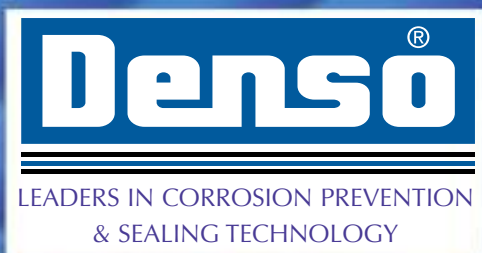




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Denso systems used to tie-in to existing pipeline coatings on the Parmelia Pipeline, Australia
- See story page 11.

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LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

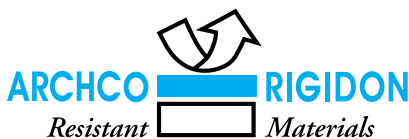
Archco-Rigidon Lining Protects Cristal Tank

Hertel (UK) of Middlesborough, part of the Hertel leading international services company, are long-term users of Archco-Rigidon 403D glass-flake vinyl-ester coatings.

One of the companies that Hertel has regularly been contracted to line internal surfaces of pipework, tanks and vessels for is Cristal of Immingham, (formally known as Cristal Pigments). The latest project was to line a large tank that contains an agitator for one of Cristal's processes.

Following blast cleaning at Hertel's premises of the internal surfaces of the tank to the Sa2½ near white metal standard, the first coat of Archco-Rigidon 403D was applied to approximately 1000 microns. A final 250 microns coat of Archco-Rigidon Blue Wax Topcoat was then applied.

Final thickness readings were taken and full holiday detection was carried out to ensure the work was in line with the specification requirements.



Project Summary

Product type:
Industrial Linings

Country: United Kingdom

Object: Mixer tank

Problem: Internal lining

Product

solution: Archco-Rigidon 403D

For quick identification of the relevant product type used in each story we have used the following colour codes:

Protective coatings for.....

- BURIED PIPELINES & LPG VESSELS
- EXPOSED STEEL & PIPEWORK
- SUB SEA PIPELINES & JETTY PILES

Protective linings for.....

- STORAGE TANKS, PUMPS ETC

Sealing & waterproofing.....

- SEALING MASTICS
- MEMBRANES & FLASHINGS
- INDUSTRIAL TAPES



The Cristal mixer tank lined with Archco-Rigidon 403D by Hertel (UK).



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Large Water Project Protected with the Denso Petrolatum Tape System

In January 2016 during the construction of a large water facility on the gulf coast of Texas, concerns arose pertaining to the bolted connections and their vulnerability to corrosion.

The Denso Petrolatum Tape System was chosen to add protection to more than 80 large valves, reducers and various connections of pipe ranging from 20 to 30 inches in diameter.

The three step system comprised of Denso Paste,

Denso Profiling Mastic and Densyl Tape was easily applied to various irregular shapes and profiles much to the contractor's satisfaction.

The owner has specified Denso products on a number of projects over recent years, and

Project Summary

Product type:
Coating for Buried Pipes

Country: USA
Object: Large valves
Problem: Corrosion prevention
Product solution: Denso Petrolatum Tape System

the success of this application only added to the confidence of engineers and contractors that the system will provide the long term corrosion protection they desire.



The surface was prepared in accordance to SSPC SP-2/SSPC SP-3 prior to application of the Denso Paste.



Application of the Denso Profiling Mastic creating a smooth profile for the Densyl Tape.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



Application of the Densyl Tape which was cut into strips over the Profiling Mastic on the flanges.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Protects Buried Pipe and Fittings in New Light Rail System

As southern Ontario continues to experience rapid growth and development the municipalities of Kitchener, Waterloo and Cambridge, which exist within the Region of Waterloo, concluded that a more advanced public transit system is necessary.

Started in August 2014 and expected to be operational in early 2018 is the light-rail transit system called "ION".

The ION transit system will connect three important municipalities with a population of over 500,000, which are hubs of technological development, education and culture. The system will span 37 kilometers with 19 stations at completion. When done, the system will tie together with re-aligned bus routes and connect other established public transit systems like GO Transit and VIA Rail trains.

