CORROCOAT news

February 2023

A Message from our Managing Director

First and foremost, we'd like to wish you a Happy New Year. Welcome to the latest edition of Corrocoat News. As usual, we have many new and exciting projects to share with you. After almost 50 years in the business, it's great to still be intrigued by the fantastic projects and work which are being undertaken, by Corrocoat, around the globe.

In this issue, our partners in India share a case study on a recent project, repairing and providing energy efficiency for pumps at a sugar factory (pg6). An area of work where we have completed many successful projects around the world.

Our partners in South Africa, Cape Town, bring us a challenging and time sensitive project, to refurbish the steel structure of a Hydroelectric Power Station Penstock. This huge project took 12 months of planning and preparation. Head over to pages 4 and 5 to find out more.

Penstock to flue gas, our partners at Corrocoat Benelux were recently commissioned to coat 300 square meters of new flue gas duct sections, with a diameter of 2200mm. Our glass flake vinyl ester acrylic co-polymer, Polyglass VEF was the coating system selected for this project. Find out more on page 9.

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Image courtesy of Kirloskar Corrocoat Pvt Ltd

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India also showcase the superior resistance offered by Polyglass VEF, within flue gas ducts and associated equipment including sumps, trenches and outlet ducts (page 11).

Within this issue as part of the 'product showcase' feature, we take a look at our Plasmet ZF Aerosol. This unique product offers an easy to apply surface tolerant corrosion protection, with minimal surface preparation. No tools are required and there is no clean up following use. With a simple 'shake and go' action to activate the coating system, this high performance surface tolerant two –pack epoxy coating, delivers effective corrosion protection in an instant. Find out more on pages 2 and 3.

Also featuring in this issue is the refurbishment and protection of a sewage tank from wastewater chemical attack, from our partners in Singapore (page 6), Surface tolerant coating application on a recycled gypsum thickener pipe bridge in the USA (page 7), and the repair of a ballast pump for a major commercial shipping company, here at Head Office in Leeds (page 7).

Corrocoat Hellas, our partners in Greece, share their recent experience exhibiting at one of the world's most prestigious shipping exhibitions (page 6). Back in the UK we share a case study on a recent onsite project, repairing and protecting 3 cooling water systems at a major power station, during two outages (page 8 -9). As ever, lots of exciting projects with exceptional results and benefits to our customers. Here's to us continuing to push the boundaries of innovation, and continuing to provide our customers with even more technical expertise and industry leading corrosion and long-term protection, in 2023.



Graham Greenwood-Sole
Managing Director

Product Showcase

Plasmet ZF Aerosol

Plasmet ZF is a tough, durable rust tolerant coating requiring minimal surface preparation. A polyamide cured epoxy glassflake compound, Plasmet ZF offers long-term resistance to corrosion attack for applications ranging from structural steel, pipework and tank externals. The product can be used in both immersed and atmospheric conditions and as a high quality primer on new and grit-blasted steelwork, for both internal and external applications.

Application

Coating with a Plasmet ZF aerosol takes much less time when compared with brush application. It also ensures that every inch of the surface is covered – even deep and hard to reach areas, which might otherwise be missed.

Key Benefits

Other key benefits that users can expect are even coverage, minimal preparation; there is no longer a need to mix components on-site from separate containers, and no clean-up requirement afterward. In addition, once opened, the aerosol has a long pot life – at least 24 hours, meaning the user has time to complete a number of jobs across a site or installation.

- Surface tolerant corrosion protection
- Minimal surface preparation
- Ideal where grit blasting is not feasible
- Contains rust inhibitor
- No tools or clean up required
- Use up to 24 hours after first mix
- May be used on its own or with suitable topcoat
- Glassflake content provides moisture vapour barrier
- Tough and durable, tolerant of vehicular traffic

NORSOK APPROVED

Corrocoat submitted Plasmet ZF for independent testing to NORSOK Standard M-501, by world leading inspection and testing organisation SGS. NORSOK standards were developed by the Norwegian petroleum industry and describe in detail how to achieve the safest and most cost-effective products in design, engineering, manufacturing and maintenance of structures in the oil & gas industry.

