

1929 - 2009
80 Years of
Pipeline & Steelwork
Protection



Denso Protal 7250 being applied to a crude oil pipeline in Canada - see story page 6-7.

Volume 29 - Number 1

QUALITY & INNOVATION FROM 1883 INTO THE 21ST CENTURY



125 YEARS SERVICE TO INDUSTRY

WINN & COALES INTERNATIONAL LTD

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

WINN & COALES (DENSO) LTD

Denso House, Chapel Road, London SE27 OTR, England

✓ Anti-corrosion and sealing systems

Tel: +44 (0) 20 8670 7511
 Fax: +44 (0) 20 8761 2456
 Email: mail@denso.net
 Website: www.denso.net



ARCHCO-RIGIDON

Denso House, Chapel Road, London SE27 OTR, England

✓ Corrosion resistant linings

Tel: +44 (0) 20 8761 6244
 Fax: +44 (0) 20 8761 2456
 Email: mail@denso.net
 Website: www.denso.net



DARTFORD COMPOSITES LTD

Unit 1, Ness Road, Erith, Kent DA8 2LD

✓ Manufacture and repair of FRP panels for cars and trains

Tel: +44 (0) 1322 350097
 Fax: +44 (0) 1322 359438
 Website: www.dartfordcomposites.co.uk



DENSO NORTH AMERICA INC - CANADA

90 Ironside Crescent, Unit 12, Toronto, Ontario, M1X 1M3
 Canada

✓ Anti-corrosion and sealing systems

Tel: +1 416 291 3435
 Fax: +1 416 291 0898
 Email: sales@densona.com
 Web site: www.densona.com



DENSO NORTH AMERICA INC - USA

9747 Whithorn Drive, Houston, Texas 77095
 United States of America

✓ Anti-corrosion and sealing systems

Tel: +1 281 821 3355
 Fax: +1 281 821 0304
 Email: houston@densona.com
 Web site: www.densona.com



DENSO SOUTH AFRICA (PTY) LTD

120 Malacca Road, Redhill Industrial Area, Durban North 4051,
 Republic of South Africa

✓ Anti-corrosion and sealing systems

Tel: +27 31 569 4319
 Fax: +27 31 569 4328
 Email: bid@denso.co.za
 Web site: www.denso.co.za



DENSO (AUSTRALIA) PTY LTD

411-413 Victoria Street, Brunswick, Victoria 3056,
 Australia

✓ Anti-corrosion and sealing systems

Tel: +61 1300 658 590
 Fax: +61 1300 655 064
 Email: denso@densoaustralia.com.au
 Website: www.densoaustralia.com.au



DENSO (NEW ZEALAND) LTD

PO Box 76167, Manakau City, Auckland,
 New Zealand

✓ Anti-corrosion and sealing systems

Tel: +64 9274 1255
 Fax: +64 9274 1258
 Email: enquiries@denso.co.nz
 Website: www.densoaustralia.com.au



SEASHIELD INTERNATIONAL

Denso House, Chapel Road, London SE27 OTR, England

✓ Marine corrosion protection systems

Tel: +44 (0) 20 8670 7511
 Fax: +44 (0) 20 8761 2456
 Email: mail@denso.net
 Website: www.denso.net



SEASHIELD INTERNATIONAL

9747 Whithorn Drive, Houston, Texas 77095
 United States of America

✓ Marine corrosion protection systems

Tel: +1 281 821 3355
 Fax: +1 281 821 0304
 Email: houston@densona.com
 Web site: www.densona.com



SEASHIELD INTERNATIONAL

411-413 Victoria Street, Brunswick, Victoria 3056,
 Australia

✓ Marine corrosion protection systems

Tel: +61 1300 658 590
 Fax: +61 1300 655 064
 Email: denso@densoaustralia.com.au
 Website: www.densoaustralia.com.au



SEASHIELD INTERNATIONAL

PO Box 76167, Manakau City, Auckland,
 New Zealand

✓ Marine corrosion protection systems

Tel: +64 9274 1255
 Fax: +64 9274 1258
 Email: enquiries@denso.co.nz
 Website: www.densoaustralia.com.au



