Base Load Power Hub (BLPH)

INDRA SRL

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

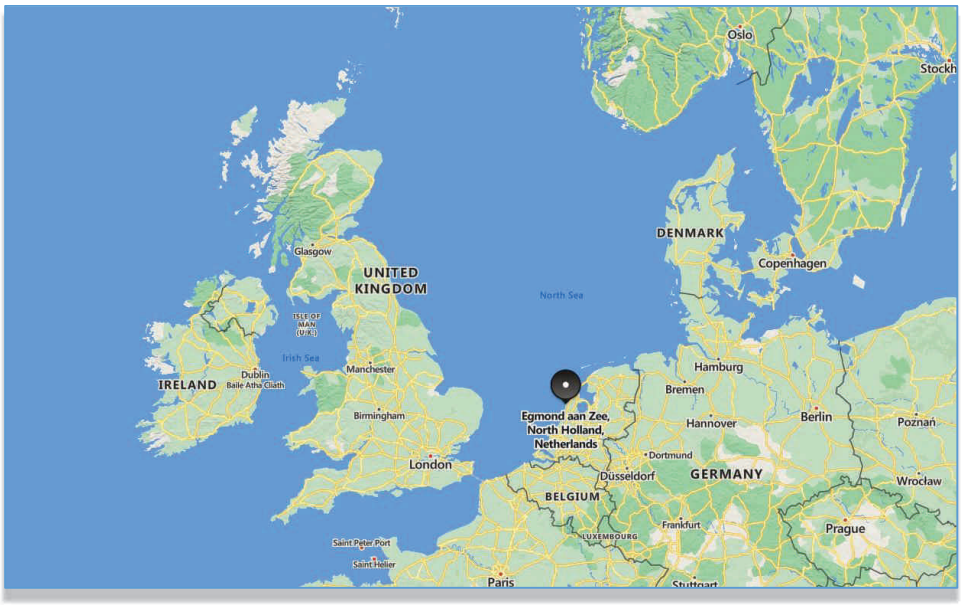


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

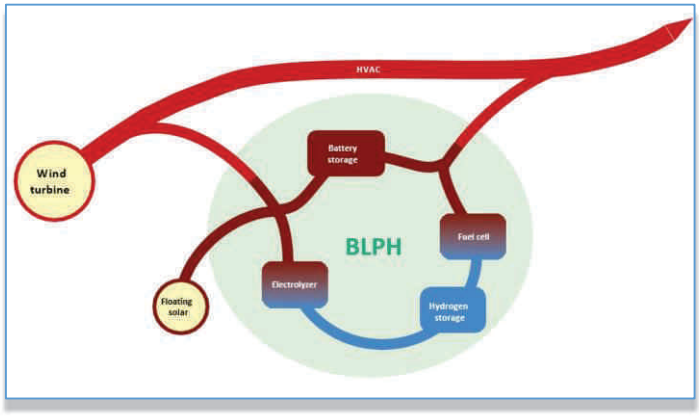


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

2.1 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 2 - Definitions and Abbreviations

PP 44/2024

PAINTING PROCEDURE

PROCEDURA DI VERNICIATURA

COATINGS APPLICATION ACCORDING TO SPEC. 123A90-DDL-MAT-SP-60006_00 SYSTEMS 1/6A/6C/9

APPLICAZIONE DEI RIVESTIMENTI SECONDO
Spec. 123A90-DDL-MAT-SP-60006_00 – Cicli 1/6A/6C/9

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Rev.	**Data**	**Elaborata da**	**Approvato da**	**Note di emissione**
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1. SCOPE

SCOPO

This procedure defines the minimum requirements for materials, application process, inspection, and tests of anticorrosive coating according to spec. 123A90-DDL-MAT-SP-60006_00, coating systems 1, 6A, 6C and 9.

Il presente documento definisce i requisiti minimi di materiali, processo di applicazione, ispezioni e controlli dei rivestimenti anticorrosivi secondo spec. 123A90-DDL-MAT-SP-60006_00, cicli 1,6A, 6C e 9.

Item list

INDRA Item	Cust. Item	Indra Part Number	Qty.	Size	Body Material	1st Isolate	SPEC	System			RAL	
								Valve Body	Lever / Handwheel	Gear	Valve Body	Lever / Handwheel / Gear
4	10	00.VSF.2684/V	1	3/4"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
5	20	00.VSF.2687/V	15	1"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
6	30	00.VSF.2690/V	2	1" 1/2	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
7	90	00.VSF.2686/V	1	3/4"	A350 LF2	Lever	123A90-DDL-MAT-SP-60006	Sys-1	Sys-6A	-	RAL 9002	RAL 9005
8	120	00.VSF.2691/V	1	1" 1/2	A350 LF2	Extended Ball Stem	123A90-DDL-MAT-SP-60006	Sys-9	Sys-6A	-	RAL 9002	RAL 9005
11	130	00.VSF.2683(T)	2	3/4"	B564 Hastelloy	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005
13	70	00.VSF.2688(T)	2	1"	A182 F55	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005
14	60	00.VSF.2685(T)	3	3/4"	A182 F55	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005
15	40	00.VSF.2693/V	2	3/4"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
16	50	00.VSF.2694/V	5	1"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
18	140	00.VSF.2695/V	1	3"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
20	100	00.VSF.2770/V	2	1"	A350 LF2	Lever	123A90-DDL-MAT-SP-60006	Sys-1	Sys-6A	-	RAL 9002	RAL 9005
21	110	00.VSF.2689/V	1	1"	A350 LF2	Extended Ball Stem	123A90-DDL-MAT-SP-60006	Sys-9	Sys-6A	-	RAL 9002	RAL 9005
22	80	00.VSF.2692(T)	2	2"	A182 F55	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005
23	150	00.VSF.2680/V	28	1"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
24	160	00.VSF.2681/V	6	1" 1/2	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
25	170	00.VSF.2682/V	1	2"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
26	200	00.VSF.2697/V	3	1"	A350 LF2	Lever	123A90-DDL-MAT-SP-60006	Sys-1	Sys-6A	-	RAL 9002	RAL 9005
27	220	00.VSF.2701/V	2	1"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
28	250	00.VSF.2702/V	2	2"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
30	240	00.VSF.2696/V	1	1"	A182 316/316L	Extended Ball Stem	123A90-DDL-MAT-SP-60006	Sys-6C	Sys-6A	-	RAL 9002	RAL 9005
31	260	00.VSF.2700/V	7	4"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005

