

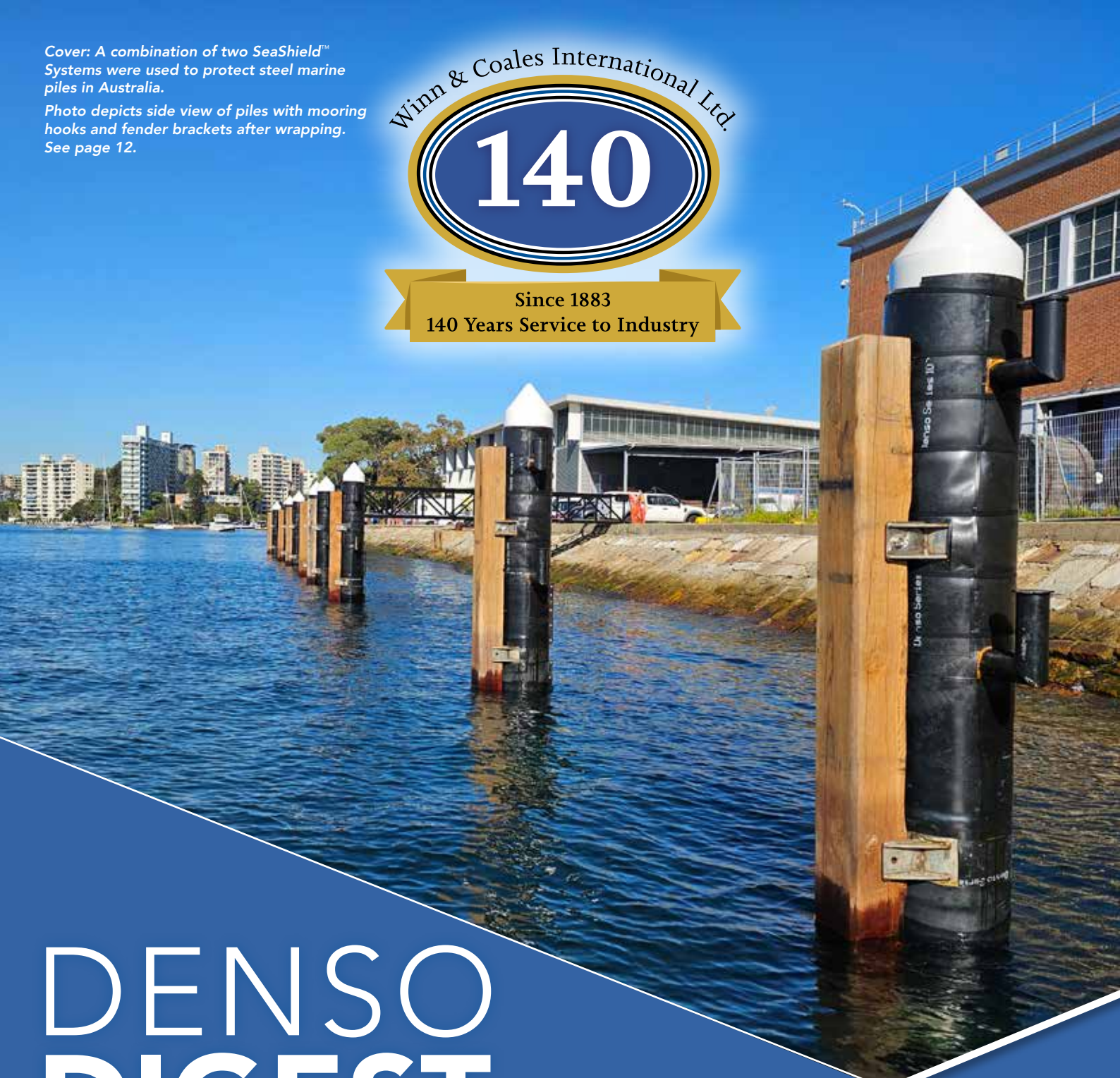
Cover: A combination of two SeaShield™ Systems were used to protect steel marine piles in Australia.

Photo depicts side view of piles with mooring hooks and fender brackets after wrapping. See page 12.

Winn & Coales International Ltd.

140

Since 1883
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DENSO DIGEST

Winn & Coales International Ltd

Volume 37, Number 2


SeaShield™

Denso®

WINN & COALES INTERNATIONAL

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Denso Gives Product Application Training to ADNOC Onshore's Contractor - TARGET



Denso technical staff recently provided an in-situ expert product demonstration and training course on the application of their DensoPol 80HT System to ADNOC Onshore's contractor TARGET.