PREMIER COATINGS LTD

Headcord Road, Smarden, near Ashford,
 Kent TN27 8PJ, England

✓ Membranes and corrosion protection systems

Tel: +44 (0) 1233 770663
 Fax: +44 (0) 1233 770633
 Email: enquiries@premiercoatings.com
 Website: www.premiercoatings.com





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



Denso Anti-Slip Tape Improves Safety in New Car Showroom

As an aid to Health and Safety requirements, Denso Anti-Slip Tape has been applied to two key areas in the new prestige Reading garage that is stocking Japanese Infiniti cars.

A total of some 250m² of the 50mm wide tape has been applied by specialist contractors BDB Design Build of Sheffield. One key area is in the service bay and the other on the emergency fire escape walkway. The tape has been chosen and supplied in black and yellow chevron (hazard) and plain yellow colours.

Denso Anti Slip Tape comprises a self-adhesive PVC Tape coated on one surface with a layer of acrylic adhesive. The upper surface is coated with a continuous layer of aluminium oxide particles. It is available in several colours and supplied in 18m roll form. The adhesive surface is protected by a plastic film interleaving which is discarded during application.

This recently introduced Denso product is designed for both indoor and outdoor use. As well as garage floors it can also be used to enhance safety on steps, paths, patios, decking and a multitude of other areas.

Project Summary

Product type:
Industrial Safety Tape

Country: United Kingdom
Location: Reading
Object: Showroom floor
Problem: Accident prevention
Product solution Denso Anti-Slip Tape

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

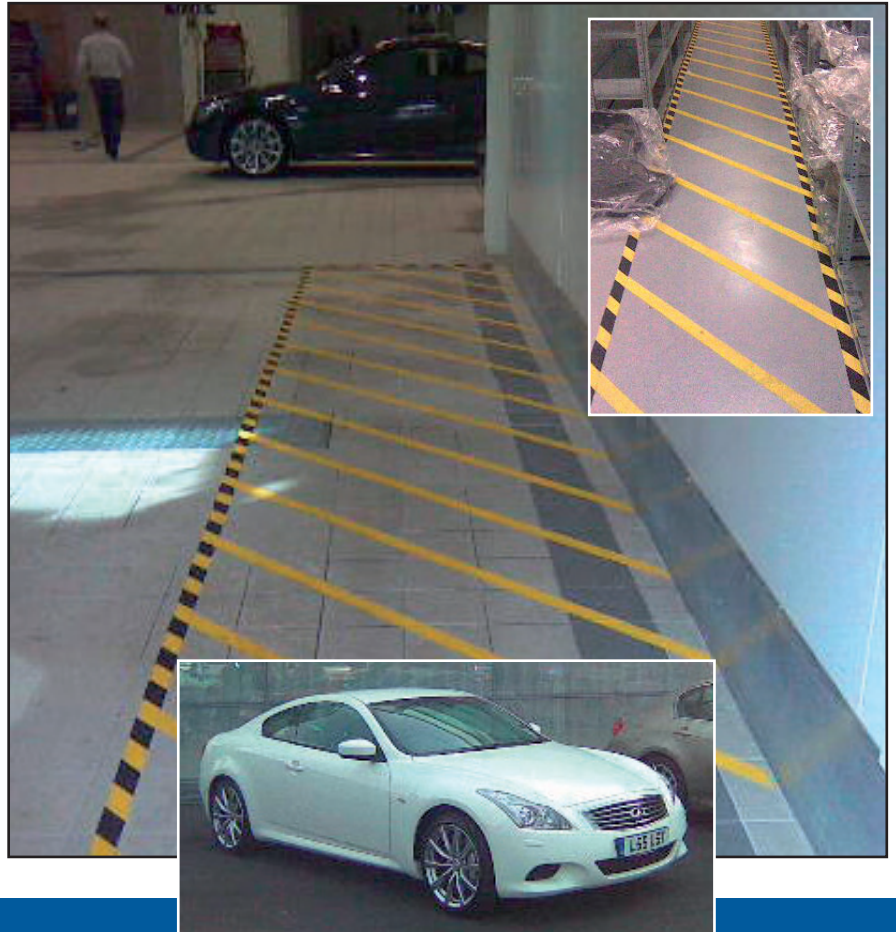
Sealing & waterproofing.....

