

1.0 PURPOSE

This Work Instruction describes the process and paint systems used to ensure effective protective coating protection are applied to prevent / control corrosion. This is achieved by classifying the corrosivity categories on the SIMEC Mining sites and Liberty Primary Steel Whyalla Plant and the required durability of the paint systems by the business units.

2.0 SCOPE

This specification applies to the selection of various coating products and systems that are approved for use on SIMEC Mining sites and Liberty Primary Steel Whyalla Plant in South Australia.

The selection of the applicable coating system to use is by the coating system no., functional location, corrosive category and expected durability. The coating systems applies to all structures, pipes and equipment, unless otherwise specified.

Note- coating systems applied shall be from the one paint manufacturer in a given location/area. If coating systems overlap with other systems or unknown systems, compatibility testing is required. This can be advised by the Paint Manufacturer, Project Engineer or Coating Technical Officer.

3.0 DOCUMENT REFERENCES, DEFINITIONS, ACRONYMS

The documents listed below are referenced in this document or are related to it. This document required a total content review and has been updated accordingly.

Document Number	Document Title
QP29.13	Safety Risk Management
ISO 8501-3	Preparation of steel substrates before application of paint or related products. Part 3 Treatment of welds edges and other areas with surface imperfections
AS 4361.1	Guide to Lead based paint management
ISO 12944	All Parts- Corrosion Protection of steel structures by protective paint systems
WI37.MTS.169	Paint Specification and Selection Procedure
WI37.MTS.174	Abrasive Blasting and Painting
	Work Health and Safety Regulations
EPA 108/11	Air and Noise Guidelines Abrasive Blast Cleaning
EPA 100/12	Air and Noise Guidelines Spray Coating Activities
Safework SA Code of Practice	Abrasive Blasting
Safework Australia Code of Practice	Spray Coating and Powder Coating

Definitions	Description
Coating Technical Officer	Person designated by the Central Engineering Manager to be responsible for Protective Coating requirements.
Corrosivity	A measure of the ability of the environment to cause corrosion.
Corrosivity Categories	There are six atmospheric-corrosivity categories (very low, low, medium, high, very high, extreme) and four for structures immersed in water and soil (fresh water, sea water, soil etc.). Refer to Appendix A.
Durability	The time elapsed (in years) before the first major maintenance (re-coating or patch repairs) of a coating system becomes necessary, to arrest corrosion. The durability ranges are low (up to 7yrs), medium (7-15yrs), high (15-25yrs) and very high (>25yrs). NOTE- about 1%-2% surface of coating breakdown, equivalent to Ri 3-Ri 4 to- ISO4628-3 is considered a point that a coating system should require touch up repairs. Scattered surface area breakdown of >5% of a paint system to the steel surface should be considered for re-newel.
Maintenance repair system (M)	Is a localized repair of a coating system to arrest corrosion and provide short term protection from 2-5 years. The surface preparation normally uses power tool preparation methods.
New Coating Systems (NC)	New application or full refurbishment of a coating system, primarily using dry or wet abrasive methods to achieve a high level of surface preparation to ensure a durability range of 7 to 15 years.
Paint Manufacturer	The company that develops the protective coating products including SDS and TDS that we use in the Specifications that their Technical Departments recommend to us and update as required.
Paint Specification	A specification which sets out the application of protective coating, quality assurance controls, inspection points before and during manufacture / fabrication of items and protective coating application on site to control corrosion. A paint specification is a document that outlines the objectives and requirements for a painting project. <u>It includes information about the products to be used, safety requirements, the surface preparation required, how the product should be applied, Quality Assurance requirements, inspection requirements, personnel qualifications and responsibilities.</u>
Project Engineer	Engineer designated responsibility for engineering issues of a project by the Plant owner.
Shall	Is used where provision is mandatory.
Should	Is used where a provision is preferred.
Acronyms	Description

Note:

The document *Abrasive Blasting and Painting - WI37.MTS.174* shall be read in conjunction with this *Protective Coating Specifications* work instruction - *WI37.MTS.173*.















The process of selecting which coating systems are to be used where, is to be in accordance with *Paint Specification Selection Procedure - WI37.MTS.169*.

4.0 SAFETY, ENVIRONMENTAL, QUALITY RISKS ANALYSIS

4.1 Safety Risk Analysis

Hazard	Hazard Control
General	Refer to the Plant Hazard Register for any temporary hazards and their control measures.
Lead based Paint Removal	AS 4361.1 Guide to lead paint management
Product storage and use in the preparation and application of protective coatings.	Refer to SDS for material safety data sheets
Spray Painting and powder Coating Abrasive Blasting Hazardous Manual Tacks	Safe Work Australia Code of Practice

4.1.1 Required Personal Protective Equipment:

						
Helmet with chin strap	Safety Goggles	Hearing Protection	Face Protection	Chemical Apron	Protective Suit	Personal Flotation Device
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						
Hydration	UV Protection	Clean Shaven	P1/P2	P3/PAPR	Breathing Apparatus	Fall Prevention
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.1.2 Special Personal Protective Equipment requirements:

Special PPE requirements:	<input type="checkbox"/> Thermal	<input type="checkbox"/> Welding	<input type="checkbox"/> Chemical	<input type="checkbox"/> Rescue	<input type="checkbox"/> Environmental weather/ambient conditions

4.2 Environmental Risks Analysis

Hazard	Hazard Control
Air Noise Water Quality Waste Management	Refer EPA Environmental Assessment Guides for Planners EPA 108/11 Abrasive blast Cleaning EPA 100/12 Spray Coating Activities

4.3 Quality Risks Analysis

Hazard	Hazard Control
Inadequate Protective Coating	Refer W37.MTS.173 WI37.MTS.174 WI37.MTS.169 Inspection and Test Plan Established.

