrication dates are:

- 1) For zinc ethyl silicate: 6 months
- 2) For other products: 1 year
- 3) Specific cases: according to manufacturer's recommendation with COMPANY approval.

Products must be stored under shelter and in such conditions as to avoid their degradation. Thinners, solvents, etc. shall be stored in a suitably ventilated fireproofed building, separate from other painting consumables.

Paint systems (especially top coat) shall be free from Lead, Mercury, Cadmium, Hexavalent Chromium.

7.7 QUALIFICATION OF APPLICATION PROCEDURE FOR EACH SYSTEM

All selected paint systems shall be applied on test plate (500mm x 500mm) representatives of the equipment to be painted about one month before the startup of the painting work. The products used shall be sampled from the same batches as those intended for the work. The paint system

shall be applied in the presence of the Paint Manufacturer and the COMPANY representative. Application shall be performed by the qualified painting specialist who will be responsible for application during the work. When the painting systems are fully cured, inspections (as detailed in the approved ITP) and adhesion testing shall be carried out to confirm that the performance of the painting systems meet those specified for each system.

7.8 APPLICATION OF THE COATING AND REPAIR COATING

7.8.1 SURFACE PREPARATION

7.8.1.1 SURFACE AND CLEANING PREPARATION PRIOR TO ABRASIVE BLASTING

All sharp edges shall be rounded (minimum radius ≥ 3 mm). The design of the equipment to be coated shall be such that it creates no interstice and inaccessible area. These points shall be clearly specified in COMPANY specification for the design of vessel or tank.

Weld spatters remains from temporary welds, deposits or surface defects shall be eliminated by appropriate means; removal by deep grinding is subjected to COMPANY approval.

All surfaces shall be washed with hot fresh water to eliminate loose deposits and to reduce the chloride contamination. All oil or grease shall be removed by using non-oily and non-toxic solvent. This includes bolt holes of all bolted assemblies.

Contractor shall protect all equipment that is not to be painted or may be affected by the presence of abrasives or paint.

7.8.1.2 CLEANLINESS OF THE ABRASIVE

Before startup of the abrasive blasting, cleanliness and salt contamination of abrasives shall be checked as per ASTM D4940. Conductivity shall be lower than 150 micro-Siemens/cm and no oil shall be visible after 30 minutes.

The use of silica sand and copper slag are prohibited.

7.8.1.3 CLIMATIC CONDITIONS DURING ABRASIVE BLASTING

Air temperature, metal temperature and air dew point shall be measured every four hours. The metal temperature shall be at least 3 °C above the surrounding air dew point and the relative humidity shall not exceed 85 %.

7.8.1.4 SURFACE CLEANLINESS AFTER ABRASIVE BLASTING

The blast cleaning procedure shall be submitted to COMPANY for approval.

The surface to be coated shall be blast cleaned using automatic blasting machine(s). Surface cleanliness shall be Sa 3 as per ISO 8501-1. All blasted surfaces shall be checked thoroughly (100 %). Surface cleanliness for repair shall be SA 2.5 as per ISO 8501-1.

The abrasive shall be selected (G medium in accordance with ISO 8502), so that the average roughness Ry5 ranges from 60 to 90 microns. This requirement includes determination of abrasive mix, as well as quantity and frequency of renewal. Surface profile roughness shall be measured with electronic apparatus in accordance with ISO 8503-4 or visio-tactile surface profile comparator. The use of replica tape to assess the roughness is not allowed. Immediately after abrasive blasting, all dust and traces of abrasives shall be removed by brushing and vacuum cleaning. Then the dust level shall be measured in accordance with ISO 8502-3. Maximum acceptable level shall be 2. Contamination by chlorides shall not exceed 30 mg/m² in accordance with ISO 8502-6 and 9.

Stainless steel surfaces (mainly the internals of some pressure vessels) to be coated shall be etched or degreased and blast-cleaned with a non-ferrous and chlorine-free abrasive. Substrate ferrous contamination shall be checked by direct colorimetry method using Prussian blue (potassium ferricyanide). No surface pollution shall be accepted. The average roughness Ry5 shall be 30 to 40 microns.

7.7.2 APPLICATION OF THE COATING AND REPAIR COATING

Paint shall always be applied to surfaces (substrate surface or previous coat) that are dry, clean and degreased.

All mating surfaces of equipment subjected to outdoor exposure shall be coated with the full coating system prior to assembly (saddles, skirts, base plates, bolted components, flanges, etc.).