33	180	00.VSF.2679/V	6	4"	A182 316/316L	Gear	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	Sys-1	RAL 9002	RAL 9005
34	210	00.VSF.2699/V	1	1" 1/2	A350 LF2	Lever	123A90-DDL-MAT-SP-60006	Sys-1	Sys-6A	-	RAL 9002	RAL 9005
35	230	00.VSF.2698(T)	2	1" 1/2	A182 F55	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005
40	190	00.VSFT.0223/V	6	6"	A182 316/316L	Gear	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	Sys-1	RAL 9002	RAL 9005
41	270	00.VSFT.0224/V	1	6"	A182 316/316L	Gear	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	Sys-1	RAL 9002	RAL 9005
42	280	00.MNF.0604/V	14	3/4"	A182 316/316L	OS&Y Bonnet	123A90-DDL-MAT-SP-60006	Sys-6A	-	-	RAL 9002	-
43	290	00.MNF.0608/V	4	3/4"	A182 316/316L	OS&Y Bonnet	123A90-DDL-MAT-SP-60006	Sys-6A	-	-	RAL 9002	-
45	300	00.MNF.0605/V	2	3/4"	A182 316/316L	OS&Y Bonnet	123A90-DDL-MAT-SP-60006	Sys-6A	-	-	RAL 9002	-
46	310	00.MNF.0612/V	3	3/4"	A350 LF2	OS&Y Bonnet	123A90-DDL-MAT-SP-60006	Sys-1	-	-	RAL 9002	-
47	320	00.MNF.0606/V	1	3/4"	A350 LF2	Extended OS&Y Bonnet	123A90-DDL-MAT-SP-60006	Sys-9	-	-	RAL 9002	-
48	390	00.VSF.2716/V	1	3"	A350 LF2	Extended Ball Stem	123A90-DDL-MAT-SP-60006	Sys-9	Sys-6A	-	RAL 9002	RAL 9005
49	400	00.VSF.2680/V	1	1"	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
50	410	00.VSF.2681/V	1	1" 1/2	A182 316/316L	Lever	123A90-DDL-MAT-SP-60006	Sys-6A	Sys-6A	-	RAL 9002	RAL 9005
51	430	00.VSF.2784(T)	3	1"	A182 F55	Extended Ball Stem	Unpainted		Sys-6A	-		RAL 9005

2. REFERENCE STANDARDS

STANDARD DI RIFERIMENTO

- 123A90-DDL-MAT-SP-60006 rev. 00 of 2023.
- Norsok M-501 Edi.6 of 2012 - Surface preparation and protective coating.
- ISO 8501-1 of 2007 Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness. Pictorial surface preparation standard.
- ISO 8501-3 of 2006 Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness. Preparation grades of welds, cut edge and other areas with surface imperfections.
- ISO 8502-3 of 2017 Preparation of steel substrates before application of paints and related products -Test for the assessment of surface cleanliness. Assessment of dust.
- ISO 8502-6 of 2006 Preparation of steel substrates before application of paints and related products -Test for the assessment of surface cleanliness. Salt contamination by Bresle method.
- ISO 8502-9 of 2020 Preparation of steel substrates before application of paints and related products -Test for the assessment of surface cleanliness. Field method for the conductometric determination of water-soluble salts.
- ISO 8503-1 of 2013 Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast cleaned substrates.
- ISO 19840 of 2012 Paints and varnishes – Corrosion protection of steel structures by protective paint systems – Measurement of, and acceptance criteria for, the thickness of dry film on rough surfaces.
- ISO 16276-1 of 2007 Paints and varnishes - Pull-off test for adhesion.
- ASTM D 4541 of 2022 Standard test method for Pull-off Strength of coatings.
- ASTM D 4285 of 2018 Standard test method for Indicating Oil or Water Compressed Air.
- ISO 29601 of 2011 Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
- SSPC-SP 1 of 2016 Solvent Cleaning.
- ASTM D4940 of 2020 Standard Test Method for Conductimetric Analysis of Water-Soluble Ionic Contamination of Blast Cleaning Abrasives

3. SURFACE PREPARATION

PREPARAZIONE DELLE SUPERFICI

3.1. Before any blasting operation, surfaces shall be visually inspected to verify the absence of defects such as weld spatters, pores, lamination defects, fragments, and dents. If any, they shall be grinded smooth. Sharp edges shall be rounded at a 2 mm radius, unless otherwise specified.

Prima della sabbiatura, le superfici devono essere ispezionate visivamente per accertare l'assenza di difetti quali pallini di saldatura, pori, laminazioni e incisioni, che devono essere eliminati a mezzo molatura. Gli spigoli vivi devono essere arrotondati ad un raggio di 2 mm, se non diversamente specificato.

3.2. All surfaces shall be solvent cleaned as per SSPC-SP1 and shall be free of dust, oil, grease, and other contaminants before sand blasting. If any contamination is detected before painting, the affected surface shall be properly cleaned and re-blasted.
Tutte le superfici devono essere pulite secondo SSPC-SP1 e devono essere prive di polvere, olio, grasso e altri contaminanti prima della sabbiatura. Se viene rilevata qualsiasi contaminazione prima della verniciatura, la superficie interessata dovrà essere adeguatamente pulita e sabbiata nuovamente.

3.3. All stainless-steel surfaces shall be blasted according to SSPC-SP16, and all carbon-steel surfaces shall be blasted according to ISO 8501-1 SA 2 1/2. The blasting media shall be Garnet 30/60, sized to produce a profile of 25-85 µm for stainless-steel surfaces shall be and 50-85 µm for carbon-steel surfaces. Blasting will be performed inside a cabin, fitted with recycling system. Abrasive free of moisture, oil, and contaminants, check using ASTM D4940.
Tutte le superfici in acciaio inossidabile dovranno essere sabbiate secondo SSPC-SP16 e tutte le superfici in acciaio al carbonio dovranno essere sabbiate secondo ISO 8501-1 SA 2 1/2. Il mezzo di sabbiatura dovrà essere Garnet 30/60, dimensionato per produrre un profilo di 25-85 µm per le superfici in acciaio inossidabile e di 50-85 µm per le superfici in acciaio al carbonio. La sabbiatura verrà eseguita all'interno di una cabina, dotata di sistema di riciclaggio. Abrasivo privo di umidità, olio e contaminanti, controllo secondo ASTM D4940.

