

DENSO DIGEST



SPECIAL DENSO COVERCOAT FEATURE

Denso Protection For Historic Transporter Bridge

Opened in 1911, the historic transporter bridge over the River Tees between Middlesbrough and Port Clarence is the only transporter bridge still operating in Britain – the others at Newport, South Wales and Warrington, Cheshire being no longer operational. Now again fully operational, the Middlesbrough transporter bridge was recently the subject of a major refurbishment programme by Cleveland County Council.

Consulting Engineers for the project were Rendel Palmer & Tritton of Newcastle-upon-Tyne, who recommended that some of the tie rods coming down from each end of the transporter truss into ground anchors should be replaced with new ones.

To ensure long-term protection of the tie down rods against corrosion, a Denso Tape wrapping system was specified. This consisted of Denso Priming Paste, which is an adhesive primer for use with the petrolatum based Denso Tape, followed by Densoclad 40 Tape outerwrap for enhanced protection.



The transporter bridge.

One of the reasons for the choice of the Denso Tape system was that Cleveland County Council's Environment, Development and Transportation department found in store some old tie down rods which some 20 years ago had been protected with the original Denso Tape (but without the modern Densoclad 40 Tape outerwrap). It was found that they were free from corrosion and the nuts on the threaded ends worked perfectly.

Nuts and threads still working, 20 years on.



Denso Protection At New Tees Barrage

Under construction between Stockton and Middlesbrough is a major barrage across the River Tees designed to maintain the present high tide condition. This is part of the project being carried out by Teesside Development Corporation to regenerate 250 acres of derelict industrial land, known as Teesdale. The area is three times as large as London Docklands' Canary Wharf project and the total rejuvenation plan will cost £500 million.

Tie rods protected with a Denso system.



Teesdale has been conceived and planned to contain all the ingredients that are essential to true urban renewal – the infrastructure on which new and modern enterprises and communities can build; the mix of commercial, residential, leisure and social facilities, plus a pleasant environment. For this the barrage, being built by Tarmac Construction under a Design and Construct contract for the T.D.C., will perform a key role. The works are being

designed for Tarmac by Watson Hawksley of Newcastle-upon-Tyne, part of Montgomery Watson, one of the world's largest water and environmental consultancies.

Major river training works are currently being carried out by Tarmac Construction as part of the barrage project. This river training operation involves the use of a large number of tie rods, all of which are being protected from corrosion by a Winn & Coales' Denso System.

The majority of tie rods are supplied pre-wrapped with the Denso tie rod wrapping system. Where tie rods are joined up, the Denso Tape is applied in situ. The Denso tie rod wrapping system being used on the Teesdale barrage contract consists of application of Denso Priming Paste followed by Denso Tape and then Denso Self-Adhesive PVC Tape.

New Denso Profiling Mastic Evolved For Tybar Joints And Valves

Northumbrian Water Ltd has recently carried out duplication of the conduit system from its water treatment plant at Broken Scar, Darlington. The work was carried out by McLoughlin Pipelines Ltd of Derby, in conjunction with Northumbrian Water's engineers.

The duplication project included the installation of 1 Km of 900mm ductile iron pipework and 4 Km of 1100mm pipework. The work also entailed installation of approximately 100 Stanton 'Tybar' joints, particularly on the 900mm pipework. For protection from corrosion, McLoughlin Pipelines recommended application of Densoclad 40 Tape, which they had used with success on previous projects. However, for maximum effectiveness, Densoclad 40 Tape is best applied over a smooth surface.

Because in most cases they were working in a trench underneath the pipe, the contractors and Northumbrian Water's engineers found that when applying conventional mastic blankets to the Tybar joints it was difficult to obtain the smooth profile required to allow the P2 specification tape wrap to be applied.

This problem was raised by Northumbrian Water's engineers with Winn & Coales, who came up with a new Denso Profiling Mastic. Because of its lighter weight and increased adhesion compared with the conventional mastic, it was found to stay in place perfectly before applying the Densoclad 40 Tape. The new Denso Profiling Mastic also turned out to be cheaper than the traditional material – another bonus in these cost conscious times.

Following its success on the Tybar joints, the new Denso Profiling Mastic has also been used



Densoclad 40 applied over Denso Profiling Mastic.



Denso Profiling Mastic applied to a valve.

as part of the protection system for valves on the 1100mm pipes at the Broken Scar water treatment plant. The valves have flanges of some 2-3 inches deep which are filled with Denso Profiling Mastic before application of Densoclad 40 Tape.