The construction is being undertaken by Grandlinc which includes Plenary Group Canada; Meridiam Infrastructure Waterloo; Aecon; Kiewit; Mass Electric Construction Canada; Keolis; STV Canada Construction; AECOM and CIBC World Markets.

Though the project continues to be controversial, it is one that



A new valve ready for installation.

demonstrates a commitment to developing environmentally sustainable modes of mass transit with all 14 rail cars being

electrically powered.

The work has been slow and challenging as excavation in the heart of these century-old cities unearths many unexpected finds from old rail lines to sanitary systems unmarked on any map. The materials of construction have also been varied as designers have had to contend with contaminated soils which put PVC piping at risk ultimately employing hundreds of meters of new ductile iron piping in addition to all of the metal fittings.

Below: Voids and awkward angles on the valve are first filled with Denso Profiling Mastic.





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



Project Summary

Product type:
Coating for Buried Pipes

Country: Canada
Object: Ductile Iron Pipes
Problem: Corrosion prevention
Product solution: Denso Petrolatum Tape System

With a project as grand as this and with a price tag of over \$790 million dollars, corrosion prevention was one of many major concerns for this new infrastructure. The designers of the development enlisted Denso to provide the Denso Petrolatum System to protect the buried ductile pipe and all of the fittings both direct buried as well as within chambers. This project, which remains in progress, requires the replacement of kilometers of water distribution piping and installation of new valves and fittings with sizes in the 600mm range.

Denso is proud to contribute to a leading-edge project which will carry thousands of people every day to work, school and home all while utilizing environmentally sustainable technology. The Denso Petrolatum System will protect the municipal infrastructure that supplies all of those people for generations to come.

Left: The valve is wrapped with Denso Petrolatum Tape to complete the protection

Below: After the Denso system is completed the valve is buried.





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Maltby Beck Proves Long-Term Service Life of Denso Steelcoat Systems

In 2005 Advanced Engineering Solutions of Cramlington applied the Denso Steelcoat 100/400 System to the outside of a pipebridge at Maltby Beck for Northumbrian Water. During a further application of the same system to an adjacent pipebridge this year (2016), Denso took the opportunity to inspect the system that had been previously applied.

The company reports that apart from some dirt and moss on the pipe, as expected the 2005 applied system is still functioning extremely well and will continue to protect the structure for many years to come.

Prior to the latest application of the Steelcoat 100/400 System to the adjacent pipebridge, the residue of the previous coating was removed by hand surface preparation carried out to St2 standard.

The Denso Steelcoat 100/400 System consists of Denso Hi-Tack Primer followed by Denso Profiling Mastic to fill voids and smooth profiles etc. This is followed by a wrap of Denso Hi-Tack Tape overwrapped with Denso Ultraseal Tape and then finally coated with Denso Acrylic Topcoat.

Below: Close up of the completed 2016 Denso Steelcoat System with sage green Topcoat finish.



Project Summary

Product type:
Exposed Steel Coating

Country: United Kingdom
Object: Pipebridge
Problem: Corrosion prevention
Product solution: Denso Steelcoat 100/400 System

Below: The original 2005 Denso Steelcoat protected pipebridge in the foreground with the new application underway to the pipebridge in the background.





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



Above: The original 2005 applied Steelcoat 400/100 System. The photo was taken in 2016 showing a little moss and dirt accumulation as to be expected.

Below: The completed 2016 Steelcoat 400/100 System in sage green finish.





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Protal Used in Gas Pipeline Valve Station Remediation

McConnell Dowell Constructions were engaged by APA Group for the remediation of 26 Valve Stations along the Amadeus Gas Pipeline which runs between Darwin and Mereenie in the Northern Territory and spans 1625km in length.

The Stations consisted of 9 x MLV Stations, 4 x Off Takes, 5 x Metering Stations and 8 x Scraper Stations where predominantly Coal Tar Epoxy (CTE) was Blasted off to SA 2 ½ Finish.