To pass the NORSOK Standard M-501 test protocol, a coating system must demonstrate high levels of protection with a minimum need for future maintenance and health, safety and environmental impact.

Plasmet ZF was tested against System 1 – use on carbon steel with a max operating temperature of <120°C. – structural steel, equipment exteriors, vessels, pipework and valves including in tidal and splash zones and System 3B – internal surfaces of carbon steel vessels – ballast water tanks/ internal seawater filled compartments.

After six-month long exposure tests for cyclic ageing, seawater immersion and cathodic disbondment, the results were received and the coating performed extremely well, passing all tests with flying colours.

As testament to the success of Plasmet ZF, SGS commented that the results on the cathodic disbondment tests were 'exceptional' reporting that they could not even get a knife blade between the coating and steel after 175 days on test!

Watch the Plasmet ZF Aerosol video on our Youtube channel

LONG TERM COST EFFECTIVE PROTECTION AGAINST CORROSION

"Shake and GO" – It's that easy!



MARINE

PIPEWORK

TANKS/ VESSELS

STRUCTURAL STEEL

Refurbishing of a Hydroelectric Power Station Penstock

The Steenbras Hydroelectric Power station was the first of its kind in Southern Africa, and to date has served the city of Cape Town for over 40 years. The hydro-electricity generated is distributed by the local (municipal) grid. Two dams are located at different elevations (300m), connected by a low-pressure tunnel through the mountain, to the high-pressure tunnel / steel penstock 3.8m in diameter, which is buried below ground to reduce environmental impact.

The penstock feeds water gravitationally through four turbines, generating 180MW of electricity for the City of Cape Town. The internals were originally coated with a thin solvent-based epoxy, which blistered. The internal lining was refurbished after 18 years in service with another epoxy lining and blistered again.

Our partners in South Africa, Cape Town, were awarded the tender for the reline of the steel section of the penstock. It took 12 months of planning, design, fabrication and testing to prepare for this challenging and time sensitive project.

Scope of Work

- Corrosion protection of 7600m² of steel penstock pipe.
- Corrosion protection of four draft tubes on the downstream sections / discharge side of the turbines.
- Protection and skimming of sealing surfaces of the sluice gates leading to the four draft tubes.
- Protection of all concrete to steel interfaces.
- Design and installation of work surface access throughout the penstock – this included the elevated horizontal and the angles walkways, cantilevered access towers in vertical sections and bridges over vertical bifurcations.
- Design, building and installation of ventilation and air control devices within the penstock.
- Installation and running of all plant equipment used for the project.



COATING SYSTEM USED

- Corrocoat Zip E – a high solids glassflake epoxy designed for service in immersed conditions.
- Plasmet Underwater Putty and Underwater Laminate – an epoxy glass flake coating system intended for application and cure underwater.

Site Challenges

Access

Only three manholes for access to the main penstock, one of which had a down vertical shaft. Some 120 tons of access equipment had to enter and be removed through these access points. Dedicated rope access teams were assigned to deliver and install anchored walkways on steeply inclined sections, and cantilevered access to towers in vertical sections. Man-riding hoists were on standby for grit removal and emergency evacuation.



Water leaks

Seepage water from the upstream concrete sections of pipe – mechanical blocks were built and water pipes installed at the cracks, to divert water away from the steel section. In certain cases, the coating specification had to be adjusted due to the constant flow of water. Corrocoat's Underwater Epoxy system was successfully applied to these areas.



Draft tubes – water can be seen seeping out of the inclined concrete section, after all water diversions and blocks had been removed.

Rope Access for Large Work surface access

Governed by the severe time constraint, a need to have larger teams working on a section drove planners to customise and use scaffolding at angled sections.

Rope Access professionals were essential to installing the customised scaffold and stair system that allowed a larger work force to work. However, some areas could only be reached via rope access alone.



