



### General description

RETROWRAP HD2 is a wraparound corrosion protection solution for inshore splash zone and underwater corrosion protection for piles, pipelines and risers. HD2 is specifically designed to endure rough splash zone and underwater conditions at hard storms and high temperature variations.

RETROWRAP HD2 is designed to suit any steel and concrete pile diameter from 100 mm (4") to 3 meters (9.83 ft), also square, hexagonal and octagonal shaped piles, and it may be interlocked to accommodate any required protected length. 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 HD2 resists long term immersion, both in seawater and in fresh water. The system is built to last for over 25 years in the most demanding conditions. Attacks, both chemical and biological, will be fought off. RETROWRAP HD2 provides permanent protection from waves and currents, while standing tall against severe UV-radiation, ozone and temperature variations.

RETROWRAP HD2 panels are a multi-layer monocoque construction consisting of a polymeric textile reinforcement encapsulated within the polyurethane matrix and outer layer and bonded in-line to a polyester, penetration resistant, felt impregnated with a corrosion inhibitor or biocide contained within a water-resistant gel, as dictated by the application for which the system will be supplied.

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 pressures and increasing 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 HD2, the tear will not propagate.

RETROWRAP HD2 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. No labor-intensive ancillary materials such as tapes, sealants or adhesives 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 HD2 installation instructions for further information regarding the installation procedure.

### Features & benefits

- Maintenance free corrosion protection concept
- Cost effective installation. Quick and easy to install; no primer, filler or tapes
- Environmentally friendly and low lifespan Carbon Footprint due to long design lifetime, 25 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, heavy-duty construction
- Supplied in interlocking modular lengths
- Polyurethane provides the highest abrasion resistance
- Provides active protection with environmentally safe corrosion inhibitors
- Excellent UV, Ozone and Oxidization resistance
- Resistance to high climatic temperature variations and hydrocarbon oil contamination
- May be fitted with corrosion rate monitoring

### Technical specification RETROWRAP HD2



#### Wrap Main Components

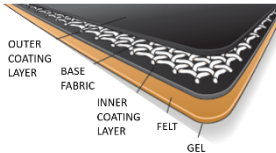
- Thermoplastic Polyurethane fabric panel
- Extruded marine and impact resistant polymeric closure flanges
- Marine grade stainless steel fastening bolt sets
- Corrosion protection gel, Retrogel P or Retrogel S

#### Product Data:

Product name	Retrowrap HD2	It's a Wrap
Product HS Code	39269092	Including fasteners
Pile Diameters applicable	Ø 100 - 3000 mm (~ 4 – 118"), typically Also for Hexagonal, Octagonal and dual/various diameter piles and pipelines	If smaller or bigger diam contact CCI Oy
Wrap Height ( Pile height to protect )	Tailor made according to customer needs. Depending on protected height , wraps are made in one, two or several pieces	One-piece wrap max height: 3 m (9,83ft)
Wrap Weight, including gel ( as delivered )	6.2 ± 0.2 kg/sqm ( 1.27 ± 0.04 lb/sq ft)	@ gelling ~3 kg / sqm (~ 0.61 lb/sq ft )
Wrap max total thickness as installed, including flanges	55 ± 2 mm ( 2.16 ± 0.08") Panel only ~ 4.8 mm (~ 0.19")	Distance from pile/structure surface
Fastening Bolts	Stainless steel, Marine Grade A4 (316), M10 X 90 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 OD20 or DIN 522 OD25	HS 73182200
Nylon Nuts (Optional)	M10 PA 6.6, DIN 555	HS 39259080
Wrap Operating Temperature	-20 to +90°C ( -4 to +194°F) , using Retrogel P gel -40 to +120°C ( -40 to +248°F) , using Retrogel S gel	Normal conditions At high temperatures
Storage Recommendations	In crates, max +50°C (122°F) ambient temp, non-dusty area, no direct exposure to sun	

#### Panel specifications

Panel Type	Reinforced coated multi layer fabric	
Outer and inner layer coating	Thermoplastic Polyurethane, TPU	PTMEG based
Color	Black	
Base fabric type	Polyester , PES	
Fabric weight ( excl. felt)	1.6 kg/sqm (0.33 lb/sq ft)	
Felt type	Polyester	
Felt weight	0.64 kg/sqm (0.13 lb/sq ft)	
Fabric thickness including felt	4.5 mm (0.177")	Excl. Gel
Tensile strength MD/XMD	4000/3000 N/5cm	DIN53354, EN ISO 1421
Tear strength MD/XMD	550/450 N	DIN 53363
Coating adhesion	170 N/5cm	IVK 3.13
Accelerated weathering	7000 hours , excellent	Supplier
Closure Flanges / Rods	Geon , Black Vinyl / PVC	



#### Gel specifications

Gel name	Retrogel P	Retrogel S
HS Code	34039900	34039900
Operating Temperature Range	-20 to +90°C ( -4 - 194°F)	-40 to +120°C (-40 - 248°F)
Base material ,approximate	Refined petroleum wax, 50 %	Flouorocarbon gel, 90%
Corrosion inhibitor, approximate	Thixatropic media, 40 %	10%
Other ,approximate	Oxyalkylates and alcohol in heavy aromatic naphtha, 10 %	-
Hydrophobic	Yes	Yes
Color	Tan	Off-white
Appearance	Soft paste	Soft paste
Odor	Oily Hydrocarbon	Slight
Specific gravity	1.2	1.23

Specifications subject to change without notice

Designed and sold by:

U.S. Patent No. 5,435,667  
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