

# DENSO BORE-WRAP<sup>®</sup>

## Field-Applied Abrasion Resistant Outerwrap (ARO)

### Description

Denso Bore-Wrap is an Abrasion Resistant Outerwrap (ARO) that has excellent performance against impact, gouge, abrasion, and fracture to protect anti-corrosion coatings during pipeline installations in difficult terrain or by means of trenchless installation methods such as directional drilling, HDD or boring. Bore-Wrap creates an abrasion resistant, sacrificial outer laminate which protects pre-approved field joint coatings and mainline coatings such as epoxies, shrink sleeves, 3LPE, 3LPP and FBE.

### Uses

Field-applied ARO. Minimizes the need for spot repairs or re-pulling pipe from damage, while providing the best mechanical protection of the underlying field-joint and/or mainline coatings.

### Features

- Prevents coating damage
- Rapid application and cure time
- No mixing or VOCs
- Tapered surface profile
- Outstanding abrasion, gouge and impact resistance
- Resistant to aggressive soil conditions

### Surface Prep

Follow the anti-corrosion coating manufacturer's recommended installation procedure. When using a two-part epoxy resin system as the anti-corrosion coating, Denso Bore-Wrap should be applied within the manufacturers re-coat window to minimize additional surface preparation requirements. Roughen existing coating to degloss before application of Denso Bore-Wrap, where required. Do not open the foil pouch containing Denso Bore-Wrap until you are ready to use product.

### Application

Begin wrapping 6" (150mm) in front of the field joint coating, with the randomized angle matting surface facing out. The woven structured (checker board) side of the fiber is to be placed facing the surface of the pipe. Wrap the material circumferentially to begin, ensuring that the leading edge has a minimum of 2 layers (100% overlap). Proceed to spirally wrap with a minimum 50% overlap, spraying each layer with water as it is applied, until the wrap has extended 6" (150mm) beyond the field joint coating. If required by the pipeline owner, additional layers can be applied by continuing the wrap



(cont →)

# TECHNICAL DATA SHEET

## Application

back toward the front at this time. Then do a final wrap around circumferentially and end with the fiber on top of fiber (do not leave a single layer hanging from the back).

Ensure the wrap is completely saturated with water and then immediately begin wrapping Denso Poly-Wrap™ the same direction the layers of Bore-Wrap were applied, compress it quickly and with tension applied. Overlap each end of the Bore-Wrap by at least 2 inches (50 mm) to ensure the ends lay flat and the resin can be retained. 2 to 3 passes should suffice.

Once compressed, use the Denso Perforating Tool to puncture the Denso Poly-Wrap. This will allow for excess resin, moisture, and CO<sub>2</sub> from the reaction to escape. Perforate using enough pressure to get through the Denso Poly-Wrap but not through the layers of Bore-Wrap.

When the material has fully cured the Denso Poly-Wrap may be removed. Cure can be checked by using a Shore D gauge on a high point of the resin (avoid measuring near ridges and fibers as the gauge tip can move). The product is ready to be used at a Shore D of 65 or greater.

**COLD WEATHER INSTALLATIONS:** Follow procedure, however, use ethylene glycol in the sprayer 30% to 50% with the water to prevent freezing and to progress the curing process. Bore-Wrap will not cure on its own at temperature below 41°F (5°C).

**HOT WEATHER INSTALLATIONS:** Follow procedure, however, use ice water in the sprayer to slow down the curing process, thus allowing the installer more working time.

## Storage

Store in original, unopened packaging in a cool shaded area at ambient temperature of 73°F (23°C) Do not expose to temperature above 111°F (44°C), or below 41°F (5°C). Do not open a bag containing Bore-Wrap until you are ready to use it, as Bore-Wrap cures when exposed to atmospheric moisture/humidity. Care must be taken when handling the sealed bags to prevent puncturing or scuffing. If the protective foil pouch is punctured, the composite wrap will cure within the sealed foil pouch.

## Shelf-Life

1 year with proper storage.

## Health & Safety

Wear protective clothing and ensure adequate ventilation. Avoid contact with skin and eyes. See Safety Data Sheet (SDS) for further information.