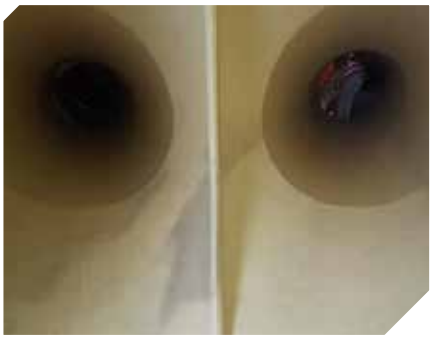
Bespoke scaffold staircase in one of the inclined sections, eliminating the need to work off ropes.



Rope access used for final inspections after access platforms had been removed.

Grit removal

Corrocoat designed Hoggajet pneumatic vacuum systems to remove in excess of 800 tons of blast media from inside the tunnel, at distances of up to 200m from manholes.



Bifurcation leading to two of the our turbines

Air and dust management

The need to work parallel in multiple areas called for the design and installation of air blocking devices and fans, allowing control over air movement direction and dust. The system proved effective enough to control humidity in the pipe, protecting blasted steel from flash rusting.

Safety

The major consideration during planning was to develop work methods that would ensure safety of up to 120 staff working with flammable material, deep inside confined spaces, in dusty conditions, on very steep slopes, above vertical drops, with extremely limited escape routes. A rope-access evacuation team was on standby 24-hours per day.

Despite all of the challenges, work was completed to the full satisfaction of Corrocoat South Africa's client.

Corrocoat Hellas Exhibit at The World's Most prestigious Shipping Event

Over the years Corrocoat have developed our systems and techniques enabling us to provide proven corrosion protection in marine environments, with service lives offered well in excess of 25 years.



Nick (left) & Costas (right) Kountios from Corrocoat Hellas.

Corrocoat Hellas recently participated as exhibitors in Posidonia 2022, one of the world's most prestigious shipping events. Posidonia, the international shipping exhibition, has long been established as one of the major calendar events of the shipping industry and takes place in Athens Greece, every two years.

Following the pandemic-induced disruption of the 2020 event, the return of the biggest event of the shipping community commenced in Athens after 4 years. With a record-breaking number of almost 41,000 exhibitors & visitors in attendance, this really was the marine event of the year.

Corrocoat Hellas was represented by Nick & Costas Kountios, with support from Graham Greenwood-Sole, Corrocoat's Managing Director.

Participating in such a prestigious event was a great opportunity to discuss projects and requirements with both existing and prospective clients.

The team had a very successful week and we look forward to sharing some of the projects, which come to fruition as a result of the exhibition, in our future issues.

Refurbishment and Protection of Sewage Tank from Wastewater Chemical Attack

An international marine client recently commissioned our partners in Singapore, BHM Engg Services, to refurbish and provide corrosion protection for a badly corroded sweage tank. The tank had been in service around 2 ½ years and the client requested an alternative to an epoxy paint system which had already failed, having suffered from chemical attack.

Polyglass Standard; a two-pack cold cured polyester/acrylic co-polymer enhanced with flaked glass, was selected for this project. Polyglass performs extremely well in immersion environments such as marine, aqueous and corrosive chemical environments.

The team began by removing the original coating and then pressure washing the tank at their workshop. It was then grit blasted before the new coating system was applied by airless spray and brush application.

The client was extremely happy with the results and the BHM team were immediately commissioned to refurbish and provide protection for a second tank.

Before







After







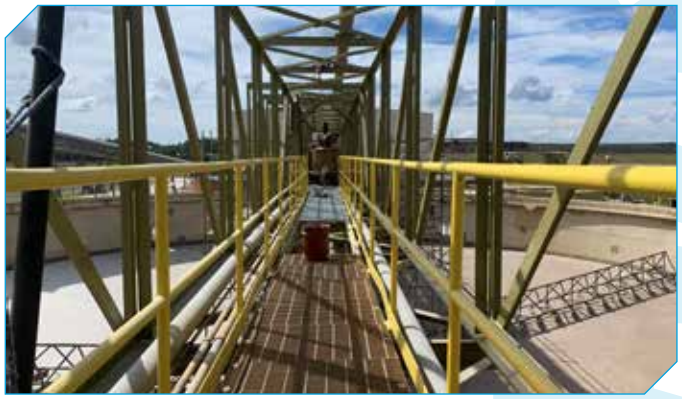
Surface Tolerant Coating Application on Recycled Gypsum Thickener Pipe Bridge

Corrocoat USA were asked to apply a surface tolerant coating system to the structural steel on a pipe bridge, on site at a coal-fired power plant in Florida.

