Raising performance in sheet and bulk molding compounds (SMC and BMC)
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Epoxy resin system for SMC formulation

XB 50021 A / XB 50021 B / Aradur® 1571 / Accelerator 1573

Description
- 4 components epoxy resin system
- Chemical B-stage
- Aspect: white liquid
- Viscosity at 25°C: 4000– 6000 mPa.s

Main features
- Low viscosity
- High glass transition temperature
- Excellent mechanical performance
- Excellent adhesion to reinforcement fibre

Applications and benefits
- Formulation of High Performance SMC
- Provides very high flexural strength and elongation
- Provides high toughness
- Provides higher level of glass transition temperature than polyester based SMC system
### Description and recommended mix ratio

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<th>Product</th>
<th>Description</th>
<th>Features</th>
<th>Recommended mix ratio</th>
</tr>
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<tr>
<td>XB 50021 A</td>
<td>Formulated epoxy resin</td>
<td>Low viscosity liquid resin, provides very high Tg and modulus</td>
<td>100</td>
</tr>
<tr>
<td>Aradur® 1571</td>
<td>Dispersion of hardener in liquid epoxy resins</td>
<td>White viscous hardener paste, good latency at RT, curing above 120°C</td>
<td>30 - 50 (1)</td>
</tr>
<tr>
<td>Accelerator 1573</td>
<td>Dispersion of solid accelerator in liquid epoxy resin</td>
<td>White viscous paste</td>
<td>4 - 8 (1)</td>
</tr>
<tr>
<td>XB 50021 B</td>
<td>Polyamine</td>
<td>Very low viscosity hardener, used as chemical B-stage hardener</td>
<td>8 - 10 (1)</td>
</tr>
</tbody>
</table>

Recommended cure cycle: 5 min at 160ºC (2)

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(1) Reactivity adjustment - customer specific
(2) Processing large quantities of mixture (adiabatic-like conditions) over long time and/or with temperature is not recommended as it will initiate the chemical B-stage reaction and the main reaction in a second step, leading potentially to exothermic and uncontrollable phenomena, with toxic fumes and gas release.
## Neat resin properties

### Epoxy resin system for SMC

#### Viscosity and thermo-mechanical properties

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<tr>
<th>Property</th>
<th>ISO Method</th>
<th>Value</th>
</tr>
</thead>
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<tr>
<td>Mix viscosity</td>
<td>ISO 9371B</td>
<td>4000 - 6000 mPa.s</td>
</tr>
<tr>
<td>DMA Tg onset</td>
<td>ISO 6721</td>
<td>160°C (1) / 130°C (2)</td>
</tr>
<tr>
<td>Flexural modulus</td>
<td>ISO 178</td>
<td>3 300 MPa (2)</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>ISO 178</td>
<td>120 MPa (2)</td>
</tr>
<tr>
<td>$K_{IC}$ / $G_{IC}$ (2)</td>
<td>ISO 13586</td>
<td>0.7 MPa.√m / 180 J/m²</td>
</tr>
</tbody>
</table>

100 parts XB 50021 A + 49 parts Aradur® 1571 + 4 parts Accelerator 1573 + 8 parts XB 50021 B

(1) Cure profile: 5 min at 160°C
(2) Cure cycle: 30 min at 90°C + 1h at 145°C
SACHTOLITH® HD-S

Description
- Synthetic zinc sulfide (ZnS)
- > 96% ZnS
- White pigment with colorimetric Index L* (Powder) > 97
- Hardness (Mohs) 3
- Sieve residue 45 microns : < 0.004 %

Main features
- Very low abrasiveness
  - Mohs hardness comparison: TiO2 (5.5 to 6.5), Diamond (10)
- Very good dispersibility

Applications
- Pigment or filler for sheet and bulk molding compounds
- Abrasion-sensitive coatings
Benefits in SMC / BMC

**SACHTOLITH® HD-S ensures retention of mechanical properties**
Sheet and bulk molding compounds (SMCs and BMCs) pigmented using SACHTOLITH® HD-S pigment are notable for improved mechanical properties compared to systems incorporating titanium dioxide (TiO₂).

**SACHTOLITH® HD-S usage avoids wear or stain on molds, tools and machinery.**

**SACHTOLITH® HD-S usage avoids contamination with abraded metal and metal ions.**
Benefits in SMC / BMC

White pigment - Zinc sulfide

Improved mechanical properties

Impact strength (KJ/m²)

- No pigment
- SACHTOLITH® HD-S
- Titanium dioxide
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