



PileForm™ W Retrowrap™ HD

Heavy-Duty Corrosion Control System
for Piles, Pipelines and Risers

DESCRIPTION

Five Star Marine® PileForm™ W Retrowrap™ HD is a heavy-duty, multi-scrim wrap around corrosion protection system used for inshore splash zone and underwater corrosion protection for piles, pipelines and risers or where heavy duty resistance to floating debris or ice flow is required. Designed to suit any diameter from 1.97 inches to 9.8 feet (50 mm to 3 meters), it may be interlocked to accommodate any required protected length. Full-length Geon™ closure flanges are factory-fitted with corrosion-resistant self-threading fasteners designed to retain PileForm™ W Retrowrap™ HD in position throughout its service life. During installation, the flanges permit the creation of induced hoop tension within the multilayer fabric, which induces the corrosion-inhibited gel to flow and totally encapsulate and protect the substrate without the use of primers, fillers or tapes.

USES

Five Star Marine® PileForm™ W Retrowrap™ HD is specifically designed to provide an easily installed retrofit installation for corrosion protection of sub sea pipelines and jetty piles. For deep water applications, the PileForm™ W Retrowrap™ HD units can be overlapped or butt joint and sealed using a cummerbund connector to provide a continuous, retrofit "active" protection system throughout the required length.

BENEFITS

- Multilayer, heavy-duty construction
- Supplied in interlocking modular lengths
- Does not require substrate shotblast preparation
- Polyurethane provides the highest abrasion resistance
- Full-length closure flanges for easy installation
- Available with unique anti-fouling outer layer
- Easy removal and replacement for inspection
- Provides active protection with environmentally safe corrosion inhibitors
- Hoop tension forces created within the outer skin resist high wave suction forces
- Cold-applied – no hot work permit required
- 10-year manufacturer's warranty

SIZING & CONFIGURATION

Five Star Marine® PileForm™ W Retrowrap™ HD panels are fabricated from a double textile reinforced polyurethane multi-layer fabric. PileForm™ W Retrowrap™ HD units are factory supplied in lengths of 40", 60", 100" and 120" (1.02 M, 1.5 M, 2.0 M & 3 M). Special lengths are available upon request. Consult Five Star Marine® for further details.

TYPICAL PROPERTIES — HEAVY-DUTY WEIGHT FABRIC

Fabric Type		BX 2-OUF
Coating Material		100% PTMEG Polyurethane
Color		Black
Urethane Surface Finish (Max.)		350 R.M.S.
Total Thickness, Finished $\pm .015"$ (inclusive of polyester felt)		.246" (6.25 mm)
Weight, Finished ± 3 oz.	ASTM D-751	90 oz/sq yd (± 3 oz)
Base Fabric Type	ASTM D-751	Nylon 6/6
Base Fabric Weight	ASTM D-751	12 oz/sq yd x 2 ply
Strip Tensile MD/XMD	ASTM D-751	1,200/1,200 lbs.
% Elongation at Break	ASTM D-751	45%
Tongue Tear MD/XMD ± 20 lbs.	ASTM D-751	200/200 lbs.
Impact Resistance	ITI/1477	175 ft/lb
Taber Abrasion	ASTM 3389 1,000 g weight H-18 wheel	>90,000 cycles (min.) Nylon reinforcing fabric exposure
Coating Adhesion	ASTM D-751	40 (± 5) lbs/inch
Accelerated Weathering	ASTM D-4396	1,000 hrs excellent
Low Temperature Bend	ASTM D-746	-70°F
Felt Type		Polyester
Felt Weight	ASTM D-751	19 oz/sq yd
Wrap Operating Temperature		-20°C - 100°C



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INSTALLATION EQUIPMENT

- (1) set (21 pieces) 1/2" Acme Threaded Draw Bolts
- (1) 7/8" AF 1/2" Drive Extended Socket
- (1) 7/8" AF Combination Wrench
- (1) 1/2" Drive Compressed Air Driven Impact Wrench
- (1) 1/2" drive 9/16" AF Socket Wrench
- (1) 1/2" Drive 9/16" AF Combination Wrench

INSTALLATION GUIDELINES

Ensure that the substrate has been cleaned in accordance with the client's cleaning procedure, and then:

1. Remove the plastic backing sheet, if fitted, by gripping it at one corner and slowly pulling such that the sheet comes off completely.
2. Convey PileForm™ W Retrowrap™ HD unit to the riser pile and with overlap area uppermost. Position wrap around the riser and tie off with temporary rope support into closed position. Fit draw bolt in every other bolt hole in flange and using impact wrench, drive draw bolt, complete with washer, through opposing flange until nut and washer can be fitted. Continue fitting draw bolts in every other bolt hole. Do not tighten draw bolts at this stage.
3. Ensure that the wrap is in the required position and free from obstruction at the closure face.
4. Using the extended box wrench fitted to the impact wrench, sequentially tighten draw bolt nuts until wrap panels are under tension and the unit has become self-supporting on riser.
5. Remove the ropes from the closure (if fitted for temporary support).
6. Continue sequentially tightening draw bolts, keeping the gap between flange spaces as equal as possible.
7. Tighten all draw bolts until flange faces are closed.
8. Fit the Stainless Steel bolt with washer through vacant holes in flanges and apply nuts finger tight.
9. Using a suitable socket attached to impact wrench, tighten stainless steel nuts until flanges are in face to face contact.
10. Refit extended box wrench, reverse direction of impact wrench and remove all draw bolts, taking care not to lose nuts and washers.
11. Repeat step 8, until all stainless steel 316L bolts are fitted.
12. Using impact wrench, tighten all stainless steel nuts and fit and tighten nylon lock nuts.
13. Check wrap to ensure that it is seated correctly on pile.

For additional Installation instructions, please call the Five Star Marine, Inc. Engineering and Technical Service Center at 1-800-328-3145.

SKU / PRODUCT CODE	DESCRIPTION	UNIT SIZE
CALL	PileForm™ W Retrowrap™ HD	VARIES

WARRANTY: "FIVE STAR MARINE, INC. (FSM) PRODUCTS ARE MANUFACTURED TO BE FREE OF MANUFACTURING DEFECTS AND TO MEET FSM'S CURRENT PUBLISHED PHYSICAL PROPERTIES WHEN APPLIED IN ACCORDANCE WITH FSM'S DIRECTIONS AND TESTED IN ACCORDANCE WITH ASTM AND FSM STANDARDS. HOWEVER, SHOULD THERE BE DEFECTS OF MANUFACTURING OF ANY KIND, THE SOLE RIGHT OF THE USER WILL BE TO RETURN ALL MATERIALS ALLEGED TO BE DEFECTIVE, FREIGHT PREPAID TO FSM, FOR REPLACEMENT. THERE ARE NO OTHER WARRANTIES BY FSM OF ANY NATURE WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH THIS PRODUCT. FSM SHALL NOT BE LIABLE FOR DAMAGES OF ANY SORT, INCLUDING PUNITIVE, ACTUAL, REMOTE, OR CONSEQUENTIAL DAMAGES, RESULTING FROM ANY CLAIMS OF BREACH OF CONTRACT, BREACH OF ANY WARRANTY, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR FROM ANY OTHER CAUSE WHATSOEVER. FSM SHALL ALSO NOT BE RESPONSIBLE FOR USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT HELD BY OTHERS."

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Specifications subject to change.

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