Base Load Power Hub (BLPH)

SDV/BDV AND TIGHT SHUT-OFF XV VALVES

VALVES SURFACE PREPARATION AND PAINTING PROCEDURES

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Fluitek Valves

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PAINTING PROCEDURE

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1.SCOPE

The scope of this specification is to provide minimum requirements for external coating of both onshore and offshore facilities in the oil and gas.

2.REFERENCE

123A90-DDL-MAT-SP-60006- Coating and Painting specification
Norsok M-501 : 2022

3. SURFACE PREPARATION

3.1 DESIGN AND PREPARATION BEFORE BLASTING

All structures and equipment shall be designed according to ISO 12944 international standard for high durability paint systems. All sharp edges shall be rounded (minimum radius > 2 mm).

The design of the item to be painted shall be such that it creates no interstice and inaccessible area. All oil or grease shall be removed by washing the item to be painted with appropriate solvents or any other suitable means before beginning blast-cleaning operations. This includes bolt holes in piping assemblies.

All mating surfaces of equipment subject to outdoor exposure shall be coated with the full coating system prior to assembly (saddles, skirts, base plates, bolted components, flanges, etc.). Special attention shall be paid to avoid splashes of zinc paint on equipment made of austenitic steel.

Abrasive blasting shall not proceed if:

1) Temperature of the substrate is less than 3 °C above the dew point

2) The relative humidity is more than 85 % RH

3) The weather is rainy or foggy, except under shelter, and subject to verification of the atmospheric conditions

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

These records shall be kept and made available.

3.2 BLAST CLEANING OF STEINLESS AND DUPLEX STEEL

All surfaces to be coated shall be blast-cleaned according to:

1) The grade of cleanliness (ISO 8501 standard)

2) The surface profile Ra (ISO 8503 standard: roughness meter with adapted cut-off or visiotactile surface profile comparator) specified for each system.

3) On stainless steels and duplex substrates, only non-metallic abrasives in compliance with ISO 11126-1-10 shall be used.

After blast-cleaning, all dust must be removed using a vacuum cleaner before application of the paint (ISO 8502 – 3). All blast-cleaned surfaces shall be coated before the deterioration of the “grade of cleanliness”. In any case, any surface that has been blast-cleaned shall be coated on the same day. Before painting work commences, checks for the contamination of the surface by salts shall be performed (ISO 8502 – 6 & 9).

4 PAINT APPLICATION

4.1 GENERAL

Paint shall always be applied to surfaces that are dry, clean and degreased, for both coating on substrate and previous coat.

Painting work shall not proceed if:

1) Temperature of the substrate is less than 3 °C above the dew point

2) The relative humidity is more than 85 % RH (90 % RH for inorganic zinc silicates)

3) The weather is rainy or foggy, except under shelter, and subject to verification of the atmospheric conditions

4) The minimum or maximum temperature of the ambient atmosphere and the substrate are within the limits given in the product data sheets (usually 10 °C for epoxy based paint).

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

Application shall be by airless spray.
Stripe coats shall be applied by brush to all angles, corners, sharp edges, bolt or rivet heads, etc., with the same product as this to be applied on the surface to be painted. The only exception is inorganic zinc silicates where stripe coats shall be applied using the repair system primer, i.e. zinc rich epoxy.

Different colours shall be used for all successive coats of the paint system. The finishing coat of the required colour shall be sufficiently opaque to cover the shade of the undercoat.

The thickness of each coat, including frequency and tolerance shall be checked by the Contractor according to ISO 19840. The values shall be recorded and made available.

4.2 SPRAY APPLICATION

Paints shall be applied by Air Spray or Airless Spray.

Hose and containers shall be thoroughly cleaned before addition of new materials. The spray gun shall be held no closer than 200 mm or more than 600 mm from the surface to be coated. During application the spray gun shall always be held at a right angle to the substrate. Each pass shall overlap the previous one by 50 percent. In order to achieve a uniform application, I when large surface areas are being coated, spray application shall be made in two directions so that the passes are at right angles to each other Le. cross spray at 50% over lapping. Pressures and spray fan shall be adjusted so that the optimum spray pattern is utilised for the surface being coated.

4.3 BRUSH APPLICATION

Application with brush is acceptable under the following conditions subject to Owner approval:

- When areas cannot be properly coated by spray for any reason.
- When spray application is difficult due to location of work accessibility.
- Above ground level when it is considered that loss of paint under prevailing conditions is excessive e.g. windy and progress of work has to be maintained and personnel in or near the work site or equipment property, may be affected by spray particles.
- For touch-up or repair of localised damaged paint or to areas of incorrectly applied paint.
- For painting of stripe coat e.g. when applying the initial coat of paint to corners, edges, crevices, holes, welds or other irregular surface prior to spray application.
- When the substrate material to be applied are suitable for brush application.
- The number of coats shall be adjusted to the dry film thickness to match.

Paint brushes used shall be of a style and quality that will permit appropriate application of the material being applied.

