REPORT

EPO-CHEM™ RL 500PF

INNOVATIVE WET & RUST TOLERANT

PRIMER/FINISH SYSTEM

(IN ONE COAT)

December 2017

Contents

INTRODUCTION

Chemco Epo-chem™ RL 500PF is a **wet & rust tolerant**, two pack, high solids epoxy that can be utilized either as a one coat primer/finish with good UV resistance or as a high performance coating which can be over-coated with colour topcoats. Furthermore, tests have shown that it is compatible with many aged paint systems, including epoxies, acrylics and other single pack materials. However, it is always advisable when over-coating existing paints to undertake small trial areas before progressing to full scale application.

Epo-chem™ RL 500PF on a sweating, rusty surface

MATERIAL CHARACTERISTICS

Epo-chem™ RL 500PF exhibits the following properties:

- High solids, two pack epoxy, single coat primer/finish
- **Wet, rust & oil tolerant**
- Applicable to hand prepared, blasted or water blasted steel
- Apply and operate at temperatures up to 150°C
- Extensively used for thermally insulated pipes and tanks; exceptional resistance to CUI
- Manufactured to meet the maintenance needs of:
    - Electricity transmission operators for pylons
    - Rail track maintenance for bridges, gantries, etc., where possession times are minimal
    - Chemical industry, structural coating with very good chemical resistance
    - Petrochemical and Offshore. Especially suited to floating tank roofs and tank externals and structural coatings offshore (not weather dependant)
    - Water and sewerage, pipe and tank externals
- Application by brush/roller or airless spray
- Good edge coverage. Reduces need for stripe coating
- Available in a limited range of colours

CUSTOMER LIST (SPECIFIED)

Epo-Chem™ RL 500PF is specified and used by:

BP	Chevron	Corus	Manweb	Marathon
MoD	RailTrack	ScottishPower	Shell	Southern Energy
Talisman	Texaco	TOTAL	Transco	Manweb
Innovene	Kerr McGee	LOR	Exxon Mobil	

HMNB - Faslane (Ministry of Defence Approval)

Oil & Gas Corporation (India)

CASE STUDIES

CASE STUDY 1: Floating Tank Roof – BP Kinneil

Case Study

Client:	*BP Kinneil, Finnart and Dalmeny*	**Industry:**	*Petrochemical*
Scope:	*Floating Tank Roof*	**Date:**	*2003 - ongoing*
Location:	*UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

A number of floating tank roofs at BP Kinneil, Finnart and Dalmeny have been refurbished since 2003 utilising **Chemco's** unique coating solution. This case study will focus on a 4,000m² floating tank roof at BP Kinneil which required a complete refurbishment. This project was carried out by Hertel.

Challenge

The wintry condition of low temperatures, high humidity and showers made these projects a difficult job for the originally specified 3-coat epoxy paint system. A work package of 24 days had been allowed to complete the project.

Solution

Following many other successful applications by the site contractor, **Epo-chem™ RL 500PF** was put forward as an alternative and accepted by the BP project team. The tank roof was high pressure washed to remove salt deposits and other contaminants, and the areas of heavy corrosion were spot blasted or mechanically prepared down to metal. Spot blasted areas were coated with 1 coat of **Epo-chem™ RL 500PF** @ 150µ DFT. Standing water was removed by brush or squeegee and 2 full coats of **Epo-chem™ RL 500PF** @ 150µ was applied overall by brush roller or spray.

Outcome

During the contract, the freshly coated areas experienced many occasions of heavy rain and many puddles of cold water forming within hours of application. The **Epo-chem™ RL 500PF** was left untouched to cure underwater without the necessity of ANY remedial work and **Chemco** guarantee of 16 years was issued, despite the curing condition. This is unique and unheard of in the history of tank roof applications.

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Photographs:

- No. 1 BP Kinneil tank top
- No. 2 Typical level of corrosion on floating roof

Rev: December 2017 Ref: P07

CASE STUDY 1: Floating Tank Roof – BP Kinneil (cont.)