Protection System At Sellafield

Winn & Coales (Denso) Ltd have recently been involved in three major contracts for the protection of pipework at British Nuclear Fuels, Sellafield works, Cumbria. Being close to a marine environment, extra precautions must be taken to protect certain pipework from corrosion. The first application was for sealing a 1400m x 265mm diameter pipe conveying rainwater out to sea from a collecting lagoon. The 1400m land based section of the discharge line was protected with the Denso Covercoat System.

The second application was for a pipebridge supporting pipelines over a railway line and river. The wind bracing was protected with the Denso Covercoat System.

The Denso Covercoat System was designed for the protection of above ground steel structures in general, as well as pipelines and pipebridges, where such structures are either situated in extremely corrosive environments or are such that abrasive blast cleaning cannot be carried out.

The basic system comprises: Denso Priming Paste, which is a brush applied petrolatum based adhesive primer, and Denso Covercoat Tape. The latter is a cold applied petrolatum based anti-corrosion tape with good adhesion and conformability. It is reinforced on the back with a polyester cloth layer. The reinforcement is subsequently saturated with solvent-free epoxy Denso Covercoat.

Additional products are necessary for certain applications, such as: Densyl Mastic to soften the profile of mechanical joints, nuts, bolts etc. prior to taping. The epoxy Covercoat provides high mechanical strength and an aesthetically pleasing appearance.

The third recently complete protection project at Sellafield works was for recirculating cooling water pipework, connecting a processing plant, to a detached cooling tower. The 500mm and 600mm diameter pipes were wrapped with Denso Tape and then overwrapped with Densoclad 40 to guarantee long-term protection.



Pipeline protected by the Denso Covercoat System.



Solvent free epoxy Denso Covercoat gives a tough finish.



Above: Denso Tape overwrapped with Densoclad 40.



The protected cooling water pipework.



The salt barn.

Denso Covercoat Protects M1 Salt Barn

Any steelwork used in the construction of storage areas for road salt is subject to an extremely hostile corrosive environment. This is certainly the case with the salt barn at the Toddington Service Area on the M1 in Bedfordshire.

Work underway with the Denso Covercoat System.



Erected some 15 years ago, the internal steel members had become badly corroded, in spite of several maintenance repaints during the time using a conventional protective paint system for steelwork.

As a means of providing long term protection and reducing maintenance costs, Bedfordshire County Council's Property Department was recommended to use the Denso Covercoat System.

Under Winn & Coales' supervision, the internal steelwork was cleaned to St2 Standard, using mechanical wire brushing and hand tools. The prepared surface was then treated with Denso Priming Paste followed by Denso Covercoat Tape plus two coats of grey Covercoat Epoxy Compound.

The first coat of Covercoat Epoxy Compound.



The project complete and the salt barn back in use.



The bracings between the roof trusses formed hollow 'U' shapes making the application difficult. This problem was overcome by placing expanded polystyrene strips into the 'U's to form a solid rectangular shape on which it was then easy to apply the Denso Covercoat Tape.

All bolt heads, nuts, etc were individually taped and covered to ensure complete encapsulation and thereby maximum protection from the salt environment.

Denso Covercoat – An Environmentally Green Protection For Gas Pipe Crossings

Denso Covercoat System for protection of British Gas Southern's pipe crossings over the River Blackwater in Hampshire has been welcomed by the local River and Council Authorities for meeting their environmental requirements.

The British Gas Southern holder station at Camberley, served by an intermediate pressure pipeline for its distribution links, was recently subjected to a maintenance and refurbishment programme. The original protection of the 16 inch, 14 inch, 2 inch and two 13 inch pipelines and pipe bridges, together with the supports and stiffeners etc., consisted of a multi-coat wet paint system following grit blasting. This had deteriorated over seven years. As most of the pipelines involved a 50 foot pipe span over the River Blackwater, British Gas Southern were concerned that grit blasting operations would allow old paint

residues and grit to fall into the river, contrary to River Authority regulations. Having had previous success with the Denso Covercoat System in Portsmouth and Reading, British Gas Southern decided that this was the way to achieve a cost effective, long term and environmentally pleasing finish to these pipelines. A further advantage of Denso Covercoat over most conventional paint systems is that it provides four levels of protection. British Gas expects that this will give a 10 year plus life to their Blackwater pipe crossings.



Application of Denso Priming Paste.



Denso Profiling Mastic is used to build up joints prior to wrapping.