Material applied by brush shall be smooth, uniform in thickness, without any apparent surface defects such as brush marks, runs, sags, or curtains.

4.4 ROLLER APPLICATION

Roller application shall only be used with written approval from the Owner.

Roller application may be used only when:

- Spraying is not feasible.
- Primer coat is applied by brush.
- Paint application by roller method is acceptable to paint manufacturer and is in accordance with the application data.

5 REPAIRS AND TOUCH UP PAINTING

5.1 GENERAL

Any defect shall be repaired before the application of further coats. Subject to the agreement of COMPANY, and after determining the type and size of the defects, the following methods of repair shall be applied

5.2 MAJOR DEFECTS

The paint shall be removed completely by abrasive blast-cleaning and the entire system shall be reapplied.

5.3 MINOR DEFECTS (localized appearance, mechanical damage, scratches, etc.)

Subject to the agreement of the Supplier of the product, the system shall be removed by localized blast-cleaning, the edges of the sound coating shall be feathered back about 50 mm, and the repair system shall be applied.

6 PAINTING AND COATING SYSTEMS

The coating systems to be used are:

- SYSTEM 6A (PC 0301)

7 INSPECTION

7.1 PAINTING INSPECTION

Prior to surface preparation, during surface and paint application Contractors' Quality Control department shall check the following points and record the results in its quality control report.

Raw materials and conditions for storage:

1) Data sheets of the products, shelf life, storage requirements
2) Storage under shelter

Construction quality:

1) Rounding of corners, sharp edges to 2 mm radius minimum

Climatic conditions for surface preparation and coating application:

1) Temperature of substrate at least 3 °C above dew point
2) Maximum humidity 85 % RH (90 % for the application of inorganic zinc silicates)
3) For paint application, ambient temperature >10 °C for epoxy

Surface preparation quality:

1) Grade of cleanliness: Sa 2 ½ according to ISO 8501
2) Cleanliness: no grease or oil, dust level 2 maximum according to ISO 8502-3
3) Anchoring profile: G medium according to ISO 8502
4) Contamination including chlorides: according to ISO 8502-6 and 9, 20 mg/m² maximum.

Coating quality:

Testings and inspections shall be carried out as per table below:

Test type	Method	Frequency	Acceptance criteria	Consequence
Environmental conditions	Ambient and steel temperature. Relative humidity. Dew point.	Before start of each shift + minimum twice per shift.	In accordance with specified requirements	No blasting or coating
Visual examination	Visual for sharp edges weld spatter slivers, rust grade, etc. ISO 8501-3	100 % of all surfaces	No defects, see specified requirements	Defects to be repaired
Cleanliness	a) ISO 8501-1 b) ISO 8502-3	a) 100 % visual of all surfaces b) Spot checks	a) In accordance with specified requirements b) Maximum quantity and size rating 2	a) Reblasting b) Recleaning and retesting until acceptable
Salt test	ISO 8502-6 and ISO 8502-9	Spot checks	Maximum conductivity corresponding to 20 mg/m^2 NaCl	Repeated washing with potable water and retesting until acceptable
Roughness	Comparator, stylus instrument or testex tape (see ISO 8503)	Each component or once per 10 m^2	As specified	Reblasting
Curing test (for Zn silicate).	ASTM D4752	Each component or once per 100 m^2	Rating 4 to 5	Allow to cure
Visual examination of coating	Visual to determine curing, contamination, solvent retention, pinholes/popping, sagging and surface defects	100 % of surface after each coat	According to specified requirements	Repair of defects
Holiday detection	ISO 29601. Voltage, see table 1	As per coating system specification	No holidays	Repair and retesting.
Film thickness	ISO 19840. Calibration on a smooth surface	ISO 19840	ISO 19840, and coating system data sheet	Repair, additional coats or recoating as appropriate
Adhesion	ISO 4624, using equipment with an automatic centred pulling force, and carried out when coating system are fully cured	Spot checks	See notes below	Coating to be rejected

NOTE 1 For coating system no. 2 A, adhesion during CPT shall be minimum 9,0 MPa. Adhesion measured during production shall be minimum 7,0 MPa for any single measurement.

NOTE 2 For coating system no. 3A, system no. 3C, system no. 3D, system no. 3E, system no. 3F and system no. 3G, maximum 30 % reduction from the CPT is acceptable. Absolute minimum value is 5 MPa.

NOTE 3 For sprayed on passive fire protection, maximum 50 % reduction from CPT value read as cohesion is acceptable. Absolute minimum values are 2,0 MPa for cement based products and 5,0 MPa for epoxy based products. Epoxy based passive fire protection may be used to glue the test dollies to the primer in order to measure the adhesive strength.

NOTE 4 For the remaining coating systems, 50 % reduction of average adhesion value from the CPT is acceptable as minimum adhesion during production coating. Absolute minimum value is 5 MPa.

NOTE 5 For adhesion test during CPT, glue failure with values below 15 MPa is not accepted. X-cut test can be used as a supplementary test for adhesion, when relevant.

