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Cover: Viscotag™ Cold Applied  
System used to protect pipeline in  
Oman - See page 3



# DENSO DIGEST

Winn & Coales International Ltd

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**Denso**<sup>®</sup>

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# Cold Applied Viscotaq™ System Used to Protect a Water Main in Oman

Following a recent successful demonstration of the Viscotaq™ Cold Applied System for a leading petroleum company in Oman, it was decided that this system would be used on a 16" diameter water main that crosses underneath a road.

The pipeline asset owner is one of the leading oil (Energy) producers in Oman and has built a very good foundation of ever more efficient production, use of latest technology, ethical business and social responsibility".

Al Haditha Petroleum Services S.A.O.C. is an Omani Super Local Community Contracting Company (SLCC) established in 2011 who provides services to Oil & Gas Clients with valued construction solutions using expertise in design, procurement, construction and commissioning of flowlines and inter-field pipelines.

Denso provided a detailed product application training session for the contractor, before they installed the Viscotaq system on to the water pipeline, so the whole operation went smoothly and was finished in good time.

The Denso/Viscotaq system consists of an initial wrap of ViscoWrap HT™ Tape followed by a wrap of Viscotaq™ PE Outerwrap. Each layer was holiday tested in turn to make sure it was sound before a layer of Denso™ Glass Outerwrap was applied at the the soil/air interface sections to provide additional mechanical protection.

Below: The completed Viscowrap system with final layer of Denso Glass Outerwrap applied.



## PROJECT SUMMARY

**Product Type:**  
Coatings for Buried Steel

**Country:** Oman  
**Object:** Water pipeline  
**Problem:** Corrosion prevention  
**Product Solution:** Viscotaq™ Cold Applied System



# Viscotaq™ System used for Crude Oil Pipeline Casing End Seal in Moose Jaw, Saskatchewan

## Testing and Approval:

The purpose of this project was to fabricate a mock up casing/carrier pipe and test the Denso Viscotaq™ Casing End Seal System, to prove effectiveness before installing on the Keystone line.

As was typical of construction execution in the past, a 40 inch casing over 80' long was installed by HDD and the Keystone carrier pipe pulled through under busy hi-way 2 in Saskatchewan, Canada. It is between 3 major pipeline companies right of ways and yards, so pretty high profile. External corrosion was identified by an ILI run and digs were completed to mitigate the corrosion. To allow time for a proper repair, a temporary seal using Denso™ Profiling Mastic was installed and then backfilled.

## PROJECT SUMMARY

**Product Type:**  
Coatings for Buried Steel

**Country:** Canada  
**Object:** Liquid crude oil pipeline  
**Problem:** Corrosion prevention  
**Product Solution:** Viscotaq™ Casing End Seal System



ACTUAL SITE

The Viscotaq Casing End Seal System was identified by a major Owner Groups' project team with information from the Denso team in Edmonton as the preferred choice for a chance at a permanent fix to the casing end seal. Maxx NA was approached as the applicator, and a request made to fabricate a scaled mock up of the casing. The mock up allowed for both training of Maxx personnel by Certified Denso Trainers with Viscotaq and a hydrotest to prove effectiveness. The typical parameter for this application is to be able to withstand a 5psi Hydrotest for a duration of 15 minutes. The process is highly involved with forces of the hydrotest being calculated with a complex formula to simulate natural forces that can occur with the casing pipe filling up with water. This is critical because the casing pipe will corrode very quickly if the area between the two pipes cannot be sealed and failure would be inevitable.



MOCK-UP



ACTUAL SITE

Above: The application of Viscosealant™ and Viscomastic™

#### The Procedure:

The casing ends are bristle blasted to an SP11 Surface prep, then the inside casing is cleaned as best possible with wire brushes and rough sandpaper where it is too difficult to get to with a power tool. Next, a good MEK solvent clean.

The initial inside seal is done by pressing the Viscomastic™ uniformly and firmly into the annulus gap. It helps to heat the sticks in a microwave or rod box before installing to be more pliable. The unique situation here is that there is a larger 3-6" gap on the top of the pipe, but only ¾" – 1.5" on the bottom, it is off-centered. To ensure a better chance of success, we incorporated using Viscosealant™ with the Viscomastic on the bottom annulus gap to fill the smaller spaces. Once the Mastic was formed and shaped to allow a smooth transition for the Viscowrap™ ST, we proceeded to wrap circumferentially starting at the Casing pipe working down to the carrier pipe with sufficient tension and leading edge distances.

Once the wrap is on tightly adhered, we proceeded to wrap Viscotaq™ Glass Outerwrap going in the opposite direction we did with the Viscowrap. Once complete with an overlap onto the pipe, we applied Polywrap to compress the Glass, then perforated the Polywrap to aid in curing. After about 30 minutes, we remove the Polywrap and continued to let cure for another 30 minutes. We would suggest a 2-3 hour cure for this process and an extra layer of Glass is also recommended. Now we are ready for hydrotesting.