The training was required because Denso have supplied ADNOC with their products for extensive use in the protection of oil pipelines throughout Abu Dhabi.

ADNOC requested this service because they understand the importance of the application of Denso products in accordance with manufacturers Winn & Coales (Denso) Ltd latest 'Instructions for Use' literature.

Denso training courses are crucial so that contractors can learn the right application methods for obtaining both maximum service life and level of protection from the applied Denso systems.

Above: DensoPol 80HT™ is applied over Denso Primer D™.

Below: Denso PVC SA Tape™ is then applied to the pipe lengths over the DensoPol 80HT™ for extra mechanical protection during transportation.



PROJECT SUMMARY

Product type:
Coatings for Buried Steel

Country: Abu Dhabi
Operation: Training course for coating pipeline
Problem: Corrosion prevention
Product Solution: DensoPol 80HT™ System

Denso Bore-Wrap™ Protects Power Station Gas Pipeline During Horizontal Directional Drilling (HDD) Installation



Denso Bore-Wrap™ 'Abrasion Resistant Outerwrap' is applied over the existing pipe coating to provide protection against impact, gouge, abrasion and fracture.

BORE-WRAP™

PROJECT SUMMARY

Product type:
Coatings for Buried Steel

Country:	N. Ireland
Object:	Power station gas pipeline
Problem:	Pipe protection during HDD install
Product Solution:	Denso Bore-Wrap™ System

GMC Utilities Group recently used Denso Bore-Wrap™ supplied by Winn and Coales (Denso) Ltd on sections of a 2.7km gas pipeline which was being constructed to provide Gas to Kilroot Power Station which is situated on the north shore of Belfast Lough.

The contract secured by GMC with their JV partner Rayden Engineering was part of a £600m scheme to transform the coal fired power station into a new low carbon energy park.

The 2.7km welded steel pipeline from Marshallstown AGI to Kilroot AGI was mainly installed by open cut

methods, but at road crossings including one on the A2, the pipe was installed by HDD.

To ensure that the integrity of the anti-corrosion coatings on the pipe was maintained, GMCR Project Manager, Richard Kyle had Denso Bore-Wrap™ applied to these sections prior to pulling the pipe under the roadways.



Denso Bore-Wrap™ is applied spirally with a 55% overlap to the pipe, followed by the application of Denso Polywrap™ to aid curing of the Bore-Wrap™.

Denso Bore-Wrap™ is an Abrasion Resistant Outerwrap (ARO) which has outstanding performance against impact, gouge, abrasion, and fracture. Bore-Wrap creates a superior sacrificial outer laminate layer, which protects both pre-approved field joint coatings and mainline coatings (such as, liquid epoxy coatings, heat shrink sleeves, 3LPE, 3LPP and FBE coatings) from damage during pipeline installations, in difficult terrain or by means of trenchless



View of pipe after it had been pulled under the roadway. Denso Bore-Wrap™ is still intact so there is no damage to the pipe coating.

installation methods, such as directional drilling, HDD or boring.

Denso Bore-Wrap™ is easily applied in the field; there is no mixing required, it is simply wrapped over the existing pipeline coating and cured with water. Due to its flexibility and exceptional level of mechanical protection, Bore-Wrap™ minimises the need for costly spot repairs or re-pulling pipe from damage.

The Denso Bore-Wrap™ is applied to the pipe then sprayed with water triggering the curing process that turns it into the abrasion resistant outerwrap.



Denso Bore-Wrap™ Protects Wastewater Pipeline in River Crossing HDD



BORE-WRAP™

PROJECT SUMMARY

Product type:
Coatings for Buried Steel

Country: Canada
Object: Wastewater pipeline
Problem: Protection during pull under river
Product Solution: Denso Bore-Wrap™ System

Denso Bore-Wrap™ is applied to the wastewater pipeline to protect against abrasion, during the pull back carried out in a directional drilling operation under the Fraser River.

