COMPANY NAME:	**Golden Triangle Polymers Company LLC**
PROJECT NAME :	**Golden Triangle Polymers Project**
PURCHASER :	**JKJV**
PURCHASER JOB CODE :	**0-8936-2**
PURCHASE ORDER NO. :	**0-8936-2-P** **-215A-201-A**
VENDOR NAME :	**Siemens Energy**
EQUIPMENT/MATERIAL NAME:	**Process Water Clean-up Unit**
ITEM NO.:	**10-X-2400**
DOCUMENT TITLE:	**PAINTING PROCEDURE &SPECIFICATION**

ISSUE PURPOSE :				FC								
	SDR CODE				PURCHASE ORDER NO.		DOC. TYPE CODE			SERIAL NO.	REV.
PURCHASER DOC.NO.			V	-	215A-201-A	-	PLN	-		706	3
COMPANY DOC. NO.	P04	-	10-JKVN								
VENDOR DOC. No.	SEI-PLN- 706										

Contractor Use

Reviewe Result

JGC Result : **B** - **Approved with minor comments**
Next Issue Purpose : **FC**
Reviewed by : JGC-PKG Y.YASUE

GOLDEN TRIANGLE POLYMERS COMPANY / JKJV GTPP	Golden Triangle Polymers Project	Document Title: PAINTING PROCEDURE &SPECIFICATION	SIEMENS energy
		Document No.: P04-10-JKVN-215A-201-A-PLN-706	
	COMMENT RESOLUTION SHEET	Rev. No.: 2	
		Vendor Name: Sparkle Clean Tech Pvt. Ltd.	

S.No.	Ref Doc No./ Title	Ref. Clause	Discipline	JGC Comments	Vendor Response	Status
				Date: 05.02.2024	Date: 05.02.2024	Closed/ Open
1	PAINTING PROCEDURE &SPECIFICATION	General	Quality		updated	
2	PAINTING PROCEDURE &SPECIFICATION	General	Quality		updated	
3	PAINTING PROCEDURE &SPECIFICATION	Ladder,Handrail & lader safety	Quality	---	Paint system 3.1 with finish paint RAL1018 (Yellow) updated	
4	PAINTING PROCEDURE &SPECIFICATION	Natural gas Piping	Quality	---	Paint system 3.1 with finish paint RAL 1023 (Yellow) updated	
5	PAINTING PROCEDURE &SPECIFICATION	Temporary lifting lug's	Quality	---	Paint system 3.1 with finish paint RAL1018 (Yellow) updated	

INDEX

1.0 INTRODUCTION:

Purpose of this procedure is to provide the method of surface preparation, application, and material to be used for the surface preparation and painting application, testing for the below listed components of Process water clean-up unit fabricated at Sparkle Shop.

1. Pressure Vessels – AWS Vessels (10-V-2401A /B/C),
2. Backwash Return Drum (10-V-2402),
3. Back wash Surge Drum (10-V-2403),
4. IGF vessel (10-V-2400),
5. (Carbon Steel)Structural Steel and Platforms including handrail, Equipment platform and ladder,
6. Lifting beams,
7. **Piping**

2.0 SCOPE:

This Procedure covers the minimum technical requirement for surface preparation of substrate and application of painting system & testing.

3.0 REFERENCE DOCUMENT:

3.1 10-MDES-00001 – General Specification for Pressure Vessel.

3.2 10-PKES-00002 – General Specification for Packaged Equipment

3.3 10-CHES-00001 – Specification for external coating

3.4 Approved GA Drawings/ ITP

3.5 **Product Data Sheets.**

- ITP - H10-10-JKVN-215A-201-A-PLN-707
- BACKWASH RETRUN DRUM GAD (10-V-2402)- D09-10-JKVN-215A-201-A-DGN-233,
- BACKWASH SURGE DRUM GAD (10-V-2403) - D09-10-JKVN-215A-201-A-DGN-234,
- AWS FILTER GAD (10-V-2401A/B/C) -D09-10-JKVN-215A-201-A-DGN-235,
- IGF VESSEL GAD (10-V-2400)- D09-10-JKVN-215A-201-A-DGN-237.
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (IGF-SKID) - D10-10-JKVN-215A-201-A-DGN-239
- PIPING ISOMETRIC & SPOOL DRAWINGS FOR INTERCONNECTION PIPING (OFF-SKID) W/ BILL OF MATERIAL- D10-10-JKVN-215A-201-A-DGN-240
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (AWS Filter-SKID)- D10-10-JKVN-215A-201-A-DGN-290
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (AWS Piping-SKID)- D10-10-JKVN-215A-201-A-DGN-291
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (Backwash Return Drum -SKID)- D10-10-JKVN-215A-201-A-DGN-292
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (Backwash Surge Drum -SKID) - D10-10-JKVN-215A-201-A-DGN-293
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (Pump 01-SKID)-
- D10-10-JKVN-215A-201-A-DGN-294
- PIPING ISOMETRIC DRAWING AND BILL OF MATERIAL (Pump 02-SKID)-
- D10-10-JKVN-215A-201-A-DGN-295
- PIPING SUPPORT AND GUIDE DRAWING - D11-10-JKVN-215A-201-A-DGN-241
- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR BACKWASH RETURN DRUM-
- B01-10-JKVN-215A-201-A-DGN-243

- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR BACKWASH SURGE DRUM- B01-10-JKVN-215A-201-A-DGN-244
- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR AWS FILTERS-
- B01-10-JKVN-215A-201-A-DGN-245
- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR AWS FRONTAL PIPING- B01-10-JKVN-215A-201-A-DGN-246
- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR PUMP SKID 1 (P-2403A/B)- B01-10-JKVN-215A-201-A-DGN-247
- SKIDS GENERAL ARRANGEMENT DWG. AND PLAN DWG. (WITH PLATFORM, LADDERS, STAIRS, DRAINAGE, GROUNDING) FOR PUMP SKID 2 (P-2402A/B & P-2404A/B) - B01-10-JKVN-215A-201-A-DGN-248
- LIFTING ARRANGEMENT FOR ALL SKIDS AND LOOSE SUPPLY ITEMS INCLUDING LIFTING BEAM DRAWING- B01-10-JKVN-215A-201-A-DGN-289

3.6 Painting Specifications

• SSPC SP 1	Solvent Cleaning
• SSPC SP 2	Hand Tool Cleaning
• SSPC SP 3	Power Tool Cleaning
• SSPC SP 5	White metal Blast cleaning
• SSPC SP 6	Commercial Blast Cleaning
• SSPC SP 7	Blush-Off Blast cleaning
• SSPC SP 10	Near white blast Cleaning
• SSPC SP 11	Power tool cleaning to bare metal
• SSPC Volume 1	Good Painting Practice
• SSPC Volume 2	Systems & Specification
• SSPC SP PA 1	Shop Field & Maintenance Painting
• SSPC SP PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
• SSPC SP PA	Guide to Safety in Paint Application
• SSPC SP AB 1	Mineral and Slag Abrasives
• SSPC SP AB 2	Cleanliness of Recycled Ferrous Metallic Abrasives
• SSPC SP VIS 1	Visual Standard for Abrasive Blast Cleaned steel
• SSPC SP VIS 3	Visual Standard for power & hand tool cleaned steel
• ASTM D4541	Standard test method for Pull off strength of surface profile of blast cleaned surface.
• ASTM D4417	Standard test method for field measurement of surface profile of blast cleaned steel
• ASTM D5162	Standard practice for Discontinuity (Holiday) testing on Non-conductive Protective coating on metallic substrates
• ISO 2808	Paint & varnishes – Determination of Film thickness
• ISO 4624	Paint & varnishes – Pull off test for Adhesion

- ISO 8501 -1 Preparation of Steel Substrates before application of paint and related products – Visual Assessment of surface cleanliness
- ISO 8502 Preparation of Steel Substrates before application of paint and related products – Test for assessment for surface cleanliness
- ISO 8504 - 2 Preparation of Steel Substrates before application of paint and related products – Surface preparation Methods
- Indian Environment (Protection) Rules, 1986 and its subsequent amendments
- Indian Air (Pollution & Prevention) Act 1981 and its subsequent amendments
- Codes, Regulation, and statues of Authorities having jurisdiction in location of installation

4.0 SAFETY PRECAUTIONS

4.1 The subcontractor/Vendor shall be aware of the many potential hazards involved in the preparation of steel and the application of coatings.

a. SSPC PA3 has a wealth of information about hazards and safety procedures.

b. Personnel involved at the job site shall review this guide prior to beginning work.

4.2 All local, state, and federal health and safety regulations shall be complied with.

4.3 The coatings used shall be within the local maximum limit for volatile organic compounds (VOC).

DELETED

4.4 Coating manufacturer's recommended precautions regarding toxicity and safe handling of all coating materials shall be followed.

a. Special care shall be observed when mixing (paints and thinner) to avoid fire hazards.

b. **DELETED**.

4.5 The abrasive blast nozzle and paint pumps shall be bonded (grounded) to the work metal to prevent the buildup of electrostatic charges, which could cause a spark discharge.

4.6 All other persons exposed to the blast dust shall wear filter-type air respirators.

4.7 Adequate ventilation shall be provided during all work and for at least four hours after the coating application, to keep solvent concentrations within safe, non-explosive limits. Vapors shall be removed with an air educator, rather than by blown air.

5.0 EXTENT OF PAINTING:

- All surfaces subject to weathering, rusting or corrosion by exposure to the elements shall be painted.
- All carbon steel surfaces shall be painted as per the appropriate system & with applicable color code (RAL) which will be in line with project specifications.

Surfaces Shall Not Be Coated.

