

1929 - 2009  
80 Years of  
Pipeline & Steelwork  
Protection



A Denso System protects the suspension cables on the Ohmishima Great Bridge, Japan - see story page 11.

Volume 28 - Number 4

QUALITY & INNOVATION FROM 1883 INTO THE 21<sup>ST</sup> CENTURY

# Denso®

LEADERS IN CORROSION PREVENTION  
& SEALING TECHNOLOGY

125 YEARS SERVICE TO INDUSTRY

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For further information on our products and their suitability for your particular project, please contact any of the Denso companies listed below:

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✓ Anti-corrosion and sealing systems

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Web site: www.densona.com



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LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

# Denso Ultraflex Tape System protects Pipe Weld Joints

Umgeni Water in Pietermaritzburg and eThekweni Water in Durban have funded a R800m project to provide for the ever increasing demand for potable water to the communities between the two cities. WK Pipelines were awarded phase 1 of the project which is currently under way.

The project consists of 20km of continuously welded 1.60m dia and 1.40m dia pipes of 18m lengths. The protection system specified consists of Denso Mastic Sealing Tape to protect the weld bead and then a full circumferential wrap of Denso Ultraflex 1250/300 with a 55% overlap to protect the welded field joints.

Other Denso products specified were Denso ST Epoxy and Densotherm HD. Denso ST Epoxy is used for the corrosion protection of the internals of the welded pipe as well as the protection to the exposed compensation plates. Densotherm HD is used for the protection of the pipe interface between the epoxy coated steel and polyethylene shopcoat (Sinterkote).

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

Photos:

- Left: The new pipeline in progress.
- Below: Application of Denso S.T. Epoxy
- Bottom: Denso Ultraflex 1250/300 Tape protecting a pipe bend.



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## Project Summary

**Product type:**  
Buried Steel Coating

- Country:** South Africa
- Location:** Pietermaritzburg to Durban
- Object:** Welded pipe joints, bends and specials
- Problem:** Corrosion prevention
- Product solution:** Denso Ultraflex and S.T. Epoxy



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

## Protal 7125/7250 Standing Up to Cold Canadian Winters

After beginning one of North America's largest hydro-electric tunneling projects at Niagara Falls, the Ontario Power Generation company needed to supply vertical access to a 47.2 foot diameter tunnel being bored 459 feet below the surface.

When completed, the tunnel will measure over 33,000 feet in length.

The project called for 5 x 36" diameter fresh air shafts to be bored vertically from the surface into the tunnel.

These vertical shafts will also provide equipment access and pump access for emergency water evacuation.

Denso Canada was chosen to supply Protal 7250 and Protal 7125 to all the exterior surfaces of the vertical steel pipes, each shaft covering a distance of nearly 500' vertically, linking to the horizontal tunnel beneath. Each of the 5