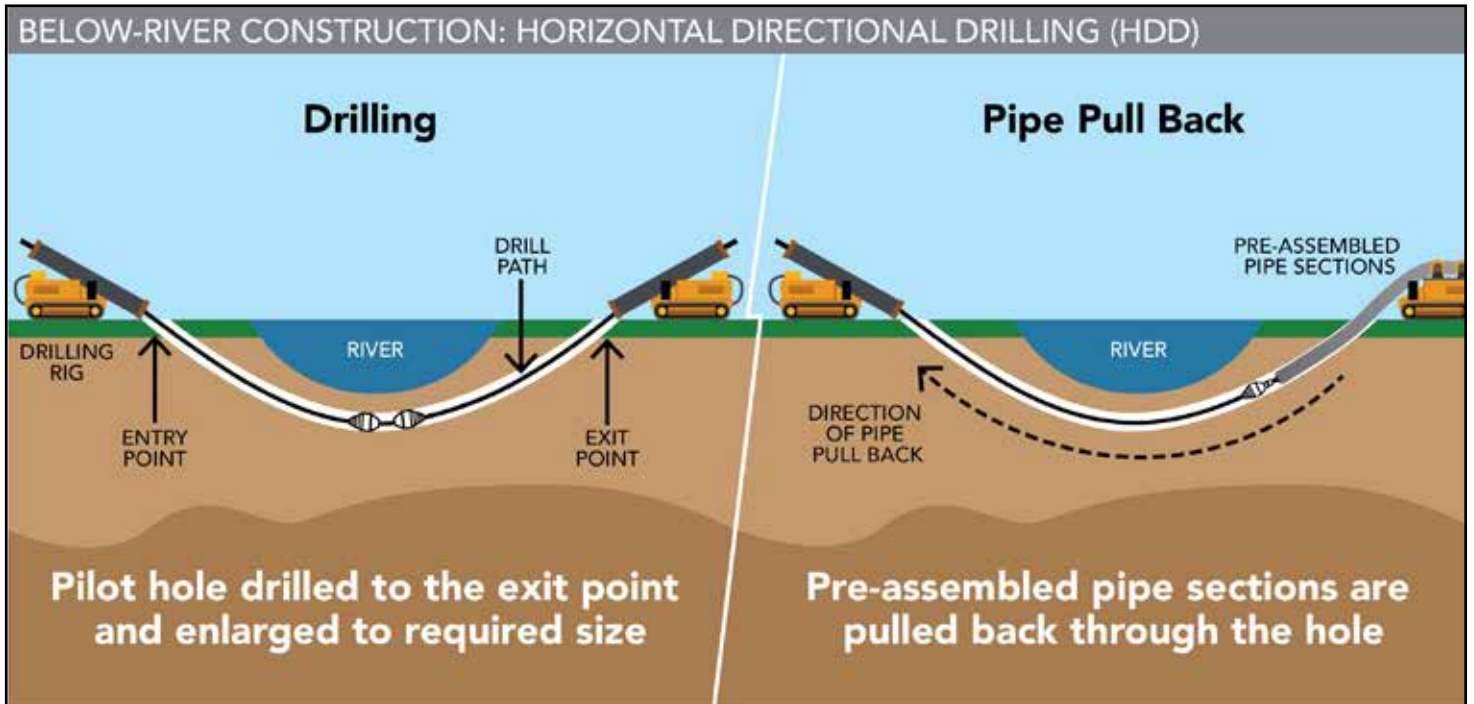
The Metro Vancouver Golden Ears Pipeline Crossing: Langley, British Columbia, required additional wastewater pipelines installed below the Fraser River from Maple Ridge and Pitt Meadows to the Northwest Langley Wastewater Treatment Plant.

The scope of work included twin 1660 lineal meters of 900 mm pipe that required installation under the Fraser River. The pipeline was to run parallel to the Golden Ears Bridge which is a high-profile bridge crossing in Langley. Horizontal directional drilling was utilized to bore a tunnel under the riverbed to reduce impact to the river.

The pipe had been coated with a liquid epoxy by a local coating company. The pipe was stored for several years on account of project delays and the engineering group was concerned about the condition of the coating.

Overhead view of the installation.





After consultation with Denso North America, the decision was made to use Denso Borewrap to protect the coating during the main pull under the river. This project required over 1000 rolls of Denso Borewrap. Denso North America Canada supplied application training and the Borewrap performed as

expected as the directional pull was completed with no damage to the pipe coating.

Denso Canada was very excited to supply the Borewrap, train and be a part of this exciting endeavor.

