



# REPORT

**EPO-CHEM™ RS 500P**

**SOLVENT-FREE, WET & RUST TOLERANT SYSTEM**

**Marine Industry**

**July 2018**

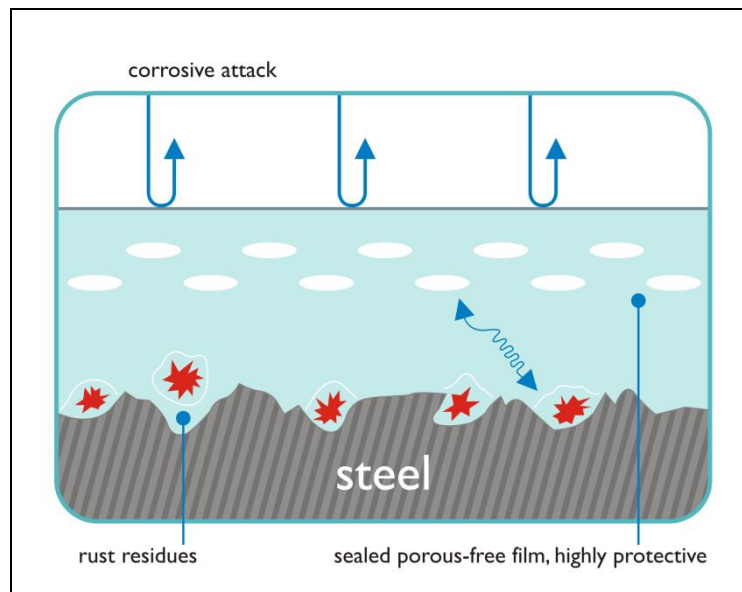
# Contents

	Page
INTRODUCTION	3
MATERIAL CHARACTERISTICS	3
CERTIFICATES AND APPROVALS	4
APPLICATION AREAS	4
CASE STUDIES	5
CASE STUDY 1: Deck Refurbishment - RoRo Ferry	6
CASE STUDY 2: Void Spaces, Cofferdams and Ballast Tanks - Arcadia Refit	7
CASE STUDY 3: Ballast Tanks - Harvey H Ward Platform	9
CASE STUDY 4: Ballast Tanks - MISC FPSO	11
CASE STUDY 5: Ballast Tanks - MV Auxis	13
CASE STUDY 6: Void Tanks - Surfer Boats	15
CASE STUDY 7: Swimming Pool Refurbishment - Cruise Ship	17
CASE STUDY 8: New Build (Shop Primer) - Oil Products Tanker	19
CASE STUDY 9: Ballast Tanks (Coal-tar Epoxy) – Self Discharging Bulk Carrier	21
CASE STUDY 10: Potable Water Tanks - Cruise Vessel	23
APPENDIX 1: AREAS OF A CRUISE SHIP COATED WITH CHEMCO	24
1.1 Areas of a Cruise Ship Coated with Chemco	25
APPENDIX 2: REFERENCE LETTERS	26
2.1 V. SHIPS	27
2.2 Yeoman Bridge	28
2.3 AET Shipmanagement	29

# 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, St 2.

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 **solvent-free, 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 (St 2 - St 3)
- 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 H&S and Fire Precaution
- Long-term corrosion protection
- 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**

## CERTIFICATES AND APPROVALS

- ABS Certified – Ballast Tank Maintenance Coating (when used in conjunction with **RA 500M**)  
(Including on wet & rusty steel)
- ABS Certified – IMO PSPC-COT Approved Oil Cargo Tank Coating
- British Network Rail
  - **RS 500P** for Aged Alkyd coatings (Protective treatment XM92)
  - **RS 500P** for New or Weathered Galvanised Steel (Protective Treatment XO99)
- Lloyds Approval
  - Lloyds Type Approval – IMO Resolution MSC.215 (82) PSPC for New Build – Bare & Shop Primed Steel
  - Lloyds Approval – Ballast Tank Maintenance Coating – **RS 500P**
- NSF Certified – Fresh Drinking Water (when used in conjunction with **RA 500M**)

## APPLICATION AREAS

- Multi-purpose tank lining: sea water ballast, potable water, grey/black water  
crude oil, refined oil, cargo/grain, mud/brine
- Decks: Internal & External
- Void Spaces & Cofferdams
- Swimming Pools
- Engine Rooms - Bilges/Under Gratings
- Bulkheads
- Rudders
- Topsides/Boottops
- Underwater areas

## **CASE STUDIES**

## CASE STUDY 1: Deck Refurbishment – RoRo Ferry

### Case Study



<b>Client:</b> <i>Norbulk Shipping</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>Ro-Ro Ferry</i>	<b>Date:</b> <i>March 2008</i>
<b>Location:</b> <i>Europe</i>	<b>Product:</b> <i>Epo-chem™ RS 500P</i>

#### Overview

Ship management company, Norbulk Shipping, required a coating with a fast turnaround for their Ro-Ro ferry service from Marseilles to North Africa where carriage of heavy traffic and fast turn-round is vital.

