

DENSO[®] DIGEST



WINN & COALES INTERNATIONAL LTD

International Corrosion Prevention and Sealing

This issue of the Denso Digest features another collection of recent international project profiles demonstrating the versatility and effectiveness of our anti-corrosion and sealing systems in a wide range of demanding environments.

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Denso Protection for New Buried Main

Cycad Construction were awarded a contract on the Kwa-Zulu Natal North Coast to lay 9.6 km of 700mm diameter FBHDPE coated pipe from Hazelmere to Ballito.

The main was needed to supply a reservoir built to service new developments in the area.

Denso provided the corrosion prevention solution for the external surfaces of the welded joints and bends of the new main.

After priming these areas with Denso Primer D, weld beads were first sealed with Denso Weldbead Tape followed by a double wrap of Ultraflex 1250/300 Tape.

To obtain a controlled thickness of mastic a Denso Mastic System was selected for sealing all of the fittings.



Denso Ultraflex Tape is ideal for the protection of butt welded joints, bends and fittings.

British Steel Chooses Denso Hotline Tape System

Denso Hotline Tape has been chosen to protect underground cooling water pipes at a new water treatment plant and pumphouse at British Steel's Scunthorpe complex. It is part of a new bloom caster section being built for British Steel in collaboration with VAI of Austria.

Because of the high water table the Denso Hotline Tape has been covered with a PVC overwrap to give extra protection. The subcontractors for application of the tape system are Phoenix Mechanical Services Ltd of Sheffield, who requested the specifications for three different tape system options to consider for the project. Phoenix Mechanical chose Denso products because of past experience of their reliability and ease of application.

Denso Hotline Tape, which can resist temperatures up to 110°C, was applied by a



The Denso machine gives even tension and maintains the correct overlap for wrapping pipelengths.



Denso pipe wrapping machine. This has the advantage of maintaining the right tension and overlap on the Hotline Tape, enabling the work to be carried out much faster than by hand. This latter point was important to Phoenix Mechanical in view of the tight time schedule in their contract. The PVC overwrap was applied by hand.

The pipes protected include a 287 metre length 500mm nominal bore flow and return line, 300mm, 200mm and 150mm bore pipes, plus several smaller diameter pipes.

Denso PVC Tape was used to overwrap Denso Hotline Tape for extra protection.

Void Filler Protects Post-Tensioned Road Bridge

Denso Void Filler was recently used to provide anti-corrosion protection in the rebuilding of the A3/A31 external post tensioned bridge at Guildford, Surrey for Surrey County Council. The project involved the removal of the former post-tensioning system and replacing it with a new PT system. The bridge abutments were also rebuilt. Traffic flow was maintained over and beneath the bridge throughout the works

The main contractors were Bilfinger & Berger Ltd, with PSC Freyssinet Ltd being the specialist sub-contractors for the post tensioning system. PSC's steel tendons were contained within plastics ducts. Denso Void Filler was injected hot into the ducts from a heated tank with its own pumping system specifically designed for the product's application by Winn & Coales' Engineering Division.

The bridge's post-tensioning system has ten 75 metre and two 55 metre long 160mm diameter high density polythene ducts. Each duct contains thirty five 15.7mm plastic coated steel super strands. Denso Void Filler



The special Denso Void Filler pumping system.

is based on petrolatum containing corrosion inhibitors and moisture repellents. It forms a permanently flexible medium for the encapsulation and protection of the steel strands. Another advantage of Denso



The A31/A3 bridge at Guildford

Void Filler injection is that individual strands, or even the complete bundle, can be removed for inspection. With cementitious grouted ducts this is not possible, as the strands are permanently bonded and cannot be removed.

Denso Void Filler can be supplied in bulk, i.e. 20 tonnes via insulated road tanker or in 200 litre drums for smaller projects. The company also maintains a range of heating, storage and pumping equipment which can be hired at reasonable cost.

From experience gained worldwide (including the Second Severn Crossing), Winn & Coales is able to offer a comprehensive design and advisory service.

Heated Void Filler was injected into the ducts containing the steel tendons.



Covercoat System Specified for Water Main Refurbishment

The Kapuni area of South Taranaki has a large network of watermains servicing dozens of small communities throughout the district. The pipelines frequently travel above-ground to cross the numerous waterways in their path. Previously, the pipelines had been protected with a plastic coating which had little resistance to weathering and was peeling in many places.

Where the original tape remained it was in reasonable condition and the task of removing it would be immense. It was recommended therefore that the Covercoat Petrolatum System should be used to completely encapsulate the pipeline. The plan was to include the sound old tape thus avoiding the expense of removing it.

The Covercoat Petrolatum System was specified for the project and Denso Licensed Applicator, Aerial Abseil Access NZ Ltd successfully tendered for the work.

