



REPORT

EPO-CHEM™ RS 500P

SOLVENT-FREE, WET & RUST TOLERANT SYSTEM

General Industry

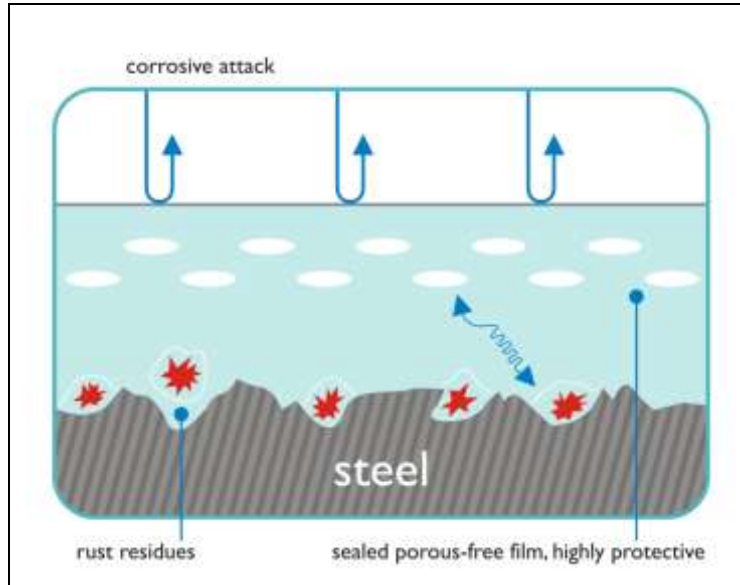
December 2015

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INTRODUCTION

Epo-chem™ RS 500P is a **solvent-free, wet & rust tolerant** primer or primer-finish epoxy system. The use of special sacrificial fillers enables the system to be applied to surface standards as low as WJ-4, ST2. The system's long-term performance is based on total sealing (porous-free film) and arresting the rust totally. They are typically applied as a 1-coat system which can be over-coated by itself or with the topcoat **Epo-chem™ RA 500M**.



MATERIAL CHARACTERISTICS

- Unique, 100% solid **wet & rust tolerant** primer or primer-finish epoxy system.
- Flexibility on the surface preparation standards or method, i.e. the most convenient method depending on availability or cost, e.g. grit blast, wet blast, HP water jetting (500-800 bars), UHP or mechanical (ST2-ST3).
- Apply in any environmental condition, no humidity restrictions.
- Ideal for tank lining or confined spaces.
- No over-coating limitation.
- No requirements for dehumidification, ventilation or heating (substantial cost savings).
- Reduced Health & Safety and Fire Precaution.
- Long-term corrosion protection (new MIO-Zinc technology).
- Excellent adhesion to rusty or poorly prepared and wet surfaces (>1200psi).
- One coat (without the topcoat) protects the substrate in excess of 10 years (independent test certificates available).
- Zero VOC - no fire hazard or odour.



RS 500P on a sweating and damp surface

CUSTOMERS

Epo-chem™ RS 500P is specified and used by worldwide companies:

British Sugar
Corus
EDF Energy
GE Caledonia
Offshore Oil Platforms
Scottish & Southern Energy
Talisman Energy
Transco
Translink
UK Hydro Power Stations
UK Nuclear Power Stations

CERTIFICATES AND APPROVALS

- ABS Certified – Ballast Tank Maintenance Coating (when used in conjunction with RA 500M)
(Including on wet & rusty steel)
- British Network Rail
 - RS 500P for Aged Alkyd coatings (Protective treatment XM92)
 - RS 500P for New or Weathered Galvanised Steel (Protective Treatment X099)
- Lloyds Approval
 - Lloyds Type Approval – IMO Resolution MSC.215 (82) PSPC for New Build – Bare Steel
 - Lloyds Type Approval – IMO Resolution MSC.215 (82) PSPC for New Build – Shop Primer
 - Lloyds Approval – Ballast Tank Maintenance Coating – RS 500P
- NSF Certified – Fresh Drinking Water (when used in conjunction with RA 500M)

CASE STUDIES

CASE STUDY 1: Bridge Refurbishment – Midlothian Council



Client: <i>Midlothian Council</i>	Industry: <i>Industrial</i>
Scope: <i>Bridge Refurbishment</i>	Date: <i>April 2009</i>
Location: <i>Scotland, UK</i>	Products: <i>Epo-chem™ RS 500P & RC 500GTC</i>

Overview
 Heavily corroded underside of road bridge required refurbishment with minimal disturbance to the public, and with minimum 10 years guarantee.

Challenge
 Working in a very damp environment, to a limited timescale and no grit blasting permitted.

Solution
 One coat of Epo-chem™ RS 500P surface/wet-tolerant epoxy system @ 150µ by brush and roller.
 Second coat of Epo-chem™ RC 500GTC epoxy acrylic topcoat @ 80µ by brush and roller.

Outcome
 The technical benefits offered by this system ensured that the work was carried out on time, within budget, with no H&S issues and no major delays. Since then, this system has been proposed for a number of similar applications within the council.

Benefits

- Solvent-free main coat
- No blasting required
- No major delays to program
- Reduced cost of plant and equipment
- Reduced H&S and Fire Precaution



Rev: January 2015

CASE STUDY 1: Bridge Refurbishment – Midlothian Council (cont.)



- Silvert-free • Water-based • Wet-tolerant
- Rust-tolerant • Zero VOC
- Tank & Pipe Linings • Under-water & Marine • Glassflake
- Rust Converters & Primers • Ceramic & Metal Repair • Anti-static, Conductive & Anti-slip Flooring
- Approved for Contact with Food, Drinking Water & Beverages • Damp or Green Concrete Primers
- Concrete Repair Systems • Basotermic System
- High Temperature Systems • Fire Retardant • Insulation Systems

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CASE STUDY 2: Turbine Hall Refurbishment

Fiddlers Ferry Power Station

Case Study



Client: <i>Scottish & Southern Energy</i>	Industry: <i>Power Generation</i>
Scope: <i>Turbine Hall Refurbishment</i>	Date: <i>2009/2010</i>
Location: <i>Fiddlers Ferry Power Station</i>	Products: <i>Epo-chem™ RS 500P & Easi-gloss™ RX 500GS</i>

Overview

Fiddlers Ferry is a forty year old coal fired power station in England. It has four steam turbines located in the central turbine hall. This huge hall has a considerable amount of internal structural steel, including support girders and roof trusses. The hall was scheduled for general upgrade and complete repaint in 2009/2010. This project was carried out by Access Direct.

Challenge

The work must be carried out without operational shutdown. Due to steam turbines, the humidity in the hall is extremely high and all surfaces can be wet. Due to people working, the products used must also be solvent-free and odourless. The work had to be carried out by rope access as scaffolding would restrict the working of the cranes on site. **Epo-chem™ RS 500P** primer and **Easi-gloss™ RX 500GS** finish coat were appropriate for this challenge.

Solution

The summary of the requirements of the job:

- Solvent-free, odourless
- Easy apply by brush/roller
- Can be applied by rope access only
- Can be applied in high humidity
- No grit blasting possible/feasible
- Hand preparation only
- Colour topcoat in various colours
- Minimum 20 years guarantee

There is only one product in the market that could satisfy all the above requirements: **Epo-chem™ RS 500P solvent-free wet & rust-tolerant epoxy coating** was applied to all areas as a single coat of 250µ DFT followed by one/two coats of **Easi-gloss™ RX 500GS water-based, high gloss finish coat @ 50-100µ DFT** by brush and roller.