Denso Bore-Wrap™ application to wastewater pipeline



Denso™ Protects Pipelines in ADNOC Offshore's Belbazem Offshore Field Project

PROJECT SUMMARY

Product type:
Coatings for Buried Steel

Country: Abu Dhabi
Object: Buried oil pipeline
Problem: Corrosion prevention
Product Solution: Densopol 80HT™ System

Densopol 80HT™ is applied over a coat of Denso Primer D™.

An Abu Dhabi National Oil Company (ADNOC) project for the full field development of the Belbazem Offshore Block, underscoring its drive to unlock and maximize value from all of Abu Dhabi's fields as it expands its oil production capacity to 5 million barrels per day (mmbpd) by 2030. Located 120 kilometers northwest of Abu Dhabi city, the Belbazem Block consists of three so-called marginal offshore fields; Belbazem, Umm Al Salsal, and Umm Al Dholou.

Al Yasat Petroleum Operations Company Ltd (Al Yasat), ADNOC's subsidiary and joint venture (JV) with China National Petroleum Corporation (CNPC), awarded the engineering, procurement and construction (EPC) contract to the National Petroleum Construction Company (NPCC). ADNOC and CNPC hold 60% and 40% stakes in Al Yasat respectively.

The project scope includes three offshore Well Head Towers (WHTs), one in each of the Block's three fields, interconnecting sub-sea pipelines, and cables to Zirku Island, located around 60 kilometers from Belbazem field. The scope also covers the development of greenfield facilities for water injection, produced water treatment, gas compression, and associated utilities as well as brownfield works for tie-in to existing facilities at Zirku Island.

The stated Densopol 80HT™ System has been successfully utilized as part of the ADNOC Offshore specification for over 20 plus years. The addition of the Denso™ PVC SA Tape Yellow (Outerwrap) was utilized to provide extra mechanical protection during the transportation of wrapped pipes from the NPCC Mussafah facilities to the jobsite and in service. The stated Densopol 80HT System was utilized for the protection of 4" to 30" diameter pipes, elbows, and girth weld joints. Application training as per the latest System IFU – Instructions For Use is always recommended.



Denso PVC SA Tape™ is applied to the pipe lengths over the Densopol 80HT™, to give extra mechanical protection during transportation to the jobsite.



Viscotaq™ & Denso™ System Protects Below Ground Pipeline and Fittings



The product requirement for this project was to use a visco-elastic type tape on the field joints and bends on the pipeline that would offer a long-term corrosion prevention solution.



Contractors applying Viscowrap™ ST on the prepared field joint, overlapping onto the shop applied PU coating.

Above: Thorough holiday testing of the Viscowrap™ ST coating is carried out before the Denso™ PVC HD is applied.

Being the only local manufacturer and supplier of visco-elastic tape wrap systems, Denso South Africa supplied Viscowrap™ ST and Denso™ PVC HD Self Adhesive Outerwrap for the protection to buried pipeline field joints and specials. This provided a cost saving solution as well as a quick turn around time due to the immediate supply of material and Denso SA offered on-site assistance and training of the applicators.

Our visco-elastic range of products can be tailored to suite the clients needs and are readily available.

Below: Denso™ PVC HD applied at 55% overlap over the Viscowrap™ ST to offer mechanical strength and sufficient squeeze on the applied innerwrap.



Denso™ PVC HD Self Adhesive Outerwrap being applied over the innerwrap.

PROJECT SUMMARY

Product type:
 Coatings for Buried Steel

- Country:** Republic of South Africa
- Object:** Buried pipeline
- Problem:** Corrosion prevention
- Product Solution:** Viscowrap™ ST and Denso™ PVC HD Self-adhesive Outerwrap

Gas Pipeline Protected with Denso™ Butyl Tape System

Denso South Africa proposed a tape wrapping and flange protection system for an existing below ground gas line which was originally commissioned in 1982 and required additional corrosion prevention to prolong life expectancy on this particular section of pipe.

Minimal surface preparation was carried out due to the age of the pipeline, followed by the application of our Denso™ Butyl Tape System and the Denso™ Buried Flange System which were used for the corrosion prevention on the entire section of pipe.

The proposed systems comply with the gas pipeline standards and have been successfully used on a number of gas pipelines across the country.



Denso™ Profiling Mastic and Denso™ Butyl Tape System applied to the prepared areas.

Below: The completed Denso Butyl Tape System now protecting the gas pipeline.



The surface condition once the existing shop applied coating was removed.



Denso Butyl P16HT™ Primer being applied in-situ by brush.

