

INSTRUCTIONS FOR USE

Densopol™ Tapes for the long-term protection of buried or immersed pipes, welded joints, bends, fittings and similar structures from corrosion.

To protect the metal structure from the environment the tape must cover the entire surface.

EQUIPMENT

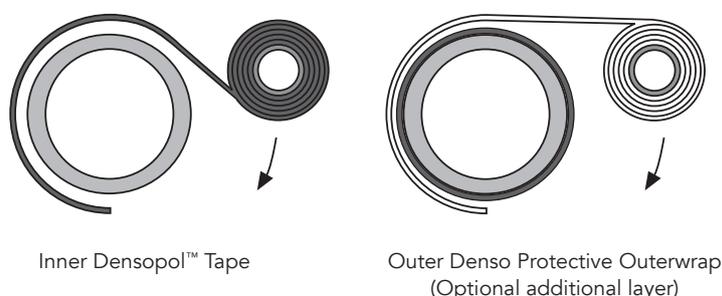
- Hand wire brush / power tool / blast cleaning equipment (optional).
- Brush, brush cleaning solvent.
- Utility knife and Holiday Detector (optional).
- PPE must be worn in accordance with the manufacturer's recommendations as set out in the Safety Data Sheets.

SURFACE PREPARATION

Surfaces must be clean, dry and free from grease. Remove grease deposits to SSPC-SP 1 Solvent Cleaning. Remove all loose rust, scale and flaking coatings by wire brushing to ISO 8501-1 St 3 or abrasive blast clean to ISO 8501-1 Sa 2½. The surface shall be preheated to a minimum of 3 °C above the dew point.

APPLICATION PROCEDURE

Diagram of correct application procedure:



1. PRIMING

Brush apply one coat of Denso Primer D™ over the entire area to be wrapped. Allow to dry until touch dry, approx. 20 mins.

Coverage:	9-11m ² /l
Wet film thickness:	Minimum 90 microns
Dry film thickness:	Minimum 40 microns
Drying time:	Approx. 20 minutes

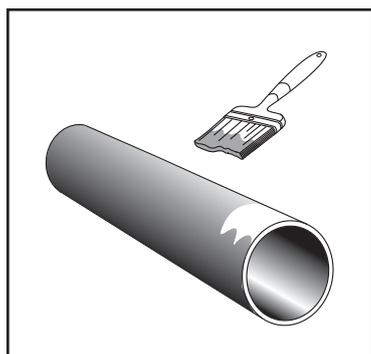


Fig. 1: Priming pipes, rods and cables. Apply Denso Primer D to entire area to be wrapped with tape.

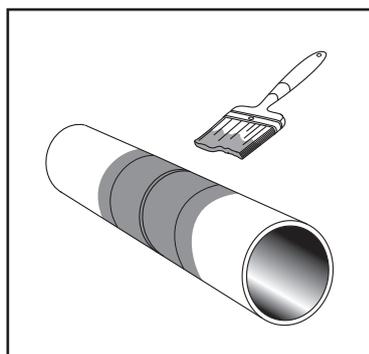


Fig. 2: Priming butt welded joints. Apply Denso Primer D to entire area to be wrapped with tape.

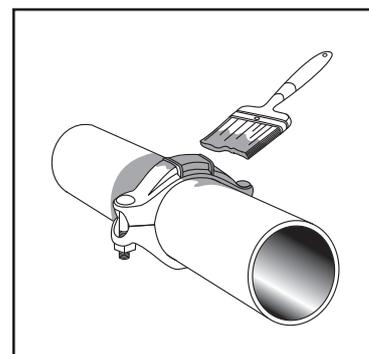
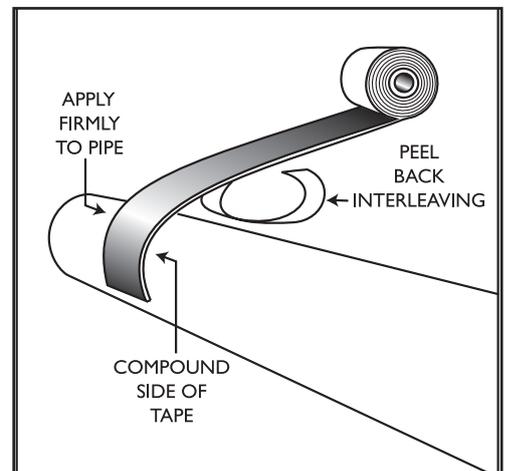


Fig. 3: Priming flanges and couplings. Apply Denso Primer D to entire area to be wrapped with tape.