(Cont. overleaf)

1



2






Photographs

- Nos. 1-2 Rope technicians preparing for work
- Nos. 3-5 Application in progress

CASE STUDY 2: Turbine Hall Refurbishment

Fiddlers Ferry Power Station (cont.)

<p>Outcome Both the client and the contractor were completely satisfied with the application of the system and the completed work.</p> <p>Benefits</p> <ul style="list-style-type: none">• Solvent-free, water based, environmentally friendly• Unique system unrivalled in the market• No delays• Easy and practical• Huge cost savings	<p>3 </p> <p>4 </p> <p>5 </p>
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- Solvent-free • Water-based • Wet-tolerant
- Rust-tolerant • Zero VOC
- Tank & Pipe Linings • Under-water & Marine • Glassfibre
- Rust Converters & Primers • Ceramic & Metal Repair • Anti-static, Conductive & Anti-slip Flooring
- Approved for Contact with Food, Drinking Water & Beverages • Damp or Green Concrete Primers
- Concrete Repair Systems • Blastomeric System
- High Temperature Systems • Fire Retardant • Insulation Systems

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CASE STUDY 3: Potable Water Tank – Basingstoke Hotel



Client: <i>Basingstoke Hotel</i>	Industry: <i>Industrial</i>
Scope: <i>Potable Water Tank Repair</i>	Date: <i>October 2012</i>
Location: <i>UK</i>	Product: <i>Epo-chem™ RS 500P & RA 500M</i>

Overview

The potable water tanks were approximately 90 years old and were showing signs of corrosion damage. The client required these tanks to be restored to "as good as new" condition.

Challenge

The tanks had holes through their shell, floors and lower walls. The tanks were also located in a confined space on the roof of the building. Working within a strict time frame also added to the difficulty of this project.

Solution

Manual preparation was selected as the surface preparation method. One primer coat of solvent-free, wet & rust tolerant Epo-chem™ RS 500P was applied first. This was followed by two topcoats of solvent-free, wet tolerant Epo-chem™ RA 500M.

Outcome


The work was completed in three working days with no delays. The tanks were restored to "as good as new" condition resulting in huge cost savings for the client as they did not need to purchase new tanks.

This system is NSF Certified for fresh drinking water applications.

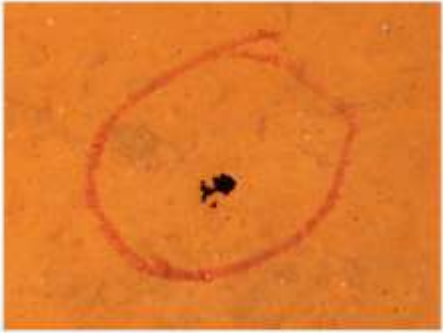
Benefits

- Solvent-free (odourless)
- Restored to "as good as new" condition
- Reduced H&S and Fire Precaution
- No grit blasting
- Substantial time and cost savings.

1



2



Photographs


- Nos. 1 & 2 Before application

*This project was completed by our approved contractor Specialist Coatings Ltd, UK


Rev: March 2015

CASE STUDY 3: Potable Water Tank – Basingstoke Hotel (cont.)


3



4



5



Photographs

- Nos. 3 & 4 After priming
- No. 5 Completed application

- Solvent-free • Water-based • Wet-tolerant
- Rust-tolerant • Zero VOC
- Tank & Pipe Linings • Under-water & Marine • Glassflake
- Rust Converters & Primers • Ceramic & Metal Repair • Anti-static, Conductive & Anti-slip Flooring
- Approved for Contact with Food, Drinking Water & Beverages • Damp or Green Concrete Primers
- Concrete Repair Systems • Badomec System
- High Temperature Systems • Fire Retardant • Insulation Systems

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CASE STUDY 4: Swimming Pools – Navigator of the Seas



Client: <i>Royal Caribbean Cruise Lines</i>	Industry: <i>Marine</i>
Vessel: <i>Navigator of the Seas</i>	Date: <i>February 2014</i>
Location: <i>Bermuda</i>	Products: <i>Epo-chem™ RS 500P & RA 500M</i>

Overview

The swimming pools on-board Royal Caribbean’s Navigator of the Seas cruise vessel had to be refurbished as the existing tile system required regular maintenance and this was causing major problems.

Challenge

Removing the existing tiles and concrete backing to expose the steel. Utilising an alternative surface preparation method to grit blasting, which could not be considered due to problems of excessive dust contamination to the surrounding areas. The client was looking for a system offering a long-term solution which did not require regular maintenance. Working within a strict time-frame also added to the difficulty of this project.

Solution

Both mechanical preparation and water jetting were utilised as the surface preparation methods to St2 and WJ-3 standards respectively. Chemco’s solvent-free, wet & rust tolerant primer Epo-chem™ RS 500P was applied followed by two coats of solvent-free, wet tolerant Epo-chem™ RA 500M.

Outcome

The project was completed in 20 days, much quicker than the given time-frame. The quality of the smooth, high gloss finish and the speed of the contract were to the satisfaction of all concerned. The surface preparation method utilised and the unique solvent-free properties of the Chemco system also allowed other work to continue nearby without disruption.

Benefits

- Solvent-free
- No grit blasting
- Reduced down-time and equipment cost
- Wet & rust tolerant properties of the Chemco system
- H&S compliant
- No disruption to other work
- Chemco system offers a long-term and easily repairable solution