#### Challenge

The main traffic deck had severely deteriorated due to weathering and heavy traffic. Norbulk Shipping required a system that could be applied with minimum surface preparation, fast drying, high build, and quick cure to enable the refurbishment to be carried out in a very quick time of 48 hours so the ship could return to normal service.

#### Solution

Norbulk Shipping decided to utilise **Epo-chem™ RS 500P** solvent-free, wet & rust tolerant system with excellent adhesion to high-pressure washed surfaces, with fast drying/curing properties and good abrasion and impact resistance. One coat of **Epo-chem™ RS 500P @ 200µ DFT** was applied.

#### Outcome

The client has now taken management of four other Ro-Ro vessels and will utilise the **Chemco** system for all deck traffic areas. This has proven to offer long-term cost-effective, easy to repair by crew and cost effective protection.

#### Benefits

- Solvent-free
- No blasting required
- Application by crew
- Reduced cost of plant and equipment
- Reduced H&S and Fire Precaution

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2



#### Photographs:

- Nos. 1-2 Deck Traffic Areas After Application

## CASE STUDY 2: Cruise Ship Refurbishment – Passenger Ship

### Case Study



<b>Client:</b> P&O Cruises/Carnival UK	<b>Industry:</b> Marine
<b>Vessel:</b> Passenger Ship	<b>Date:</b> December 2008
<b>Location:</b> Bremerhaven, Germany	<b>Product:</b> Epo-chem™ RS 500P

#### Overview

P&O Cruise Lines had already carried out a small trial using Epo-chem™ RS 500P on a similar ship in the engine (difficult access areas of wet and rusty decks under the gratings). Following the successful trials, it was proven that the system met the technical requirements and was specified for follow-up work on this passenger ship whilst on its refit docking program.

#### Challenge

Traditional solvent-based coatings cause major problems and interruption to the refit program as many different activities by different contractors are being performed on board the vessel. Grit blasting was also considered to be too expensive, time consuming and interruptive to all activities being carried out. As an alternative, with docking time at a premium, the Chemco solvent-free, wet & rust tolerant system met all the criteria.

#### Solution

Epo-chem™ RS 500P was ideal for the 'Arcadia' refit docking program. It can be applied on minimum surface preparation (WJ-4/St2), it is solvent-free and completely wet tolerant. Within two weeks, some 4,000m<sup>2</sup> was prepared and coated in voids, cofferdams and ballast tanks. Due to the additional benefits of the product, extra work could be undertaken on decks and engine room floor with no interruption to other works being carried out in the vicinity.

#### Specification

Areas of repair were prepared by high pressure water wash (500-800 bar) to the standard of WJ4. This was followed by one stripe coat and one full coat of Epo-chem™ RS 500P @ 200μ applied by brush, roller or spray.

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#### Photographs:

- Nos. 1-2 Pipe before and after application
- No. 3 Void space before and after application



## CASE STUDY 2: Cruise Ship Refurbishment – Passenger Ship (cont.)

### Outcome

P&O Cruise Lines were completely satisfied as no downtime occurred due to the technology of the Chemco product and the results were outstanding. The decision by P&O Cruise Lines technical staff confirmed that Epo-chem™ RS 500P is an environmentally friendly, safe coating offering major cost savings.

### Benefits

- Solvent-free
- No grit blasting
- No interruption to all other contractors during refit
- All surface preparation work was carried out by high pressure water wash (500-800 bars)
- Reduced cost of plant and equipment
- No major delays to program
- Application can be carried out in very high humidity or on wet substrate
- Chemco system will protect the steel substrate in excess of 10 years



#### Photographs:

- No. 4 Void space before and after application
- Nos. 5-6 Vessel floor before and after

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## CASE STUDY 3: Ballast Tanks – Harvey H Ward Platform

### Case Study



<b>Client:</b> <i>Transocean</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>Rig Harvey H Ward</i>	<b>Date:</b> <i>December 2009</i>
<b>Location:</b> <i>Sembawang Shipyard, Singapore</i>	<b>Product:</b> <i>Epo-chem™ RS 500P</i>

#### Overview

Transocean required to refurbish ballast tanks (over 12,000m<sup>2</sup>) from a soft coating to a hard coating finish as part of the classification. The application had to be environmentally friendly. Chemco was able to utilise **Epo-chem™ RS 500P solvent-free, wet tolerant** that can be applied without the need of dehumidification equipment making the project more cost effective.