- SEALING MASTICS
- MEMBRANES & FLASHINGS
- INDUSTRIAL TAPES



Above: The new prestige Infiniti car showroom in Reading.

Below: Denso Anti-Slip Tape used in the service bay and emergency walkways (inset).



Accident Prevention in New Car Showroom - United Kingdom



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Archco-Rigidon Lining Chosen to Solve Condenser Corrosion Problem

Engineers at a major iron mill located in Gwangyang, Korea were experiencing a series of corrosion problems with the mill condensers.

As replacement would be an expensive and time consuming operation, Denso's Korean agent, K-Cotech suggested repairing the damaged condensers with an Archco-Rigidon 402B(423D) and 502B(523D) liquid lining system.

The condensers were first grit blasted to remove the old FRP coating and then primed. A filler coat was used to fill the winding section and then Archco-Rigidon 402B lining was applied over the damaged areas.

When the system was completed the iron mill engineers were delighted at the results.

Photos:

Top: The badly corroded condensers.

Below: The problem is solved using the Archco-Rigidon lining system.



Project Summary

Product type:
Industrial Lining

Country:	Korea
Location:	Gwangyang
Object:	Mill condensers
Problem:	Corrosion prevention
Product solution:	Archco-Rigidon 402B & 502B



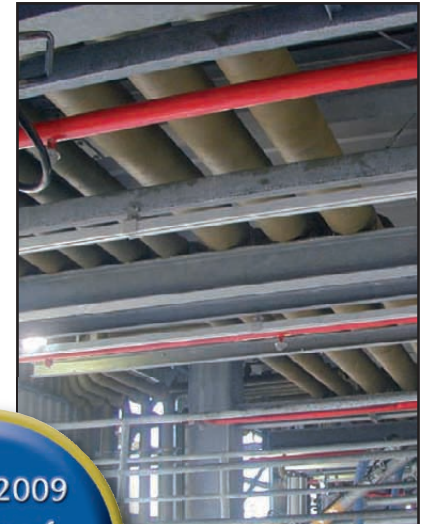


LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Densyl Tape Protects Gasolene Loading Station Pipework

A Densyl Tape System was used to give effective corrosion prevention to selected pipework located at a Japan Energy gasolene loading station.

All joints and flanges on the pipework sections chosen for the Denso system, were filled with Densyl Mastic to give a smooth profile prior to wrapping with Densyl Tape. The conformity, flexibility and acceptably neat finish of the petrolatum tape system is perfectly demonstrated in the photographs below.



1929 - 2009
80 Years of
Pipeline & Steelwork
Protection



Project Summary	
Product type: Exposed Surface Coating	
Country:	Japan
Location:	Unspecified
Object:	Gasolene pipes
Problem:	Corrosion prevention
Product solution:	Densyl Tape System