The deteriorated original coating.



Denso Covercoat Tape is applied to pipe.



Covercoat Epoxy Compound can be applied by roller.

The Denso Covercoat System was designed for the protection of above ground steel structures in general, as well as pipelines, pipe crossings and pipe bridges, where such structures are either situated in extremely corrosive environments or are such that abrasive blast cleaning cannot be carried out. It is less dependent upon surface preparation than most liquid coatings.

The system used at Blackwater was as follows: Denso Priming Paste was brush applied over primed, cleaned pipe surface and followed by Denso Covercoat Tape. This is a cold applied petrolatum based anti-corrosion tape with good adhesion and conformability and is reinforced on the back with a polyester cloth layer. Two coats of a two-part brush applied epoxy coating were then applied to saturate the polyester cloth backing on the tape, to provide high mechanical strength and an aesthetically pleasing finish. New Denso Profiling Mastic was used to soften the profile of mechanical joints before application of the Covercoat System.



Covercoat Epoxy Compound, brush applied to mechanical joints.



The finished system gives a tough but pleasing finish.

Denso Protection For Piper B Platform

Elf Enterprise Caledonia Ltd is the operator for the consortium which is investing over £1.3 billion in the redevelopment of the North Sea Piper oil field, as well as the development of the Saltire and Chanter fields.

The Piper B platform is the first of a new generation of North Sea production platforms and consists of an eight-legged jacket supporting 27,300 tonnes of topsides facilities. It is also the first offshore project to be accredited to BS 5750 and the corresponding standards ISO 9001 and European Norm EN 29001. This relates to the Quality Management System, which covers all facets of design, onshore fabrication, offshore installation, construction, commissioning and operating etc.

A key topside unit is the compression module, which contains gas compression facilities for gas export and gas lift. This was built for Elf Enterprise at Wallsend by the contractors Press Offshore.

As part of the strict anti-corrosion precautions taken to protect the compression module from the hostile North Sea environment, a modified Denso Covercoat system

Denso Covercoat protection for vent gas pipes.



was used to give extra protection to 50mm pipes which carry vent gas on the module. This modified system consisted of Densyl KF Tape, overwrapped with Denso P.P.3 Polyester Reinforcement and then two-pack epoxy Covercoat compound. The Densyl KF Tape – Kuosaki Fire, is certified against fire. The versatility of Densyl Tape was also utilised by Elf Enterprise for carrying out some temporary repairs during construction.

The completed compression module, weighing 6,400 tonnes, was floated by barge to Piper B and hoisted onto the Production Utilities Deck.

Rucksack Frames Can't Knock Covercoat

In 1990 the Yorkshire Dales National Park authorities decided on a major refurbishment of a late 19th century suspension bridge at Hebden, near Grassington. This included a new deck and cable hangers. The consulting engineers, W.S. Atkinson of Middlesborough, recommended a Denso Self-Adhesive PVC Tape protection system as the most economic yet effective system for protecting the cables, hangers and the bottom section of the bridge piers and anchors.

Unfortunately, no one contemplated the mechanical damage that was to arise from framed rucksacks since the refurbishment was completed. This occurred mainly on the main cables as hikers made their way over the bridge.

Winn & Coales' Technical Representative George Butler and Graham Wardle decided that an effective, but again economical method of protection to prevent further mechanical damage would be to use Denso Covercoat.

The latest inspection, in September 1992, has shown it to be entirely satisfactory.

The basic Covercoat System consists of Denso Primer followed by Denso Covercoat Tape. This is followed by the Covercoat itself, which is a cold applied two part, brush applied epoxy coating for saturating the polyester cloth backing on the underlying tape, thus providing the high mechanical strength needed.



The suspension bridge with Denso Covercoat armoured cables.

New Profiling Mastic Aids Protection Of Pipeline Mechanical Coupling Joints

New Denso Profiling Mastic has been used successfully to form the basis of a Denso Tape protection system, on pipeline mechanical joints, at the Iver Water Treatment Works, Buckinghamshire.

The Three Valleys Water Service's Iver Treatment Works is located close to Heathrow Airport, the M4 and M25. It was commissioned in 1974 and treats water abstracted from the River Thames. Under Phase I extensions its original capacity of 160 Ml/d is being increased to 200 Ml/d by six additional granular activated carbon filters. Plant and process units for ozone treatment of raw water and clarified water are also a significant feature of this phase of the extension works.

