

CRYSTIC[®] 196 & 196W

Polyester Resin with Excellent Physical Properties

Introduction

Crystic 196 is an orthophthalic polyester resin with excellent mechanical properties, impact resistance and electrical performance. It is recommended for the manufacture of mouldings for land transport, marine and industrial applications. It is available as a tack-free cure version Crystic[®] 196W, and as a light stabilised version Crystic 196UV, both with the same physical properties.

Applications

Crystic 196 is suitable for hand lay-up, and automated processes such as pultrusion, filament winding and resin injection.

Formulation

Crystic 196 should be allowed to attain workshop temperature (18°C- 25°C) before use. It requires the addition of a catalyst and an accelerator to start the curing reaction. The recommended catalyst is Norox[®] KP9. The catalyst should be added at 2% into the resin, and thoroughly dispersed. This mix will remain usable for approximately 8 hours at workshop temperature (18°C - 25°C). Shortly before use, the correct amount of Crystic Accelerator E should be stirred into the catalysed resin. At ambient temperature of 25°C this is 2%. Higher temperatures require lower levels and lower temperatures higher levels. Where mouldings are to be used with foodstuffs, Norox[®] MEKP-925H is recommended. This catalyst gives a longer pot life (approximately 50% longer) at a given temperature and can be useful when working at high ambient temperatures. It is also used in conjunction with Crystic Accelerator E.

The recommended range of formulations is given in Table 1.

Table 1: Recommended formulations for Crystic 196:

<i>Component</i>	<i>Parts by weight</i>
Crystic 196 or 196W	100
Crystic Accelerator E	1.0 – 5.0
Norox KP9 or Norox MEKP-925H	1.0 – 3.0

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.

The resin, mould and workshop should all be at or above 15°C before curing is carried out. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended.

Additives

Crystic 196 may be pigmented by the addition of up to 5% of Crystic Pigment Paste. Since the addition of certain pigments, fillers and extra styrene may affect the food taint, toxicity and chemical resistant properties of laminates; users should seek advice from our Technical Service Department before making any additions.

Post Curing

Satisfactory laminates for many applications can be made by curing Crystic 196 at workshop temperature (18°C - 25°C). For optimum heat resistance and mechanical properties, however, laminates must be post cured before being put into service. Mouldings should be allowed to cure for 24 hours at 20°C, then be oven cured for 3 hours at 80°C, or 16 hours at 40°C. Mouldings that are to be used with foodstuffs should be allowed to cure for 24 hours at 20°C, and then be oven cured for a minimum of 3 hours at 85°C. They should be thoroughly wet - steam cleaned for at least one hour prior to use.

If wet - steam cleaning is not practical, suitably shaped mouldings can be filled with hot water (60°C - 80°C) containing non-perfumed detergent. After 2 hours, they should be emptied and thoroughly rinsed with several batches of clean, hot water. These precautions are essential to avoid the tainting of foodstuffs.

Chemical Resistance

Performance figures for fully cured Crystic 196 laminates in more than 200 chemical environments are shown in Technical Leaflet No. 145.3, 'Safe Chemical Containment'.

Typical Properties

The following tables give typical properties of Crystic 196 when tested in accordance with SANS713:2007.

Table 2: Typical properties of liquid Crystic 196

Property	Units	Nominal value
Appearance		Clear, yellowish
Viscosity @ 25°C Brookfield RVT Sp.3 @ 100rpm	centipoise	900
Acid Value	mg KOH/g	20.3
Volatile Content	%	33
Stability in the dark @ 20°C	months	6
Geltime @ 25°C using 2% Norox KP9 and 2% Crystic Accelerator E	minutes	9

Table 3: Typical properties of fully cured* Crystic 196 (Unfilled casting).

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		45
Deflection Temperature under load † (1.80 MPa)	°C	65
Water Absorption 7d @ 23°C	mg	60
Tensile Strength	MPa	69
Tensile Modulus	MPa	3800
Elongation at Break	%	1.7

* Curing Schedule - 24 hrs @ 20°C, 3 hrs @ 80°C

† Curing Schedule - 24 hrs @ 20°C, 5 hrs @ 80°C, 3 hrs @ 120°C STORAGE

Crystic 196 should be stored in the dark in suitable, closed containers. It is recommended that the storage temperature should be less than 25°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 196 is supplied in 25kg kegs, 225kg drums, and 1125kg intermediate bulk containers. 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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