Halar® 558 ethylene chlorotrifluoroethylene copolymer

Halar® 558 fluoro polymer is a foammable grade for wire coating, including primary insulations, coaxial cable cores, cross-webs, fire alarm cable, jackets, and foam tubing. Like other grades of Halar® resin, this grade of resin offers broad use temperature capability, from cryogenic temperatures to 150°C, and excellent chemical resistance to a wide variety of acids, bases and organic solvents. Cables incorporating Halar® 558 have met the fire performance requirements called out in NFPA 90a ("Standard for Air-Conditioning and Ventilating Systems"). To meet these requirements they must pass NFPA 262 Standard Method of Test for Flame Travel and Smoke of Wire and Cables.

General

Material Status
- Commercial: Active

Availability
- Africa & Middle East
- Asia Pacific
- Europe
- Latin America
- North America

Additive
- Blowing Agent
- Nucleating Agent
- Processing Aid

Uses
- Cable Jacketing
- Electronic Insulation

Agency Ratings
- NFPA Code 90a
- UL 444

Forms
- Pellets

Processing Method
- Foam Extrusion

<table>
<thead>
<tr>
<th>Physical</th>
<th>Typical Value</th>
<th>Unit</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density / Specific Gravity</td>
<td>1.68</td>
<td></td>
<td>ASTM D792</td>
</tr>
<tr>
<td>Melt Mass-Flow Rate (MFR)</td>
<td>15 to 20 g/10 min</td>
<td></td>
<td>ASTM D3275</td>
</tr>
<tr>
<td>Water Absorption (Equilibrium)</td>
<td>&lt; 0.10 %</td>
<td></td>
<td>ASTM D570</td>
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</table>

<table>
<thead>
<tr>
<th>Thermal</th>
<th>Typical Value</th>
<th>Unit</th>
<th>Test method</th>
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</thead>
<tbody>
<tr>
<td>Melting Temperature</td>
<td>242 °C</td>
<td></td>
<td>DSC</td>
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</table>

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Typical Value</th>
<th>Unit</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Rating</td>
<td>V-0</td>
<td></td>
<td>UL 94</td>
</tr>
<tr>
<td>Oxygen Index (1.60 mm)</td>
<td>52 %</td>
<td></td>
<td>ASTM D2863</td>
</tr>
</tbody>
</table>

Additional Information

Color Master Batches
- In common with all other grades of Halar resins, Halar 558 can be easily pigmented with commercially available color concentrates. When coloring primary insulation with color concentrates it is highly recommended that the percentage used less than 1% by weight. This is due to the fact that color concentrates will affect the electrical properties of the primary insulation.

Safe Handling and Use
- Processing of Halar 558 fluoropolymer at temperatures above 572°F (300°C) is not recommended. Thermal degradation can occur at significant rates. When degradation occurs Halar 558 liberated hydrochloric acid (HCL) and hydrofluoric acid (HF) which are irritating, corrosive, and toxic gases at relatively low concentrations. Please refer to the Safe Handling of Fluoropolymer Resins published by the Society of Plastics Industry.
- To avoid inhalation of decomposition products, it is recommended that adequate local ventilation in the form of hoods or flexible duct be utilized to remove extrusion fumes. If handled inappropriately Halar 558 may release harmful toxic chemicals.
**Halar® 558**
ethylene chlorotrifluoroethylene copolymer

<table>
<thead>
<tr>
<th>Extrusion</th>
<th>Typical Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder Zone 1 Temp.</td>
<td>243</td>
<td>°C</td>
</tr>
<tr>
<td>Cylinder Zone 2 Temp.</td>
<td>249</td>
<td>°C</td>
</tr>
<tr>
<td>Cylinder Zone 3 Temp.</td>
<td>263</td>
<td>°C</td>
</tr>
<tr>
<td>Cylinder Zone 4 Temp.</td>
<td>280</td>
<td>°C</td>
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<tr>
<td>Flange Temperature Flange 1</td>
<td>252</td>
<td>°C</td>
</tr>
<tr>
<td>Flange 2</td>
<td>252</td>
<td>°C</td>
</tr>
<tr>
<td>Throat Temperature</td>
<td>243</td>
<td>°C</td>
</tr>
<tr>
<td>Crosshead Temperature</td>
<td>254</td>
<td>°C</td>
</tr>
<tr>
<td>Die Holder Temperature</td>
<td>246</td>
<td>°C</td>
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<tr>
<td>Die Temperature</td>
<td>274</td>
<td>°C</td>
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<tr>
<td>Screw L/D Ratio</td>
<td>24.0:1.0</td>
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**Extrusion Notes**

Halar 558 resin is a completely pre-compounded fluoropolymer which contains a nucleating agent, a chemical blowing agent that decomposes when the resin is extruded and a processing aid. There is no need to inject nitrogen gas into the system. The closed cell voids may be controlled from 0-70% by adjusting processing conditions such as melt temperature, head pressure and quench rates. If it is desired to reduce void content through reduction of blowing agent Halar 558 may be blended with Halar 500.

Halar 558 has been processed successfully with a number of different screw designs including a standard fluoropolymer design, with or without a pineapple mixing head including 3:1 compression ratio with 12/5/9 flights of feed/transition/compression respectively. Specific screws to avoid are rapid (1-2 flight) transition and Maddox mixing head designs.

**Equipment/Tooling Recommendations**

- Extruder Size: 1in to 2.5in
- Extruder L/D: 24:1
- Screens: 40 / 60
- Crosshead Type: Fixed or Adjustable
- Cone Length: 0.25in to 0.75in
- Line Speed: Up to 1700 fpm
- Tooling Set: Pressure
- Blow Up Ratio: 1.75 to 2.75
Notes
Typical properties: these are not to be construed as specifications.