#### Challenge

Classification Societies are insisting on a measurable DFT on top of steel for corrosion protection. Soft coating to be replaced with hard coating.

#### Solution

The Shipyard and Transocean were interested in Chemco 500 Series, a system that was 100% environmentally friendly for both the tank cleaning and the subsequent coating system.

#### Outcome

The tanks were high pressure washed for removal of soft coating. The resulting substrate, and with the high humidity prevailing, **Epo-chem™ RS 500P solvent-free, wet & rust tolerant** epoxy system was applied in two coats to a DFT of 300μ. Adhesion tests were taken to assure the owners of the excellent adhesion (min 1,200psi) of the system. The system was guaranteed for long-term in-service use.

#### Benefits

- Solvent-free
- Client approval
- Shipyard work-rate was not affected
- Reduced H&S and Fire Precaution
- Reduced cost of plant and equipment
- Application can be carried out in very high humidity or on wet substrate
- Chemco International system will protect the steel substrate in excess of 10 years

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#### Photographs:

- No. 1 Ballast Tank After UHP Washing
- No. 2 Ballast Tank After the Application of Rusteco Gel

### CASE STUDY 3: Ballast Tanks – Harvey H Ward Platform (cont.)



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## CASE STUDY 4: Ballast Tanks – MISC FPSO

### Case Study



<b>Client:</b> <i>Talisman Malaysia</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>MISC Bhd.</i>	<b>Date:</b> <i>January 2008</i>
<b>Location:</b> <i>Malaysia</i>	<b>Products:</b> <i>Epo-chem™ RA 500M &amp; RS 500P</i>

#### Overview

The MISC FPSO required her ballast tanks to be coated in order to achieve class certification. However, the vessel was in constant use and the owners required a solution which did not require dry-grit blasting or involve solvent-based paints due to the risk of explosion and fire. Furthermore, the requirement for a large number of equipment, e.g compressor, dehumidifier etc., would make the contract impractical and expensive. Chemco was approached as the only company that could match the customer's requirements.

#### Challenge

Preparation of the tanks at sea with high pressure washing and coatings to be carried out in high humidity and on rusty steel. Application of solvent-free coatings capable of application on poorly prepared substrate, some without any profile and with mill scale; and still achieve class certification whilst the vessel is in full production/operation.

#### Solution

High pressure-wash (800 bar) to remove loose rust and loose mill scale. First/Primer coat and stripe coat was carried out with Epo-chem™ RS 500P solvent-free, wet & rust tolerant system @ 100µ DFT followed by the topcoat with Epo-chem™ RA 500M solvent-free, wet tolerant system @ 250µ DFT.

#### Outcome

The work was successfully supervised by Chemco Speciality Coatings (SEA), Chemco's subsidiary in Singapore. Class certification was achieved with zero downtime.

#### Benefits

Chemco was the only company which could provide the solution and did so in a cost-effective manner. The client gained class certification with no loss of production. They were also delighted to receive Chemco's comprehensive guarantee.

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#### Photographs

- No. 1 Talisman on station
- Nos. 2-3 Surfaces ready for coating



## CASE STUDY 4: Ballast Tanks – MISC FPSO (cont.)



### Photographs

- Nos. 4-5 Stripe coating with RS 500P
- No. 6 Full coat RS 500P
- No. 7 RA 500M being applied on wet surface
- No. 8 Completed RA 500M topcoat

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## CASE STUDY 5: Ballast Tanks – MV Auxis

### Case Study



<b>Client:</b> IBL - Ireland Blyth Ltd	<b>Industry:</b> Marine
<b>Vessel:</b> M/V AUXIS	<b>Date:</b> October 2013
<b>Location:</b> Durban, South Africa	<b>Products:</b> Epo-chem™ RS 500P & RA 500M

#### Overview

The ballast tanks of the vessel M/V AUXIS required a full refurbishment for over 6,000m<sup>2</sup> (double bottoms tanks, wings tanks and deep tank) after the original coatings had failed.

#### Challenge

Some areas of the ballast tanks were heavily corroded with limited access. There was also a very limited time-scale for completion of this project and as a result, grit blasting was not permissible.

