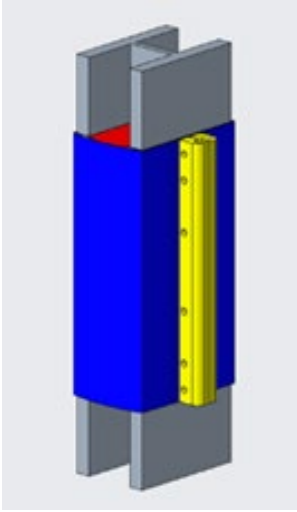


### General description



RETROWRAP H ( STD2 ) is a wraparound corrosion protection solution for inshore splash zone and underwater corrosion protection for H-piles. RETROWRAP H (STD2) is specifically designed as a long-term solution to endure rough conditions through the splash zone at semihard wave conditions and moderate temperature variations.

RETROWRAP H ( STD2 ) is designed to suit H-pile sizes up to about 1 X 1 m (39" X 39") square dimensions and it can be interlocked to accommodate any required protected length.

First class corrosion protection is achieved by wrapping the protected area with corrosion protection inhibitor gel impregnated into a felt layer. The felt is pressed and hold in place by tailor made urethane fill-up pieces (in the H-pile middle part) and finally the tensioned outer coated fabric panel. Ends of the Retrowrap assembly are sealed to ensure a solid solution. RETROWRAP H (STD2 ) panels are a multi-layer monocoque construction, like in Retrowrap STD2, consisting of a polymeric textile reinforcement encapsulated within the polyvinyl chloride matrix outer layer.

Full-length closure flanges are factory-fitted with corrosion-resistant marine grade fasteners designed to retain Retrowrap 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.

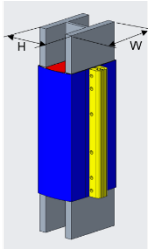
RETROWRAP STD2 provides permanent protection from waves and currents, while standing tall against severe UV-radiation, ozone and temperature variations.

The materials in the system are stressed below their operational limits ensuring a high safety factor in all parameters while in service, and they resist both high wave suction forces and heavy sea growth. If accidentally punctured, the hoop tension will cause the gel impregnated within the inner layer carrier to be exuded from the damaged area and "self-seal". The inhibitor within the gel will neutralize any oxygenated water which has permeated through the damaged wrap at the time of impact. The design of the laminar membrane and the hoop tensions involved combine to ensure that in the extremely unlikely event of a tear being introduced to the RETROWRAP H (STD2), the tear will not propagate.

RETROWRAP H (STD2) Installation is cost effective, fast and easy. Using our specially designed draw bolt installation set, installation can be accomplished fast and safety even in demanding installations conditions. A minimum of ancillary materials are used in order to reduce to a minimum the possibility of human error and/or non-compatibility of components in the installation of the system. See RETROWRAP H installation instructions for further information regarding the installation procedure.

### Features & benefits

- Maintenance free corrosion protection concept
- Cost effective installation. Quick, easy and safe to install
- Environmentally friendly and low lifespan Carbon Footprint due to long design lifetime, 15 years.
- Minimal operational lifetime costs
- Easy removal and replacement for inspection
- Minimal pile surface preparation -does not require substrate shotblast preparation
- Cold-applied – no hot work permit required
- Hoop tension forces created within the outer skin resist high wave suction forces and sea growth
- Material to retain hoop tension throughout the projected operational life of the fabric
- Multilayer fabric
- Supplied in interlocking modular lengths
- High abrasion resistance
- Provides active protection with environmentally safe corrosion inhibitors
- May be fitted with corrosion rate monitoring



### Technical specification

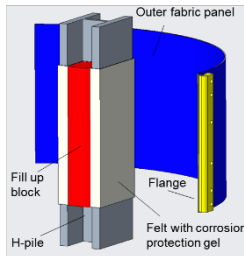
#### RETROWRAP H ( STD2 )

#### Wrap Main Components

- Inner layer with felt, saturated with corrosion protection gel, Retrogel P
- Polyurethane fill-up blocks
- PVC outer fabric panel
- Extruded marine and impact resistant polymetric closure flanges
- Stainless steel fastening bolt set ( by request also other material marine grade bolt sets )

