

## STOPAQ® HIGH IMPACT SHIELD

### Product Information

**Product description:** Stopaq® High Impact Shield wraparound heat shrinkable sleeves consists of a radiation cross-linked polyethylene external backing and an internal adhesive.

Stopaq® High Impact Shield is applied on top of Stopaq® corrosion preventing coating materials (e.g. Stopaq® Wrappingband CZH) as a mechanical outer wrap.

The purposes of the mechanical outer wrap is to provide additional pressure in order to support cold flow of the corrosion preventing compound and the self-healing properties of the complete coating system and to give mechanical protection against impact and indentation.

Stopaq® High Impact Shield is compatible with most commonly used plant-applied coatings, such as PE, PP and FBE, both in onshore and offshore applications.

#### Features:

- Fast and easy to apply
- Easy to control shrinking technique
- Excellent adhesion to PE, PP and FBE plant-applied coatings.
- Excellent impact and indentation resistance of complete coating system
- No underfilm migration of moisture for complete coating system
- No cathodic disbondment of complete coating system

#### Benefits:

- No primer required
- Can be applied by gas torch
- Only low preheating of pipe surface required
- Resistant to loss of adhesion due to water immersion
- Combines perfectly with compound of Stopaq® corrosion preventing coating materials
- As a complete coating system, it is a cost-effective solution for new construction of pipelines and rehabilitation of pipeline coatings

### Application examples

**Onshore and Offshore pipeline field joints:** Mechanical protective outer wrap as part of Stopaq® corrosion preventing coating systems applied on girth-welds.

**Piping, Vessels and Fittings:** Mechanical protective outer wrap as part of Stopaq® corrosion preventing coating systems applied on pipeline structures, reservoirs and various fittings, both onshore and offshore.

### Product properties of Stopaq® High Impact Shield

<b>Colour</b>	Black	
<b>Thickness as supplied</b>	Backing	0.7 mm
	Adhesive	0.6 mm
	Total	1.3 mm
<b>Temperature range</b>	Operating: up to + 65°C	
<b>Tensile strength</b>	≥ 20 MPa (ASTM D-638)	
<b>Elongation</b>	≥ 600% (ASTM D-638)	
<b>Hardness, shore D</b>	≥ 55 (ASTM D-2240)	
<b>Peel strength to PE plant coating</b>	Tested @ 10 mm/min <sup>*)</sup> :	
	- @ +23°C	≥ 0.9 N/mm
	- @ +60°C	≥ 0.14 N/mm
<b>Thermal ageing resistance</b>	Thermal ageing at 60°C for 100 days, tested @ 10 mm/min <sup>*)</sup> :	
	- @ +23°C	≥ 1.5 N/mm
	- @ +60°C	≥ 0.15 N/mm
<b>Hot water immersion</b>	Hot water immersion at 60°C for 100 days, tested @ 10 mm/min <sup>*)</sup> :	
	- @ +23°C	≥ 1.2 N/mm
	- @ +60°C	≥ 0.15 N/mm

### Properties of coating system comprising Stopaq® Wrappingband CZH and Stopaq® High Impact Shield

<b>Self-healing</b>	Artificial coating defect (Ø 6 mm):	
	- @ +23°C:	no holidays, defect self-healed
	- @ +60°C:	no holidays, defect self-healed
Self-healing completed within 24 hours, coating thickness has restored to its initial thickness.		
<b>Impact resistance</b>	Tested at 15 J <sup>*)</sup> :	
	- @ +23°C:	no holidays
	- @ +60°C:	no holidays
<b>Indentation resistance</b>	Tested at 10 N/mm <sup>2</sup> pressure <sup>*)</sup> :	
	- @ +23°C:	no holidays
	- @ +60°C:	no holidays
	Residual thickness: ≥ 0.6 mm	
<b>Cathodic disbondment resistance</b>	Inspected after 28 days <sup>*)</sup> :	
	- @ +23°C:	disbondment 0 mm, no holidays
	- @ +60°C:	disbondment 0 mm, no holidays

