WINN & COALES INTERNATIONAL LTD

Denso Digest

The Densotherm HD System used to protect a 1900mm x 800mm dia Crotch Plate Tee in South Africa - see page 11.

QUALITY & INNOVATION FROM 1883 INTO THE 21ST CENTURY

Denso®

LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

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:

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✓ Anti-corrosion and sealing systems

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

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Tel: +1 416 291 3435
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DENSO NORTH AMERICA INC - USA
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United States of America
✓ Anti-corrosion and sealing systems

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Fax: +1 281 821 0304
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Fax: +27 31 569 4328
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DENSO (NEW ZEALAND) LTD
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✓ Anti-corrosion and sealing systems

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Website: www.densoaustralia.com.au

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Corrosion Prevention - Marine Marker Post

SeaShield Protection for Southampton Marker Post

To enable quick identification of the subject matter within each story in this brochure we have adopted the following colour codes.

PROJECTS INVOLVING:

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

Southampton has extended one of the outfalls for its secondary treated sewage by a further 80 metres into Ashlett Creek of Southampton Water. A marker post fitted with a light beacon to warn marine traffic has been erected at the end of the extended outfall by specialist marine installation contractors, Visser & Smit Hanab UK Ltd of Kettering.

The 4.5m marker post has been protected by the application of SeaShield 100 Series to the areas affected by the tidal rise and fall, together with the splash zone.

A key component of the SeaShield System is Denso Marine Piling Tape which is a cold applied petrolatum based tape for application under water. The SeaShield jackets, which protect the tape from mechanical damage, are fabricated from uv light stabilised HDPE. They are fixed into position with non-corrodible bands or threaded fasteners.

The marker post in Southampton Water protected with SeaShield 100 Series.

Corrosion Prevention - Ground Anchors

Denso Void-Filler Protects Submarine Dockyard Anchors

Denso Void-filler has been specified as an aid to corrosion prevention after the construction and installation of 42 No.21 strand ground anchors within the Submarine Refit complex at Devonport Royal Dockyard, Plymouth.

The anchors are between 52m and 69m in length and replace existing anchors that stabilise 5 Basin North Wall between 14 and 15 dock within the Submarine Refit Complex.

The work is being carried out by the MOD and DML approved contractors, Systems Geotechnique Ltd, based in St.Helens, Merseyside and Alton, Hampshire.

The Denso Void-Filler is used in three ways on this project:

1. Each 15.2mm individual anchor strand is coated with Void-filler and then covered with a plastic sheath during manufacture.

2. The head detail of each anchor, once installed and stressed, is pumped full of Void-filler and the exposed strands above the anchor head are covered with a layer of Void-filler.

3. Each anchor head is then sealed with a steel 'top hat', which is bolted to the anchor bearing plate and then pumped full of Void-filler.

Denso Void-filler is thereby preventing the ingress of both water and air to each anchor head, the main ingredients for corrosion especially in the marine environment of the dockyard.

Denso Void-filler is based on a microcrystalline petrolatum containing corrosion inhibitors and moisture repellents. It forms a permanently flexible medium for the encapsulation and protection of bearings, tendons, stay cables etc. It has been used in a number of major civil engineering projects including both Severn Bridges.

A nuclear-powered submarine being manoeuvred into Devonport Royal Dockyard's Submarine Refit Complex.