7.7.3 CLIMATIC CONDITION DURING COATING APPLICATION

Coating work shall not be proceeded if:

- 1) Temperature of the substrate is less than 3 °C above the dew point,
- 2) Relative humidity is more than 85 % RH
- 3) Weather is rainy or foggy, except under shelter, and subjected to verification of the atmospheric conditions,
- 4) Minimum and maximum temperatures of the ambient atmosphere and those of the substrate are outside of the limits given in the product data sheets. The minimum application temperature is 10 °C.

All blast-cleaned surfaces shall be coated before the deterioration of the specified "grade of cleanliness". In all cases, any surface that has been blast-cleaned shall be coated within 4 hours.

Applicator shall keep a daily record of the dew point, relative humidity, ambient atmosphere and substrate temperatures (all measured before the work commences, twice per shift and when ambient conditions are obviously changing) to ensure that conditions are acceptable. These records shall be kept and made available to COMPANY.

7.8.4 COATING APPLICATION

Application shall be by airless spray. Stripe coats shall be applied by brush to all angles, corners, sharp edges, bolt or rivet heads, etc. with the same product as that to be applied on the surface to be coated.

Different colors shall be used for all successive coats of the coating system. The finishing coat of the required color shall be sufficiently opaque to cover the shade of the undercoat. Wet film thickness of each coat shall be measured immediately after application. The dry film thickness of each coat with required frequency shall be measured by the Applicator in accordance with ISO 19840. The tolerances on the each coat thickness shall be respected. The values shall be recorded and made available to COMPANY. Interval between coats shall be in accordance with Paint Manufacturer product data sheets.

7.8.5 COATING APPLICATION INSIDE NOZZLES

The nozzles with diameters larger than 4" can be coated similar to internal coating of the vessel or tank, the diameter is sufficiently large. For diameters equal or smaller than 4" an insert made of glass fibre reinforced resin (GFRR), typically glass fibre reinforced vinyl-ester (GFRV) or glass flake epoxy (EPGF) depending on service conditions, should be manufactured and inserted in the nozzle. The external diameter of the insert should be as close as possible to the internal diameter of the nozzle. The space between the nozzle and insert is to be filled with the resin as shown in Figure 1 and Figure 2.

