



Cover: Protal 7200 protects gas pipeline
in Malaysia - See pages 6 -7.

DENSO DIGEST

Winn & Coales International Ltd

Volume 38, Number 3

40 Years of Protal
Anniversary Issue

Denso[®]

WINN & COALES INTERNATIONAL

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Celebrating 40 Years of Protal Coatings 1986 - 2026

In this issue of the Denso Digest we are celebrating the 40th Anniversary of the launch of Denso Protal Coatings.



Winn & Coales International Ltd Director John Burton signing the sales agreement with Clifford Eden of Protal UK in 1986.

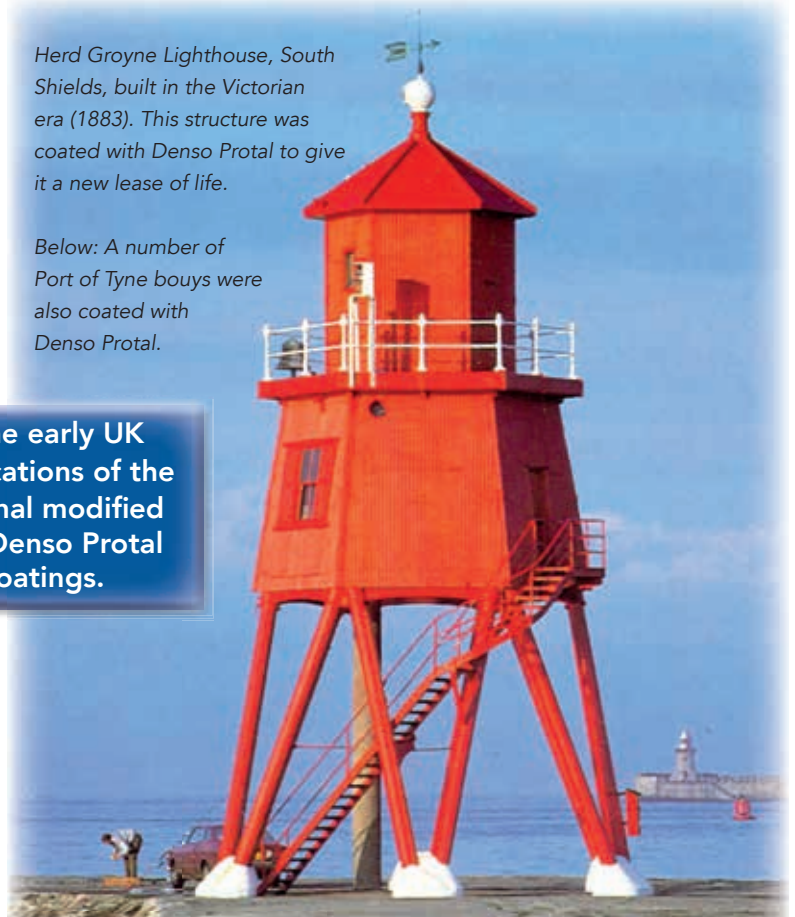
Winn & Coales International Ltd acquired these original modified wax coatings in 1986 from Protal UK, which had been founded 16 years earlier in 1970 by Mr Clifford Eden.

Under Mr Eden's guidance, Protal UK had spent these initial years developing their product range into a selection of effective, easily applied, surface tolerant, high build liquid coatings and they had attracted many customers across the UK in the process.

Herd Groyne Lighthouse, South Shields, built in the Victorian era (1883). This structure was coated with Denso Protal to give it a new lease of life.

Below: A number of Port of Tyne bouys were also coated with Denso Protal.

