

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.
- Andonox[®] 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 (18°C-20°C). Cure will take place between 80°C and 140°C, but for most applications, 120°C will be satisfactory. Approximate gellimes are shown in the Table 1, which should be used as a guide only, not as a specification.

Table 1: Approximate hot curing gellimes for Crystic 5512

Temperature	Setting Time in Minutes
80°C	8
100°C	4
120°C	2

Hot curing may also be carried out using Curox[®] I-250. This should be added at 2-3% on the resin component of the formulation, depending on filler loading and pultrusion cross-sectional area. The die temperature can vary from 120°C to 160°C depending on production speed requirements and the design of the pultrusion.

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 (18°C - 20°C) for 6 to 24 hours. Gelation will take place at 60°C 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 (18°C-20°C). 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 (20°C). 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 20°C and then be oven cured for 3 hours at 80°C.

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

Property	Units	Nominal value
Appearance		Clear, yellowish liquid
Viscosity at 25°C 37.35 sec ⁻¹	centipoise	800
Density at 25°C	g/cm ³	1.10
Volatile Content	%	34
Acid Value	mg KOH/g	22
Stability at 20°C	months	6
Geltime at 25°C using 2% Andonox [®] KP9 catalyst and 4% Crystic Accelerator E	minutes	12

Storage

Crystic 5512 should be stored in the dark in suitable, closed containers. It is recommended that the storage temperature should be less than 20°C where practical, but should not exceed 30°C. 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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