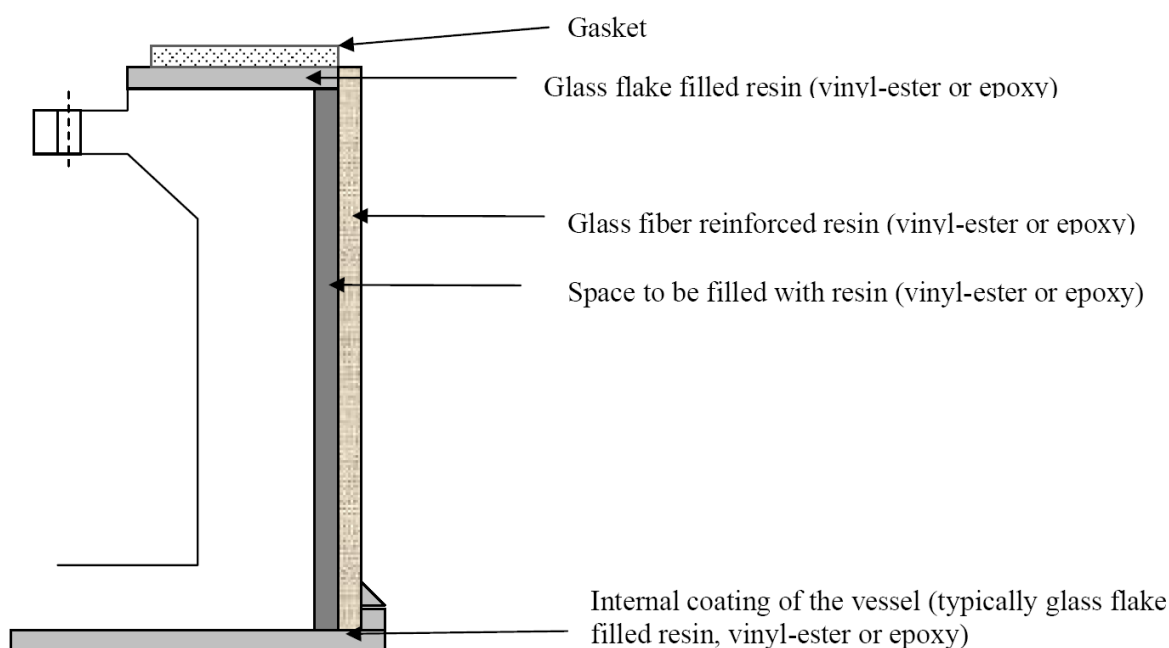


Figure 1 - Internal Coating of Nozzles for Low Pressure Vessels and Tanks

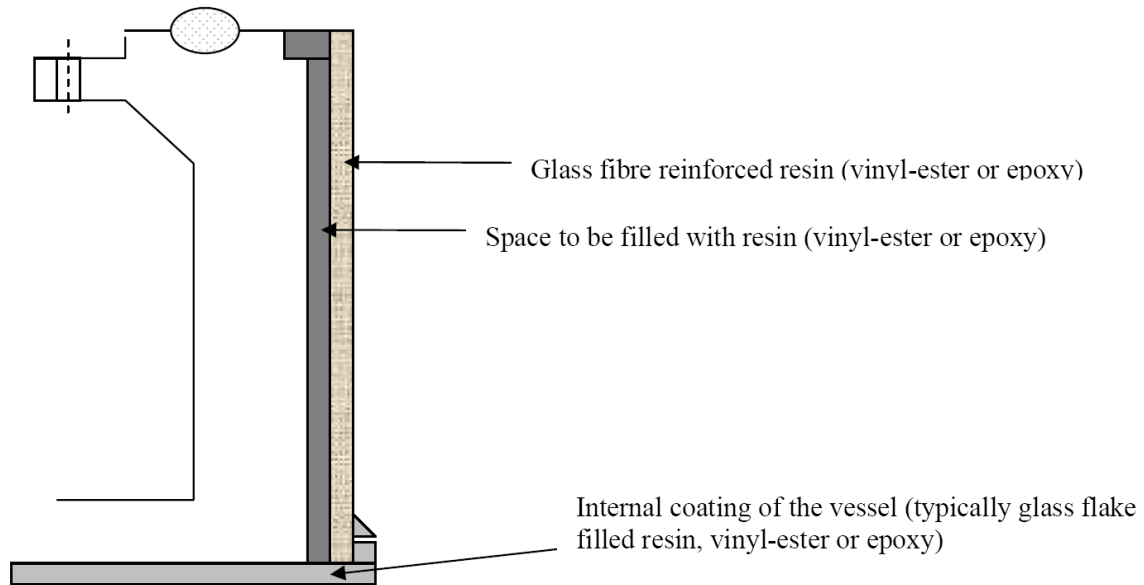


Figure 2 - Internal Coating of Nozzles for High Pressure Vessels

7.8.6 APPLICATION OF REPAIR COATING

All defects shall be repaired before the application of the next layer. For major defects, the coating shall be removed completely by abrasive blast-cleaning and the entire system shall be re-applied. A major defect shall be identified or qualified by COMPANY inspector and/or applicator quality control representative.

Examples of major defects:

- 1) Same types of defects (for example porosities penetrating up to metal) are detected at several locations (close to each other) on the flat coated surface.
- 2) More than one penetrating defect or lack of adhesion larger than 1 cm² per m² of surface area.

For minor defects (localized appearance, mechanical damage, scratches, etc.), the coating shall be removed by localized blast-cleaning. The edges of the sound coating shall be feathered back about 50 mm prior to application of the repair coating.

7.9 INSPECTION

Applied coating shall be inspected to ensure that the final coating quality is in accordance with COMPANY requirements. The inspections during surface preparation and coating application shall be carried out by the Applicator's Quality Control Department in the presence of the Inspector from the beginning of the work and throughout production. The results shall be recorded in the quality control report.

An inspection test plan shall be prepared by the Contractor and submitted to COMPANY for approval.

The Contractor shall notify the COMPANY, at least 10 working days before application start up to allow mobilization of the Inspector.

The Inspector shall have free access to the workshops and laboratory of the Applicator who shall also provide him with all the facilities necessary for the proper execution of his work (i.e. office, telephone and fax, handling equipment, measuring instruments with calibration certificates, etc.).

Upon arrival at the coating plant, the Inspector shall receive from the main Contractor the documents supplied by the Manufacturer and all other relevant documentation regarding the work to be carried out.

