Engineering Specifications
for
SeaShield Series 30
Timber Pile Protection System

1.0 Scope

1.1 This specification may be used for the materials and application of Denso SeaShield Series 30 for Timber Pile Protection.

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, 9747 Whithorn Drive, 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 SeaShield Marine Tape

The SeaShield Marine Tape shall be comprised of a non-woven synthetic fabric carrier fully impregnated and coated with a neutral petrolatum based compound with water displacing agents and wide spectrum biocides.

The SeaShield Marine Tape shall have a character stable in composition and plastcity over a wide temperature range. The tape shall be non-hardening and non-cracking. The tape shall accommodate vibration and extreme movement of substrate. Highly resistant to mineral acids and alkalies.

The SeaShield Marine Tape shall meet the physical specifications values listed on the specification sheet.

3.2 Foam Seals

The foam seals shall consist of 0.75 in. thick by 3 in. wide flexible polyether type polyurethane foam conforming to the following physical properties:

Physical Property	Value	Test Method
Density, lbs./cu. ft.	1.85 +/- .1	ASTM D-3574
IFD, lbs./50 sq. in. @ 25%	45 +/- 4	ASTM D-3574
Tensile Strength, lbs./in.	12 min.	ASTM D-3574
Tear Strength, lbs./sq. in.	1.5 min.	ASTM D-3574
Elongation, %	160% min.	ASTM D-3574
Compression Set, 50%	10% max.	ASTM D-3574

3.3 Flexible Plastic Outercover

The flexible plastic outercover shall be either Ethylene Propylene Diene Terpolymer (EPDM) or Polyvinyl Chloride (PVC). It shall be new, seamless non-rigid 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, pinholes and any other defects that may affect its service. A black pigment shall be dispersed into the resin to produce a plastic sheep of an even color. The sheet shall conform to the following mechanical and physical properties.

Physical Property	Value	Test Method
Tensile Strength		
PVC	138 min.	ASTM D-882
Breaking Strength		
EPDM	90 lbf (400 N)	ASTM D-751 A
Elongation		
PVC	450% min.	ASTM D-882
EPDM	250% min.	ASTM D-751
Graves Tear		
PVC	14 lbs. min.	ASTM D-1004
Shrinkage		
PVC	5% max.	ASTM D-1204
Specific Gravity		
PVC	1.20-1.35	ASTM D-792
EPDM	1.10-1.20	ASTM D-297
Low Temperature		
PVC	-20°F	ASTM D-1790

EPDM	-49°F	ASTM D-2137
Mil Thickness		
PVC	+/-10%	ASTM D-1593
EPDM	+/-10%	ASTM D-751

3.4 Strapping

The strapping system shall be comprised of 5052 aluminum alloy, Delrin plastic or 316 stainless steel. The straps shall be of sufficient length to completely encircle the pile over the top and bottom foam seals.

3.5 Nails

Nail shall be of two types:

a. Type I nails shall be nominal 1-1/2 inches in length, equipped with a neoprene washer 316 stainless steel. Ring Shank diameter shall be .135 inch with + or - 5%. Head diameter shall be 3/8" with + or - 10%.

b. Type II nails shall be nominal 3 1/2 inches in length, 316 stainless steel. Ring shank diameter shall be .165 inch with + or - 5%. Head diameter shall be .27 inch with + or - 10%.

3.6 Creosote Seal Membrane

A creosote seal membrane shall be installed to the inside of the outercover if polyvinyl chloride (PVC) material is utilized. The membrane shall be a polyethylene film with a minimum thickness of 0.003 in.

3.7 Wood Pole Pieces

The wood pole pieces shall be Brazilian hard select grade wood without defects.

4.0 Installation

4.1 Cleaning and Surface Preparation

Identify piles to be protected with the outercover between elevations indicated in the drawings.

Remove marine growth, and foreign matter for the entire length which is to be protected with the barrier wrap. All surface projections such as nails, bolts, large splinters, fouling organisms and other surface conditions that would penetrate the outercover shall be removed.

4.2 Foam Seals

Foam seals may be adhered to the inside of the outercover at top and bottom ends as required on contract drawings.

4.3 Wood Poles Pieces

The wood pole pieces shall be attached to the vertical edge of the outercover.

4.4 Plastic Barrier Outercover

Locate the outercover between the elevations indicated in the specifications and drawings. With the pole pieces attached to the vertical edges of the EPDM or PVC, the outercovers shall be wrapped around the wood pile and the pole pieces brought together and joined. A ratchet tool shall be used to rotate the pole pieces, winding up the excess outercover to form a tight sheath around the pile. The gathered vertical seam shall be secured to the pile with Type II nails. With the outercover fastened in the final position, selected strapping shall be placed directly over the top and bottom seals. The straps shall be drawn tight with a strapping ratchet tool so that the foam seals are compressed. Type I nails shall be driven at a minimum of 90 degrees around the circumference of the pile through the outercover and foam seal. Additional nails shall be driven wherever pile surfaces require closer spacing to ensure a tight fit.

4.5 Overlapping Outercovers

Where it is necessary to utilize more than one outercover to protect the entire length of a pile, the second outercover shall overlap a minimum of 12 inches (above and or below) the inner cover. Rotate the vertical closure seam of the overlapping outercover 90 degrees from the vertical seam of the unit (s) above and or below. Install over-lapping outercovers as described in part 4.4.

4.6 Nailing

To ensure a tight enclosure, drive Type II nails through the outercover and wood pole pieces a minimum of every 3 feet along the closure seam. Drive Type I nails at top and bottom seals to ensure a tight seal between the seal and pile.

4.7 Mud Line Seal

Excavate the soil around the base of the piles so that the outercover extends to a minimum of 2 feet below the mud line. After installation of the outercover, back fill all excavated areas to the original mud line.

DENSO NORTH AMERICA

HOUSTON:
9747 Whithorn Drive,
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

A Member of Winn & Coales International