40 YEARS OF MARINE PROTECTION

APPLICATION INSTRUCTIONS

Seashield Series 100 System

for Pile Protection

1. SYSTEM:

System consists of Denso Seashield tapes, primers and mastics with a HDPE outer jacket fastened with SmartBand strapping and buckles.
To protect the pile and surrounding areas from the environment the tape covers and makes intimate contact with the entire surface of any substrate in the splash or tidal zone.

2. USES:

For splash or tidal zone protection of piles in relatively sheltered environments.
Applicable to pilings that have a constant outside diameter (OD) throughout the length of the protection zone. For pilings without a constant OD products Denso Seashield primer, mastic and prefabricated void fillers can be used to create a constant OD profile which enables the use of the system.
Used by yacht clubs on marinas and mooring berths. By road authorities on bridges and jetties. By local councils on bridges jetties and piers. By refineries, bulk commodities handlers and port authorities on loading wharfs, jetties, dolphins, piers and beacons. By shipyards on loading wharfs.

Figure 1. *Complete Series 100 System on cylindrical piling* ▲

3. EQUIPMENT LIST:

Wire brush, powered wire brush, scraper, hammer and chisel, water blasting equipment (optional).
Brush cleaning solvent, utility knife, cleaning cloth, hand cleaner, barrier cream.
Diving gear and equipment or overalls, gloves and any other personal protection equipment deemed necessary by the materials Safety Data Sheets and Job Safety Analysis conducted prior to the commencement of any work undertaken.

4. MATERIALS LIST:

- Denso Seashield Primer.
- Denso Seashield Mastic for filling and profiling any irregular surfaces.
- Denso Marine Piling Tape or Seal T Tape corrosion protection layer.
- Seashield Series 100 Jackets designed and custom made for each pile for mechanical protection of the system.
- Smartband strapping, buckles and fitting tool supplied by Denso to secure and hold jackets in place.

5. APPLICATION of TAPE SYSTEM:

a) Surface Preparation:
Surfaces to be protected must free from all marine growth, loose rust, original coatings, dirt etc. The surface is prepared by scraping, chipping, water blasting or the use of a hull scrubber.
The choice of method will depend on a number of factors and will need to take into account the most practical with regard to site conditions and any environmental constraints imposed due to site location.
Methods can include the use of abrasive blast cleaning, high pressure water jetting, pneumatically or hydraulically driven tools such as scabblers, wire brushes, rotary scrapers and needle guns. Hand tools such as wire brushes, scrapers, chipping hammers etc.

5. APPLICATION of TAPE SYSTEM (continued):

- Ensure that all thick layers of rust are removed from all steel surfaces.
- Remove from the area to be protected all marine growth.
- Areas of firmly adhering rust scale must be removed by chipping hammers and/or hand power tools.
- Remove corrosion deposits from the bottom of any deep pitting deeper than 2mm.
- Weld scars and protrusions of any kind (other than the welded seam on the pile) must be cut away and the surfaces ground smooth to remove sharp edges and sudden changes of profile.
- Wire brush and remove any loose and flaking paint. Wash off surface with seawater and bucket.

Precautions may need to be taken due to environmental concerns. During removal of any pre-existing coating measures should be taken to reduce the amount of debris, paint flakes or old coating etc. from being deposited into the marine environment. Local regulations may dictate certain precautions to be taken and conditions that need to be met as part of these works. A job site Environmental Management Plan may be available for guidance in these matters.

First Inspection:
When all growth, rust, etc. has been removed a close examination must be made of the surface area that has been prepared, to ensure a thoroughly clean surface without growth, sharp or protruding surfaces is obtained.

b) Priming:
Priming is required when using Seal T Tape. Priming may not be required if using Marine Piling Tape as it is designed to be self priming on new steel. On all other applications Denso Seashield Primer should be used.
Denso Seashield Primer is applied to the surface area by gloved hand, cloth, roller or brush, at a spreading rate of 1.0kg/m². It is applied in a circular motion obtaining an even film, while all voids, concaves, and holes should be filled. Denso Seashield Primer can be applied above and below the water's surface.

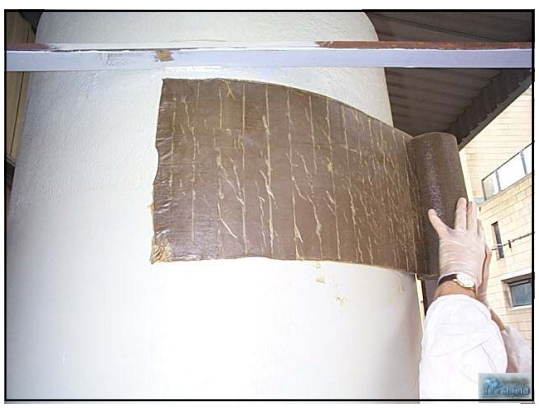
Primer is required in;