3.4. Compressed air used for surface cleaning shall be free of water and oil contamination. Adequate separators and traps shall be provided, installed in the coolest part of the system. All traps, separators and filters shall be cleaned regularly, i.e. daily or more frequently if required. Cleanliness of compressed air shall be verified using a blotter test in accordance with ASTM D4285-83 (2018) at least once per working shift.
L'aria compressa utilizzata per la pulizia delle superfici deve essere priva di contaminazione di acqua e olio. Dovranno essere previsti separatori e trappole adeguati, installati nella parte più fredda dell'impianto. Tutte le trappole, i separatori e i filtri devono essere puliti regolarmente, ovvero quotidianamente o più frequentemente se necessario. La pulizia dell'aria compressa deve essere verificata utilizzando un test blotter in conformità con ASTM D4285-83 (2018) almeno una volta per turno di lavoro.

4. COATINGS APPLICATION

APPLICAZIONE DEI PRODOTTI VERNICIANTI

4.1. The first coat of paint shall be applied before any oxidation or turning appears on the surface, and in any case within 4 hours after blasting is completed.
La prima mano del ciclo deve essere applicata prima che sia visibile qualunque ossidazione o modifica del colore della superficie ed in ogni caso entro 4 ore dalla fine della sabbiatura.

4.2. All welds, sharp edges, angles, bolts and nut heads, and any other surface of difficult access to spray, shall be stripe-coated by brush before full coat application for each coat.
Saldature, spigoli vivi, angoli bulloni, dadi e ogni altra superficie di difficile accesso alle operazioni di applicazione devono essere passate a pennello ("stripe coat") per ogni strato.

4.3. Before painting, ambient conditions shall be checked, to verify air and support temperature, dew point and relative humidity. Painting shall be performed only if support temperature is at least 3°C above dew point. Paint manufacturer recommendations and instructions included in paints technical data sheets shall be followed. No painting is allowed if the steel temperature is below 5°C, and relative humidity above 85 %.

Prima di iniziare l'applicazione, deve essere verificata la temperatura dell'aria, del supporto e l'umidità relativa, calcolando il punto di rugiada. L'applicazione deve essere effettuata solo se la temperatura del supporto è di almeno 3°C superiore al punto di rugiada. Devono essere seguite le istruzioni del produttore incluse nelle schede tecniche dei prodotti vernicianti. L'applicazione non è consentita se la temperatura del supporto è inferiore a 5°C e quando l'umidità relativa è superiore all'85 %.

4.4. Between coats, surface shall be inspected to check the presence of moisture, water, oil or other contaminants. Ambient conditions shall be also checked before and during each coat of paint application. DFT of each coat shall be measured, and any damage, defects or areas outside the specified thickness repaired prior to follow on coats in the system.
Tra una mano e l'altra, deve essere eseguito un controllo visivo, al fine di verificare l'assenza di condensa, acqua, unto o altri contaminanti. Anche le condizioni ambientali devono essere misurate prima e durante l'applicazione di ciascuna mano. Deve essere misurato lo spessore secco di ciascuna mano ed ogni danno, difetto o spessore non conforme deve essere riparato prima di procedere con la mano successiva.

4.5. The repair of defects will follow the methods described below:
La riparazione dei difetti deve seguire quanto di seguito indicato:

4.5.1. Damage of paint work without exposure of metal surface - The damaged area will be washed with solvent to remove all contamination, rinsed with fresh water, and left dry. The paint adjacent to the damaged area shall be feathered using a suitable method, to ensure the continuity with the repaired area and a good mechanical adhesion. After the surface preparation, the original coating system shall be applied up to the required thickness. The overlap of the new coats over the exiting coating system shall be at least 25mm.
Danni al ciclo senza esposizione del substrato metallico - L'area danneggiata deve essere lavata con solvente per rimuovere ogni contaminazione, risciacquata con acqua dolce e fatta asciugare. La vernice adiacente all'area danneggiata sarà irruvidita in modo adeguato al fine di garantire la continuità del film con l'area danneggiata ed una buona adesione meccanica. Dopo la preparazione, deve essere applicato il ciclo originale, fino a raggiungere lo spessore richiesto. La sovrapposizione dei nuovi strati sul sistema di rivestimento esistente deve essere di almeno 25 mm.

4.5.2. Damage of paintwork with exposure of metal surface - The damaged area will be cleaned and re-blasted as originally, and the complete coating system shall be applied in accordance with the Manufacturer instructions. The repaired area shall be extended at least one inch into the existing paint, and the edges will be feathered using a suitable method.
Danni al ciclo con esposizione del substrato metallico – L'area danneggiata deve essere pulita e risabbiata come in origine, e deve essere applicato il ciclo originale completo, come da istruzione del produttore. L'area riparata deve essere estesa per almeno 25 mm sul ciclo esistente ed I bordi devono essere irruviditi in modo adeguato.

4.6. All paints application parameters, such as mixing ratio, thinner, nozzle pressure, tip size, etc., shall be according to paint manufacturer technical data sheets. Application techniques shall be according SSPC Volume 1° - Good Painting Practice.
I parametri applicativi, quali rapporto di miscelazione, diluizione, diametro dell'ugello e pressione di spruzzo, ecc., devono essere in linea con le schede tecniche del produttore. L'applicazione deve essere a regola d'arte, in accordo con SSPC Volume 1° - Good Painting Practice.