The pipe bridge, spanned a 135 foot (41 meter) diameter thickener tank, which is used to clarify or separate the solids included in recycled gypsum. The solids are transported from the recycling tanks, which are upstream in the Flue Gas Desulphurization System. Once clarified, the gypsum is refined further and then sold to a neighbouring facility, who use the gypsum to make drywall board used in houses and commercial buildings.

The client hired a firm to perform an engineering inspection in the spring and were advised to replace the severely corroded steel members, and apply a suitable corrosion resistant coating to the new and remaining members. The structural steel members were corroded as a result of a reaction with the low pH vapours, that fume up from the tank beneath.

As this tank is integral to the power generation process, the project was completed during an outage. Corrocoat USA had only 2 weeks to complete the project, which included 4,700 square feet (432 square meters) of structural steel, many of which were small angles, channels and I-beams.



Working off scaffolding, the crew executed a surface tolerant specification that included pressure washing and spot preparation using angle grinders and needle guns. They then primed with Plasmet ZF; a surface tolerant two-pack epoxy coating compound incorporating a rust inhibitor and passivator, with MIO (micaceous iron oxides) and glass flake for increased protection. This was then over-coated with Corrothane AP1.

It took 8 men thirteen consecutive days, working long hours, to complete the project to the satisfaction of the customer. The team completed the project one day ahead of schedule, an impressive feat considering the intricacies/ geometries of the project.

Repairing Ballast Pump for an FPSO

Corrocoat was approached by a client; a major commercial shipping company, to repair a badly damaged ballast pump casing. The pump had sucked in a large item that had cracked open the casing at the bottom of the suction chamber.

Following arrival at the workshop, the affected area was cut out and a new bronze plate was attached using specialist welding techniques. The volute casing surface was then abrasive blasted to Sa2 ½ surface finish to provide a minimum surface profile of 50 microns. A two-pack cold cured vinyl ester laminating resin was then applied on the inside and outside of the affected area, to re-profile and add strength to the area.



Damaged ballast pump

Finally, the casing was coated with Corroglass 600 series to a DFT of 1.25mm inside and coated to the requested RAL outside. The professional preparation and repairing of the casting before coating and the use of Corroglass 600 will ensure the casting will be in service for many more years. Designed to provide protection against erosion corrosion in immersed environments, the product is outstanding in its performance, and can be used in many areas of application to build thick layers. It can also be moulded and machined.



Resin laminate on damaged area

The professional preparation and repair of the casting before coating and the use of Corroglass 600 will ensure that the casting will be in service for many more years. The specialist coating used, is designed to provide protection against erosion corrosion in immersed conditions.



Repaired ballast pump

Project Completed for Power Station During Major Outage

A large UK power station started a project to service and repair 3 cooling water units at their power station in the UK. Work was required to be completed during three outages, all carried out in 2022. A fully trained 10 man site team, working a 24hr rota, was provided in order to complete the work to the required completion date.