#### Solution

Utilise water jetting as the surface preparation method to WJ-3 standards. Apply one stripe coat of solvent-free, wet & rust tolerant epoxy Epo-chem™ RS 500P followed by one full coat of Epo-chem™ RS 500P @ 200µ DFT. In some localized areas, where most of the existing paint was still adherent, one primer coat of Epo-chem™ RS 500P in all the bare steel areas was applied, followed by one topcoat of solvent-free, wet tolerant epoxy Epo-chem RA 500M applied @ 250µ DFT.

#### Outcome

The work programme was successfully completed, within the timeframe given and to the satisfaction of all concerned: Owner, Classification Society and Shipyard.

#### Benefits

- Solvent-free
- Environmentally friendly system (no grit blasting)
- Reduced H&S and fire precautions
- No dew point or humidity restrictions
- No overcoating limitations
- No delays
- No disruption to other on-going work (hot)

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#### Photographs

- No. 1 Deep tank before surface preparation
- No. 2 Wing tank before surface preparation

## CASE STUDY 5: Ballast Tanks – MV Auxis (cont.)

<p>3</p> 	<p>4</p> 
<p>5</p> 	<p>6</p> 
<p>7</p> 	<p><b>Photographs</b></p> <ul style="list-style-type: none"> <li>• No. 3 Double bottom tank after surface preparation</li> <li>• No. 4 Deep tank after surface preparation</li> <li>• No. 5 Double bottom tank after stripe coat</li> <li>• No. 6 Double bottom tank after full coat.</li> <li>• No. 7 Wing tank after full coat</li> </ul>

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## CASE STUDY 6: Void Tanks – Surfer Boats

### Case Study



<b>Client:</b> <i>Bourbon Offshore Asia</i>	<b>Industry:</b> <i>Marine</i>
<b>Scope:</b> <i>Void Tanks - Surfer Boats</i>	<b>Date:</b> <i>June &amp; October 2013</i>
<b>Location:</b> <i>Singapore &amp; Indonesia</i>	<b>Products:</b> <i>Epo-chem™ RS 500P &amp; RA 500M</i>

#### Overview

The aluminium void tanks onboard Bourbon Offshore Asia's Surfer Boat 2612 & Surfer Boat 2601, required to be refurbished as they were showing signs of deterioration.

#### Challenge

Providing a suitable coating system capable of adhering to a aluminium surface. The tanks are located within a very small confined space only accessible by crawling through. Grit blasting and water jetting could not be utilised due to monetary constraints of the client. Working within a tight timeframe also added to the difficulty of this project.

#### Solution

The preparation method and the Chemco coating specification was the same for both Surfer boats. Utilise mechanical preparation as the surface preparation method. Apply solvent-free, wet & rust tolerant epoxy Epo-chem™ RS 500P as a primer @ 100µ DFT by roller, followed by a topcoat of solvent-free epoxy Epo-chem™ RA 500M @ 200µ DFT.

#### Outcome

This project was carried out on time with no delays. The Chemco system and the speed of the contract was to the satisfaction of all concerned.

#### Benefits

- Solvent-free
- Chemco system capable of adhering to an aluminium surface
- No humidity or dew point restrictions
- Reduced H&S precautions
- Reduced contract duration
- Reduced cost of plant and equipment

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#### Photographs

- Nos. 1-2 Surfer Boats 2612 & 2601 Before Surface Preparation, Respectively

## CASE STUDY 6: Void Tanks – Surfer Boats (cont.)

3		4	
5		6	
7		8	
<div><p><u>Photographs</u></p><ul style="list-style-type: none"><li>• Nos. 3-4 Surfer Boats 2612 &amp; 2601 After Surface Preparation, Respectively</li><li>• Nos. 5-6 Surfer Boat 2612 After Application of Chemco System</li><li>• Nos. 7-8 Surfer Boat 2601 After Application of Chemco System</li></ul></div>			

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## CASE STUDY 7: Swimming Pool Refurbishment – Cruise Ship

### Case Study



<b>Client:</b> <i>Royal Caribbean Cruise Lines</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>Cruise Ship</i>	<b>Date:</b> <i>February 2014</i>
<b>Location:</b> <i>Bermuda</i>	<b>Products:</b> <i>Epo-chem™ RS 500P &amp; RA 500M</i>

#### Overview

The swimming pools on-board Royal Caribbean's 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