5. COATING SYSTEM

CICLO DI VERNICIATURA

The coating systems to be applied:
Il ciclo da applicare:

System 1
Grade of cleanliness: ISO 8501-1 SA 2 1/2.
Roughness: 50÷85 µm R_{y5}, according to ISO 8503-5
Nominal dry film thickness (NDFT): 325 µm

Coat Mano	Type Tipo	Product name Nome del prodotto	Minimum DFT Spessore minimo	Colour Colore
1	Epoxy Zinc	INTERZINC 52	75 µm	GREY
2	Epoxy	INTERGARD 475 HS	200 µm	GREY
3	UV-resistant topcoat	INTERTHANE 990	50 µm	NOTE
		Total minimum DFT Spessore minimo totale	325 µm	

COLOR NOTE:
RAL 9002 FOR VALVES
RAL 9005 FOR GEARS

System 6A
Grade of cleanliness: SSPC-SP16.
Roughness: 25÷85 µm R_{y5}, according to ISO 8503-5
Nominal dry film thickness (NDFT): 225 µm

Coat Mano	Type Tipo	Product name Nome del prodotto	Minimum DFT Spessore minimo	Colour Colore
1	Epoxy	INTERGARD 269	50 µm	RED
2	Epoxy	INTERGARD 475 HS	100 µm	GREY
3	UV-resistant topcoat	INTERTHANE 990	75 µm	NOTE
		Total minimum DFT Spessore minimo totale	225 µm	

COLOR NOTE:
RAL 9002 FOR VALVES
RAL 9005 FOR LEVERS AND HANDWHEELS

System 6C
Grade of cleanliness: SSPC-SP16.
Roughness: 25÷85 µm R_{y5}, according to ISO 8503-5
Nominal dry film thickness (NDFT): 250 µm

Coat Mano	Type Tipo	Product name Nome del prodotto	Minimum DFT Spessore minimo	Colour Colore
1	Epoxy, Epoxy phenolic, Epoxy novolac	THERMALINE 440	125 µm	RED
2	Epoxy, Epoxy phenolic, Epoxy novolac	THERMALINE 440	125 µm	RAL 9002
		Total minimum DFT Spessore minimo totale	250 µm	

System 9
Grade of cleanliness: ISO 8501-1 SA 2 1/2.
Roughness: 50÷85 µm R_{y5}, according to ISO 8503-5
Nominal dry film thickness (NDFT): 300 µm

Coat Mano	Type Tipo	Product name Nome del prodotto	Minimum DFT Spessore minimo	Colour Colore
1	Epoxy, Epoxy phenolic, Epoxy novolac	THERMALINE 440	150 µm	RED
2	Epoxy, Epoxy phenolic, Epoxy novolac	THERMALINE 440	150 µm	RAL 9002
		Total minimum DFT Spessore minimo totale	300 µm	

6. INSPECTIONS AND TESTS
ISPEZIONI E CONTROLLI

6.1. The inspector in charge for quality control shall provide to carry out inspections and tests as listed in the ITP below.
L'ispettore addetto al controllo qualità provvederà ad effettuare le ispezioni ed i test elencati nel seguente piano dei controlli.

6.2. All items listed in the ITP shall be considered as "Hold Point", so that the work shall not proceed until the results are conforming.
I punti del piano di controllo devono essere considerati punti vincolanti, per cui il processo non può proseguire fino a quando i risultati dei test non sono conformi.

6.3. Test results shall be recorded in a painting inspection report, together with all important items identification data.
I risultati dei test devono essere registrati sul rapporto di verniciatura, assieme ad ogni altro dato identificativo del manufatto trattato.

Test type	What to control	Method	Frequency	Acceptance criteria	Consequence
Coating material conformity	Paint quality	Doc. review	Each delivery	Manufacturer certificate	Paint not to be used
Abrasive conformity	Size & chemical composition	Doc. review	Each delivery	Manufacturer certificate	Abrasive not to be used
Blotter test	Absence of moisture and oil	ASTM D 4285	At start	No moisture, no oil	Install oil and moisture traps
Steel imperfections	Absence of sharp edges, weld spatters, indentations, etc.	ISO 8501-3	100%	Grade P3	Repair defects
Salt Test	Absence of salts contamination	ISO 8502-6 & -9	Spot check	20 mg/m² NaCl	re-blast and re-test
Abrasive conductivity	Absence of salts contamination	ASTM D4920	Spot check	< 150 µS/cm	Abrasive not to be used
Dust test	Dust removal	ISO 8502-3	Spot check	Max quantity and size rating 2	Blow with clean air and re-test
Roughness	Anchor pattern	ISO 8503-5	Once per shift	SS 25-85 µm R_Y CS 50-85 µm R_Y	Re-blast
Material conformity	Batch number Container integrity Storage temperature	Visual	Each batch	Technical data sheet	Paint not to be used

Material preparation	Mixing and thinning	Visual	Each coat	Technical data sheet	Paint not to be used
Environmental conditions	Ambient and steel temperature Relative humidity Dew point	Thermo-hygrometer	Beginning of each coat, then every four hours	According to materials data sheets	No painting
Wet film thickness	Wet film thickness	Wet film gage	Beginning of each coat	According to materials data sheets	Adjust thickness
Visual examination of coatings	No contaminants, pinholes, blisters, sags, surface defects	Visual	100% after each coat	No defect	Repair of defects
Repairs	Respect of repair procedure	Visual	100%	As per ITP	Repeat repairs
Total DFT	Specified DFT	ISO 19840	100 %	According to systems 1/6A/6C/9	Repair, additional coats or recoat as appropriate
Curing	Coating curing	Visual	100 %	According to materials data sheets	Coating to be rejected
Holiday Detection	Absence of film discontinuities	ISO 29601	100%	No holidays	Repair and retest
Adhesion	On test panel	ISO 16276-1	One each lot	Absolute min. 5 MPa	Coating to be rejected

7. Personnel Qualification

Qualifica del personale

All operators are qualified according Norsok M-501 and ASTM D-4228 international standard, in relation with use of blasting and spraying equipment, paint storage, mixing, thinning and application techniques. Qualification certificates are attached. Personnel carrying out inspections and tests shall be certified at Level 3 (FROSIO or NACE).

Tutti gli operatori sono qualificati secondo lo standard internazionale Norsok M-501 e ASTM D-4228, in relazione all'uso di attrezzature per la sabbiatura e la spruzzatura, lo stoccaggio della vernice, la miscelazione, la diluizione e le tecniche di applicazione. I certificati di qualifica sono allegati. Il personale che effettua ispezioni e prove è certificato a livello 3 (FROSIO o NACE).

8. Health & Safety

Salute e Sicurezza

Working environment and infrastructure are in compliance with the laws, norms and rules regarding health and safety. The staff is aware through appropriate training of the procedures regarding health and safety.

Details of safety measures and PPE are included in the internal safety procedure.