PROJECT SUMMARY

Product type:
Coatings for Buried Steel

Country:	Republic of South Africa
Object:	Buried gas pipeline
Problem:	Corrosion prevention
Product Solution:	Denso Butyl P16HT™ Primer, Denso Butyl S43™ Innerwrap, Denso Butyl R23™ Outerwrap



A Combination of Two SeaShield™ Systems used to Protect Steel Piles



Denso Australia recently completed a project in NSW involving the use of SeaShield 2000FD™ and SeaShield 100™ systems. In total, the project involved pile wrapping of close to 30 steel piles with various diameters and lengths of coverage.

Inset: One of the piles with mooring hooks and brackets before application.



Front view of SeaShield 2000FD™ and SeaShield 100™ applied to pile with mooring hooks and brackets on the back side.



H piles after wrapping.

PROJECT SUMMARY	
Product type: Sub Sea Splash Zone Coating	
Country:	Australia
Object:	Steel piles
Problem:	Corrosion prevention
Product Solution:	SeaShield Series 200FD™ & 100™ Systems

In addition to wrapping the facility's mooring and fender piles, several of the piles had new repositioned mooring hooks and fender brackets incorporated into their design. With the mooring hooks and brackets creating an obstruction on several of the piles, we knew that the SeaShield 2000FD™ system would not be the sole corrosion protection solution required.

In these instances, the piles required a combination of the two SeaShield systems to be used together with the SeaShield 100™ system being applied to cover areas of these piles in which the SeaShield 2000FD system couldn't be cut or modified to protect.

This recent project not only marks the first time our two SeaShield systems have been used together in this way, but is also yet another excellent showcase for the innovative 'made-to-measure' solutions that Denso Australia are able to provide. In doing so, the project was completed successfully and the contractor has since relayed the asset owner's high level of satisfaction with both the final appearance of the SeaShield application as well as the overall outcome!

Viscotaq™ Approved for Repairs to Potable Water Tanks

In June 2023, Denso Australia were excited to announce that their Viscotaq™ products had successfully passed every testing criteria in accordance with the AS/NZS 4020:2018 (Potable Water) Standard. By meeting these requirements, Denso have since been able to provide assurance that their Viscotaq range is safe and suitable for use in drinking water applications.

PROJECT SUMMARY

Product type:
Industrial Linings

Country: Australia
 Object: Concrete potable water tank
 Problem: Repair of damaged area
 Product Solution: ViscoWrap™ ST and ViscoMastic™

More recently, Denso Australia have completed their first Viscotaq application in the potable water space. In July 2023, we were approached by a local contractor to assist with repairing and corrosion-proofing the internal floor of a water tank in Melbourne, Victoria.

Surface preparation for this project required the use of a grinder to remove the existing membrane off the floor to expose the steel underneath - this was necessary to ensure maximum adhesion of the ViscoWrap™ ST coating later in the application process.

Next, ViscoMastic™ was used to cover the damaged area of the floor to assist with filling any pits in the exposed steel.

Following this, the ViscoWrap ST was measured and cut to size with special care being taken to ensure that the dimensions of the cut-out had accounted for at least an additional 50mm of coverage on all sides of the damaged area.

Finally, the ViscoWrap ST was laid over the applied ViscoMastic and firmly pressed down with a siliconised roller.

Since the completion of the project, we've received feedback that the client has been very happy with the result of the repair.

The repair sequence...



SeaShield™ Chosen to Protect Alcatraz Wharf Piles

In the early 1900's Alcatraz Island was used as a military prison and sits approximately 1.5 miles offshore within San Francisco Bay.

In the 1930's, the military prison was converted into a federal prison and was operational until 1963. During the 29 years operating as a federal prison, there were several high-profile criminals who served prison time there such as Al Capone, Machine Gun Kelly, and Whitey Bulger.

In the early 1970's, Alcatraz Island was opened to the public as a tourist attraction and now sees over an estimated 1.5 million visitors per year.

Below: The installation of the SeaShield™ systems underway.