Outcome (cont'd.)

The planned 24 day program was completed in 12 days, offering a huge cost savings as compared to the usual delays due to bad weather. Since the successful completion of this contract, the material has been specified for a number of other tank roofs, tank externals and pipe work in Grangemouth, Dalmeny, Finnart and Kinneil, all with complete success.

Benefits

- Flexibility of surface preparation (any method can be utilised)
- Exceptional **wet & rust tolerant** properties
- Can be applied in any environmental conditions
- Significantly reduced downtime (work programme completed in half the given time frame)
- **Chemco** uniquely guarantee their work.

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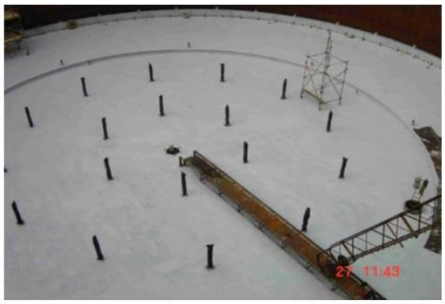

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Photographs:

- No. 3 Completed application: Two coats of Epo-chem™ RL 500PF
- No. 4 Overview of non-slip walkway

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CASE STUDY 2: Electricity Pylon Refurbishment – Scottish Power

Case Study

Client:	*Scottish Power*	**Industry:**	*Power Generation*
Scope:	*Electricity Pylons*	**Date:**	*March 2003*
Location:	*Scotland, UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

Scottish Power sought to replace the current two-coat alkyd system with a material that met the following criteria:

- Single coat application
- Applicable over new or rusty galvanised steel
- Minimal surface preparation
- Surface and moisture tolerant
- Easy to apply by brush
- 10 years maintenance free guarantee

Challenge

The project would be completed in open air and potentially in very poor weather conditions. Grit blasting was not permissible.

Solution

Wire brushing was selected as the surface preparation method to be utilised. This was followed by one coat of **wet & rust tolerant Epo-chem™ RL 500PF.**

Outcome

The project was completed on time, within budget and to the complete satisfaction of all concerned.

Benefits

- **Wet & rust** tolerant properties of **Epo-chem™ RL 500PF**
- No grit blasting
- No delays due to extreme weathering
- Reduced H&S and Fire Precautions
- Reduced contract duration

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Photographs

- Nos. 1-2 Before application

Rev: December 2017 Ref: PG02

CASE STUDY 2: Electricity Pylon Refurbishment – Scottish Power

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Photographs

- Nos. 3-5 After application

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CASE STUDY 3: Ducting - Longannet Power Station

Case Study

Client:	*Longannet Power Station*	**Industry:**	*Power Generation*
Scope:	*High Temperature Ducting*	**Date:**	*November 2003*
Location:	*Scotland, UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

High temperature ducting located at the Longannet Power Station required a new protective coating system capable of being applied and operate at high temperatures.

Challenge

The ducting would be operating at 150ºC during application. There could be no operational shutdown and no grit blasting was permissible.

Solution

Wire brushing was selected as the surface preparation method to be utilised. This was followed by two coats of **wet & rust tolerant Epo-chem™ RL 500PF.**

Outcome

The project was completed on time, within budget and to the complete satisfaction of all concerned.

Benefits

- **Wet & rust tolerant** properties of **Epo-chem™ RL 500PF**
- No grit blasting
- No operational shutdown
- No disruption to others working in close proximity
- Reduced H&S and Fire Precautions
- Reduced contract duration

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Photographs

- Nos. 1-2 External view of large ducting

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Ref: PG04

CASE STUDY 3: Ducting - Longannet Power Station

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Photographs

- No. 3 Before application
- Nos. 4-5 Completed application

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CASE STUDY 4: External Tank Refurbishment – Flotta Oil Platform

Case Study

Client:	*Talisman Energy (UK)*	**Industry:**	*Oil & Gas*
Scope:	*Oil Tank Externals*	**Date:**	*September 2007*
Location:	*UK*	**Products:**	*Epo-Chem™ RL 500PF & Fast-Guard™ RN 500TC*

Overview

The large oil tank required to be blasted and coated externally and have a minimum life expectancy of 16 years.

