About Huntsman

Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated chemicals with 2016 revenues of approximately $10 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 100 manufacturing and R&D facilities in approximately 30 countries and employ approximately 15,000 associates within our 5 distinct business divisions including the Pigments and Additives division that we intend to IPO or spin-off as Venator Materials Corporation. For more information about Huntsman, please visit the company’s website at www.huntsman.com.

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Fire-rated PUR-based foam technology

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AN EASY-TO-PROCESS, FIRE-RATED PUR-BASED FOAM TECHNOLOGY
Demonstrating progress in panel production and performance

Insulation experts and foam technologists at Huntsman have developed DaltoPUR® FR—a fire-rated polyurethane (PUR) insulation technology designed to improve the manufacture and performance of composite sandwich panels.

Offering a consistent Class E foam at all panel thicknesses, and achieving Cs3d0 or better in Single Burning Item (SBI) tests, across a variety of panel joint designs and thicknesses, DaltoPUR® FR-based insulating foam is lightweight, and has low thermal conductivity and moisture resistance properties. With a reaction profile optimized to allow easy foam processing, our DaltoPUR® FR foam technology can give panel producers the flexibility to quickly and efficiently manufacture different panel types, of varying thicknesses.

Foams based on DaltoPUR® FR technology have low friability. The required minimum conveyor temperature is 40°C. DaltoPUR® FR foam technology can deliver the required bottom adhesion and long-term durability required, without the use of a primer. Lambda values can be further improved through the choice of specific blowing agents. Furthermore, it is easy to shift from Class F to Class E production since the processing conditions (40°C conveyor temperature, no primer) are identical.

Using our DaltoPUR® FR insulation technology, panel producers can achieve:

- Improved foam processing through foam wave stability and flat panel surfaces
- Similar laminator conditions as for class F (easy to switch)
- A minimum result of Cs3d0 in SBI tests
- All required physical properties and low lambda values at very competitive densities

We also offer panel producers a family of fire-rated PIR-based foam technologies (DaltoPIR®), a range of fire-rated PIR core panel primers (DaltoPIR PRIM®) and adhesives (DaltoSTICK®) for all types of solid insulating cores.

Fire-rated and non fire-rated product range

<table>
<thead>
<tr>
<th></th>
<th>DaltoPUR® STD</th>
<th>DaltoPUR® FR</th>
<th>DaltoPIR® FR</th>
<th>DaltoPIR® HFR</th>
<th>DaltoPIR® XHFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction to fire</td>
<td>F</td>
<td>min. Cs3d0</td>
<td>Bsl2d0</td>
<td>Bsl2d0</td>
<td>Bsl1d0</td>
</tr>
<tr>
<td>Fire resistance</td>
<td></td>
<td></td>
<td>EI 15</td>
<td>EI 30</td>
<td>EI 30</td>
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<tr>
<td>(100 mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Conveyor</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>temperature (°C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iso / Polyol ratio</td>
<td>155 – 165</td>
<td>165 – 180</td>
<td>185 – 210</td>
<td>250 – 265</td>
<td>250 – 280</td>
</tr>
<tr>
<td>DaltoPIR® PRIM</td>
<td>Not required</td>
<td>Not required</td>
<td>Recommended</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Overall density</td>
<td>38 – 39</td>
<td>39 – 41</td>
<td>38 – 42</td>
<td>38 – 42</td>
<td>38 – 42</td>
</tr>
<tr>
<td>(kg/m3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial lambda</td>
<td>18 – 21</td>
<td>18 – 22</td>
<td>18 – 21</td>
<td>18 – 21</td>
<td>18 – 21</td>
</tr>
<tr>
<td>(mW/mK at 10°C)</td>
<td></td>
<td></td>
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</tbody>
</table>

A trusted polyurethane partner for panel producers

With deep knowledge and expertise in sustainable construction, lifecycle analysis and building fire safety, we are a recognized leader in the polyurethane-based insulation market.

A long-established supplier and a trusted partner to the composite panel industry, our research experts, foam technologists and adhesive specialists have a strong commitment to driving progress in panel production and performance.

Working from a technical center in Ternate, Italy, dedicated to insulation innovation, our team ensures that our foam and adhesive products are optimized to meet the ever-evolving needs and legislative requirements of the fast-paced composite panel sector, and the global construction industry that it serves.