NOTE 6 Spot checks shall be defined and agreed on before start of each project and included in the inspection and test plan (ITP).

8 PAINTER QUALIFICATION

PAINTING INSPECTOR

- NACE International Coating Inspector Training and Certificate Program Level **III** is considered acceptable for qualification of painting inspector .
  FROSIO, the Norwegian Professional Council for education and Certification of inspector for Surface Treatment Level III, is considered acceptable for qualification of Painting inspector.

PAINTER QUALIFICATION

- All Painters shall demonstrate ability and knowledge of pertinent items of this procedure by successfully executing a written test and performing related tasks using approved procedures (skill test).

9 PAINT CYCLE

System 6A

Fluitek Valves	**PAINTING PROCEDURE PC 0301**	PAG 1 DI 1 REV 00

GENERAL SERVICE APPLICATION	Stainless steel surfaces
SCOPE	Painting of carbon steel valves according to Spec. 123A90-DDL-MAT-SP-60006 system 6A
TEMPERATURE RESISTANCE	-50°C To +80°C
SURFACE PREPARATION	CLEANLINESS: Sweep blast, Ref SSPC-SP16 ROUGHNESS: ISO 8503 GRADE MEDIUM G. - Anchor profile 25-85 microns

N° of coats	Type of PROCESS	Manufacturer	Product	Film Thickness
1st Coat	Epoxy Primer	INTERNATIONAL	INTERGARD 269	50 microns
2rd Coat	Epoxy Polyamine	INTERNATIONAL	INTERGARD 475HS	100 microns
3rd Coat	Polyurethane	INTERNATIONAL	INTERTHANE 990	75 microns
MINIMUM TOTAL DRY FILM THICKNESS:		225 microns		
FINAL COLOR: RAL 9002				

NOTES :
Application temperature drying times and other physical data of paint as per manufacturer specifications.

FLUITEK ORSENIGO VALVES S.r.l.
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Document distributed and certified through electronic system

00	20/05/2024	ISSUED FOR APPROVAL	PATELLI L.
REV	**Data**	**Note**	**Emesso da:**

10 PAINT REPORT SAMPLE

CATTANEO GIOVANNI VERNICIATURE — TSA REPORT 586-23 25/07/2023

Customer:		Purchaser:		Project:	

Purchaser Order No.:		JOB n°:	
Paint Procedure:		Paint System:	
Article:		Qty:	

com											
cv											
Qty											

ENVIRONMENTAL CONDITIONS:

Activity	BLASTING	COAT 1	COAT 2	COAT 3	COAT 4
Start date					
Time					
Steel temperature [°C]					
Air temperature [°C]					
Relative humidity [%]					
Dew point [°C]					
Blotter test acc. To ASTM D4285					

SURFACE PREPARATION METHOD:

Cleaning type	
Blasting standard	
Grit type	

SURFACE PREPARATION TEST RESULT:

Test type	Date	Required	Result
Soluble salt (ISO8502-6/9)			
Residual dust (ISO8502-3)			
Surface cleanliness			
Surface roughness (ISO 8503-2) comparator			
Surface roughness (ISO 8503-5) replica tape			
Mek test (ASTM D4752)			

COATING MATERIALS:

COAT N.	1	2	3	4
Paint supplier				
Coating brand name				
Batch no. / A				
Batch no. / B				
Expiration date				
Colour				
Application method				
Minimum DFT	µm	µm	µm	µm
Medium DFT	µm	µm	µm	µm
Required DFT	µm	µm	µm	µm

COATING ACCEPTANCE TEST:

Test type	Date	Required	Result
Visual appearance			
Final colour			
Total DFT (ISO 19840)			
Adhesion test:			

Tested by:	Approved by:	Painter:	Customer Inspector:

Cattaneo Giovanni Verniciature Via G.Galilei 82 . Trescore Balneario (BG) 24069 ITALY . P.Iva 02905530161 www.cattaneoverniciature.it - cattaneo.qualitycontrol@outlook.com - Ph: +39 035942656

SJB VERNICIATURA

PAINTING CERTIFICATE

Customer:	Date:	Report N°:
Customer Project:	Specification: //	
Article:	Paint Supplier:	
Item:	DWG: //	

EQUIPMENT			
Rough. Comparator		Dew Point Meter	
Tick.Gauge		Conductivity Meter	
Adhesion Gauge		Foil Thickness Gauge	

SURFACE PREPARATION

Date: 22/09/2023

Test type	*According to*	*Required*							
Sourface Cleanliness	ISO 8501-1	SA 2,5							
Sourface Roughness	ISO 8503-2	MEDIUM G							
Sourface Roughness	ISO 8503-5	50 - 75 µm							
Soluble Salt Test	ISO 8502-6/9	//							
Residual Dust	ISO 8502-3	//							
0Type of Abrasive	//	//							
Blotter test	ASTM D4285	No oil / No water							
Environmental Condiction	ISO 8502-4	Ta°C	Ts°C	RH%	Td°C	Ta°C	Ts°C	RH%	Td°C

