

CRYSTIC[®] 274

Non Accelerated Isophthalic Polyester Resin for Filament Winding Applications

Introduction

Crystic 274 is a Non-accelerated isophthalic unsaturated polyester resin. It is recommended for use in the filament winding processes.

Surfaces in contact with aggressive environments should be made resin rich by incorporating a surfacing tissue. Alternatively, fabric backed polypropylene (e.g. Celmar[®]) or certain grades of uPVC can be used, backed with glass fibre reinforced Crystic 274. Performance figures for fully cured Crystic 274 laminates, in more than 200 chemical environments are shown in Technical leaflet No. 145.3, "Safe Chemical Containment".

Formulation

Crystic[®] 274 should be allowed to attain workshop temperature (18°C - 20°C) before use. It requires the addition of accelerator and catalyst to start the curing reaction. The recommended accelerator is Crystic Accelerator G. The recommended catalysts are Norox[®] KP9 and Norox[®] MEKP 925H.

The required amount of accelerator must be stirred into the resin and mixed in thoroughly before use. Accelerated resin can be stored for some time in closed drums, but it is recommended that it be used as soon as possible to avoid lengthening of the geltime. Catalyst should be added carefully with stirring just before the resin is required. Some recommended formulations are given in Table 1:

Table 1: Recommended formulation for Crystic 274

Component	Parts by weight
Crystic 274	100
Catalyst Norox KP9 or Norox MEKP 925 H	1.0 – 3.0
Crystic Accelerator G	1.0 – 4.0

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 temperature and the amount of Crystic Accelerator G, and the amount of Catalyst control the gel time of the resin formulation. Users are urged to carry out their own geltime tests to ensure that the pot life is suitable for their application. 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[®] 274 may be pigmented by the addition of up to 5% Crystic Pigment Paste. Certain pigments, fillers or extra styrene can adversely affect the food taint, toxicity and chemical resistant properties of Crystic 274. Customers 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 274 by curing at workshop temperature (20°C). However, for optimum chemical, water and heat resistant properties, 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. 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.

Typical Properties

The following tables give typical properties of Crystic 274 when tested in accordance with BS 2782.

Table 2: Typical properties of Crystic 274 liquid resin:

Property	Units	Nominal value
Appearance		Clear straw coloured liquid
Viscosity @ 25°C Brookfield RVT sp.3 @100rpm	centipoise	450 - 550
Non volatile Content	%	57
Acid Value	mg KOH/g	16
Stability in the dark @ 20°C	months	6 @ 25°C
Geltime @ 25°C using: 100pbw Crystic 274 1.1pbv Norox KP9 catalyst 1pbv Crystic Accelerator E	minutes	10 - 13

Table 3: Typical properties of Crystic 274 fully cured* resin (unfilled casting):

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		45
Deflection Temperature under load † (1.80 MPa)	°C	83.7
Water Absorption 24 hours at 23°C	mg	0.61
Tensile Strength	MPa	75
Tensile Modulus	MPa	3740
Elongation at Break	%	3.6
Flexural Strength	Mpa	122

*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 274 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 274 is supplied in 25kg and 225kg containers.

Health and Safety

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

Technical Leaflet No 102.22SA

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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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