L'ambiente di lavoro e le infrastrutture sono conformi alle leggi, alle norme e alle regole in materia di salute e sicurezza. Il personale è consapevole, attraverso un'adeguata formazione, delle procedure in materia di salute e sicurezza.

I dettagli delle misure di sicurezza e dei DPI sono inclusi nella procedura di sicurezza interna.

9. Attachments
Allegati

- Products Technical Data Sheets.
- Abrasive Chemical Analysis.
- Operator Qualification Certificates.
- Inspector Qualification Certificates.
- Painting Certificates Samples.
- Adhesion Certificates Samples.
- Schede tecniche dei prodotti.
- Analisi chimica abrasivo.
- Certificati di qualifica dell'operatore.
- Certificati di qualifica dell'ispettore.
- Esempio di Certificato di Verniciatura.
- Esempio di certificato di test di adesione.

Interzinc® 52

Epoxy Zinc-Rich

PRODUCT DESCRIPTION

A two component, metallic zinc rich epoxy primer which complies with the composition and performance requirements of SSPC Paint 20.

INTENDED USES

As a high performance primer to give maximum protection as part of any anti-corrosive coating system for aggressive environments including those found on offshore structures, petrochemical facilities, pulp and paper plants, bridges and power plants.

Interzinc 52 has been designed to provide excellent corrosion resistance in both maintenance and new construction situations.

PRACTICAL INFORMATION FOR INTERZINC 52

Colour	Blue, Grey, Green
Gloss Level	Matt
Volume Solids	59% ± 2%
Typical Thickness	50-75 microns (2-3 mils) dry equivalent to 85-127 microns (3.4-5.1 mils) wet
Theoretical Coverage	7.87 m²/litre at 75 microns d.f.t and stated volume solids 315 sq.ft/US gallon at 3 mils d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
5°C (41°F)	2 hours	10 hours	8 hours	Extended[1]
15°C (59°F)	90 minutes	6 hours	4 hours	Extended[1]
25°C (77°F)	75 minutes	4 hours	3 hours	Extended[1]
40°C (104°F)	45 minutes	2 hours	2 hours	Extended[1]

[1] See International Protective Coatings Definitions and Abbreviations

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

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

REGULATORY DATA

Flash Point (Typical)	Part A 29°C (84°F); Part B 30°C (86°F); Mixed 29°C (84°F)	
Product Weight	2.52 kg/l (21.0 lb/gal)	
VOC	2.80 lb/gal (336 g/lt)	EPA Method 24
	152 g/kg	EU Solvent Emissions Directive (Council Directive 1999/13/EC)
	360 g/lt	Chinese National Standard GB23985

See Product Characteristics section for further details

Interzinc® 52

Epoxy Zinc-Rich

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

Abrasive blast clean to Sa2½ (ISO 8501-1:2007) or SSPC-SP6. If oxidation has occurred between blasting and application of Interzinc 52, the surface should be reblasted to the specified visual standard.

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

A surface profile of 40-75 microns (1.6-3.0 mils) is recommended.

Shop Primed Steelwork

Interzinc 52 is suitable for application to unweathered steelwork freshly coated with zinc silicate shop primers.

If the zinc shop primer shows extensive or widely scattered breakdown, or excessive zinc corrosion products, overall sweep blasting will be necessary. Other types of shop primer are not suitable for overcoating and will require complete removal by abrasive blast cleaning.

Weld seams and damaged areas should be cleaned to a minimum St3 (ISO 8501-1:2007) or SSPC-SP3. Optimum performance will be achieved with blasting to Sa2½ (ISO 8501-1:2007) or SSPC-SP6; where this is not practical, power tool preparation to SSPC-SP11 is recommended.

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

5°C (41°F)	15°C (59°F)	25°C (77°F)	40°C (104°F)
24 hours	12 hours	5 hours	2 hours

Airless Spray	Recommended	Tip Range 0.43-0.53 mm (17-21 thou) Total output fluid pressure at spray tip not less than 176 kg/cm² (2503 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 50-75 microns (2.0-3.0 mils) can be achieved
Roller	Not recommended	
Thinner	International GTA220 (or International GTA415)	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)	

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 approrpriate regional regulations/legislation.

PRODUCT CHARACTERISTICS

In order to ensure good anti-corrosive performance, it is important to achieve a minimum dry film thickness of Interzinc 52 of 40 microns (1.5 mils). To achieve a uniform, coalesced, closed film at this dry film thickness, it will be necessary to thin Interzinc 52 10% with International thinners. The film thickness of Interzinc 52 applied must be compatible with the blast profile achieved during surface preparation. Low film thickness should not be applied over coarse blast profiles.

Care should be excercised to avoid the application of dry film thicknesses in excess of 150 microns (6 mils). Care should be exercised to avoid over-application, which may result in cohesive film failure with subsequent high builds, and to avoid dry spray which can lead to pinholing of subsequent coats. Over-application will also result in slower curing and extended handling and overcoating times. Over-application of Interzinc 52 will extend both the minimum overcoating periods and handling times, and may be detrimental to long term overcoating properties.

When Interzinc 52 is allowed to weather before topcoating ensure all zinc salts are removed prior to paint application and only topcoat with recommended materials.

Surface temperature must always be a minimum of 3°C (5°F) above dew point.

Interzinc 52 is not normally recommended for underwater use. Please consult International Protective Coatings for details in this situation.

Interzinc 52 is suitable for the localised repair of damaged inorganic zinc primer - consult International Protective Coatings for specific advice.

Low Temperature Curing

An alternative curing agent is available for applications at temperatures less than 5°C (41°F). When using this alternative curing agent it should be noted that the VOC will increase to 384 g/l (EPA Method 24) and the Part B flash point is 24ºC (79ºF).

Interzinc 52 is capable of curing at temperatures below 0°C (32°F). However, this product should not be applied at temperatures below 0°C (32°F) where there is a possibility of ice formation on the substrate.

			Minimum overcoating interval with recommended topcoats		
Temperature	Touch Dry	Hard Dry	*Minimum*	*Maximum*	Pot Life
-5°C (23°F)	3 hours	31 hours	31 hours	Extended*	18 hours
0°C (32°F)	2.5 hours	16 hours	16 hours	Extended*	18 hours
5°C (41°F)	30 minutes	4 hours	4 hours	Extended*	18 hours
15°C (59°F)	20 minutes	3.5 hours	3.5 hours	Extended*	8 hours
25°C (77°F)	15 minutes	3 hours	3 hours	Extended*	2.5 hours

Touch dry times shown above are actual drying times due to chemical cure, rather than physical set due to solidification of the coating film at temperatures below 0°C (32°F)

* See International Protective Coatings Definitions & Abbreviations

For further details regarding cure times and overcoatability, please contact International Protective Coatings.