Unless specified otherwise, the following surface shall not be coated:

- Interior surfaces of piping.
- Insulation (HP (personal Protection guard mesh))
- Galvanized surfaces (Grating & structural bolts for galvanizing)

- Nonferrous metals (except safety color required and Insulated Stainless Steel which operation temperature from 120 ºF to 350 ºF).
- Glass surfaces of gage glasses and sight glasses
- Name plates and identification tags
- Gasket contact surfaces (Flat Face & Serration area of WNRF Flanges)
- Carbon steel/Stainless steel/Galvanized equipment, tanks and pipes bolt and nut no coating is required. However, temporary corrosion protection shall be applied in accordance with 10-CEES-00005 “Supplementary Specification to USGCII-CEES-00005”.

6.0 SURFACE PREPARATION:

6.1 Preparation for Abrasive Blasting

1. Sharp edges, such as those occurring in rolled structural members, as well as those resulting from flame cutting, welding, etc. Shall be removed by below mentioned methods before abrasive blasting and application of any coating system.
   - Grinding and Sanding: Grinding and sanding are frequently employed to remove surface defects such as weld spatter, scale, or irregularities. This process smoothest the surface by using abrasive tools or materials. It helps in achieving a consistent and uniform appearance.
   - Polishing: Polishing is used to create a smooth, mirror-like surface finish. It is typically done using abrasive compounds, polishing machines, and buffing wheels. Polishing helps eliminate scratches, minor imperfections, and surface roughness.
2. Neither welding nor grinding, including cosmetic grinding (other than removal of welding spatter and sharp edges prior to surface preparation), shall be permitted on the pressure resisting components and welds of pressure vessels and piping after hydrostatic testing, unless accepted in writing by Company.
3. For external coating systems, the gasket contact faces on flanges for vessels, tanks, valves, pipes and pumps shall be protected during blasting and painting. The remaining surface of the flange and bolt holes shall be abrasive blast cleaned and painted in accordance with the specified coating system.
4. Surfaces to be coated shall be clean of all contaminants that would affect the integrity of the coating system.
5. Environmental conditions like relative humidity etc. should meet the manufacturer’s data sheet requirements & shall be recorded in Inspection report.
6. DELETED

6.2 Abrasive Blasting

1. Blaster shall have a minimum of two years’ experience in blasting.
2. All abrasive blasted surfaces shall be blasted in accordance with the SSPC or NACE blast specified on the coating system data sheets.
3. The anchor profile shall be as specified on Coating manufacturer’s product data sheets.
4. The anchor profile shall be verified in accordance with ASTM D4417 Method C or Equivalent using Either course or extra-course Testex R○ Press-O-Film tape and a spring-loaded micrometer.

6.2.1 Abrasive

1. Abrasive blast cleaning shall be performed with a clean, sharp grade of abrasive.
2. Copper slag shall be utilized as an abrasive material suitable for the blasting of Carbon Steel (CS), Stainless Steel (SS), and Hot-Dip Galvanized (HDG) surfaces.
3. Dry, grit-type abrasives shall be used. Grain size shall be suitable for producing the specified anchor profile.

4. Abrasives shall be free of dust, dirt, and other foreign matter and shall always be kept dry.
5. Silica or other abrasive substances containing more than 1 percent crystalline silica shall not be used as an abrasive blasting material.
6. **DELETED**

6.2.2 Prior To Blasting

1. Before the commencement of blasting and painting processes, ensure that all unpainted surfaces are adequately shielded. This protective measure must be accomplished through the careful application of masking tape to preserve the integrity of the unpainted areas.
2. Air supply compressors shall be equipped with adequately sized and properly maintained oil and water separators.
3. Air compressors shall be capable of maintaining 690 kPa (100 psig) minimum at the nozzle.
4. All abrasive blasting equipment shall have inline oil traps and air driers.
5. Blast air pressure shall be a minimum of 95 psig unless the demonstration test proves acceptable otherwise.
6. Weld areas shall be ground, chipped, or wire brushed as necessary prior to blasting to remove rust, residual flux, and weld spatter.
7. Prior to abrasive blasting, valves, sight glasses, name tags, machinery, electrical fixtures, stainless steel electrical control panels, etc., subject to damage from either the blast or from the abrasive material remaining, shall be protected.
8. The Humidity level, Ambient and metal Temperature shall be checked & recorded by Quality Engineer in the inspection report before release of equipment for Blasting**.**
9. When possible, name tags should be installed after painting is complete.
10. If it is not possible to coat under tags, their edges shall be sealed with silicone to prevent moisture accumulation.
11. Cadmium-plated, Teflon-coated, electroplated, metallized, or other specially coated items shall not be blasted unless otherwise directed by the Company.
12. All visible burrs, laminations, slivers and scabs shall be removed or repaired prior to blasting.
13. All Edges/Corner shall be rounded.
14. For Blasting, dry oil-free compressed air shall be used.

6.2.3 Blasting

1. Blasting shall be performed in dry weather. Dry blast cleaning operations shall not be conducted on surfaces exposed to rain, water spray, or any other moisture.
2. Abrasive blast cleaning shall not be performed when the ambient or substrate temperature is less than 50 (30C) above the dew point temperature.
   a. Dew point temperature shall be determined by sling psychrometer in accordance with ASTM E337 or equivalent electronic device, at the location where the work is being performed.
   b. Substrate temperature shall be determined with a surface thermometer.
3. Blasting shall be accomplished so that previously painted surfaces are not contaminated by abrasive or blast wastes.
4. The rough edge of any existing coating shall be feather-edged before applying the next coat. This can be accomplished by abrasive blast, power tool, or hand sanding.

5. Subsequent blasting shall continue a minimum of one inch into the primed surfaces.

6.2.4 Post Blasting

1. After blasting and immediately before spraying, dust and loose residues shall be removed by brushing, blowing off with clean dry air, or vacuum cleaning.
2. The complete removal of all blasting material from both the vessel and the internal nozzles is required prior to application of the coating and the surface preparation.
3. Blast cleaned surfaces that show evidence of rust bloom or that have been left uncoated for more than four hours shall be re-cleaned to the specified degree of cleanliness prior to coating.
4. No inhibitive washes or holding primers intended to prevent rusting shall be used after blasting.
5. Welding undercut, and porosity shall be repaired prior to application of the coating and the surface preparation restored to the specified level.
6. Roughness profile shall be in the range of 50-75µm or as per paint manufactures recommendation.
7. Painting shall commence within 4 hours of blasting. If not, or when there is an appearance of rust bloom, re-blasting to be carried out and painted.
8. All blast cleaned surfaces shall be blown down dust free, and then inspected for proper cleaning prior to painting. SSPC-VIS1 shall be used as a visual standard for confirming the degree of surface cleanliness.

7.0 PAINTING /COATING APPLICATION

7.1 General

1. Painter shall have a minimum of two years' experience in painting.
2. The application shall be in accordance with SSPC-PA1, Coating manufacturer's published application instructions, material safety data sheet (MSDS), and the requirements specified herein.
3. Application equipment shall be as recommended by Coating manufacturer, shall be clean and in good condition, and shall be suitable for applying the coating as specified.
4. The number of coats to be applied shall never be fewer than the number of coats required by this specification and shall have individual coat dry film thicknesses not less than the minimum thickness specified.
5. Wet film thickness shall be spot checked during the application of each coat to assure the specified dry film thickness (DFT) will be met.
6. Thickness requirements shall be met with each coat and total thickness shall not be "made-up" in any one coat.
7. When using zinc paints, the coatings shall not be applied on stainless steel.
8. Personnel protection insulation (Insulation code HP1 & HP2) considers as an uninsulated condition and select the uninsulated coating system based on the material substrate and Operating Temperature Range.

7.2 Environmental Conditions

1. Coating done outdoors shall be done in daylight hours and completed at least one hour prior to sundown.
2. Indoor painting is allowed 24hours a day if the specified metal and air temperatures and relative humidity requirements are always met inside the building or vessel during preparation, painting, and curing.
3. No coating shall be applied when any of the following conditions are present:
   a. Ambient or surface temperatures are above 49°C or below 10°C or outside the Coating manufacturer's recommended temperature limits.

b. when the relative humidity is above 85%.

c. Ambient or substrate temperature is less than 5°F (3°C) above the dew point temperature or the steel substrate is expected to fall below the dew point four hours after application of the coating.

d. During strong winds or gusty conditions, particularly for spray application.

e. During rain, snow, or fog, or on damp surfaces or surfaces that may have frost.

4. Newly painted surfaces damaged by rain shall be re-blasted and repaired.

7.3 Paint Selection Temperature

The appropriate Paint System shall be selected considering the following operating conditions.

Maximum operating temperature from those listed operating conditions except for cyclic temperature operating conditions shall be taken to select the paint system specified in ATTACHMENT-1 of 10-CHES-00001 Rev.06 .The operating temperature includes high temperatures that occur during commissioning, start-up, or shut-down such as steam-out, or dry hot gas blowing.

1. NORMAL OPERATION

   a. Continuous Temperature Operation

   b. Cyclic Temperature Operation:

   Cyclic minimum or maximum operating temperature is out of the temperature range of the relevant individual Paint Systems.

2. OTHER CONDITION

   a. Initial Start Up

   b. Normal Start Up

   c. Normal Shutdown

   d. Steam Out

   e. Dual Temperature

7.4 Materials selection

1. The coating material shall be selected accordingly from the following approved PAINT MANUFACTURERs except for VENDOR's Standard System.

   a. Jotun

   b. Carboline Paints

7.5 Materials

1. Coating materials shall be furnished in Coating manufacturer's unopened containers, clearly identifiable, and shall be kept covered, clean, and protected.
2. Each coating container shall be clearly labeled to show coating identification, date of manufacture, batch number, and any other information to satisfy regulatory requirements at the job site. Each coating shall also be accompanied by its material safety data sheet and product data sheet.
3. Coating containers shall be kept in the factory sealed condition until use.
4. Materials older than the Coating manufacturer's recommended shelf life shall not be used.
5. Materials shall be used in order of the oldest first.
6. Coating that has deteriorated during storage shall not be used.
7. Solvents used for thinning shall be as recommended by Coating manufacturer.