Any old bitumen tape in poor condition was removed and the bare steel primed. Flanges and

joints were profiled using Densyl Mastic and the pipes were then spirally wrapped with 200mm wide Denso Covercoat Tape. Following application of the water based Cementitious Base Coat to seal and protect the tape, the system was completed with the environmentally responsible Green Water Based Acrylic Top Coat.

The result - environmentally friendly long-life protection for South Taranaki pipelines.

Denso Covercoat Tape is applied ready for the application of the water based Cementitious Base Coat.



The completed Denso Covercoat System applied to a pipe that crosses one of the numerous waterways in South Taranaki.



Tubemakers use Denso System for Steel Pipe Specials

Tubemakers of Australia are suppliers of large, cement lined steel pipes for water mains. Sintacote is applied in the factory to the straight sections, specials are then protected against corrosion with the Densopol 60 Tape System (Rockwrap 3000).

These include weld areas in the construction of lobster back bends, transitions, branches and crotch plates. Such areas present complex profiles to be protected. The Densopol 60 Tape System (Rockwrap 3000) meets the demands for a tough coating, flexible enough to conform as required.

The photographs give an indication of the complex shapes that required wrapping. In one section of pipework there were three outlets with both ends of the transitions wrapped as well as the branch pipe and the crotch plates. Combined they presented some of the most complex profiles encountered.



The Densopol Tape System (Rockwrap 3000) is suitable for wrapping difficult profiles.





Above ground oilfield pipelines, The North Slope of Alaska.

Denso Tapes Show Versatility on The North Slope of Alaska

The TransAlaska Pipeline System (TAPS) is often referred to as one of the technological marvels of the 20th century. After 20 years of operation, the 800 miles of 48" pipeline has safely pumped over 11 billion barrels of crude oil down the line on its way to the American market. Nearly one million barrels of oil per day are pumped into the TAPS pipeline from the remote Prudhoe Bay and Kuparuk oilfields. The piping from these fields is above ground due to the difficulty of burying, operating and maintaining pipelines in the 50 foot deep permafrost which is characteristic of the tundra.

At Kuparuk and Prudhoe Bay, the above ground pipelines are insulated with foamed-in-place polyurethane, which is jacketed with a spiral ribbed galvanised steel. At the weld joints, two half shell polyurethane pieces are sandwiched around the bare steel pipe, wrapped with a sheet of galvanised steel, banded shut and have the edges caulked with silicone. These areas are called weld pack areas and rest on vertical support members constructed of steel saddles anchored by steel piles.

When the silicone weathers, water penetrates under the galvanised jacketing in the form of rain, snow and condensation. The weld packs rest on the saddles and do not allow the water to drain. High production temperatures (120 to 180°F) keep the water from freezing and therefore keep it in an active corrosion mode. X-ray testing shows loss of steel at the weld pack areas. Environmental temperatures average -25°F in the winter making coating selection a challenge.

A combination of Denso Hotline Tape, Densyl Tape and the new Denso Grey Petrolatum Tape has been selected as the coating system to face the application and service temperature challenge. Depending on the temperature, either Densyl Tape or Hotline Tape is specified for wrapping the bare pipe section at the weld pack area. The insulation is fitted over the area and Denso Grey Tape is wrapped between the mainline galvanised jacket and outer jacket in place of the silicone sealant.

There are over 60,000 weld pack areas to coat at about 10 linear foot per weld pack. The unique Denso Tape system has been chosen to coat and waterproof these areas as part of an ongoing corrosion control program that is expected to continue for several years. This application on the prestigious TransAlaska Pipeline oilfield system showcases the versatility under extreme conditions for which the Denso petrolatum tapes are renowned.

Protal 7000 Epoxy Coatings for the Oil and Gas Industry

Denso North America Inc, based in Toronto, Canada, with offices in Edmonton, Alberta, Houston, Texas and Philadelphia, Pennsylvania has experienced tremendous growth in the application of epoxy coatings in the oil and gas industries throughout North America for various corrosion protection applications



Protal 7000 application to a girth weld.

These unique coatings are based on 100% solids epoxy resin technology, are iso-cyanate and solvent free, rendering them VOC free and environmentally responsible. They are easy to apply in the field by spray, brush or roller and offer excellent cathodic disbondment results, high impact resistance, fast curing along with high abrasion resistance, high adhesion and low odour.

The acceptance of Denso Protal 7000 epoxy coatings has been based on extensive trials and tests meeting stringent international standards for products of this nature.

The Protal 7000 series of coatings are tough, durable products with high build characteristics, specifically formulated to be compatible with fusion bonded epoxy coatings and many other

mainline coating systems. They are used on a variety of pipe diameters ranging from 6" to 48" and larger. Protal 7000 is used extensively for girth weld protection, tie-ins, road bore applications, river crossings, repairs to fusion bonded epoxy and as a primary coating for fittings and fabrication on new pipeline construction. It is also used in many rehabilitation programs on existing pipelines.