This product has the following specification approvals:
- Steel Structures Painting Council - SSPC Paint 20

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 colour 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

Interzinc 52 is designed for application to correctly prepared steel. However, it is also possible to apply over approved prefabrication primers. Further details of these can be obtained from International Protective Coatings. Recommended topcoats are:

Intercure 200	InterH2O 401
Intercure 420	Interseal 670HS
Interfine 629HS	Interthane 990
Intergard 251	Interzone 1000
Intergard 269	Interzone 505
Intergard 475HS	Interzone 954
Intergard 740	

For other suitable topcoats, consult International Protective Coatings.

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
	10 litre	8 litre	10 litre	2 litre	2.5 litre
	3 US gal	2.4 US gal	3.5 US gal	0.6 US gal	1 US gal
	For availability of other pack sizes, contact International Protective Coatings.				
SHIPPING WEIGHT (TYPICAL)	Unit Size	Part A		Part B	
	10 litre	24.5 kg		2.1 kg	
	3 US gal	63.3 lb		5.3 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® 269

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

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.

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.

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.

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Intergard® 475HS

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[1]
41°F (5°C)	90 minutes	16 hours	16 hours	Extended[1]
50°F (10°C)	80 minutes	14 hours	13 hours	Extended[1]
59°F (15°C)	75 minutes	10 hours	10 hours	Extended[1]
77°F (25°C)	60 minutes	5 hours	5 hours	Extended[1]

[1] 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

Intergard® 475HS

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

Intergard® 475HS

Epoxy

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

Intergard® 475HS

Epoxy

Interthane 990E

For alternative primers and finishes, consult International Protective Coatings.

* See relevant product data sheet for details.

Interthane 990

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

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

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

Polyurethane Finish

LIMITATIONS

This product is not recommended for use in permanantly immersed conditions.
Interthane 990 may be used on boottop 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

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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Thermaline® 440

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Modified Epoxy Phenolic
Description	Thermaline 440 (formerly Thermaline 400 EU) is a high performance, heat resistant epoxy phenolic that specializes in providing color for uninsulated piping and equipment. This immersion-grade coating which has excellent resistance to wet/dry cycling conditions at elevated temperatures when using dry grind pigments. This formulation allows for use on hot steel substrates under insulation operating continuously up to 400°F (204°C). It has excellent chemical resistance properties to handle the corrosive effects of wet insulation under thermal cycling conditions.
Features	• Versatile use from *cryogenic temperatures* of -320°F (-196°C) up to 400°F (204ºC) exposures • Very good flexibility • Excellent overall chemical resistance • Very good abrasion resistance • Easily applied by spray • Acceptable for use over stainless steels • Rapid Tint System Colors available* * Contact your Carboline Representative for availability
Color	0500 (Red), G760 (Grey) are standard A wide range of colors are available using our rapid tint system. Contact your local Carboline representative for availability. Rapid tint colors are not recommended for CUI and/or immersion service. *Coating discoloration can be expected when exposed to elevated temperatures in excess of 200°F (93°C). This discoloration does not affect performance.*
Finish	Semi-Gloss
Dry Film Thickness	5 - 6 mils (127 - 152 microns) per coat Dry film thickness above 10 mils (250 microns) per coat, is not recommended.
Solid(s) Content	Solids by volume: 52 ± 2%
Theoretical Coverage Rates	166 sq.ft/gallon at 5.0 mils DFT (4.0 sq.m/liter at 125 µm) 139 sq.ft/gallon at 6.0 mils DFT (3.4 sq.m/liter at 150 µm) Mixing and application losses will vary and must be taken into consideration when estimating project requirements.
VOC Values	**As Supplied** : 3.50 lbs/gal (420 g/l) Thinner 236 E : 3.50 lbs/gal (420 g/l) Thinner 2 : 3.68 lbs/gal (441 g/l) Thinner 33 : 3.69 lbs/gal (443 g/l) The use of Thinner 2 or Thinner 33 may exceed your local allowances for VOC. Please check your local regulations before using. Thinner 236 E is a US EPA VOC exempt solvent
Under Insulation Resistance	Continuous: 400°F (204°C) Non-Continuous: 450°F (232°C)

SELECTION & SPECIFICATION DATA

Limitations	Discoloration will occur when exposed to temperatures in excess of 200°F (93°C), however product will perform as intended. Not recommended for exposure to strong mineral or organic acids. For CUI & immersion projects use only factory made material in special colors. Epoxies may lose gloss, discolor and eventually chalk in sunlight exposure.

SUBSTRATES & SURFACE PREPARATION

General	Surfaces must be clean and dry. All surfaces must be thoroughly cleaned to remove dirt, grease, and any other contaminants that can reduce adhesion per SSPC-SP1 solvent cleaning with recommended surface preparation.
Steel	Abrasive blast to SSPC-SP10 (ISO 8501-1 Sa 2½) to obtain a 1.5 - 3.0 mil (35 - 75 µm) anchor profile. For previously prepared substrates that have an existing anchor profile, High Pressure Water Jetting (HPWJ) to a minimum WJ-1 standard is acceptable.
Stainless Steel	Surface profile should be a dense angular 1.0 - 2.0 (25 - 50 µm) mils and is best achieved through abrasive blasting (non-metallic abrasive)per SSPC-SP16. Remove all contaminants that would interfere with the performance of stainless steel for the intended service such as, but not limited to, embedded iron or chlorides.