### Project Summary

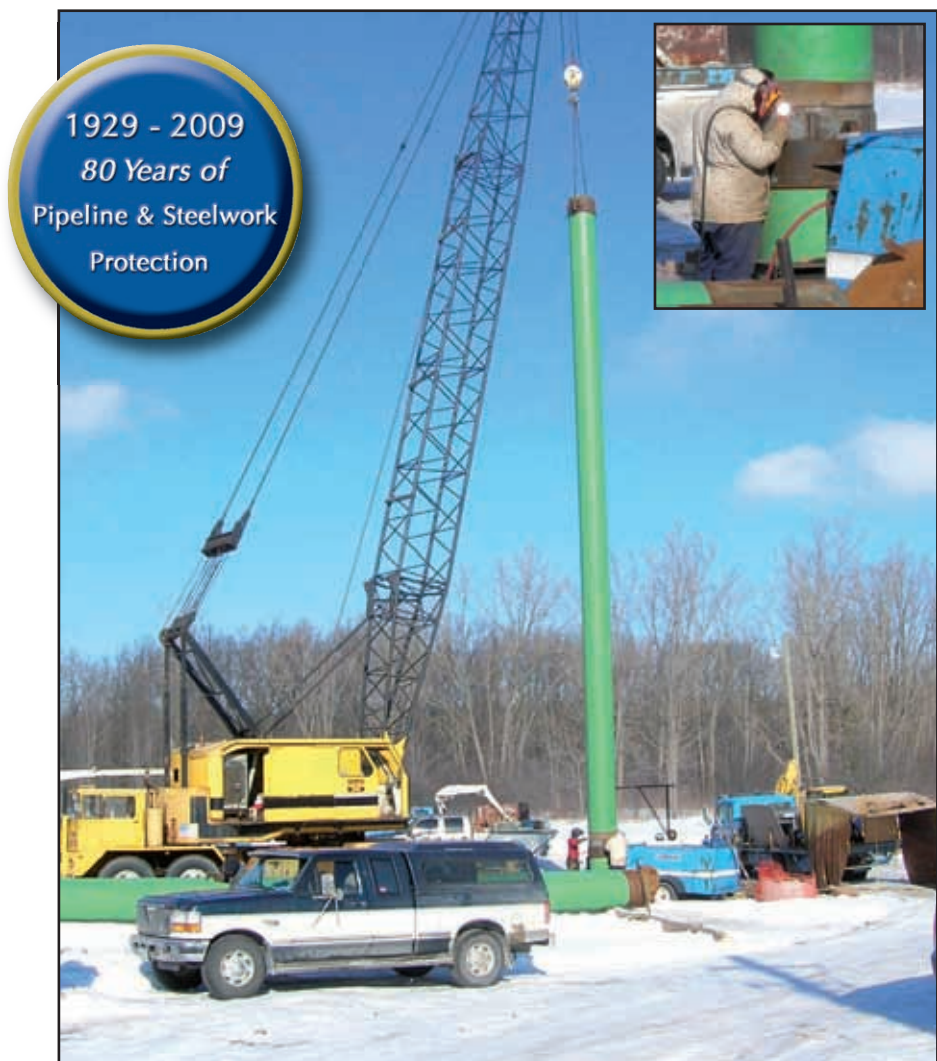
**Product type:**  
Buried Steel Coating

**Country:** Canada  
**Location:** Niagara Falls  
**Object:** Steel air shafts  
**Problem:** Corrosion prevention  
**Product solution:** Protal 7250 and Protal 7125

Photos:

Left: Girth weld area being coated with Protal 7125 in sub-zero temperatures.

Below & inset: A steel air shaft is welded to a tunnel section prior to the Protal application.



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shafts was spaced approximately 13 feet apart along a specific section of the tunnel.

Each pipe section was coated in plant with Protal 7250 and shipped to site where it was hoisted by crane and lowered into the shaft.

Using a collar arrangement to prevent the pipe length from slipping down the shaft, each hoisted pipe section was welded in place and lowered into the ground. The girth weld area was then coated with Protal 7125 and the entire process was repeated until all the sections were finished.

The vertical shaft work was completed in the winter months at sub-zero temperatures, hence the use of Protal 7125 on the field applied girth welds.

Denso Protal products - growing in different directions!!!



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

## Denso North America Offers New Protal ARO - Abrasion Resistant Overcoating

**Liquid epoxy overcoating for the maximum protection of Fusion Bonded Epoxy (FBE) in directional drilling applications.**

The new Protal ARO is a VOC free, 100% solids liquid epoxy coating formulated to be applied over FBE as an ARO coating (abrasion resistant overcoating). It is a 3:1 ratio compatible for most plural component spray units coating that can be spray or hand applied in the field or shop. Protal ARO is used to protect FBE mainline coatings and over Protal 7200 on girth welds during directional drilling, bores, river crossings and other rough terrain applications. Protal ARO can also be used to provide additional protection to the coating on bends, fittings and fabrication when severe handling or rough terrain exists.

Protal ARO offers excellent gouge and abrasion resistance, fast touch dry and set times, high

temperature resistance (up to 150°F), and high build (up to 60 mils in one coat). In addition, it has excellent adhesion to FBE and Protal 7200 and is safe and environmentally friendly.