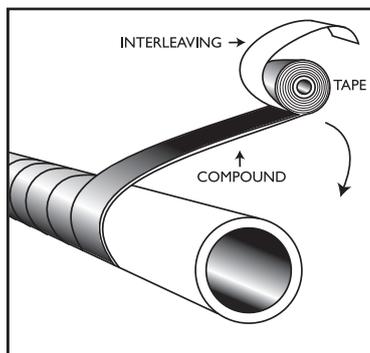
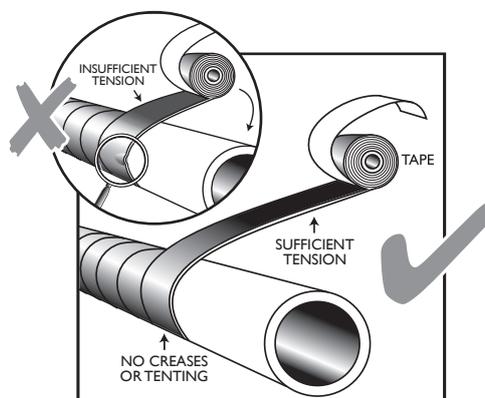
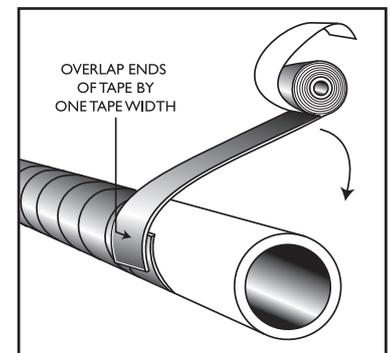
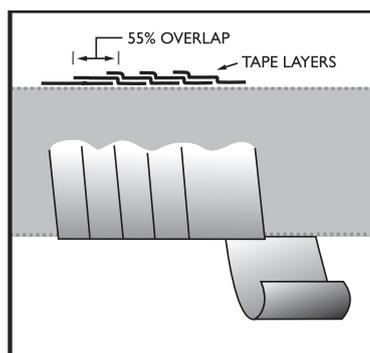
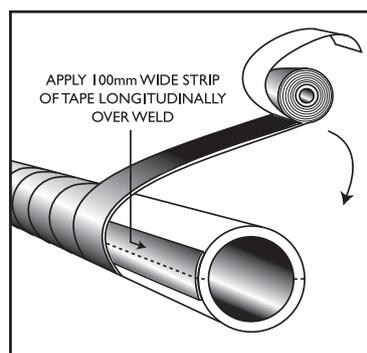
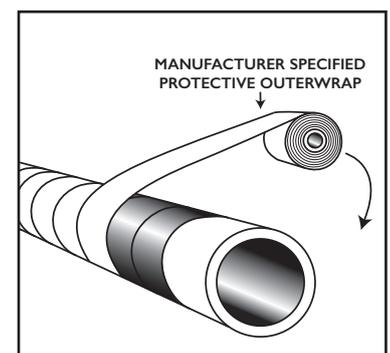
DENSOPOL 60™ & DENSOPOL 80™ (INCLUDING TROPICAL VERSIONS)**2. APPLICATION****A) PIPES, RODS AND CABLES**

Select as wide a width of tape as practical, e.g. 100mm wide for 150mm diameter pipe. Peel back about 0.5m of interleaving and apply the adhesive side of the tape firmly to the pipe. Maintain sufficient tension to ensure that the tape conforms to the surface without gaps. Repeat this, overlapping each turn by 55% to give double thickness. Start a new roll by overlapping the ends by one tape width.

An additional layer of Denso Protective Outerwrap can be added for extra mechanical protection over the inner layer of Densopol. It is recommended to complete the application of the Densopol before applying the Denso Protective Outerwrap. This allows for inspection of the Densopol application prior to the application of the Denso Protective Outerwrap. Please consult with the manufacturer for advice.

**Fig. 4:** Starting the first roll of tape.

NOTE: Where longitudinal welds are included in the area to be wrapped, apply a strip or strips of the tape longitudinally over the weld and press into the contours so the weld is completely covered before wrapping.

