

## Radiation cross-linkable, flame retardant compound

|  |  |   |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
|--|--|---|------------------------------|-----------------|---------------|------------------------------|--|---------------|--|--------------------|--|----------------------------|--|----------|
| <p>■ <b>Compound class</b><br/>Insulation / sheathing</p>  | <p>■ <b>Compound category</b><br/></p>         | <p>■ <b>Flame retardant</b><br/>Halogenated</p> |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
| <p>■ <b>Standards</b><br/>SAE J1128 TXL, GXL and SXL;<br/>UL 3289, 3321</p>  | <p>SAE J1127 STX and SGX<br/>CSA AWM I A/B</p> | <p>CSA CL 1251, 1503</p>                        |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
| <p>■ <b>Operating temperature [°C]</b><br/>-50 to 150</p>  | <p>■ <b>Oil resistance level</b><br/>★★★</p>   |   |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
| <p>■ <b>Typical applications</b><br/><i>Motor lead wires for coil connections, class F motors and transformers, pumps, solenoids, Internal wiring of appliances, sensor wires, flexible battery cables and wire insulation of low voltage multicore cables for road vehicles.</i></p>                          |  |   |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
| <p>General Applications</p>  | <p>Automotive</p>                              |   |                              |                 |               |                              |  |               |  |                    |  |                            |  |          |
| <p>■ <b>Features</b></p> <table border="0"> <tr> <td></td> <td>Flame retardant</td> <td></td> <td>Flexible at low temperatures</td> <td></td> <td>Oil resistant</td> </tr> <tr> <td></td> <td>Abrasion resistant</td> <td></td> <td>High temperature resistant</td> <td></td> <td>Flexible</td> </tr> </table> |  |   |                              | Flame retardant |               | Flexible at low temperatures |  | Oil resistant |  | Abrasion resistant |  | High temperature resistant |  | Flexible |
|  | Flame retardant                                |   | Flexible at low temperatures |                 | Oil resistant |                              |  |               |  |                    |  |                            |  |          |
|  | Abrasion resistant                             |   | High temperature resistant   |                 | Flexible      |                              |  |               |  |                    |  |                            |  |          |

## PHYSICAL PROPERTIES

| Physical properties             | Unit              | Typical value | Test method        |
|---------------------------------|-------------------|---------------|--------------------|
| Density*                        | g/cm <sup>3</sup> | <b>1.2</b>    | DIN EN ISO 1183-1A |
| Melt Flow Index (190°C; 5,0 kg) | g/10 min          | <b>4.9</b>    | DIN EN ISO 1133    |
| Hardness*                       | Shore D           | <b>50</b>     | DIN ISO 48-4       |

## MECHANICAL PROPERTIES

| Thermoplastic / Before cross-linking **    | Unit              | Typical value    | Test method   |
|--|-------------------|------------------|---------------|
| Tensile strength                           | N/mm <sup>2</sup> | <b>15</b>        | IEC 60811-501 |
| Elongation at break                        | %                 | <b>500</b>       | IEC 60811-501 |
| After crosslinking ***                     | Unit              | Typical value    | Test method   |
| Tensile strength (120 kGy)                 | N/mm <sup>2</sup> | <b>17</b>        | IEC 60811-501 |
| Elongation at break (120 kGy)              | %                 | <b>330</b>       | IEC 60811-501 |
| Abrasion resistance                        | -                 | <b>Excellent</b> |               |
| After ageing in air oven 168h at 180°C *** | Unit              | Typical value    | Test method   |
| Variation in tensile strength              | %                 | <b>-18.0</b>     | IEC 60811-401 |
| Variation in elongation at break           | %                 | <b>-14.7</b>     | IEC 60811-401 |

| ■ After ageing in air oven 2.160h (90d) at 158°C ***  | Unit | Typical value | Test method   |
|---|------|---------------|---------------|
| Variation in tensile strength                         | %    | <b>-13.8</b>  | IEC 60811-401 |
| Variation in elongation at break                      | %    | <b>-25.7</b>  | IEC 60811-401 |
| ■ After ageing in air oven 2.880h (120d) at 158°C *** | Unit | Typical value | Test method   |
| Variation in tensile strength                         | %    | <b>-3.2</b>   | IEC 60811-401 |
| Variation in elongation at break                      | %    | <b>-30.7</b>  | IEC 60811-401 |

## THERMAL PROPERTIES \*\*\*

| ■ Low temperature tests                    | Unit | Typical value | Test method   |
|--|------|---------------|---------------|
| Elongation at break at -55°C (100-150 kGy) | %    | <b>&gt;30</b> | IEC 60811-505 |
| ■ Hot set test at 200°C / 15min / 0,2MPa   | Unit | Typical value | Test method   |
| Elongation under load                      | %    | <b>30</b>     | IEC 60811-507 |
| Residual elongation                        | %    | <b>&lt;10</b> | IEC 60811-507 |

## ELECTRICAL PROPERTIES\*

| ■ Major electrical properties    | Unit  | Typical value          | Test method |
|----------------------------------|-------|------------------------|-------------|
| Volume resistivity               | Ω cm  | <b>10<sup>15</sup></b> | ASTM D 257  |
| Dielectric strength              | kV/mm | <b>25</b>              | ASTM D 149  |
| Dielectric constant at 50Hz 20°C | -     | <b>2.9</b>             | ASTM D 150  |