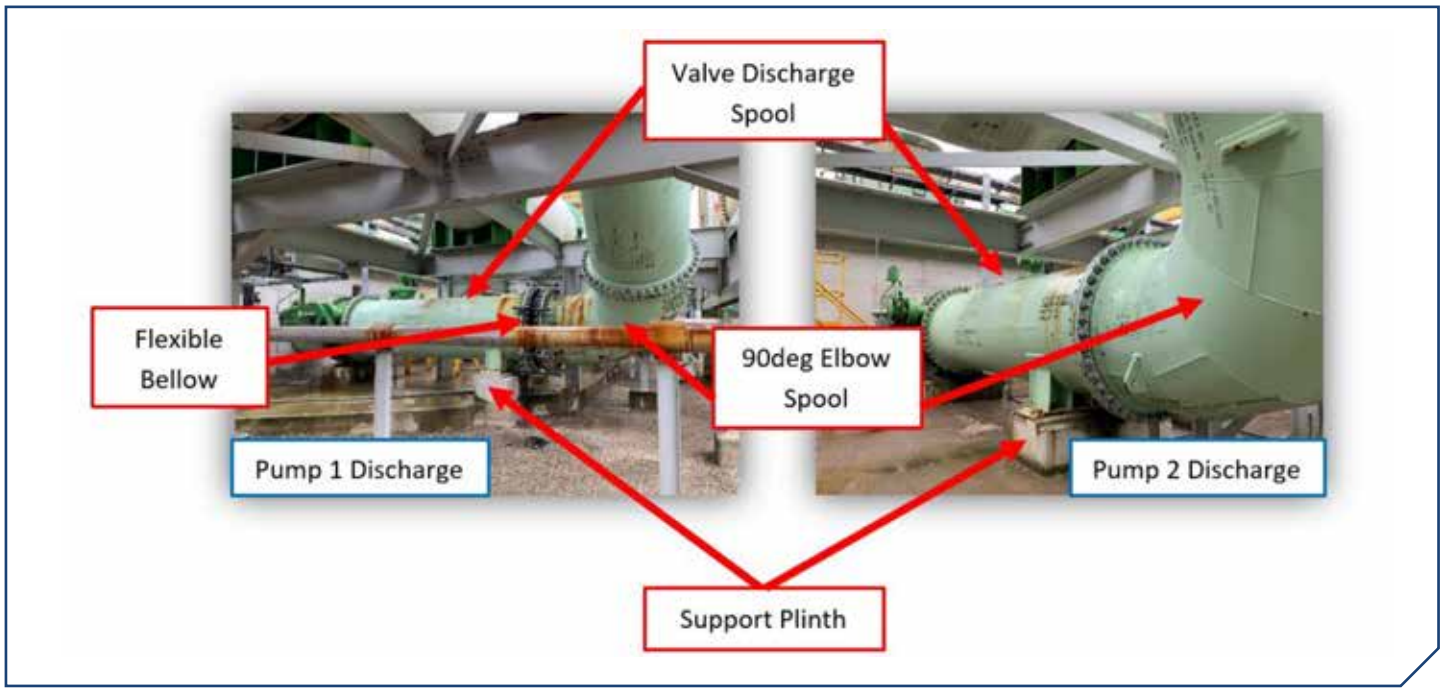
Due to the nature of the Penner System at the plant, and the length of the pipe spool, which spanned over 15m, the project required specialist equipment. This included a crane, slings and lifting equipment. It also required a confined space rescue team, associated access equipment, as being able to ensure safety on site was a key parameter in securing the contract.

Pipework

In order to gain safe access to the main cooling water pipeline, the team removed 4 off 54" butterfly valves. Within the contract these valves where then inspected and repaired as required. Over 3 tonnes of silt and other contaminants where then cleared from the pipes.

Ultra high-pressure water cleaning units were then used to remove the existing rubber lining. The rubber lining was found to be in poor condition, showing signs of erosion on the bends and main stream pipework, and undercutting in some of the flange areas.

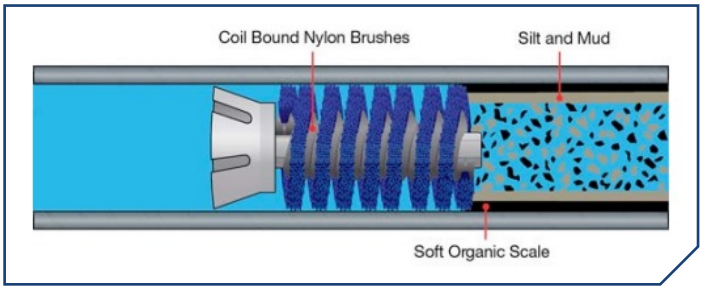
The pipes were inspected prior to abrasive blasting to prepare the substrate for coating application. The specified coating system of Polyglass VEF and Corrocoat Armagel were applied to protect the substrates from seawater with a high silt content.