COATING SYSTEM

Number of Coat	**1^**	**2^**	**3^**	**4^**
Date and Time				
Paint Product Name				
Color				
Batch n°	**A)** **A)**	**B)** **B)**	**A)** **B)**	**A)** **B)**
Ambient Temperature				
Steel Temperature				
RH%				
Dew Point				
Method				
Required DFT				
Mean DFT				

CHECK INORGANIC ZINC

Test type	*According to*	*Date*	*Required*	*Result*
Mek Test	ASTM D4752	//	//	//

COATING ACCEPTANCE TEST

Test type	*According to*	*Date*	*Required*	*Result*
Visual Check				
Final Color				Total
DFT	ISO 19840			

Tested by:	*Customer QC:*	*Customer Inspector:*	*Inspector Signature:*
SJB VERNICIATURA di Sejdani Jawad Via E. Fermi, 54 - 24020 SCANZOROSCIATE (BG) Cell.: 3207514315 mail: sejdanij@gmail.com P. IVA 04306890163 Date:	Date:	Date:	Date:

11 PAINTING MATRIX

Pos.	Commessa	Classe	Diametro	Qta ord.	Ciclo verniciatura
001	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
002	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
003	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
004	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
005	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
006	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
007	240062	#300	4″	1,00	SYSTEM 6A RAL 9002
008	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
009	240062	#300	2 x 1.1/2″	1,00	SYSTEM 6A RAL 9002
010	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
011	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
012	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
013	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
014	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
015	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
016	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
017	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
018	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
019	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
020	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
021	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
022	240062	#300	1″	1,00	SYSTEM 6A RAL 9002
023	240062	#300	1.1/2″	1,00	SYSTEM 6A RAL 9002
024	240062	#150	1.1/2″	1,00	UNCOATED
025	240062	#150	1.1/2″	1,00	UNCOATED
026	240062	#150	1.1/2″	1,00	UNCOATED
027	240062	#150	2x 1.1/2″	1,00	UNCOATED
028	240062	#150	1″	1,00	SYSTEM 6A RAL 9002

12 DATASHEET

Intergard® 269

International

Epoxy

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Oil or grease should be removed in accordance with SSPC-SP1 solvent cleaning.

Abrasive Blast Cleaning

For immersion service, Intergard 269 must be applied to surfaces blast cleaned to Sa2½ (ISO 8501-1:2007) or SSPC-SP10. However, for atmospheric exposure Intergard 269 may be applied to surfaces prepared to a minimum of Sa2½ (ISO 8501-1:2007) or SSPC-SP6.

Surface defects revealed by the blast cleaning process should be ground, filled, or treated in the appropriate manner.

Ultra High Pressure Hydroblasting / (non-immersed service only)

May be applied to surfaces prepared to Sa2 (ISO 8501-1:2007) or SSPC-SP6 which have flash rusted to no worse than Grade HB2M (refer to International Hydroblasting Standards). Further information is available from International Protective Coatings.

Tie Coat Applications (see Product Characteristics)

In the case of zinc primers, where necessary, remove weld spatter, smooth weld seams and sharp edges and blast clean welds and damaged primer to Sa2½ (ISO 8501-1:2007) or SSPC-SP6. The shop primer or other primer surface should be dry and free of all contamination (oil, grease, salt etc) and overcoated with Intergard 269 within the overcoating intervals specified for the primer (consult the relevant product data sheet).

Ensure that the zinc primer has fully cured and is clean, dry and free from zinc salts prior to overcoating.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

4 part(s) : 1 part(s) by volume

Working Pot Life

10°C (50°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)
17 hours	12 hours	8 hours	3 hours

Airless Spray	Recommended	Tip Range 0.38-0.53 mm (15-21 thou) Total output fluid pressure at spray tip not less than 141 kg/cm² (2005 p.s.i.)
Air Spray (Pressure Pot)	Recommended	Gun DeVilbiss MBC or JGA Air Cap 704 or 765 Fluid Tip E
Brush	Suitable - small areas only	Typically 25-30 microns (1.0-1.2 mils) can be achieved
Roller	Suitable - small areas only	Typically 25-30 microns (1.0-1.2 mils) can be achieved
Thinner	International GTA220 (or International GTA415)	Do not thin more than allowed by local environmental legislation
Cleaner	International GTA822 or International GTA415	

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

Intergard® 269

International

Epoxy

PRODUCT DESCRIPTION

A quick drying two component epoxy primer.

Suitable for overcoating after prolonged periods of weathering.

INTENDED USES

As a blast holding primer suitable for use in immersed and exposed conditions and overcoatable with a wide range of high performance systems.

For use at both new construction and maintenance.

Also for use as a tie coat on zinc silicate to prevent zinc salt formation on weathering and pinholing of subsequent high build topcoats.