8. All painting materials shall be chemically pure, and free from foreign contaminants. The age of coating material component shall not exceed the Manufacturer's recommended shelf life during storage and pot-life during mixing and application.

1. Components shall be thoroughly mixed per recommendations noted in Coating manufacturer's data sheets.
2. Mixing shall be done in clean containers, free from traces of grease, other paints, or contaminants.
3. Coating containers shall be kept covered to prevent contamination.
4. Paint shall be mechanically mixed in full batches.
5. Multi-component coatings, such as inorganic zinc, epoxies and urethanes, shall have the components accurately measured according to Coating manufacturer's directions.
6. Mixing partial kits is not acceptable.
7. Thinning shall not exceed the allowable VOC level for the coating used.
9. **Thermaline 4700 paint product from Carboline is not acceptable.**
10. **Intermixing products from different paint suppliers is not permitted.**

7.6 Shelf and Pot life

1. Materials that have exceeded the Coating manufacturer's recommended shelf life shall not be used.
2. Coating manufacturer's recommended pot life shall not be exceeded. When this limit is reached, the spray pot shall be emptied and cleaned, and new material mixed.

7.7 Spray Application

1. Subcontractor/Vendor's applicators shall be skilled in the proper application technique for each coating.
   a. Proper equipment, per the Coating manufacturer's data sheets, shall be used.
   b. Applicators or equipment failing to meet this requirement, to Company/Contractor's or Coating manufacturer's satisfaction, shall be removed from coating application.
2. Spray guns, lines, and pressure pots shall be cleaned prior to adding new material. The air caps, nozzles, and needles shall be those recommended by Coating manufacturer for the material being sprayed.
3. Moisture traps, separators, and driers shall be installed between the air supply and the pressure pot. The drain valve must be kept open slightly to permit continuous draining of any condensate during operations.
4. Operating pressures shall comply with the recommendation of Coating manufacturer. All pressure pots shall be equipped with pressure regulators and gauges.
5. Paint shall be applied in a uniform layer, with 50 percent overlapping of the previous pass utilizing the cross-hatch method. During application, the spray gun shall be held perpendicular to the surface being painted.

7.8 Brush and Roller Application

1. Written Company acceptance is required before brush or roller application can be substituted for spray application.
2. Prepare and coat surfaces that will become inaccessible during fabrication and assembly before they become inaccessible. Inaccessible and restricted areas that prevent spray application of paint shall be painted by brush or roller to ensure the specified film thickness is provided.

3. All welds that cannot be properly spray coated shall be brush or stripe coated with an approved coating before applying successive spray coats over the primer coating.
4. Brushes shall be of a style and quality that will enable proper application of the coating.
5. Brushing shall be done so that a smooth coat with uniform thickness is obtained. When applying coatings with a brush, multiple coats may be required to achieve the specified thickness.

7.9 Priming

1. The specified coating system primer shall be applied within 4 hours from the time that completion of blasting and before rusting, discoloration, or surface contamination occurs.
2. Surfaces to be coated shall be clean, dust-free, and dry before application of any coating and shall meet applicable hand, power tool, or abrasive blasting surface preparation requirements before priming.
3. Care shall be exercised to prevent overspray, spillage, or application of coatings to surfaces for which they are not intended. Skips, sags, and drips should be repaired.
4. Inorganic zinc primer shall be applied using an agitated pot (or equivalent).
5. Batch number shall be taken and date of manufacturing shall be rechecked together with type of paint.

7.10 Top coating

1. Each coat of paint shall be of contrasting color to indicate the extent of coverage.
2. All coatings shall be allowed to dry for at least the minimum time recommended by Coating manufacturer, considering temperature and humidity, before applying succeeding coats.
3. Maximum overcoat time shall be limited to Coating manufacturer's recommendation.
4. Prior to top coating an inorganic zinc primer, the cure of the primer shall be verified. Check for proper cure of primer using the solvent rub method as described in ASTM D4752.
5. Inorganic zinc primers shall have all overspray removed with a stiff bristle brush or wire screen and shall be clean and thoroughly cured prior to top coating.
6. When spraying over inorganic zinc primers, a mist coat shall be used to avoid bubbling. This mist coat may be a thinned coat or may be applied by a quick pass of the spray gun prior to applying the full coat but allowing enough time for solvent evaporation.

7.11 Film Thickness

8.1. Wet film thickness shall be spot checked during the application of each coat to assure the specified dry film thickness (DFT) will be met.

8.2. Wet film thickness measurements are not suitable for some materials such as inorganic zinc primers, flake filled epoxies, etc.

8.3. The DFT of each coat shall be checked in accordance with the procedures defined by SSPC-PA2 using magnetic gauge that has been properly calibrated.

8.4. Coating thickness on stainless steel shall be checked using a SSPC PA2 Type 2 electronic gauge suitable for use on non-ferrous substrates. Measurements shall be taken after removal of dry spray and overspray.

8.5. All gauges shall be adjusted to compensate for the surface profile effect prior to application of any coating.

8.6. The appearance of each finish coat shall be checked.

7.12 Defects

1. Coatings shall be free of defects such as runs, sags, pin holes, voids, blisters, wrinkles, mud cracking, and bubbles.
2. Dry spray and overspray shall be removed.
3. The DFT of each coat shall not be outside the specified range.

7.13 Coating Repair

1. Prior to application of any coat, all defects and damage to the previous coat(s) shall be repaired. Damage to finished work shall be thoroughly cleaned and re-coated.
2. Damaged areas including weld joints shall be spot blast cleaned or power tool cleaned (SSPC SP3) as necessary to restore any exposed steel to its original degree of cleanliness.
3. All loose, cracked, and damaged coating shall be removed, and the adjacent sound coating feathered back approximately 2 inches (50 mm) to form a uniform and smooth surface. Feathering shall be done by hand or power sanding with a grit wheel or sandpaper.
4. The prepared surface shall be free of loose, burnt, or blistered coating.
5. Unless specified otherwise, the coating used for repair shall be the same as the original and shall have the same DFT.

7.14 Vendor Standard Coating system

1. A separate procedure is to be submitted to the client for approval before proceeding with the painting process.
2. Refer paint procedure no.- P04-10-JKVN -V-215A-201-A-PLN-724 for centrifugal Pumps , P04-10-JKVN -V-215A-201-A-PLN-730 for control valves, Manual valves, ON-OFF valve, Pressure safety valve & strainer & H02-10-JKVN-215A-201-A-PLN-729 for sampling station.

8.0 COATING SYSTEMS

8.1. Coating System to be followed as per attached Painting Coating System Detail's below

9.0 INSPECTION AND TESTING:

Surface preparation, priming and finishing painting are subject to inspection and approval by Contractor/Company. The detail of inspection items is described in Attachment -1– Inspection & Test Summary

9.1 General

1. The Vendor shall perform all inspections necessary to ensure that surface preparation and coating application complies with the requirements of this specification.
2. The indicated records shall be kept daily and shall be submitted to the Company and Contractor at least weekly.
3. COM-EF-844, or an approved equivalent coating inspection record, shall be used to record this information.
4. Company/Contractor representative shall be given adequate notice prior to the start of surface preparation and coating application so that they can witness the work.
5. The company/Contractor representative shall have the option to witness or repeat any of these functions as necessary.

6. Materials, equipment, and work shall always be available to Company/Contractor's authorized inspector(s). Company/Contractor's authorized inspector(s) shall have access to the work site during the progress of the work and the right to conduct any inspection or testing deemed necessary to ensure that the coatings are properly applied
7. Instruments used in inspection activities (e.g., thermometer, pyrometers, hygrometers, thickness gauges, profile gauges, and holiday detectors) shall be supplied by /Vendor in proper working order and calibrated prior to use.
8. **DELETED**.
9. The Subcontractor/Vendor painting Inspector shall be certified under either one (1) of the following certification institutes NACE International Certified or equivalent e.g., NACE level 1, SSPC PCI level 1, FROSIO level 1, etc. and must have adequate experience in the oil & gas industry.

9.2 **Inspection by Company and Contractor**

1. Company/Contractor representative shall be given at least two days' notice at site and 12 working days' notice at Vendor's shop prior to the start of surface preparation or coating application so that they can witness the work.
2. Company and Contractor's inspectors shall ensure that all necessary inspections are carried out at each hold point.
3. Company and Contractor's inspectors shall have the right to condemn any materials, equipment, or work not in compliance with this specification,
4. Necessary corrective actions shall be performed by Subcontractor/Vendor at Subcontractor/Vendor's expense.
5. Scaffolding, beam clamps, or any other equipment that will interfere with or damage coating shall not be used.
6. Vendor shall provide safe access to all areas for inspection by Company/Contractor.
7. Vendor shall maintain the area to prevent contamination of coatings (i.e., wet down dusty fabrication and painting areas including the surrounding grounds when dry conditions are experienced).