Condenser Cleaning

Manway doors were removed to improve access and the condenser water-boxes ultra-high pressure cleaned, to remove the existing lining. The condenser tubes were then cleaned using 'tube bulleting'. Nylon brushes were used to remove all material from 18000 condenser tubes. The tubes were then dried using foam projectiles. A light test was carried out to identify any blockages

After protecting the condenser tubes against damage, the condenser tube face and water box were blasted, prior to application of Polyglass VEF to provide full corrosion protection against the seawater.



Mechanical Works

104 anodes were removed, inspected and replaced where required, including the anode holders. The waterbox shell, handles, doors and drains were also inspected and replaced or repaired as required.

All work was completed on time, to budget and with no safety issues.









Protection for 300 Square Meters of new Flue Gas Duct Sections

Our partners at Corrocoat Benelux were recently commissioned to coat 300 square meters of new flue gas duct sections, with a diameter of 2200mm.

The sections were intended for an energy from waste plant and required a coating which could protect the steel against flue gases. Corrocoat Benelux have a long standing relationship with the client, who specialise in fabrication of this type of equipment, and have worked with them on numerous projects over the last 10 years.

The project was carried out at the Corrocoat workshop, and took a team of 4 men, under 2 weeks to complete. The sections were blasted internally and externally to Sa2 ½. A surface profile of approximately 70 microns was acheived on the internals, which was then coated with Polyglass VEF using airless spray application. Polyglass VEF is a glass flake vinyl ester acrylic co-polymer, which has superior resitance to chemical attack and high temperature resistance. The externals were coated with 1 layer of Plasmet ZF which once again offered superior resistance in a chemical environment.





Refurbishment & Protection for Pumps at Sugar Factory

India is not only the largest consumer of sugar in the world, it is now also the largest producer of sugar, displacing Brazil. The Indian sugar industry is the second largest agro-based industry in India.* With this in mind, our partners in India, Kirloskar Corrocoat Pvt Ltd (KCPL), regularly work with clients in the sugar industry, providing refurbishment, repair and corrosion protection for plants and ancillary equipment. Kirloskar Corrocoat have applied Fluiglide E to more than 500 pumps in the sugar industry: providing improved efficiency, along with corrosion protection, to considerably extend the life of the pumps.

Fluiglide was featured in the product showcase in the last edition of Corrocoat News. These energy-efficient products maximise the performance of pumping systems used in power generation cooling water systems, water & waste treatment and process industries worldwide. They also provide an effective corrosion barrier, preventing early fall-off in performance due to nodular growth, corrosion and surface roughness.

KCPL recently worked with a client/sugar factory in the populous state of Maharashtra. They took on a project to refurbish and protect 5 injection water pumps (ranging from 6" to 16") with Fluiglide E, with the aim of improving overall efficiency.

The below images show the top and bottom casing and the impeller.









Note, the wear ring portions and bore ID area were totally damaged by erosion & corrosion. The hydraulic portion of casing was in a heavily damaged condition

*source = indiancompanies.in

For the refurbishment work, the internals were grit blasted in accordance with ISO-8501 to Sa2 ½ surface finish, and then coated using Fluiglide E, applied by brush to a minimum DFT of 1.2mm. The pitting and cavities were filled with Corrocoat EA; a viscous, solvent-free, high build, two pack epoxy coating with excellent erosion resistance, toughness and outstanding anti-corrosive properties.









The internals were then spark tested at 10kV. The externals were also grit blasted to Sa2 ½ surface finish and coated with a standard epoxy paint for aesthetic effect only, as requested by the client. Bearings and wearing rings were replaced, and the pumps were reassembled using new fasteners, gaskets and fixings.



Assembled pumps awaiting dispatch to the client.

FGD Tanks, Sumps, Trenches & Outlet Ducts

India's enormous energy needs are compelling a huge expansion of its installed power capacities. In response to the environmental implications of these high targets, the Indian Power Ministry has mandated clean coal technologies for the new generation of power plants, and has implemented major emission controls for existing plants, including installing flue gas desulfurization (FGD) systems.

