

DENSO DIGEST



Denso Void Filler Protects New Bridge Stressing Cables

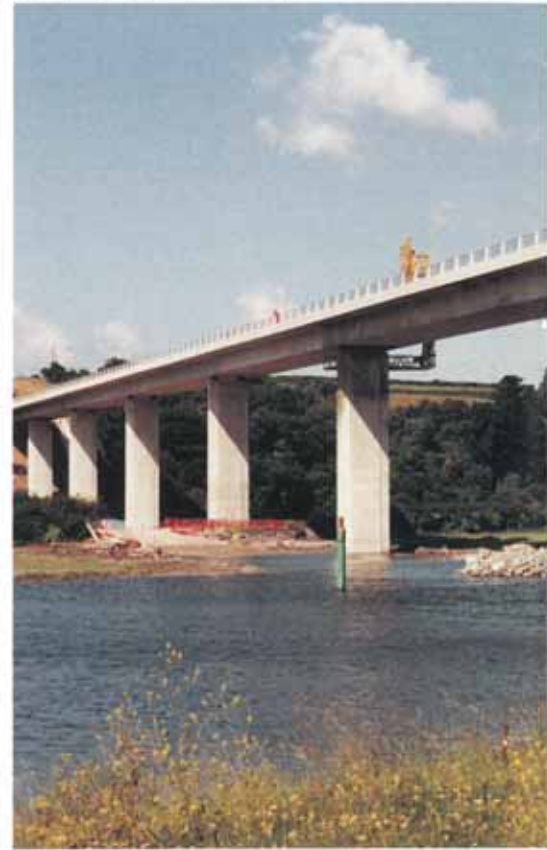
Denso Void Filler and Densyl Mastic were chosen to give anti-corrosion protection to a new road bridge at Wadebridge, Cornwall. The bridge carries the A39 over the River Camel on the new Wadebridge by-pass and is being built for the Department of Transport, by Balfour Beatty, with prestressing work carried out by Balvac Whitely Moran.

Denso Void Filler has been applied by the contractors to the live tendons of the bridge's stressing cables in order to exclude air and moisture and thus provide them with a corrosion-free environment. Access can however be obtained to the stressing cable tendons at any time in order that they can be destressed and monitored for load

bearing strength when required.

Densyl Mastic is used to form a 'plug' that stops the grout mixing with the grease coating over the cables. The Densyl Mastic can be easily removed and the individual strands making up the cable tendons examined for signs of corrosion.

The new road bridge nearing completion.



Denso Void Filler applied to the stressing cable tendons.





The ends of the tendons are capped off to allow easy access for monitoring their condition.



View over top of new road bridge.

Denso Void Filler is a semi-solid petrolatum compound especially formulated for pumping into voids. The compound can be pumped cold or warm and sets to a semi-solid paste. Additives are included to ensure penetration, wetting of all

surfaces, displacement of surface dampness and to inhibit corrosion. Obviously, to be effective, the product should completely fill the void to exclude air, water and condensation.

The new road bridge during early stages of construction.



Flexible Seal For Pen-Y-Clip Tunnel Roadway

Tokband Spezial has been used to provide a flexible joint seal between the concrete kerb edge and the hard wearing course in the new Pen-y-Clip road tunnel on the A55, North Wales. The main contractors for the 930m length tunnel, now nearing completion, are Laing Civil Engineering.

Supplied in 15mm x 45mm profile, Tokband Spezial has been used on both carriageways, i.e. a total length of 1800m. As an effective flexible seal its main function is to prevent the ingress of water from the surface running down through the joint to the reinforced concrete underneath the road surface. At the same time it gives a good bond between the road wearing course and the concrete kerbs.

Tokband Spezial, a polymer modified bitumen strip, is now approved by the Department of Transport in the Manual of Contracts 7th Edition S.H.W. for use in asphalt wearing course joints for asphalt to asphalt and asphalt to concrete interfaces as an alternative to the previously commonly used molten bitumen.



The tunnel entrance showing ground anchors featured in a previous Denso Digest.



Application of Tokband Spezial to kerb edge.