Challenge

Working without any protection from the elements, no grit blasting feasible (no containment possible) in high humidity and possible rain to a limited timescale.

Solution

Chemco offered a unique solution:
Water blasting and utilising a **wet & rust tolerant** system on tank externals with exceptional track records in major petrochemical sites throughout the world. One coat of **Epo-chem™ RL 500PF wet & rust tolerant** epoxy system @ 150µ by airless spray. Coloured topcoat of **Fast-guard™ RN 500TC** water-based epoxy @ 80µ by airless spray.

Outcome

The technical benefits offered by these systems ensured that the work was carried out on time, within budget and with no major delays.

Benefits

- No delays
- Huge cost savings
- Reduced cost of plant and equipment
- Reduced H&S and Fire Precaution
- **Chemco** system will protect the steel Substrate in excess of 16 years

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Photographs:
- No. 1 Surface preparation by water blasting
- Nos. 2-3 Application of Epo-chem™ RL 500PF

Rev: December 2017

Ref: OG01

CASE STUDY 4: External Tank Refurbishment – Flotta Oil Platform (cont.)

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Photographs:

- No. 4 Application of Epo-chem™ RL 500PF
- No. 5 Finished application

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CASE STUDY 5: Safety Barriers Refurbishment – North Lanarkshire Council

Case Study

Client:	*North Lanarkshire Council*	**Industry:**	*Industrial*
Scope:	*Safety Barriers*	**Date:**	*October 2008, Review June 2011*
Location:	*Cumbernauld, UK*	**Products:**	*Epo-chem™ RL 500PF*

Overview

The Roads Department of North Lanarkshire Council required heavily rusted galvanised safety barriers to be recoated in order to preserve them and improve their appearance in an urban area.

Challenge

Limited access, grit blasting and containment not feasible. Potential wet and damp substrate with no protection from the elements, no disruption or disturbance to public was permissible.

Solution

Hand prepared surfaces by wire brush to St2 followed by one coat of **Epo-chem™ RL 500PF wet & rust tolerant** epoxy **primer-finish** @ 150µ applied by brush and roller.

Outcome

The work was carried out on time, within budget and with minimum inconvenience to the public. Inspected and photographed again in 2011, (page 2) no remedial work was necessary.

Benefits

- **Only Epo-chem™ RL 500PF** could meet all of the customer's requirements
- The **Epo-chem™ RL 500PF** system will protect the steel substrate in excess of 10 years
- Any areas that are damaged later can be touched-up with minimum preparation and there is no over-coating time limitation

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Photographs:

- Nos. 1-2 Before application in October 2008

Rev: December 2017

Ref: IND12

CASE STUDY 5: Safety Barriers Refurbishment – North Lanarkshire Council (cont.)

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Photographs:

- Nos. 3-4 After application in October 2008
- Nos. 5-6 Inspection after 3 years, June 2011

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CASE STUDY 6: Offshore Platform Hull – West Cressida Platform

Case Study

Client:	*Seadrill*	**Industry:**	*Offshore*
Scope:	*West Cressida Platform*	**Date:**	*December 2012*
Location:	*Thailand*	**Products:**	*Epo-chem™ RL 500PF & RC 500GTC*

Overview

In 2012, **Chemco Speciality Coatings** in Singapore were asked to provide a solution to refurbish the West Cressida platform as the existing coating system had failed.

Challenge

Due to the nature of offshore platforms, accessibility to the platforms' hull and living quarter areas would be difficult. With the client's schedule being tight and the **rig being in operation**, water-jetting was the only cost-effective, time-saving alternative surface preparation method to grit blasting which could be used. Due to tropical weather conditions, high humidity would also be a factor.