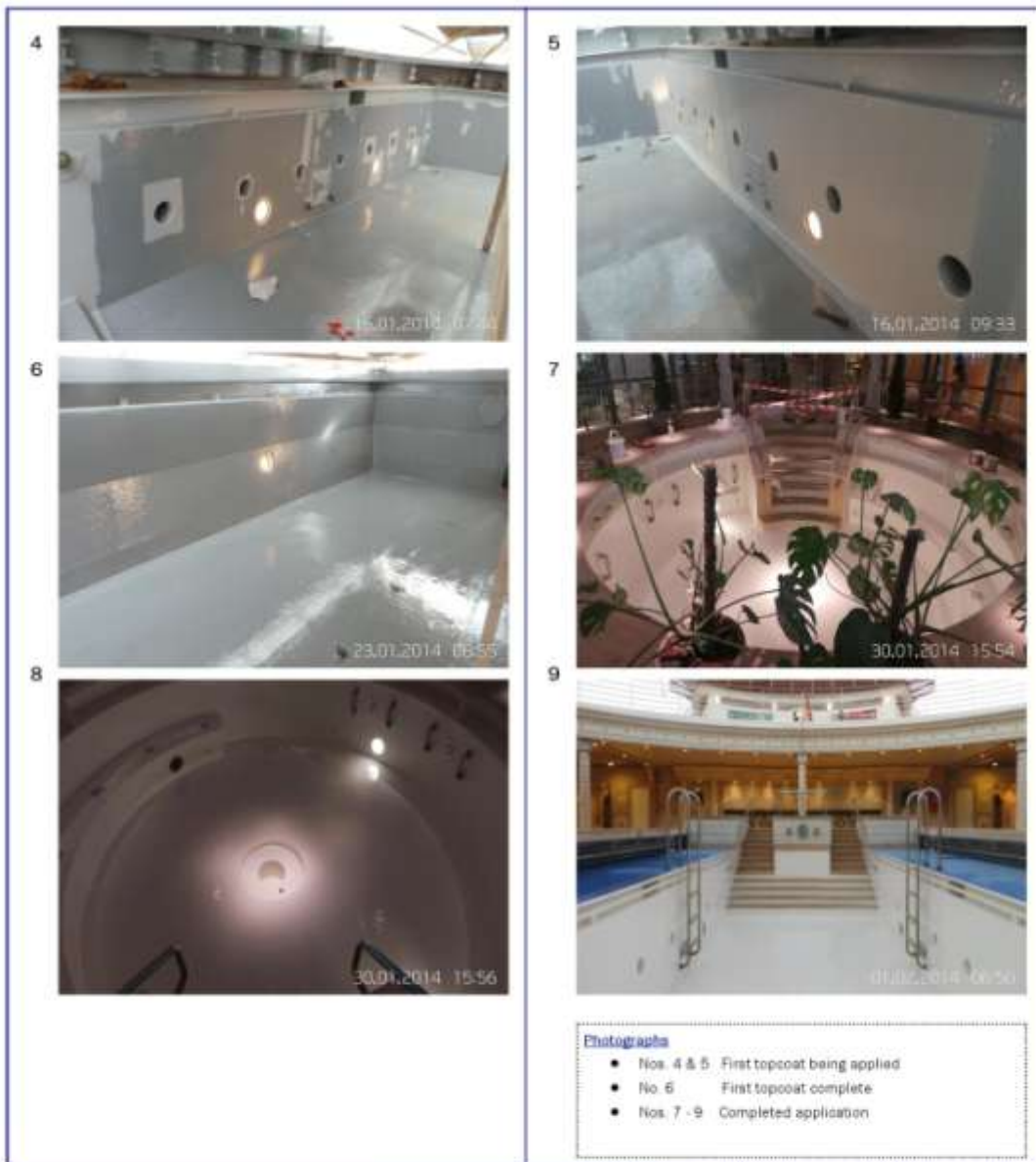
Continued overleaf



Photographs

- Nos. 1 & 2 After surface preparation
- No. 3 Topcoat being applied on top of primer

CASE STUDY 4: Swimming Pools – Navigator of the Seas (cont.)



- Solvent-free • Water-based • Wet-tolerant
- Rust-tolerant • Zero VOC
- Tank & Pipe Linings • Under-water & Marine • Glassfibre
- Rust Converters & Primers • Ceramic & Metal Repair • Anti-static, Conductive & Anti-slip Flooring
- Approved for Contact with Food, Drinking Water & Beverages • Damp or Green Concrete Primers
- Concrete Repair Systems • Elastomeric Systems
- High Temperature Systems • Fire Retardant • Insulation Systems

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CASE STUDY 5: External Underground Tank Refurbishment

Rugeley Power Station



Client: Rugeley Power Station	Industry: Power Generation
Scope: Fire-mains Water Tank	Date: May 2008
Location: UK	Products: Fast-guard™ RN 500TC & Epo-chem™ RS 500P

Overview
Rugeley Power Station required a large fire-mains water tank to be coated situated in an underground building with limited access.

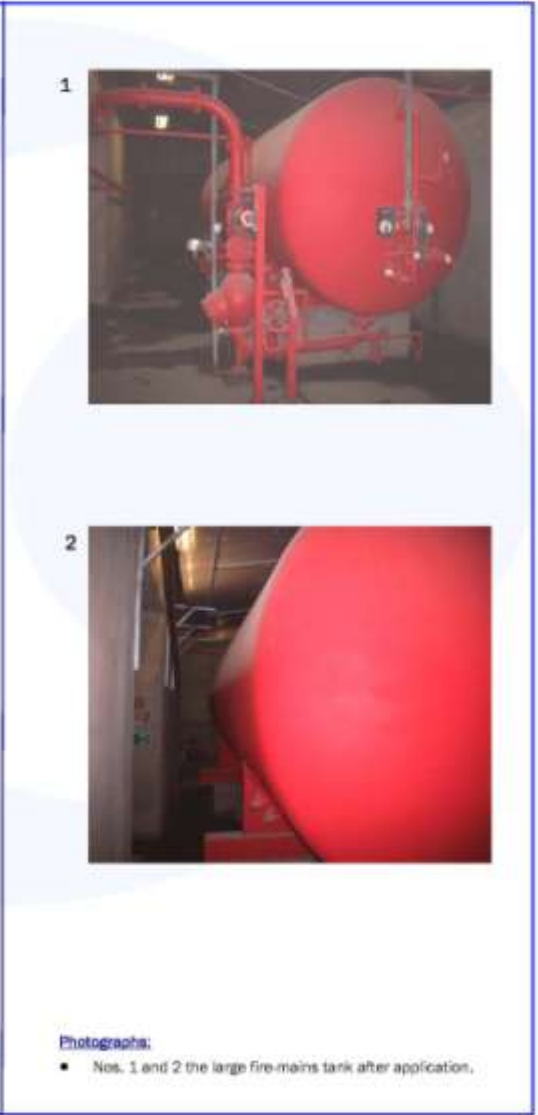
Challenge
The tank was located in a confined and restrictive area. No blasting was permitted/feasible and there was a continual damp/wet condition with very little air movement.

Solution
One coat of Epo-chem™ RS 500P solvent-free, wet & rust-tolerant epoxy system @ 150 - 200µ DFT by brush and roller.
A colour topcoat of Fast-guard™ RN 500TC water-based acrylic system was applied to the client's colour specification @ 80µ DFT.

Outcome
Due to the successful application, both the client and the applicator have now specified Chemco systems in all other areas with similar problems. Chemco is an acknowledged major problem solver within the industry.

Benefits
Utilizing this innovative system, the application team could carry out a very difficult task in a very short space of time; without any requirement for ventilation or dehumidification equipment.

- No grit blasting.
- Reduced H&S and Fire Precaution
- Reduced cost of plant and equipment
- Chemco system will protect the steel substrate in excess of 10 years



CASE STUDY 6: Ammonia Pipelines – Chemical Plant



500 series for Ammonia Pipelines



Before – Ammonia Bullet Pipelines



After – Coated Pipework

Industry	Chemical Manufacturing
Date	2010
Substrate	Steel Substrate
Products	Chemco Epo-chem™ RS 500P Chemco Epo-chem™ RA 500M
Environment	Wet and Cold Pipelines

Challenge The ammonia lines had been in service since the plant was built. Severe external corrosion caused holes to form in the pipe and there were no spare lines for the plant to be shutdown. Very expensive pipe sealing clamps were in use and the condition of the rest of the pipelines was deteriorating rapidly. As the pipes are constantly cold and very wet, engineers had put corrosion protection of the pipes in abeyance which was just exacerbating the problem.

Chemco's Solution Moisture tolerant and Solvent-free epoxies RS 500P and RA 500M were recommended as this system requires minimum surface preparation (i.e. no dry grit blasting) and solvent-based materials were not allowed. Ideal for confined spaces.