ATTACHMENT-1

INSPECTION AND TEST SUMMARY

Attach MSDS in next revision for all paints

Item No.	Inspection Items (Characteristics To Be Verified)	Frequency	Applied Document And Standard	Acceptance Criteria
1.0	**Pre-painting Inspection**			
1.1	Verify that Coating, thinning and abrasive materials are as specified	100% all surface	Coating material and abrasive data sheet Material Safety Data Sheet (MSDS) Coating material batch certificate	All Material shall be complied with this specification. No hazardous material shall be used.
1.2	Verify that storage conditions of all materials are adequate and properly maintained.	100% all surface	Coating material data sheet	Paint manufacturer recommendation
2.0	**Surface preparation**			
Item No.	Inspection Items (Characteristics To Be Verified)	Frequency	Applied Document And Standard	Acceptance Criteria
2.1	Visual check surface condition prior to surface preparation Verify that oil and grease are removed. Verify that weld and sharp edges suitably prepared Verify that surfaces not to be coated are masked off or otherwise protected before surface preparation	100% all surface	SSPC SP1 ISO 8501 - 1	No visible contamination from oil and grease etc., No surface defect such as visible burrs, slivers, scabs, and weld spatter etc., and sharp edges shall be properly rounded. Ensure properly masked off.
2.2	Verify that the air supply is clean and free of oil and moisture. Verify the adequacy of cleaning and blasting equipment, hoses, etc.	Every shift prior to start work	ASTM D4285	Free of oil and water contamination With Safety condition

2.3	Abrasive materials Verify the cleanliness and dryness of abrasive. Verify the shape, type and size	Every shift prior to start blasting	ASTM D4940	≤300 µS/cm at room temperature Type and size to produce anchor profile
2.4	Environmental condition: a) Ambient Temperature b) Relative Humidity c) Surface Temperature d) Dew point	Min.3 times/day inclusive of twice prior to start painting or blasting	section 7.2 “Weather conditions” section 6.2.3 “Blasting”	a) Above 10 °C (50°F) & below 49 °C (120 °F) b) Below 85% c) Above 10 °C (50 °F) & below 49 °C (120 °F) d) More than 3 oC (5 °F) above Dew point
Item No.	Inspection Items (Characteristics To Be Verified)	Frequency	Applied Document And Standard	Acceptance Criteria
2.5	Verify the surface preparation grade	100% all surface	SSPC VIS 1	Confirm to final grade specified in the coating system
2.6	Surface Roughness (Profile):	a) Random Min. one time for each 50 m² for Equipment, pipe, and structure b) One time for each 25 valves or twice per shift in case the valve size above 24 inch.	ASTM D4417	Comply Coating material data sheet specified roughness.
2.7	Salt Test	Min. 1 time / Shift	ISO 8502 6 & 9	Carbon Steel – 50 mg/m² (5 µg/cm²) Stainless Steel: 30 mg/m² (3 µg/cm²)
2.8	Dust level	Min. 1 time / Shift	ISO 8502 -3	Grade 1 Rating 2
3.0	**DFT & Final Visual Inspection**			
Item No.	Inspection Items (Characteristics To Be Verified)	Frequency	Applied Document And Standard	Acceptance Criteria

3.1	DFT check for each coat	Min. 5 spot / 10m2	SSPC PA2	According to the Specification requirements.
3.2	Final Visual Inspection to check a) Visually inspect the coated surface for defects and uniform appearance. b) Verify that the coating system has cured. c) Verify that all identified repairs have been repaired.	100% all surface	Visual Check	No surface defect such as vspray drizzle, areas left uncoated, inclusions ofdirt, blisters, porosity, sags, tears, brush marks. All painted surfaces shall be visually inspected to ensure the absence of skips, overspray, sags, foreign particles contamination, air pockets, drips, holidays (For Internal surface of vessel Only) @ 67.5 V, Holiday Detection shall be conducted on vessel internal surface coat. Acceptance Criteria – No holidays/damages
3.3	Adhesion Test:	a)Structure& piping 1 time/500m² b)Equipment– once/ equipment or 100m2 in the case the equipment is greater than 20m2. c)Valve-Once per each 50 valves. d)Other items – To be consider case by case	ASTM D4541 (For Dry film thickness above 5 mils) ASTM D3359 Method B (For Dry film thickness up to 5 mils)	ASTM D4541: Coating manufacturer's recommendation or minimum 3 Mpa ASTM D3359: Coating manufacturer's recommendation or acceptable criteria as 4B
3.4	Final DFT	Min. 5 spot / 10m2	SSPC PA2	According to the specification requirements.
3.5	Final Record			All the records for the required inspection shall be recorded accordingly with DFT Map with GAD.

10.0 ACCEPTANCE CRITERIA:

The finished work shall not contain any runs, sags, or other application flaws which could lead to premature coating failure.

No work shall be considered complete or accepted until the coated surface thickness are within the required parameters.

The unit of measurement shall be reported dual units (US units & SI units)

11. PAINT REPORT FORMAT: (INTERNAL & EXTERNAL TYPICAL)

	SURFACE PREPARATION & PAINTING REPORT	Report No:	
		Date :	

BLASTING AND PAINTING INSPECTION REPORT

Client	
Contractor	
Job/Po No.	
Project	
Drawing No.	
Item Description	
Paint Procedure	
Coating System	

Surface Condition Before Preparation	Equipment/Technique Used

Surface Preparation		DATE & Time :	
		DATE & Time :	
Pre-Blasting Inspection			

Atmospheric Condition		Blasting Inspection			
Atmospheric Temp:.		Types of Abrasives :			
Relative Humidity:		Surface Finish		Surface Profile	
Surface Temp.:		Reqd.	Actual	Reqd.	Actual Profile Achieved
Dew Point:					

Cleanliness ISO 8501-1 & ISO 8502-3		Visual Comparator - ISO 8501-1	
Salt Test as per ISO 8502-6 & ISO 8502-9			

COATING MATERIAL

Coating Type	Paint	Make	Batch No. & Mfg.Date	Exp.Date
Primer Coat				
Intermediate Coat				
Intermediate Coat				
Finish Coat				

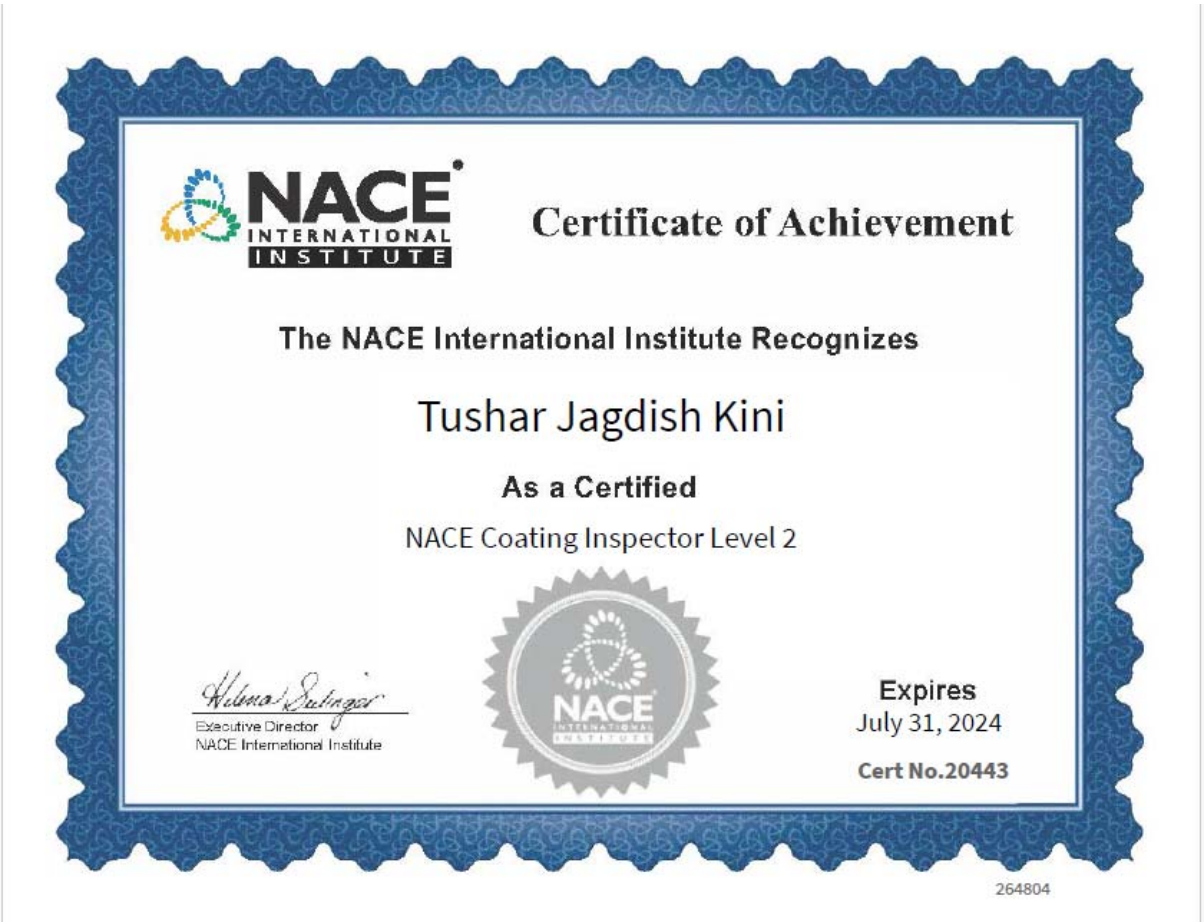
PAINT DATA	PRIMER COAT	INTERMIDIATE COAT	FINISH COAT	TOUCH UP COATING (IF ANY)
BRAND NAME OF PAINT				
SHADE				
ATMOSPHERIC TEMP. - ° C				
RELATIVE HUMIDITY - %				
SURFACE TEMP. - ° C				
DEW POINT TEMP. - ° C				
DFT REQUIRD. - µ (Micron)				
DFT ACTUAL - µ (Micron)				
DFT Total - µ (Micron)				

