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Denso®
Digest



QUALITY AND INNOVATION FROM 1883 INTO THE 21st CENTURY

Denso®
LEADERS IN CORROSION PREVENTION
& SEALING TECHNOLOGY

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Welcome to the latest collection of project stories from around the globe illustrating the virtues of Denso Anti-corrosion and sealing products. Please contact your local Denso company for more advice or product information or fax/mail the form on the back of this publication.

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40
YEARSPROVEN BY THE
CONSTRUCTION INDUSTRY

Above:
Independent water pressure testing of manhole units jointed with Tokstrip to determine seal strength.



Box culvert units jointed with Tokstrip.

Winn & Coales (Denso) Ltd are confident that these major product enhancements will ensure Tokstrip remains the market leading joint sealant well into the new millennium.

Sealing Mastics - Precast Concrete Units

Tokstrip Precast Concrete Joint Sealant Gets Major Revamp

Tokstrip, the brand leading joint sealant for precast concrete units has just undergone a major revamp. The UK manufactured flexible rubber/bitumen strip which meets BS EN 1917 requirements for manholes due to be published mid 2000, has been used in the construction industry for over 40 years to joint precast concrete culverts, manhole rings and inspection chambers and has gained an excellent reputation for effectiveness, reliability, consistent quality and long service life.

Focusing on our customers changing needs, manufacturers Winn & Coales (Denso) Ltd, after many months of ongoing development work are pleased to release the new Tokstrip which incorporates the following features.



Regular laboratory testing ensures consistent product quality and reliability.

- Only one grade of Tokstrip is now required for all year round use.
- More user friendly and easier to handle.
- New fast drying standard primer now available.
- New clear primer is now available where appearance is important

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
- DIY WEATHERPROOFING

Tokstrip®

GRP Dome Designed For New Russian Orthodox Church

Winn & Coales International subsidiary, Dartford Composites, who specialise in the creation of glass reinforced plastic components, recently won the contract to design and manufacture a cupula (dome) for the new Russian Orthodox Church that has been built in Chiswick, West London.

The grp cupula measures 5.5m in diameter and 5.5m high. Similar to the structure of an orange, the bottom half was made out of 18 segments and nine segments for the top, with both halves then being bolted together.

On completion the cupula was taken from Dartford Composites' factory at Slade Green to the Chiswick site. There it was cladded with 5,000



Above: The segments were joined together similar to the construction of an orange.

Right: The completed structure ready for cladding with 5000 aluminium shingle tiles.

Left: One of the 42 gold leaf stars.



The new church ready for its cupula.



aluminium shingle tiles, together with 42 gold leaf stars. On top of the cupula a gold leaf grp ball (also designed by Dartford Composites) was positioned, surmounted by a gold leaf coated metal cross.

All of this work was carried out at ground level on a steel frame section which was lifted up by a crane and anchored to the roof of the new Church.

Right: The completed cupula in position.



Corrosion Prevention - Protection of Ground Anchors

Denso Void Filler Used On Naval Dockyard Anchors

Denso Void Filler has been used for some time at Devonport Royal Dockyard for protecting rock anchors from the corrosive conditions of sea water. It is applied within the sleeves covering the segments of the anchors, as well as within the anchor heads, preventing the ingress of both water and air, the necessary prerequisites for corrosion.

Now, as part of DML's 15 dock modernisation project for Royal Navy attack submarines at Devonport Royal Dockyard, due to previous experience of its effectiveness, some 23 of the 206 anchor pits, measuring 1m x 1m x 600mm, have been filled with Denso Void Filler. The pits were then covered with metal plates so that in the



Devonport Royal Dockyard

dry-dock condition they can be walked and driven over. Eventually all the anchor pits will be filled in the same way.

Denso Void Filler, the main component of Denso Steelcoat 50 System, is a petrolatum compound which contains additives to displace moisture and inhibit corrosion. It was injected hot into the anchor pits from a heated tank with its own pumping system specifically designed for Void Filler application by Winn & Coales Engineering Division. Denso Void Filler has been used on a number of major construction projects including the protection of all stay cables and internal/external post tensioning steel strands on the Second Seven Crossing.