Solution

A gondola system was used to access the ships hull. For the living quarter areas where the gondola system could not be accessed, rope access was used. With the rig being in operation, high pressure water jetting had to be used to remove the existing failed coating and rust. This process also removed the substantial sea growth and all salt contamination in one operation. One coat of **wet & rust** tolerant **Epo-chem™ RL 500PF** was applied, followed by one topcoat of **Epo-chem™ RC 500GTC.**

Outcome

Utilising water-jetting as the surface preparation method significantly reduced costs and time as **Epo-chem™ RL 500PF** could be applied in any humidity with no dew point restrictions. The **Chemco** system allowed work to be safely conducted at height, with high levels of productivity. The client was extremely satisfied with the speed of the contract and the outcome of the **Chemco** system.

Continued overleaf

Benefits

- No grit blasting
- No disruption to working platform
- No major delays
- Reduced cost of plant and equipment
- Due to **Epo-chem™ RL 500PF's wet & rust** tolerant properties there was no weather constraints
- No humidity or dew point restrictions

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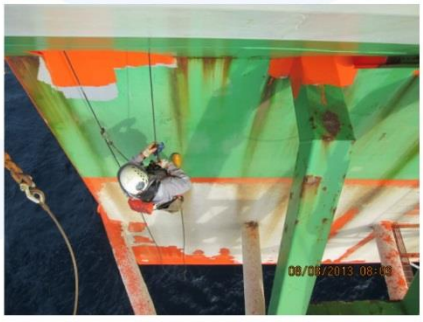

Photographs

- Nos. 1 and 2 Existing failed coatings

Rev: December 2017

Ref: OS04

CASE STUDY 6: Offshore Platform Hull – West Cressida Platform (cont.)

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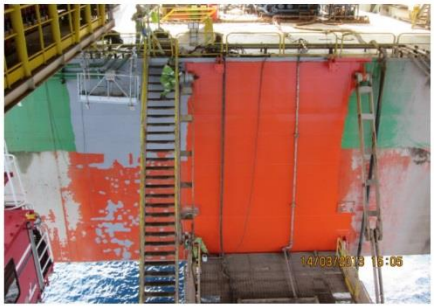

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Photographs

- No. 3 Priming stage on West Cressida's hull
- Nos. 4 and 5 Contrast between original failed coating and new high gloss topcoat
- Nos. 6 - 8 Completed application of Chemco system

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CASE STUDY 7: Loch Side Crane – Scottish & Southern Energy

Case Study

Client:	*Scottish & Southern Energy*	**Industry:**	*Power Generation*
Scope:	*Loch Side Crane*	**Date:**	*June 2004*
Location:	*Invergarry, UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

Loch side crane at Invergarry Hydro Station was to be refurbished in an environmentally friendly and cost-effective way.

Challenge

Total encapsulation, grit blasting and using a conventional 3-coat system, was totally impractical and cost prohibitive.

Solution

Utilising totally **wet & rust-tolerant Epo-chem™ RL 500PF**, all objectives could be achieved. Surface preparation consisted mechanical/power tool cleaning of the substrate followed by high pressure water wash to remove surface contamination. All areas down to metal was patch repaired using one coat of **Epo-chem™ RL 500PF** followed by an overall full coat of **Epo-chem™ RL 500PF** @ 150µ DFT by brush and roller.

Outcome

The work was carried out with no environmental impact, no delays due to weather in a very simple and cost-effective manner.

Benefits

- No grit blasting, encapsulation
- Huge cost savings
- Reduced H&S and Fire Precaution
- Reduced cost of plant and equipment
- Application can carried out in adverse climatic condition without protection

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Photographs:

- No. 1 BP mobile dam crane
- No. 2 Associated crane structural steel

Rev: December 2017 Ref: PG01

CASE STUDY 8: External Doors – Alwyn Oil Platform

Case Study

Client: *TOTAL*	**Industry:** *Offshore*
Scope: *External Doors*	**Date:** *December 2009*
Location: *Alwyn Oil Platform, UK*	**Products:** *Epo-chem™ RC 500GTC & RL 500PF*

Overview

The large external doors of the heli-deck administration building required re-coating with minimal surface preparation and no disruption to the heli-deck area.