Rain, water, condensation or high humidity has no effect on freshly painted surfaces and its environmentally friendly properties allowed work to continue throughout the Queensland Wet Season. Areas were high-pressure washed at 500bar to a WJ-4 standard. Coating was applied to an average DFT of 300µm

Results This coating system is relatively new to Australia and is a prime example of innovative technology being used to save the existing plant from the possibility of catastrophic failure. Despite the extreme weather experienced in Queensland and the complex layout, the coating work was finished on time and within budget restrictions. As a result, there will be considerable savings in the cost of pipe sealing clamps in the future and plant safety has been increased exponentially.



CASE STUDY 7: Fan Impeller – Mining & Mineral Processing



500 Series for Fan Impeller



During Fabrication



Application of primer by hand due to complexity



View of impeller completion

Industry	Mining & Mineral Processing
Date	September 2013
Substrate	2.8m Diameter Fabricated Steel Impeller
Products	Epo-chem™ RS 500P Ceram-chem™ RP 500 designed to improve laminar flow with a low friction finish.
Challenge	Prior to Chemco Australia's involvement, pressure washing was required every 3-6 months to prevent large amounts of build up. This build up would cause balancing issues and unnecessary bearing load. Chemco was engaged to improve the efficiency of the impeller, decrease problems with build up, and reduce maintenance and associated costs.
Chemco's Solution	Chemco Australia recommended an abrasive resistant lining with a low friction finish to reduce the amount of build up, and reduce ongoing maintenance costs.
Scope	Grind welds, sharp edges and remove weld spatter Abrasive blast to class 2.5 Apply primer: Epo-chem™ RS 500P Apply ceramic filled epoxy: Ceram-chem™ RP 500 Balancing on coating completion and touch up.
Results	The impeller was inspected after return to service for 6 and again after 12 months. The inspection found a significant improvement, including reduced build up and a better balance.

we defy nature

APPENDIX 1

CERTIFICATES & APPROVALS

1.1 ABS Certificate – RS 500P/RA 500M on bare steel and blast cleaned steel surfaces
(Including on wet & rusty steel)



CERTIFICATE NUMBER
14-LD1135810A-PDA-01

DATE
23 January 2014

ABS TECHNICAL OFFICE
London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
CHEMCO INTERNATIONAL - SCOTLAND

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT: IMO PSPC Approved Seawater Ballast Tank Coating

MODEL: RS 500P/RA 500M ON BARE STEEL AND BLAST CLEANED STEEL SURFACES.

This Product Design Assessment (PDA) Certificate 14-LD1135810A-PDA-01, dated 23/Jan/2014 remains valid until 23/Jan/2019 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non-ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING


Andrew Warrall
Engineer

NOTE: This certificate constitutes compliance with one or more of the Rules, Codes, standards or other criteria of ABS or a statutory, regulatory or mandatory code. It is issued solely by the Bureau of ABS, its subsidiaries, its agents or other authorized persons. Any significant changes to the design or construction of the vessel or facility will need to be certified by the Bureau, its agents and/or other authorized persons. The application of this certificate is governed by the "Terms and Conditions of the Request for Product Type Approval and Agreement" as contained in the ABS Rules.

ABS201113

1.2 RS 500P for Aged Alkyd coatings (Protective Treatment XM92)



This is to certify that

Protective Treatment XM92

**For Maintenance Painting of Steelwork with Sound Existing
Aged Alkyd Coatings Not Requiring a Decorative Finish**

Supplied by

CHEMCO

Chemco International Ltd
East Shawhead Industrial Estate
Coatbridge
Scotland
ML5 4LY

has been independently tested by

Scientifics Ltd

500 London Road, Derby

and found to satisfy the appropriate requirements of

Network Rail Line Specification RT98

Spot blast-clean to surface standard Sa2½, BS7079, Part A1
Epochem RS500PF (Spot prime, 150µm dft)
Epochem RS500PF (150 µm dft)

Minimum Expected Service Life : 10 Years
(dependent on the standard of surface preparation achieved)
Certificate Expiry Date : 06/06/2008

Certificate No:

XM92/039

Registered Office: 500 London Road, Derby, DE24 8BQ
Telephone: 01332 264611 Fax: 01332 263386
http://www.scientifics.com email: info@scientifics.com
0164

Authorised by:

Malcolm Astle
Team Leader, Coatings

Date: 06/06/2008

1.3 RS 500P for New or Weathered Galvanised Steel (Protective Treatment X099)



This is to certify that

Protective Treatment X099
For New or Weathered Galvanized Steelwork
Not Requiring a Decorative Finish

Supplied by

CHEMCO

Chemco International Ltd.
East Shawhead Industrial Estate
Coatbridge
Scotland
ML5 4LY

has been independently tested by

Scientifics Ltd
500 London Road, Derby

and found to satisfy the appropriate requirements of

Network Rail Line Specification RT98

Epochem RS500PF (Stripe coat 150µm dft)
Epochem RS500PF (150 µm dft)

Minimum Expected Service Life : 10 Years
(dependent on the standard of surface preparation achieved)
Certificate Expiry Date : 06/06/2008

Certificate No:

X099/011

Authorised by: 

Malcolm Astle
Team Leader, Coatings

Date: 06/06/2008.

Registered Office: 500 London Road, Derby DE24 8BQ
Telephone: 01332 244018 Fax: 01332 241386
<http://www.scientifics.com> email: info@scientifics.com

94A



Protective Coatings for Water Ballast Tanks and Double-side Skin Spaces

Certificate No: MNDE/2011/4217

Page 1 of 2

This is to certify that the protective coating system manufactured at the plant below is in compliance with IMO Resolution MSC.215(82) *Performance Standard for Protective Coatings for Dedicated Seawater Ballast Tanks in all Types of Slips and Double-side Skin Spaces of Bulk Carriers (PSPC)* adopted on 8th December 2006.

This approval is granted in accordance with the PSPC, IACS Regulations and LR Rules. The surface preparation and application requirements specified in the product technical data sheet (PTDS) have been reviewed and comply with the PSPC. This approval does not cover properties other than corrosion prevention, such as service life, safety or toxicity etc.

The approval is subject to Lloyd's Register being informed of any changes in the product's formulation, specification or status of manufacturing quality control accreditation. Periodic auditing of the manufacturer's quality control and assurance systems will confirm compliance. Lloyd's Register reserves the right to withdraw or re-issue this certificate.

Manufacturer: **Chemco International Ltd.
East Shawhead Industrial Estate,
Coatbridge,
Scotland,
United Kingdom**

Coating system: **Epo-chem™ RS 500P / Epo-chem™ RA 500M**

Product codes: **RS 500P / RA 500M**

Curing agents: **HR 500P / HF 500M**

Applications **Water ballast tanks and double-side skin spaces**

Notes:

1. Surface preparation and coating application should be carried out in accordance with the manufacturer's PTDS.
2. Product approved for use with the compatible shop primers listed on page 2, or on clean blasted bare steel.

Date of issue: **26 May 2011**
Date of expiry: **1 June 2016**

A handwritten signature in black ink, appearing to read 'RD' with a flourish.