Protal 7200 was the system of choice for APA Group and McConnell Dowell and proved to be an economical, high quality application where it was applied through Plural Spray application on pipe work and cut in with brushes on the valves and flanges.



Where Transitions between Above and Below Ground took place, Denso S43/R23 Tape System was used in line with APA Group's Buried Pipeline Specification.

The Project saw the supply of over 5,000 Litres of Protal 7200



Pictures: All steel parts of the valve stations were protected with Protal 7200.



Project Summary

Product type:
Coating for Buried Pipes

Country: Australia
Object: 26 Valve Stations
Problem: Corrosion prevention
Product Protal 7200 & Denso
solution: S43/R23 System

coating approximately 1,300 square meters of pipeline ranging in size from 50mm to 500mm in diameter and was conducted over a 14 month period from July 2015 – September 2016.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Tape System Protects Pipeline Joints

Parmelia Pipeline, Eneabba – 278km North of Perth, Australia managed by APA Group was supplied with Denso S43/R23 tape system, which was used to tie-in with the existing pipeline coating.

The complete product range used on this project consisted of:

- S43/R23 Tape System
- Petrolatum Tape System
- Glass Outerwrap Tape System

This range of products was decided to be the best option for this project, as APA wanted to ensure that the chosen protective coating system would withstand the natural backfill being used. The hot tap section of the pipeline also needed to be protected in a tape system that could be removed at a later date for on-going inspections. Glass outerwrap was used to provide additional impact protection over the petrolatum tape system.

Project Summary	
Product type: Coating for Buried Pipes	
Country:	Australia
Object:	Pipeline Joints
Problem:	Corrosion prevention
Product solution:	Denso Petrolatum Tape & R43/R23 Systems



Application of the Denso Petrolatum Tape System.

APA personnel on-site were highly knowledgeable with the Denso range of products and required very little training during application and the project was completed on the same day without any issues.



Application of the Glass Outerwrap System.



Application of the SA PVC Tape.



Protection of a joint and tie-in to existing coating underway.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

28 Year Case History on Fire Water Mains Protection at Precious Metals Refinery

Anglo American Platinum is the world's leading primary producer of Platinum Group Metals (PGMs). They provide a complete resource-to-market service, supplying their network of global customers with a range of mined, recycled and traded products.



The original outer wrap damage was partly caused by the backfills and recent excavation.

The aim of the inspection was to determine the condition of the fire water mains, (protected by Denso), since its installation in 1988. The current condition of the pipe would act as an important assessment to ensure the continued supply of fire water and to assess possible maintenance required after 28 years.

Three areas were marked up for excavation and the results of these excavations would determine the remedial action going forward. All three excavations found the Denso outer wrap to be slightly damaged which was partly caused by the original backfilling and recent excavation of the trench. No damage was noticed on the Denso Petrolatum Tape inner wrap which was still found to be saturated with the petrolatum compound.

The entire coating system was removed and the pipe surface was cleaned. No corrosion whatsoever was evident after 28 years since its installation in 1988. The inspections reflected an excellent coating system



The pipe still in perfect condition - immediately after the removal of the original Denso system and still showing a layer of petrolatum compound.

which was applied as per the specification. This highlights the importance of recommending the correct coating system and applying the material in strict accordance with the specification.

A 6" tie-in was then subsequently done for a fire water system installation at the Main Store using the original system supplied back in 1988!

Denso Petrolatum Tape System Used:

- Denso S105 Paste
- Denso Petrolatum Tape
- Denso MDP Outer wrap



After cleaning, the pipe was re-coated with the Denso Petrolatum Tape System using a 55% overlap of the tape.



The new tie in, also wrapped in the same Denso Petrolatum Tape System used in 1988.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

SeaShield Jackets Out-perform Concrete Mortar Protection

Pipeline Protection (NE) Ltd has used eighteen SeaShield jackets in an unusual application as part of the protection of the Jurby outfall pipe in the Isle of Man. This outfall discharges foul effluent from Manx Utilities' nearby treated waste water plant.