5.0 CORROSION CATEGORIES and DURABILITY for SIMEC Mining and Liberty Primary Steel

Table 1- Liberty Primary Steel Plant Whyalla General Corrosivity Categories and Durability Requirements

Area/Location	Exterior Corrosivity	Exterior Durability	Interior Corrosivity	Interior Durability
Administration Buildings	C5- Very High-Industrial, Coastal	10 to 15 years	C2- Low	10-15 years
Workshops- Dry spaces	C5- Very High-Industrial, Coastal	10 to 15 years	C2- Low- dry spaces C3- Medium- open areas to outside	10-15 years
Steel Products Area	C5- Very High-Industrial, Coastal	10 to 15 years	C3- Medium- dry areas C5- High-moist/wet areas, fumes, dust	10-15 years
Central Engineering Area	C5- Very High-Industrial, Coastal	10 to 15 years	C3- Medium- dry areas C5- High-moist/wet areas, fumes, dust	10-15 years
Steelmaking	C5- Very High-Industrial, Coastal	10 to 15 years	C3- Medium- dry areas C5- High-moist/wet areas, fumes, dust	10-15 years
Wharf Area- Sheet Piles, Navigation Beacons	CX-Extreme-immersed, splash zone	15-20 years	NA	NA
Wharf Area- Salt Water Pump House- equipment and pipework	C5-Very High-Industrial, Coastal	10-15 years	C5-Very High-Coastal, condensation	10-15 years
Cast Iron Pipe to Saltwater Pump House Buried and above ground section	Im3, C5-Very High-Industrial, Coastal	>25 years	Im2-No internal lining, no Cathodic protection	>25 years
Coke Ovens Gas Piping (Asset to be de-commissioned)	C5-Very High-Industrial, Coastal	5-10 years	Im2-Lining system, no Cathodic protection	5-10 years

Note: the Whyalla Steel processing plant is directly located on the Upper Spencer Gulf coastline and is given a general site C5 to CX corrosivity rating depending on site specific conditions and microclimates.

Table 2- SIMEC Mining Sites-Eyre Peninsula SA- General Corrosivity Categories and Durability

Area/Location	Exterior Corrosivity	Exterior Durability	Interior Corrosivity	Interior Durability
Administration Buildings	C3- Medium-Industrial	10 to 15 years	C2- Low	10-15 years
Workshops- Dry spaces	C3- Medium-Industrial	10 to 15 years	C2- Low- dry spaces not open C3- Medium- open areas to outside	10-15 years
Crushing Ore – Hoppers, screens and support structures	C4-High- Industrial-Iron dust, abrasion and water slurry	10 to 15 years	NA	NA
Piping- External-not buried (above ground)	C3- Medium-Industrial	10 to 15 years	NA	NA
Piping -Buried-External Surfaces (Slurry line)	Im 3- with Cathodic Protection and Denso tape system	>25 years	NA	NA
Piping -Buried-Internal surfaces (slurry line)	NA	NA	Im1- high abrasion-slurry pipeline to Whyalla Plant	NA-No Coating /lining- Durability of pipeline >25 years
Storage Tanks-Water Slurry - Internal and External surfaces	C3- Medium-Industrial	10 to 15 years	Im1- high abrasion from slurry mixing	10-15 years- rubber linings
Pellet Plant (SIMEC Asset @Whyalla Steel Plant)	C5- Very High-Industrial, Coastal -Supporting steel structures and buildings	10 to 15 years	Im1-Ore Crushing and separation- high abrasion, crushing, magnetite and fly ash	10-15 years

Note: the Mine Sites are located greater than 5 km from the coast inland and are generally categorized as C3-C4 mainly due to dust from iron ore crushing, except for the pellet plant (C5), which is located on the Whyalla Steel Processing site.

6.0 PROCEDURE

6.1 Control

- 6.1.1 Liberty Primary Steel Whyalla Protective Coating Specifications are located within Central Engineering Planning Office.
- 6.1.2 The Technical Officer for protective coatings is responsible for compiling and submitting revisions to any Protective Coating Specifications.

6.2 Responsibility

- 6.2.1 Central Engineering is responsible for the control and content of Protective Coating Specifications.
- 6.2.2 Authority for changes and or new specifications is the Central Engineering Manager or his / her nominee.

6.3 Issue of the Protective Coating Specification to Contractors

- 6.3.1 Controlled Copies of Protective Coating Specifications are issued by the Supply Department and to all local preferred contractors. The Supply Department also issues current uncontrolled copies as appropriate to other contractors on a job-by-job basis.
- 6.3.2 The specific coating system to be applied shall be communicated to the Contractor by the contract manager and shall follow the procedure outlined in WI37.MTS.169- Paint Specification Selection Procedure.

6.4 Updates/Revision to Protective Coating Specification

- 6.4.1 Central Engineering is responsible for any changes/updates being made to Protective Coating Specification. Records of changes will be kept.
- 6.4.2 Once changes have been made, authorization for those changes is to be made by the Central Engineering Manager or nominee.