Richard Dawson
Surveyor to Lloyd's Register EMEA
A member of Lloyd's Register Group

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Issue No. 1



Protective Coatings for Water Ballast Tanks and Double-side Skin Spaces

Certificate No: MNDE/2011/4217

Page 2 of 2

Compatible Shop Primers:

<u>Primer</u>	<u>Product Code(s)</u>	<u>Manufacturer</u>
---------------	------------------------	---------------------

Bare steel only

End of list

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Issue No. 1



Protective Coatings for Water Ballast Tanks and Double-side Skin Spaces

Certificate No: MNDE/2011/4217

Page 1 of 2

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This approval is granted in accordance with the PSPC, IACS Regulations and LR Rules. The surface preparation and application requirements specified in the product technical data sheet (PTDS) have been reviewed and comply with the PSPC. This approval does not cover properties other than corrosion prevention, such as service life, safety or toxicity etc.

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Manufacturer: **Chemco International Ltd.**
East Shawhead Industrial Estate,
Coatbridge,
Scotland,
United Kingdom

Coating system: **Epo-chem™ RS 500P / Epo-chem™ RA 500M**

Product codes: **RS 500P / RA 500M**

Curing agents: **HR 500P / HF 500M**

Applications **Water ballast tanks and double-side skin spaces**

Notes:

1. Surface preparation and coating application should be carried out in accordance with the manufacturer's PTDS.
2. Product approved for use with the compatible shop primers listed on page 2, or on clean blasted bare steel.

Date of issue: **17 January 2012**

Date of expiry: **1 June 2016**

Richard Dawson
Surveyor to Lloyd's Register EMEA
A member of Lloyd's Register Group

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Issue No. 2



Protective Coatings for Water Ballast Tanks and Double-side Skin Spaces

Certificate No: MNDE/2011/4217

Page 2 of 2

Compatible Shop Primers:

<u>Primer</u>	<u>Product Code(s)</u>	<u>Manufacturer</u>
Interplate 937	NQA933, NQA934, NQA936	International Paint Ltd.
Sigmaweld 190	179171, 179172	PPG Protective & Marine Coatings
Cerabond 2000	N/A	Chugoku Marine Paints, Ltd.
Nippon Ceramo (<i>Nippon Ceramo</i>)	N/A	Nippon Paint Marine Coatings Co., Ltd.

End of list

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Issue No. 2

1.6 Lloyds Approval – Ballast Tank Maintenance Coating – RS 500P

In the event of any conflict or ambiguity between this printout and the original electronic document, the electronic document shall prevail.



RECOGNISED BALLAST TANK MAINTENANCE COATING

Certificate No. MATS/3838/3

This certificate is issued to the company named below. The ballast tank maintenance coating described has been recognised for use in constructions built under Lloyd's Register survey. This recognition is subject to Lloyd's Register being informed of any changes in or modifications to the coating and the product being used in accordance with the manufacturer's instructions and with the relevant requirements of Lloyd's Register's Rules and Regulations.

Company	CHEMCO INTERNATIONAL LTD. UNITED KINGDOM
Trade name	EPO-CHEM RS 500P
Class	CLASS 1
Coating Type	EPOXY
Number of Coats	1*
Coating Thickness	200 microns
Remarks	<p>* Additional stripe coat to be applied to welds, edges and section changes.</p> <p>Maintenance of dedicated seawater ballast tanks on vessels compliant with MSC.215(82) "Performance Standard for Protective Coatings for Dedicated Seawater Ballast Tanks in All Types of Ships and Double-Side Skin Spaces of Bulk Carriers" shall be performed in accordance with IMO MSC.1/Circ.1330 "Guidelines for Maintenance and Repair of Protective Coatings"</p>

Valid until 18 May 2020

Date 21 May 2015

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A handwritten signature in blue ink, appearing to read 'Stuart Downie', with a horizontal line extending to the right.

Stuart Downie
Senior Surveyor to Lloyd's Register EMEA
A member of the Lloyd's Register group

NSF International

789 N. Dixboro Road, Ann Arbor, MI 48105 USA

RECOGNIZES

Chemco International Ltd
Facility: Coatbridge, United Kingdom

AS COMPLYING WITH NSF/ANSI 61 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.



Certification Program
Accredited by the
American National
Standards Institute



Certification Program
Accredited by the
Standards Council
of Canada

This certificate is the property of NSF International and must be returned upon request. For the most current and complete information, please access NSF's website (www.nsf.org).

September 26, 2014
Certificate# C0184107 - 01

A handwritten signature in black ink, appearing to read "D. Purkiss".

David Purkiss
General Manager, Water Systems

1.7 NSF Certificate: Fresh Drinking Water System (when used in conjunction with RA 500M) (cont.)



OFFICIAL LISTING

NSF International Certifies that the products appearing on this Listing conform to the requirements of NSF/ANSI Standard 61 - Drinking Water System Components - Health Effects

This is the Official Listing recorded on September 26, 2014.

Chemco International Ltd
 13-23 Hagmill Road
 East Shawhead Industrial Estate
 Coatbridge ML5 4XD
 United Kingdom
 +44 1236 606060

Facility: Coatbridge, United Kingdom

Trade Designation	Protective (Barrier) Materials		Water Contact Temp	Water Contact Material
	Water Contact	Size Restriction		
III 123 (G) Tanks				
Epo-Chem EA 500		>= 1000 gal.	CLD 23	EPOXY
Epo-Chem EA 500 UM		>= 1000 gal.	CLD 23	EPOXY
Epo-Chem EA 500M		>= 1000 gal.	CLD 23	EPOXY

- [1] All RA500 products are used with Epo-Chem EB 500P primer.
- [2] Colors: <only capitalize the first color, put the colors in alpha order>
 Number of Coats: Primer 1, Top Coat 1
 Maximum Field Use Dry Film Thickness (in mils): Primer: 10; Top coat: 25; Total system: 35
 Maximum Thinner: 5% T5 Thinner
 Recoat Cure Time and Temperature: Primer cure time is 2 hours at 30°C
 Final Cure Time and Temperature: 48 hours at 30°C
 Special Comments: Primer: Mix Ratio is 4.18:0.82 (Part A:Part B) by weight Top Coat: Mix Ratio is 3.67:1.333 (Part A:Part B) by weight
- [3] Product is Certified to NSF/ANSI 372 and conforms with the lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

Notes: Additions shall not be made to this document without prior evaluation and acceptance by NSF International.

1 of 1

799 N. Duxboro Road, Ann Arbor, Michigan 48105-9723 U.S.A.
 1-800-NSF-MARK / 734-769-8010
 www.nsf.org

C0184103

APPENDIX 2

TEST REPORTS

2.1 Long-Term Condition Test for Wet Substrates



Report No: COA/01515
Issue Date: 28th April 2003

**Test Report:
Evaluation of
Epochem
RS500 and
RL500 Coating
Systems
Applied in Wet
Conditions**

Authorised by: 
A Gascoyne
Coatings & Corrosion Technologist

Prepared by:

A Gascoyne
Scientifics Ltd
500 London Road
Derby
DE24 8BQ

Prepared for:

Mark O'Hanlon
Chemco International Ltd
East Shawhead Industrial
Estate
Coatbridge
Scotland
ML5 4LY

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COA01515/MSU5629 -1

Page 1 of 3

2.1 Long-Term Condition Test for Wet Substrates (cont.)



Epo-chem RL500PF: Applied to Wet Aged Alkyd (Test Panels: 021729A).
Dfts ranging from: 108 – 141 µm

