



Engineering Specifications for **SeaShield™ Series 2000FD** Steel and Concrete Pile Protection

1.0 Scope

- 1.1 This specification may be used for the materials and application of Denso SeaShield Series 2000FD for protection of steel and concrete piles.
- 1.2 The Engineer shall select appropriate sections of the specification to insure 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 application of the specified system.
- 2.2 The manufacturer of specified materials shall be Denso North America Inc., 9710 Telge Road, Houston, TX 77095, Tel: 281-821-3355, Fax: 281-821-030, e-mail: info@densona.com

3.0 Materials

- 3.1 Denso S105 Primer
 - 3.1.1 The Denso S105 Paste shall be comprised of saturated petroleum hydrocarbons (petrolatum), inert fillers and passivating agents.
 - 3.1.2 The paste is used to displace moisture, passivate surface oxides and fill surface imperfections on severely corroded areas.
 - 3.1.3 The physical specification values shall meet the values given on the data sheet for the Denso S105 Paste.
- 3.2 Densyl Mastic
 - 3.2.1 The Densyl Mastic 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 Densyl Mastic shall be cold applied self supporting Mastic for molding around irregular shaped fittings to provide a suitable profile for applying the Denso Marine Piling Tape.

3.2.3 The physical specification values shall meet the values given on the data sheet for the Densyl Mastic.

3.3 Denso Marine Piling Tape

- 3.3.1 The Denso Marine Piling Tape shall be comprised of a non-woven synthetic fabric carrier fully impregnated and coated with a neutral petrolatum based compound with inert siliceous fillers, water displacing agents and inhibitors. It is backed with a HD polyethylene film.
- 3.3.2 The Denso Marine Piling Tape 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. Highly resistant to mineral acids and alkalis.
- 3.3.3 The Denso Marine Piling Tape shall meet the physical specifications values listed on the data sheet.

3.4 SeaShield 2000FD Outercover

- 3.4.1 The SeaShield 2000FD Outercover shall be comprised of High Density Polyethylene (HDPE). It shall be new, seamless virgin material. Use of reprocessed resin is prohibited. The sheet shall be uniform throughout, free from dirt, oil and other foreign matter and free from cracks, creases, wrinkles, bubbles, pin-holes and any other defects that may affect its service.
- 3.4.2 The SeaShield 2000FD Outercover is used to prevent damage to underlying Denso Marine Piling Tape. The outercovers will be custom engineered to have the correct fit for the diameter of the pile. The jackets shall be manufactured with Denso proprietary equipment to ensure quality fabrication.

3.5 SeaShield Bolts, Nuts & Washers

- 3.5.1 The SeaShield Fasteners shall be comprised of M12 x 90 mm Hexagon Bolt, 316 Stainless Steel
- 3.5.2 M12 Self Locking Nylon Insert Nut, 316 Stainless Steel
- 3.5.3 M12 x 35 mm Penny Washer 316 Stainless Steel, for every nut and bolt there are two washers.

4.0 General Surface Preparation Requirements

- 4.1 Remove weld spatter, sharp points and edges.
- 4.2 Remove marine growth, loose rust, paint and foreign matter by hand and /or power tools.
- 4.3 A hydraulic whirl away or high pressure water blasting may be used to prepare the surface.

5.0 Application of Denso S105 Paste

- 5.1 If surface has corrosion pits greater than 2 mm, apply a thin uniform layer of Denso S105 over corroded area and fill all pits.
- 5.2 When applying the Denso S105 Paste underwater use a gloved hand to displace the water and slowly rub S105 Paste onto surface and into pits. (Note: When applying underwater the primer will be less visible on the pile.)

6.0 Application of Densyl Mastic

- 6.1 To protect complex surfaces and configurations such as brackets, flanges, valves etc., apply Densyl Mastic by filling and packing to achieve a uniform contour to which tape can be applied without bridging or voids.
- 6.2 Use Densyl Mastic to fill in cavities at the pile/pile cap interfaces.

7.0 Application of Denso Marine Piling Tape to a Cylindrical Pile

- 7.1 The tape shall be spirally wrapped onto pile using a 55% overlap, which will provide a double thickness of tape throughout. Application shall proceed at the designated high point of the area and proceed downward to the low point.
- 7.2 Hold end of the 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.
- 7.3 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.
- 7.4 Maintain a minimum 6" (150 mm) overlap when overlapping one roll with the end of a new roll.
- 7.5 At the completion of each roll, smooth the overlaps by hand in the direction of the spiral to insure sealing of the overlap.