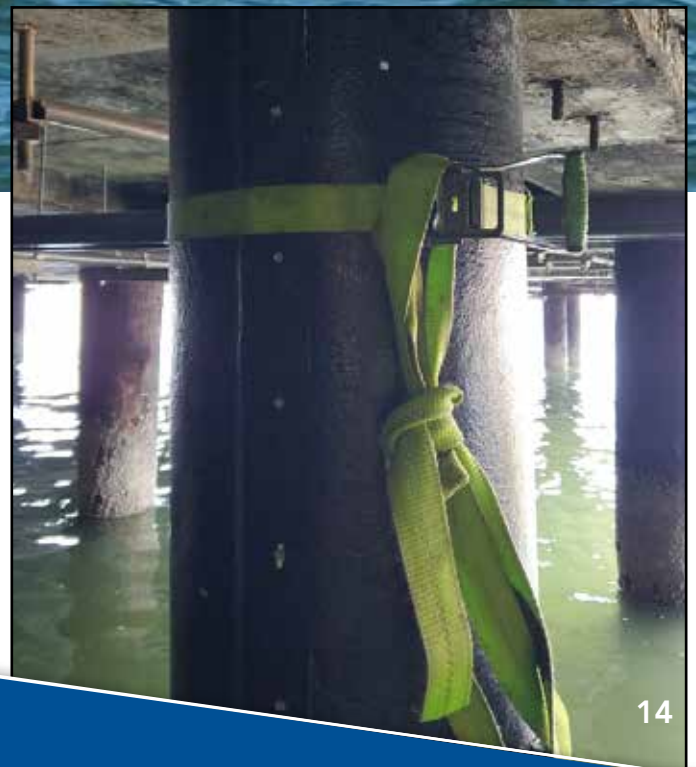


PROJECT SUMMARY

Product type:
Sub Sea Splash Zone Coating

Country: United States of America
Object: Steel piles
Problem: Corrosion prevention
Product Solution: SeaShield Series 500™ & FX-70™ Systems

Below: Tensionable strapping is used to hold the SeaShield™ jackets in place during injection of the epoxy grout.



Denso was asked to provide several SeaShield™ products to repair 111 piles on the Alcatraz Wharf Repair Project. Both the General Contractor and the Dive Contractor elected to work with Denso as they had successfully installed several SeaShield Systems on numerous projects in the past and were very pleased with the performance and ease of installation.

Denso's SeaShield Series 500™ was used, as well as a version of our Series FX-70™, in conjunction with a rebar cage. The SeaShield Series 500 was selected for piles that exhibited some sign of slight degradation, but ultimately were deemed structurally sound, to provide a long-term durable system for corrosion prevention.

The 550™ Epoxy Grout, used within the Series 500 system, is an extremely flowable and pumpable high strength epoxy grout that will fill in any small voids and/or cracks that may be present.

The SeaShield Series FX-70 was used on piles that were deemed no longer structurally sound. The components of the FX-70 System (SeaShield Fiber-Form™ Jacket, SeaShield FX-225™ Cementitious Grout, and SeaShield 550 Epoxy Grout) were used in conjunction with rebar to provide a full structural repair to these piles. All SeaShield Fiber-Form Jackets on this project were manufactured with a black finish to minimize visibility.

The underside of the Alcatraz Wharf showing some of the the 111 completed SeaShield™ protected piles.



If you would like more information about our long-term corrosion prevention and sealing systems that deal with the problem areas listed below, simply tick the boxes and send us back this completed page and we will supply you with more information.

BURIED ONSHORE COATINGS

- External corrosion prevention for underground pipelines, welded joints, valves and fittings.
- Protection of mounded LPG vessels and fuel tanks.

SUBSEA & SPLASH ZONE COATINGS

- Maintenance corrosion protection for steel jetty piles.
- Subsea pipelines and outfalls.
- Protection of timber and concrete piling.

SEALING MASTICS

- Joint sealing of precast concrete manholes and culverts.
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- Joint sealing for airport runways.
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EXPOSED SURFACE COATINGS

- Corrosion prevention for chemical plant, structural steelwork, above ground pipes, storage tanks, offshore rigs, bridges and support cables, cranes and pipe bridges.
- Corrosion prevention for metal roof purlins and metal roof sheets.
- Protecting pre-stressing and post tensioning bridge cables and ground anchorages.

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- Internal linings for tanks, pumps, vessels and pipelines.
- Linings for concrete bunds and floors.
- External abrasive wear protection.

INDUSTRIAL TAPES

- Sealing and insulating.
- Protecting and bonding.

MEMBRANES AND FLASHINGS

- Tanking / waterproofing.
- Exposed rooftops and parapets.

DIY WEATHERPROOFING

- Waterproofing and flashing.

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