



Petrolatum Products Specification Guide

1.0 Scope

- 1.1 This specification may be used for the priming, caulking and wrapping with Denso petrolatum products of any of the following surfaces: piping, nuts, bolts, flanges, dresser couplings, valves, tanks, structural steelwork, dissimilar metals/materials, mechanical or electrical penetrations, mechanical equipment and other surfaces as specified herein for above and below ground service.
- 1.2 The Engineer shall select appropriate sections of the specification to ensure that the specification is comprehensive for specified work.

2.0 General Requirements

- 2.1 Contractor shall comply with all written recommendations of the manufacturer regarding applications of the specified system.
- 2.2 To obtain the specified materials contact Denso, Inc., 9710 Telge Road, Houston, TX 77095, Tel: (281) 821-3355 or 90 Ironside Crescent Unit 12, Toronto, Ontario, Canada M1X1M3, Tel: 416-291-3435. E-mail: info@densona.com.

3.0 Materials

- 3.1 Denso Primers
 - 3.1.1 The Primer shall be comprised of saturated petroleum hydrocarbons (petrolatum) inert fillers and passivating agents.
 - 3.1.2 The Primer will be an integral component of most Denso Tape systems for the preparation of metal surfaces prior to wrapping. Denso Primers will displace moisture, passivate surface oxides, fill surface imperfections and ensure intimate contact between Denso Petrolatum Tapes.
- 3.2 Denso Mastics
 - 3.2.1 The Denso Mastics shall be comprised of saturated petroleum hydrocarbons (petrolatum) inert fillers, reinforcing fibers and thermal extenders. Variations may contain beads of cellular polymer and flow control additives.
 - 3.2.2 Denso Mastics shall be cold applied self supporting Mastics for molding around irregular shaped fittings to provide a suitable profile for applying anti-corrosion tapes.
 - 3.2.3 The physical specification values shall meet the values given on the data sheet for the type of Denso Mastic required.

- 3.3 Denso Petrolatum Tapes

- 3.3.1 Petrolatum tapes shall have a character stable in composition and plasticity over a wide temperature range. The tape shall be non-hardening and non-cracking. The tape shall accommodate vibration and extreme movement of substrate. Superficial oxidation renders surface less tacky. The tape is highly resistant to mineral acids and alkalis.
- 3.3.2 The physical specification values shall meet the values given on the data sheet for the type of Denso Petrolatum tape required.

4.0 General Surface Preparation Requirements

- 4.1 Remove dirt, grease and oil including excessive moisture and frost in accordance with the requirements of SSPC-SP-1, "Solvent Cleaning".
- 4.2 Remove weld spatter, sharp points and edges.
- 4.3 Remove loose rust, paint and foreign matter by hand and/or power tools cleaning in accordance with SSPC-SP-2, or SP-3, "Hand Tool Cleaning" or "Power Tool Cleaning" respectively.
- 4.4 High pressure water blasting may be used to prepare the surface.

5.0 Application of Denso Primers

- 5.1 Apply specified paste/primer: Denso Paste™, Denso S105™, or Denso Hi-Tack™ Primer by hand, brush, glove, rag or roller.
- 5.2 Apply a thin uniform film over the entire surface to be wrapped.
- 5.3 Apply a liberal coating to threads, cavities, shoulders, pits, etc.

6.0 Application of Denso Mastics

- 6.1 To protect complex surfaces and configurations such as valve bodies, flanges, dresser couplings, etc., apply Densyl™ Mastic or Denso Profiling Mastic™ by filling and packing to achieve a uniform contour to which tape can be applied without bridging or voids.

7.0 Application of Denso Petrolatum Tape on Straight Line Pipe

- 7.1 The tape shall be spirally wrapped on pipe, cable, conduit fittings etc., using a minimum 1" (25 mm) overlap on all applications. Where additional protection is required, the overlap shall be increased to 55% which will provide a double thickness of tape.
- 7.2 The tape may be applied longitudinally, i.e. "cigarette wrapped", (except Denso Hotline™ Tape) when the space is too restricted or confined to apply in the preferred spiral matter. Use a minimum 1" (25 mm) overlap, and keep the overlap on the topside of the pipe to provide a weatherboard effect.
- 7.3 Hold end of tape firmly against the starting point and firmly press on the surface. Unroll the tape, keeping the roll close to the surface. Do not get a long lead of tape as it will tend to fold and gap on the surface being wrapped. The tape is best applied by rolling it around the pipe and giving it proper tension (See Figure 1).
- 7.4 Apply sufficient tension to provide continuous adhesion, but do not stretch the tape. As application proceeds, press out all folds and air pockets that may occur.
- 7.5 Maintain a minimum 6" (150 mm) overlap when overlapping one roll with the end of a new roll. Overlap must occur on the top half of the pipe.
- 7.6 At the completion of each roll, smooth the overlaps by hand in the direction of the spiral (See Figure 2) to ensure sealing of the overlap.