Denso Void Filler Protection For M62 Ground Anchors

Over 30 ground anchors were supplied by Dywidag-Systems International Ltd in order to give slope stability and resistance to landslides at Junction 22 of the eastbound carriageway of the M62. The Dywidag ground anchors are of the Permanent Multistrand type, with double corrosion protection to give a 120 year lifespan

A key feature of the anti-corrosion protection was the use of Winn & Coales Denso

Void Filler, which was pumped into the 260mm o.d. x 600mm end caps. Denso Void Filler

Denso Void Filler, the main component of Denso Steelcoat 50 System is pumped into into the ground anchor end caps.

forms a permanently flexible medium for the encapsulation and protection of the individual strands of the multistrand anchors.

Dywidag-Systems has installed permanent load cells within each cap for long term monitoring as part of a planned maintenance programme. The use of Denso Void Filler enables access for individual check-loading of each strand with a monostrand jack, to establish the retained load.



Corrosion Prevention - Exposed Steelwork

Denso Steelcoat Systems Protect Cargill Salt's Head Frame

Cargill Salt's facility in Avery Island, Louisiana has been in operation since 1954 and is one of the largest salt producing facilities in the United States. The salt is mined from deposits approximately a half mile underground. The salt is transported above ground through shafts which are supported and operated by a steel head frame.

After many years of operation in a salty, corrosive environment the steel head frame was experiencing severe corrosion problems. Over the years liquid coatings were used to protect the frame with little success in solving Cargill's corrosion problems. The steel was contaminated and impregnated with salts making it very difficult for any coating to survive. Cargill needed a coating that was surface tolerant, easy to apply

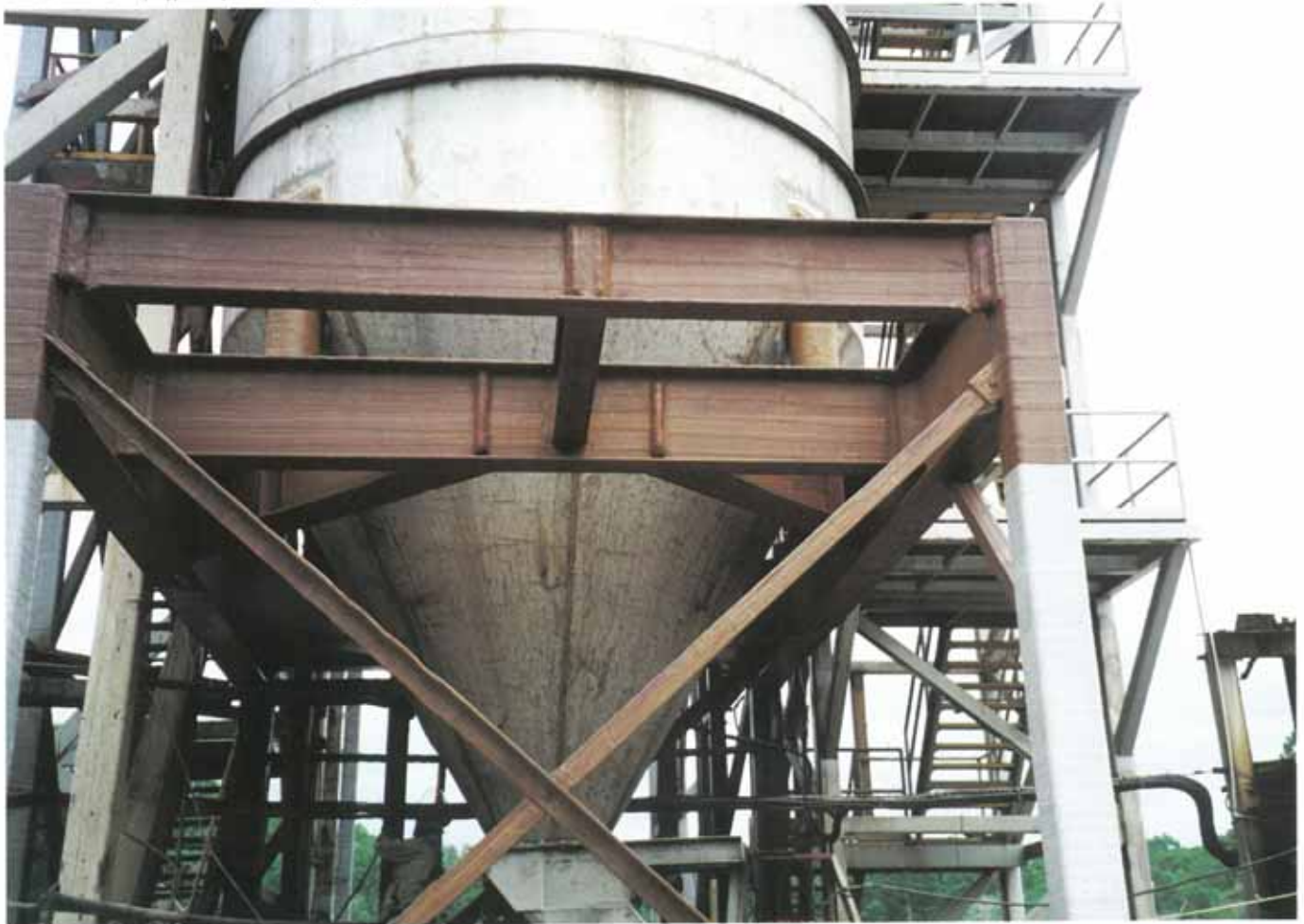
and would not be effected by the harsh environment.