**Fig. 5:** Diagram showing the correct application procedure for wrapping tape.**Fig. 6:** The tape shall be applied with sufficient tension to prevent creasing or tenting and to ensure adhesion of the bitumen compound to the primed substrate. The level of tension required will depend on the grade of tape being used, the temperature of the tape and the ambient conditions at site.**Fig. 7:** Starting a new roll of tape.**Fig. 8:** Overlapping each turn by 55% gives a double thickness.**Fig. 9:** Wrapping a longitudinal weld.**Fig. 10:** An additional layer of Denso Protective Outerwrap can be added for extra mechanical protection over the inner layer of Densopol. Please consult with the manufacturer for advice.

DENSOPOL 60™ & DENSOPOL 80™ (INCLUDING TROPICAL VERSIONS)

B) BUTT WELDED JOINTS

Apply as **(A)** but start and finish wrapping with a minimum of 75mm overlap on to the existing pipe coating either side of the joint area.

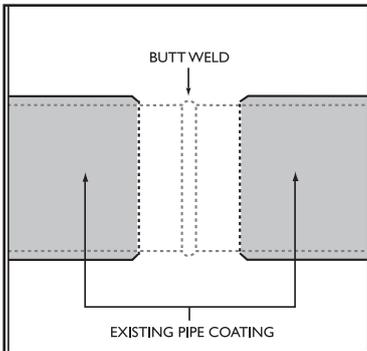


Fig. 11: Butt weld and existing coating ready for overwrapping with tape. Note cutback of coating can be 75mm - 150mm either side of the weld except on FBE coated pipe.

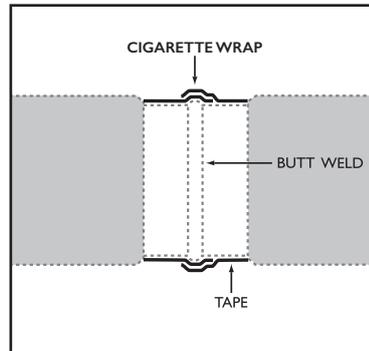


Fig. 12: If the factory coating is 3LPE, the typical thickness can be between 2.5mm to 5mm. It is therefore important to chamfer the edge of the 3LPE to 35°. Denso Primer D should be applied to the entire joint and onto the 3LPE by at least 75mm. Densopol Tape should then be applied using a cigarette method to completely cover the joint and factory cutback. The ends of the cigarette wrap should overlap by the same distance as the width of the tape being used.

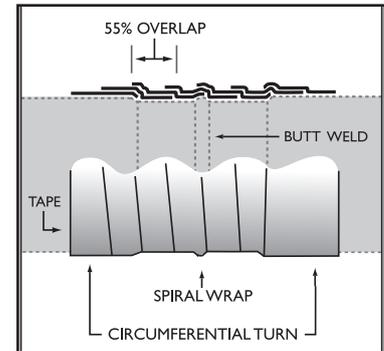


Fig. 13: Note method of wrapping.
 1. Start with one circumferential turn onto factory coating.
 2. Then change to spiral wrap with 55% overlap over weld area.
 3. Finish with one circumferential turn over factory coating the opposite side of the weld. Overlap tape at least 75mm onto existing coating.
 4. Circumferential wrap of Denso Protective Outerwrap can be added, as **(A)**.

C) FLANGES, COUPLINGS AND VALVES

Profile the pipe joint with Densyl™ Mastic or Denso™ Profiling Mastic so that there will be no air gaps under the subsequent tape wrapping. Push the mastic firmly into all cavities and around all bolt heads, building it up to form a smooth profile suitable for wrapping – without forming bridges or voids.

Start the tape on the centre of the crown of the joint and wrap away from the centre, towards the adjoining pipe, overlapping each turn by 55% to give double thickness. Select a narrow width tape for this. Finish with at least one circumferential wrap onto the pipe to conclude first half of the application.

On the crown of the joint, start a new roll by overlapping the ends of tape by one tape width. Wrap towards the pipe on the opposite side of the joint, overlapping the tape by 55%. Smooth finished wrap down well – particularly at the tape edges.

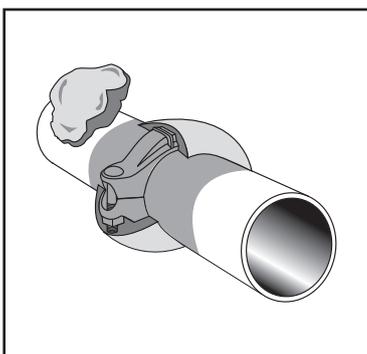


Fig. 14: Profiling the joint.