DFT Meter detail	EQUIPMENT	REMARK

Remarks: (if any)

SPARKLE CLEAN TECH PVT. LTD./ VENDOR	TPIA	TPIA	TPIA

12. INSPECTOR QUALIFICATION: NACE LEVEL II CERTIFICATE



Painting Coating System Detail's - ATTACHMENT-2											
Sr No	Component (Item & Substrate)	Specification	Coating Shedule		Surface Prepration	Paint System No	Prepration / Painting	Requirements	Equivalent Paint Name	Manufacturer Name	DFT
			Insulation	Operation Temprature							Mils
1	Equipment – Vessels 06 No's (External Coat) Backwash Return Drum Tag No : 10-V-2402 Backwash Surge Drum Tag No : 10-V-2403 Nutshell Filter Tag No: 10-V-2401A/B/C IGF Vessel Tag No : 10-V-2400	10-CHES-00001 Rev.06	Uninsulated With/without steam out	From 200 ˚F (93℃) to 500 ˚F (260℃) (200 ˚F≦ T ≦ 500 ˚F)	SP10	2.5	Primer Coat	Self-Cured Inorganic Zinc -Solvent Reducible	Resist 86	Jotun	2.0-3.0
							Tie Coat	Silicone Acrylic	Solvalitt Midtherm	Jotun	0.75-1.5
							Top Coat	Silicone Acrylic	Solvalitt Midtherm	Jotun	0.75-1.5
							Finish Colour RAL 7038 (Grey)				TOTAL DFT Min.-Max (mils) 3.5-6.0
2	Equipment – Vessels 06 No's (Internal Coat) Backwash Return Drum Tag No : 10-V-2402 Backwash Surge Drum Tag No : 10-V-2403 Nutshell Filter Tag No: 10-V-2401A/B/C IGF Vessel Tag No : 10-V-2400	----------	N/A	N/A	SP10	----------	Primer Coat	1 Coat of Plasite 7159 HAR Epoxy (Light Grey)	Tankguard Storage	Jotun	5-6
							Top Coat	1 Coat of Plasite 7159 HAR Epoxy (Light Grey)	Tankguard Storage	Jotun Jotun	5-6
							Finish Colour (Ligh Grey)				TOTAL DFT Min.-Max (mils) 10-12
3	Skirt/Saddle Base Plate and Saddle	10-CHES-00001 Rev.06	Uninsulated	Ambient	SP10	3.1	Primer Coat	Self-Cured Inorganic Zinc -Solvent Reducible	Resist 86	Jotun	2.0-3.0
							Tie Coat	Epoxy-Polyamide High Build	Penguard Midcoat	Jotun	5.0-7.0
							Top Coat	Polyurethane-Aliphatic	Hardtop XP	Jotun	2.0-3.0
							Finish Colour RAL 7038 (Grey)				TOTAL DFT Min.-Max (mils) 9.0-13.0
4	Bottom Surface of Base plate, sliding plate	10-CHES-00001 Rev.06	N/A	Ambient	SP10	3.1	Primer Coat	Self-Cured Inorganic Zinc -Solvent Reducible	Resist 86	Jotun	2.0-3.0 TOTAL DFT Min.-Max (mils) 2.0-3.0

5	Lifting beams & Pad eyes of lifting beam (only for structural items)	10-CHES-00001 Rev.06	N/A	Ambient	SP16	1.6CC	Primer Coat	Epoxy for Galvanized	Penguard Primer	Jotun	2.0
							Top Coat	Polyurethane-Aliphatic	Hardtop XP	Jotun	1.5-2.5
							Finish Colour RAL 2010 (Safety Orange)				TOTAL DFT Min.-Max (mils) 3.5-4.5
6	(Carbon Steel) Structural Steel and Platforms Unfireproofed and Exposed Structural Steel including Equipment platform	10-CHES-00001 Rev.06	N/A	Ambient	SP10	3.1	Primer Coat	Self-Cured Inorganic Zinc -Solvent Reducible	Resist 86	Jotun	2.0-3.0
							Tie Coat	Epoxy-Polyamide High Build	Penguard Midcoat	Jotun	5.0-7.0
							Top Coat	Polyurethane-Aliphatic	Hardtop XP	Jotun	2.0-3.0
							Finish Colour RAL 7038 (Grey)				TOTAL DFT Min.-Max (mils) 9.0-13.0
6A	**(Carbon Steel) ~~Structural Steel including~~ handrail, Ladder & Ladder Safety**	10-CHES-00001 Rev.06	N/A	Ambient	SP10	3.1	**Primer Coat**	**Self-Cured Inorganic Zinc -Solvent Reducible**	**Resist 86**	**Jotun**	**2.0-3.0**
							Tie Coat	**Epoxy-Polyamide High Build**	**Penguard Midcoat**	**Jotun**	**5.0-7.0**
							Top Coat	**Polyurethane-Aliphatic**	**Hardtop XP**	**Jotun**	**2.0-3.0**
							Yellow RAL 1018				**TOTAL DFT Min.-Max (mils) 9.0-13.0**
7	Equipment – Piping (External Coat) Aboveground Piping, Valves (Itemized, Control), Fittings, Flanges, inline Piping Components and Supports	10-CHES-00001 Rev.06	Uninsulated With/without steam out	From 200 ˚F (93℃) to 500 ˚F (260℃) (200 ˚F≦ T ≦ 500 ˚F)	SP10	2.5	Primer Coat	Self-Cured Inorganic Zinc -Solvent Reducible	Resist 86	Jotun	2.0-3.0
							Tie Coat	Silicone Acrylic	Solvalitt Midtherm	Jotun	0.75-1.5
							Top Coat	Silicone Acrylic	Solvalitt Midtherm	Jotun	0.75-1.5
							Finish Colour RAL 7038 (Grey)				TOTAL DFT Min.-Max (mils) 3.5-6.0

7A	**Equipment – Piping (External Coat) Natural Gas Piping**	10-CHES-00001 Rev.06	Uninsulated With/without steam out	From 200 ˚F (93℃) to 500 ˚F (260℃) (200 ˚F≦ T ≦ 500 ˚F)	SP10	3.1	**Primer Coat**	**Self-Cured Inorganic Zinc -Solvent Reducible**	**Resist 86**	**Jotun**	**2.0-3.0**
							Tie Coat	**Epoxy-Polyamide**	**Penguard Midcoat**	**Jotun**	**5.0-7.0**
							Top Coat	**Polyurethane-Aliphatic**	**Hardtop XP**	**Jotun**	**2.0-3.0**
							Finish color for Natural Gas piping shall be RAL 1023 (Yellow)				**TOTAL DFT Min.-Max (mils) 9.0-13.0**
8	**(Carbon Steel) Skid lifting Lug temporay**	10-CHES-00001 Rev.06	N/A	Ambient	SP10	3.1	**Primer Coat**	**Self-Cured Inorganic Zinc -Solvent Reducible**	**Resist 86**	**Jotun**	**2.0-3.0**
							Tie Coat	**Epoxy-Polyamide High Build**	**Penguard Midcoat**	**Jotun**	**5.0-7.0**
							Top Coat	**Polyurethane-Aliphatic**	**Hardtop XP**	**Jotun**	**2.0-3.0**
							Yellow RAL 1018				**TOTAL DFT Min.-Max (mils) 9.0-13.0**
9	Equipment – Piping (External Coat) Aboveground Piping, Valves (Itemized, Control), Fittings, Flanges, inline Piping Components and Supports	10-CHES-00001 Rev.06	Insulated with/without Cyclic/Dual Temp. Service	From 50 ˚F (-45℃) to450 ˚F (232℃) (-50 ˚F≦ T ≦ 450 ˚F)	CS: SP10 SS: SP16	12.4	Primer Coat	Epoxy-Phenolic	Jotatemp 250	Jotun	4.0-5.0
							Top Coat	Epoxy-Phenolic	Jotatemp 250	Jotun	4.0-5.0
							Gray as per Manufactuer standard				TOTAL DFT Min.-Max (mils) 8.0-10.0

specify final color

Resist 86

Product description

This is a two component moisture curing inorganic zinc ethyl silicate coating. It is a fast curing, very high zinc dust containing product. It conforms to the compositional requirements of SSPC paint 20, level 1, ISO 12944-5 and AS/NZS 3750.15 1994. It provides excellent corrosion protection as a single coat or as part of a complete coating system. It is heat resistant up to 540 °C (1004 °F). To be used as primer in a coating system and as single coat system in atmospheric environments. Suitable for properly prepared carbon steel substrates only. This product complies with ASTM D520 type II zinc dust.

Typical use

Protective:
Suitable for structural steel and piping to be exposed to highly corrosive environments, C5I or C5M (ISO 12944-2). Recommended for offshore environments, refineries, power plants, bridges, buildings, mining equipment and general structural steel. Specially designed as a primer for coating systems where extended durability is required.

Approvals and certificates

Pre-qualification testing in accordance with NORSOK M-501, Rev. 5, System 1, suitable for exterior exposure in offshore environment, below 120 °C.
Suitable for use in mating surfaces of High Strength Friction Grip Bolted Connections:
Complies with the requirements of Research Council on Structural Connections (RCSC) Class B, Appendix A (Slip coefficient and resistance to tension creep).

Additional certificates and approvals may be available on request.

Colours

greenish grey, grey

Product data

Property	Test/Standard	Description
Solids by volume	OCCA Monograph No. 4	67 ± 2 %
Gloss level (GU 60 °)	ISO 2813	matt (0-35)
Flash point	ISO 3679 Method 1	14 °C
Density	calculated	2.6 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	455 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	510 g/l
VOC-China	GB/T 23985-2009 (tested)	467 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested)	503 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
All data is valid for mixed paint.
Gloss description: According to Jotun Performance Coatings' definition.