The Denso Steelcoat 100 & 300 Systems demonstrated all these advantages and were selected by Cargill engineers to protect over 10,000 square feet of their steel head frame. The petrolatum products included over 200 cases of Denso ColourTape, 20 cases of Denso Hi-Tack Tape and 5 cases of Denso Hi-Tack Primer.



The Cargill Salt steel head frame.

Denso's flexible, easily applied tapes, offer exceptional protection against corrosive substances such as salt.



Corrosion Prevention - Buried Pipelines

New Protal Epoxy Coating Captures Canadian Pipeline Work

Here in Canada and throughout America in general, epoxy technology as it applies to the pipeline industry, has been advancing rapidly to keep pace with the demands of the gas transmission industry.

Denso North America Inc. has been developing several epoxy coatings to meet the requirements of the pipeline industry in both Canada and the USA. At this time, the largest pipeline in the last 40 years is

smaller lateral extensions. This product, like most other epoxies in the Denso family, is 100% solids, 3:1 mixing ratio, VOC free and is specially formulated to compliment fusion bond epoxy pipe.



The coatings can be brush, roller or spray applied.

being constructed to transport gas reserves from Northern Canada to the USA Midwestern markets in the area of Chicago. Known as the Alliance Pipeline, (see report in the previous Denso Digest Vol. 23 No.2) this massive development will encompass approximately 2,990 kilometres of large to medium diameter pipe for the mainline and a further 762 kilometres of smaller diameter pipe for the lateral and distribution network off of the main pipe structure.

Seeing the need for a high build, fast cure coating, Denso has received approval and is now supplying large quantities of Protal 7200 brush grade to both the mainline work and the

Some of the features of this environmentally 'forest green' colored epoxy include its fast touch dry and full cure times, high moisture and temperature resistance and adhesion.

Denso Protal Coatings are fast curing, with high moisture and temperature resistant qualities.



Denso Protal protection.

The product is available in a variety of kit sizes to meet the various pipe diameters and is also sold in cartridge pack form for small field repairs to fusion bond epoxy.

To date, Denso Canada has supplied Protal 7200 and Protal 7000 for both the mainline pipe work and the lateral pipe, as well as Protal 7125 for repair areas. Additionally, we are supplying our tapes, primers and mastics for certain fittings and appurtenances.

The Alliance project is scheduled to be completed late in the year 2000 and over the next year, we will continue to supply a large variety of our epoxies, in various formats to the entire pipeline system, making Denso Canada the largest supplier of epoxies for the pipeline project.

Corrosion Prevention - Exposed Steelwork

Ferry Terminal Gets Denso Steelcoat 300 Treatment

Due to the very aggressive marine environment, the roof supports in a ferry terminal in West Singapore needed painting every six months. The Port Authority wanted a permanent solution to the problem so they called in the local Denso agent, Shriro (Singapore) Pte Ltd, for advice.

After a site inspection, Shriro (Singapore) Pte Ltd suggested to the Port Authority that they use Denso Steelcoat 300 System which comprises a surface tolerant coloured petrolatum tape coating (Denso ColourTape) which is highly resistant to corrosive atmospheres.

An added benefit of using Denso ColourTape is that it is available in a shade of blue which matched the overall colour scheme of the terminal.