Figure 2

- 7.7 On all vertical applications begin at the bottom and proceed up thereby creating a "weatherboard" overlap (See Figure 2).

8.0 Application of Tape on Flanges, Dresser Couplings, Valves Bodies, etc.

- 8.1 After the bolts and nuts have received a filler of mastic, flanges can be wrapped either with a width of tape wide enough, that when wrapped circumferentially, enough tape will lap over the side to allow the installer to smooth it into the side of the flanges and several inches onto the pipe; or take several short pieces of tape and by applying them longitudinally along the axis of the pipe up over the flanges and down the other side, and overlapping each piece by a minimum of 1" (25 mm).

9.0 Underground Applications

- 9.1 Prepare surface as described in Section 4.0.
- 9.2 Apply applicable primer as described in Section 5.0.
- 9.3 Apply applicable Denso Petrolatum Tape as required in Section 7.0.
- 9.4 Use Viscotaq PVC Outerwrap, Denso Glass Outerwrap, or Denso Poly-Wrap for an outerwrap when the following conditions apply:
 - a. A barrier to prevent backfilling damage.
 - b. To aid in the prevention of leaching of the petrolatum in hot, dry, and sandy soils.
 - c. To maintain dielectric strength when the system includes cathodic protection.

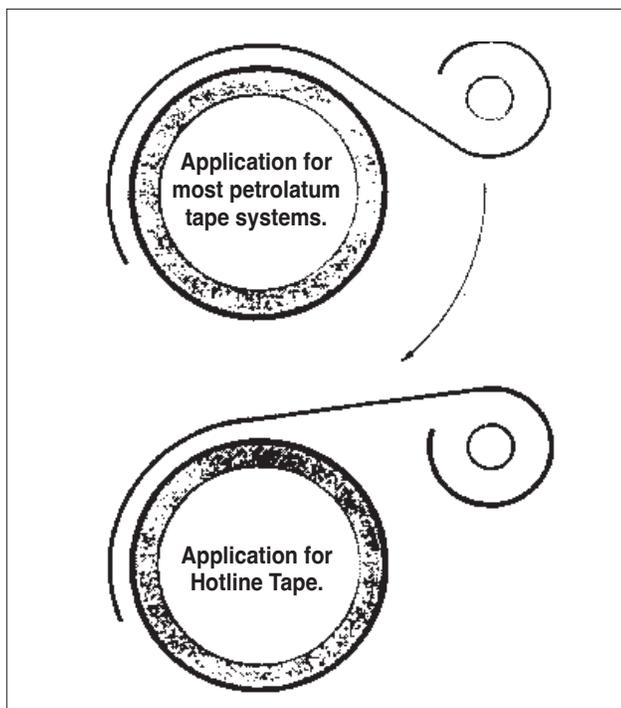


Figure 1 - When applying the Hotline Tape, WB Tape and Marine Piling Tape, the tape should be applied sticky side down with the clear film on the outside.

10.0 Structural Steelwork

- 10.1 Prepare surface as described in Section 4.0.
- 10.2 Use Denso Hi-Tack Primer & Denso Hi-Tack Tape which permit overlaps of at least 1" (25 mm) to be made in a downward direction (weatherboard effect) on vertical surfaces. Minimize the overlaps on the underside of horizontal surfaces (See Figure 3).
- 10.3 Apply tape longitudinally by unrolling along the structural shape so that the outside of roll is in contact with the steelwork. The Denso Hi-Tack Tape should be applied in 6' to 10' (1.8 m to 3 m) lengths for easier application.
- 10.4 Press and smooth down as application proceeds with particular attention to the overlaps. Care should be exercised to ensure that the tape is pressed firmly home in all angles and corners, and then worked along the adjacent flat surfaces to prevent gaps, bridging or stretching.
- 10.5 An alternative method for the protection of structural steel "H" beams is to insert pre-cut polystyrene blocks in the webs of the members, slightly proud of the flange width, liberally primed on all sides with Denso Hi-Tack Primer before placement. The resulting "box" configuration can then be spirally wrapped with Denso Hi-Tack Tape, using the appropriate overlap.
- 10.6 Apply sufficient tension to give complete adherence, but do not stretch the tape at any time.
- 10.7 Avoid folds and air pockets, pressing out any which may appear.
- 10.8 Rivet heads, nuts and bolts, etc. may be dealt with by making an incision in the tape in the form of a cross over the crown of the rivet etc. Then, a small patch of tape is pressed over the partially exposed crown and thoroughly smoothed over.
- 10.9 Sharp edges and corners require extra care. Avoid damage caused by stretching or rubbing tape along such

edges. On corroded edges, a prior positioning of a length of 2" (50 mm) wide tape should be made to cushion the applied tape.