7.9.4 CONSTRUCTION QUALITY

The areas to be inspected are:

- 1) Rounding of corners, sharp edges,
- 2) Checking of the quality, continuity and cleanliness of welds

7.9.5 SURFACE PREPARATION QUALITY

The following measurements / inspections shall be carried out:

- 1) Contamination by oil, grease and loose deposits
- 2) Climatic conditions (air and steel temperatures, dew point)
- 3) Cleanliness of the abrasive
- 4) Degree of surface cleanliness after abrasive blasting
- 5) Chloride contamination
- 6) Dust level of the prepared surface
- 7) Roughness (Ry5) of the prepared surface

7.9.6 COATING QUALITY

For the coating quality, the following tests / inspections shall be carried out:

- 1) State of curing of primer and of each coat
- 2) Interval between coats (in accordance with Manufacturer product data sheets)
- 3) Wet film thickness for each coat immediately after application
- 4) Number of coats, DFT of each coat and of the final system
- 5) Appearance and colour
- 6) Porosity
- 7) Adherence

Specific COMPANY requirements concerning the porosity, adherence and visual inspections are given below.

7.9.7 POROSITY TEST

The porosity of the coating shall be checked across the entire surface using a wet sponge or an electrical brush in accordance with the coating system's instructions. No arcing at the voltages specified in the coating system's data sheet shall be permitted (typically 5V / micron of thickness).

7.9.8 ADHERENCE

During the coating application, the Applicator shall also coat two specimen plates (200 mm x 100 mm) per each piece of equipment and per each system for adherence tests. Adherence tests shall be carried out only when the system is completely dry and fully polymerized.

If the results are unsatisfactory, the tests shall be carried out on the corresponding surfaces of the equipment. The required number of in-situ tests shall be agreed between Applicator and COMPANY.

The adherence tests shall be carried out using one of the following methods:

- 1) Systems with DFT less than 200 μm : Cross-cut test class 0 in accordance with ISO 2409
- 2) Systems with DFT above 200 μm : pull-off test according to ISO 4624: The minimum acceptable values are 3 MPa for measurements made with mechanical equipment (type Ersad, Satec, or equivalent) and 5 MPa for checks made with hydraulic equipment (Type PAT or equivalent). The equipment must be fitted with a gauge indicating the pulling force.

Type of failure (adhesive or cohesive) shall be recorded.

7.9.9 VISUAL INSPECTION

After application of each coat, the coating shall be of a uniform color and aspect, and free of any surface defect detrimental to its quality. No defects such as "orange peel", cracking, bubbling, pinholes, runs and sags, blistering, etc. shall be observed.

7.10 ACCEPTANCE AND GUARANTEE

Condition of guarantee shall be clearly specified by the COMPANY in the order and clearly jointly approved by Contractor/Manufacturer/Applicator.

The Contractor, the Paint Manufacturer and the Applicator shall jointly sign all tests and inspections (as set forth in this specification) reports. For provisional acceptance, COMPANY shall verify that all inspections required in this specification have been carried out and that all results are satisfactory.

Contractor shall hand over a technical file to COMPANY at the end of the work, which shall include:

- 1) All inspection reports
- 2) Provisional acceptance reports
- 3) Guarantee certificate from Paint Manufacturer
- 4) Approval and/or test certificates for coatings in contact with specific products (food products, jet fuel, etc.)
- 5) Insurance certificates for the guarantee

For the final acceptance, an inspection shall be carried out at the end of the guarantee period, which is 3 years unless otherwise specified in the CONTRACT. The maximum degree of rust shall be Ri2 only in accordance with ISO 4628 (the surface affected by metal loss shall be considered). All cracking, blistering, or flaking shall be considered as a coating defect of the same size.

7.11 HANDLING, STORAGE AND TRANSPORTATION

Precautionary measures have to be taken to prevent internal coating damages during the phases following final internal acceptance inspection at Applicator plant.

- After final inspection for cleanliness, all the nozzles shall be closed using as necessary plywood boards securely fastened or plastic plugs to prevent ingress of foreign matters. Nozzles shall be maintained closed during storage and transportation at final location and kept closed as long as it is not necessary to remove the protection.
- During installation of internal and external equipment of the vessels and tie-in adjustments and subsequent inspections, all precautions shall be taken to avoid damages. If some damages occur, they shall be repaired using the approved repair procedure completed with a porosity test.
- Before final tie-in to the plant piping system all the coated parts of the flanges shall be carefully inspected and possible damages repaired.
- A final inspection before commissioning shall be carried out to make sure that no harmful materials remain inside the vessel such as hand tool, bolts and nuts, welding rods, stones, etc.

It is supposed that the vessels are pressure-tested prior internal coating work. If not, after pressure testing (or re-testing), a careful visual inspection of the internal coating, as a minimum, shall be carried out in particular at the nozzles to verify the absence of disbonding or coating cracks.

