REPORT

EPO-CHEM™ RS 500P

SOLVENT-FREE, WET & RUST TOLERANT SYSTEM

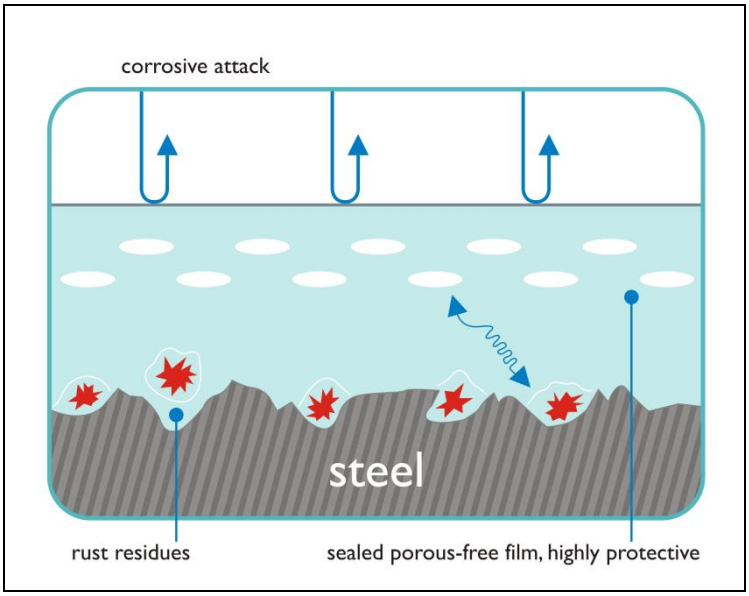
General Industry

July 2018

Contents

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 **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 Health & Safety 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

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 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)
- ABS Certified – IMO PSPC-COT Approved Oil Cargo Tank Coating

CASE STUDIES

CASE STUDY 1: Bridge Refurbishment – Midlothian Council

Case Study

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

Overview

Heavily corroded underside of road bridge required refurbishment with minimal disturbance to the public and with minimum10 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

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Photographs:

- Nos. 1 & 2 Bridge Before Application

Rev: December 2017

Ref: IND01

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

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Photographs:

- Nos. 3 & 4 Bridge After Application

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CASE STUDY 2: Turbine Hall Refurbishment

Fiddlers Ferry Power Station

Case Study

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

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
- 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.

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Photographs

- Nos. 1 and 2 Rope Technicians Preparing For Work

Rev: December 2017 Ref: PG07

CASE STUDY 2: Turbine Hall Refurbishment

Fiddlers Ferry Power Station (cont.)

Outcome

Both the client and the contractor were completely satisfied with the application of the system and the completed work.

Benefits

- Solvent-free
- Water based, environmentally friendly
- Unique system unrivalled in the market
- No delays
- Easy and practical
- Huge cost savings

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Photographs

- Nos. 3 - 5 Application in Progress

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CASE STUDY 3: Potable Water Tank – Basingstoke Hotel

Case Study

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

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
- Restored to "as good as new" condition
- Reduced H&S and Fire Precaution
- No grit blasting
- Substantial time and cost savings

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Photographs
- Nos. 1 & 2 Before application

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

Rev: December 2017

Ref: IND06

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

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Photographs

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

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CASE STUDY 4: Swimming Pool Refurbishment – Cruise Ship

Case Study

Client:	*Royal Caribbean Cruise Lines*	**Industry:**	*Marine*
Vessel:	*Cruise Ship*	**Date:**	*February 2014*
Location:	*Bermuda*	**Products:**	*Epo-chem™ RS 500P & RA 500M*

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

Rev: July 2018

Ref: M33

CASE STUDY 4: Swimming Pool Refurbishment – Cruise Ship (cont.)

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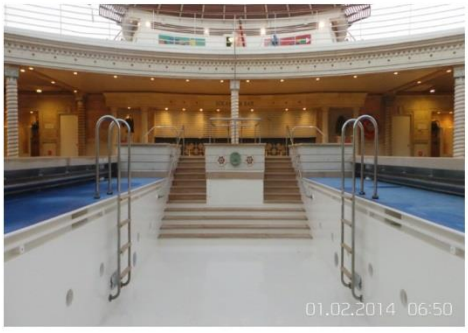

Photographs

- Nos. 4 and 5 First Topcoat Being Applied
- No. 6 First Topcoat Complete
- Nos. 7 - 9 Completed Application

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CASE STUDY 5: External Underground Tank Refurbishment

Rugeley Power Station

Case Study

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 DFTby 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

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Photographs:

- Nos. 1 and 2 The large fire-mains tank after application

Rev: December 2017

Ref: PG03

CASE STUDY 6: Ammonia Pipelines – Chemical Plant

500 series for Ammonia Pipelines

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.

Before – Ammonia Bullet Pipelines

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

After – Coated Pipework

Results

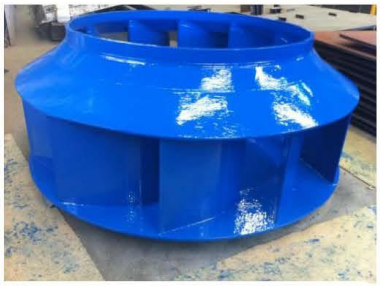
This coating system is relatively new to Australia and is a prime example of innovative technology being used to save the existing plant from the possibility of catastrophic failure. Despite the extreme weather experienced in Queensland and the complex layout, the coating work was finished on time and 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.