Vacuum insulation panel with rubber / PIR protection for flat roof applications.

Description

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 other components are opacifiers for minimizing infrared radiation, and fiber filaments as reinforcing fillers. For protection purposes, the panel is covered with a sheet of rubber granule on one side and a sheet of PIR insulation on the other.

VACUPOR® Roof is currently in the approval process for the National Technical Approval (AbZ). The core material of VACUPOR® Roof 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.

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

Due to the single- or double-sided coverage with rubber granule protection sheets, VACUPOR® Roof is excellent suitable for all kind of plane layings. The construction of the insulation gets considerably easier and the VIPs can be entered without danger of damaging.

Typical applications

VACUPOR® Roof is successfully used as insulation material in the following areas:
- Terrace insulation
- Cold storage floor insulation
- Floor insulation
- Flat roof insulation

Form of delivery

Standard sizes:
- 1200 mm x 1000 mm
- 1200 mm x 500 mm
- 1000 mm x 600 mm
- 1000 mm x 300 mm
- 600 mm x 500 mm
- 600 mm x 250 mm
- 300 mm x 250 mm

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

Special formats available on request

Restrictions on applications

The metallized, 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 internal pressure.

Safety directions

VACUPOR® Roof is not a hazardous material as defined in EU directive 2006/1907/EEC. Please also observe our material safety data sheet.

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.
### Physical properties (applicable to standard format)

<table>
<thead>
<tr>
<th><strong>Colour</strong> (Caused by film / coverage)</th>
<th>Silver / Black / Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal density (kg/m³)</strong>&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>170 - 210</td>
</tr>
<tr>
<td><strong>Thermal conductivity (W/m·K) DIN 52612</strong>&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Measured at 22.5°C (72.5°F) mean temperature</td>
</tr>
<tr>
<td>@ l mbar&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>≤0.005</td>
</tr>
<tr>
<td>@ ambient pressure</td>
<td>≤0.019</td>
</tr>
<tr>
<td><strong>Heat resistance</strong>&lt;sup&gt;(3)&lt;/sup&gt; (Caused by film weld seam) (°C)</td>
<td>-50 &lt; T &lt; 120</td>
</tr>
<tr>
<td><strong>Interior pressure</strong>&lt;sup&gt;(2)&lt;/sup&gt; (As delivered) (mbar)</td>
<td>≤ 5</td>
</tr>
<tr>
<td><strong>Theoretical pressure rise</strong> (Under standard conditions) (mbar/a)</td>
<td>~ 1.0</td>
</tr>
<tr>
<td><strong>Length and width tolerances (mm)</strong>&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>0 to 500 mm: ± 1.0 / - 2.0, 501 to 1000 mm: ± 1.0 / - 4.0, &gt; 1000 mm: ± 1.0 / - 6.0</td>
</tr>
<tr>
<td><strong>Thickness tolerances (mm)</strong>&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>&lt; 20 mm: ± 1.0, 20 to 30 mm: ± 1.0 / - 2.0, &gt; 30 mm: ± 1.0 / - 3.0</td>
</tr>
<tr>
<td><strong>Thermal shock resistance</strong></td>
<td>The core material of VACUPOR® Roof is insensitive to high and low temperature thermal shocks.</td>
</tr>
</tbody>
</table>

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

**Please note:**

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.

<table>
<thead>
<tr>
<th><strong>Thermal conductivity</strong></th>
<th><strong>Gas Pressure (hPa)</strong></th>
<th><strong>U value (W/m²·K)</strong></th>
<th><strong>λ (10⁻² W/m·K)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 10⁻³</td>
<td>0.187</td>
<td>3.63</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.188</td>
<td>3.66</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.193</td>
<td>3.75</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>0.219</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>0.448</td>
<td>8.70</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>0.943</td>
<td>18.30</td>
</tr>
</tbody>
</table>

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies’ raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties’ rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the product for a particular purpose. Whilst the values and application information in the datasheet are typical, they are given for guidance only. The values and the information given are subject to normal manufacturing variation and may be subject to change without notice. Morgan Advanced Materials – Thermal Ceramics makes no guarantees and gives no warranties about the suitability of a product and you should seek advice to confirm the product’s suitability for use with Morgan Advanced Materials – Thermal Ceramics.

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Thermal Conductivity as a function of internal pressure (DIN 52612)

![Graph showing Thermal Conductivity (Panel Core) DIN 52612]

Thermal Conductivity (Panel Core) DIN 52612

![Graph showing Compression Behaviour (Panel Core)]

Compression Behaviour (Panel Core)

Low-temp. Compression Strength

![Graph showing Low-temp. Compression Strength]

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