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

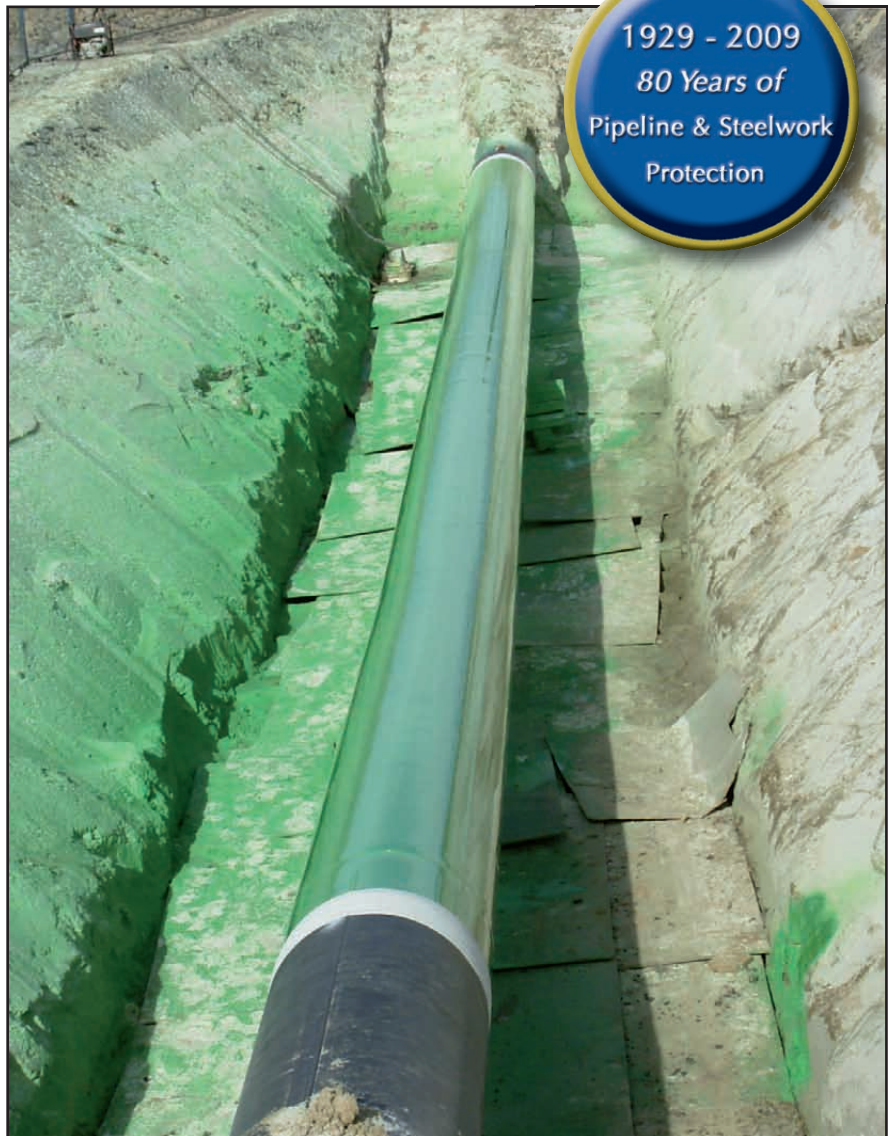
Aiding in the Health of a Pipeline

Canada's abundance of oil is primarily in Western Canada and must travel great distances in order to bring this natural resource to market. A massive infrastructure of pipelines is in place where many thousands of kilometers of small diameter liquids production piping eventually ends up flowing into much larger diameter transmission piping which brings crude oil to refineries and refined product to bulk terminals and tank farms across Canada and the United States of America.

After a pipeline is buried and commissioned its life begins, and during the course of which the pipeline will be subject to many forms of inspections, evaluations and resulting treatments. Based on a wide variety of variable circumstances and environments a pipeline's physical condition will deteriorate over time and subsequent remedies must be applied in order to bring it back to its original health.

The following is a snapshot in time of one such situation on Canada's largest liquids pipeline transmission system.

One form of pipeline inspection is the use of 'Smart pigs'. 'Smart pigs' or internal inspection tools are mechanical devices that are inserted into one end of a pipeline and then proceeded to travel down the section of pipe to be inspected. After the desired length of pipeline is travelled, the inspection tool is discharged from the pipeline having gathered data which helps technicians diagnose the condition of the pipeline. Inspection methods such as Ultrasonics (UT) and Magnetic Flux Leakage (MFL) are commonly used to pinpoint weaknesses in the pipeline, a large part of which are caused by corrosion. In this particular scenario the owner company ran a MFL tool through sections of pipeline stretching hundreds of kilometers and as a result of the



inspection, potential problems were identified in a few locations. The next phase of the project was to expose the sections of buried pipeline where the 'smart pig' had logged anomalies,

remove the existing coating and perform a more detailed inspection on the problem areas and determine a corrective course of action. Once final visual and technical evaluations



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

of the pipeline were performed, the identified areas were either reinforced with weld-on mechanical steel sleeves (which was the norm) or deemed in satisfactory condition. At the end of the inspection process all areas needed to be re-coated before back-filling the pipeline which is where Denso got involved.