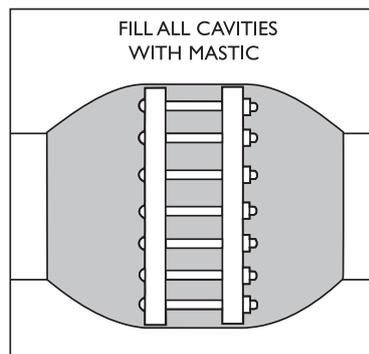


Fig. 15: Make sure that the mastic is pushed into all crevices and that it forms a smooth profile for wrapping.

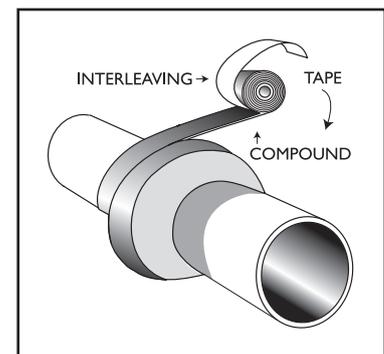


Fig. 16: Wrap joint in two halves. Start on crown and work towards pipe, then repeat from crown working towards pipe on opposite side of joint.

D) DAMAGED COATINGS

Either cut a circumferential band of the damaged coating and treat as for Butt Welded Joints or cut away and remove loose coating from the damaged area and smooth or chamfer edges. Prime the exposed metal and a circumferential band extending 75mm either side of the damage. Build up the damaged area with patches of tape or Densyl Mastic. Wrap the section of pipe as for Butt Welded Joints.

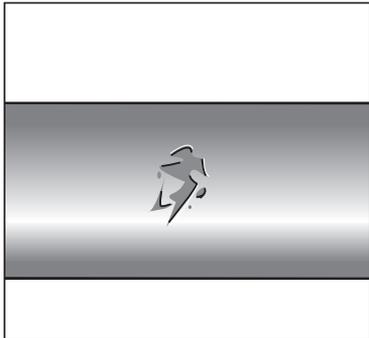


Fig. 17: Damaged pipe coating.

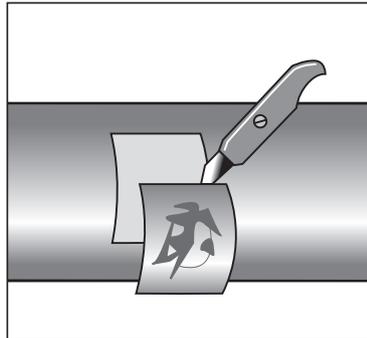


Fig. 18: Remove loose or damaged area then clean thoroughly.

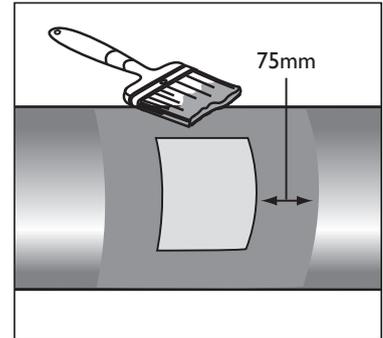


Fig. 19: Smooth edges and prime area at least 75mm onto sound coating.

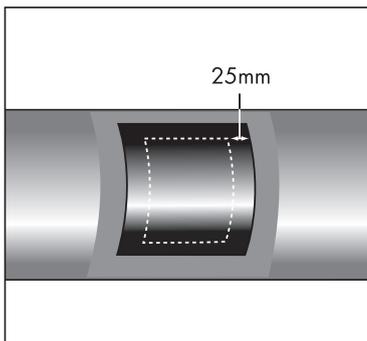


Fig. 20: Repair damaged area with a patch of tape overlapping at least 25mm onto primed sound coating area before wrapping with tape as (B).

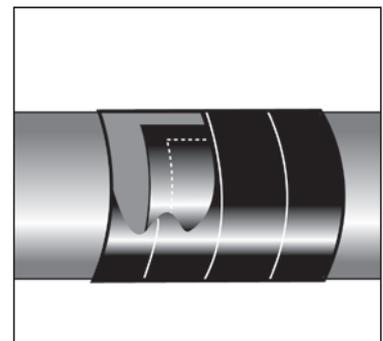


Fig. 21: Overwrap repair as (B).