8.0 APPENDICES

LIST OF APPROVED SUPPLIERS

Supplier	Code	Office No.	Mobile No.	Email address
BELZONA	B	-	+66(0) 8 6374 2095	panit@panmechanic.com
CARBOLINE	C	-	+66(0) 8 1628 6240	sumarin@dimetsiam.com
HEMPEL	H	+66(0) 2 392 1226	+66(0) 9 0880 9678	kesinee_cws@tcputhai.com ken.cws@tcputhai.com
INTERNATIONAL COATING	I	+66(0) 2 744 1299	+66(0) 8 2486 2498	pongprawut.onkaew@akzonobel.com
JOTUN	J	+66(0) 2 022 9888	+66(0) 8 9201 1172	somchai.wiwatbenchaphol@jotun.com
PPG	P	-	+66(0) 8 9789 3516 +66(0) 8 9921 2166	suched.sangchuay@ppg.com tipporn.Sawatchupong@ppg.com

System No: S101 B

Zone: Hydrocarbon Process Vessels

Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
2	Primer	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
	Final Coat	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
3	Primer	Belzona 1391T	EPPH	300	Belzona 1391T	EPPH	300	130
	Final Coat	Belzona 1391T	EPPH	300	Belzona 1391T	EPPH	300	130
4	Primer	Belzona 1523	EPPH	250	Belzona 1523	EPPH	250	140
	Final Coat	Belzona 1523	EPPH	250	Belzona 1523	EPPH	250	140
5	Primer	Belzona 1593	EPPH	250	Belzona 1593	EPPH	250	160
	Final Coat	Belzona 1593	EPPH	250	Belzona 1593	EPPH	250	160

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S102 B

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thickness (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 1331	EPM	250	Belzona 1331	EPM	250	50
	Final Coat	Belzona 1331	EPM	250	Belzona 1331	EPM	250	50
2	Primer	Belzona 1381	EPM	250	Belzona 1381	EPM	250	95
	Final Coat	Belzona 1381	EPM	250	Belzona 1381	EPM	250	95
3	Primer	Belzona 1391T	EPPH	300	Belzona 1391T	EPPH	300	130
	Final Coat	Belzona 1391T	EPPH	300	Belzona 1391T	EPPH	300	130
4	Primer	Belzona 1593	EPPH	250	Belzona 1593	EPPH	250	160
	Final Coat	Belzona 1593	EPPH	250	Belzona 1593	EPPH	250	160

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S103 B

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
2	Primer	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
	Final Coat	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
3	Primer	Belzona 1523	EPPH	250	Belzona 1523	EPPH	250	140
	Final Coat	Belzona 1523	EPPH	250	Belzona 1523	EPPH	250	140

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S104 B

Zone: Industrial Water Tanks

Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
2	Primer	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
	Final Coat	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S105 B

Zone: Drinking Water Tanks (with NSF Approval)

Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5812DW	EPM	250	Belzona 5812DW	EPM	250	50
	Final Coat	Belzona 5812DW	EPM	250	Belzona 5812DW	EPM	250	50
2	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S106 B
Zone: Gas – Oil Tanks
Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
2	Primer	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
	Final Coat	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 B
Zone: Jet Fuel Tanks
Supplier: BELZONA

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
	Final Coat	Belzona 5892	EPPH	250	Belzona 5892	EPPH	250	95
2	Primer	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110
	Final Coat	Belzona 1391S	EPPH	250	Belzona 1391S	EPPH	250	110

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S101 C
Zone: Hydrocarbon Process Vessels
Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
	Final coat	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
2	Primer	Phenoline 1205	EPN	250	Phenoline 1205	EPN	250	95
	Final coat	Phenoline 1205	EPN	250	Phenoline 1205	EPN	250	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S102 C

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 1205	EPN	250	Phenoline 1205	EPN	250	95
	Final coat	Phenoline 1205	EPN	250	Phenoline 1205	EPN	250	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S103 C

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
	Final coat	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S104 C

Zone: Industrial Water Tanks

Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
	Final coat	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S105 C

Zone: Drinking Water Tanks (with NSF/ANSI 61 Approval)

Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Carboguard 891	EP	150	Carboguard 891	EP	150	60
	Final coat	Carboguard 891	EP	150	Carboguard 891	EP	150	60

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S106 C

Zone: Gas – Oil Tanks

Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
	Final coat	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 C
Zone: Jet Fuel Tanks
Supplier: CARBOLINE

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65
	Final coat	Phenoline 385	EPPH	150	Phenoline 385	EPPH	150	65