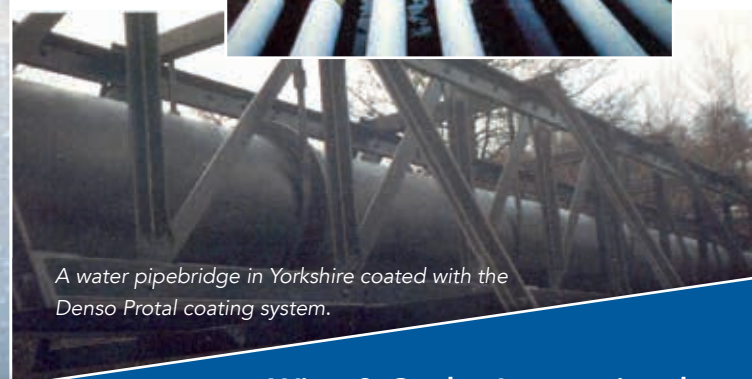
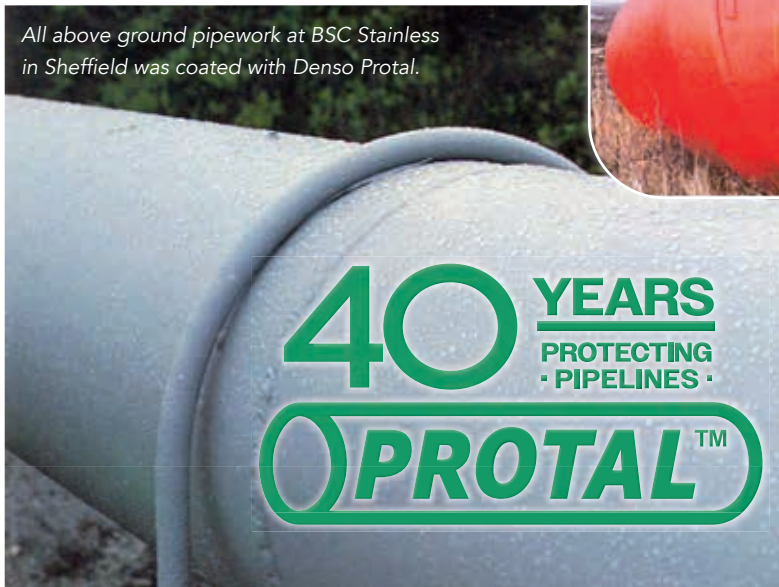
Some early UK applications of the original modified wax Denso Protal coatings.



Foreshore pipework at Esso Petroleum's Avonmouth terminal coated with Denso Protal.



All above ground pipework at BSC Stainless in Sheffield was coated with Denso Protal.



A water pipebridge in Yorkshire coated with the Denso Protal coating system.

Celebrating 40 Years of Protal Coatings

So it was in 1986 that Winn & Coales International Ltd, took on these modified wax coatings along with many of Protal UK's customers and hit the ground running with this fantastic new product range.

The acquisition of Protal UK was a natural progression for Winn & Coales International as the liquid coatings were the perfect addition to their existing corrosion prevention product range. Their existing products for the protection of buried steel at the time consisted mainly of tape and mastic systems and being able to offer an alternative 'liquid coating' range meant that the company now had solutions for many new applications that they could not have dealt with previously.

Over the following years Winn & Coales International and their overseas subsidiaries continual investment in research and development ensured that the Protal range was gradually transformed from the inherited modified wax compositions into the hi-tech range of epoxy coatings it is today. Whilst the original wax coatings were and still are very effective the new epoxy range offers many more advantages and potential applications.



Above ground gas pipework in the UK coated with Denso Protal 7300, which can be applied to damp or dry surfaces.

Protal is easily applied by brush, pad or roller...



Celebrating 40 Years of Protal Coatings



...or by plural component spray equipment.



Protal Coatings - Main Features:

- High build achieved in only one coating operation
- Very fast curing liquid applied coatings
- Designed for the external protection of all line-pipe, fittings, specials and storage vessels
- Excellent cathodic disbonding resistance
- Standard high quality abrasive blast cleaning surface preparation
- Can be applied by either brush, roller or spray methods
- Protal Repair Cartridge Kits complete with a dispensing gun, are available in all Protal grades
- Economical with minimal wastage - very quick and easy to apply
- Coatings available for applying at low temperatures down to -20C (-4F)
- Coatings available for application to damp steel surfaces
- VOC free coatings available
- Tougher abrasion resistant coatings available

The following pages of this Denso Digest show a selection of recent Protal case histories from around the world... ►



Protal™ 7200 Protects Gas Pipeline in Malaysia

This Protal gas pipeline protection project in Malacca, Malaysia was won in an open tender by Denso agent In-Situ Maintenance Services, against several of the other major liquid coating providers, currently operating in the Malaysian market.