Film thickness per coat

Typical recommended specification range

Dry film thickness	50	-	90	µm
Wet film thickness	75	-	135	µm
Theoretical spreading rate	13.4	-	7.4	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

	Surface preparation	
Substrate	**Minimum**	**Recommended**
Carbon steel	Sa 2½ (ISO 8501-1) with a surface profile Fine to Medium G (ISO 8503-2)	Sa 2½ (ISO 8501-1) with a surface profile Fine to Medium G (ISO 8503-2)

Application

Application methods

The product can be applied by

Spray:	Use air spray or airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness. In order to avoid settling of heavy zinc, continuous mechanical stirring during application is recommended.

Product mixing ratio (by volume)

Resist 86 Comp A	8 part(s)
Jotun Zinc 100 Comp B	2.6 part(s)

Component A is a liquid and Component B is dry zinc dust. Component A must be well shaken before use. Pour the zinc dust slowly into the liquid during mechanical mixing. Stir until lump free and pass through a 60 mesh sieve.

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 4 / Jotun Thinner No. 25

Thinning max.: 5 %

Jotun Thinner No. 4: for fast evaporation
Jotun Thinner No. 25: for slow evaporation

Guiding data for airless spray

Nozzle tip (inch/1000): 17-21

Pressure at nozzle (minimum): 100 bar/1400 psi

Drying and Curing time

Substrate temperature	5 °C	10 °C	23 °C	40 °C
Surface (touch) dry	1 h	30 min	15 min	13 min
Walk-on-dry	1.5 h	45 min	30 min	25 min
Dry to over coat, minimum	18 h	13 h	4 h	1.5 h
Dried/cured for service	18 h	13 h	4 h	1.5 h

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

The drying and curing times, as well as over coating intervals for inorganic zinc ethyl silicates are measured under controlled temperatures, relative humidity (RH) 70 % during application and curing, and at average of the DFT range for the product. Higher RH will increase the curing speed.

At application below 60% RH curing will be retarted. Jotun Zinc 100 LHA can be used to speed up curing. Refer to the Application Guide (AG) for additional information.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Induction time and Pot life

Paint temperature	23 °C
Pot life	8 h

This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Heat resistance

	Temperature	
	Continuous	**Peak**
Dry, atmospheric	400 °C	540 °C

This product can withstand a peak temperature of 540 °C (1000 °F) for a longer period as well. A continuous temperature above 400 °C (752 °F) will however affect the long term performance of an inorganic zinc silicate coating.

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Subsequent coat: epoxy, silicone acrylic

Packaging (typical)

	Volume (litres)	**Size of containers (litres)**
Resist 86 Comp A	8	10
Jotun Zinc 100 Comp B	2.6	20

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Resist 86 Comp A	6 month(s)
Jotun Zinc 100 Comp B	48 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.

This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Solvalitt Midtherm

Product description

This is a one component physically drying silicone acrylic coating. It is heat resistant up to 260 °C. Can be used as primer, mid coat or finish coat in atmospheric environments. Suitable for properly prepared carbon steel, galvanised steel, stainless steel and aluminium substrates.

Typical use

Protective:
Designed as a heat resistant coating. Suitable for insulated and non insulated surfaces. Recommended as finish coat for insulated surfaces, in systems with suitable primers.

Other variants available

Solvalitt Midtherm Alu

Refer to separate TDS for each variant.

Colours

According to colour card.

Due to variations in the thermal stability of pigments, slight colour changes can occur when the coating is heated. Note that such a colour change will not affect the performance of the coating.

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	42 ± 2 %
Gloss level (GU 60 °)	ISO 2813	matt (0-35)
Flash point	ISO 3679 Method 1	27 °C
Density	calculated	1.3 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	535 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	519 g/l
VOC-China	GB/T 23985-2009 (tested)	515 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
Gloss description: According to Jotun Performance Coatings' definition.

Note: Heat resistant topcoats can be tinted in a range of colours. However, due to its pigmentation certain colours will appear less gloss and colour stable than others.

This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Film thickness per coat

Typical recommended specification range

Dry film thickness	20	-	40	µm
Wet film thickness	50	-	100	µm
Theoretical spreading rate	21	-	10.5	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

Substrate	Surface preparation	
	Minimum	Recommended
Carbon steel	Sa 2½ (ISO 8501-1)	Sa 2½ (ISO 8501-1)
Stainless steel	Cleanliness and surface profile corresponding to Sa 2½ (ISO 8501-1), Fine G (ISO 8503-2)	Cleanliness and surface profile corresponding to Sa 2½ (ISO 8501-1), Fine G (ISO 8503-2)
Aluminium	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface.	Dry abrasive blast cleaning to SSPC-SP 13/NACE No. 6.
Galvanised steel	The surface shall be clean, dry and appear with a rough and dull profile.	Sweep blast-cleaning using non-metallic abrasive leaving a clean, rough and even pattern.
Coated surfaces	Clean, dry and undamaged compatible coating	Clean, dry and undamaged compatible coating

Application

Application methods

The product can be applied by

Spray:	Use air spray or airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.

Product mixing

Single pack

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 7

Guiding data for airless spray

Nozzle tip (inch/1000): 15-17

Pressure at nozzle (minimum): 100 bar/1450 psi

Drying and Curing time

Substrate temperature	5 °C	10 °C	23 °C	40 °C
Surface (touch) dry	45 min	30 min	15 min	10 min
Walk-on-dry	4 h	3 h	2 h	1 h
Dry to over coat, minimum	6 h	3 h	2 h	1 h

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Freshly applied Solvalitt film may have slightly reduced mechanical properties. This effect can however be overcome by heating the paint system to 200 °C for approx. 1 hour.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Heat resistance

	Temperature	
	Continuous	Peak
Dry, atmospheric	260 °C	-

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat: zinc silicate, silicone acrylic

Subsequent coat: silicone acrylic

Packaging (typical)

	Volume (litres)	Size of containers (litres)
Solvalitt Midtherm	5	5

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Solvalitt Midtherm 24 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

Disclaimer

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Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.

This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Tankguard Storage

Product description

This is a two component polyamine cured phenolic/novolac epoxy coating. It is a specially designed tank lining with excellent chemical resistance. Can be used as primer, mid coat or finish coat in atmospheric and immersed environments. Suitable for properly prepared carbon steel, galvanised steel, stainless steel and concrete substrates.

Typical use

Protective:
Specially designed as an internal lining for offshore, onshore and buried tanks and pipes such as chemical storage, waste water, grey water, process water, concrete bund, fire service lines and drilling mud tanks. Can be used in pressure vessels. This coating has very good resistance to high temperature products. Refer to Protective Product Resistance List.

Approvals and certificates

Approved to UK Defence Standard 80-97 issue 5, annex G for resistance to Avcat F-44 aviation fuel
In compliance with Federal Drug Authority, USA, FDA Title 21, Part 175.300, approved for exposure to dry and liquid foods

Additional certificates and approvals may be available on request.

Colours

light grey, light red, red

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	63 ± 2 %
Gloss level (GU 60 °)	ISO 2813	matt (0-35)
Flash point	ISO 3679 Method 1	28 °C
Density	calculated	1.6 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	335 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	337 g/l
VOC-China	GB/T 23985-2009 (tested)	323 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested)	395 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
All data is valid for mixed paint.
Gloss description: According to Jotun Performance Coatings' definition.

Film thickness per coat

Typical recommended specification range

Dry film thickness	100	-	200	µm
Wet film thickness	160	-	320	µm
Theoretical spreading rate	6.3	-	3.2	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

Substrate	Surface preparation	
	Minimum	Recommended
Carbon steel	Sa 2½ (ISO 8501-1)	Sa 2½ (ISO 8501-1)
Coated surfaces	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)
Stainless steel	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface and to remove all polish from the surface.	Abrasive blast cleaning to achieve a surface profile using non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile.
Galvanised steel	The surface shall be clean, dry and appear with a rough and dull profile.	Light brush blasting using non-metallic abrasive leaving a clean, rough and even pattern.
Concrete	Dry abrasive blast cleaning to SSPC-SP 13/NACE No. 6.	Dry abrasive blast cleaning to SSPC-SP 13/NACE No. 6.

Optimum performance, including adhesion, corrosion protection, heat resistance and chemical resistance is achieved with recommended surface preparation.

Application

Application methods

The product can be applied by

Spray:	Use airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.
Roller:	Roller application only to be used for scallops, ratholes, small pipes etc.

Product mixing ratio (by volume)

Tankguard Storage Comp A	6.5 part(s)
Tankguard Storage Comp B	1 part(s)

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 23

Guiding data for airless spray

Nozzle tip (inch/1000): 17-21

Pressure at nozzle (minimum): 150 bar/2100 psi

Drying and Curing time

Substrate temperature	10 °C	15 °C	23 °C	30 °C	40 °C
Surface (touch) dry	15 h	12 h	4 h	3 h	2 h
Walk-on-dry	24 h	20 h	10 h	8 h	4 h
Dry to over coat, minimum	24 h	20 h	10 h	7 h	4 h
Dried/cured for service	21 d	14 d	7 d	4 d	3 d

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Induction time and Pot life

Paint temperature	23 °C
Induction time	20 min
Pot life	4 h

Heat resistance

	Temperature	
	Continuous	**Peak**
Dry, atmospheric	200 °C	200 °C
Immersed, sea water	95 °C	95 °C
Immersed, crude oil	120 °C	120 °C

Further resistance information can be found in Protective Product Resistance List available on Jotun's website, or contact your local Jotun office.