7.0 APPROVED COATING SYSTEMS (Example new layout)

- 7.1 NC Table – New Coating System
- 7.2 M Table - Maintenance Coating Systems- Spot Repairs only

NC Table: New Coating Systems

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temp. Range °C PH	Suitable Corrosivity Category ISO 12944-2	Expected Durability ISO Std/AS 2312	Applicable Site Locations
NC1-01-2024	New Steelwork Exposed to Severe Industrial Environments	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Intercure 200(80)	Penguard Express ZP (80)	Hempadur Fast Dry 1741 (75)	Sigmafast 278 (80)	Atmospheric, Industrial, coastal marine	0-60 PH neutral	Very High C5-I/M	7-15YEARS	All sites in Eyre Peninsula SA.
			Coat 2- Intercure 420(125)	Penguard Universal (125)	Hempaprime Multi 500 (125)	Sigmacover 410 (125)					
			Coat 3-Interfine 629 (75)	Hardtop Smartpack (75))	Paracryl IF 540 (65)	Sigmadur 540 (75)					
			Total DFT 280 µm	Total DFT 280 µm	Total DFT 265 µm	Total DFT 280 µm					
NC2-01-2024	Structural Steelwork and Piping Systems Fast Turnaround for Cold Weather application	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Intergard 345(140)	Jotamastic 90 (125)	Hempaprime Multi 500 (125)	Sigmacover 2 (140)	Atmospheric, Industrial, coastal marine	0-60 PH neutral	Very High C5-I/M	5-15YEARS	All sites in Eyre Peninsula SA.
			Coat 2-Intergard 345(140)	Jotamastic 90 (125)	Hempaprime Multi 500 (125)	Sigmacover 2(140)					
			Total DFT 280 µm	Total DFT 250 µm	Total DFT 250 µm	Total DFT 280 µm					
NC3-01-2024	Steelwork Exposed to a Fumes and Temperatures up to a Maximum of 400C and as a primer for steelwork required urgently for installation and later topcoat	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzinc 2280 (75)	Resist 86au (75)	Galvosil 15700 (75)	Amercoat D9(75)	Atmospheric, Industrial, coastal marine	0-400 PH neutral	Very High C5-I/M	2-5 years	All sites in Eyre Peninsula SA.
			Total DFT 75 µm	Total DFT 75 µm	Total DFT 75 µm	Total DFT 75 µm					
NC4-01-2024	Steelwork Exposed to a Marine Salt Spray Environment (not immersed) i.e Jetty/Wharf handrails, structural supports	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzinc 52 (75)	Barrier 77 (75)	Avanteguard 550(75)	Sigmazinc 109HS (75)	Atmospheric coastal marine, Marine salt spray	0-60 PH Neutral	Very High- Extreme C5, CX Marine	10-15 years with polyurethane topcoat.	All sites in Eyre Peninsula SA. Polyurethane topcoat added to prevent chalking from UV.
			Coat 2-Interzone 954(300)	Marathon 500 (300)	Epinamel DTM 985 (300)	Sigmashield 880(300)					
			Coat 3-Intethane 990 (75)	Hardtop AX (75)	Hempathane HS 55610 (75)	PSX 700 (100)					
			Total DFT 375 µm	Total DFT 375 µm	Total DFT 375 µm	Total DFT 475 µm					
NC5-01-2024	Internal Protection of Flanged Steel Coke Ovens Gas Pipe Work	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interline 984 (300)	Tankguard SF / Tankguard Storage (200)	Hempadur 85671 (150)	Novaguard 840 (300)	Hydrocarbon gas- Internal of pipe	100-200- PH Neutral to slightly acidic	Very High C5	5-10 years	Whyalla Steel Works System to be de-commissioned and replaced with SCOG (Synthetic Coke Ovens Gas).
			Coat 2-Interline 984(300)	Tankguard SF / Tankguard Storage (200)	Hempadur 85671 (150)	Novaguard 840(300)					
			Total DFT- 600 µm	Total DFT- 400 µm	Total DFT- 300 µm	Total DFT- 600 µm					
NC6-01-2024	Steelwork Exposed within the Caster Spray Chamber	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interbond 2340 UPC (150)	Epoxy HR (150)	Hempadur 85671 (150)	Sigmacover 400/2 GF (125)	Salt spray High humidity	0-200 Neutral	Very High C5	7-15 years if total DFT is 300 microns	Whyalla Steel Works
			Coat 2- Interbond 2340 UPC (150)	Epoxy HR (150)	Hempadur 85671 (150)	Sigmacover 400/2 GF (125)					
			Total DFT- 300 µm	Total DFT- 300 µm	Total DFT- 300 µm	Total DFT- 250 µm					

NC Table: New Coating Systems cont.