The forty metre beach length of the pipe was originally protected against corrosion with a factory-applied polyethylene coating some five years ago. In order to resist the erosion of the coating and the pipe by a combination of wind-borne and water-borne sand and gravel particles in this extremely aggressive environment, a fibre cement mortar was applied.

In July of this year an inspection by Pipeline Protection (NE) revealed that the fibre cement had been eroded in most areas and particularly in the intertidal zone. It was here that the SeaShield 100 jackets were then applied. Their structure consists of HD polyethylene sheeting, and they

also have excellent resistance to uv radiation.

In early October a further inspection indicated that erosion of the outfall had been checked.



Above: Damage to the cement mortar on the Jurby outfall pipe.

Below: The Jurby outfall pipe now protected with SeaShield 100 Jackets



Project Summary

Product type:
Sub Sea Splash Zone Coating

Country: Isle of Man
Object: Outfall pipe joints
Problem: Corrosion prevention
Product solution: Denso SeaShield 80 System

A senior engineer at Pipeline Protection said: "The SeaShield jackets still looked very good."

The jackets are normally used as part of Winn & Coales SeaShield 100 system which was specifically developed for anti-corrosion protection in splash and intertidal zones, including for exposed pipes. In this main use the system consists of Denso Paste S105, Marine Piling Tape, SeaShield jackets and Smartbands for fixing. This seals the substrate against oxygen and water, preventing corrosion.





Premier System Protects Buried Couplings in Qatar

During works for the Expressway Program West Corridor 010 (Package 1) project in Qatar in November 2015, a Premier Coatings Ltd corrosion prevention system was used to protect numerous carbon steel coupling joints that were destined to be buried.

The carbon steel couplings were used to connect a GRP pipe one side to a concrete inspection chamber the other.

The Premier System was selected for the long-term protection of the couplings based on numerous successful Middle East case histories over the past 20 plus years.

The system comprises Premcote Primer applied to the coupling surface, Premier Joint Moulding Putty used to fill voids and smooth profiles ready for overwrapping with Premcote 1500 Tape.

Project Summary

Product type:
Coating for Buried Pipes

Country: Qatar
Object: Steel couplings
Problem: Corrosion prevention
Product solution: Premier Premcote Tape System



Above: After cleaning, the coupling is primed with Premcote Primer.



A circumferential wrap of Premcote 1500 Tape completes the protection. Inset shows Premier Joint Moulding putty used to smooth profiles.



CORROSION PREVENTION & SEALING TECHNOLOGY

Premier Protection for Qatar Water Transmission Pipeline

76km of DN1600 buried water transmission pipeline associated with the Qatar Economic Zone (QEZ) Desalination Plant was recently protected with the Premier Premcote Tape System.

Contractors Sinohydro used the effective Premcote 1500 Tape System to protect this buried ductile iron water pipeline based on 20 plus years of successful applications of the same Premier system.

After cleaning, a coating of Premcote Primer is applied followed (when dry) by an overwrap of Premcote 1500 Tape, completing the protection.

Below: Close-up of finished application of the Premcote Tape System.



Above and Below: The Premier Premcote System protected pipelengths are laid out prior to installation on-site.



On completion of the wrapping and in accordance with the clients specification a blue colour polyethylene sleeving was applied over the Premcote 1500 Tape to provide temporary UV protection prior to the laying and back filling of the ductile iron socket and spigot pipes.

Below: The Premier protected water transmission pipeline is finally buried.



Project Summary

Product type:
Coating for Buried Pipes

Country: Qatar
Object: Water pipeline
Problem: Corrosion prevention
Product solution: Premier Premcote Tape System

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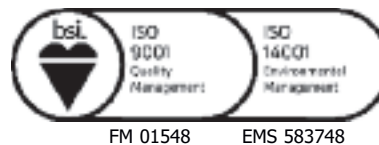
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