One of the world leading FGD technology providers received numerous orders for installations of FGD Systems, from a national thermal power provider. The technology provider contracted our partners in India, Kirloskar Corrocoat Pvt Ltd (KCPL), to provide corrosion protection for FGD tanks. One of the projects also included work on roller compacted concrete (RCC) sumps, trenches, tanks and the outlet ducts of an absorber.

Surface preparation and coating application for RCC surfaces, ie sumps and trenches were as follows:

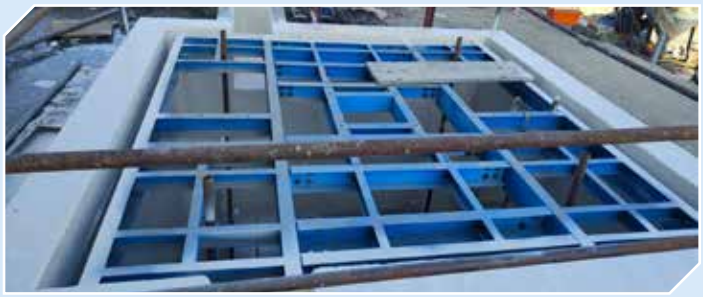
Surface Preparation

Abrasive blasting as per SSPC SP 13 / NACE No. 6 & SP 5 Data Sheet for Concrete Substrate requirement for coating.

Coating Application

- Airless Spray application of PPA at 100 microns / Polyglass VEF at 600 microns
- Brush application for stripe coating of Polyglass VEHA
- Hand applied laminating resin 600 and glass fibre matting.
- Airless spray application of Polyglass VEF at 1.22 mm DFT = Total 3mm dry film thickness (DFT).



The surface preparation and coating application for the metallic substrates and equipment, ie tanks and outlet duct of an absorber, are outlined below:

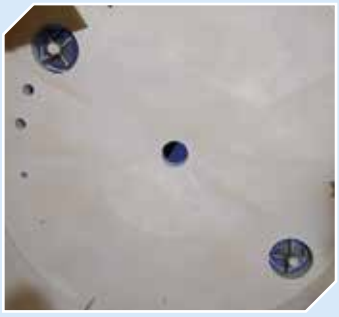
Surface Preparation

Abrasive blasting as per SA 2.5/ NACE No. 2/SSPC-SP10

Coating Application

- Airless Spray application of Polyglass PVV at 100 microns / Polyglass VEF at 600 microns
- Brush application for stripe coating of Polyglass VEHA
- Hand applied laminating resin 600 and glass fibre matting @ 1.2 mm DFT.
- Airless spray application of Polyglass VEF at 1.22 mm DFT.
- Total 3mm dry film thickness (DFT).






KCPL completed 3 out of the 5 projects assigned to this works contract. The last two projects were completed in October 2022, in line with the client's schedule.

CORROCOAT news

We recently created a digital archive displaying all of our issues of Corrocoat News. Head over to https://www.corrocoat.com/corrocoat-news/ where you will find issues of our company newsletter dating back to 1986: when we first started sharing exciting news from the company.

From new team members to new global partners, and the development, manufacturing and initial testing of glassflake technology, to the projects currently undertaken at our Research and Development Division in our Leeds Head Office, Corrocoat News helps highlight exactly why we are renowned for our products and services worldwide.



Farewell to Our Works Director

In our last issue we mentioned our Works Director was retiring following 32 years at the company. We said our final farewell and wished Nigel Riley all the best in his retirement. Here is with our CEO and Technical Director, Charles Watkinson, and the rest of the Corrocoat Head Office Team, at his retirement presentation.



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Corrocoat – Leading the Field

Since 1974, **Corrocoat** has led the way in anti-corrosion coatings. Our products have helped protect all kinds of industrial giants – some of the biggest names operating in power generation, oil and gas and petrochemical industries – from the harmful effects of corrosion.

At **Corrocoat**, we save our customers from expensive replacement costs. From traditional paints that repair and maintain, to unique glass flake coatings which excel in advanced corrosion protection.

Whatever the industrial sector, and whatever the application, we have a bespoke product and a specific set of skills to help. With a blend of high-grade solutions and highly-technical expertise, we're proud to provide corrosion engineering and long-term corrosion protection to all.

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