The project was finally awarded to Denso because of the added benefits of their Protal 7200 product such as fast required cure time (Shore D hardness within 2-3 hours), higher adhesion strength than the competition (confirmed in a Dolly Pull Off Test) and flexibility of the high build single coat thickness.

The project site prepared and ready for the work to start.

Below: The consignment of Protal 7200 at the project site is checked prior to work commencing.

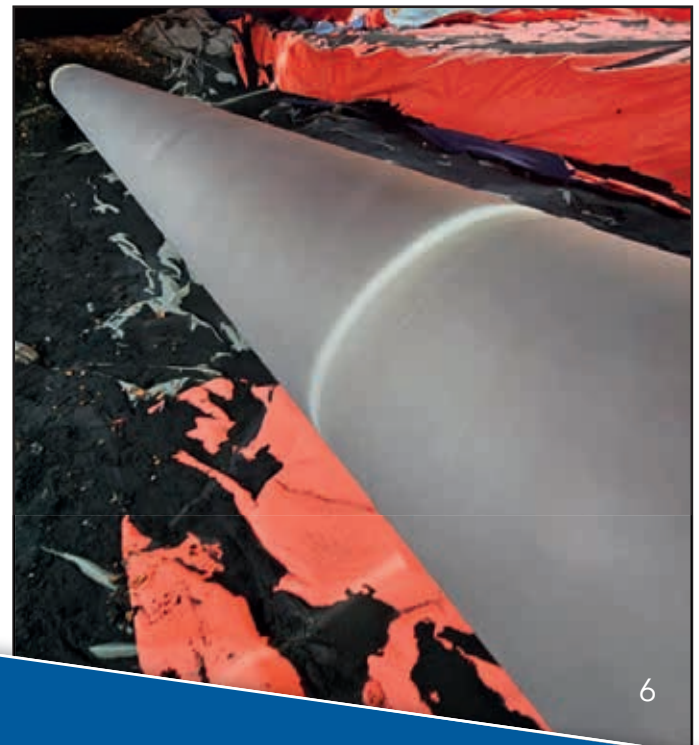


Below: Protal 7200 undergoing a Dolly Pull Off Test to establish the coating's adhesive strength.



PROJECT SUMMARY	
Product Type: Coatings for Buried Steel	
Country:	Malaysia
Object:	Gas Pipeline
Problem:	Corrosion Prevention
Product Solution:	Protal™ 7200

Below: All pipe surfaces were abrasive blast cleaned prior to applying the Protal 7200 liquid coating.



The project was completed ahead of time by contractor Flakeshield Sdn, Bhd and the client was very happy with the progress.

Further work for Denso is expected from the client, based on the success of this Protal coating project.

The completed Protal 7200 pipeline coating application.



Below & right: Holiday testing of the cured Protal 7200.



Protal 7700™ Selected to Protect One of Australia's Oldest Gas Pipelines



The application of Protal 7700.

In late 2022, Denso Australia's Protal 7700™ liquid epoxy was selected to protect one of the oldest gas pipelines in Australia. The pipeline boasts an OD of 400mm and extends from Moomba in Central Australia all the way to Adelaide, South Australia.

PROJECT SUMMARY

Product Type:
Coatings for Buried Steel

Country: Australia
Object: Gas Pipeline
Problem: Corrosion Prevention
Product Solution: Protal 7700™ & Denso™ Glass Outerwrap



The completed application of Protal 7700.





The application of Protal 7700.