3. INSPECTION

Ensure that the entire surface is covered with no gaps or air pockets. The tape shall have been applied at the correct overlap so that there is a minimum of two layers of tape at any point over the surface. The tape shall have been applied at the correct tension and it is normal for a small amount of bitumen compound to have been extruded past the edge of the plastic backing due to the tension applied to the tape. Examine adhesion by coupon test 24 hours after wrapping. Perform a holiday test using the correct voltages according to the tape and number of layers used (refer to the table on the following page). Please note that the longer the wrapped pipes are exposed outside of the recommended direct UV exposure and storage temperature limits, the more pronounced the extruded compound will become. It is the responsibility of the contractor laying-in the pipes to ensure exposure and maximum storage limits are observed.

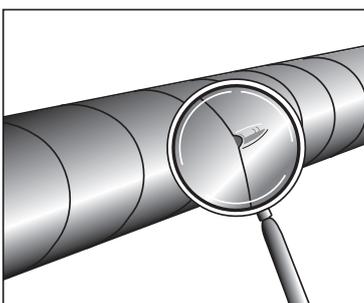


Fig. 22: Examine for gaps or air pockets (see repair procedure Figs. 17 to 21).

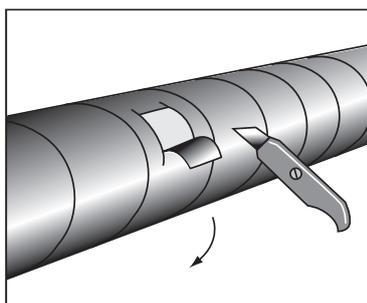


Fig. 23: Adhesion can be tested by pulling/removing a 50mm wide coupon of tape from the surface.

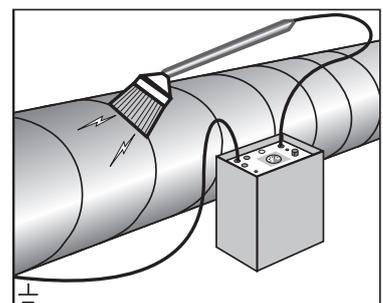


Fig. 24: Perform a holiday test using a ring or brass brush (refer to the table for holiday detection voltages).

DENSOPOL 60™ & DENSOPOL 80™ (INCLUDING TROPICAL VERSIONS)

APPLICATION TEMPERATURES & HOLIDAY DETECTION VOLTAGES

Tape may be conditioned within the below range of temperatures to facilitate ease of application. Note, that as the temperature of the tape is increased, it shall become more flexible and the tension used during application shall be adjusted accordingly. This is particularly important when applying the tape using a machine, rather than by hand.

		APPLICATION TEMPERATURE		HOLIDAY DETECTION VOLTAGE		
		MINIMUM	MAXIMUM	1 LAYER	2 LAYER	
TROPICAL	STANDARD	Densopol 60™	+5°C	+45°C	10 kV	15 kV
		Densopol 80™	+5°C	+45°C	10 kV	15 kV
		Densopol 60 HT™	+15°C	+50°C	10 kV	15 kV
		Densopol 80 HT™	+18°C	+50°C	10 kV	15 kV

STORAGE

- Store correct way up in original packaging.
- Store away from heat and open flames.
- Do not store in direct sunlight.
- Standard Grades store between: +5°C and +20°C
- Tropical Grades store between: +5°C and +35°C

Wrapped pipes or similar that are not immediately backfilled shall be protected from direct sunlight, adverse weather conditions and shall be stored within the application temperature range shown above.

HANDLING

- Do not get in eyes, on skin, or on clothing.
- Wash thoroughly after use and before work breaks to remove compound from the skin.
- Careful attention should be given to personal hygiene.
- Change and clean soiled clothing.

Please refer to Safety Data Sheets for full information.

DISPOSAL

Please minimise or avoid waste wherever possible. Please do not discard waste material, including packaging, in the surrounding environment. Follow all relevant legislation for disposal.

IMPORTANT:

Winn & Coales (Denso) Ltd pursue a policy to develop and continually improve all of our products and therefore information given in these instructions for use is intended as a general guide and does not constitute a warranty, specification or risk assessment. Instructions for use are intended to provide sufficiently detailed information to achieve successful installation in normal circumstances. These guidelines may not cover all circumstances; however, our sales personnel are committed to assisting the user in establishing the suitability of the product for its intended purpose and additional specific information, advice and training (including Safety Data Sheets) is available. It is strongly recommended that installation is conducted with due regard to Health and Safety using a safe system of work, including risk assessments and method statements, in accordance with relevant local statutes and regulations. Equipment used for installation must be suitable for the intended use, maintained in a safe condition, inspected for signs of deterioration, and used by competent personnel. Any conflict between these guidelines and the specific project specifications must be resolved by the user before work commences. All rights reserved.