MOCK-UP

Above: The application of Viscowrap ST

As we were training, we used a couple of different methods for install, but for the final method used, we hydrotested to 5 psi for 15 minutes and had no failure. For further testing, we increased pressure up to 10psi for 4 minutes with NO leaking. We eventually ran the pressure up to 55psi before complete failure. The test was a complete success with the given parameters. The Owner group agreed and signed off on the procees/ materials for actual application.

The final picture included below is from the actual site in Saskatchewan and the install looked great and should perform for many years for the company.



ACTUAL SITE



# SeaShield™ Protects Timber Piles on Boat Dock

Denso was contacted by Brian Greene of GBI Diving for his customer, who was searching for a solution to prevent further degradation of the timber piles on their boat dock. The piles were still in relatively good condition; however, the homeowner wanted to proactively prevent further wear and tear from the salt water and marine borer damage.



## PROJECT SUMMARY

Product Type:  
Sub Sea Splash Zone Coating

Country: Florida, USA  
Object: Timber piles  
Problem: Protection from degradation  
Product Solution: SeaShield Series 70™

Denso recommended the SeaShield Series 70™ Pile Protection System. The system is based around the Denso™ Marine Piling Tape, a petrolatum wax tape that truly seals off these timber piles from the destructive environment. The Denso Marine Piling Tape is protected by a layer of the Denso™ Glass Outerwrap UV, which provides a tough, durable, cast-like outer layer of mechanical and long-term UV protection.

*Left: Long-term protection that adds years of service life to piles.*





*The SeaShield™ system prevents infestation of marine borers.*

The system is extremely simple to apply and does not require any custom-made sizes. First, the Denso Marine Piling Tape is spirally wrapped around the pile using a 55% overlap, followed immediately by a layer of the Denso Glass Outerwrap UV that is also spirally wrapped using a 55% overlap. In addition, it helps to tightly wrap a layer of the Denso™ Poly-wrap over the Glass Outerwrap UV temporarily to help compress down the layers. The Poly-Wrap is removed once the Glass Outerwrap UV has cured after approximately 1-2 hours.

Brian Greene and his team at GBI Diving did an excellent job with the application, and his customer was extremely happy with it, knowing their timber piles would be protected for many years to come.

*Left: Simple design allows for easy installation.*



  
**SeaShield™**



## PROJECT SUMMARY

Product Type:  
Coatings for Exposed Steel

Country:	Republic of South Africa
Object:	Exposed steel column bases
Problem:	Corrosion prevention
Product Solution:	Denso Steelcoat™ Column Base Protection System



## Steelcoat™ Protection for Factory Steel Column Bases

Deficiencies in surface preparation at this plant in Impala Platinum Springs, led to grit from grit blasting interfering with plant operations, which worsened severe corrosion problems and, despite regular reapplication of surface-tolerant epoxy to alleviate these issues, the challenges persist. This highlighted the urgent need to reevaluate surface preparation methods and investigate alternative corrosion prevention strategies to effectively address the ongoing corrosion concerns.



The Steelcoat™ Column Base Protection System was recommended. This system comprises of Denso™ Hi-Tack Primer to coat the cleaned substrate, Denso™ Profiling Mastic is used to fill any voids and to build up any angles required to create a smooth profile, a layer of Denso™ Hi-Tack Tape is then applied over the area followed by a layer of Denso D14™ Scrim and a coat of Denso™ Basecoat and Denso™ Acrylic Topcoat is applied to complete the protective system.

The system requires only minimal surface preparation, specifically to St2 standards, while still offering a long-life expectancy. Additionally, it necessitates minimal yearly maintenance to ensure the integrity of the system remains intact. This combination of features underscores its efficiency and durability, providing a cost-effective solution with reduced downtime and maintenance requirements.

*Top right: The Steelcoat™ Column Base Protection System in place before the Denso™ Acrylic Topcoat is applied..*

*Below: Completed Steelcoat™ Column Base Protection System*





# SeaShield™ Protection for 'Tsunami Warning System' Marker Beacon

We take tremendous pride in regularly safeguarding critical assets all around the world. This is well evidenced in a recent example where Denso's SeaShield 70™ system was selected to provide long-term corrosion protection to eight important marker beacons highlighting the safe passage into the Port of Geraldton.

The application of the durable tape wrap system was originally completed in 2021 by TAMS Group.