<sup>\*)</sup> According to ISO 21809-3:2008 / Amendment 1:2011

### General order information

<b>Product</b>	Stopaq® High Impact Shield is supplied in rolls or pre-cut pieces, packed in cardboard boxes	
	<b>Art. nr.:</b>	<b>Contents:</b>
	1330	Stopaq® High Impact Shield 660mm x 30m, 1 roll/box, 18 rolls/pallet
	1340	Stopaq® High Impact Shield 660mm x 4,06m (pre-cut for 48" pipe diameter), 9 pcs/box, 162 pcs/pallet
	1331 1332	Stopaq® Closure Strip 660mm x 4" (1 pcs.) Stopaq® Closure Strip 660mm x 6" (1 pcs.)
<b>Customized products</b>	Other dimensions are available on request, e.g. different widths, pre-cut lengths with or without pre-attached Closure Strips. Minimum quantities apply. Contact Stopaq B.V. for further information.	
<b>Handling</b>	Be aware of heavy weight rolls. Handle with care. Keep boxes upright.	
<b>Storage conditions</b>	Store indoor, clean and dry, away from direct sunlight in a cool place below +40°C.	

Application instruction: Job preparation	
<b>Tools, equipment and auxiliaries</b>	<ul style="list-style-type: none"> <li>Temperature probe, Dew point tester, Scissors, Knife, Measuring tape, Abrading pads, Wire brushes, Steel roller, Propane gas torch with torch head type 60.</li> <li>Isopropyl alcohol, cas. nr. 67-63-0</li> <li>Personal protective gear.</li> </ul>
<b>High humidity</b>	The High Impact Shield can be applied in a humid atmosphere. The substrates however, should be free from condensing water by keeping the surface temperature at least 3°C above dew point.
<b>Work area and substrates</b>	The substrates should be dry, clean and protected against negative weather conditions.
<b>Product conditions</b>	The High Impact Shield should be dry and clean. For the ease of handling, the temperature of the product should preferably be +10°C to +30°C.

Application instruction: Dimensions							
The High Impact Shield must be cut to size; the length (L) depends on pipe diameter, see guideline below:							
NPS <sup>A)</sup>	DN <sup>B)</sup>	Ø(mm) <sup>C)</sup>	L(mm)	NPS	DN	Ø(mm)	L(mm)
2"	50	60.3	<b>305</b>	24"	600	610	<b>2110</b>
2½"	65	73.0	<b>330</b>	26"	650	660	<b>2270</b>
3"	80	88.9	<b>380</b>	28"	700	711	<b>2430</b>
3½"	90	101.6	<b>430</b>	30"	750	762	<b>2600</b>
4"	100	114.3	<b>460</b>	32"	800	813	<b>2760</b>
5"	125	141.3	<b>550</b>	34"	850	864	<b>2930</b>
6"	150	168.3	<b>640</b>	36"	900	914	<b>3100</b>
8"	200	219.1	<b>800</b>	40"	1000	1016	<b>3430</b>
10"	250	273.1	<b>980</b>	42"	1050	1067	<b>3590</b>
12"	300	323.9	<b>1150</b>	44"	1100	1118	<b>3750</b>
14"	350	355.6	<b>1260</b>	46"	1150	1168	<b>3910</b>
16"	400	406.4	<b>1420</b>	48"	1200	1219	<b>4065</b>
18"	450	457.2	<b>1590</b>	52"	1300	1321	<b>4420</b>
20"	500	508.0	<b>1770</b>	56"	1400	1422	<b>4750</b>
22"	550	558.8	<b>1950</b>	60"	1500	1524	<b>5080</b>
A) NPS – Nominal Pipe Size acc. ASME B36.10 & ASME B36.19							
B) DN – Diamètre Nominal/Nominal Diameter							
C) Ø – Outer Diameter of the pipe							
Dimension of the Closure Strip to be used depends on the pipe diameter:							
– Ø ≤ NPS 18" / DN 450: art 1331 - Stopaq® Closure strip 660 x 4"							
– Ø ≥ NPS 20" / DN 500: art 1332 - Stopaq® Closure strip 660 x 6"							