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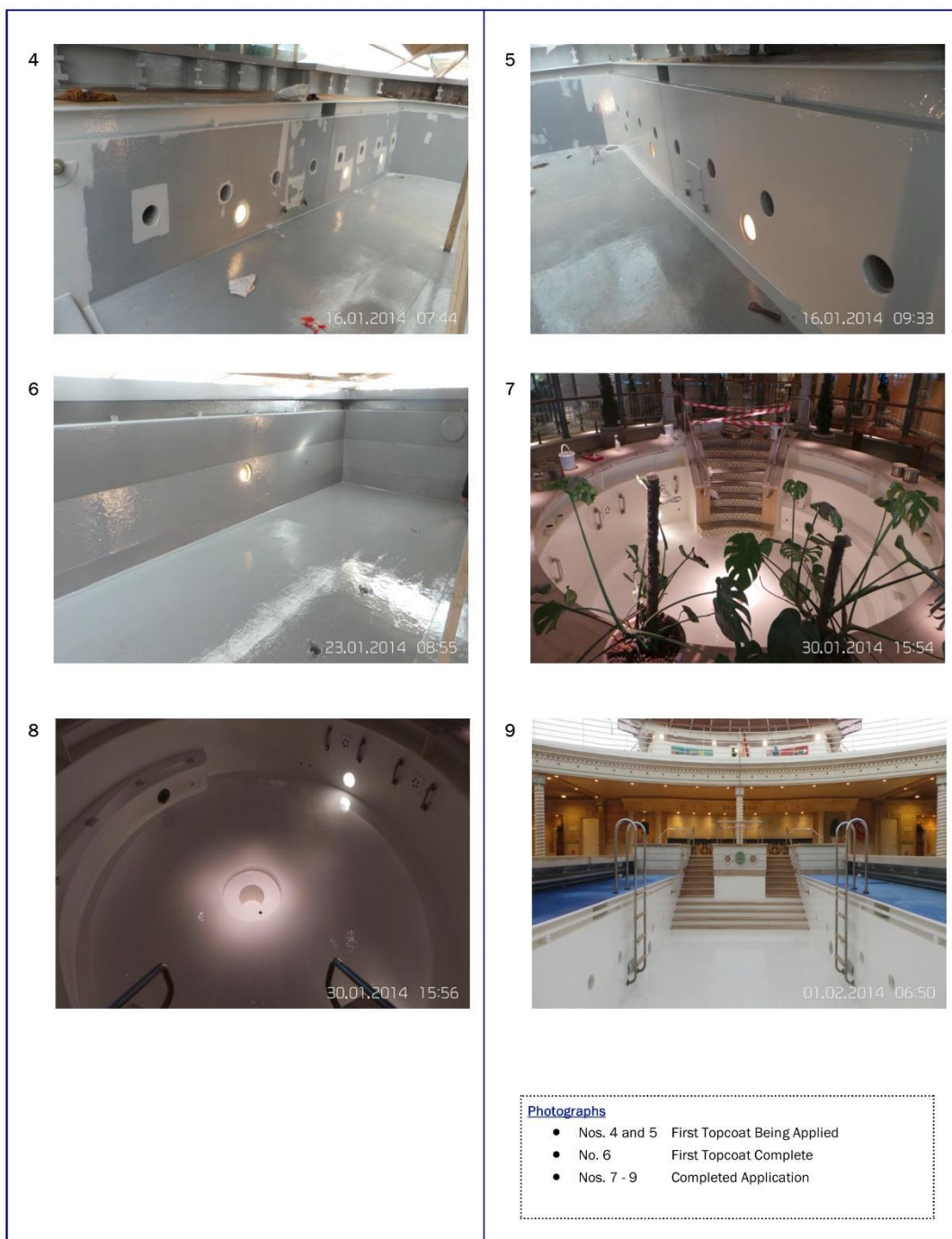


#### Photographs

- Nos. 1-2 After Surface Preparation
- No. 3 Topcoat Being Applied on Top of Primer



## CASE STUDY 7: Swimming Pool Refurbishment – Cruise Ship (cont.)



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## CASE STUDY 8: New Build (Shop Primer) – Oil Products Tanker

### Case Study



<b>Client:</b> <i>Rix Shipping</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>Oil Products Tanker</i>	<b>Date:</b> <i>2012</i>
<b>Location:</b> <i>UK</i>	<b>Products:</b> <i>Epo-chem™ RS 500P &amp; RA 500M</i>

#### Overview

This Oil Products Tanker New Build, required to have the double skin ballast tanks (over 5,000m<sup>2</sup>) coated with an IMO PSPC approved product. The owners decided that they required a solution which did not require grit blasting or solvent-based paints as the work had to be carried out in confined spaces. Traditionally, shop primers need to be completely removed prior to the application of a coating system. The vessel was visited by its owners and Lloyds as this was the first New Build in the UK that was coated under the new IMO PSPC regulations.