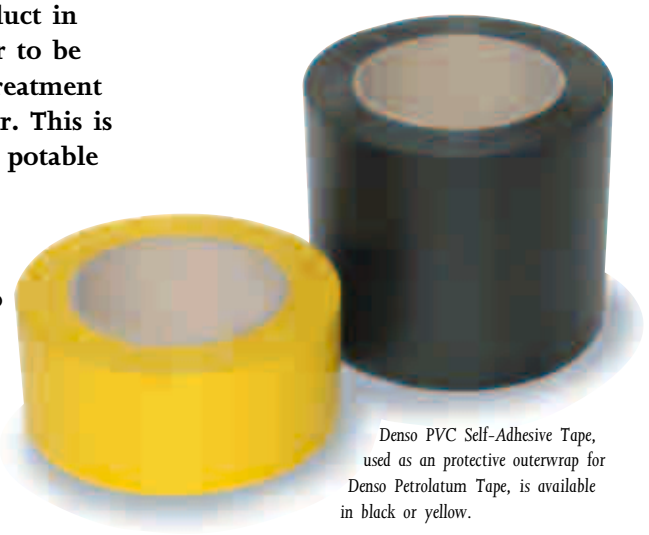
Corrosion Prevention - Mild Steel Support Beams

Denso Protection on Severn Trent Elan Valley Aqueduct

Interserve plc of Birmingham are currently carrying out a major contract for Severn Trent Water at its Elan Valley Aqueduct in Powys, Mid-Wales. The work involved will enable water to be extracted from the aqueduct for a new nearby process treatment works, from where it will be pumped to a new reservoir. This is part of Severn Trent's ongoing programme of upgrading potable water supplies for its customers.

The project includes the construction of an H-shaped universal mild steel beam to carry the weight of the water extraction pipework over the 110 year old aqueduct structure. Corrosion prevention for the universal beam is being achieved by the use of a wrap of Denso Petrolatum Tape followed by an outerwrap of Denso PVC Self-Adhesive Tape to the Civil Engineering Specification for the Water Industry P2 specification.

Denso Tape is a non-woven synthetic fibre fabric impregnated and coated with an adhesive compound based on petrolatum. Denso PVC Self Adhesive Tape is a plasticised PVC sheeting coated one side with a rubber resin pressurised sensitive adhesive.



Denso PVC Self-Adhesive Tape, used as an protective outerwrap for Denso Petrolatum Tape, is available in black or yellow.

The water extraction pipework sitting on the H-shaped mild steel beam prior to the application of Denso Tape system.

Corrosion Prevention - Welded Pipeline Joints

Protal 7200 Protects Girth Welds on Push-Rack Application

A major gas pipeline company recently selected Protal 7200 to protect the weld joints on 12 miles of 20" pipeline in East Texas.

Protal 7200 was selected as the coating due mainly to its extremely fast cure and excellent cathodic disbondment results. Side-by-side tests against competitive liquid epoxies and shrink sleeves, conducted by the pipeline company, was the ultimate deciding factor in selecting Protal 7200. Protal 7200 is a two-part, 100% solids epoxy coating that can be applied in one coat up to 50 mils. The coating exhibits excellent cathodic disbondment results of 4 mm @ 150°F (65°C). In addition to its fast cure, Protal 7200 also exhibits excellent adhesion properties, outstanding gouge/abrasion resistance and is environmentally safe.

Left: Protal 7200 brush applied to 30 mils at 180°F.

Below: *Pipe is pushed into the water 20 to 30 minutes after coating application*

Above: Protal 7200 is cured and holiday detected within 15 minutes.

By preheating the pipe surface up to 180°F (82°C), the coating was cured in 15 minutes to a shore D hardness of 75 allowing the pipe to be holiday tested and pass over the final rollers on the push rack system. Unlike FBE, which requires expensive and heavy equipment, Protal 7200 only requires a brush or roller to apply. The costly risk of downtime due to equipment failure is eliminated. Due to these cost savings Protal 7200 is ideal for a variety of field or shop applications including girth welds, tie-ins, drilling applications, station piping, fittings and repairs to FBE.

Denso has an extensive line of pipeline coatings to protect a wide variety of pipeline applications in almost any environment.

Corrosion Prevention - Bolted Flange Crevices

Butyl Tape Protection for Vital Potable Water Application

Following the NSW government's recent decision to ensure emergency and on-going reliable water supplies for Sydney, a 'deep water' access sump was created in the Prospect Reservoir.