PRACTICAL INFORMATION FOR INTERGARD 269

Colour	Red (See Product Characteristics section for further details)
Gloss Level	Matt
Volume Solids	47%
Typical Thickness	40 microns (1.6 mils) dry equivalent to 85 microns (3.4 mils) wet
Theoretical Coverage	11.80 m²/litre at 40 microns d.f.t and stated volume solids 471 sq.ft/US gallon at 1.6 mils d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush, Roller

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
10°C (50°F)	40 minutes	16 hours	16 hours	Extended[1]
15°C (59°F)	35 minutes	12 hours	12 hours	Extended[1]
25°C (77°F)	30 minutes	8 hours	8 hours	Extended[1]
40°C (104°F)	15 minutes	1 hour	4 hours	Extended[1]

[1] Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

REGULATORY DATA

Flash Point (Typical)	Part A 26°C (79°F); Part B 25°C (77°F); Mixed 26°C (79°F)	
Product Weight	1.53 kg/l (12.8 lb/gal)	
VOC	3.75 lb/gal (450 g/lt)	EPA Method 24
	293 g/kg	EU Solvent Emissions Directive (Council Directive 1999/13/EC)

See Product Characteristics section for further details

Intergard® 269

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Epoxy

PRODUCT CHARACTERISTICS

Use as a Holding Primer

Intergard 269 is suitable for use as a blast holding primer for steelwork intended for exposure in both immersed and atmospheric exposure conditions. Apply Intergard 269 at the recommended thickness as over-application will result in a glossy surface which may not be suitable for overcoating after ageing.

When coating steel in high ambient temperatures thinning with International thinners may be necessary to prevent dry spray and control film thickness.

This product will not cure adequately below 5°C (41°F). For maximum performance ambient curing temperatures should be above 10°C (50°F).

Intergard 269 is also suitable for application to degreased and abraded stainless steel and galvanised steel. Abrasion can be carried out by light blasting using a non-ferrous abrasive or by carborondum disking on small areas.

Use as a Tie Coat

To ensure good penetration of zinc silicate coatings Intergard 269 should be thinned by 15-25% with International thinners. Intergard 269 should be allowed to cure before topcoating with high builds otherwise the effectiveness in preventing pinholing is reduced.

Excessive film thickness may lead to splitting of the film when overcoated with high build systems.

For application at temperatures below 10°C (50°F) alternative tie coats are available. For information contact International Protective Coatings.

When used in a marine environment the schemes and overcoating intervals utilised may differ.

Intergard 269 is globally available in Red; alternative shades may be available upon request. Consult International Protective Coatings for further details.

Note: VOC values quoted are based on maximum possible for the product taking into account variations due to colour differences and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

Intergard 269 is suitable for use over the following primers:

Interzinc 22
Interzinc 52

The following topcoats/intermediates are recommended for Intergard 269:

Intercure 200HS	Intergard 740
Intercure 420	Interseal 670HS
Interfine 629HS	Interthane 870
Interfine 878	Interthane 990
Interfine 979	Interzone 505
Intergard 251	Interzone 954
Intergard 345	Interzone 1000
Intergard 475HS	

For details of other systems, consult International Protective Coatings.

Intergard® 269

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ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

PACK SIZE	Unit Size	Part A		Part B	
		Vol	Pack	Vol	Pack
	20 litre	16 litre	20 litre	4 litre	5 litre
	5 US gal	4 US gal	5 US gal	1 US gal	1 US gal

For availability of other pack sizes, contact International Protective Coatings.

SHIPPING WEIGHT (TYPICAL)	Unit Size	Part A	Part B
	20 litre	28.9 kg	4.1 kg
	5 US gal	59.7 lb	8.4 lb

STORAGE	Shelf Life	12 months minimum at 25°C (77°F). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

Important Note

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local representative that this data sheet is current prior to using the product.

This Technical Data Sheet is available on our website at www.international-marine.com or www.international-pc.com, and should be the same as this document. Should there be any discrepancies between this document and the version of the Technical Data Sheet that appears on the website, then the version on the website will take precedence.

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www.international-pc.com

Intergard® 475HS

International

Epoxy

PRODUCT DESCRIPTION

A low VOC, high solids, high build, two component epoxy coating. Available with conventional pigmentation, or alternatively can be pigmented with micaceous iron oxide to provide enhanced overcoating properties.

INTENDED USES

For use as a high build epoxy coating to improve barrier protection for a range of anti-corrosive coating systems in a wide range of environments including offshore structures, petrochemical plants, pulp and paper mills and bridges. Suitable for use in both maintenance and new construction situations as part of an anti-corrosive coating system. The micaceous iron oxide variant improves long term overcoating properties, better facilitating application in the fabrication shop, prior to shipping, with final overcoating on site.