- 10.10 See Figure 3 for examples.

11.0 Cold Sweating Lines or Wet Surfaces

- 11.1 Remove excess moisture or frost with rags or squeegee.
- 11.2 Apply Denso Paste S105 as described in Section 5.0.
- 11.3 Apply applicable Denso Petrolatum Tape as recommended in Section 7.0.

12.0 Cooling Tower Piping and Associated Steelwork

- 12.1 All exposed horizontal pipework within 100 feet (30.5 m) of the tower requires a 55% overlap of Denso Petrolatum Tape. An optional protective outerwrap may be used for additional protection (See Section 18.0).
- 12.2 All exposed horizontal pipework downwind of the cooling tower, subject to fallout from the tower, requires a 55% overlap.
- 12.3 A material-saving method may be used to provide a double thickness of tape on the top half of the pipe. Apply applicable Denso Petrolatum Tape longitudinally along the top axis of the pipe and then apply a minimum 1" (25 mm) overlap spirally around the pipe.
- 12.4 All other pipework, valves, fittings, etc., including vertical risers and less exposed surfaces, may use the 1" (25 mm) overlap, depending upon site and/or environmental conditions.

13.0 Wind Line Corrosion (Pipe Penetration)

- 13.1 The surface of the pipe shall be cleaned a minimum of 12" (300 mm) below and above grade as described in Section 4.0.