Working with the owner company, third party inspection and the coatings applicator Denso came to the table providing technical advice and the proper materials to reinstate the health of the pipelines coating system. The system needed had to be one that could be applied in the field under varying conditions on a pipeline that was in operation. For this surgery, the Denso Protal 7250 was utilized on the majority of

Project Summary	
Product type: Buried Steel Coating	
Country:	Canada
Location:	Countrywide
Object:	42" diameter crude oil pipeline
Problem:	Corrosion prevention
Product solution:	Denso Protal 7250, Denso Hotline Tape and Denso Glasswrap Outerwrap

the length of pipeline that had been stripped of the original three-layer polyethylene coating. After a short period and after the 7250 epoxy had set, the final requirement of the surgical operation required the newly installed 7250 be tied into the existing three-layer polyethylene coating at either end of the repair. This last step was accomplished by using Denso

Hotline Tape to transition the two coatings and to ensure strong mechanical protection on the 42" diameter pipe transition coating, Denso Glass Outerwrap was utilized.

The final result was a good, reliable in-situ coating rehabilitation system that leaves the owner company feeling confident about the health of their pipeline.



Pictures:

Page 6 - A finished pipeline section.

Left - The effective transition from the new Protal 7250 to the original three-layer polyethylene coating was achieved with a wrap of Denso Hotline Tape.

Above - A final outerwrap of Denso Glass Outerwrap completes the job.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Finished Product Port Delivery Pipeline Protected with Denso System

Starting in July 2009, this was another project within the greater New Zealand Kupe Oil and Gas field development, for which Denso New Zealand has supplied almost all facets of its long term corrosion protection requirements.

The Denso S43/R23 System was again chosen for its excellent all round adhesive and CD properties for the protection of the 450mm diameter pipeline field joints on this 17km project.

Denso provided full application training, applicator certification, peel test certification etc, resulting in absolute peace of mind for the consultant and asset owner alike.

This project was completed on time and to the satisfaction of all parties concerned.

The pipeline joints are cleaned by grit blasting.



Project Summary

Product type:
Buried Steel Coating

Country: New Zealand

Location: Unspecified

Object: Pipeline Joints

Problem: Corrosion prevention

Product solution: Denso S43 / R23 System

Below: After priming, the S43 Tape is applied to the joint using a Densoman wrapping machine.



Below: The R23 Tape is applied over the S43 Tape, completing the joint protection system.



1929 - 2009
80 Years of
Pipeline & Steelwork
Protection



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Protects Transnet Pipeline's New Multi Product Pipeline (NMPP) Project

The NMPP Project is designed to efficiently transport diesel, petrol and jet aviation fuel to the inland of South Africa (the Gauteng region). It will consist of: A 24" three layer PE coated 525 km multi-products liquid fuel pipeline (or 'trunkline'), including up to nine pump stations, running from Durban, KwaZulu Natal to Jameson Park near Heidelberg in Gauteng.

There are also three 16" three layer PE coated lines measuring a total of 180km in and around Gauteng.

The consulting engineers on the project are from Arup, Worley Parsons and Transnet Pipelines. The Joint Venture is called the NMPPP alliance. Spiecapag and the South African construction company Group Five are the main pipeline contractors on the project.

Denso South Africa has been specified to supply materials for the field joint coatings on both the 24" and 16" pipelines.

To date Denso has supplied the field joint coating to 150km of 16" and to 31km of the 24" pipeline

The field joint coating comprises the Denso Protal

Project Summary

Product type:
Buried Steel Coating

Country:	South Africa
Location:	Durban to Heidelberg
Object:	Pipeline Joints
Problem:	Corrosion prevention
Product solution:	Protal 7200, Corroklad Stoneguard 1200

7200 which is then overwrapped with the Denso Corroklad inner and outerwraps. The field joint is then protected with the Denso Stoneguard 1200.