Test	Result									
Application & Appearance	<p>Application: Intermittent 'skidding' of the brush over the wet surface. Presence of water adversely affected the paint substance finish (see appearance).</p> <p>Appearance: Generally satisfactory, but with elongated areas of water-affected paintwork (locally thin film).</p>									
Cross-cut adhesion test, BS3900: Part E6: 1992	Classification 0 result, triplicate determination with 3mm spacing.									
Pull-off adhesion, ASTM D4541	All three tests gave pull-off adhesion values greater than 1000 psi.									
Resistance to impact, BS3900: Part E7	No defects evident in the coating system, including cracking, flaking or detachment from the substrate.									
Resistance to humidity, BS3900: Part F2: 1973	Panels inspected after 2000 hours exposure. No signs of softening, swelling, blistering or underfilm corrosion were evident.									
Resistance to Salt Spray, BS3900: Part F12: 1997	After 2000 hours exposure, rusting and rust staining was recorded at the parallel scratches, but no undercutting present. No breakdown was noted on the remainder of the panel.									
Resistance to UV/Condensation, BS3900: Part F16: 1997	<p>No signs of cracking, flaking, blistering or loss of substrate adhesion were evident after 1000 or 2000 hours, however, slight chalking was evident after 1000 and 2000 hours exposure. Changes in colour (CMC(2:1) colour difference equation) and gloss are detailed below:</p> <table border="1"> <thead> <tr> <th>Exposure Period</th> <th>Colour Change ΔE</th> <th>Change in gloss 60° Head</th> </tr> </thead> <tbody> <tr> <td>1000 hours</td> <td>2.04</td> <td>-2 G.U. (3 to 1)</td> </tr> <tr> <td>2000 hours</td> <td>3.15</td> <td>-2 G.U. (3 to 1)</td> </tr> </tbody> </table>	Exposure Period	Colour Change ΔE	Change in gloss 60° Head	1000 hours	2.04	-2 G.U. (3 to 1)	2000 hours	3.15	-2 G.U. (3 to 1)
Exposure Period	Colour Change ΔE	Change in gloss 60° Head								
1000 hours	2.04	-2 G.U. (3 to 1)								
2000 hours	3.15	-2 G.U. (3 to 1)								


2.1 Long-Term Condition Test for Wet Substrates (cont.)



Epo-chem RS500PF: Applied to Wet Aged Alkyd (Test Panels: 021733A).
Dfts ranging from: 130 - 152µm

Test	Result									
Application & Appearance	<p>Application: Intermittent 'skidding' of the brush over the wet surface.</p> <p>Appearance: Generally satisfactory, but with elongated areas of water-affected paintwork (locally thin film).</p>									
Cross-cut adhesion test, BS3900: Part E6: 1992	Classification 0 result, triplicate determination with 3mm spacing.									
Pull-off adhesion, ASTM D4541	All three tests gave pull-off adhesion values greater than 1000 psi.									
Resistance to impact, BS3900: Part E7	No defects evident in the coating system, including cracking, flaking or detachment from the substrate.									
Resistance to humidity, BS3900: Part F2: 1973	Panels inspected after 2000 hours exposure. No signs of softening, swelling, blistering or underfilm corrosion were evident.									
Resistance to Salt Spray, BS3900: Part F12: 1997	After 2000 hours exposure, rusting and rust staining was recorded at the parallel scratches, also undercutting was present due to failure of the original alkyd.									
Resistance to UV/Condensation, BS3900: Part F16: 1997	<p>No signs of cracking, flaking, blistering or loss of substrate adhesion were evident after 1000 or 2000 hours, however, significant chalking was evident after 1000 hours exposure. Changes in colour (CMC(2:1) colour difference equation) and gloss are detailed below.</p> <table border="1"> <thead> <tr> <th>Exposure Period</th> <th>Colour Change ΔE</th> <th>Change in gloss 60° Head</th> </tr> </thead> <tbody> <tr> <td>1000 hours</td> <td>9.36</td> <td>-63 G.U. (65 to 2)</td> </tr> <tr> <td>2000 hours</td> <td>7.42</td> <td>-64 G.U. (65 to 1)</td> </tr> </tbody> </table>	Exposure Period	Colour Change ΔE	Change in gloss 60° Head	1000 hours	9.36	-63 G.U. (65 to 2)	2000 hours	7.42	-64 G.U. (65 to 1)
Exposure Period	Colour Change ΔE	Change in gloss 60° Head								
1000 hours	9.36	-63 G.U. (65 to 2)								
2000 hours	7.42	-64 G.U. (65 to 1)								

2.2 JE Test Report

 <h2 style="margin: 0;">PAINTING REPORT</h2>			
JOB NO.:	Cmp/1547	REPORT NO.:	000
UNIT:	G3	INSPECTION DATE:	13/09/02
JOB TITLE:	PAINT TESTING ON LEAD COATED AND WET PIPE.		
<p>DESCRIPTION OF ITEM (State Drawing Nos. where applicable):</p> <p>Test Carried Out On 8" Pipe with 4off different paints Supplied by chemco international paint.</p> <p>(1) RA 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p> <p>(2) RI 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p> <p>(3) RL 500 _____ EPOXY SYSTEM WITH ADDED SOLVENT.</p> <p>(4) RS 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p>			
<p>SUMMARY</p> <p>RA-500 _____ RI _____ RS _____ . Are all 100% volume solids.</p> <p>RL-500 _____ 90% volume solids.</p> <p>RA 500 looks to be the better coat when applying, and can be seen to be flashing off within 30 min. (very good).</p> <p>RI 500 A Bit Harder to apply but as seen good overall coat. (good).</p> <p>RL 500 This application found to sag during application using brush,(more care when applying). (good).</p> <p>RS 500 This coat same as RI 500 When applying found to be a bit hard to apply. (good).</p>			
<p>OBSERVATIONS</p> <p>Four parts off an 8" lead coated pipe were prepared for coating, this pipe was also seen to be wet Prior To paint application.</p> <p>Remove all loose material .</p> <p>To final wire brush.</p> <p>To clean down.</p> <p>To apply to all four areas coating with different material (all areas coated on 13-09-02) .</p> <p>Today 16-09-02 dollys were attach to these areas for adhesion testing which will Be carried out on 20-09-02.</p>			
<p>REPORT DATE: <u>13-09-02</u></p> <p>INSPECTOR: <u>A COOK</u></p>		<p>DISTRIBUTION:</p> <div style="border: 1px solid black; height: 60px; width: 100%;"></div>	

2.2 JE Test Report (cont.)

JE				
PAINTING REPORT				
JOB NO.:	Cmp/1547	REPORT NO.:	001	
UNIT:	G3	INSPECTION DATE:	18/09/02	
JOB TITLE:	PAINT TESTING ON LEAD COATED AND WET PIPE.			
DESCRIPTION OF ITEM (State Drawing Nos. where applicable): Test Carried Out On 8" Pipe with 4 off different paints Supplied by chemco international paint. (1) RA 500 _____ EPOXY SOLVENT-FREE SYSTEM . (2) R.I 500 _____ EPOXY SOLVENT-FREE SYSTEM . (3) RL 500 _____ EPOXY SYSTEM WITH ADDED SOLVENT. (4) RS 500 _____ EPOXY SOLVENT-FREE SYSTEM .				
SUMMARY				
ADHESION PULL OFF RESULT				
Adhesion test carried out by A cook J E Coating Inspector.				
Item Tested ; 8" Pipe 4 off 12" areas marked up for testing with above materials				
Test instrument ; elcometer adhesion tester.				
Results ;				
RI 500		RA 500		
Dolly 1. (1150 psi) 100 %Cohesion		Dolly 3 1 (1150 psi) 100 % Cohesion		
RS 500		RL 500		
Dolly 2. (1250 psi) 100 % Cohesion		Dolly 4. (1350 psi) 100% Cohesion		
Test pipe wire brushed and cleaned, accepted, and painted with 4 different materials Over a wet surface (4 off) 12" areas dollys pulled on 18-09-02 at 9Am. Leaving a Further 4 off pull off tests to do on 20-09-02.				
OBSERVATIONS				
Note : A total off 8 dollys fitted at different angels .Date fitted 16-09-02. 4 Off In number pulled on 18-09-02. See above for test results.				
REPORT DATE: 18-09-02		DISTRIBUTION:		
INSPECTOR: A COOK		<table border="1" style="width: 100%; height: 50px;"> <tr> <td> </td> </tr> </table>		