## RESISTANCE\*\*\*

| ■ Fluid IRM 902 4h at 70°C                                    | Unit | Typical value    | Test method   |
|---|------|------------------|---------------|
| Variation in tensile strength                                 | %    | <b>-16.9</b>     | IEC 60811-404 |
| Variation in elongation at break                              | %    | <b>-0.2</b>      | IEC 60811-404 |
| ■ Fluid IRM 902 24h at 50°C                                   | Unit | Typical value    | Test method   |
| Variation in tensile strength                                 | %    | <b>-11.5</b>     | IEC 60811-404 |
| Variation in elongation at break                              | %    | <b>-1.6</b>      | IEC 60811-404 |
| ■ Ozone resistance 24h / 25°C / 250 – 300 x 10 <sup>4</sup> % | Unit | Typical value    | Test method   |
| Requirement   |      | <b>no cracks</b> | DIN EN 50396  |

## BURNING PROPERTIES\*

| ■ Main burning properties | Unit | Typical value | Test method   |
|---------------------------|------|---------------|---------------|
| LOI                       | %    | <b>27</b>     | ASTM D 2863 A |
| Flammability              | -    | <b>Pass</b>   | UL 224        |

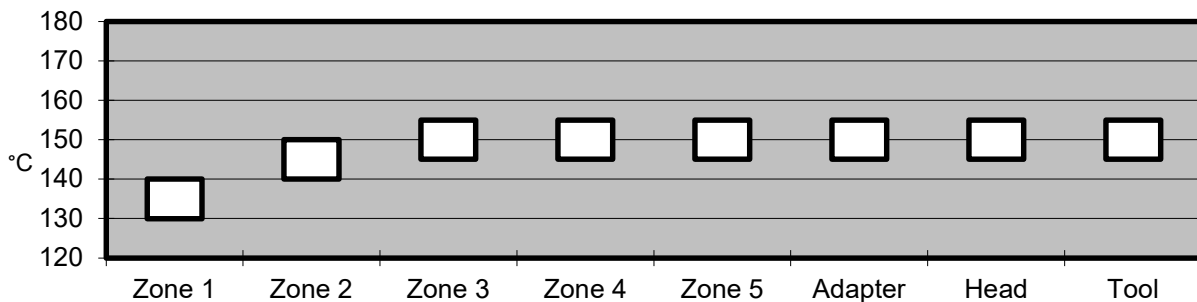
\* pressed plaques

\*\* extruded tapes

\*\*\* cross-linked plaques or tapes

## PROCESSING GUIDE

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|--|--|
| <ul style="list-style-type: none"> <li>■ <b>Screw configuration</b></li> <li>■ <b>Screw cooling</b></li> <li>■ <b>Screen pack</b></li> <li>■ <b>Extrusion dies</b></li> <li>■ <b>Die opening</b></li> <li>■ <b>Temperature profile extruder</b></li> </ul> | <p>Barrier type screw (BM) having high flights and a L/D-ratio &gt; 24:1</p> <p>For high line speeds, cooling the screw to around 80°C can be very effective although this could lead to pulsation</p> <p>40/60/80/40 mesh</p> <p>Pressure or tube. For pressure extrusion, normal dies are recommended.</p> <p>Die opening approximately slightly below the required OD of the wire.</p> <p>The profile shown below may vary slightly depending on extruder type, head design &amp; output.</p> |
|--|--|



|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>■ <b>Maximum mass temperature</b></li> <li>■ <b>Conductor pre-heating</b></li> <li>■ <b>Wire/conductor</b></li> <li>■ <b>Quenching</b></li> <li>■ <b>Drying</b></li> <li>■ <b>Recommended colour master batches</b></li> </ul> | <p>170°C</p> <p>Preheating not required, but may positively influence elongation at break</p> <p>Bare copper / Tin-coated</p> <p>Warm water in the first cooling section (60-80°C)</p> <p>Pre-dry at 60°C during 4 hrs.</p> <p>Well dispersed EVA master batch 0,5-1,0%. For black jacket applications, UV resistance can be obtained by adding a higher level of master batch depending on requirements and type of carbon black master batch used.</p> |
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## CROSS-LINKING INFORMATION

|   |                    |
|---|--------------------|
| <ul style="list-style-type: none"> <li>■ <b>Recommended radiation dose</b></li> </ul> | <p>100-150 kGy</p> |
|---|--------------------|

## STORAGE INFORMATION

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ <b>Form &amp; packaging</b></li> <li>■ <b>Shelf life</b></li> </ul> | <p>Pellets in sizes 2.8mm &amp; 5.5mm<br/>Moisture-resistant bags (25kg) &amp; octabins (alu-innerliner, max. 1250kg)</p> <p>1 year after production</p> |
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Note: The information given in this datasheet is believed to be accurate and reliable. However, no warranty, express or implied, or guarantee is given as to the suitability, accuracy, reliability or completeness of the information. This information does not hold us liable for damages or penalties resulting from following our suggestions or recommendations.

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