Bulldog Projects and Pipeline Coatings are the liquid field joint applicators on the project, the field joint is blasted to SA2½ and



A pipeline bend being spray coated with Denso Protal 7200.

the Protal 7200 is applied with a roller or applicator pad.

The Corroklad inner and outerwraps are both applied with a Densoman Wrapping machine with 55% overlaps, the Denso Stoneguard 1200 is applied and secured with an adhesive outerwrap.

The project also required long radius induction heated bends for both pipelines, Bulldog Projects and RJ Southey coated the bends in their yards. The bends were blasted and the Protal 7200 spray applied, the Corroklad inner and outerwraps and Denso Stoneguard 1200 is then applied on site prior to installation.

There were 190 x 24" bends of various degrees and 96 various degree 16" bends.

Stockpiled pipeline bends, coated with Protal 7200 and ready for installation.



The pipeline construction underway.





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

SeaShield Series 500 and 2000FD Protects Steel Piles in Icy Environment

The Series 500 and Series 2000FD Systems were selected and installed in the Duluth-Superior Harbor to provide corrosion protection of the steel piles.

Over the years the Duluth-Superior Harbor has experienced corrosion problems with many of the dock structures due to the bacteria in the water. The environment can be quite aggressive during the winter months as there is a large ice buildup that provides impact damage, as well as extreme thermal expansion and contraction forces. The SeaShield Series 500 and Series 2000FD Systems were used to protect H-piles and cylindrical piles to help solve the ongoing corrosion problem.

SeaShield Series 500

The Series 500 was used to protect the steel H-piles. The system includes a custom fabricated Fiber-Form Jacket and SeaShield 550 Epoxy Grout. The Fiber-Forms were fabricated in two half shells to the shape of the existing H-pile to allow for a 1" (25 mm) annulus space between the jacket and pile. The Fiber-Forms were installed and secured with self tapping screws and temporary nylon straps. The 1" (25 mm) annulus space was adjusted with plastic offset screws. The SeaShield 550 resin, hardener and aggregate were mixed and then poured through a pneumatic vibratory funnel into the top of the jacket.



1. Installation of the two Fiber-Form half shells.



2. Installation of the screws through the tongue and groove closure.



3. Annulus space adjusted with plastic screws between Fiber-Form and H-pile.



4. Pouring of mixed Seshield 550 Epoxy Grout through pneumatic vibratory funnel.



Series 500 during winter ice buildup.



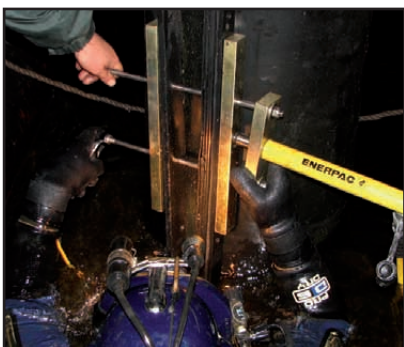
LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

SeaShield Series 2000FD

The Series 2000FD was used to protect the cylindrical piles. The system includes a Denso Marine Piling Tape and a custom engineered HDPE outercover. The Denso Marine Piling Tape was applied above and below water with a 55% overlap. The outercover was then installed and secured with 316 stainless steel bolts using Denso's proprietary tensioning bars and hydraulic equipment.

The Series 500 and 2000FD Systems have been inspected after one year of severe winter ice buildup with no damage. The systems have provided a long-term solution for this aggressive environment.

Denso manufactures a full line of SeaShield Pile Protection Systems and pipeline coatings that are considered the choice by owners, engineers and dive contractors around the world.



Installation of HDPE jacket and hydraulic tensioning system.



Completed installation of SeaShield 2000FD on 18" diameter pile.



Series 2000FD during winter ice buildup.



Project Summary

Product type: Sub Sea / Splash Zone Coating

Country:	United States of America
Location:	Superior, Wisconsin
Object:	Steel piles
Problem:	Corrosion prevention
Product solution:	SeaShield Series 500 and 2000 FD