Application instruction: Surface preparation	
<b>General</b>	Prior to application of the Stopaq® High Impact Shield, bare steel pipe parts must be coated with Stopaq® corrosion preventing coating materials such as Wrappingband CZH. See specific Stopaq® coating instructions for application details of Stopaq® Wrappingband CZH and Stopaq® High Impact Shield.
<b>Surface condition</b>	The areas to be coated have to be clean, dry, and free from oil, grease and dust. All contamination must be removed.
<b>Measuring and marking</b>	Measuring and marking of the position where the High Impact Shield has to be applied, must be done prior to application.
<b>Cleaning of plant coating</b>	De-gloss and degrease plant coating using an abrading pad and isopropyl alcohol. Note: cleaning can be done in one operation when degreasing the steel surface as required in application of Wrappingband CZH.
<b>Temperature of plant coating</b>	Prior to and during application of the High Impact Shield, the temperature of the plant coating should not be less than +35°C. Preheating of the plant coating to approximately +45°C is recommended and shall be done prior to application of Wrappingband CZH. Time lapse between preheating and application should be kept as short as possible to prevent temperature to drop below +35°C.

Application instruction: Brief version	
<b>General</b>	See specific Stopaq® coating instructions for application details of Stopaq® High Impact Shield.
<b>Positioning</b>	Position the High Impact Shield as marked. Wrap the High Impact Shield around the pipe starting at 2 o'clock position, provided that the overlap of Wrappingband CZH is located oppositely at 10 o'clock position. Remove the release liner from one end of the High Impact Shield over a length of approximately 300 mm. Attach this end to the pipe, complete the full wrap, remove the release liner over approximately 300 mm from the other end and create a layer-to-layer overlap of 50 mm. In case of horizontal pipes the layer-to-layer overlap seam must face downwards. The High Impact Shield should hang loose around the pipe, the sleeve diameter should be slightly bigger than the pipe diameter in order to facilitate removal of the release liner.
<b>Release liner</b>	Hold the High Impact Shield in position and remove the release liner by pulling it sideways through the void between sleeve and pipe.
<b>Application of Closure Strip</b>	Gently preheat the adhesive of the Closure strip by using the propane torch. Patch it centrally over the seam of the High Impact Shield. Heat the closure strip intensively and patch it towards the pipe. After completion the indicator squares should be visible all over the Closure Strip.
<b>Heat-shrinking of High Impact Shield</b>	Heat-shrinking of High Impact Shield must be done from one extremity to the other (left-to-right or right-to-left) using the propane torch. Two workers are needed to execute heat-shrinking, one on each side of the pipe. The workers have to start shrinking at the same extremity and work up and down in a seesaw manner, the torches always being opposite of each other, and gradually from one extremity to the other. Start heat shrinking of the High Impact Shield towards the plant coating using full torch power. Be careful not to damage the High Impact Shield by excessive heat! Continue heat shrinking by moving gently towards the other extremity. In areas where Stopaq Wrappingband CZH is applied underneath, torch heating power should be reduced. When reaching the other extremity, shrinking towards the plant coating shall be achieved using full torch power again. Proper installation is indicated by vanishing of the indicator squares that were initially present.

Handling and commissioning	
<b>Exposure to loads</b>	Coated objects should not be exposed to excessive loads before cooling down to ambient temperature.
<b>Burying</b>	Burying is possible after the heat-shrinkable sleeve has cooled down to ambient temperature. Backfill and compact with clean fill materials without stones, hard lumps, and the like.
<b>Immersing</b>	Immersion in water is possible immediately after completion of the coating application.

Information	
<b>Documentation</b>	Extensive information is available on our website. Application instructions and other documentation can be obtained by contacting our head office, from our local distributor or by sending email to <a href="mailto:info@stopaq.com">info@stopaq.com</a>
<b>Certified staff</b>	Application of the described coating system should be carried out by certified personnel.



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