

CRYSTIC® 1160PA

General Purpose Polyester Resin with very low styrene emission

Introduction

Crystic® 1160PA is an orthophthalic, low styrene emission, low viscosity unsaturated polyester resin. It is supplied as a solution dissolved in monomeric styrene. It is pre-accelerated to give sufficient pot life for contact moulding using Norox® KP9 at normal ambient temperatures. It is suitable for a wide range of applications.

Applications

Crystic® 1160PA can be used without modification in most types of spray equipment. Its thixotropy will prevent draining when used on vertical or inclined surfaces with chopped strand mat. It requires only the addition of catalyst to start the curing reaction and is therefore ideal for long production runs under controlled workshop conditions. **Crystic® 1160PA** has been formulated to give a tough resilient laminate. It can be used with confidence in the construction of industrial and general-purpose mouldings.

Features and Benefits

Crystic® 1160PA has been specially formulated to give rapid wetting and impregnation of reinforcements and to aid in the elimination of air. It is almost colourless when cured, and emits very low levels of atmospheric styrene during use. It is part of Scott Bader's Crystic Green system.

Versions

Crystic® 1160PA is supplied as summer and winter versions with different geltimes. The winter version is labelled **Crystic® 1160-PA**.

Formulation

Crystic® 1160PA is formulated for room temperature curing applications. It requires only addition of the correct amount of catalyst to start the curing reaction. The recommended formulation is given in table 1.

Table 1: Formulation for curing **Crystic® 1160PA**.

Component	Parts by weight
Crystic® 1160PA	100
Norox® KP9 or KP-925H	1.0-3.0

The catalyst must be stirred thoroughly into the resin shortly before use. Curing should not be carried out at temperatures below 15°C. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended. The resin must be allowed to attain workshop temperature (15-30°C) before being formulated for use.

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.

Pot Life

The temperature, and the amount of Norox® KP9 or Norox® KP 925H control the gel time of the resin formulation. **Crystic® 1160PA** is formulated for use between 15°C and 30°C. It is recommended that workshop temperatures be maintained within this range.

At temperatures above 30°C, the gel time even at 1% Norox® KP9 catalyst can be so short that there is insufficient working time to use up all the resin that has been mixed. In such cases, do not use less than 1% catalyst as this can cause undercure. Rather use Norox® KP-925H. If using 1% Norox® KP-925H catalyst still gives too short a working time, do not use less than this. Rather mix smaller quantities of resin at a time so that it can all be used within the working time available.

At temperatures below 15°C, the curing reaction can be so slow that there is a high probability of undercure of the resin, even with over 2.5% Norox® KP9. Do not use more than 3% catalyst as that will not speed up the geltime appreciably or result in a faster cure; in fact it can further retard the cure. Rather warm up the resin and working area so that it is above 15°C.

Pigments and fillers

Crystic® 1160PA may be pigmented with up to 5 percent of **Crystic® Pigment Paste**, although lesser amounts are normally sufficient in a laminating resin. Pigment pastes and fillers should be used with caution, as they are likely to have a significant effect on the storage stability, geltime and cure of the resin system, and the physical strength properties of the final product.

Post curing

For most applications, where the moulded product will be used at ambient temperatures, satisfactory laminates can be produced without post curing at elevated temperatures, provided workshop temperatures are not below 20°C.

For more critical applications, where optimum properties are required, or where the service temperature of the moulding will be above ambient temperature, post curing at elevated temperature is recommended. The optimum temperature for **Crystic® 1160PA** is 80°C. After release from the mould, laminates should be allowed to mature for 24 hours at a workshop temperature of not less than 20°C. before being post cured. Place the part in an oven, suitably supported to prevent warping, and increase the temperature from ambient to 80°C in 10°C stages.

Leave the moulding at 80°C for three hours, and then switch the oven off. Allow the moulding to cool slowly in the oven. Post curing is most effective if it is carried out immediately after the 24 hour maturing period.

Physical Properties

The most important typical liquid properties of **Crystic® 1160PA** are given in Table 2 & 3 below:

Table 2: Typical liquid properties of **Crystic® 1160PA**.

Property	Units	Nominal value
Viscosity at 25°C: Brookfield RVT at 100rpm	centipoise	335
Thixotropic index	ratio	1.6
Relative density 25°/25°C	g/cm ³	1.1
Acid Value	mgKOH/g	22.5
Volatile Content	%	39.5
Colour	visual	Very pale straw
Stability in the dark at 25°C	months	3
Geltime at 25°C using 1% Norox® KP9 catalyst - Crystic® 1160PA	minutes	25
Crystic® 1160-PA	minutes	19

Table 3: Typical properties of **Crystic® 1160PA** fully cured* resin (unfilled casting)

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		40
Deflection Temperature under load † (1.80 MPa)	°C	68
Tensile Strength	mPa	52
Tensile Modulus	mPa	3900
Elongation at Break	%	1.4

* 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® 1160PA 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 outdoors, it is recommended that drums be kept in a horizontal position to avoid the possible ingress of water.

Packaging

Crystic® 1160PA is supplied in 25kg kegs, 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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