CRYSTIC® 5512
Tough, Resilient Isophthalic Polyester Resin

Introduction
Crystic 5512 is a tough, resilient isophthalic unsaturated polyester resin. It is particularly recommended for use in high performance applications using pultrusion and filament winding methods. The outstanding wetting characteristics of the resin make it particularly suitable for use with continuous rovings, carbon fibre and Kevlar®. Fully cured laminates made with Crystic 5512 have high mechanical strength and give superb surface finish.

Formulation
Crystic 5512 can be used in hot, heat-assisted and cold curing formulations by using the following recommended catalyst systems.

- Benzoyl peroxide powder (Peroxide Chemicals® BP-50-FT) for hot curing.
- Curox® I-250 (blend of MIKP and promoter catalysts) for hot curing, particularly pultrusion.
- BP-50-FT and Cumene Hydroperoxide (CuHP80) for heat-assisted curing.
- Norox® KP-9 or Norox® MEKP-925 H for cold curing.

Hot Curing
BP-50-FT should be added at 2% and thoroughly dispersed in the resin. The catalysed mix will remain usable for approximately 5 days at workshop temperature (18ºC-20ºC). Cure will take place between 80ºC and 140ºC, but for most applications, 120ºC will be satisfactory. Approximate geltimes are shown in the Table 1, which should be used as a guide only, not as a specification.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Setting Time in Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>80ºC</td>
<td>8</td>
</tr>
<tr>
<td>100ºC</td>
<td>4</td>
</tr>
<tr>
<td>120ºC</td>
<td>2</td>
</tr>
</tbody>
</table>

Heat-Assisted Curing
BP-50-FT and CuHP80 should be added at 1% each and thoroughly dispersed in the resin. Shortly before use, the correct amount (1% - 4%) of Crystic Accelerator E should be stirred into the resin. This mix will remain usable at workshop temperature (18ºC - 20ºC) for 6 to 24 hours. Gelation will take place at 60ºC and above, making this formulation particularly suitable for winding and drawing applications, which require a long pot life.

Cold Curing
Catalyst M should be added at 2% into the resin. For a longer pot life, 2% Catalyst O should be used. The catalyst must be thoroughly dispersed in the resin, and this mix will remain usable for approximately 8 hours at workshop temperature (18ºC-20ºC). Shortly before use, the correct amount (1%-4%) of Crystic Accelerator E should be stirred into the catalysed resin.

N.B. Peroxide catalysts are highly reactive and may decompose with explosive violence, or cause fires, if they come into contact with flammable materials, metals or accelerators. For this reason they must never be stored in metal containers or be mixed directly with accelerators.
Additives

Crystic 5512 may be pigmented by the addition of up to 5% Crystic Pigment Paste. The addition of certain pigments and fillers may be necessary in order to produce satisfactory pultrusions. Users should therefore satisfy themselves that any additions made will give the performance required.

Post Curing

Satisfactory laminates for many applications can be made with Crystic 5512 by curing at workshop temperature (20ºC). However, for optimum properties, heat-assisted and cold cured laminates must be post cured before being put into service. Mouldings should be allowed to cure for 24 hours at 20ºC and then be oven cured for 3 hours at 80ºC.

Post curing is not normally necessary for hot cured laminates provided that the moulding cycle is adequate.

Typical Properties

The following table gives typical properties of Crystic 5512 when tested in accordance with SABS 713-1999.

Table 2: Typical properties of Crystic 5512 Liquid Resin

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Nominal value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td></td>
<td>Clear, yellowish liquid</td>
</tr>
<tr>
<td>Viscosity @ 25ºC 37.35 sec⁻¹</td>
<td>centipoise</td>
<td>800</td>
</tr>
<tr>
<td>Density @ 25ºC</td>
<td>g/cm³</td>
<td>1.10</td>
</tr>
<tr>
<td>Volatile Content</td>
<td>%</td>
<td>34</td>
</tr>
<tr>
<td>Acid Value</td>
<td>mg KOH/g</td>
<td>22</td>
</tr>
<tr>
<td>Stability in the dark @ 20ºC</td>
<td>months</td>
<td>6</td>
</tr>
<tr>
<td>Geltime @ 25ºC using 2% Norox KP9 catalyst and 4% Crystic Accelerator E</td>
<td>minutes</td>
<td>12</td>
</tr>
</tbody>
</table>

Storage

Crystic 5512 should be stored in the dark in suitable, closed containers. It is recommended that the storage temperature should be less than 20ºC where practical, but should not exceed 30ºC. Ideally, containers should be opened only immediately prior to use. Where they have to be stored outside, it is recommended that drums be kept in a horizontal position to avoid the possible ingress of water. Wherever possible, containers should be stored under cover.

Packaging

Crystic 5512 is supplied in 25kg kegs and 225kg drums. Bulk supplies can be delivered by road tanker.

Health and Safety

Please see the applicable Material Safety Data Sheets, depending on the curing system used.

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Before you use this information, kindly verify that this data sheet is the latest version.

All information is given in good faith but without warranty. We cannot accept responsibility or liability for any damage, loss or patent infringement resulting from the use of this information.

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