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S101 H

Zone: Hydrocarbon Process Vessels

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hempadur 35760	EPPH	200	Hempadur 35760	EPPH	200	65
	Final Coat	Hempadur 35760	EPPH	200	Hempadur 35760	EPPH	200	65
2	Primer	Hempadur 85671	EPN	75	Hempadur 85671	EPN	75	93
	Final Coat	Defend 640	EPN	400	Defend 640	EPN	400	93
3	Primer	Prepare 120	VY	75	Prepare 120	VY	75	120
	Intermediate	Defend 740	VY	500	Defend 740	VY	500	120
	Final Coat	Defend 740	VY	500	Defend 740	VY	500	120

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S102 H

August 2018, R01

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Prepare 120	VY	75	Prepare 120	VY	75	80
	Final Coat	Defend 500	VY	500	Defend 500	VY	500	80
2	Primer	Hempadur 85671	EPN	75	Hempadur 85671	EPN	75	93
	Final Coat	Defend 640	EPN	500	Defend 640	EPN	500	93
3	Primer	Prepare 120	VY	75	Prepare 120	VY	75	120
	Intermediate	Defend 740	VY	500	Defend 740	VY	500	120
	Final Coat	Defend 740	VY	500	Defend 740	VY	500	120

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S103 H

August 2018, R01

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hempadur 85671	EPN	75	Hempadur 85671	EPN	75	93
	Final Coat	Defend 640	EPN	400	Defend 640	EPN	400	93
2	Primer	Prepare 120	VY	75	Prepare 120	VY	75	120
	Intermediate	Defend 740	VY	500	Defend 740	VY	500	120
	Final Coat	Defend 740	VY	500	Defend 740	VY	500	120

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S104 H

Zone: Industrial Water Tanks

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50
	Final Coat	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S105 H

Zone: Drinking Water Tanks (with NSF/ANSI 61 Approval)

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hepadur 35560	EP	150	Hepadur 35560	EP	150	45
	Final Coat	Hepadur 35560	EP	150	Hepadur 35560	EP	150	45

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S106 H
Zone: Gas – Oil Tanks
Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50
	Final Coat	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 H

Zone: Jet Fuel Tanks

Supplier: HEMPEL

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50
	Final Coat	Hepadur 15460	EP	150	Hepadur 15460	EP	150	50
2	Primer	Hempadur 85671	EPN	125	Hempadur 85671	EPN	125	60
	Final Coat	Hempadur 85671	EPN	125	Hempadur 85671	EPN	125	60

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S101 I
Zone: Hydrocarbon Process Vessels
Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness:
 - 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 850, Interline 982, Interline 994
 - 75 to 100 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 984, Enviroline 405HTR

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interline 850	EPPH	125	Interline 850	EPPH	125	40
	Final coat	Interline 850	EPPH	125	Interline 850	EPPH	125	40
2	Primer	Interline 994	EPPH	90	Interline 994	EPPH	90	50
	Intermediate	Interline 994	EPPH	90	Interline 994	EPPH	90	50
	Final coat	Interline 994	EPPH	90	Interline 994	EPPH	90	50
3	Primer	Interline 982*	EP	25	Interline 850	EPPH	25	40
	Final coat	Interline 984	EPPH	400	Interline 984	EPPH	400	40
4	Primer	Enviroline 405HTR	EPN	350	Interline 405HTR	EPN	350	50
	Final coat	Enviroline 405HTR	EPN	350	Interline 405HTR	EPN	350	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.
- Interline 982 is optional primer for holding blasted clean surface in the semi-protected environment of tank interior.

System No: S102 I

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 75 to 100 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interline 984	EPPH	300	Interline 984	EPPH	300	40
	Final coat	Interline 984	EPPH	300	Interline 984	EPPH	300	40
2	Primer	Enviroline 376F-30	EPN	300	Enviroline 376 Series	EPN	300	40
	Final coat	Enviroline 376F-30	EPN	300	Enviroline 376 Series	EPN	300	40
3	Primer coat	Ceilcoat 380 Primer	VY	50	Ceilcoat 380 Primer	VY	50	40
	Intermediate	Ceilcoat 242 Flakeline	VY	500	Ceilcoat 242 Flakeline	VY	500	40
	Final coat	Ceilcoat 242 Flakeline	VY	500	Ceilcoat 242 Flakeline	VY	500	40
4	Primer	Enviroline 376F-60	EPN	650	Enviroline 376F-60	EPN	650	40
	Final coat	Enviroline 376F-60	EPN	650	Enviroline 376F-60	EPN	650	40
5	Primer	Enviroline 405HTR	EPN	400	Interline 405HTR	EPN	400	50
	Final coat	Enviroline 405HTR	EPN	400	Interline 405HTR	EPN	400	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.
- Interline 984 and Enviroline 376F-30 are suitable for low-medium abrasion service.
- Enviroline 376F-60 and Enviroline 405HTR are suitable for medium-high abrasion service.
- Ceilcoat system is suitable for severe abrasion service.