The basic design is an underwater excavation that leads into a large volume pump chamber where four submersible pumps will discharge through 900mm piping. The nature of the chamber design lends itself to including several 1060 OD bolted flanges and valve units.

Before the project was fully commissioned the contractors found early evidence of crevice corrosion on 22 of these flanges. Given that this installation will only be used in times of extreme emergency there is zero tolerance for breakdowns and leaks, especially as a corroded flange unit could be submersed under 10 metres of turbulent raw water and would require the entire the system be shut down and drained.

As there is a need for long term protection demanding AS4020 potable water safe coatings that offer potential for coating and flange maintenance Denso engineered a basic system that utilises our new Butyl Mastic and Butyl Primer as its platform.

Above: Application of the Denso Butyl Primer to the cleaned flange crevice and edge.

Below: Application of the Denso Butyl Mastic to the tack dry primed flange.

The flanges were first wire brushed to remove any active corrosion; the client also required that the flange edges were sanded clean. The crevice and flange edge are coated with a consistent layer of Butyl Primer which was allowed to tack dry. The butyl mastic was then rolled and stretched into a bead which was forced into the crevice 'until refusal'.

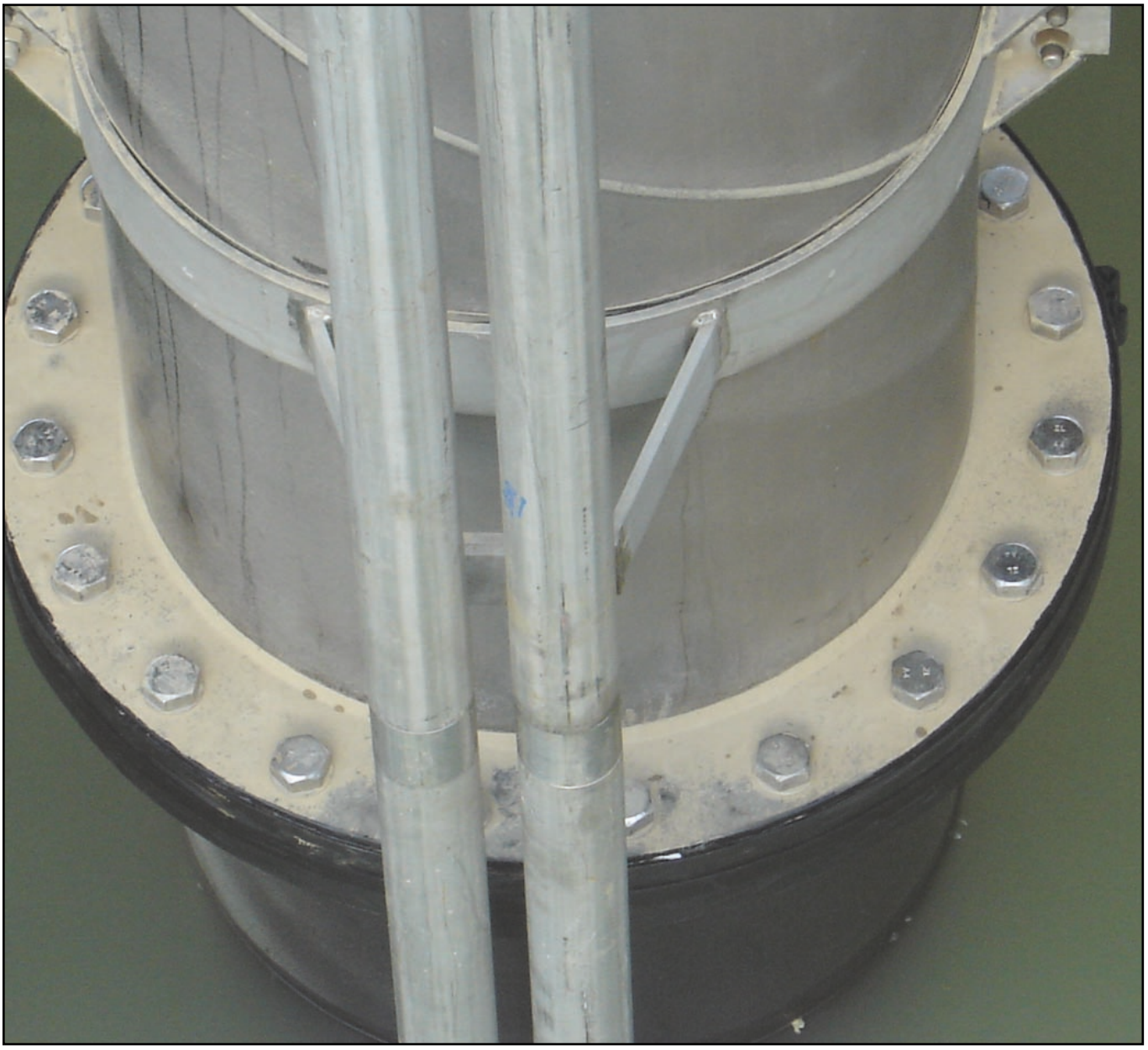
Keeping the interleaving in place to guide tension we applied a single layer of Butyl Mastic around the circumference of the flange. Care was taken to press the mastic down firmly and to avoid over stretching the mastic strip. The interleaving is then removed and discarded.