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Note that the coating will be resistant to various immersion temperatures depending on the specific chemical and whether immersion is constant or intermittent. Heat resistance is influenced by the total coating system. If used as part of a system, ensure all coatings in the system have similar heat resistance.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat:	phenolic/novolac epoxy
Subsequent coat:	phenolic/novolac epoxy

Tankguard Holding Primer can be used as a temporary protection and is fully compatible with the tank coating system.

Packaging (typical)

	Volume (litres)	**Size of containers (litres)**
Tankguard Storage Comp A	16.3	20
Tankguard Storage Comp B	2.5	3

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Tankguard Storage Comp A	24 month(s)
Tankguard Storage Comp B	24 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

Disclaimer

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Penguard Midcoat

Product description

This is a two component polyamide cured epoxy coating. It is a high solids, high build product. Designed as a mid coat in systems for new construction in atmospheric environments. Suitable in approved coating systems.

Typical use

Suitable for structural steel and piping to be exposed to highly corrosive environments, C5I or C5M (ISO 12944-2). Recommended for offshore environments, refineries, power plants, bridges, buildings and mining equipment.

Approvals and certificates

Contributes to satisfying the following credit(s):
- Indoor Environmental Quality (IEQ) under LEED® 2009

Pre-qualification testing in accordance with NORSOK M-501, Rev. 5, System 1, suitable for exterior exposure in offshore environment, below 120 °C.

Additional certificates and approvals may be available on request.

Other variants available

Penguard Midcoat MIO

Refer to separate TDS for each variant.

Colours

buff, grey, light red, turquoise, white

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	82 ± 2 %
Gloss level (GU 60 °)	ISO 2813	semi gloss (35-70)
Flash point	ISO 3679 Method 1	25 °C
Density	calculated	1.7 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	250 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	245 g/l
VOC-China	GB/T 23985-2009 (ISO 11890-1) (tested)	201 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested)	270 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
All data is valid for mixed paint.
Gloss description: According to Jotun Performance Coatings' definition.

Film thickness per coat

Typical recommended specification range

Dry film thickness	100	-	250	µm
Wet film thickness	125	-	300	µm
Theoretical spreading rate	8.2	-	3.3	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

	Surface preparation	
Substrate	**Minimum**	**Recommended**
Coated surfaces	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)

Application

Application methods

The product can be applied by

Spray:	Use airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.

Product mixing ratio (by volume)

Penguard Midcoat Comp A	4 part(s)
Penguard Midcoat Comp B	1 part(s)

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

Guiding data for airless spray

Nozzle tip (inch/1000):	17-23
Pressure at nozzle (minimum):	150 bar/2100 psi

Drying and Curing time

Substrate temperature	15 °C	23 °C	40 °C
Surface (touch) dry	6 h	4 h	2 h
Walk-on-dry	9 h	6 h	3 h
Dry to over coat, minimum	9 h	6 h	3 h
Dried/cured for service	10 d	7 d	5 d

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Induction time and Pot life

Paint temperature	23 °C
Induction time	10 min
Pot life	2 h

Heat resistance

	Temperature	
	Continuous	Peak
Dry, atmospheric	120 °C	140 °C

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat:	zinc epoxy, zinc silicate
Subsequent coat:	epoxy, polyurethane, polysiloxane

Packaging (typical)

	Volume (litres)	Size of containers (litres)
Penguard Midcoat Comp A	4/16	5/20
Penguard Midcoat Comp B	1/4	1/5

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Penguard Midcoat Comp A	24 month(s)
Penguard Midcoat Comp B	48 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

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Health and safety

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This Technical Data Sheet supersedes those previously issued.
The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

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Hardtop XP

Product description

This is a two component chemically curing aliphatic acrylic polyurethane coating. It has a glossy finish with very good gloss retention. It is a high solids product. The product has good application properties with low dry spray. To be used as topcoat in atmospheric environments.

Typical use

Marine:
Recommended for topside, deck and superstructure.

Protective:
Recommended for offshore environments, refineries, power plants, bridges and buildings. Suitable for a wide range of industrial structures. Used as a topcoat in pre-qualified NORSOK systems.

Approvals and certificates

This product contributes to the Green Buildings Standard credits. Please see section Green Building Standards.

NORSOK System 1, Rev.5
Grain, Newcastle Occupational Health
Food, Compliant with USA, FDA Title 21, Part 175.300 for dry solids

When used as part of an approved scheme, this material has the following certification:
- Low Flame Spread in accordance with EU Directive for Marine Equipment. Approved in accordance with parts 5 and 2 of Annex 1 of IMO 2010 FTP Code, or Parts 5 and 2 of Annex 1 of IMO FTPC when in compliance with IMO 2010 FTP Code Ch. 8

Consult your Jotun representative for details.

Additional certificates and approvals may be available on request.

Other variants available

Hardtop XP Alu
Hardtop XPL
Hardtop XPF (Winter grade version)

Refer to separate TDS for each variant.

Colours

according to colour card and Multicolor Industry tinting system (MCI)

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	63 ± 2 %
Gloss level (GU 60 °)	ISO 2813	gloss (70-85)
Flash point	ISO 3679 Method 1	30 °C
Density	calculated	1.4 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	323 g/l

VOC-EU	IED (2010/75/EU) (theoretical)	326 g/l
VOC-China	GB/T 23985-2009 (tested)	330 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested) (Max. thinning ratio included)	385 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.

Gloss description: According to Jotun Performance Coatings' definition.

The VOC values refer to white colour.

Film thickness per coat

Typical recommended specification range

Dry film thickness	50	-	100	µm
Wet film thickness	80	-	160	µm
Theoretical spreading rate	12.6	-	6.3	m²/l

Bright colours may need film thickness in the high end of the recommended specification range to achieve opacity.

Special effect colours may have diverging specification range. Refer to the Application Guide (AG) for additional information or contact your nearest Jotun office.

Surface preparation

Surface preparation summary table

	Surface preparation	
Substrate	**Minimum**	**Recommended**
Coated surfaces	Clean, dry and undamaged compatible coating	Clean, dry and undamaged compatible coating

Application

Application methods

The product can be applied by

Spray:	Use air spray or airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.
Roller:	May be used. Care must be taken to achieve the specified dry film thickness.

Product mixing ratio (by volume)

Hardtop XP Comp A	10 part(s)
Hardtop XP Comp B	1 part(s)

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 10 / Jotun Thinner No. 26

Jotun Thinner No. 26 is supplied and used in USA due to legislation.

Jotun Thinner No 63 can be used for faster curing. Max addition; 5%. Please note that addition of Thinner No 63 will give reduced polife depending on ambient temperature.

Guiding data for airless spray

Nozzle tip (inch/1000): 13-19

Pressure at nozzle (minimum): 150 bar/2100 psi

Guiding data for air spray

Nozzle tip: HVLP: 11-19 (inch/1000) / Pressure pot: 1.1-1.9 (mm)

Pressure at nozzle (minimum): HVLP: 2.1 bar/30 psi / Pressure pot: 2.1 bar/30 psi

Drying and Curing time

Substrate temperature	5 °C	10 °C	23 °C	40 °C
Surface (touch) dry	16 h	6 h	3.5 h	2 h
Walk-on-dry	24 h	14 h	7 h	4 h
Dry to over coat, minimum	24 h	14 h	7 h	4 h
Dried/cured for service	21 d	14 d	7 d	3 d

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Induction time and Pot life

Paint temperature	23 °C	40 °C
Pot life	1.5 h	50 min

Heat resistance

	Temperature	
	Continuous	Peak
Dry, atmospheric	120 °C	140 °C

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat: epoxy, zinc epoxy, epoxy mastic, polyurethane

Packaging (typical)

	Volume (litres)	Size of containers (litres)
Hardtop XP Comp A	4.55 / 18.2	5 / 20
Hardtop XP Comp B	0.45 / 1.8	1 / 3

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Hardtop XP Comp A	48 month(s)
Hardtop XP Comp B	48 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Green Building Standards

This product contributes to Green Building Standard credits by meeting the following specific requirements:

LEED®v4 (2013)
MR credit: Building product disclosure and optimization
- Material Ingredients, Option 2: Material Ingredient Optimization, International Alternative Compliance Path - REACH optimization: Fully inventoried chemical ingredients to 100 ppm and not containing substances on the REACH Authorization list – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list.
- Environmental Product Declarations. Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2016)
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804).

BREEAM® International (2013)
- Hea 02: VOC content for Two-pack performance Coatings SB (500 g/l) (EU Directive 2004/42/CE).

The EPDs are available at www.epd-norge.no

Caution

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Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products and epoxy based products used as a finish coat may chalk when exposed to sunlight and weathering.

Colour and gloss retention on topcoats/finish coats may vary depending on type of colour, exposure environment such as temperature, UV intensity etc., application quality and generic type of paint. Contact your local Jotun office for further information.

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Penguard Primer

Product description

This is a two component, polyamide cured, high molecular weight epoxy coating. Designed as a primer for new construction. Can be used as primer as a part of a complete system in atmospheric and immersed environments. Suitable for properly prepared carbon steel, stainless steel, aluminium, concrete, galvanised steel, shop primed steel and thermally sprayed zinc substrates.

Typical use

Suitable for structural steel and piping to be exposed to corrosive environments up to very high and immersed. Recommended for offshore environments, refineries, power plants, bridges, buildings and mining equipment.

Approvals and certificates

When used as part of an approved scheme, this material has the following certification:
- Low Flame Spread in accordance with EU Directive for Marine Equipment. Approved in accordance with parts 5 and 2 of Annex 1 of IMO 2010 FTP Code, or Parts 5 and 2 of Annex 1 of IMO FTPC when in compliance with IMO 2010 FTP Code Ch. 8

Consult your Jotun representative for details.