MIXING & THINNING

Mixing	Power mix components separately; then combine and mix thoroughly for a minimum of two minutes. **DO NOT MIX PARTIAL KITS**
Thinning	Maybe be thinned up to 5% by volume with Thinner 236 E, Thinner 2* or Thinner 33* for spray application. Use of thinners other than those supplied or approved by Carboline may adversely affect product performance and will void product warranty whether express or implied. * The use of these thinners may exceed your local allowances for VOC. Check your local regulations before using.
Ratio	2:1 by volume (A to B)
Pot Life	4 hours at 75°F (24°C) and less at higher temperature. Pot life ends when coating loses body and begins to sag.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

General	Thermaline 440 may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.
Conventional Spray	Pressure pot equipped with dual regulators, 3/8" ID minimum material hose, conventional spray gun using a 0.055-0.070" fluid tip with appropriate air cap.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Airless Spray	Pump Ratio: 30:1 (min)* GPM Output: 3.0 (min) Material Hose: 3/8" ID (min) Tip Size: 0.017-0.021" Output PSI: 2000-2500 Filter Size: 60 mesh *PTFE packings are recommended.
Brush & Roller (General)	Recommended for touch-up, striping of weld seams, and hard-to-reach areas in addition to larger surface areas. Multiple coats will be required for larger areas to obtain the desired appearance and required dry film thickness. Application by roller to large surface areas should be holiday tested. Apply in full strokes, avoid re-brushing or re-rolling. Use a natural bristle brush and short nap mohair roller with a phenolic core.
Roller	Use a short nap (3/8" - 1/2") mohair roller with a phenolic core

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	55°F (13°C)	41°F (5°C)	41°F (5°C)	0%
Maximum	95°F (35°C)	167°F (75°C)	104°F (40°C)	85%

Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Do not apply when the surface temperature is less than 5F above the dew point. High substrate temperatures may lead to faster curing and porous film. Special thinning and application techniques may be required above or below normal conditions.

CURING SCHEDULE

Surface Temp.	Dry to Recoat	Final Cure Immersion
41°F (5°C)	24 Hours	NR
50°F (10°C)	15 Hours	4 Days
59°F (15°C)	10 Hours	3 Days
77°F (25°C)	6 Hours	2 Days

These times are based on the recommended dry film thickness. Excessive film thickness or inadequate ventilation conditions after application require longer dry times and will cause premature failure in extreme cases. Maximum recoat time is 60 days at 75°F (24°C), 50% relative humidity, and protected from UV. If exceeded and depending on curing time and exposure, pretreatment may be required prior to overcoating. Contact Carboline for further information.
EXCESSIVE HUMIDITY OR CONDENSATION ON THE SURFACE DURING CURING MAY RESULT IN SURFACE HAZE OR BLUSH; ANY HAZE OR BLUSH SHOULD BE REMOVED BY WASHING WITH WATER BEFORE RECOATING.

CLEANUP & SAFETY

Cleanup	Use Carboline Thinner 2. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

CLEANUP & SAFETY

Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.
Ventilation	When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.
Caution	This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

PACKAGING, HANDLING & STORAGE

Packaging	**North America** Part A & B available in both 1 and 5 gallon kits **Outside North America** Part A 3.5 gallon (13,3 liters) Part B 1.76 gallon (6,7 liters or Part A 1.76 gallon (6,7 liters*) Part B 0.871 gallon (3,3 liters*) * Not available in all locations.
Shelf Life	24 months when stored at 75°F (24°C)and in original, unopened containers.
Storage Temperature & Humidity	40°-110°F(4°-43°C) 0-95% Relative Humidity
Storage	Store indoors and out of direct sunlight
Shipping Weight (Approximate)	**North America** 1 Gallon Kit - 15 lbs (6.8 kg) 5 Gallon Kit - 75 lbs (34 kg) **Outside North America** 10 liter kit - 18.1 kg 20 liter kit - 36.2 kg
Flash Point (Setaflash)	Thermaline 440 Part A: 64°F(18°C) Thermaline 440 Part B: 80°F(27°C)

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.

Product Data Sheet

GMA PremiumBlast™

Average Chemical Composition (Typical)

SiO_2*	33%
Al_2O_3	17%
FeO	NA
Fe_2O_3	35%
MgO	7%
CaO	5%
TiO_2	1%
MnO	1%

**Refers to SiO_2 bound within the lattice of the homogeneous garnet crystal (not free silica)*

Mineral Composition (Typical)

Garnet (predominately Almandine)	91%
Pyroxene	3%
Ilmenite	<1%
Quartz (free silica)	<0.2%
Hornblende	4%
Others	1%

Physical Characteristics (Typical)

Bulk Density	143.58 lbs/ft³ (2.3 t/m³)
Specific Gravity	4.1
Hardness (moh)	7.5 – 8.0
Melting Point	2282°F (1250°C)
Shape of Natural Grains	Angular

Other Characteristics (Typical)

Radioactivity	Non-detectable above background
Moisture Absorption	Non-hygroscopic, Inert
Total Chlorides	1 – 2 ppm
Conductivity	46 µS/cm (4.6 mS/m)

**Tested in accordance to ISO and ASTM standards.*

Product Range (typical weight % retained)

Mesh	Microns	Cumulative	Discrete
25	710	0	1
30	600	1	5
35	500	6	21
40	425	27	28
45	355	55	24
50	300	79	14
60	250	93	4
70	212	97	2
80	180	99	1
PAN	PAN	100	0

Packaging

- 55 lb. (25 kg) paper bags on 1 metric ton or 2 metric ton pallet
- 1 metric ton or 2 metric ton bulk bags with bottom spout and an inner plastic liner
- Loose bulk delivered by pneumatic truck.

Source

- Made in USA
- Product code: GMX-USA-30/60
- Product specification: 30/60 Mesh Garnet.

PDS Code: GMX-USA-30/60 PDS-V1-2018-08

INDUSTRIAL PAINTING QUALIFICATION OF OPERATORS

QUALIFICA DEGLI OPERATORI DEL SETTORE VERNICIATURA INDUSTRIALE

CERTIFICATE

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si attesta che

Mr. ANDREA GASPARRI

Born in/nato a: Busto Arsizio (VA) On/il: November 5th 1993

CF: GSPNDR93S05B300B

has been evaluated according

è stato valutato in riferimento ai seguenti standard

- NORSOK M-501:2012 rev. 6 "surface preparation and protective coating"
- BAKER HUGHES Painting Specification ITN07791:2018 - rev. 18
- ASTM D-4228 "Standard Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces"

and qualified as

e qualificato come

BLASTER

Qualification awarded on the basis of the evidence collected and the examination held on