System No: S103 I

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness:
 - 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 850, Interline 982, Interline 994
 - 75 to 100 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 984, Enviroline 405HTR

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interline 850	EPPN	125	Interline 850	EPPN	125	40
	Final coat	Interline 850	EPPN	125	Interline 850	EPPN	125	40
2	Primer	Interline 994	EPPN	90	Interline 994	EPPN	90	50
	Intermediate	Interline 994	EPPN	90	Interline 994	EPPN	90	50
	Final coat	Interline 994	EPPN	90	Interline 994	EPPN	90	50
3	Primer	Interline 982*	EP	25	Interline 850	EPPN	25	40
	Final coat	Interline 984	EPPN	400	Interline 984	EPPN	400	40
4	Primer	Enviroline 405HTR	EPN	400	Interline 405HTR	EPN	400	50
	Final coat	Enviroline 405HTR	EPN	400	Interline 405HTR	EPN	400	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.
- Interline 982 is optional primer for holding blasted clean surface in the semi-protected environment of tank interior.

System No: S104 I

Zone: Industrial Water Tanks

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interseal 670HS	EP	125	Interseal 670HS	EP	125	40
	Final coat	Interseal 670HS	EP	125	Interseal 670HS	EP	125	40
2	Primer	Interline 850	EPPH	125	Interline 850	EPPH	125	50
	Final coat	Interline 850	EPPH	125	Interline 850	EPPH	125	50
3	Primer	Interline 994	EPPH	90	Interline 994	EPPH	90	82
	Intermediate	Interline 994	EPPH	90	Interline 994	EPPH	90	82
	Final coat	Interline 994	EPPH	90	Interline 994	EPPH	90	82

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.
- Interseal 670HS is suitable for low chemical contaminated water.

System No: S105 I

Zone: Drinking Water Tanks (with BS6920 or AS/NZS4020 Approval)

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interseal 670HS	EP	125	Interseal 670HS	EP	125	40
	Final coat	Interseal 670HS	EP	125	Interseal 670HS	EP	125	40
2	Primer	Interline 850	EPPH	125	Interline 850	EPPH	125	50
	Final coat	Interline 850	EPPH	125	Interline 850	EPPH	125	50
3	Primer	Interline 982*	EP	25	Interline 850	EPPH	25	50
	Final coat	Interline 925	EP	400	Interline 850	EPPH	400	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.
- Interline 982 is optional primer for holding blasted clean surface in the semi-protected environment of tank interior.

System No: S106 I

Zone: Gas – Oil Tanks

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness:
 - 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 850, Interline 994
 - 75 to 100 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 984, Enviroline 376 F30, Enviroline 376 F60, Enviroline 405HTR

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interline 850	EPPH	125	Interline 850	EPPH	125	50
	Final coat	Interline 850	EPPH	125	Interline 850	EPPH	125	50
2	Primer	Interline 994	EPPH	125	Interline 994	EPPH	125	71
	Intermediate coat	Interline 994	EPPH	90	Interline 994	EPPH	90	71
	Final coat	Interline 994	EPPH	125	Interline 994	EPPH	125	71
3	Primer	Enviroline 376 F30	EPN	400	Enviroline 376 F30	EPN	400	71
	Final coat	Enviroline 376 F30	EPN	400	Enviroline 376 F30	EPN	400	71
4	Primer	Enviroline 376 F60	EPN	400	Enviroline 376 F60	EPN	400	71
	Final coat	Enviroline 376 F60	EPN	400	Enviroline 376 F60	EPN	400	71
5	Primer	Interline 405HTR	EPN	400	Interline 405HTR	EPN	400	82
	Final coat	Interline 405HTR	EPN	400	Interline 405HTR	EPN	400	82
6	Primer	Interline 984	EPPH	250	Interline 984	EPPH	250	82
	Final coat	Interline 984	EPPH	250	Interline 984	EPPH	250	82

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 I

Zone: Jet Fuel Tanks

Supplier: INTERNATIONAL COATING

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness:
 - 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 850
 - 75 to 100 microns or Grit-medium (G) (ISO 8503-2: 2012) for Interline 984

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Interline 850	EPPH	125	Interline 850	EPPH	125	50
	Final coat	Interline 850	EPPH	125	Interline 850	EPPH	125	50
2	Primer	Interline 984	EPPH	250	Interline 984	EPPH	250	50
	Final coat	Interline 984	EPPH	250	Interline 984	EPPH	250	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S101 J