- *Areas of deep pitting:* Defined as pits of 2.0mm or deeper where there is a danger of the tape wrapping 'bridging' the pits and leaving a void. These areas must be treated with a liberal coating of Seashield Primer to fill up any voids. If a very deep pit occurs then after priming cut a patch if Seashield Mastic and press firmly into the area.
- *Weld Scars:* Apply a liberal coat of Seashield Primer over these areas. After wrapping the pile with tape examine the area where scars occur. If there is any bridging cut with a sharp knife and press down to remove air. Patch with additional tape if required.
- *Spiral and Vertical Welds:* Apply a liberal amount of primer to the weld and smooth down by hand to create a fillet of primer either side of the weld. Sufficient should be used to avoid bridging when the tape is applied.
- *Remaining Pile:* Apply a thin coat of primer to the remaining exposed pile surface to be protected.

***Figure 2**. Cleaned pile showing the application of primer down either side of a vertical weld seam and into pits. Shown is a hexagonal pile. The procedure is the same for cylindrical and universal piles.* ▶

Second Inspection:
The primed area must be thoroughly inspected to ensure that all the surface area has been properly coated with the primer, including pitted voids, concaves and holes. A smooth profile must be evident to ease the application of tape.

c) Tape Wrapping:
For hexagonal or universal piles Denso can supply foamed void fillers specially designed for pressing into the voids. The void is layered with Primer and Seal T Tape then the foamed void filler is pressed into the void. This then produces a uniform cylindrical external pile profile to enable the spiral application of tapes.
It is important to apply the tape with the correct side facing the pile. The outside of the tape is to make intimate with the piling substrate. The pile is wrapped from the top down or the bottom up depending on access and the order in which any stacker jackets are to be fitted. There is not a preferred direction and any weather boarding effect can be ignored as the tape is deformed under the jacket when it is properly fitted.



In the pile protection zone apply the tape by starting with two full circumferential wraps then proceed spirally along the pile progressing with a 55% overlap, giving effectively a double layer of tape. This will ensure a minimum double thickness of tape all the way. Carry on until the roll runs out. Commence each new roll by overlapping the last roll by the same length as the tape width, for example if the tape is 150mm wide then the overlap will be about 150mm.

◀ ***Figure 3**. Denso Marine Piling Tape with the backing facing away from the pile surface and the first circumferential wrap being positioned.*

5. APPLICATION of TAPE SYSTEM (continued):

c) Tape Wrapping (cont):

As wrapping proceeds smooth by gloved hand to exclude water, air bubbles and wrinkles from under the tape and to aid sealing of overlaps. Any overlapped edges are to be moulded and blended together by hand. This process is repeated all the way along the protection zone finishing again with two complete horizontal turns of the tape.

It may be worthwhile assessing the number of jackets that can be applied and the tidal conditions so that only enough tape is applied for the same number of jackets that can be fitted in a day. The tape that is then left exposed should be temporarily protected with some spare HDPE sheet until the job can be finished. Do not leave tape only exposed to the elements and the sea as it may become dislodged before the job can be completed and will have to be discarded and the piles rewrapped.

◄ ***Figure 4***. *Marine Piling Tape overlap of roll ends.*

Third Inspection:

It is imperative to thoroughly inspect the wrapped pile surface area ensuring it has been wrapped with the specified 55% overlap, that all water, air bubbles and wrinkles are excluded from under the tape and that all overlaps are sealed moulded and blended together.

6. APPLICATION of SERIES 100 JACKETS:

- A “Stopper Band” fixing strap is required below the bottom of the tape to prevent jacket slippage. This comprises of at least 3 or more SmartBand 19 mm buckles and strapping designed to act as a ledge for the jacket around the pile.
- Wrap the Series 100 jacket cover around the pile, ensuring the vertical edge of the P.V.C. stiffening strip is to the outside. The overlapping joint should be positioned so as to face towards the shore to avoid damage by propeller turbulence
- Locate the 19 mm SmartBand straps and buckles spaced at a maximum of 300mm vertically apart between centres and in 50mm from the bottom and top of the jacket, ensuring all buckles are generally in the same vertical position (as near as possible to the vertical stiffening strip). The vertical stiffening strip has markings indicating the expected vertical positions of the straps and buckles.

  For the 10mm Smartband strapping the procedure is the same with the exception of the vertical spacing between bands being a maximum of 200mm vertically apart between centres.
- Insert the SmartBand strap teeth uppermost into one end of the buckle. Wrap the strap around the outside of the jacket and insert into the opposite end of the buckle. Pull the buckle through hand tight before reverting to the SmartBand fitting tool to complete tightening. Use the cutter blade on the fitting tool to remove excess strapping.

Final Inspection:

Check that all jacket surfaces are smooth and flat around the pile, all strapping is not loose and that the jacket is securely fixed to the pile and is not able to be moved in any direction.