*Photo Credit: Mid West Ports, 2024*




## PROJECT SUMMARY

Product Type:  
Sub Sea Splash Zone Coating

Country: Australia  
Object: Marker beacon  
Problem: Corrosion Prevention  
Product Solution: SeaShield Series 70™

*Photo Credit: Mid West Ports, 2024*



*Left and above: The tsunami warning system being set up on one of the SeaShield protected marker beacons.*



*Above: The completed SeaShield 70 system protecting the splash zone of one of the eight marker beacons.*

In June 2024, the marker beacon was equipped with a new Tsunami Warning System along the Geraldton coastline (an initiative undertaken by Mid West Ports, the Bureau of Meteorology and Geoscience Australia). These sensors are an Australia-wide initiative, providing real-time data to the Bureau of Metrology right across the country every minute. Recent photos of the installation show the SeaShield 70 system to be completely intact and maintaining its role in protecting the steel surface of the beacons.



# A SeaShield™ Protected Pumping Station Inlet Application in 2015 - Revisited in July 2024

In 2015, Denso Australia completed an application of its SeaShield 70™ system with the goal of providing long-term corrosion protection to the inlet at Murray Bridge's wastewater pump station (located in South Australia). The application of this system included the protection of waler beams attached to sheet piling. In addition to the components of the 70 system (SeaShield™ Primer, Marine Piling Tape, Denso™ Glass Outerwrap), Denso™ Profiling Mastic was also required to fill any voids and to contour around the sharp edges of the beams thus allowing us to achieve a secure spiral wrap around the asset.



Above : A hole was cut in the 2015 applied coating and some of the Denso™ Profiling Mastic was removed to allow inspection of the inlet.

We've recently (July 2024) revisited the project site to check on the condition of the original coating. Upon cutting out a hole and removing the material, we are happy to confirm that no corrosion has occurred. The asset owner is similarly delighted with the result and have asked that we provide more product for the full completion of this project. The Denso team are adamant that long-term corrosion protection is best achieved through a combination of quality materials and quality application. As such, we'd like to credit the excellent work carried out by our contractor for this project, Swart and sons.

## PROJECT SUMMARY

Product Type:  
Sub Sea Splash Zone Coating

Country: Australia  
Object: Pumping station inlet  
Problem: Corrosion Prevention  
Product Solution: SeaShield Series 70™



Once the inspection was complete and the inlet was found to be in good condition the Denso materials were replaced and the 2015 application was made good again.





# More Piles Protected with SeaShield™ at the Red Funnel Ferry Crossing Terminal, Southampton

Work has continued at the Red Funnel Ferry Terminal in Southampton where multiple SeaShield™ systems have been administered and combined in order to protect 6 hexagonal piles on Dolphin No.1.

Using a combination of the SeaShield 2000FD™ and SeaShield 70™ Systems, the piles were wrapped in the usual way on site (circumferentially), however some featured obstructions, such as ladder supports and O-rings which hold chains connected to the fenders. Thanks to the user-friendly application of Denso™ Glass Outerwrap UV (GOW UV) – a key component of the SeaShield 70 System – Seatech Commercial Diving Services were able to protect the areas where a typical HDPE jacket could not be applied. Both systems were then overlapped, leaving a fully protected pile from top to bottom.

## PROJECT SUMMARY

**Product Type:**  
Sub Sea Splash Zone Coating

**Country:** United Kingdom  
**Object:** Jetty Piles  
**Problem:** Corrosion Prevention  
**Product Solution:** SeaShield Series 70™ and 2000FD™

*Below: The condition of the pile (left) after cleaning and before the SeaShield™ HDPE Jacket is applied using the SeaShield™ Clamping Tool (right).*







Above: A circumferential wrap of SeaShield™ Marine Piling Tape is applied to a pile (left) prior to applying the Denso™ GOW UV (right).



Below: Tape application complete and inset showing the completed combination of the SeaShield 2000FD™ and SeaShield 70™ Systems.





# Denso P1 System™ Protects Pipe Joints at a Southern Water Treatment Facility

The Denso P1 System™ has been applied, by Knights Brown, to newly installed 600mm, 800mm and 900mm Viking Johnson Couplings on a water main to provide external corrosion protection, allowing them to remain integral for many years to come.

1. The Viking Johnson Couplings are cleaned ready for application of the Denso P1 System

## PROJECT SUMMARY

**Product Type:**  
Coatings for Buried Steel

**Country:** United Kingdom  
**Object:** Water Main  
**Problem:** Corrosion prevention  
**Product Solution:** Denso P1 System™

2. A layer of Denso™ Paste is applied over the entire coupling.







3. Denso™ Profiling Mastic is then used to fill voids and smooth the profile.



4. The coupling is then wrapped with a double layer of Denso™ Tape.

The fittings were primed with Denso Paste™, prior to the application of Denso™ Profiling Mastic to create an even profile and remove any trapped air or moisture. Denso Tape™ was then applied spirally with a 55% overlap to complete the system.

The contractors followed the Instructions for Use documents and the CESWI P1 Specification for an excellent application, ensuring these assets are properly protected.



5. The completed Denso P1 System™.



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.

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