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temp. Range °C PH	Suitable Corrosivity Category ISO 12944-2	Expected Durability ISO Std/AS 2312 years	Applicable Site Locations
NC7-01-2024	Protective Coating for New Steelwork Coke Crushing and Screening Plant at Coke Ovens	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzinc 52 (40)	Barrier 77(75)	Avanteguard 550 (50)	Sigma 109HS (75)	Atmospheric, Industrial, coastal marine. Abrasion	0-60 Neutral to acidic	Very High C5I/M	5-10	Whyalla Steel Works System to be de-commissioned.
			Coat 2- Interzone 954 GF (400)	Jotamastic 90 GF (300)	Multi Strength 35870 (300)	Sigmashield 880 (200)					
			Total DFT 440 µm	Total DFT 375 µm	Total DFT 350 µm	Total DFT 275 µm					
NC8-01-2024	Abrasion Protection Coating System- slurry bins, crushing bins/conveyors etc.	Sa 21/2 50-75 microns P3 edges P2-welds	Coat1- Interzone 954 GF (200)	Marathon 550 (250)	DTM 985 (200)	Sigmacover 400/2 GF (125)	Atmospheric, Industrial-Slurry Abrasion	0-60 PH-Neutral	Very High C5I	5-15 years depending on abrasion levels	All sites in Eyre Peninsula SA. Can include glass flake(GF) formulation to improve abrasion resistance.
			Coat 2- Interzone 954 GF (200)	Marathon 550 (250)	DTM 985 (200)	Sigmacover 400/2 GF (125)					
			Total DFT-400 µm	Total DFT- 500 µm	Total DFT- 400 µm	Total DFT-250 µm					
NC9-01-2024	New Steelwork and Equipment Exposed to Moderate Environments to C3	Sa 21/2 50-75 microns P2 edges P2-welds	Coat 1-Intergard 251HS (100)	Penguard Universal (100)	Hempaprime Multi 500 (100)	Sigmacover 280 (100)	Atmospheric-Industrial – Internal and external structures	0-60 PH- neutral	Moderate C3	7-15 YRS	Exterior- Only suitable for SIMEC mining sites >5km from coast. Interior of dry workshops- all sites Eyre Peninsula SA.
			Coat 2- Interthane 990/870 (75)	Hardtop Smartpack (75))	Paracryl IF 540 (75)	Sigmadur 550 (60)					
			Total DFT-175 µm	Total DFT-175 µm	Total DFT-175 µm	Total DFT-160 µm					
NC10-01-2024	Internal Protection of Flanged Steel Salt Water immersed Pipe work and Structural Steel	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzone 954 (250)	Marathon 500 (250)	Epiname DTM 985 (250)	Sigmashield 880 (250)	Immersed in sea water	0-60 PH neutral	Im2- immersed, no CP	10-15 yrs	All sites in Eyre Peninsula SA. Holiday testing is required for immersion service.
			Coat 2-Interzone 954 (250)	Marathon 500 (250)	Epiname DTM 985 (250)	Sigmashield 880 (250)					
			Total DFT-500 µm	Total DFT-500 µm	Total DFT-500 µm	Total DFT-500 µm					
NC11-01-2024	Cold Spray Aluminium Coating System up to 400C to carbon steel- Under Insulation	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1- Intertherm 751CSA (140)	Jotatemp 1000 (125)	Versiline CUI (100)	High Temp 1027 (125)	Atmospheric, Industrial, coastal marine	0-400 PH neutral	Very High C5I/M	Nonstandard- approximately 10 yrs.	All sites in Eyre Peninsula SA. Applicable for steam lines, Stacks, refractory and Chimneys as a protective coating for carbon steel, underneath insulation and cladding.
			Coat 2- Intertherm 751CSA (140)	Jotatemp 1000 (125)	Versiline CUI (100)	High Temp 1027 (125)					
			Total DFT- 280 µm	Total DFT- 250 µm	Total DFT- 200 µm	Total DFT- 250 µm					
NC12-01-2024	Coating System for Aluminium Surfaces & Galvanised Steel/ Pipe work -Decorative only	Sweep blast only P3 edges P2-welds	Coat 1- Interthane 3230G (150)	Penguard Special (100)	Hempadure 15553 (75)	Sigmacover 280 (75)	Atmospheric, Industrial, coastal marine	0-60 PH neutral	Very High C5I/M	7-15	All sites in Eyre Peninsula SA.
			May also be applied @ in 2 coats-2x75 microns	Coat 2- Hardtop AX (50)	Hempathane HS 55610 (100)	Sigmadur 550 (75)					
			Total DFT-150 µm	Total DFT-150 µm	Total DFT-175 µm	Total DFT-150 µm					
NC13-01-2024	Protective Coating System for Electric Motors	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1- Interplus 1180 MIO (225)	Coat 1- Barrier77 (75)	Coat 1-Multi 500 (240)	Coat 1- Sigmazinc 109 (75)	Atmospheric, Industrial, coastal marine	0-60 PH neutral	Very High C5I/M	7-15	All sites in Eyre Peninsula SA. Added Polyurethane to prevent chalking and for easy cleaning.
			Coat 2- Interthane 990/870 (75)	Coat 2- Penguard universal (200)	Coat 2- Hempathane HS 55610 (60)	Coat 2-Sigmacover 410 (200)					
				Coat 3- Hardtop AX (50)		Coat 3- Sigmadur 550 (50)					
			Total DFT 300 µm	Total DFT 325 µm	Total DFT 300 µm	Total DFT 325 µm					

NC Table: New Coating Systems cont.