PRACTICAL INFORMATION FOR INTERGARD 475HS

Color	Light gray MIO and a selected range of colors
Gloss Level	Matte
Volume Solids	80%
Typical Thickness	4-8 mils (100-200 microns) dry equivalent to 5-10 mils (125-250 microns) wet
Theoretical Coverage	257 sq.ft/US gallon at 5 mils d.f.t and stated volume solids 6.40 m²/liter at 125 microns d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush, Roller

Drying Time

			Overcoating interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
23°F (-5°C)	150 minutes	48 hours	48 hours	Extended*
41°F (5°C)	90 minutes	16 hours	16 hours	Extended*
50°F (10°C)	80 minutes	14 hours	13 hours	Extended*
59°F (15°C)	75 minutes	10 hours	10 hours	Extended*
77°F (25°C)	60 minutes	5 hours	5 hours	Extended*

* See International Protective Coatings Definitions & Abbreviations
Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

For curing at elevated temperatures an alternative curing agent is available. See Product Characteristics for details.

REGULATORY DATA

Flash Point (Typical) Part A 93°F (34°C); Part B 88°F (31°C); Mixed 91°F (33°C)

VOC	1.72 lb/gal (207 g/lt) 92 g/kg	EPA Method 24 EU Solvent Emissions Directive (Council Directive 1999/13/EC)
	159 g/lt (1.32 lb/US Gal)	Chinese National Standard GB23985

See Product Characteristics section for further details

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Epoxy

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application, all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Primed Surfaces

Intergard 475HS should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Intergard 475HS must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. SSPC-SP6 or Sa2½ (ISO 8501 -1:2007), Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Intergard 475HS.

Zinc Primed Surfaces

Ensure that the surface of the primer is clean, dry and free from contamination and zinc salts before application of Intergard 475HS. Ensure zinc primers are fully cured before overcoating.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed, it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

3 part(s) : 1 part(s) by volume

Working Pot Life

23°F (-5°C)	41°F (5°C)	59°F (15°C)	77°F (25°C)
3 hours	3 hours	2.5 hours	2 hours

Airless Spray

Recommended

Tip Range 21-25 thou (0.53-0.63 mm)
Total output fluid pressure at spray tip not less than 2702 psi (190 kg/cm²)

Air Spray (Pressure Pot)

Recommended

Gun	DeVilbiss MBC or JGA
Air Cap	704 or 765
Fluid Tip	E

Brush

Suitable

Typically 3.0 mils (75 microns) can be achieved

Roller

Suitable

Typically 3.0 mils (75 microns) can be achieved

Thinner

International GTA007

Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA822 (or International GTA415)

Choice of cleaner may be subject to local legislation. Please consult your local representative for specific advice.

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation

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PRODUCT CHARACTERISTICS

Intergard 475HS is primarily designed for use as a high build barrier coat to impart barrier protection to a coating system. It is recommended that it should be overcoated with a durable finish from the Interfine or Interthane range when appearance is important.

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Lower or high temperatures may require specific application techniques to achieve maximum film build.

When applying Intergard 475HS by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

Surface temperature must always be a minimum of 5°F (3°C) above dew point. When applying Intergard 475HS in confined spaces, ensure adequate ventilation. Exposure to unacceptably low temperatures and/or high humidities during, or immediately after, application may result in incomplete cure and surface contamination that could jeopardize subsequent intercoat adhesion.

Elevated Temperature Curing

An alternative curing agent is available for applications at temperatures greater than 77°F (25°C).

			Overcoating Interval with recommended topcoats	
Temperature	Touch Dry	Hard Dry	Minimum	Maximum
77°F (25°C)	90 minutes	6 hours	6 hours	Extended *
104°F (40°C)	60 minutes	2 hours	2 hours	Extended *

* See International Protective Coatings Definitions and Abbreviations

Interchanging standard and elevated temperature curing agents during application to a specific structure will give rise to an observable color change due to the difference in the yellowing/discoloration process common to all epoxies on exposure to UV light. In common with all epoxies, Intergard 475HS will chalk and discolor on exterior exposure. However, these phenomena are not detrimental to anti-corrosive performance.

Intergard 475HS is not designed for continuous water immersion.

The micaceous iron oxide variant of this product is frequently used as a "travel coat" prior to final overcoating on site. To ensure best extended overcoating properties, ensure overapplication does not occur and that the surface is fully cleaned of any contamination which may be present in the surface texture due to the coarse nature of the micaceous iron oxide pigmentation.

When applying Intergard 475HS at temperatures less than 59°F (15°C) or wet film thicknesses of 6 mils (150 microns) or less, addition of around 5% International GTA007 thinners will improve film appearance, sprayability and aid film thickness control.

On consultation with International Protective Coatings this product is compatible with alternative application methods such as flow coating.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

Intergard 475HS is designed for use over correctly primed steel. Suitable primers are:

Intercure 200	Interzinc 22 (mist coat or tie coat recommended)*
Intergard 251	Interzinc 315
Intergard 251HS	Interzinc 52
Intergard 269	Interzinc 52E
Interzinc 2280(mist coat or tie coat recommended)*	

Suitable topcoats are:

Intergard 740	Interfine 629HS
Interfine 878	Interfine 979
Interthane 990	Intergard 475HS

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Interthane 990E

For alternative primers and finishes, consult International Protective Coatings.