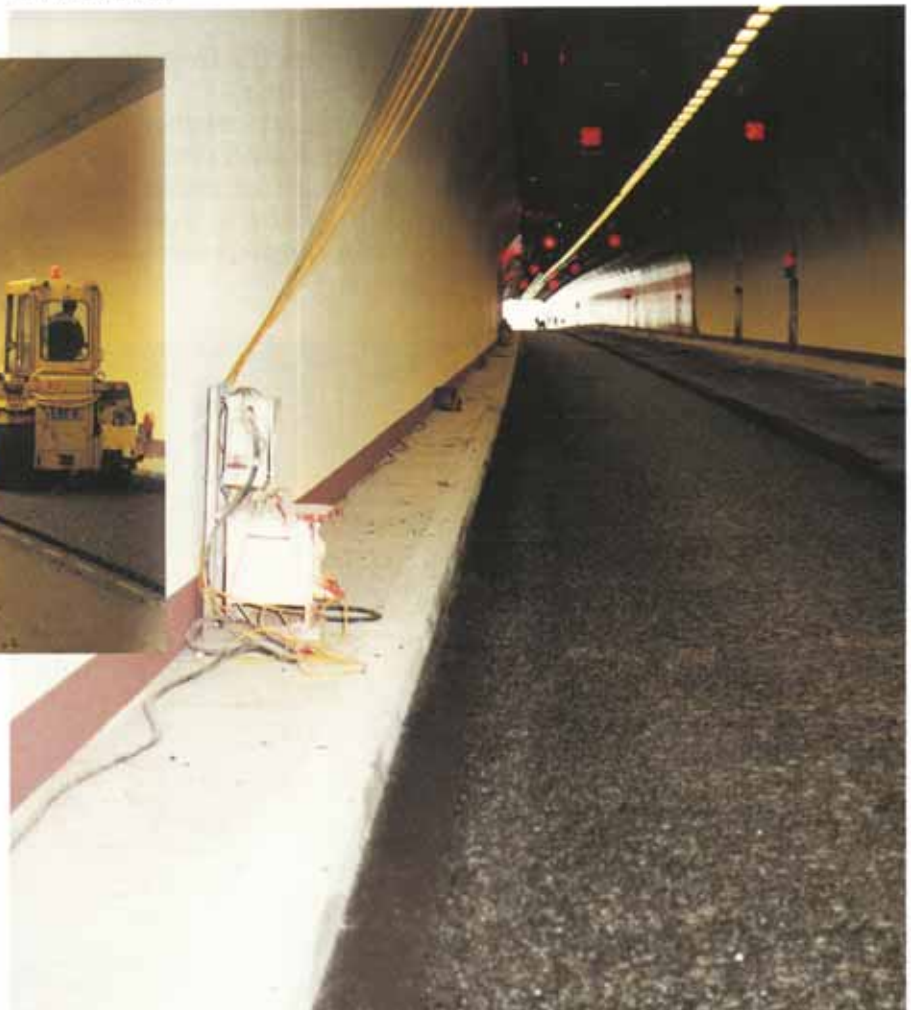
Consulting engineers for this Welsh Office project, Travers Morgan Ltd, specified the use of Tokband Spezial following previous good experience with the product.

Earlier in the construction of the Pen-y-Clip tunnel Denso Void Filler was used to protect the ground anchors. Denso Void Filler fills the void between the steel wires making up the flexible tendons of the ground anchors and the outer sleeve, thus excluding air and moisture. (For further details see article in Denso Digest Vol 20 No. 1).

The finished flexible seal.



The wearing course is laid up to the Tokband Spezial.





The pipebridge.

Denso Covercoat Protection For Grangemouth Pipebridge

When the Scottish Central Regional Council's Department of Water and Drainage decided to carry out a refurbishment programme at the Dalgrain pumping station at Grangemouth, it was faced with overcoming a specific corrosion problem. This was in areas, mainly at the bottom, of the nine 27" diameter Viking Johnson couplings on the pipebridge carrying sewage discharge from the west side of Grangemouth.



Some years ago these couplings had been protected by the application of a heavy bituminous coating, which had been poured into the recesses. The effects of temperature extremes over a lengthy period had caused considerable cracking of the bitumen at the top of the couplings, allowing the entry of water.

Inspection of the V.J. couplings by Babbie Electrical & Mechanical Consulting Engineers showed that in nearly all cases the water, having gained entry at the top, had run down to cause corrosion underneath.

As engineers at the Babbie Group were no strangers to Denso products having specified them for many years, they approached Winn & Coales again for a system suitable for this particular application. The



The first coat of Denso Covercoat Epoxy Compound is applied to the Covercoat Tape.



After cleaning the V.J. Coupling is coated with Denso Priming Paste.



The joint profile is built up using Denso Profiling Mastic.

answer was the Denso Covercoat System, comprising a reinforced tape wrap system overcoated with a solvent-free epoxy coating. A 'bandaging' wrapping tape system was rejected because past experience had shown that this could be unwrapped by vandals.

Working with the main contractors, Biwater Pumps Ltd of Warley, West Midlands, Winn & Coales engineers scrubbed off the

old bitumen before application of the Denso Covercoat System.

The Covercoat System used at Dalgrain was as follows: Denso Priming Paste was applied to the prepared surfaces of the V.J. Couplings, followed by Denso Profiling Mastic. This is an easy-to-use lightweight mastic which was moulded around the couplings to build-up a profile prior to the application of the Denso Covercoat

Tape. The petrolatum based tape has good adhesion and conformability and is reinforced on the back with a polyester cloth layer. Two coats of the two-pack brush applied Covercoat Epoxy Compound were then applied to saturate the polyester cloth backing on the tape to provide high mechanical strength.





Construction underway on the relief scheme alongside the M4 motorway.