#### Challenge

To find a coating system which could be applied without the removal of the shop primer and without grit blasting. Working in very tight, confined spaces also added to the difficulty of this project.

#### Solution

Water jetting (500 bar) was utilised as the surface preparation method to remove any contaminants from the shop primed surfaces and the weld areas were mechanically prepared prior to the application of the IMO Approved Chemco System. One stripe coat of solvent-free, wet & rust tolerant Epo-chem™ RS 500P was then applied, followed by one full coat, both @ 100µ. To complete the system, one topcoat of solvent-free, wet tolerant Epo-chem™ RA 500M was applied @ 250µ.

#### Outcome

The work was successfully completed and supervised by Baymarine's QA and Chemco's Technical Representative, meeting all the parameters for IMO and Lloyds Register for class certification.

#### Benefits

- Solvent-free
- No grit blasting
- Wet & rust tolerant properties of Chemco system
- Compatibility with shop primers (IMO Approved)
- Reduced H&S and Fire Precaution
- Substantial time and cost savings

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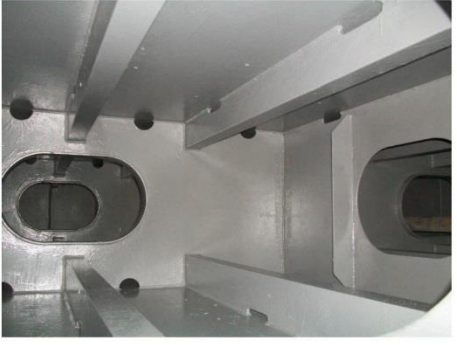


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#### Photographs

- No. 1 Before application
- No. 2 Stripe coating

## CASE STUDY 8: New Build (Shop Primer) – Oil Products Tanker (cont.)

<p>3</p> 	<p>4</p> 
<p>5</p> 	<p>6</p> 
<p>7</p> 	<p><b>Photographs</b></p> <ul style="list-style-type: none"><li>• Nos. 3-4 During priming</li><li>• No. 5 Priming complete</li><li>• Nos. 6-7 Completed application</li></ul>

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## CASE STUDY 9: Ballast Tanks (Coal-tar Epoxy) – Self Discharging Bulk Carrier

### Case Study



<b>Client:</b> <i>V. Ships</i>	<b>Industry:</b> <i>Marine</i>
<b>Vessel:</b> <i>Self Discharging Bulk Carrier</i>	<b>Date:</b> <i>2008 - ongoing project</i>
<b>Location:</b> <i>Poland</i>	<b>Products:</b> <i>Epo-chem™ RS 500P &amp; RA 500M</i>

#### Overview

The ballast tanks onboard the Self Discharging Bulk Carrier had previously been coated with coal-tar epoxy. Areas within these ballast tanks were now showing signs of corrosion damage and required to be patch repaired.

#### Challenge

To find a protective coating system which would be compatible with a coal-tar epoxy tank lining.

#### Solution

Chemco's Epo-chem™ RS 500P (primer) & RA 500M (topcoat) were selected as the protective coating system to be utilised as it is uniquely compatible with coal-tar epoxies. The areas which required the patch repair were mechanically prepared by power tooling to St2 standards. Upon completion of the surface preparation, one coat of solvent-free, wet & rust tolerant Epo-chem™ RS 500P was applied to the prepared areas. This was followed by one topcoat of solvent-free, wet tolerant Epo-chem™ RA 500M.

#### Outcome

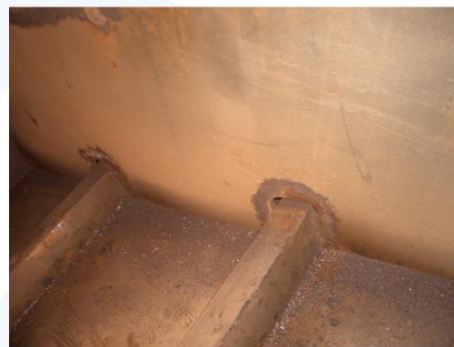
The unique characteristics of Epo-chem™ RS 500P allowed the system to be applied with no compatibility issues and with strong adhesion to the coal-tar epoxy. The owners of this vessel are very satisfied with Chemco and issued a letter of recommendation. They also stated that after 5 years the coating is still in perfect condition.