## Packaging

Bore-Wrap is supplied in sizes 6" (150 mm) or 10" (250 mm) wide and lengths of either 20' (6 m) or 30' (9 m). The material is sealed in a nitrogen filled foil bag and boxed in quantities depending on roll size.

(con't →)

# Denso Bore-Wrap®

## TECHNICAL DATA

PROPERTIES	VALUE
Thickness (ISO 21809-3 Annex B)	41 mils/layer (1,041 microns/layer)
Impact (RP 0394)	113.9 joules
Gouge Depth (CSA Z245.20 Clause 12.15)	24 mils (609 microns) 50kg double burr
3 mm Gouge Tip (NFPCA HDD Load to Penetrate)	625 kg
10 mm Gouge Tip (NFPCA HDD Load to Penetrate)	2000 kg
Flexibility (CSA Z245.20 Clause 12.11)	>3 deg/PD
Abrasion Resistance (ASTM D4060 C17 Wheel)	40,164 cycles/ply
Fracture Toughness Testing (ASTM E1922)	21.1 MPa m <sup>1/2</sup>
TG	268°F (131°C)
Tensile Strength (ASTM D638)	33,380 psi (230 MPa)
Tensile Modulus (ASTM D638)	2,221,978 psi (15,320 Mpa)
Tensile Elongation (ASTM D638)	1.66%
Flexural Strength (ASTM D7264)	28,300 psi (195 MPa)
Flexural Modulus (ASTM D7264)	1,990,000 psi (13,721 MPA)
Compression Strength (ASTM D695)	119,000 psi (820 MPa)
Modulus of Elasticity (ASTM D3039)	2,221,978 psi (15.32 Gpa)
Shore D (ISO 868 /ASTM D2240)	78 (pull back ready at 65)
Specific Gravity (ASTM D792)	106.8 lb/ft <sup>3</sup> (1.71 g/cm <sup>3</sup> )
Water Absorption 2h @ 212°F (100°C) (ASTM D570)	0.008 oz (0.221 grams)
Water Absorption 24h @ 73°F (23°C) (ASTM D570)	0.004 oz (0.102 grams)
Indentation at 10N/mm <sup>2</sup> (ISO 21809-3 Annex E)	No observable damage
Lap Shear (ASTM D5868)	2,348 psi (1.63 MPa)
Dielectric Strength (ASTM D149)	110 V/mil
Working Time	7 minutes
Application Temperature	0°F (-17°C) to 200°F (93°C)
Cure Schedule	30 minutes 70°F (21°C) - 80°F (26°C)
Shelf Life	1 year

## Quantity Estimates

Tape Width	Roll Length	Rolls/Case	Coverage with 50% Overlap
in.	ea.	ea.	ea.
6" (150 mm)	30' (9 m)	6	7.5 ft <sup>2</sup> /roll (0.69 m <sup>2</sup> /roll)
10" (250 mm)	20' (6 m)	5	8.3 ft <sup>2</sup> /roll (0.77 m <sup>2</sup> /roll)
10" (250 mm)	30' (9 m)	4	12.5 ft <sup>2</sup> /roll (1.16 m <sup>2</sup> /roll)



DENSO NORTH AMERICA

**HOUSTON:**  
9710 Telge Road,  
Houston, Texas,  
U.S.A. 77095  
Tel: 281-821-3355  
Fax: 281-821-0304

**TORONTO:**  
90 Ironside Crescent,  
Unit 12, Toronto,  
Ontario, Canada M1X1M3  
Tel: 416-291-3435  
Fax: 416-291-0898

[www.densona.com](http://www.densona.com)

[info@densona.com](mailto:info@densona.com)

**A Member of Winn  
& Coales International**

The information given on this sheet is intended as a general guide only and should not be used for specification purposes. We believe the information to be accurate and reliable but do not guarantee it. We assume no responsibility for the use of this information. Users must, by their own tests, determine the suitability of the products and information supplied by us for their own particular purposes. No patent liability can be assumed.