An HDPE (2mm) strip was applied over the Butyl Mastic to provide protection from turbulence, possible debris and some UV exposure. This is secured in place by the new 25mm Smartband and reusable locking head.

Even though the applicators were working from boats the client was pleased to see that from cleaning to strapping each of these 1060 OD bolted flanges took only 20 minutes to complete.

Left: *Application of the 25mm Denso Smartband to secure the 2mm HDPE strip.*

Below: *Finished flange.*



Restoration - Concrete Jetty Piles

SeaShield Series 500 System Continues to Create Business on Canada's East Coast

Following the successful introduction of the new Series 500 epoxy/aggregate system of concrete restoration in the fall of 2006, Denso Canada has now landed a new project for this system at the Bayshore Power Project in Saint John, New Brunswick as well as an extension of the Bayside Terminal and Loading Wharf in Western New Brunswick at St. Andrews.

The two projects are the result of the very successful introduction of the Series 500 system that incorporates Denso Fiberglass jackets and epoxy/aggregate mix for rebuilding and restoring concrete pilings on wharf and dock structures.

In the case of the Bayshore Power Project, the material is used at the loading dock facility and in the case of the Bayshore Terminal, it represents another construction year for piling restoration during low tides.

The Terminal project involves completing a total of 200 pilings over the next several years.

This system is continuing to grow in popularity as more and more concrete pilings have eroded to the point where structural stability if a major factor in either replacing the piling or repairing it. The cost of replacement is prohibitive and Denso has offered their system as a very cost effective and long term solution to piling restoration.

Below: *Installation of the SeaShield Series 500 system involves pumping epoxy/aggregate grout into the annulus between a Denso Fiberglass jacket and the pile surface.*

Below: *The concrete piles underneath the Bayside Wharf.*

Corrosion Prevention - Pipeline Tee's

Densotherm HD System Protects Water Pipelines Tee's

The VRESAP (Vaal River Eastern Sub-System Augmentation Project) is a 115km 1.9m diameter pipeline running from the Vaal Dam to the Secunda area, supplying water to power stations and a major fuel refinery in the area.

Denso South Africa recommended the Densotherm HD system for the corrosion protection of various composite and crotch plated tee's for the project. MPC JV, the pipeline contractor, awarded the application of the Densotherm to GBM, a Denso approved contractor who is based in Secunda.

In total there are 255 tee's on the pipeline which is due for completion in September 2007.

Below: *A 1900mm x 800mm dia Crotch Plate Tee.*

Below: *The Densotherm HD System is tough and confromable.*