Additional certificates and approvals may be available on request.

Colours

grey, red

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	51 ± 2 %
Gloss level (GU 60 °)	ISO 2813	matt (0-35)
Flash point	ISO 3679 Method 1	25 °C
Density	calculated	1.3 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	440 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	456 g/l
VOC-China	GB/T 23985-2009 (ISO 11890-1) (tested)	415 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested)	450 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
All data is valid for mixed paint.
Gloss description: According to Jotun Performance Coatings' definition.

Film thickness per coat

Typical recommended specification range

Dry film thickness	40	-	60	µm
Wet film thickness	80	-	120	µm
Theoretical spreading rate	12.8	-	8.5	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

Substrate	Surface preparation	
	Minimum	Recommended
Carbon steel	St 2 (ISO 8501-1)	Sa 2½ (ISO 8501-1)
Stainless steel	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface and to remove all polish from the surface.	Abrasive blast cleaning to achieve a surface profile using approved non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile.
Aluminium	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface and to remove all polish from the surface.	Abrasive blast cleaning to achieve a surface profile using approved non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile.
Galvanised steel	The surface shall be clean, dry and appear with a rough and dull profile.	Light brush blasting using non-metallic abrasive leaving a clean, rough and even pattern.
Shop primed steel	Dry, clean and intact shop primer.	Abrasive swept or alternatively blasted to Sa 2 (ISO 8501-1) of at least 70 % of the surface.
Coated surfaces	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)	Clean, dry and undamaged compatible coating (ISO 12944-4 6.1.4)
Concrete	Moisture content maximum 5 %. Mechanically prepare the existing concrete surface by scabbling, needle gun, mechanical disc grinding.	Minimum 4 weeks curing. Moisture content maximum 5 %. Prepare the surface by means of enclosed blast shot or diamond grinding and other appropriate means to abrade the surrounding concrete and to remove laitance.

Optimum performance, including adhesion, corrosion protection, heat resistance and chemical resistance is achieved with recommended surface preparation.

Application

Application methods

The product can be applied by

Spray:	Use airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.

Product mixing ratio (by volume)

Penguard Primer Comp A	4 part(s)
Penguard Comp B	1 part(s)

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

Guiding data for airless spray

Nozzle tip (inch/1000):	15-19
Pressure at nozzle (minimum):	150 bar/2100 psi

Drying and Curing time

Substrate temperature	10 °C	23 °C	40 °C
Surface (touch) dry	2 h	1 h	30 min
Walk-on-dry	14 h	6.5 h	3 h
Dry to over coat, minimum	8 h	4 h	3 h
Dried/cured for service	14 d	7 d	3 d

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Induction time and Pot life

Paint temperature	23 °C
Induction time	30 min
Pot life	8 h

Heat resistance

	Temperature	
	Continuous	Peak
Dry, atmospheric	120 °C	140 °C
Immersed, sea water	50 °C	60 °C

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Note that the coating will be resistant to various immersion temperatures depending on the specific chemical and whether immersion is constant or intermittent. Heat resistance is influenced by the total coating system. If used as part of a system, ensure all coatings in the system have similar heat resistance.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat:	epoxy, epoxy mastic, zinc epoxy, zinc silicate
Subsequent coat:	acrylic, epoxy, polyurethane, polysiloxane

Packaging (typical)

	Volume (litres)	Size of containers (litres)
Penguard Primer Comp A	4/16	5/20
Penguard Comp B	1/4	1/5

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

This Technical Data Sheet supersedes those previously issued.

The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Shelf life at 23 °C

Penguard Primer Comp A	24 month(s)
Penguard Comp B	48 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

Disclaimer

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Jotatemp 250

Product description

This is a two component glass flake reinforced epoxy composite coating. It is heat resistant up to 250 °C (482 °F) and can be applied on hot substrates up to 150 °C (300 °F). Can be used as primer, mid coat or finish coat in atmospheric environments. Suitable for properly prepared carbon steel, galvanised steel, stainless steel and aluminium substrates. Suitable for temperatures ranging from cryogenic, i.e. -196 °C to 250 °C (-321 °F to 482 °F), insulated and non insulated surfaces.
The product passes the standard tests used for qualifying coatings preventing corrosion under insulation (CUI). It will offer proper corrosion protection at ambient conditions during construction and shut-down periods.

Typical use

Protective:
Designed as corrosion protection for surfaces operating at elevated temperatures where extended protection against corrosion is desired. Particularly suited for use under insulation. Suitable for insulated and non insulated surfaces.

Colours

white, red, light grey, aluminium

Aluminium colour shall not be overcoated.

Product data

Property	Test/Standard	Description
Solids by volume	ISO 3233	70 ± 2 %
Gloss level (GU 60 °)	ISO 2813	matt (0-35)
Flash point	ISO 3679 Method 1	28 °C
Density	calculated	1.5 kg/l
VOC-US/Hong Kong	US EPA method 24 (tested) (CARB(SCM)2007, SCAQMD rule 1113, Hong Kong)	270 g/l
VOC-EU	IED (2010/75/EU) (theoretical)	283 g/l
VOC-China	GB/T 23985-2009 (tested)	233 g/l
VOC-Korea	Korea Clean Air Conservation Act (tested) (Max. thinning ratio included)	354 g/l

The provided data is typical for factory produced products, subject to slight variation depending on colour.
All data is valid for mixed paint.
Gloss description: According to Jotun Performance Coatings' definition.

Film thickness per coat

Typical recommended specification range

Dry film thickness	140	-	200	µm
Wet film thickness	200	-	300	µm
Theoretical spreading rate	5	-	3.5	m²/l

Surface preparation

To secure lasting adhesion to the subsequent product all surfaces shall be clean, dry and free from any contamination.

Surface preparation summary table

Substrate	Surface preparation	
	Minimum	Recommended
Carbon steel	St 2 (ISO 8501-1) if temperature does not exceed 230 °C	Sa 2½ (ISO 8501-1)
Stainless steel	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface.	Abrasive blast cleaning to achieve a surface profile using non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile.
Aluminium	The surface shall be hand or machine abraded with non-metallic abrasives or bonded fibre machine or hand abrasive pads to impart a scratch pattern to the surface.	Abrasive blast cleaning to achieve a surface profile using non-metallic abrasive media which is suitable to achieve a sharp and angular surface profile.
Galvanised steel	The surface shall be clean, dry and appear with a rough and dull profile.	Sweep blast-cleaning using non-metallic abrasive leaving a clean, rough and even pattern.
Shop primed steel	Dry, clean and approved inorganic zinc shopprimer.	Sa 2½ (ISO 8501-1)
Coated surfaces	Clean, dry and undamaged compatible coating	Clean, dry and undamaged compatible coating

Application

Application methods

The product can be applied by

Spray:	Use airless spray.
Brush:	Recommended for stripe coating and small areas. Care must be taken to achieve the specified dry film thickness.

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The Technical Data Sheet (TDS) is recommended to be read in conjunction with the Safety Data Sheet (SDS) and the Application Guide (AG) for this product. For your nearest local Jotun office, please visit our website at www.jotun.com

Product mixing ratio (by volume)

Jotatemp 250 Comp A	5 part(s)
Jotatemp 250 Comp B	1 part(s)

Thinner/Cleaning solvent

Thinner:	Jotun Thinner No. 23
Thinning max.:	10 %

Note: Korean VOC regulation "Korea Clean Air Conservation Act" and its corresponding thinning limit will prevail over recommended thinning volumes.

Guiding data for airless spray

Nozzle tip (inch/1000):	19-21
Pressure at nozzle (minimum):	150 bar/2100 psi

Drying and Curing time

Substrate temperature	10 °C	15 °C	23 °C	40 °C
Surface (touch) dry	13 h	6 h	2.5 h	1.5 h
Walk-on-dry	24 h	13 h	7 h	2.5 h
Dry to over coat, minimum	13 h	6 h	2.5 h	1.5 h

For maximum overcoating intervals, refer to the Application Guide (AG) for this product.

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Induction time and Pot life

Paint temperature	23 °C
Induction time	20 min
Pot life	2 h

Reduced at higher temperatures.

Heat resistance

	Temperature	
	Continuous	**Peak**
Dry, atmospheric	250 °C	300 °C

Peak temperature duration max. 1 hour.

The temperatures listed relate to retention of protective properties. Aesthetic properties may suffer at these temperatures.

Product compatibility

Depending on the actual exposure of the coating system, various primers and topcoats can be used in combination with this product. Some examples are shown below. Contact Jotun for specific system recommendation.

Previous coat:	inorganic zinc silicate
Subsequent coat:	glass flake reinforced epoxy composite, silicone acrylic *
	* Maximum heat resistance is 230 °C (446 °F)

Packaging (typical)

	Volume (litres)	Size of containers (litres)
Jotatemp 250 Comp A	15	20
Jotatemp 250 Comp B	3	3

The volume stated is for factory made colours. Note that local variants in pack size and filled volumes can vary due to local regulations.

Storage

The product must be stored in accordance with national regulations. Keep the containers in a dry, cool, well ventilated space and away from sources of heat and ignition. Containers must be kept tightly closed. Handle with care.

Shelf life at 23 °C

Jotatemp 250 Comp A	24 month(s)
Jotatemp 250 Comp B	24 month(s)

In some markets commercial shelf life can be dictated shorter by local legislation. The above is minimum shelf life, thereafter the paint quality is subject to re-inspection.

Caution

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Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products may fade and chalk when exposed to sunlight and weathering.

Colour and gloss retention on topcoats/finish coats may vary depending on type of colour, exposure environment such as temperature, UV intensity etc., and application quality. Contact your local Jotun office for further information.

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