Denso manufactures a full line



Photos:  
Above: Directional drill application with Protal ARO coated pipe.  
Below: Protal ARO being spray applied in the shop

of Protal liquid coatings to meet the demand of the pipeline industry. Protal liquid coatings are the coatings of choice by owners, oil and gas specifiers and contractors across North America.



### Project Summary

**Product type:**  
Buried Steel Coating

**Country:** USA  
**Location:** Dallas, Texas  
**Object:** FBE coated pipe  
**Problem:** Protection during directional drilling  
**Product solution:** Protal ARO



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

# SeaShield System Selected for Repairs to Indonesian Chemical Jetty

To provide a tailor made solution to meet specific site requirements a number of Jetty piles, all with a damaged PE layer and showing the inevitable corrosion as a consequence, were recently repaired with a Denso SeaShield system.

The jetty in Cilegon, Banten, Indonesia is owned by PT. Asahimas Chemical who chose a SeaShield system due to its enviable reputation as an effective, long term solution to marine corrosion problems.

The system was installed by our agent PT. Imbema Pacific Indonesia. After removing all of

the PE layer material around the damaged area and all loose and flaky rust ect, the surface was coated with Denso S105 Paste. Strips of Densyl Tape were then applied over the paste to bring the repair level up to the surrounding 'sound' PE layer. A single sheet of Denso Hi-Tack Tape was then applied over the

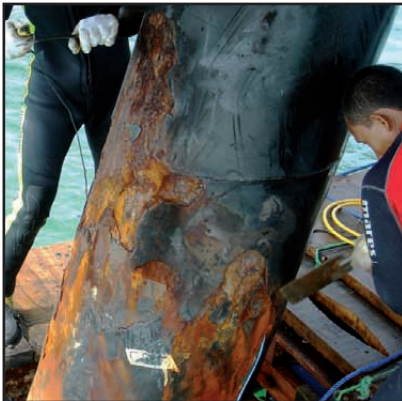
## Project Summary

Product type:  
Sub Sea / Splash Zone Coating

<b>Country:</b>	Indonesia
<b>Location:</b>	Cilegon, Banten
<b>Object:</b>	Jetty Piles
<b>Problem:</b>	Corrosion prevention
<b>Product solution:</b>	Denso SeaShield

Densyl Tape followed by the HDPE Jackets which were attached using a hydraulic pump to compress the joints together. This enabled the fixing bolts to be tightened securely.

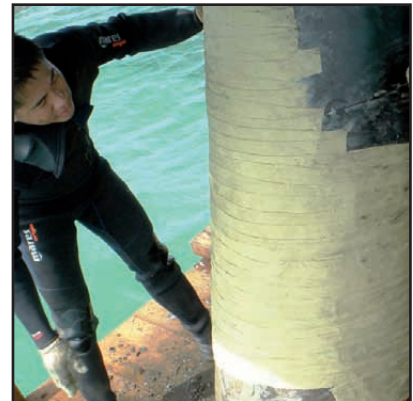
The work was all completed to schedule.



1. All loose PE layer, rust and debris is removed from the damaged area using scrapers and wire brushes.



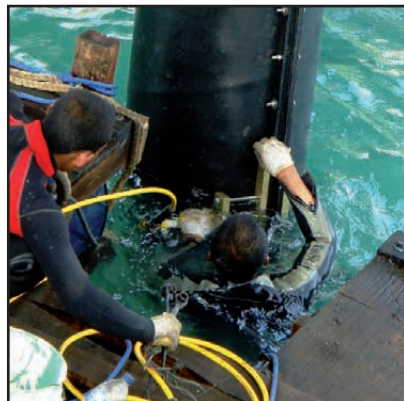
2. Denso S105 paste is then applied to the cleaned area only.



3. Strips of Densyl Tape are then placed over the Denso S105 Paste to bring the repair area up to the surrounding level.



4. A single sheet of Denso Hi-Tack Tape is then positioned as a band, over the Densyl Tape and around the whole pile.



5. Finally SeaShield 2000 FD Jackets are attached using a hydraulic pump to compress the joint to enable easy bolting.



6. The finished application, a durable and neat repair for the damaged piles.



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## Denso KF Tape Solves Storage Tank Problem

The engineers at a large oil company situated in Onsan, Ulsan needed a cost effective and commercially proven repair solution for some tanks that were used to store toluene because the bottom plate of the tanks were showing signs of corrosion.