2.2 JE Test Report (cont.)

JE			
PAINTING REPORT			
JOB NO.:	Cmp/1547	REPORT NO.:	002
UNIT:	G3	INSPECTION DATE:	20/09/02
JOB TITLE: PAINT TESTING ON LEAD COATED AND WET PIPE.			
<p>DESCRIPTION OF ITEM (State Drawing Nos. where applicable):</p> <p>Test Carried Out On 8" Pipe with 4off different paints Supplied by chemco international paint.</p> <p>(1) RA 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p> <p>(2) R I 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p> <p>(3) RL 500 _____ EPOXY SYSTEM WITH ADDED SOLVENT.</p> <p>(4) RS 500 _____ EPOXY SOLVENT-FREE SYSTEM .</p>			
SUMMARY			
ADHESION PULL OFF RESULT			
Adhesion test carried out by A cook J E Coating Inspector.			
Item Tested ; 8" Pipe 4 off 12" areas marked up for testing with above materials			
Test instrument ; elcometer adhesion tester.			
Results ;			
RI 500		RA 500	
Dolly 1. (1150 psi) 100 %Cohesion		Dolly 3 (1150 psi) 100 % Cohesion	
RS 500		RL 500	
Dolly 2. (1300 psi) 100 % Cohesion		Dolly 4. (1450 psi) 100% Cohesion	
Further test carried out to same painted areas (different locations) .			
Test carried out to 09.00 hrs on 20-09-02			
OBSERVATIONS			
Note : After 7 Days Further 4 Dollys Pulled , see results above.			
REPORT DATE: 23-09-02			DISTRIBUTION:
INSPECTOR: A COOK			

PULL-OFF ADHESION TEST REPORT

AQUA PRIMER RS 500P



Sea Horse Services Sdn. Bhd. (258211-A)

(Date prepared: 21st December, 2006)

REPORT PREPARED
BY:

TESTS CONDUCTED
BY:

TESTS WITNESSED AND
VERIFIED BY:



SEA HORSE SERVICES
SDN. BHD.


SIRIM QAS INTERNATIONAL
SDN. BHD.


ABDUL AZIZ BAKRIN
Senior Technical Executive
Chemical Testing Division
SIRIM QAS International Sdn. Bhd.



TALISMAN MALAYSIA
LIMITED



2.3 Talisman Malaysia – Test Report (cont.)

**SEA HORSE SERVICES SDN. BHD.** (098211-J)

Page | 2

PULL-OFF ADHESION TESTS FOR AQUA PRIMER RS 500P

1.0 INTRODUCTION

1.1 Sea Horse Services Sdn. Bhd. has requested SIRIM QAS International Sdn. Bhd. to conduct the Pull-Off Adhesion Test to verify and confirm the manufacturer's claims as well as to prove to any prospective clients that the coating system will perform to ASTM D4541-02. The minimum strength that has been periodically requested by the clients is 450 p.s.i. The tests on the plates are to confirm that the coating system can withstand a pressure of at least 450 p.s.i.

1.2 The tests were conducted by SIRIM QAS International Sdn. Bhd. in Chemical Testing Laboratory, which is accredited by SAMM under ISO 17025-2000 to perform these tests. The tests were conducted by SIRIM QAS International Sdn. Bhd. personnel and witnessed by Sea Horse Services Sdn. Bhd. and Talisman Malaysia Ltd. personnel. The results are attached to this document report.

1.3 The coating system tested is the AQUA PRIMER RS 500P

2.0 TEST PLATES

2.1 Three (3) nos. plates labelled Plate No. 1, Plate No. 2 and Plate No. 3 are tested and the surfaces were prepared as follows:

2.1.1 Plate No. 1: Rusted surface with mill scale and prepared to ST 2 standards.

2.1.2 Plate No.2: Grinded wet surface.

2.1.3 Plate No. 3: Power-tooled.

3.0 TEST STANDARDS & PROCEDURES

3.1 For each of the plates, 3 dories were attached as the glue left to dry for at least 24 hours. Please refer to **Attachment 1** for the positions of the dories. The thickness of each of the location was recorded.

3.2 The tests were carried out after the glue has cured and the tests were carried out by SIRIM QAS International Sdn. Bhd.'s personnel in the presence of Sea Horse Services Sdn. Bhd.'s and Talisman Malaysia Limited's personnel. Please refer to **Attachment 2** on the tests.

3.3 The tests were carried out using a manual pull-off equipment and the data recorded.

NO.47-C, JALAN 62C2, GREEN TECHNOLOGY PARK, SEREMBAN 2, 70000 SEREMBAN, NEGERI SEMBILAN D.K.
TEL: +606-6015872, +606-6014503, FAX: +606-6013675, E-MAIL: hydram@seahorse.com
Engineering Solutions/Repair/Restoration – Blasting-Coating-Painting-Chemicals-Ultra High Water Pressure Jet

2.3 Talisman Malaysia – Test Report (cont.)

 **SEA HORSE SERVICES SDN. BHD.**, (256211-A)

3.4 The thickness of each location of the dolies were checked. Please refer to Attachment 3 on this test.

3.5 The tests were carried out by SIRIM QAS International Sdn. Bhd. following and complying with the international standards of tests namely ASTM D4541-02.

4.0 TEST RESULTS Page | 3

4.1 The test results are shown in the following pages.

5.0 CONCLUSION

5.1 The tests were carried out and it can be concluded that the coating system AQUA PRIMER RS 500P has complied with the minimum adhesion strength of 450 p.s.i.