The project began with multiple bell-holes, (each ranging from 10-15m long) being created along the length of the pipeline prior to surface preparation and product application. Surface preparation of the substrate involved the removal of the previous coatings along the pipeline in order to rectify structural integrity in certain areas. Once these repairs had been completed, the pipe was then abrasive blast cleaned to an SA2.5 standard and later coated with Protal 7700. The interface areas between the old existing coating and the newly, spray-applied Protal 7700 were protected with Denso Petrolatum Tape and Denso Glass Outerwrap.

In summary, the applied coating is expected to see out the life of the pipeline and the client has expressed that they are not only extremely comfortable using Protal 7700, but are also very happy with its application rates and overall performance.

Denso Bore-Wrap & Protal 7700™ Used For The HDD Installation of Steel Pipeline

Maneuvering the Protal and Bore-Wrap protected pipeline into position for drilling.

BORE-WRAP™

PROJECT SUMMARY

Product Type:
Coatings for Buried Steel

Country: Australia
Object: Gas Pipeline
Problem: Corrosion Prevention
Product Solution: Denso Bore-Wrap & Protal 7700™

Below: The Protal 7700 liquid coating is applied to the field joints and allowed to cure.

In December 2022, Denso Australia completed supply of a project involving the protection of 400 lineal metres of DN250 mild steel pipeline in Bolivar, South Australia.

The field joints for the DN250 FBE coated pipeline were prepared to SA 2.5 (abrasive blast clean) prior to the contractor applying Protal 7700™ (rapid cure, high build epoxy) as the Field Joint Coating (FJC) at a nominal Dry Film Thickness (DFT) of 1000 microns via airless spray guns from 1000ml cartridges.



Denso Bore-Wrap™ is designed to protect the underlying corrosion system and work efficiently with the cathodic protection system as it is a non-shielding Abrasion Resistant Outerwrap (ARO).

The ease of application for both the Protal & Bore-Wrap products contributed greatly to cost savings in labour and QA. In addition, the successful application of these products has ensured that both the client's asset as well as the corrosion coating are protected long-term through the rigours of the HDD installation process.

Top left: Denso Bore-Wrap is applied over the Protal 7700 for protection during the HDD installation process.

Below: The Bore-wrap protected pipe is lowered into position so that the drilling can begin.



From Rocky Soils to Total Protection: Denso's Protal 7200™ and Bore-Wrap® in Action



Horizontal Directional Drilling (HDD) presents some of the toughest conditions for pipeline coatings, particularly at the weld joints. In the Midwest region, rocky and sandy soils create constant abrasion, impact, and gouging forces during pullback that can quickly damage conventional field-applied coatings. Weld caps are especially vulnerable, as they often endure the brunt of mechanical stress. Without robust protection, these areas risk coating failure, leading to premature corrosion, costly repairs, or even environmental hazards. For operators, ensuring weld joints remain intact through the HDD process is not just about corrosion prevention - it's about safeguarding long-term pipeline integrity in high-consequence applications areas.

On a recent 8" pipeline construction project in the USA's Midwest Region, the Pipeline Operator elected to use Denso's Protal 7200, a high-performance corrosion prevention epoxy coating, and Denso Bore-Wrap, a field-applied ARO wrap, to protect all weld joints on the numerous HDDs that were involved in the installation process. The aggressive, rocky, and sandy soils in the region pose serious challenges to conventional field-applied coatings, particularly on the weld caps. By applying Bore-Wrap over the cured Protal 7200, the operator ensured added mechanical protection and long-term durability - a proven solution where standard coatings are often vulnerable to HDD installation.

Left: Protal 7200 applied at 25 to 40 mils DFT.