* See relevant product data sheet for details.

Interthane 990

International.

Polyurethane Finish

PRODUCT DESCRIPTION

A two pack, acrylic polyurethane finish giving excellent durability and long term recoatability.

INTENDED USES

As a cosmetic finish on above water areas. Suitable for use on topsides, external superstructure, external decks and boottops.
For use at Newbuilding, Maintenance & Repair or On Board Maintenance.

PRODUCT INFORMATION

Colour	PHB000-White, PHY999-Black ; and a wide range of colours.
Finish/Sheen	High Gloss
Part B (Curing Agent)	PHA046
Volume Solids	57% ±3% (ISO 3233:1998)
Mix Ratio	6.00 volume(s) Part A to 1 volume(s) Part B
Typical Film Thickness	50 microns dry (88 microns wet)
Theoretical Coverage	11.4 m²/litre at 50 microns dft, allow appropriate loss factors
Method of Application	Airless Spray, Brush, Conventional Spray, Roller
Flash Point (Typical)	Part A 34°C; Part B 49°C; Mixed 35°C
Induction Period	Not required

Drying Information	-5°C	5°C	25°C	35°C
Touch Dry [ISO 9117/3:2010]	8 hrs	5 hrs	1.5 hrs	60 mins
Hard Dry [ISO 9117-1:2009]	60 hrs	24 hrs	6 hrs	4 hrs
Pot Life	26 hrs	12 hrs	2 hrs	60 mins

Overcoating Data - see limitations

	Substrate Temperature							
	-5°C		5°C		25°C		35°C	
Overcoated By	Min	Max	Min	Max	Min	Max	Min	Max
Interthane 990	60 hrs	ext	24 hrs	ext	6 hrs	ext	4 hrs	ext

Note Drying and overcoating times quoted are measured at 50 microns dry, at higher film thickness times will be increased.

REGULATORY DATA

VOC

420 g/lt as supplied (EPA Method 24)
341 g/kg of liquid paint as supplied. EU Solvent Emissions Directive (Council Directive 1999/13/EC)
379 g/lt Chinese National Standard GB23985

Note: VOC values are typical and are provided for guidance purposes only. These may be subject to variation depending on factors such as differences in colour and normal manufacturing tolerances.

Interthane 990

International.

Polyurethane Finish

CERTIFICATION

When used as part of an approved scheme, this material has the following certification:

- Fire Resistance - Surface Spread of Flame (Exova Warringtonfire)
- Fire Resistance - Smoke & Toxicity (Exova Warringtonfire)
- NORSOK M-501, Rev 4, system no.1 (NITN)
- Fire Resistance - Marine Equipment Directive compliant

Consult your International Paint representative for details.

SYSTEMS AND COMPATIBILITY

Interthane 990 must be applied over a recommended primer system, which will vary depending upon the vessel area. Direct application is acceptable over the following marine anticorrosives:

Intergard 264 (USA)
Intergard 400
Intergard 5600
Intergard 5620
Intergard 7600
Intershield 300
Intershield 803

A tiecoat of Intergard 263, Intergard 267 or Intergard 269 may be required if Interthane 990 is to be applied over other epoxy primers and may also be used to extend the maximum overcoating interval when Interthane 990 is to be applied over those primers listed above.

Interprime 198 may also be used as a primer for Interthane 990.

Consult your International Paint representative for the system best suited for the surfaces to be protected.

SURFACE PREPARATIONS

Use in accordance with the standard Worldwide Marine Specifications.
All surfaces to be coated should be clean, dry and free from contamination.
High pressure fresh water wash or fresh water wash, as appropriate, and remove all oil or grease, soluble contaminants and other foreign matter in accordance with SSPC-SP1 solvent cleaning.

NEWBUILDING/MAJOR REFURBISHMENT

Interthane 990 should always be applied over a recommended primer coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990 must be applied within the overcoating intervals specified (consult the relevant product data sheet). For boottop areas the overcoating intervals for primers are reduced. Consult International Paint.
Areas of breakdown, damage etc. should be prepared to the specified standard (eg. Sa2½ (ISO 8501-1:2007)) and primed prior to the application of Interthane 990.

REPAIR/OBM

Interthane 990 should always be applied over a recommended primer coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990 must be applied within the overcoating intervals specified (consult the relevant product data sheet). For boottop areas the overcoating intervals for primers are reduced. Consult International Paint.
Areas of breakdown, damage etc. should be prepared to the specified standard (eg. Sa2½ (ISO 8501-1:2007)) and primed prior to the application of Interthane 990.
Interthane 990 may be applied directly over aged Interthane 990 following thorough fresh water washing and degreasing provided the coating to be overcoated is in an intact and tightly adherent condition. Loose or flaking coatings should be removed back to a firm edge and Interthane 990 or an appropriate primer should be used to repair the area before application of the full coat.
This product may be applied directly over most generic types of paint that have been aged for at least 3 months. It is advisable that a small trial be carried out before applying a full coat.