REPORT PREPARED BY:	TESTS CONDUCTED BY:	TESTS WITNESSED AND VERIFIED BY:
---------------------	---------------------	----------------------------------

 SEA HORSE SERVICES SDN. BHD.	 SIRIM QAS INTERNATIONAL SDN. BHD. AZIZI HARIN Senior Technical Executive Chemical Testing Section SIRIM QAS International Sdn. Bhd.	 TALISMAN MALAYSIA LIMITED  
---	--	---

NO.47-C, JALAN 62C2, GREEN TECHNOLOGY PARK, BERKEMAN 2, 7000 SEREMBAN, NEGERI SEMBILAN D.K.
TEL: +606-8013572, +606-8014803, FAX: +606-8013570, E-MAIL: hydras@talismanys.com
Engineering Solutions/Repair/Restoration – Sliding-Coating-Painting-Chemicals-Ultra High Water Pressure Jet

2.3 Talisman Malaysia – Test Report (cont.)


SEA HORSE SERVICES SDN. BHD. (258211-A)

PULL-OFF ADHESION TESTS
JOINT-WITNESS TESTS

TESTS DETAILS:

PLATE NOS.	1 (Rusted surface with mill scales; prepared to ST 2)
REPORT NO.	SHS-SIRIM/REP/001/2007
METHOD	ASTM D4541-02 STANDARD TEST METHOD FOR PULL-OFF STRENGTH OF COATINGS USING PORTABLE ADHESION TESTERS
PAINTING SYSTEM	AQUA PRIMER RS 500P
SUBSTRATE	CARBON STEEL
CLIENT	TALISMAN MALAYSIA LTD.
PAINTING/COATING SYSTEM OWNER	SEA HORSE SERVICES SDN. BHD.
LOCATION/AREA OF TESTS	SIRIM QAS INTERNATIONAL SDN. BHD., SHAH ALAM, SELANGOR D.E.
DATE OF DOLLY ATTACHMENT	15/12/2006
DATE OF DOLLY PULL-OFF	18/12/2006
TYPE OF ADHESIVE USED	EPOXY GLUE
TYPE OF INSTRUMENT USED	MANUAL PULL-OFF
MINIMUM ADHESION REQUIRED	450 p.s.i.

RESULTS

DOLLY POSITION	DFT-BEFORE (MICRONS)	DFT-AFTER (MICRONS)	PULLED-OFF RESULTS IN N/mm ² (psi)	REMARKS
A	59.3	59.3	>7 (>1,015)	10% adhesion failure. Adhesion minimum strength more than 450 p.s.i.
B	59.1	59.1	>7 (>1,015)	56% adhesion failure. Adhesion minimum strength more than 450 p.s.i.
C	71.5	71.5	>7 (>1,015)	20% adhesion failure. Adhesion minimum strength more than 450 p.s.i.

">" denotes "more than"

<p>CONDUCTED BY:</p>  <p>SIRIM QAS INTERNATIONAL SDN. BHD.</p>	<p>WITNESSED BY:</p>  <p>SEA HORSE SERVICES SDN. BHD.</p>	<p>WITNESSED BY:</p>  <p>TALISMAN MALAYSIA LTD.</p>
---	--	---

NO.47-C, JALAN SDIC, GREEN TECHNOLOGY PARK, SEREMBAN 2, 7000 SEREMBAN, NEGERI SEMBILAN D.E. TEL: +606-6011572, +606-6014503; FAX: +606-6013375; E-MAIL: info@sea-horse.com
Engineering Solutions/Repair/Restoration – Diving-Coating-Painting-Chemicals-Ultra High Water Pressure Jet

2.3 Talisman Malaysia – Test Report (cont.)

SEA HORSE SERVICES SDN. BHD. (598211-A)

PULL-OFF ADHESION TESTS
JOINT-WITNESS TESTS

TESTS DETAILS:

PLATE NOS.	2 (Grinded wet surface)
REPORT NO.	SHS-SIRIM/REP/002/2007
METHOD	ASTM D4541-02 STANDARD TEST METHOD FOR PULL-OFF STRENGTH OF COATINGS USING PORTABLE ADHESION TESTERS
PAINTING SYSTEM	AQUA PRIMER RS 500P
SUBSTRATE	CARBON STEEL
CLIENT	TALISMAN MALAYSIA LTD.
PAINTING/COATING SYSTEM OWNER	SEA HORSE SERVICES SDN. BHD.
LOCATION/AREA OF TESTS	SIRIM QAS SDN. BHD., SHAH ALAM, SELANGOR D.E.
DATE OF DOLLY ATTACHMENT	15/12/2006
DATE OF DOLLY PULL-OFF	18/12/2006
TYPE OF ADHESIVE USED	EPOXY GLUE
TYPE OF INSTRUMENT USED	MANUAL PULL-OFF
MINIMUM ADHESION REQUIRED	450 p.s.i.

RESULTS

DOLLY POSITION	DFT-BEFORE (MICRONS)	DFT-AFTER (MICRONS)	PULLED-OFF RESULTS IN N/mm ² (psi)	REMARKS
A	64.9	64.9	>7 (>1,015.0)	30% adhesion failure. Adhesion minimum strength more than 450 p.s.i.
B	64.4	64.4	4.5 (632.5)	90% adhesion failure. Adhesion minimum strength more than 400 p.s.i.
C	60.4	60.4	6.8 (986.0)	85% adhesion failure. Adhesion minimum strength more than 450 p.s.i.

*">" denotes "more than"

CONDUCTED BY:  **SIRIM QAS INTERNATIONAL SDN. BHD.**

WITNESSED BY:  **SEA HORSE SERVICES SDN. BHD.**

WITNESSED BY:  **TALISMAN MALAYSIA LTD.**

NO.47-C, JALAN 82C2, GREEN TECHNOLOGY PARK, SEREMBAN 2, 7000 SEREMBAN, NEGERI SEMBILAN D.E. TEL: +603-865572, +606-9014903, FAX: +606-9013378, E-MAIL: info@shs.com.my
Engineering Solutions/Repair/Restoration – Diving-Coating-Painting-Chemicals-Ultra High Water Pressure Jet

2.3 Talisman Malaysia – Test Report (cont.)

ADHESION PULL-OFF TESTS

JOINT-WITNESS TESTS

TESTS DETAILS:

PLATE NOS.	B (Power-tooled)
REPORT NO.	SHS-SIRIM/REP/003/2007
METHOD	ASTM D4541-02 STANDARD TEST METHOD FOR PULL-OFF STRENGTH OF COATINGS USING PORTABLE ADHESION TESTERS
PAINTING SYSTEM	AQUA PRIMER RS 500P
SUBSTRATE	CARBON STEEL
CLIENT	TALISMAN MALAYSIA LTD.
PAINTING/COATING SYSTEM OWNER	SEA HORSE SERVICES SDN. BHD.
LOCATION/AREA OF TESTS	SIRIM QAS INT. SDN. BHD., SHAH ALAM, SELANGOR D.E.
DATE OF DOLLY ATTACHMENT	15/12/2006
DATE OF DOLLY PULL-OFF	18/12/2006
TYPE OF ADHESIVE USED	EPOXY GLUE
TYPE OF INSTRUMENT USED	MANUAL PULL-OFF
MINIMUM ADHESION REQUIRED	450 p.s.i.

RESULTS

DOLLY POSITION	DFT-BEFORE (MICRONS)	DFT-AFTER (MICRONS)	PULLED-OFF RESULTS IN N/mm ² (psi)	REMARKS
A	94.9	94.9	>7 (>1,015.0)	40% adhesion failure. Adhesion minimum strength more than 450 p.s.i.
B	118	118	>7 (>1,015.0)	10% adhesion failure. Adhesion minimum strength more than 450 p.s.i.
C	123	123	>7 (>1,015.0)	40% adhesion failure. Adhesion minimum strength more than 450 p.s.i.

">" denotes "more than"

CONDUCTED BY:



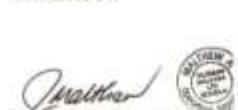
SIRIM QAS INTERNATIONAL
SDN. BHD.

WITNESSED BY:



SEA HORSE SERVICES
SDN. BHD.

WITNESSED BY:



TALISMAN MALAYSIA LTD