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temp. Range °C PH	Suitable Corrosivity Category ISO 12944-2	Expected Durability ISO Std/AS 2312 years	Applicable Site Locations
NC14-01-2024	Protective Coating System for Hydraulic Equipment	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interplus 1180 X (165)	Coat 1- Barrier77 (75)	Coat 1-Multi 500 (240)	Coat 1- Sigmazinc 109 (75)	Atmospheric, Industrial, coastal marine	0-60 PH Neutral	Very High C5I/M	7-15	All sites in Eyre Peninsula SA. Added Polyurethane to prevent chalking and for easy cleaning.
			Coat 2- Interthane 990/870 (75)	Coat 2- Penguard universal (200)	Coat – 2 Hempathane HS 55610 (60)	Coat 2-Sigmacover 410 (200)					
				Coat 3- Hardtop AX (50)		Coat 3- Sigmatur 550 (50)					
			Total DFT 240 µm	Total DFT- 325 µm	Total DFT 300 µm	Total DFT 325 µm					
NC15-01-2024	Protective Coating System for Friction Grip Joints (Bolted structural joints)	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzinc 2280 (75)	Resist 86 (75)	Avantguard 860 (75)	Amercoat D9 (75)	Atmospheric, Industrial, coastal marine	0-60 Neutral	Very High C5I/M	2-10	All sites in Eyre Peninsula SA Not suitable for acidic or Alkaline environments. Relative Humidity >60% is required for adequate curing during application. Can be used as an anti-corrosive primer on it's own to protect steel for 2-5 years in a C5 environment.
			Total DFT- 75 µm	Total DFT- 75 µm	Total DFT- 75 µm	Total DFT- 75 µm					
NC16-01-2024	Protective Coating System for Heat Resistant to 540C-flare stacks, chimneys, exhausts, vents and pipe work	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1- Interzinc 2280 (75)	Coat 1- Jotatemp 1000 (150) mild steel only	Coat 1- Versiline CUI (100)	Coat 1- Sigmatherm 540 (25)	High temperature, Atmospheric, Industrial, coastal marine	0-540 Neutral	Very High C5I/M	Min 10	All sites in Eyre Peninsula SA
			Coat 2-Intertherm 50 (25)	Coat 2-Jotatemp 1000 (150)-mild steel only	Coat 2-Versiline CUI (100)	Coat 2-Sigmatherm 540 (25)					
			Coat 3-Intertherm 50 (25)			May not last 10yrs					
			Total DFT 125 µm	Total DFT 300 µm	Total DFT 200 µm	Total DFT 50 µm					
NC17-01-2024	Protective Coating System for Navigation Beacons	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzone 954 (200)	Coat 1-Marathon 550 (350)	Coat 1-DTM 985 (250)	Coat 1-Sigmashield 880 (225)	Immersed sea water, splash zone	0-60 Neutral	CX- Extreme	Min 15 yrs	All coastal sites in Eyre Peninsula SA High voltage testing recommended at full cure of coating system.
			Coat 2- Interzone 954 (200)	Coat 2- Marathon 550 (350)	Coat 2- DTM 985 (250)	Coat 2- Sigmashield 880 (225)					
			Topcoat - Interthane 990/870 (75) above immersed areas	Topcoat - Hardtop AX (75) above immersed areas	Topcoat - Hempathane HS 55610 (50) above immersed areas	Topcoat - PSX 700 (100) above immersed areas					
			Total DFT 475 µm	Total DFT-775 µm	Total DFT- 550 µm	Total DFT- 550 µm					
NC18-01-2024	Protective Coating System for Sheet Piles	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Interzone 954 GF- GREY (300)	Marathon 550 (350)	UHB 1000 (1500)	Sigmashield 880 (400)	Immersed sea water	0-60 Neutral	CX- Extreme	15-25 yrs	Liberty Wharf Whyalla SA High voltage testing recommended at full cure of coating system.
			Coat 2-Interzone 954 GF- GREY (300)	Marathon 550 (350)	UHB 1000 (1500)	Sigmashield 880 (400)					
			Total DFT- 600 µm	Total DFT- 700 µm	Total DFT- 3000 µm	Total DFT-800 µm					
NC19-01-2024	Protective Coating System for SIMEC buried magnetite. Slurry and process water Transfer pipelines. Middleback Ranges SA	As per Coating manufacturer specification	1. Line Pipe HDPE- factory application of HDPE (1mm) according to AS1518 and THIES project specification SLU-002-P-SP-002 revision 1. 2. For field joints- Denso S43/R23 tape system- an inner and an outer wrap Butyl tape system 3. Canusa HBE 95- Novalac epoxy system applied on offtakes, valves and fittings etc-typical thickness 500-1000 microns			Buried in soil, not coastal	NA	Im3	>20 years	SIMEC-Middleback Ranges SA High voltage testing recommended at full cure of tape, HDPE and coating system.	

NC Table: New Coating Systems

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temp. Range °C PH	Suitable Corrosivity Category ISO 12944-2	Expected Durability ISO Std/AS 2312 years	Applicable Site Locations
NC20-01-2024	Holding Primers- temporary protection of the steel after blasting	Sa 21/2 50-75 microns P3 edges P2-welds	Coat 1-Intergard 269 40-75 µm	Jotafix Epoxy Primer 50-100 µm	Hempaline Prepare 130 40-60 µm	Sigmacover 280 50-75 µm	Up to 6 months- Atmospheric	0-60 Neutral	C5	Up to 6 months	All sites in Eyre Peninsula SA A temporary coating only, to be water washed and re-blasted prior to applying full systems.

NOTES

1. Surface Preparation- Sa 21/2 is to AS 1627 part 4. Weld and edge preparation is to ISO 8501-3. All weld spatters shall be removed for immersed/buried structures/pipes, including atmospheric corrosive categories C4 or greater.
2. Stripe coating is required on all coating layers except for finish coats with polyurethane.
3. Where more than one coat of paint is applied, the colour of successive coats should be different to aid in their application and inspection.