The Tape was spirally applied to all the roof supports and after nine months service there is no sign of the corrosion returning.



Surface tolerant and highly corrosion resistant, Denso ColourTape was spirally applied to the ferry terminal steel roof supports.

Corrosion Prevention - Jetty Piles / Splash Zone

Fleetwood Seashield Installation

Associated British Ports at Fleetwood, Lancs, have been implementing a renovation and protection programme for the four dolphin ramps where Ro-Ro ferries tie-up. The twice daily ferries are the main goods transit link between Fleetwood and Larne in Northern Ireland.

There are 18 jetty piles to each dolphin, plus another 60 supporting the access roadway to the dolphin ramps. The dolphins

the access roadway. Contractors for this lengthy project are F K Preston of Fleetwood, who are grit blasting, marine and industrial painting specialists.

In all cases on this project to-date they first high pressure water blasted the piles to remove all barnacles, etc, using water at 700 psi. They then applied the SeaShield system from the

soffit under the jetty down to a depth of 4 metres. The renovation programme is due to be completed in 2000.

The protection of structures in the splash and inter-tidal zones (and Fleetwood has a very high tidal range) presents many unique



problems. Winn & Coales have worked very closely with its overseas companies to develop a range of SeaShield systems to meet the demands of individual marine environments.

The common and vital element of all the SeaShield systems for steel and concrete pile protection is the waterproof anti-corrosion layer placed over the substrate. This consists of a petrolatum based primer containing water displacing agents, corrosion inhibitors and a wide spectrum biocide. Over the primer is wrapped a double layer of petrolatum tape which then completely isolates the pile from its surrounding environment.

The SeaShield 80 system also has an outer armouring which consists of a rubber bitumen / pvc laminate tape which is wrapped over the petrolatum tape in a double layer to protect against mechanical damage.



One of the dolphins undergoing renovation.

were constructed nearly 30 years ago and have recently been showing visible signs of corrosion.

Winn & Coales SeaShield 80 system is due to be used for the protection of all the jetty piles as well as the the piles supporting

Linings - Storage Tanks

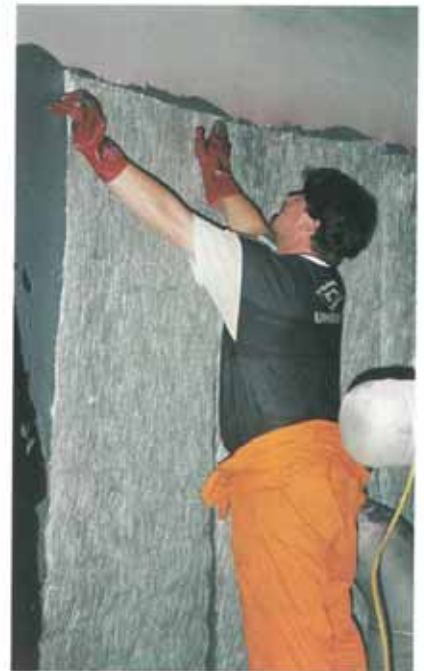
Archco-Rigidon Lining Extends Effluent Tank Life

Medway Power Station in the Isle of Grain, Kent, has used Winn & Coales Archco-Rigidon 423D and 623D corrosion resistant materials to extend considerably the life of an existing storage tank for warm neutralised effluent.



The lining of the 12m high by 5m diameter tank was carried out by contractors Shutdown Maintenance Services. The tank handles caustic and acid chemicals, often in turbulent, erosive conditions and the Station Engineer wanted to extend the tank's life before the onset of any corrosion.

Archco-Rigidon 423D glass flake vinyl ester was spray applied to the roof and walls and Archco-Rigidon 623D vinyl ester/glass cloth laminate system



Archco-Rigidon 623D vinyl ester/glass cloth laminate system was floor and lower wall areas.

was hand and roller applied to give optimum corrosion protection and flexible strength to the floor areas and 2m up the walls. Shutdown Maintenance Services technical staff, under the supervision of the Medway Power Station maintenance engineers, carried out testing of the systems before installation. These two corrosion resistant materials have a proven track record of long term protection in a wide variety of corrosive environments.

ARCHCO RIGIDON
Resistant Materials

Above: The effluent storage tank.