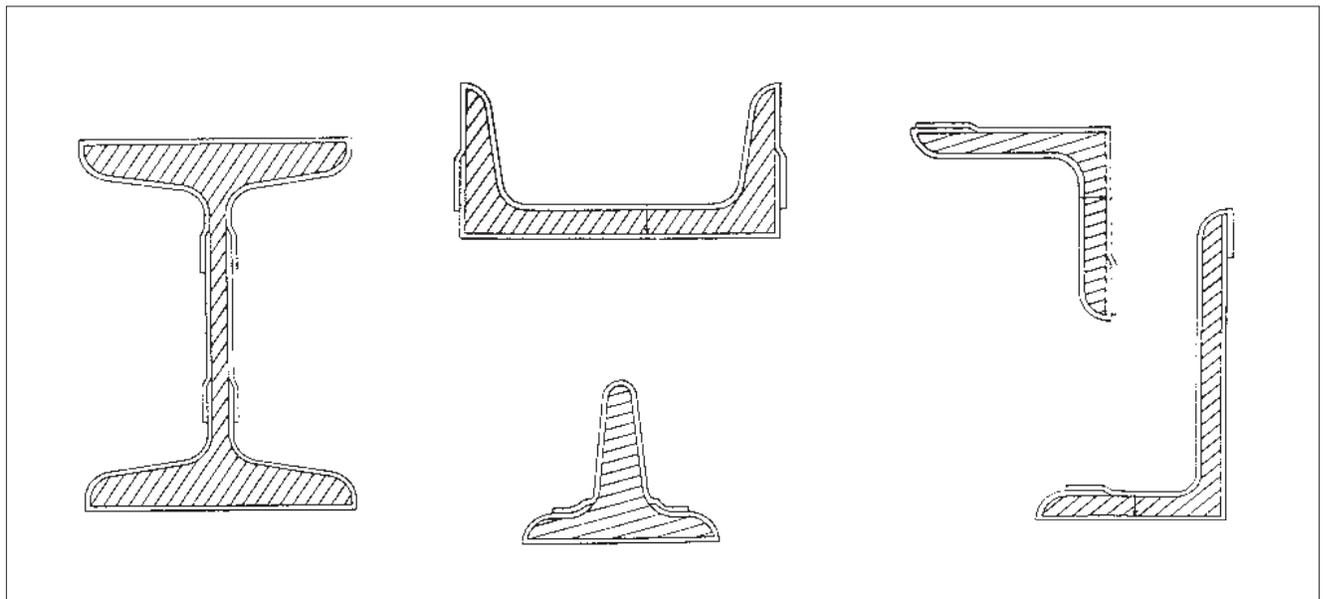


Figure 3

- 13.2 Apply applicable Denso Primer and Denso Petrolatum Tape as described in Sections 5.0 and 7.0.
- 13.3 **Outerwrapping:** *Denso Glass Outerwrap™ shall be spirally wrapped over entire coated area onto the existing coating by 4" (100 mm). The minimum Denso Glass Outerwrap coverage shall be 50% overlap in each of two separate layers. This will provide a four-layer thickness throughout the overall coated area. Additional layers will provide additional mechanical protection. Temperate water is used to activate the resin in the Denso Glass Outerwrap. In cold weather, a methyl alcohol (winter windshield washer fluid) solution can be used. The Denso Glass Outerwrap can be soaked in water and/or alcohol solution to activate the resin for twenty to thirty seconds prior to application. Alternately, a water and/or methyl alcohol solution can be spray applied to each layer of the Denso Glass Outerwrap as it is applied. Denso Glass Outerwrap will be considered ready to backfill when the resin in the Denso Glass Outerwrap has cured to the degree that it provides adhesion between the layers of itself and is firm enough not to be affected by the backfilling operation. In cold weather, the Denso Glass Outerwrap may not achieve full cure prior to being backfilled, however it will continue to cure even after being backfilled once it warms up.*
- 13.4 Application of Denso Poly-Wrap™: A final temporary double layer of Denso Poly-Wrap shall be immediately applied over the uncured Denso Glass Outerwrap. This allows all seams of the Denso Glass Outerwrap to lay out more smoothly and provides a tighter cured seal. The Denso Poly-Wrap should be removed after approx. 15 to 30 minutes depending on temperature.

14.0 Protection of Insulated Lines

- 14.1 Apply applicable Denso Primer and Denso Petrolatum Tape as described in Sections 5.0 and 7.0.
- 14.2 Insulation may be applied immediately after application of the Denso Petrolatum System is complete.

15.0 Field Joints of Shop-Coated Pipe

- 15.1 Prepare surfaces as described in Section 4.0.
- 15.2 Apply applicable Denso Primers and Denso Petrolatum Tapes as described in Sections 5.0 and 7.0. Start and finish application of tape several inches onto each end of the substrate.
- 15.3 Apply Viscotaq PVC Outerwrap or Denso Glass Outerwrap beginning on the shop applied coating, over the tape finishing up several inches onto each side of shop applied coating. Do not exceed the edge of the Denso Petrolatum Tape.

16.0 Pipe Hangers, Brackets, Supports, U-Bolts, etc.

- 16.1 Prepare surfaces as described in Section 4.0.
- 16.2 Apply applicable Denso Primer as recommended making certain that all thread are well covered.
- 16.3 If the pipe is not already wrapped with a Denso Petrolatum System, application is made to both the bracket, U-bolt, pipe surface, etc., as appropriate. The tape is applied in accordance with Section 7.0.

17.0 Repair of Damaged Tape or Coating

- 17.1 Denso Petrolatum Tape may be used to repair damaged coatings or tapes. The following procedure should be followed:
- 17.2 Remove damaged tape or non-adhering coating. Remove corrosion products. Apply thin coat of Denso Paste. On thick-film coatings or tapes, we recommend the use of a small amount of mastic as a filler to eliminate the abrupt edge where the old coating or tape ends. Begin the application of tape a minimum of two inches back from the damaged area utilizing the recommended overlap for the service. Complete wrapping of repair area so that the tape overlaps at least 2" (50 mm) onto the original coating.
- 17.3 When repairing damaged Denso Petrolatum Tape, the damaged area frequently can be repaired by applying a patch or a full circumferential wrap. The new Denso Petrolatum Tape can readily be pressed onto the old tape. Patches should only be installed on the top half of a pipe surface.

18.0 Protective Outerwraps

- 18.1 Viscotaq PVC Outerwrap and Denso Poly-Wrap is available as an overwrap for mechanical protection or as a general non-tack barrier.
- 18.2 Denso Glass Outerwrap as described in Section 13.3.
- 18.3 30 to 100 mil (762 to 2,2540 microns) Polyethylene can provide a durable covering for Denso Petrolatum Tape. Jacketing shall be banded every 18" to 24" (450 to 600 mm).

19.0 Inspection

- 19.1 The underlying surface beneath any of the Denso Petrolatum Tapes may be inspected at any time, while in service, merely by cutting an "H" or "X" in the tape. Peel back the flaps and inspect the underlying surface. Upon completion of the inspection, simply press the flaps back in place. Smooth the tape and smear the cut edges and tape is again ready for service.



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