M1 Table: Maintenance Coating Systems- Spot Repairs only

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temperature Range °C, PH	Suitable Corrosivity Category ISO 12944-2	Expected Durability ISO Std/AS 2312 years	Comments
M1 02-2024	General Steelwork Exposed to Severe Industrial Environments	ST3- Bristle blaster	1 coat @ 500 µm Interzone 954	1 coat Marathon 500 – 400µm	2 coats @200 µm Multi 500	1 coat @ 500 µm Sigmashield 880	Atmospheric, Industrial, coastal marine.	0-60 PH Neutral	Very High C5-I/M	2-5	All sites in Eyre Peninsula SA Polyurethane topcoat not needed for a short term repair 1coat @250 microns can be applied in C1 to C3 environments.
			OR 2 coats @ 250 µm - Interzone 954	Or 2 coats @200 µm Marathon 500		OR 2 coats @ 250 µm Sigmashield 880					
M2-02-2024	Carbon Steel and Stainless-steel Process pipes, valves and vessels up to 200C	ST3- Bristle blaster	2 coats @ 100 µm Interbond 2340 UPC	2 coats@125 µm Epoxy HR	2 coats @100 µm Hempadur 85671	2 coats @125 µm Amerlock 4022 2K/GF	Atmospheric, Industrial, coastal marine.	0-200 PH neutral	Very High C5-I/M	2-5	All sites in Eyre Peninsula SA
M3- 02-2024	General steel work spot abrasive blasting for general steel work										.
M4-02-2024	General steelwork repair										
M5- 02-2024	External pipework repair	ST3- Bristle blaster	Coat 1- Interplus 1180 MIO- 200 microns	2 coats @ 125 microns Jotamastic 90	2 coats @ 100 microns Multi 500	2 coats @ 100 microns SC 350	Atmospheric, Industrial, coastal marine.	0-60 PH neutral	Very High C5-I/M	2-5	All sites in Eyre Peninsula SA User this system to prevent chalking.
			Coat 2- Interthane 870/990- 75 microns	Coat 3- 75-micron Hardtop AX	Coat 3- 75-micron Hempathane HS 55610	Coat 3 -75 microns SD 550					
			Total DFT 275 microns	Total DFT 325 microns	Total DFT 275 microns	Total 275 microns					

TABLE 2- Maintenance Coating Systems- Spot Repairs only

Liberty System No.	Description	Surface Preparation See note 1	International (NDFT) microns	Jotun (NDFT) microns	Hempel (NDFT) microns	PPG (NDFT) microns	Exposure	Temperature Range °C, PH			Comments
M6-02-2024	On site tank external repair	ST3- Bristle blaster	2 coats @ 400 microns Interzone 954	2 coats @ 200 microns Jotamastic 90	2 coats @200 microns Multi 500	2 coats @ 200 microns Sigmashield 880.	Atmospheric, Industrial, coastal marine	0-60	Very High C5-I/M	2-5	All sites in Eyre Peninsula SA
			Total DFT 400 µm	Total DFT 400 µm	Total DFT 400 µm	Total DFT 400 µm					
M7-02-2024 Superseded by M1 system	Maintenance painting for Stockbridge repair										All sites in Eyre Peninsula SA Recommend remove System to be de-commissioned.
M8-02-2024 Superseded by M1 system	Maintenance painting for cladding sheet repair on buildings										All sites in Eyre Peninsula SA Recommend remove as similar to M1 system
M9-02-2024	Internal coating of structural Mill Sand Filters.	Spot blasting Sa 21/2 preferred	2 coats @ 250 microns Interzone 954GF	2 coats @ 250 microns Marathon 550.	2 coats @ 200 microns DTM 985	2 coats @ 200 microns Amerlock 400 2k GF	Immersed in water, up to 300 ppm chloride Abrasion from gravel filter	0-40	Lm2. Very High	2-5 with Sa 21/2	Whyalla steelworks site SA If power tool to ST3 using bristle blaster is used, durability of repair is lower than spot blasting.
			Total DFT- 500 µm	Total DFT- 500 µm	Total DFT- 400 µm	Total DFT- 400 µm					
M10-02-2024	Internal Protection of saltwater piping	Spot blasting Sa 21/2 preferred	2 coats @ 250 µm Interzone 954	2 coats @ 250 µm Marathon 550.	2 coats @ 200 µm DTM 985	2 coats @ 200 µm Sigmashield 880	Immersed in sea water	0-60	Lm2. Very High	2-5	All sites in Eyre Peninsula SA If power tool to ST3 using bristle blaster is used, durability of repair is lower than spot blasting.
			Total DFT- 500 µm	Total DFT- 500 µm	Total DFT- 400 µm	Total DFT- 400 µm					
M11-02-2024	Repair of Denso Tapes of outer wrapped pipes, using DENSO Viscotaq wrap system	ST3- Bristle blaster	1. Atmospheric pipes- use DENAU_VIS-01 system- VISCOTAQ ST, PE, Outer wrap, Denso Glass UV 2. Buried pipes- use DENAU_VIS-01- system- VISCOTAQ ST, PE, Outer wrap, Denso Glass 3. Atmospheric complex shape pipes use DENAU_VIS_05 system-VISCOTAQ-Viscomastic, EZ wrap, UV topcoat.				Atmospheric Coastal marine, industrial	0-60	C5I/M, Lm2. Very High	>20 years	All sites in Eyre Peninsula SA Suitable for repair of other buried pipeline systems with existing Denso wrapping systems.
M12-02-2024	Coke Ovens maintenance coating low treatment option- exposed steelwork	ST3- Bristle blaster	1 Coat Interzone 954@ 400 µm	1 coats @ 400 µm Jotamastic 90	2 coats @200 µm Multi 500	1 coat@400 µm Sigmashield 880	Atmospheric, Industrial, coastal marine.	0-60, PH slightly acidic	Very High C5-I/M	2-5	System to be de-commissioned

Notes

1. Surface preparation using power tool cleaning ST3 is according to AS 1627 Part 2 using a bristle blaster to ensure no surface polishing occurs and a dull matt rough surface is achieved to promote coating adhesion. Prior to power tool cleaning the surface and surrounding coatings shall be pressure washed with demineralized water or solvent cleaned as required to achieve a surface that is clean, dry and free from contaminants.
2. Where more than one coat of paint is applied, the colour of successive coats should be different to aid in their application and inspection.

