Product Information

Product description: Stopaq® Vinyl ester is an epoxy novolac vinyl ester resin pre-impregnated glass-fibre reinforced outer wrap material, curing by means of Ultraviolet light.

Stopaq® Vinyl ester is especially designed for continuous operation at high temperatures. It is applied on top of Stopaq® corrosion preventing coating systems to provide additional resistance against mechanical impacts, weathering, UV-radiation and chemicals.

After curing with UV-light, Stopaq® Vinyl ester forms a hard and rigid shell on top of previously applied Stopaq® coating systems.

Features:
- Fast and easy to apply
- High resistance to mechanical impacts and indentations
- Long-term resistance to ageing effects, even when used continuously at maximum temperature specified
- Resistant to cold, hot, wet and chemically aggressive environments
- Wide operational temperature range
- Long pot life when sheltered from UV-light sources

Benefits:
- Fast curing, relatively independent from ambient temperature
- Complete curing can be obtained by UV-A light sources or by sunlight
- Low styrene emission
- Top coats can be applied immediately after complete curing

Application examples

Soil-to-air transitions of pipelines: Rigid mechanical protection of Stopaq® corrosion preventing coating systems on risers against soil shear, mechanical impacts, indentations and weathering.

Field joint coatings: Rigid mechanical protection of Stopaq® corrosion preventing coating systems on pipeline girth welds against soil shear, mechanical impacts and indentations.

Pipe saddles: Rigid mechanical protection of Stopaq® corrosion preventing coating systems on pipe saddles against indentations and abrasion by movements of the pipeline.

Pipelines and fittings: Rigid mechanical protection of Stopaq® corrosion preventing coating systems on above ground and buried pipeline sections, bends, tees, valves and flanges against soil shear, mechanical impacts, indentations and weathering.

Product properties of Stopaq® Vinyl ester

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Grey (opaque)</td>
</tr>
<tr>
<td>Thickness</td>
<td>2 mm (1.5 mm on request)</td>
</tr>
<tr>
<td>Density</td>
<td>1.7 g/cm³</td>
</tr>
<tr>
<td>Light sources for curing</td>
<td>UV-A lamps (wavelength 380 – 400 nm)</td>
</tr>
<tr>
<td>Curing time to final hardness</td>
<td>20 – 60 minutes, depending on temperature and UV-light intensity</td>
</tr>
<tr>
<td>Temperatures</td>
<td>Ambient during application: Above -15°C Operation: -45°C to +150°C</td>
</tr>
<tr>
<td>Heat distortion temperature</td>
<td>≥ 255°C (ASTM D648)</td>
</tr>
<tr>
<td>Hardness</td>
<td>Barcol: ≥ 60 (ASTM D-2583)</td>
</tr>
<tr>
<td>Elongation at break</td>
<td>1.0 % (ISO 527, for 2 mm thickness)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>Izod: ≥ 60 kJ/m² (ISO 180, for 2 mm thickness)</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>≥ 70 MPa (ISO 527, for 2 mm thickness)</td>
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</tbody>
</table>

General order information

Product

Stopaq® Vinyl ester is supplied in rolls with various widths and lengths, provided with light-blocking foil, packed on cardboard cores in cardboard boxes:

<table>
<thead>
<tr>
<th>Art. Nr.</th>
<th>Product dimensions and contents:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1153</td>
<td>2mm x 180mm x 10m, 3 rolls/box</td>
</tr>
<tr>
<td>1150</td>
<td>2mm x 600mm x 10m, 1 roll/box</td>
</tr>
<tr>
<td></td>
<td>1.5 mm thickness on request</td>
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</tbody>
</table>

Handling

Handle with care.
Avoid unnecessary exposure to light.

Storage

Store in a cool, dark, dry, and well ventilated place in original light-blocking foil in original cardboard boxes.
Storage temperature between +5°C and +25°C.
Shelf-life ≥ 6 months when stored in original package.
Do not use if product is hardened.
**Application instruction: Job preparation**

| Tools, equipment and auxiliaries | Scissors, knife, measuring tape, application roller. |
| Additional coating materials | Stopaq® Compression Foil |
| OHSE measures | Consult Safety Data Sheet for protective personal safety measures, personal protective gear, application conditions, etc. |
| Ambient conditions | Ambient temperatures should be above -15°C. During application of Stopaq® Vinyl ester, the temperature should preferably be between +10°C and +20°C for the ease of application. |
| Work area and substrate | The substrate should be dry and clean. The substrate should be free from condensing water which can be reached by keeping the temperature at least 3°C above dew point. |
| Product conditions | Stopaq® Vinyl ester should be dry and the substrate should be sealed against ingress of water (rain, condensation) by circumferential application of Stopaq® Compression Foil. |
| Calculation of material consumption | Stopaq® Vinyl ester is applied in straight wraps perpendicular to the pipe with the following overlap-dimensions: |
| | – Circumferential overlap: ≥ 50 mm |
| | – Side-by-side overlap of consecutive pieces: ≥ 30 mm |

**Application instruction: Brief version**

See specific Stopaq coating instructions for e.g. soil-to-air risers, field joints, pipe wrapping, coating of fittings, etc.

**Cutting to size**

Take the role of Stopaq® Vinyl ester from its original packaging and cut off the appropriate length. Immediately after cutting, the remaining roll of Stopaq® Vinyl ester shall be stored into its original packaging to prevent premature curing.

**Release liners**

The inner release liner (yellow, opaque appearance) and the outer release liner (colourless, transparent) must be carefully removed from the Stopaq® Vinyl ester prior to wrapping.

**Wrapping**

Start wrapping the cut piece of Stopaq® Vinyl ester, complete the full circumferential wrap while applying slight tension and create a circumferential overlap of ≥ 50 mm.

With consecutive wraps:

- circumferential overlaps shall be made alternately at opposite sides of the object. 
- side-by-side overlaps should be ≥ 30 mm onto the previously applied piece of Vinyl ester.

Minimize air entrapment underneath the Vinyl ester. An application roller may be used to shape the Vinyl ester towards the contour of the coated object.

**Compressing and fastening**

Prior to curing the applied pieces of Stopaq® Vinyl ester should be compressed and fastened by tensioned wrapping of Stopaq® Compression Foil on top of the applied Vinyl ester.

**Curing**

Place UV-lamps – or, in case of curing by sunlight, the reflective mirrors - around the object coated with Stopaq® Vinyl ester. Ensure that the entire coated surface will be enlightened.

Switch on the UV-lamps; be careful not to watch UV-light sources without adequate eye protection! After curing time has elapsed, check for completion of curing. The cured Vinyl ester shall feel hard.

**Removing foil**

After curing the Compression Foil should be removed from the Vinyl ester.

**Coating of Vinyl ester**

Stopaq® Vinyl ester should be coated with Stopaq® Gelcoat to enhance durability and performance of the Vinyl ester.

**Sealing of coating transition area**

Above ground situated coating transition area should be sealed against ingress of water (rain, condensation) by circumferential application of Stopaq® Sealing Tape. The Sealing Tape must overlap the coated Vinyl ester and the original pipe coating.

**Handling and commissioning**

**Exposure to loads**

Coated objects should not be exposed to loads before curing of the coating has completed. Cured coatings should not be exposed to excessive loads.

**Burying**

Burying is possible after full curing of the coating system. Backfill and compact with clean fill materials without stones, hard lumps, and the like.

**Information**

**Documentation**

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 info@stopaq.com.

**Certified staff**

Application of the described coating system should be carried out by certified personnel.