There are always gaps present between the steel bottom plate and the concrete plinth that it sits on and consequently air and water penetrates into them and the bottom plate starts to corrode.

K-Cotech Co. Ltd engineers looked at the problem and recommended to the oil company that all of the corroded plates should be repaired with a Denso anti-corrosion system utilising Denso Hi-Tack Primer, Denso Primer D, Densyl Mastic and Densyl KF Tape. This system would seal all of the gaps and stop the bottom plate from corroding any further.

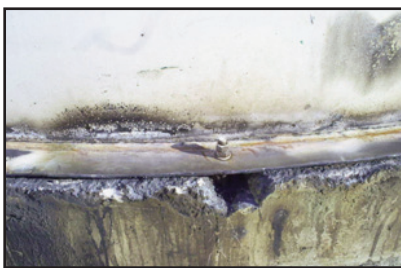
Right: The oil company's tanks on site at Onsan, Ulsan.

The chosen system was eventually applied by K-Cotech and the oil company engineers were very pleased with the results.

### Project Summary

**Product type:**  
Exposed Surface Coating

<b>Country:</b>	Korea
<b>Location:</b>	Onsan, Ulsan
<b>Object:</b>	Toluene Tanks
<b>Problem:</b>	Corrosion prevention
<b>Product solution:</b>	Denso KF Tape System



1. Corroded/damaged tank base.



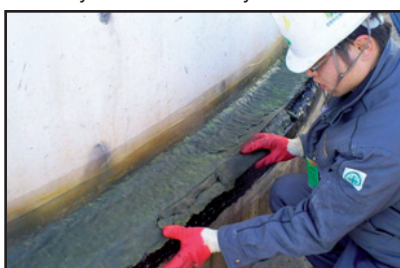
2. Preparation - cleaning the area ready for the Denso system.



3. Priming the steel surfaces with Denso Hi-Tack Primer.



4. Priming the concrete surfaces with Denso Primer D.



5. Applying Densyl Mastic to fill all voids.



6. Applying the Densyl KF Tape to complete the system.



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## The Densopol Tape System Protects Outfall Pipeline

The Denso Densopol 80 Tape System has been selected to protect the field joints on The Alkimos Outfall Pipeline situated 40km North of Perth Western Australia.

The project is part of the Alkimos Wastewater Treatment Scheme and is an alliance between the Water Corporation and the private sector, being named The Alkimos Water Alliance.

The outfall pipeline is a 3.7km long 1270 Diameter MSCL Pipe, comprising 294 joints to be protected.

The Sintakote pipe supplied by Tyco Water is delivered to site and then a concrete weight coating is applied.

At the cutback area Denso Primer 'D' is first applied by brush/roller, followed by The Denso Densopol 80 Tape, spirally wrapped incorporating a 55% overlap.

This effectively gives a protective coating of 4mm (4000 microns) prior to the cutback

Photos:

Top: A joint protected with the Densopol Tape system

Middle: Concrete weight coat pipelengths.

Bottom: The outfall pipeline under construction.

area being in-filled with concrete.

The 3.7km long ocean outfall pipeline will be buried up to 4 metres below the beach and will sit in a trench on the seabed some 8-12 metres below sea-level. Towards the end of the pipeline the depth of water is between 25-30 metres.



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### Project Summary

**Product type:**  
Buried Steel Coating

**Country:** Australia  
**Location:** Perth  
**Object:** Outfall pipeline  
**Problem:** Corrosion prevention  
**Product solution:** Densopol Tape





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

## Premseal Membrane used to Waterproof Hull Reservoir Roof

Approximately 11,000m<sup>2</sup> of self amalgamating Premier Premseal 100 blue cold applied waterproofing, adhesive membrane has been used to waterproof the roof of Yorkshire Water's Keldgate No.1 reservoir that supplies Hull's potable water system.

It is part of an ongoing maintenance scheme to maintain water quality for Yorkshire Water's customers. The work was carried out by the term contractors, Stonebury Ltd of Beverley, Yorks and Cranfield, Bedfordshire.