Most major gas and oil transmission companies across North America use the expertise of Denso North America Inc. and our epoxy coatings for successful completion of their pipeline projects on a year round basis, from the high summer heat of deserts, to the cold winter climates of the far north. Protal 7000 is available in brush or spray grade for normal temperature, high temperature or cold weather applications.

Whenever and wherever a pipeline is built requiring maximum protection from corrosion, Denso North America Inc. and our product line are considered as the materials of choice by engineers, construction and oil and gas transmission companies across North America.

Application of Protal 7000 by roller.



10km Water Pipeline and Joints get Denso Protection

Northumbrian Water is nearing completion of Phase III of the project involving refurbishment of Conduit 58, a 36 inch pipeline supplying major industrial users on Teeside. The 10km main can carry up to 60 million litres of water per day.

This final phase is a 2km section running south of the River Tees. As with the earlier phases, Northumbrian Water has again chosen Denso materials to provide long-term protection of the pipeline and VJ couplings.

The Denso System used comprises Denso Paste followed by Denso NW58 Tape for repairs to the pipeline, with the VJ couplings being protected with Denso Profiling Mastic overwrapped with Denso NW58 Tape. Existing sound Denso Tape has been coated with Denso Protal NW coating to give even longer life protection in this industrial and marine environment.

Coating work was carried out by contractors Terrain Pipeline Protection of Hartlepool.

The evidence of the past performance of the Denso materials helped to give Northumbrian Water the confidence to re-specify these long-life pipeline protection materials.

A coating of Denso Protal NW was applied to existing sound Denso Tape on certain sections of the pipeline.



Pipeline joints were protected with Denso Profiling Mastic to even the contours before overwrapping with Denso NW58 Tape.



Where the original tape needed replacement the pipeline was treated with Denso Paste overwrapped with Denso NW58 Tape.



Archco-Rigidon Coating Chosen for UK's Largest Waste Incineration Plant

Cleanaway Ltd, one of the UK's leading industrial and commercial waste disposal companies, operates Britain's largest waste disposal and incineration plant at Ellesmere Port. It handles a wide range of chemicals, solvents, oils, etc.

The combustion gases from the controlled incineration plant pass through an extensive filtering system as part of the process to meet all environmental control requirements. Over a period of time this led to deterioration of the coating on the ducting housing the fabric filters. Cleanaway Ltd selected Repair Protection & Maintenance Ltd (RPM) of Pontefract, West Yorkshire, to carry out the repairs to the ducting coating.

RPM, a new company in corrosion engineering but with considerable experience of the specialist coating industry, then visited Winn & Coales (Denso) Ltd for advice on the most suitable coating for this demanding application. RPM says it selected Denso's Archco-Rigidon products because of their reputation as quality anti-corrosion coatings and the valuable technical backup that is available.

The material RPM selected for the repairs was Archco-Rigidon 423D, a spray applied glass flake filled vinyl ester resin coating. This coating has a proven track record in such corrosive environments and was compatible with the existing coating.

The grit blasting operation in the fabric filter ducting, which is some eighty five feet above ground level, revealed a number



Spray application of Archco-Rigidon 423D glass flake filled vinyl ester resin coating.

of holes in the roof which had been caused by under lagging corrosion. These were repaired utilising a glass fibre membrane and an Archco-Rigidon compatible vinyl ester laminating resin. Matting patches were used to bridge the holes with a further larger mat deployed to strengthen the surrounding

thinned area.

Cleanaway were aware that additional repair work would be necessary and as the shutdown progressed RPM were asked to quote for the internal lining of two clarifier tanks, each approximately 100m² in area. Again, a competitive price and an assurance that this work could be accommodated within the shutdown time frame secured the contract for RPM.

The clarifier tanks were of a bolted panel construction which had previously had problems with seepage at the joints. This had been temporarily resolved by the application of a 300mm wide band of mastic sealer over the panel joints. As part of the coating procedure the mastic was to be removed and replaced with a glass fibre bandage which would be applied between the main spray coats of Archco-Rigidon 423D, which was considered the most appropriate coating for this work. An intermediate stripe coat was applied over the glass fibre matted joints.

Other inspections on site revealed defects in the existing coating in a number of areas, including the inlet and outlet ducts on the fabric filter, the mist eliminator duct and two sections of the stack inlet pipe. In some areas the existing coating was removed completely and re-coated, whilst a sweep blast and top coat was all that was required in others. Despite the fact that this additional work increased the original repair contract ten fold, all work was completed within the shut down time frame.

ARCHCO RIGIDON
Resistant  Materials

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Cover picture: Protal 7000 application to North American pipeline. (See page 9).