Below: Internal view of the completed Archco-Rigidon system



Corrosion Prevention - Exposed Steel Pipebridges

Denso Steelcoat 400 System Used On Lancashire Pipebridges

Winn & Coales Denso Steelcoat 400 System has been used to protect North West Water's 27" water mains crossing the rivers Langdenholme and Loud Way in the Trough of Bowland, North Lancashire. The work was carried out by Daniel Contractors Ltd.

The Denso Steelwork System was used by North West Water's contractors in a renovation programme on the two pipebridges. They were previously protected with a bitumen based wrapping. All loose material was removed and

coldness of the pipes as a result of the water flowing through them, a hot blower paint stripper torch was used to gently heat and seal the wrap joint whilst installing the final wrap.

The completed wrap was finally given a two coat



Top:
Water main over the Loud Way river during application of Denso Steelcoat 400 System.

Above:
The Langdenholme river pipebridge showing the completed Forest Green finish.

subsequent holes and depressions were filled with Densyl Mastic to provide a smooth profile prior to wrapping with tape. Denso Hi-Tack Primer was applied followed by Denso Hi-Tack Tape forming the main corrosion prevention layer. Denso Hi-Tack Reinforcing Tape was then spirally applied. Due to the

application of Denso Acrylic Topcoat in Forest Green to complete the tough weather resistant Steelcoat System, enabling Daniel Contracting to meet their client's requirement for a 20 year guarantee of surface finish.

Concrete Surface Protection - Tunnels and Riser Shafts

Denso S.T. Epoxy Specified For Dartford Tunnel Concrete Panels

Dartford River Crossing Limited recently decided to give an improved and more modern appearance to the Kent and Essex entrances/exits of the East Tunnel carrying the M25 under the Thames. The mosaic tiles around the entrances had become subject to weathering, with one or two being displaced.

Using the services of North Kent Shotblasting, an approved contractor, the mosaic was removed and the concrete panels rendered. The panels were then spray coated with one coat of Denso Epoxy Concrete Primer followed by two coats of Denso S.T. Epoxy Mastic to give an aesthetically pleasing, long lasting finish.

Denso S.T. Epoxy Mastic is a coating with exceptional

properties that can be spray or brush applied to deliver long-term protection to steel or concrete in a wide range of corrosive environments.



The Dartford East Tunnel entrance.

Night Owl Abseilers Apply Denso S.T. Epoxy Protection

Denso S.T. Epoxy Mastic is being used in an increasing range of applications to give protection against a wide variety of polluting and/or corrosive environments. The latest is to give long-term protection to a 33 metre riser shaft from the kitchen of one of the premier hotels in London's West End.



Application of Denso S.T. Epoxy to the riser shaft.

The 33m x 1,1m x 800mm riser shaft was subject to grease build-up from the kitchen's cooking equipment as it extracted air through the ventilation system. The riser shaft passes eleven floors internally, which are of brick and plaster structure. During a cleaning operation by specialist contractors Altico Services Ltd (working through Green Clean Services) to remove loose grease deposits from the sides of the shaft by manual scraping, it was noted that large areas of plaster had blown from the brickwork in the shaft and in some cases was missing, exposing

a considerable area of brickwork. This was far more difficult to maintain than a smooth sealed surface.

Altico Services drew up a specification to clean all shaft surfaces thoroughly, including pressure washing with degreasing agents, and apply a smooth, clean sealant coating with superior adhesion properties that would guarantee long life. Altico choose Denso S. T. Epoxy Mastic from Winn & Coales who also gave assistance in drawing up the specification.

Altico Services carried out the preparation and application stages by abseiling, using techniques recognised by the Industrial Rope Access Trade Association (IRATA). Furthermore, Altico's abseiling technicians had to work between 12.00 hours midnight and 6.00 am so as not to interfere with the functioning of the hotel's renowned kitchen.

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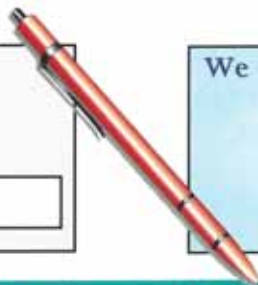


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If you are interested in any of the products featured in this issue of the Denso Digest please tick box:
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We also offer tried and tested systems to deal with all the problem areas listed below, simply fax back this completed page and we will supply you with more information.

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