SIMONA® PC FR RAIL
Flame retardant interior linings for rail vehicles

With SIMONA® PC FR RAIL you’re always on the safe side. Specially developed to meet the requirements of the DIN EN 45545 standard, our low-flammability SIMONA® PC FR RAIL sheets provide maximum safety for the interior lining of rail vehicles.

Areas of use
SIMONA® PC FR RAIL is mainly used as an interior lining material for rail vehicles. It can be deployed in the following areas, for example:
- Back linings
- Seats
- Armrests
- Wall linings
- Window panels
- Partitions
- Ceiling elements
- Shelving

Product details
- Excellent surface quality
- Broad service temperature range
- Excellent fire properties:
  - DIN EN 45545: HL2, R1 for 1 – 3 mm
  - UL 94: V0
- Excellent thermoforming properties that enable high degrees of complexity in shaping
- Low shrinkage values in processing
- High tensile modulus of elasticity
- Moisture absorption comparable with that of other polycarbonates

Processing Information
SIMONA® PC FR RAIL can be further processed by commonly used processing methods.

Thermoforming
- Drying temperature: 90°C (predrying to prepare for thermoforming)
- Drying time: 60 min/1 mm wall thicknesses
- Heating temperature range: 190 - 210°C
- Mould temperature: 60°C

Machining
- Rotational speed: 2,400 to 2,500 rpm
- Forward feed: 22 m/min

Connecting and joining
SIMONA® PC FR RAIL products can be connected to other plastics, metals, etc. by welding and gluing.

If you have any questions about processing our products, please contact our Technical Service Centre:
tsc@simona.de

Product range of SIMONA® PC FR RAIL sheets

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>3.000 x 2.000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>1 - 3 mm</td>
</tr>
<tr>
<td>Colour</td>
<td>natural</td>
</tr>
<tr>
<td>Surface</td>
<td>smooth</td>
</tr>
</tbody>
</table>

Other dimensions, colours and embossing/textures available on request
Fire protection conforming to standard

DIN EN 45545 was developed on the basis of existing fire protection regulations for rail vehicles being operated within the International Union of Railways (UIC) and various European countries. It regulates fire protection requirements for materials used in rail vehicles on a Europe-wide basis. The standard defines three different Hazard Levels (HL) as well as test methods and test requirements for materials used, in accordance with the respective Hazard Level (R requirement clauses).

SIMONA® PC FR RAIL meets the requirements of HL2 for R1, which covers about 80% of the interior components used in rail transport. Consequently, the product is ideal for use as an interior lining material in rail vehicles. All the other requirement classes that SIMONA® PC FR RAIL complies with can be seen from the table below.

Overview of important fire tests and requirement properties of plastics for railway applications in accordance with DIN EN 45545

<table>
<thead>
<tr>
<th>Reference to test method</th>
<th>Parameter, unit</th>
<th>Maximum/ Minimum</th>
<th>DIN EN 45545 requirements to achieve HL2 for R1</th>
<th>SIMONA® PC FR RAIL complies with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral flame spread</td>
<td>T02</td>
<td>CFE kWm²</td>
<td>Min. 20 a</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>ISO 5658-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cone calorimeter</td>
<td>T03.01</td>
<td>MARHE kWm²</td>
<td>Max. 90</td>
<td>✔ (3 mm): ✔ HL2</td>
</tr>
<tr>
<td>Heat release rate</td>
<td>ISO 5660-1, 50 kWm²</td>
<td></td>
<td></td>
<td>✔ (3 mm): ✔ HL2</td>
</tr>
<tr>
<td>Smoke development</td>
<td>T10.01</td>
<td>Ds(4) dimension-less</td>
<td>Max. 300</td>
<td>✔ (3 mm): ✔ R2: ✔ HL2</td>
</tr>
<tr>
<td></td>
<td>EN ISO 5659-2, 50 kWm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke development</td>
<td>T10.02</td>
<td>VOF4 min</td>
<td>Max. 600</td>
<td>✔ (3 mm): ✔ R6: ✔ HL2</td>
</tr>
<tr>
<td></td>
<td>EN ISO 5659-2, 50 kWm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTIR smoke gas analysis</td>
<td>T11.01</td>
<td>CITG dimension-less</td>
<td>Max. 0.9</td>
<td>✔ (3 mm): ✔ R19: ✔ HL1</td>
</tr>
<tr>
<td></td>
<td>EN ISO 5659-2, 50 kWm²</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The test load of 25 kWm² required by DIN EN 45545 is lower than the test load of 50 kWm² actually applied in this case.

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For the highest demands in terms of service capability and material safety