PROJECT SUMMARY

Product Type:
Coatings for Buried Steel

Country: United States of America
Object: Natural Gas Pipeline
Problem: Corrosion Prevention and Mechanical Protection
Product Solution: Denso Bore-Wrap & Protal 7200™

A total of 8 HDD's ranging from 1,100 feet up to 3,600 feet were completed on the project. First, the 8" weld joints were blasted to a near-white finish, SSPC-SP 10/NACE No. 2, while achieving a 4.0 mil anchor profile. Protal 7200 was applied at approximately 25 to 40 mils and allowed to fully cure. Next, holiday detection was completed. The contractor then roughened the plant-applied FBE ARO coating to a length of 6" on either side of the Protal 7200. Finally, Denso Bore-Wrap was wrapped with a double layer providing 80 mils of ultimate protection. Denso Bore-Wrap provides the utmost protection against shear, abrasion, impact, and gouge (SAIG). Together, Denso's Protal 7200 and Bore-Wrap form a synergistic system that is proven to protect the weld joints from corrosion and keep them unscathed from HDD installation methods.

Upon completion of the 8 Directional Drills, with zero coating damage reported, the Denso Bore-Wrap protected all the weld joints from damage, thus allowing the underlying Protal 7200 to be protected. The pipeline operator was very pleased with the outcome, noting the reliability and added confidence the dual system provided. This again was another successful project where the application of a double dose of Denso products will provide the ultimate long-term corrosion prevention and coating protection to the pipeline's critical weld joints in high-consequence directional drill applications.

Left: Denso Bore-Wrap applied over Protal 7200 for added SAIG protection.

Below: Completed Bore-Wrap Application.



Protal 7300™ (UK): Protecting The UK'S Gas Network Now, For A Low Carbon Future

In a UK first, SGN (Scottish Gas Networks) completed a live trial to demonstrate the potential of repurposing the UK's existing gas network to carry hydrogen.



Wide angle view of the completed Protal 7300 (UK) application to the gas pipe in Dalmeny.



PROJECT SUMMARY

Product Type:
Coatings for Buried Steel

Country: United Kingdom
Object: Gas Pipeline
Problem: Corrosion Prevention
Product Solution: Protal 7300™

The live trial was conducted on a 30 km stretch of high-pressure Local Transmission System (LTS) pipeline between Granton (near Edinburgh) and Grangemouth. This representative sample of the UK's 11,600 km LTS network demonstrated that not only could the existing gas infrastructure be repurposed to carry hydrogen, but that key operational and maintenance works usually conducted on natural gas pipelines could also be safely implemented on live hydrogen pipelines. The success of this pioneering live trial is an important step towards decarbonising the UK's gas network and proves that existing infrastructure, which delivers energy to millions of homes and businesses every day, can provide a minimally disruptive option for enabling a low carbon future.



Above: Protal 7300 (UK) can be applied to dry, damp or wet surfaces.

Below: Protal 7300 (UK) can be applied by roller, brush or pad.





Protal™ Protection for Components of the World's First Net -Zero Emissions Integrated Ethylene Cracker

Dow's Fort Saskatchewan Path2Zero expansion project will create the world's first net-zero emissions integrated ethylene cracker and derivatives site with respect to scope 1 and 2 emissions.

This project began when Dow reduced carbon emissions by 15% between the years 2005-2020 while still growing overall sales by 30%. This was significant so Dow decided that by 2030, the target is to reduce global emissions another 15%. By 2050 Dow plans to be Carbon Neutral.

The "Octopus" (see page 19) prior to coating with Protal 7200.

This goal all began in Texas with DOW's facility "Texas 9" and the lessons learned in 2017. The goal was to continue to grow but also be more cost efficient and sustainable. Texas 9 was constructed at 20% lower capital cost than the industry average and delivered 65% lower conversion costs with 60% lower emissions per lbs produced on average. Texas 9 is a leading asset in reliability, cost, returns on investment capital and carbon intensity. Lowering emissions is the right thing to do and this success is what keeps DOW on the path to net zero emissions.

This brings us to Dow Fort Saskatchewan which is 45 minutes north of Edmonton Alberta Canada. First, Dow looked at their facilities to determine which facilities already had infrastructure in place and were willing to invest in Hydrogen infrastructure, carbon capture and storage capacity. This project will triple ethylene and Polyethylene capacity and be 15% lower capital intensive than the Texas 9.