Denso Tape Seals Cable Conduit Joints At M4's Brynglas Tunnels

Work currently being carried out on the relief scheme for traffic around the junction of the M4 and A4042 near Newport, South Wales, involves the construction of box sections carrying an overhead junction of the M4 around the Brynglas Tunnels. The work is being carried out for the Department of Transport by main contractors Amey Construction Ltd and specialist sub-contractors Balvac Whitley Moran Ltd.

Denso Tape has been chosen to seal the joints in metal conduits, carrying prestressed cables, against entry of the concrete grout. The threaded metal conduits are pushed through the mesh of the concrete reinforcing. A short length of a wider diameter spiral threaded conduit is used to join sections together and each end of the resultant joint is wrapped with Denso Tape to stop the ingress of any of the concrete grout.

The void formed in the concrete by the completely sealed conduit system then allows installation of prestressing cables prior to post tensioning.

The Denso Tape seal prevents the concrete grout from entering the conduit.



Flexible Denso Tape is easily applied to the conduits in difficult situations.



The glazing bars prior to cleaning.

Denso Flashing Tape Encapsulates Roof Glazing Bars

Ascom Hasler of Croydon, who manufacture ticket vending machines for British Rail, have recently had their factory roof refurbished by Industrial Roofing (UK) Ltd of Belmont, Surrey. The contractors chose self-adhesive Denso Flashing Tape for an important role in this project.



Application of Denso Flashing Tape Primer.

Industrial Roofing took all the glazing bars back to the bare metal, applied a coat of Denso Flashing Tape Primer, then used Denso Flashing Tape to encapsulate the glazing bars completely, excluding them from the atmosphere. Apart from ensuring completely waterproof joints this will also prevent the re-growth of moss, which had previously formed under the glazing bars and had been removed as part of the refurbishment project.

Denso Flashing Tape was also used on gutter joints and for some repairs carried out by the contractors on earlier re-cladding work.

Denso Flashing Tape is a flexible but strong flashing strip with an adhesive bitumen compound on grey foil backing with a plastics interleaving. It gives an excellent bond to all common roofing materials.



Denso Flashing Tape applied to the primed glazing bars.

A finished section showing weatherproofed glazing bars.



Sealing Cable Ducts Against Water At Welsh Water

At Welsh Water's Ponthir Water Treatment Works there are several miles of electric cable going back and forth to operate the various switches, pumps and valves, etc. Some 10 to 20 cable ducts meet at a time in several underground chambers to operate specific machinery units.

Densoseal 16A being applied to a cable duct.



Sealed ducts in underground chamber.



During recent extension and renovation work carried out at Ponthir for Welsh Water by contractors Lintott plc it was decided that Densoseal 16A should be used throughout to seal all cable ducts against the ingress of water. A key factor in the choice of Densoseal 16A is that it withstands at least 20 kPa (2 metre head) water pressure for a minimum of 30 minutes.

Densoseal 16A is a self-supporting non-setting fibrous mastic based on polybutene mineral fillers and water displacing materials. Specifically developed for sealing cable ducts and conduits against water and gas, it has British Telecom type approval and meets the requirements of British Gas for sealing services.

Densoseal 16A adheres to conduit materials such as steel, glazed earthenware and unplasticised PVC and to cable sheath materials such as lead, polythene or PVC; even when the surfaces are damp.

Densoseal 16A gives a neat but durable seal.



Protal Protection For A Southampton Bridge

Built 17 years ago, the 700 metre long road bridge over the River Itchen in Southampton has recently been subject to a refurbishment programme including re-painting.

One of the bridge supports.



The contractor appointed by Southampton City Council for the project was British Diving Services of Southbrook Road, Southampton.

As to be expected, the contractor found that the areas of the bridge in most need of further protection were the bridge supports in the tidal/splash area. Here the sheet piling supports are alternately immersed in tidal water and then exposed to the atmosphere – the ideal conditions for corrosion. It was found that the corrosion was worse at the top of the splash zone and very minimal at the bottom, i.e. at the low tide water level.

Working between the tides, British Diving Services first shot blasted the sheet piling supports down to the low tide water level. Then, in order to ensure maximum long term protection, applied Denso Protal 5065 anti-corrosion coating. This was applied by airless spray, with touch-up brush, to a depth of 400 microns.

Denso Protal 5065 forms a firmly bonded corrosion inhibiting film on the surface which acts as an effective physical barrier against air and moisture.

Some reasons for its choice by Southampton City Council include: a) excellent adhesion to shot blasted corroded steel and any residues of aged coatings; b) quickly achieved high film builds (whether brush or spray applied); c) successful application to surfaces which are not completely dry; d) resistance to chipping and cracking even at low temperatures.

All timber supports in the River Itchen bridge are bolted to the sheet piling. During the refurbishment project a number of timber supports were replaced, and Winn & Coales' Densoseal 16A mastic was applied to all countersunk holes to protect the bolt heads.

Denso Protal 5065 spray applied to tidal/splash area.





Cover: Itchen Bridge, Southampton – see page 11.

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