Zone: Hydrocarbon Process Vessels

Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
	Final coat	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
2	Primer	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
	Final Coat	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
3	Primer	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95
	Final Coat	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S102 J

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Jotamastic 90 GF	EPM	300	Jotamastic 90 GF	EPM	300	60
	Final coat	Jotamastic 90 GF	EPM	300	Jotamastic 90 GF	EPM	300	60
2	Primer	Chemflake Special	VY	300	Chemflake Special	VY	300	85
	Final coat	Chemflake Special	VY	300	Chemflake Special	VY	300	85

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S103 J

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
	Final coat	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
2	Primer	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
	Final Coat	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
3	Primer	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95
	Final Coat	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S104 J

Zone: Industrial Water Tanks

Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
	Final coat	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
2	Primer	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
	Final Coat	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	95
3	Primer	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95
	Final Coat	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	95

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S105 J

Zone: Drinking Water Tanks (with NSF or BS6920 Approval)

Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard 412	EP	125	Tankguard 412	EP	125	50
	Final coat	Tankguard 412	EP	125	Tankguard 412	EP	125	50
2	Primer	Tankguard DW	EP	125	Tankguard DW	EP	125	50
	Final Coat	Tankguard DW	EP	125	Tankguard DW	EP	125	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S106 J
Zone: Gas – Oil Tanks
Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
	Final coat	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	60
2	Primer	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	70
	Final Coat	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	70
3	Primer	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	90
	Final Coat	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	90

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 J
Zone: Jet Fuel Tanks
Supplier: JOTUN

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	40
	Final coat	Tankguard HB Classic	EP	125	Tankguard HB Classic	EP	125	40
2	Primer	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	70
	Final Coat	Tankguard Storage	EPPH	125	Tankguard Storage	EPPH	125	70
3	Primer	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	80
	Final Coat	Tankguard Plus	EPPH	125	Tankguard Plus	EPPH	125	80

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S101 P

Zone: Hydrocarbon Process Vessels

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmacover 280	EP	50	Sigmacover 280	EP	50	60
	Intermediate	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	60
	Final coat	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	60
2	Primer	Novaguard 4801	EPPH	600	Novaguard 4801	EPPH	600	150
	Final coat	Novaguard 4801	EPPH	600	Novaguard 4801	EPPH	600	150

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S102 P

Zone: Hydrocarbon Process Vessels with high volume of solid particles

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Novaguard 4801	EPPH	600	Novaguard 4801	EPPH	600	150
	Final coat	Novaguard 4801	EPPH	600	Novaguard 4801	EPPH	600	150

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S103 P

Zone: Hydrocarbon Storage Tanks (Internal Bottom Surface, External Bottom Surface, Internal Surface of Fixed Roof)

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmacover 280	EP	50	Sigmacover 280	EP	50	60
	Intermediate	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	60
	Final coat	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	60

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S104 P

Zone: Industrial Water Tanks

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	50
	Final coat	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S105 P

Zone: Drinking Water Tanks (with NSF/ANSI 61 Approval)

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	50
	Final coat	Sigmaguard CSF 650	EP	300	Sigmaguard CSF 650	EP	300	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S106 P

Zone: Gas – Oil Tanks

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmaguard 720	EP	150	Sigmaguard 720	EP	150	50
	Final coat	Sigmaguard 720	EP	150	Sigmaguard 720	EP	150	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

System No: S107 P

Zone: Jet Fuel Tanks

Supplier: PPG

Surface preparation:

- 1) Grade of cleanliness: Sa 3 (ISO 8501-1: 2007). For repair system: Sa 2½
- 2) Roughness: 50 to 75 microns or Grit-medium (G) (ISO 8503-2: 2012)

Option	System Details	Coating System			Repair System			Max. Immersion Temp. (C°)
		Reference	Binder	Thick (µm)	Reference	Binder	Thick (µm)	
1	Primer	Sigmaguard 720	EP	150	Sigmaguard 720	EP	150	50
	Final coat	Sigmaguard 720	EP	150	Sigmaguard 720	EP	150	50

Remark:

- The grade of cleanliness Sa 3 (ISO 8501 standard) for shop blasting and minimum Sa 2½ (ISO 8501 standard) for outdoor application.
- Specific guarantee period: 3 years, No defects such as blistering, cracking, flaking and degree of rust lower than Ri 2.
- Maximum Immersion Temperature Resistance shall be equal or more than process maximum operating temperature of vessels/tanks.

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