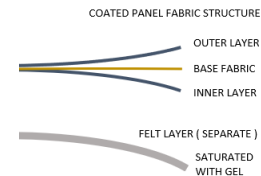
#### Product Data:

|   |   |  |
|---|---|--|
| Product name  | Retrowrap H (STD2)  | For H-piles  |
| Product HS Code   | 39269092  | Including fasteners                                |
| Pile Size applicable  | Up to W:1000 mm x H:1000 mm ( 39' x 39' ), typically  | If bigger contact CCI Oy                           |
| Wrap Height<br>( Pile height to protect )                   | Custom-made according to customer needs.<br>Depending on protected height, wraps are made in one, two or several pieces | Typical one-piece wrap<br>max height 3 m ( 9,83ft) |
| Wrap Weight, ( as delivered )                               | 1 ± 0.2 kg/sqm ( ~ 0.2 lb/sq ft ), excluding felt and fill up blocks  |  |
| Felt Weight ( as delivered )                                | 3,6 ± 0.2 kg/sqm ( ~ 0.74 lb/sq ft ), including gel   | @ gelling ~2 kg / sqm<br>( ~ 0.41 lb/sq ft )       |
| Fill up blocks  | Polyurethane, Custom-made for each pile size and type   |  |
| Wrap max total thickness as<br>installed, including flanges | 55 ± 2 mm ( at fastening flange)<br>Panel only ~ 4.8 mm ( ~ 190 mils )  | Distance from<br>pile/structure surface            |
| Fastening Bolts   | Stainless steel, Marine Grade A4 (316), M10 DIN 931   | HS 73181575  |
| Fastening Nuts  | Stainless steel, Marine Grade A4 (316), M10 DIN 934   | HS 73181631  |
| Fastening Washers   | Stainless steel, Marine Grade A4 (316), M10 DIN 125 or DIN 522  | HS 73182200  |
| Nylon Nuts ( Optional )                                     | M10 PA 6.6, DIN 555   | HS 39259080  |
| Wrap Operating Temperature                                  | -20 to +75°C ( -4 to +167°F ), using Retrogel P gel   | Normal conditions                                  |
| Storage Recommendations                                     | Max +50°C ( 122°F ) ambient temp , non-dusty area, no direct exposure to sun  | In crates  |



#### Panel specifications

|                                 |                                      |                   |
|---------------------------------|--------------------------------------|-------------------|
| Panel Type                      | Reinforced coated multi layer fabric |                   |
| Outer and inner layer coating   | Polyvinyl chloride, PVC              |                   |
| Color                           | Black                                |                   |
| Base fabric type                | Polyester , PES                      | DIN EN ISO 2076   |
| Fabric weight ( excl. felt )    | 0,9 kg/sqm ( ~ 0.18 lb/sq ft )       | EN ISO 2286-2     |
| Felt type                       | Polyester                            |                   |
| Felt weight, as gelled          | ~ 3,6 kg /sqm ( ~ 0.74 lb/sq ft )    |                   |
| Fabric thickness including felt | 4 mm (157mils) ± 2%                  |                   |
| Tensile strength MD/XMD         | 4300/4100 N/5cm                      | EN ISO 1421/V1    |
| Tear strength MD/XMD            | 500/500 N                            | DIN 53363         |
| Coating adhesion                | 20 N/cm                              | PA 09.03 (intern) |
| Light fastness                  | > 6                                  | EN ISO 105 B02    |
| Closure Flanges / Rods          | Geon , Vinyle / PVC                  |                   |



#### Gel specifications

|                                  |                                      |
|----------------------------------|--------------------------------------|
| <b>Gel name</b>                  | <b>Retrogel P</b>                    |
| HS Code                          | 34039900                             |
| Operating Temperature Range      | -20 to +90°C ( -4 to +194°F )        |
| Base material ,approximate       | Refined petroleum wax, 50 %          |
| Corrosion inhibitor, approximate | Thixotropic media, 40 %              |
| Other ,approximate               | Oxyalkylates, alcohol ,naphtha, 10 % |
| Hydrophobic                      | Yes                                  |
| Color                            | Tan                                  |
| Appearance                       | Soft paste                           |
| Odor                             | Oily Hydrocarbon                     |
| Specific gravity                 | 1.2                                  |

Specifications subject to change without notice

Designed and sold by:

Corrosion Control International Oy ( CCI Oy )

Veckjärventie 3

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