Figure 5. *Illustrated examples of the Series 100 System on various piles*

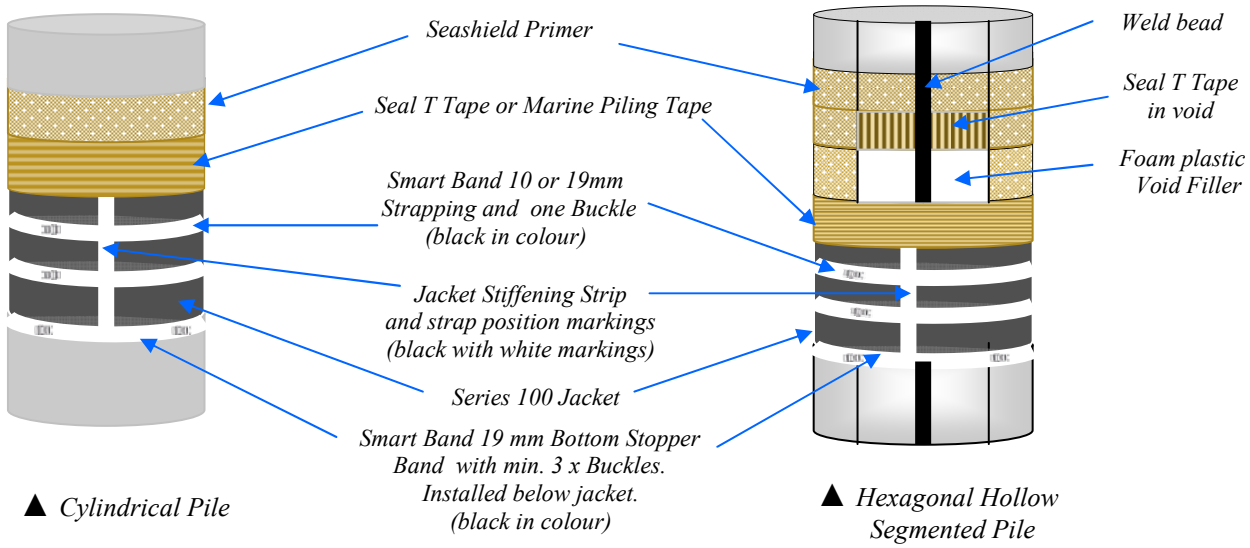
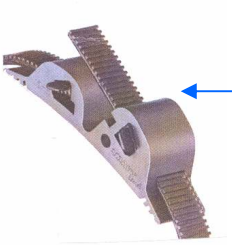


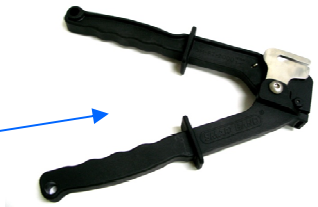
Figure 6. *SmartBand Fasteners*



Smart Band 10 mm Strapping & Buckle

Smart Band 19 mm Strapping & Buckle

Smart Band 19 mm Fixing Tool



7. SAFETY DATA:

Storage: Denso Seashield Primer, Mastic, Denso Marine Piling Tape or Seal T Tape shall be stored in a cool dry place out of direct sunlight between 5° and 25°C. Seashield Series 100 Jackets shall be stored the way they arrive, out of direct sunlight until they are required.

Transport: Avoid prolonged exposure to high temperatures during transit, preferably in an enclosed vehicle.

Handling: Seashield Series 100 Jackets shall be kept rolled and taped to prevent damage for transportation to the installation site. Care shall be taken to avoid sudden impact that may tear or damage the jacket.

Action in case of fire: Extinguish with water fog, dry powder, carbon dioxide or chemical foam. Self-contained breathing apparatus may be required.

Skin Contact: Wash with warm water and mild soap.
Use pumiced heavy duty hand cleaner for stubborn stains.

Swallowing: If feeling unwell, seek medical advice.

Inhalation: In a fire situation avoid inhaling fumes.

Spillage: No materials classified as hazardous. Pick up and collect material by hand or with absorbent rags or pads.

Disposal: Incineration or landfill in accordance with local regulations.

Other: For more information please refer to Denso safety data and technical data sheets. Available for all system components.

Approved Quality Management System
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Denso (Australia) Pty Ltd

411 - 413 Victoria Street,
Brunswick, Vic 3056
Australia

MELBOURNE ♦ SYDNEY ♦ ADELAIDE ♦ BRISBANE ♦ PERTH

Tel: + 61 3 93567600 or 1300 658 590 (toll free) ♦ Email: denso@densoaustralia.com.au ♦ Web: www.densoaustralia.com.au

Denso (New Zealand) Limited

Tel: + 64 21 304 660 ♦ Email: info@denso.co.nz

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