PROJECT SUMMARY

Product Type: Coatings for Buried Steel

Country:	Canada
Object:	Steel Ethylene Cracker Components
Problem:	Corrosion Prevention
Product Solution:	Protal 7200™

The project aimed to convert cracker off-gas into hydrogen as a clean fuel to be used in ethylene production. Carbon dioxide was to be captured on-site and then transported to be stored by adjacent partners.

Story continues on page 18...

Below: Large diameter 70 foot spool coated flawlessly with Protal 7200.





Complex designs made maneuvering, handling and coating such large spools a challenge.

The project is expected to increase the U.S. chemical company's polyethylene capacity by two million tons per year and decarbonize its global ethylene capacity by 20 per cent.

Dow is confident that with groundbreaking state-of-the-art facilities like this and Texas 9 it will be able to supply low to zero emission products to their customers who want to lower their carbon footprint. It will create 6000 temporary jobs and 400-500 permanent jobs. Federal and local government support along with DOW's commitment to lower emissions, was essential to getting this project off the ground.

PROJECT SUMMARY

Product Type:
Coatings for Buried Steel

Country:	Canada
Object:	Steel Ethylene Cracker Components
Problem:	Corrosion Prevention
Product Solution:	Protal 7200™

PCL Construction Industrial was awarded phases of this complex project's fabrication and design. PCL has a rich history in Alberta for facility construction and engineering.

Local application company Franks Group was chosen to expertly coat the many large, complicated spools required for this project. It required much ingenuity to properly prepare surfaces, coat, inspect, and ship to site.

Frank's Group is a family-owned business that started in 1970. Since then, it has grown into a four-plant industrial corporation in Nisku and Leduc area. Frank's Group has provided quality workmanship to a wide range of customers throughout the years.

As family-owned and operated, Alberta-based company Denso is proud to have Franks Group as an approved Protal application company for over a decade.

The picture below shows just some of the outstanding Team members posing with what the group affectionally called the "Octopus". A 72" diameter spool weighing 55,000LBs. They needed 4 cranes to maneuver this pipe from blasting to coating then shipping.

Large complex projects require an excellent team to execute. From Engineering, Fabrication and Coating. Denso is Proud to be part of such a world Class project that will make the world a little greener, in more ways than one. We look forward to many more in the future.



Skilled Protal applicators, the Franks Group posing in front of the Protal 7200 coated "Octopus".

If you would like more information about our long-term corrosion prevention and sealing systems that deal with the problem areas listed below, simply tick the boxes and send us back this completed page and we will supply you with more information.

BURIED ONSHORE COATINGS

- ☐ External corrosion prevention for underground pipelines, welded joints, valves and fittings.
- ☐ Protection of mounded LPG vessels and fuel tanks.

SUBSEA & SPLASH ZONE COATINGS

- ☐ Maintenance corrosion protection for steel jetty piles.
- ☐ Subsea pipelines and outfalls.
- ☐ Protection of timber and concrete piling.

SEALING MASTICS

- ☐ Joint sealing of precast concrete manholes and culverts.
- ☐ Joint and crack sealing of asphalt road surface wearing courses.
- ☐ Joint sealing for airport runways.
- ☐ Sealing of cable entry ducts.

EXPOSED SURFACE COATINGS

- ☐ Corrosion prevention for chemical plant, structural steelwork, above ground pipes, storage tanks, offshore rigs, bridges and support cables, cranes and pipe bridges.
- ☐ Corrosion prevention for metal roof purlins and metal roof sheets.
- ☐ Protecting pre-stressing and post tensioning bridge cables and ground anchorages.

INDUSTRIAL LININGS

- ☐ Internal linings for tanks, pumps, vessels and pipelines.
- ☐ Linings for concrete bunds and floors.
- ☐ External abrasive wear protection.

INDUSTRIAL TAPES

- ☐ Sealing and insulating.
- ☐ Protecting and bonding.

MEMBRANES AND FLASHINGS

- ☐ Tanking / waterproofing.
- ☐ Exposed rooftops and parapets.

DIY WEATHERPROOFING

- ☐ Waterproofing and flashing.

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