The 100-year-old Keldgate No. 1 reservoir is of vaulted roof construction. To ensure maximum waterproofing effectiveness, Stonbury engineers applied the Premseal 100 in full strip lengths starting along the roof 'valleys' then working up to the 'peaks', so going with the flow of rain water.

Premseal 100 prevents the ingress of water and water-borne aggressive salts such as chlorides and sulphates penetrating concrete structures. It is approved by the Water Research Council and is UK WFBS Listed for use in potable water situations as well as having BBA Certification.

Premseal 100 is constructed from orient cross laminated high density polyethylene sheeting and bitumen-polymer compound. The product is a tough, durable, cold applied self-adhesive sheet

Project Summary	
Product type: Waterproofing Membrane	
<b>Country:</b>	United Kingdom
<b>Location:</b>	Keldgate
<b>Object:</b>	Reservoir roof
<b>Problem:</b>	Waterproofing
<b>Product solution:</b>	Premseal 100 (Blue)

with an overall thickness of 1.5mm. A unique feature is the selvedge that enables a fast and secure seal on all side edge laps. The blue HDPE film enables inspection for consultants and clients to be made easier and quicker. Where buried, the waterproofing layer is easily identified during any subsequent excavation, allowing greater care to be taken to avoid unnecessary damage.

Keldgate No.1 reservoir roof after a storm, demonstrating the rain water flow from the Premseal 100 protected vaulted ceiling roof design.



premier  
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## Oil Intake Pipeline Inspected After 21 Years of Denso Protection

An oil intake pipeline in Japan which was originally protected in 1985 with a Denso system combining Densyl KF Tape and Denso Profiling Mastic, was inspected in March 2006 to see how it was performing.



The original Denso coating system was removed from part of the pipeline to check its condition. The pipe, flange, nuts and bolts below were all found to be in excellent condition.

After the inspection was finished the removed section of tape and mastic was replaced.

All of the engineers involved had to agree that the inspection provided a very impressive demonstration of the long-term corrosion prevention capabilities of the Densyl KF Tape system.

Photos:

Left: The Denso system removed after 21 years for inspection.

Below: Close up of nut, thread and flange in excellent condition.



### Project Summary

**Product type:**  
Buried Steel Coating

<b>Country:</b>	Japan
<b>Location:</b>	Unspecified
<b>Object:</b>	Oil intake pipeline
<b>Problem:</b>	Corrosion prevention
<b>Product solution:</b>	Densyl KF Tape System



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## Denso System Protects Bridge Suspension Cables

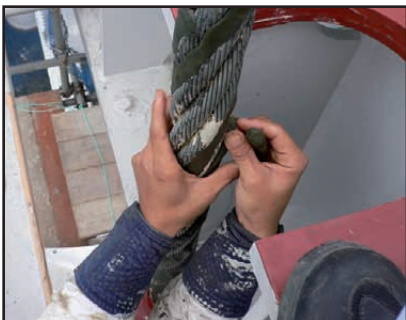
Engineers in charge of the Ohmishima Great Bridge that crosses the Setonaikai Inland Sea in Japan, wanted to protect the base of the 160 bridge suspension cables against corrosion.

A Denso system was chosen comprising Densyl Mastic Strips then a coating of Denso Paste overwrapped with Densyl KF

Tape with a final outer layer of self-adhesive tape to protect against mechanical damage.



Cable protection work in progress on the Ohmishima Great Bridge.



1. Densyl Mastic Strips used to smooth the cable contour prior to wrapping.



2. After applying a coating of Denso Paste, over the Densyl Mastic Strips and cable strands, Densyl KF Tape is spirally wrapped with a 55% overlap.



Project Summary	
Product type: Exposed Surface Coating	
<b>Country:</b>	Japan
<b>Location:</b>	Setonaikai Sea
<b>Object:</b>	Bridge suspension cables
<b>Problem:</b>	Corrosion prevention
<b>Product solution:</b>	Denso Tape System



3. A final wrap of self-adhesive tape completes the protection system.