Steel pipelines, from 1200mm to 1600mm diameter were used to connect the new units into the existing treatment process. These

short sections of pipeline have epoxy lining and reinforced bitumen coating and are jointed with mechanical couplings.

The specified external protection for the wrapping of the mechanical couplings was moulded putty followed by heavy duty tape comprising rubber bitumen compound and thick pvc backing. Before joint wrapping commenced Winn & Coales personnel demonstrated the use of their materials complying strictly with the specification, and an alternative comprising Denso Profiling Mastic followed by Denso Tape with an overwrap of Denso Polythene Cling Wrap.

The demonstration showed that the new Denso Profiling Mastic, extended with polystyrene beads, was easy to use and mould around the couplings and that the overwrap of Denso Tape and film was quick to apply in the trench using unskilled labour. Overall it was judged that a satisfactory result could be obtained using the alternative materials at a lower cost to the contractor, General Water Processes. This alternative system was proposed by the contractor and accepted by the consultant, Binnie and Partners.

Almost 100 couplings between 1200mm and 1600mm diameter were wrapped in this way as part of the recently commissioned extensions project.

The pipeline design, specification and supervision of construction was carried out by Binnie and Partners on behalf of Three Valleys Water. Pipes and couplings were supplied by Clayton Son & Company Ltd. Pipe laying was carried out by Norwest Holst Construction Ltd as subcontractor to General Water Processes Ltd. Overall project management on behalf of Three Valleys Water was the responsibility of General Utilities Projects Ltd.



Easy to apply Denso Profiling Mastic.



Denso Tape overwrap.

Denso Polythene Cling Wrap completes the system.





After removal of the concrete the steel surface was cleaned.

Protection For Concrete Coated Jetty Piles

In the recent 2nd LNG Berth project in Bintulu Port, Sarawak, Malaysia a Denso System was chosen to protect the splash/tidal zone area of 600 no. 610mm diameter concrete coated piles against marine growth and corrosion.

The consultants Gibbs & Hill Inc (USA) and Konsultant SHC (Malaysia) specified a Denso Seashield System to the Bintulu Port Authority because of its track record in similar applications throughout the world.

The project involved the removal of a 1.4 metre section of concrete from each pile and the subsequent removal of all marine growth and loose rust scale from the steel surface underneath.

The area was then coated with Denso S105 Paste prior to wrapping with Denso Marine Piling Tape using a 55% overlap for maximum protection.

An application of plastic jacketing material completed the application before the concrete was replaced.

Although the project was carried out during difficult tidal conditions, the simplicity of the system enabled its completion by contractors Percon-Ballast Sdn Bhd and sub-contractors Kejuruteraan Awam Cang Ceng (M) Sdn Bhd in good time.



The Seashield system at various stages of completion:

A completed pile prior to concrete replacement.



Tok Paving Tape – An Effective Seam Sealant For The A47

Cambridgeshire County Council's Highway Engineers came up with an effective, but economic method for covering the seam between adjoining concrete carriageways prior to applying hot rolled asphalt surfacing. This was on the A47 Eye By-Pass near Peterborough, where as a result of differential shrinkage of the continuously laid reinforced concrete road base, a discrete gap arose between the East and West bound lanes.

The problem was discussed with Winn & Coales (Denso) Ltd and Tok Paving Tape (introduced last year by Winn & Coales) was recommended. Its function is to provide a moisture barrier that reduces water penetration into the sub grade, thereby deterring reflective cracking, i.e. retarding the development of any cracks in the hot rolled asphalt overlay. A recent inspection of the Eye By-Pass by Cambridgeshire County Council indicates that Tok Paving Tape is carrying out this function to full satisfaction.

This use of Tok Paving Tape as a sealing strip is particularly significant in view of the Department of Transport's new ruling that all motorways and trunk roads carrying over 75,000 vehicles per day will be constructed with fully flexible materials or with composite materials of a continuously laid reinforced concrete road base surfaced with hot rolled asphalt.



Tokseal Primer applied to joint in carriageway.



Application of Tok Paving Tape using special applicator machine



The resurfaced A47 Eye By-Pass.

Tok Paving tape is a cold applied synthetic fibre fabric coated with a high tack bitumen adhesive, protected by a disposable release film. It is available in various widths up to 850mm. Application of Tokseal Primer – after first removing dirt and debris – is recommended beforehand.



Cover: British Nuclear Fuels, Sellafield. Wind bracing protected with the Denso Covercoat System (see page 4).

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