8.0 FINAL COLOURS (Reference Appendix A)

8.1 Mechanical Equipment

All final coat colours shall comply with AS 2700. Mechanical equipment shall be finished in Light Grey N35 unless specified otherwise.

8.2 Electrical Equipment

Final coat colours shall comply with AS 2700 as follows: -

Power Distribution Panels

External	-	Orange X15
Internal	-	Gloss White

Motor Load Centers

External	-	Serpentine G22 or Orange
Internal	-	Gloss White

<u>Field Mounted Equipment Enclosures</u>	-	Orange X 15
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<u>Relay Panels</u>	-	Aqua B25
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<u>Motor Local Control Stations</u>	-	Orange X 15
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<u>Rotor Resistance Cubicles</u>	-	Serpentine G22
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Control Panels

External	-	Opaline G32
Internal	-	Gloss White

<u>Transformers</u>	-	Light Grey N35
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8.3 Structural Steelwork, Plate Work and Sheeting

All structural steelwork shall be finished in Light Grey N35 unless specified otherwise.

8.4 Hand Railing and Stanchions

Golden Yellow - Y14.

In addition hand railing shall be marked for a length of 150mm in red and strong blue to highlight the locations of belt drift switches and under speed switches etc. as directed by the Company Representative.

8.5 Steel Pipe Work - Colour Coding

All carbon steel pipe work (including galvanized pipe work) and stainless steel pipe work which is defined in the specification as being painted (excluding LP air ducts over 200mm diameter) shall be painted over their entire external length and labelled in accordance with colours as listed in AS 2700.

9.0 DOCUMENTS, APPENDICES

Appendix A	Final Colour Chart
Appendix B	Corrosivity Categories and Durability Ranges Table 1: Atmospheric corrosivity categories and example of typical environments Table 2: Categories for water and soil
Appendix C	Corrosion breakdown charts

APPENDIX A- Final Colour Chart

DESCRIPTION	AS2700
Structural steel for buildings, pipe racks, walkways, conveyors & handrails	Light Grey N35
Crash rails, top handrails & ladder stringers	Golden Yellow Y14
Cladding of buildings & conveyors, internal & external surfaces	Light Grey N35
Cladding of insulated tanks & pipe work	Light Grey N35
Cranes – monorails & hoists	Golden Yellow Y14
Marine piling, dolphins & structures	Black
Fire hydrants	Scarlet R12
Stacker & reclaimers booms	Golden Yellow Y14
Stacks	Graphite Grey N65
External surfaces of uninsulated tanks & pipe work:	
Water tanks	Light Grey N35
Sulphuric acid tanks	Light Grey N35
Caustic & white spirit tanks	White
Fuel oil tanks	Black
Idler brackets & conveyor pulleys	Light Grey N35
Electrical control panels:	
External use	Golden Yellow Y14
Internal use	Light Grey N35
Switchgear, electric motors & pumps	Light Grey N35
Variable speed fluid couplings, valves & agitator drives	Light Grey N35

APPENDIX B- Corrosivity Categories and Durability Ranges

In this document, durability is expressed in terms of four ranges:

- low (L) up to 7 years;
- medium (M) 7 years to 15 years;
- high (H) 15 years to 25 years;
- very high (VH) more than 25 years.

Table 1 — Atmospheric-corrosivity categories and examples of typical environments

Corrosivity category	Mass loss per unit surface/thickness loss (after first year of exposure)				Examples of typical environments (informative only)	
	Low-carbon steel		Zinc		Exterior	Interior
	Mass loss g/m ²	Thickness loss µm	Mass loss g/m ²	Thickness loss µm		
C1 very low	≤ 10	≤ 1,3	≤ 0,7	≤ 0,1	—	Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels
C2 low	> 10 to 200	> 1,3 to 25	> 0,7 to 5	> 0,1 to 0,7	Atmospheres with low level of pollution: mostly rural areas	Unheated buildings where condensation can occur, e.g. depots, sports halls
C3 medium	> 200 to 400	> 25 to 50	> 5 to 15	> 0,7 to 2,1	Urban and industrial atmospheres, moderate sulfur dioxide pollution; coastal areas with low salinity	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies
C4 high	> 400 to 650	> 50 to 80	> 15 to 30	> 2,1 to 4,2	Industrial areas and coastal areas with moderate salinity	Chemical plants, swimming pools, coastal ship and boatyards
C5 very high	> 650 to 1 500	> 80 to 200	> 30 to 60	> 4,2 to 8,4	Industrial areas with high humidity and aggressive atmosphere and coastal areas with high salinity	Buildings or areas with almost permanent condensation and with high pollution
CX extreme	> 1 500 to 5 500	> 200 to 700	> 60 to 180	> 8,4 to 25	Offshore areas with high salinity and industrial areas with extreme humidity and aggressive atmosphere and sub-tropical and tropical atmospheres	Industrial areas with extreme humidity and aggressive atmosphere

NOTE The loss values used for the corrosivity categories are identical to those given in ISO 9223.