Consult your International Paint representative for specific recommendations.

NOTE
For use in Marine situations in North America, the following surface preparation standards can be used: SSPC-SP10 in place of Sa2½ (ISO 8501-1:2007)

Interthane 990

International

Polyurethane Finish

APPLICATION

Mixing	Material is supplied in 2 containers as a unit. Always mix a complete unit in the proportions supplied. (1) Agitate Base (Part A) with a power agitator. (2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.
Thinner	Thinning is not normally required. Consult the local representative for advice during application in extreme conditions. Do not thin more than allowed by local environmental legislation.
Airless Spray	Recommended Tip Range 0.33-0.45 mm (13-18 thou) Total output fluid pressure at spray tip not less than 155 kg/cm² (2200 p.s.i.)
Conventional Spray	Use suitable proprietary equipment. Thinning may be required.
Brush	Suitable.
Roller	Suitable.
Cleaner	International GTA056/GTA713/GTA733
Work Stoppages and Cleanup	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA056/GTA713/GTA733. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units. Clean all equipment immediately after use with International GTA056/GTA713/GTA733. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays. Do not exceed pot life limitations. All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.
Welding	In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation. In North America do so in accordance with instruction in ANSI/ASC Z49.1 "Safety in Welding and Cutting."

SAFETY

All work involving the application and use of this product should be performed in compliance with all relevant national Health, Safety & Environmental standards and regulations.

Prior to use, obtain, consult and follow the Material Safety Data Sheet for this product concerning health and safety information. Read and follow all precautionary notices on the Material Safety Data Sheet and container labels. If you do not fully understand these warnings and instructions or if you can not strictly comply with them, do not use this product. Proper ventilation and protective measures must be provided during application and drying to keep solvent vapour concentrations within safe limits and to protect against toxic or oxygen deficient hazards. Take precautions to avoid skin and eye contact (ie. gloves, goggles, face masks, barrier creams etc.) Actual safety measures are dependant on application methods and work environment.

EMERGENCY CONTACT NUMBERS:
USA/Canada - Medical Advisory Number 1-800-854-6813
Europe - Contact (44) 191 4696111. For advice to Doctors & Hospitals only contact (44) 207 6359191
China – Contact (86) 532 83889090
R.O.W. - Contact Regional Office

Warning: Contains isocyanate. Wear air-fed hood for spray application.

Interthane 990

International.

Polyurethane Finish

LIMITATIONS

This product is not recommended for use in permanantly immersed conditions.
Interthane 990 may be used on booltop areas at reduced overcoating intervals over appropriate primers. Consult International Paint.
For brush and roller application, and in some colours, two coats of Interthane 990 may be required to give uniform coverage, especially when applying Interthane 990 over dark undercoats and when using certain lead-free bright finish colours such as yellows and oranges. Best practice is to use a colour compatible intermediate or anticorrosive coating under Interthane 990.
Interthane 990 may be applied at substrate temperatures down to -15°C. Before applications are made below -5°C consult your local IP representative for further detail of application procedure.
Low temperature, high relative humidity and condensation occurring during or immediately after application may result in a matt finish and an inferior film. Premature exposure to ponding water will cause colour change, especially in dark colours and at low temperatures.
Overcoating information is given for guidance only and is subject to regional variation depending upon local climate and environmental conditions. Consult your local International Paint representative for specific recommendations.
Apply in good weather. Temperature of the surface to be coated must be at least 3°C above the dew point. For optimum application properties bring the material to 21-27°C, unless specifically instructed otherwise, prior to mixing and application. Unmixed material (in closed containers) should be maintained in protected storage in accordance with information given in the STORAGE Section of this data sheet. Technical and application data herein is for the purpose of establishing a general guideline of the coating application procedures. Test performance results were obtained in a controlled laboratory environment and International Paint makes no claim that the exhibited published test results, or any other tests, accurately represent results found in all field environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection, verification of performance and use of the coating.
In the overcoating data section 'ext' = extended overcoating period. Please refer to our Marine Painting Guide - Definitions and Abbreviations available on our website.

UNIT SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
20 lt	17.14 lt	20 lt	2.86 lt	5 lt
5 US gal	5 US gal	5 US gal	1 US gal	1 US gal
1 US gal	1 US gal	1 US gal	1 US quart	1 US quart

Note : US containers are short filled
For availability of other unit sizes consult International Paint

UNIT SHIPPING WEIGHT (TYPICAL)

Unit Size	Unit Weight
1 US gal	13.7 lb
20 lt	26.59 Kg
5 US gal	54.7 lb

STORAGE

Shelf Life: Part A - 24 months minimum at 25°C.
Part B - 12 months minimum at 25°C
Subject to reinspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

WORLDWIDE AVAILABILITY Consult International Paint.

IMPORTANT NOTE

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