#### Benefits

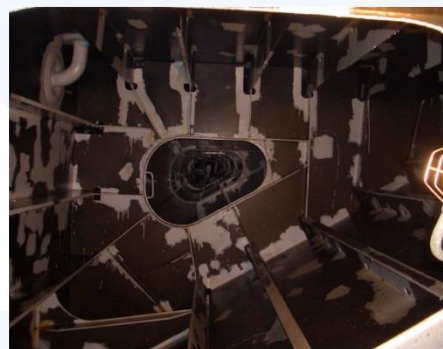
- Solvent-free
- No grit blasting
- Rust tolerant properties of Epo-chem™ RS 500P
- Compatibility with coal-tar epoxy
- Reduced H&S and Fire Precaution
- Substantial time and cost savings

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#### Photographs

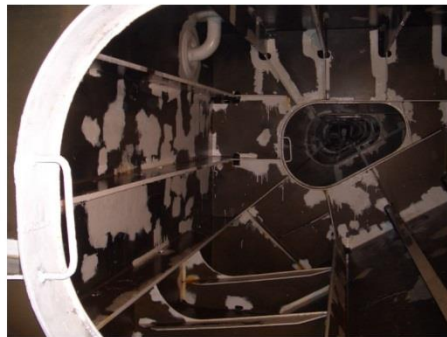
- No. 1 Surface Prepared by Mechanical Preparation
- No. 2 Patch Repair Complete

## CASE STUDY 9: Ballast Tanks (Coal-tar Epoxy) – Self Discharging Bulk Carrier (cont.)

3



4



### Photographs

- Nos. 3-4 Patch Repair Complete



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## CASE STUDY 10: Potable Water Tanks – Cruise Vessel

### Case Study



<b>Client:</b> <i>Major Cruise Liner Company</i>	<b>Industry:</b> <i>Marine</i>
<b>Scope:</b> <i>Potable Water Tanks</i>	<b>Date:</b> <i>March 2012</i>
<b>Location:</b> <i>UK</i>	<b>Products:</b> <i>Epo-chem™ RS 500P &amp; RA 500M</i>

#### Overview

One of the world's largest cruise liner companies required to have the potable water tanks onboard one of their cruise ships refurbished as they were showing signs of age and deterioration.

#### Challenge

Grit blasting was not permissible. There was also a strict time frame given for completion of the project.

#### Solution

Water jetting to WJ-3 standards was used as the surface preparation method. This was followed by one primer coat of solvent-free, wet & rust tolerant epoxy Epo-chem™ RS 500P. One topcoat of solvent-free, wet tolerant epoxy Epo-chem™ RA 500M was applied to complete the coating system.

#### Outcome

The solvent-free properties of the Chemco system and utilising water jetting ensured that there was no disruption to other ongoing work within the vicinity. The unique wet & rust tolerant properties of the Chemco system also ensured that coating application could take place immediately upon completion of the surface preparation, resulting in substantial time and cost savings being achieved.

This system is NSF Certified for potable water applications.

#### Benefits

- Solvent-free
- Wet & rust tolerant properties
- No grit blasting
- Reduced H&S and Fire Precaution
- Reduced downtime
- Substantial time and cost savings
- No disruption to other ongoing work in the vicinity

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#### Photographs

- Nos. 1-2 Completed application

## **APPENDIX 1**

### **AREAS OF A CRUISE SHIP COATED WITH CHEMCO**

## 1.1 Areas of a Cruise Ship Coated with Chemco

### THE FOLLOWING IS A COMPREHENSIVE LIST OF SPECIFIC AREAS ON CRUISE VESSELS WHERE CHEMCO COATINGS HAVE BEEN UTILISED:

- Sea Water Ballast Tanks
- Grey Water Tanks
- Sewage Tanks
- Potable Water Tanks
- Fuel Oil Tanks
- Boiler Tanks
- Hot Well Tanks
- Sulphur Fuel Residue Tanks
- Void Spaces
- Battery Rooms
- Fan Rooms
- Chemical Stores
- Steam Pipes (up to 150° C)
- Accommodation Spaces
- Lifeboat Davits - Scuppers
- Chain Lockers
- Food Preparation Rooms
- Firewall Supports
- Sea Inlet Boxes
- Engine Room Bilges
- Machinery Spaces
- Air Con Ducting
- Plenums
- Balconies/Main Decks
- Swimming Pools
- Pool Rooms
- Service Walkways/Passages
- Refrigeration Rooms
- Galleys
- Shower Rooms
- Outside Shell
- Superstructures
- Funnels
- Rudders
- Propellers
- Thrusters Compartments

A lot of the work listed above can be completed in-service, with the technical aspects of the Chemco coatings permitting them to be utilised in areas where most solvent-based systems simply cannot; due to passenger disruption or food/laundry work being in progress.