Table 2 — Categories for water and soil

Category	Environment	Examples of environments and structures
Im1	Fresh water	River installations, hydro-electric power plants
Im2	Sea or brackish water	Immersed structures without cathodic protection (e.g. harbour areas with structures like sluice gates, locks or jetties)
Im3	Soil	Buried tanks, steel piles, steel pipes
Im4	Sea or brackish water	Immersed structures with cathodic protection (e.g. offshore structures)

NOTE For corrosivity category Im1 and Im3, cathodic protection can be used with a paint system tested accordingly

APPENDIX C- Corrosion breakdown charts

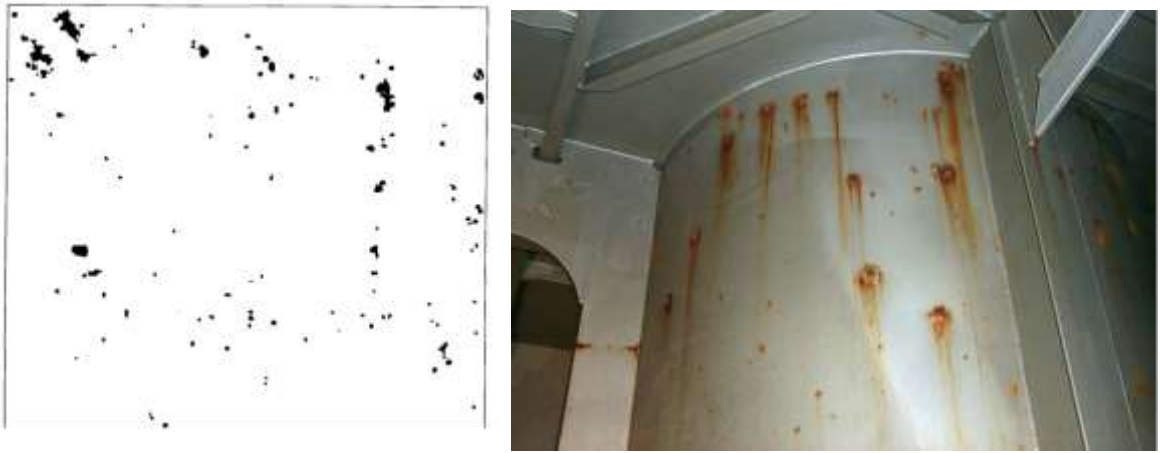


Figure 1- Ri 3- ISO 4628-3- 1% Scattered breakdown

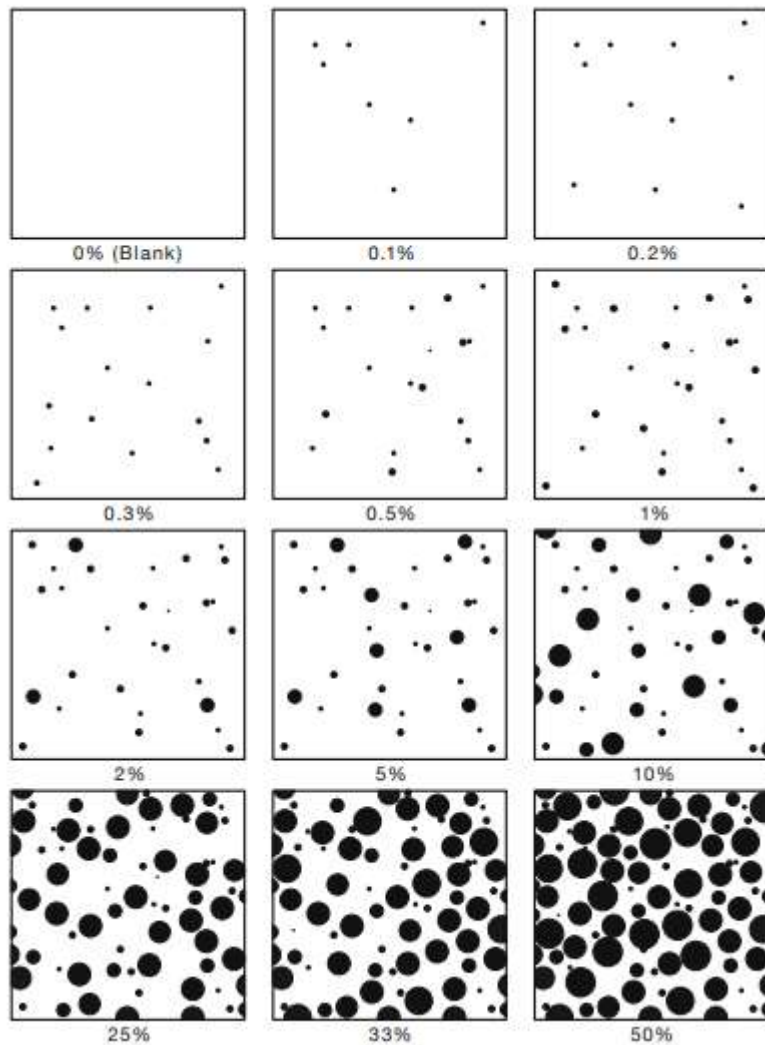


Figure 2- Scattered corrosion extent chart