VACUPOR® Roof
Vacuum-Insulation-Panel with Rubber / PIR Protection for flat roof applications

Characteristics

VACUPOR® Roof is a microporous insulation material with an extremely low coefficient of thermal conductivity, i.e. with very good insulating properties. VACUPOR® Roof consists of inorganic oxides. The main constituent is fumed silica, the other components are opacifiers for minimizing infrared radiation, and fibre filaments as reinforcing fillers.

For protection purposes the panel is covered with a sheet of rubber granules one one side and a sheet of PIR insulation on the other.

VACUPOR® NT-B2, the core insulation panel, is fully CE marked and approved. VACUPOR® Roof is currently in the approval process for CE marking in its own right, as a combined sandwich.

VACUPOR® Roof (core material) is not flammable and is classified A1 according to DIN ISO EN 13501-1.

VACUPOR® Roof is heat sealed in a metallized, multilayer plastic barrier film under vacuum. The very low internal pressure and the microporous panel core is responsible for the extremely low thermal conductivity values.

Application

VACUPOR® Roof was specially developed for applications in the building and construction industry where an approval by the building authorities is required.

Because of the double-sided protection layers of the rubber granular matting and the PIR, VACUPOR® Roof is excellently suited to all kind of plane and flat applications. The installation of the insulation is extremely simple and there is minimal danger of damaging the core Vacuum Insulation Panel.

The low density and the specially developed IR opacifiers contained in these grades, greatly reduce the thermal conductivity of VACUPOR® Roof Systems.

VACUPOR® Roof is also successfully used as insulation material in the following areas:

- Terrace insulation
- Flat roof insulation
- Cold storage floor insulation
- Floor insulation

Form of delivery

1. Standard sizes:
   - 1200 mm * 1000 mm * X
   - 1000 mm * 600 mm * X
   - 1200 mm * 500 mm * X
   - 1000 mm * 300 mm * X
   - 600 mm * 500 mm * X
   - 600 mm * 250 mm * X
   - 300 mm * 250 mm * X

2. Standard thicknesses (X):
   - 10, 15, 20, 25, 30, 35, 40, 45 and 50mm
   - Further thicknesses on request

3. Special formats available on request

Restrictions on Applications

The metalized, multilayer plastic film of the VACUPOR® Roof must not be damaged by drilling, cutting, milling, nailing or the like, since the interior pressure of the panel will rise and the special properties of the panel, in particular its excellent insulation characteristics, will be lost.

Shelf life

VACUPOR® Roof has a very long shelf life. Please also observe our pressure rise table: Thermal conductivity as a function of interior pressure.
### Properties (applicable to standard format)

<table>
<thead>
<tr>
<th>Properties</th>
<th>Comments</th>
<th>Standards</th>
<th>Units</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Caused by film / Coverage</td>
<td></td>
<td></td>
<td>Silver / Black / Yellow</td>
</tr>
<tr>
<td>Density $^1$</td>
<td>kg / m$^3$</td>
<td>170-210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal conductivity $^2$</td>
<td>@ 1 mbar</td>
<td>Measured at 22.5 °C (72.5 °F) mean temperature</td>
<td>DIN 52612</td>
<td>W / (m×K) ≤ 0,005</td>
</tr>
<tr>
<td></td>
<td>@ ambient pressure</td>
<td></td>
<td></td>
<td>W / (m×K) ≤ 0,019</td>
</tr>
<tr>
<td>Rated value for VACUPOR® NT-B2</td>
<td>According to DIBT approval</td>
<td></td>
<td></td>
<td>0,008</td>
</tr>
<tr>
<td></td>
<td>number Z-23.11-1662</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat resistance $^3$</td>
<td>Caused by film weld seam</td>
<td>°C</td>
<td>-50 &lt; T &lt; 120</td>
<td></td>
</tr>
<tr>
<td>Maximum film projection</td>
<td>mm</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior pressure $^2$</td>
<td>As delivered</td>
<td>mbar</td>
<td>≤ 5</td>
<td></td>
</tr>
<tr>
<td>Theoretical pressure rise</td>
<td>Under standard conditions</td>
<td>mbar / a</td>
<td>0,5</td>
<td></td>
</tr>
<tr>
<td>Maximum panel dimensions</td>
<td>Length</td>
<td>mm</td>
<td>150 - 2200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Width</td>
<td>mm</td>
<td>150 - 1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thickness</td>
<td>mm</td>
<td>10 - 50</td>
<td></td>
</tr>
<tr>
<td>Length and width tolerances</td>
<td>0 to 500 mm</td>
<td>mm</td>
<td>+ 1,0 / - 2,0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>501 to 1000 mm</td>
<td>mm</td>
<td>+ 1,0 / - 4,0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 1000 mm</td>
<td>mm</td>
<td>+ 1,0 / - 6,0</td>
<td></td>
</tr>
<tr>
<td>Thickness tolerances</td>
<td>&lt; 20 mm</td>
<td>mm</td>
<td>± 1,0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 mm to 30 mm</td>
<td>mm</td>
<td>+ 1,0 / - 2,0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 30 mm</td>
<td>mm</td>
<td>+ 1,0 / - 3,0</td>
<td></td>
</tr>
<tr>
<td>Thermal shock resistance</td>
<td>VACUPOR® Roof (corematerial)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>is insensitive to high and low temperature thermal shocks</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$ Dependent on board thickness
$^2$ Dependent on the panel-size and thickness, internal pressure can be between 0.5 – 5 mbar. The standard internal pressure in the evacuation chamber is < 0.5 mbar.
$^3$ The limits are fixed by the barrier film (sealing material) used; constant load: ≤ 80°C (176°F); short load time with 120°C (248°F): roughly 30 minutes.

The above data is only intended as a guide and should not be used in preparing specifications.
Safety directions

VACUPOR® Roof is not a hazardous material as defined in EU directive 2006/1907/EEC.

VACUPOR® Roof does not liberate hazardous decomposition products and, as far as is known at present, does not cause any problems to human health or the environment.

<table>
<thead>
<tr>
<th>gas pressure $p_{\text{gas}}$ [hPa]</th>
<th>U- Value $U$ [W/(m$^2$K)]</th>
<th>$\lambda$ [10$^{-3}$ W/(mK)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt; 10^{-3}$</td>
<td>0.187</td>
<td>3.63</td>
</tr>
<tr>
<td>0.1</td>
<td>0.188</td>
<td>3.66</td>
</tr>
<tr>
<td>1.0</td>
<td>0.193</td>
<td>3.75</td>
</tr>
<tr>
<td>10</td>
<td>0.219</td>
<td>4.25</td>
</tr>
<tr>
<td>150</td>
<td>0.448</td>
<td>8.70</td>
</tr>
<tr>
<td>1000</td>
<td>0.943</td>
<td>18.30</td>
</tr>
</tbody>
</table>

For Further Information Contact:

Vacutherm Ltd
Brayton Domain,
Aspatria,
Wigton,
Cumbria, CA7 2BD.
Tel: 016973 20483
Email: office@vacutherm.co.uk
Web: www.vacutherm.co.uk