Equally a lot of the work can be done at refit and allowed to continue despite hot work taking place nearby. Utilising solvent-based systems H&S issues would be a major concern, culminating in long time delays at refits resulting in extensive costs being obtained.

## **APPENDIX 2**

### **REFERENCE LETTERS**



## 2.1 Reference Letter: V. Ships



*V. Ships UK Limited  
Skypark  
8 Elliot Place  
GLASGOW G3 8EP  
Ph: + 44 141 243 2435  
Fax: +44 141 243 2436  
www.vships.com*

4<sup>th</sup> December 2007

Dear Manni,

We have used Chemco moisture tolerant RS 500P epoxy for the repair and maintenance works in several of our managed vessels.

We have monitored these areas on routine inspections and are satisfied by the performance and intend using this coating for future works as a flexible coating for applications at sea and in dock.

Prior to application the steel substrates were prepared by mechanical cleaning and HP washing. The coating was then applied, in one coat, at a thickness of between 150 - 200 microns.

It is our view that solvent free epoxy coatings with moisture tolerant properties will become the norm for projects where time is the major constraint.

Yours sincerely,

Corinne Burley

*Fleet Manager  
V. Ships UK Ltd.*

## 2.2 Reference Letter: Yeoman

M.V. Yeoman Bridge.

22<sup>nd</sup> April 2010

Re :- Chemco coatings

To whom it may concern

For the past five years we have been using Chemco as a protective coating after carrying out ballast tank repairs on both our two sister vessels – Yeoman Bridge and Yeoman Bontrup. The repairs consisting mainly of longitudinal fractures being gouged / welded and new soft nose brackets fitted. Shellplate renewals in drydock due to fractures. Shellplate / internal renewals due to tug / fender damage.

Preparation of the steel is by power tooling / wire brushing to remove any scale/gingering, and feathering of the original coal tar epoxy coating, which Chemco is compatible with. Although Chemco is moisture tolerant we always try to have the steel as dry as possible. Prior to application tins containing the primer and top coats are brought into a warm environment the day before to bring them up at least 10 degs C, as recommended by the manufacturer.

Application is by brush or roller, allowing 16 hours between primer and top coat.

Typical thickness when applied : –

Primer - 200 ~ 250 microns.

Top Coat – 200 ~ 250 microns.

We have been using Chemco now for five years and during that time we have nothing but praise for this product. Years after it has been applied, you can go to an old repair, and the chemco coating is as good as the day it was applied, with no signs of breakdown whatsoever. It is a first class product hence the reason we use it, and will continue to use it, and only it, in our ballast tanks.

Gcoff McRorie



Yeoman Glensanda Marine Superintendent

## 2.3 Reference Letter: AET Shipmanagement



**AET Shipmanagement  
(USA) LLC**  
1900 West Loop South  
Suite 920  
Houston TX 77027  
USA

T +1 (832) 615 2000  
F +1 (713) 622 2256

[www.aet-tankers.com](http://www.aet-tankers.com)

We hereby confirm the use of CHEMCO **RS 500P** anticorrosive coating system for the refurbishment of the Sea Water Ballast Tanks of the "MT EAGLE ANAHEIM". This project took place in Huangpu – P. R. of China, in September/October 2014.

The goal was to carry out the refurbishment in the shortest possible duration cost effectively whilst achieving long term corrosion protection. Consequently Chemco specialist system was chosen due to the moisture (wet) and surface (rust) tolerance capabilities, both for "less demanding" surface preparation standards and for wet surfaces. Utilising this product enabled the use of Hydro-blasting for surface preparation without delays or downtimes.

The Technical support provided by CHEMCO International was vital to ensure the satisfactory completion of the project on time.

CHEMCO INTERNATIONAL LTD (GB556463226), supplied the below mentioned product from UK and also from stocks available in Singapore.

Supply Date	Designation (products)	Technical Characteristics
August and October 2014	RS 500P	Wet and rust tolerant, solvent-free epoxy

Houston Tx, USA, November 2014

A handwritten signature in black ink, appearing to read 'Abdul Majeed', written over a horizontal dotted line.

*Superintendent Mr. Abdul Majeed  
AET Ship Management (USA) LLC.*

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Company registration no 4886504