Challenge

Working in a very busy area of the platform, minimal surface preparation and limited timescales combined with severe weather conditions.

Solution

A primer coat of **Epo-chem™ RL 500PF** epoxy system @ 150µ and a topcoat of **Epo-chem™ RC 500GTC** epoxy acrylic system @ 100µ by brush and roller.

Outcome

The major technical benefits offered by utilizing this system assured the client that the work was carried out safely, on time and with no major delays to the program.

Benefits

- No blasting required
- No major delays to program
- 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 external door after application

Rev: December 2017

Ref: OS02

CASE STUDY 9: Steel Pipes and Flanges – East Brae Platform

Case Study

Client:	*Marathon Oil*	**Industry:**	*Offshore*
Scope:	*Steel Pipes & Flanges*	**Date:**	*March 2009*
Location:	*East Brae Platform, UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

Heavily corroded steel pipes and flanges required a corrosion protection system with minimal surface preparation and no disruption to a busy production area.

Challenge

Working in a very restrictive area, minimal surface preparation, extreme weather conditions and limited timescale, combined with live hot pipe work.

Solution

Two coats of **Epo-chem™ RL 500PF wet & rust tolerant** epoxy system was applied @ 150µ per coat by brush and roller.

Outcome

The major technical benefits offered by utilizing this system ensured that the work was carried out safely, on time and with no delays to the program.

Benefits

- No blasting
- No delays
- Application carried out on hot pipe work without shutdown
- 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:

- No.1 Steel pipes before application

Rev: December 2017

Ref: OS03

CASE STUDY 10: Pipework – Flotta Oil Terminal

Case Study

Client:	*Talisman Energy (UK)*	**Industry:**	*Petrochemical*
Scope:	*Pipework*	**Date:**	*August 2008*
Location:	*UK*	**Product:**	*Epo-chem™ RL 500PF*

Overview

Large number of pipe work with external coating damage to be refurbished without shut down, grit blasting or weather protection.

Challenge

The harsh weather condition, no grit blasting, live pipe work in a very damp and wet condition added to the difficulties of the job.

Solution

A single coat of **Epo-chem™ RL 500PF wet & rust tolerant** epoxy primer finish system @ 200µ was applied by brush, roller and spray. Minimal or no surface preparation was carried out.

Outcome

The technical benefits offered by this system ensured that the work was carried out on time, within budget and with no delays. Since this project has been completed, other similar areas within the terminal have been specified using **Epo-chem™ RL 500PF**.

Benefits

- No blasting required
- Single coat application
- Application carried out in high humidity
- No delays to program
- Reduced cost of plant and equipment
- Reduced H&S and Fire Precaution
- **Chemco** single coat system will protect the substrate in excess of 10 years

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Photographs:

- Nos. 1-3 Pipes after application

Rev: December 2017

Ref: P11

CASE STUDY 11: Railings Refurbishment – Fermanagh District Council

Case Study

Client:	*Fermanagh District Council*	**Industry:**	*Industrial*
Scope:	*Railings Refurbishment*	**Date:**	*March 2009*
Location:	*Northern Ireland*	**Products:**	*Epo-chem™ RC 500GTC & RL 500PF*

Overview

Public park railings required to be coated without disruption to the public.

Challenge

Working in a very damp environment, to a limited timescale, with no disruption to the public and no grit blasting permitted.

Solution

One coat of **Epo-chem™ RL 500PF wet & rust 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 assured the client that the work was carried out on time, in budget, with no H&S issues and no major delays. More importantly, there was no disruption to the public.

Benefits

- Not weather dependant
- No major delays to program
- Reduced cost of plant and equipment
- Long-term, maintenance-free protection

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Photographs:

- Nos. 1 - 3 Public park railings after application

Rev: December 2017

Ref: IND10