8.0 Application of SeaShield 2000FD Outercover

- 8.1 Minimum ambient and water temperature shall be 45°F (7°C) during application.
- 8.2 A Denso Hydraulic Tensioning Kit will be required to properly tension and fit the SeaShield 2000FD Outercover. Assemble the Hydraulic Tensioning Kit per to the Operating Instructions prior to application.
- 8.3 Temporary hold and locate the outercover between the elevations indicated in the specifications and drawings.
- 8.4 Align the bolting bar holes and install the middle clamping bar and slide rods through both bolting bar holes. Install the other clamping bar and tighten the nut and washer on both ends. Make sure nut is screwed right up to the shoulder so the washer can slide freely on the shaft.
- 8.5 Install the top and bottom clamping bars. The clamping bars shall be fitted so there are 2 exposed bolt holes at the top and bottom of the outercover and 2 holes between each of the 3 clamps.
- 8.6 Apply pressure evenly to each hydraulic hand pump which will show 1500psi (10.34 MPa) while jacketing. Bring the bolting bars together evenly until the pump gauges read approximately 5000psi (34.47 MPa).
- 8.7 Install the M12 x 90 316 SS bolts, nuts & washers into the exposed empty holes and tightened up so that the bars are compressed and the nut has reached the end of the thread or cannot be tightened further.
- 8.8 Remove the hydraulic clamps and install the M12 x 90 316 SS bolts, nuts & washers in remaining holes and tightened up. For complete written instructions with photos please refer to the Operating Instructions for SeaShield Series 2000FD.



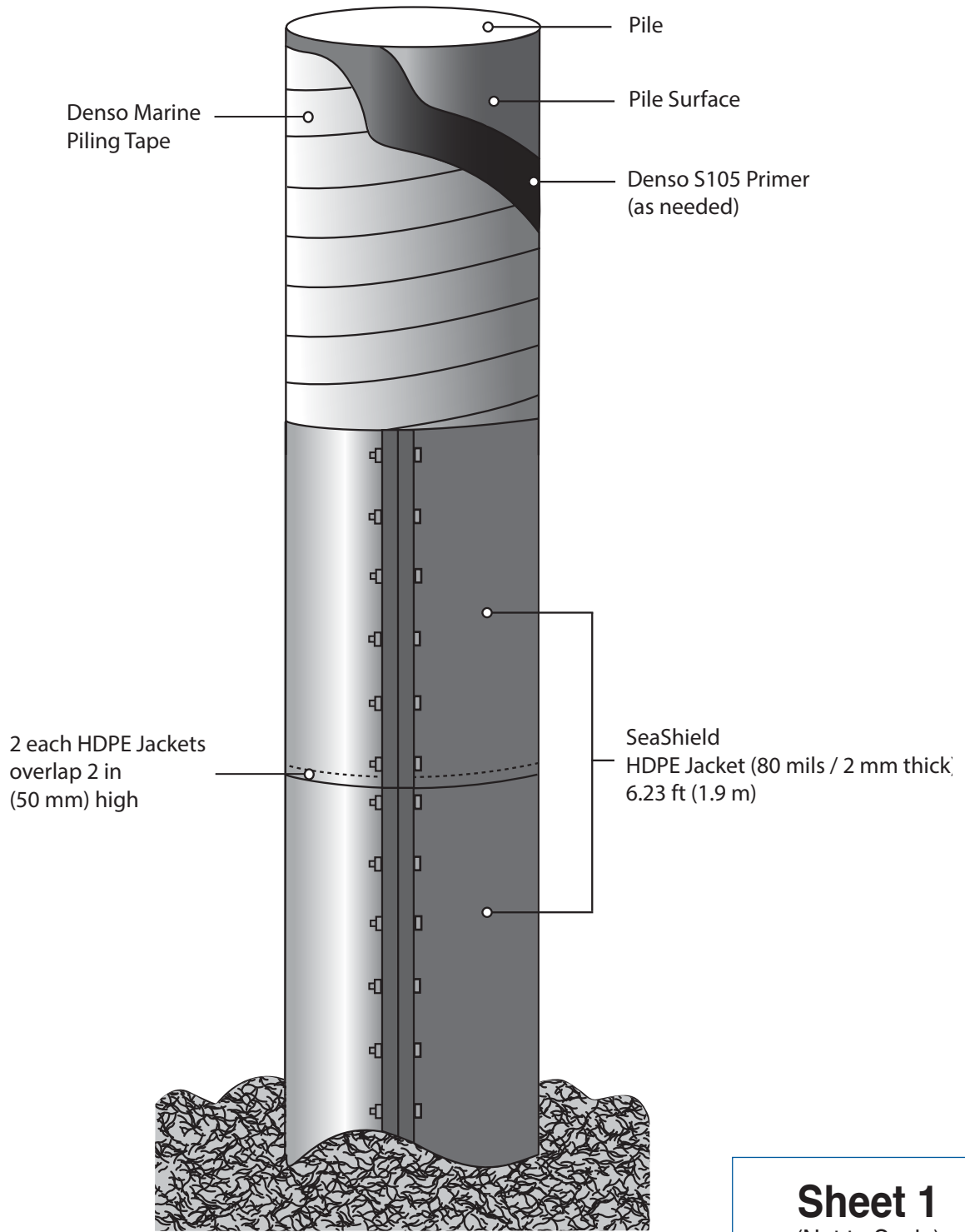
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Sheet 1
(Not to Scale)

SeaShield Series 2000FD Splashzone Protection System