Qualifica assegnata sulla base delle evidenze raccolte e dell'esame svolto il

September 8th to 24th 2020

The examination was carried out at the workshop

La valutazione è stata effettuata presso lo stabilimento della società

GMP COLOR

Via per Legnano, 59
20023 Cerro Maggiore (MI)

September 28th 2020

STUDIO ACG INT
DI CARLO BRERO
Via Dante Alighieri 21, 45011 Adria (RO), Italy
www.studioacgint.com - +39 - 338 - 320 72 11

Carlo Brero
NACE Coating Insp. Lev. 2 Certified
CIP Certification Number 10937
ARAMCO insp. SAP 70012504
CEPAS Lead auditor - cert. ID 443

NACE LEAD

CERTIFIED NACE INTERNATIONAL COATING INSPECTOR
EXP. 09/2022
2727
R W

QUALIFICATION OF INDUSTRIAL PAINTING OPERATORS

CERTIFICATE

This is to certify that

Mr. SUNDAY EDOMWONYI OGIEVA

Born in/ : Nigeria on/ : September 13th, 1988

C.F.: DMWSDY88P13Z335U

Has been evaluated according

- Norsok M-50, Edition 6, February 2021: Surface Preparation and Protective Coating
- ASTM D-4228-2017: Standard Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces

and qualified as

BLASTER

Qualification awarded on the basis of evidence collected and examination held on

October 4th to 9th, 2021

Examination was carried out at: GMP COLOR Via per Legnano, 59
20025 Cerro Maggiore (MI)

Examiner:

Flavio Brero
Certified NACE International Coating Inspector Level III°

CERTIFIED NACE INTERNATIONAL COATING INSPECTOR
EXP. 09/2022
2727
R W

INDUSTRIAL PAINTING QUALIFICATION OF OPERATORS

QUALIFICA DEGLI OPERATORI DEL SETTORE VERNICIATURA INDUSTRIALE

CERTIFICATE

this is to certify that

si attesta che

Mr. RISSAOUI AHMED

Born in/nato a: Morocco On/il: June 15th 1967

CF: RSSHMD67H15Z330Z

has been evaluated according

è stato valutato in riferimento ai seguenti standard

- NORSOK M-501:2012 rev. 6 "surface preparation and protective coating"
- ASTM D-4228 "Standard Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces"

and qualified as

e qualificato come

PAINTER

Qualification awarded on the basis of the evidence collected and the examination held on

Qualifica assegnata sulla base delle evidenze raccolte e dell'esame svolto il

September 8th to 24th 2020

The examination was carried out at the workshop

La valutazione è stata effettuata presso lo stabilimento della società

GMP COLOR

Via per Legnano, 59
20023 Cerro Maggiore (MI)

September 28th 2020

CERTIFIED NACE INTERNATIONAL COATING INSPECTOR
EXP. 09/2022
2727
R W

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Carlo Brero
NACE Coating Insp. Lev. 2 Certified
CIP Certification Number 10937
ARAMCO insp. SAP 70012504
CEPAS Lead auditor - cert. ID 443

NACE LEAD

QUALIFICATION OF INDUSTRIAL PAINTING OPERATORS

CERTIFICATE

This is to certify that

Mr. MANUEL MOLENT

Born in/ : Legnano (MI) on/ : February 26th, 1988

C.F.: MLNMNL98B26E514J

Has been evaluated according

- Norsok M-50, Edition 6, February 2021: Surface Preparation and Protective Coating
- ASTM D-4228-2017: Standard Practice for Qualification of Coating Applicators for Application of Coatings to Steel Surfaces

and qualified as

PAINTER/SPRAYER

Qualification awarded on the basis of evidence collected and examination held on

October 4th to 9th, 2021

Examination was carried out at: GMP COLOR Via per Legnano, 59
20025 Cerro Maggiore (MI)

Examiner:

Flavio Brero
Certified NACE International Coating Inspector Level III°



NACE INTERNATIONAL INSTITUTE

Certificate of Achievement

The NACE International Institute Recognizes

Flavio Brero

As a Certified

NACE Certified Coating Inspector - Level 3

Executive Director
NACE International Institute

Expires
August 31, 2025

Cert No.2727

145678

PAINTING CERTIFICATE

MD-009 (rev 0 - 19/09/2020)

REPORT IDENTIFICATION			
Date	Certificate ID	Ref. Transport Note ID	Client
Customer Job No.	Description	Item	Painting Specification/Procedure

AMBIENT CONDITION					
Date	Hour	Ambient Temp. °C	Steel Temp. °C	Humidity %	Dew Point

SURFACE PREPARATION			
Degreasing		Abrasive Type	
Roughness		Cleaners	
Soluble Contaminants Test - ISO 8502-6/9		Dust Test - ISO 8502-3	
Result (mg/m²):		Result (rate):	

PAINTING				
Number of Coats	1	2	3	4
Date				
Hour				
Room Temperature				
Steel Temperature				
Humidity %				
Dew Point				
Application Method				
Paint Product Name				
Product Batch Number				
Colour				
Total dry film thickness (ISO 19840)				
Visual Aspect Result				
Remarks				

MEASURING INSTRUMENTS		

GMP COLOR	CLIENT'S INSPECTOR	THIRD PARTY INSPECTOR

COMPANY USE INFORMATION

ADHESION TEST REPORT

MD-023 (rev 0 - 24/09/2020)

REPORT IDENTIFICATION			
Date	**Certificate ID**	**Ref. Transport Note ID**	**Client**
.	.	.	.
Customer Job No.	**Description**	**Item**	**Painting Specification/Procedure**
.	Test Plate	**REF. TO CERTIFICATE** .	.

Adhesion Test according to …… has been carried out, with the following results:

TEST RESULTS					
Dollies	**1**	**2**	**3**	**4**	
DFT	.	.	.	.	
Pull-off Strength	.	.	.	.	
Failure Distribution	.	.	.	.	
Dollies	**5**	**6**	**7**	**8**	
DFT					
Pull-off strength					
Failure Distribution					
Remarks	- **Test carried out on sample plate** - **Glue: Loctite 496**				

MEASURING INSTRUMENTS		
POSITEST ATM20A	S.N. AT17055	Calibration expiring date: December 2024

GMP COLOR	CLIENT'S INSPECTOR	THIRD PARTY INSPECTOR
GMP COLOR S.R.L.		

COMPANY USE INFORMATION