

CRYSTIC[®] 272

Tough, Resilient Isophthalic Polyester Resin

INTRODUCTION

Crystic[®] 272 is an isophthalic unsaturated polyester resin. It is recommended for use in high performance applications using filament winding, pultrusion, and centrifugal or contact moulding 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[®] 272** have high mechanical strength and excellent strength retention in wet environments, at temperatures up to 60°C.

FORMULATION

Crystic[®] 272 can be used in hot, heat-assisted and cold curing formulations by using the following recommended catalyst systems.

- Benox[®] C50 for hot curing.
- Benox[®] C50 and Norox[®] CHP for heat-assisted curing.
- Andonox[®] KP9, or
- Norox[®] MEKP-925H for cold curing.

HOT CURING

Benox[®] C50 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-25°C). Cure will take place between 80°C and 140°C, but for most applications, 120°C will be satisfactory. Approximate gel times are shown in the Table 1, which should be used as a guide only, not as a specification.

Table 1: Approximate hot curing geltimes for **Crystic® 272**.

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

HEAT-ASSISTED CURING

Benox® C50 and Norox® CHP should be added at 1% 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 - 25°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

Andonox® KP9 should be added at 2% into the resin. For taint free laminates, to be used with foodstuffs, 2% Norox® MEKP-925H 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® 272 may be pigmented by the addition of up to 5% **Crystic® Pigment Paste**. The addition of certain pigments, fillers or extra styrene may adversely affect the food taint, toxicity and chemical resistant properties of **Crystic® 272**. Users should therefore satisfy themselves that any additions made would give the performance required.

CHEMICAL RESISTANCE

Performance figures for fully cured **Crystic® 272** laminates, in more than 200 chemical environments, are shown in Technical Leaflet No. 145 "Safe Chemical Containment".

POST CURING

Satisfactory laminates for many applications can be made with **Crystic® 272** by curing at workshop temperature (25°C). However, for optimum chemical, water and heat resistant 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 25°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.

Mouldings that are to be used with foodstuffs should be allowed to cure for 24 hours at 25°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

Table 3: Typical properties of **Crystic® 272** Liquid Resin

Property	Units	Nominal value
Appearance		Clear, yellowish liquid
Viscosity @ 25°C 37.35 sec^{-1}	centipoise	360
Density @ 25°C	g/cm^3	1.10
Volatile Content	%	41
Acid Value	mg KOH/g	18
Stability from date of manufacture when stored in accordance with storage recommendations.	months	9
Geltime @ 25°C using 2% Andonox® KP9 and 2% Crystic® Accelerator E	minutes	12

Table 4: Typical properties of **Crystic® 272** Fully Cured* Resin (unfilled casting)

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		43
Deflection Temperature under load (1.80 MPa) †	°C	66
Water Absorption 7 days at 23°C	mg	55
Tensile Strength	MPa	79
Tensile Modulus	MPa	3400
Elongation at Break	%	3.6 minimum

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

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

STORAGE

Crystic® 272 should be stored between 5°C and 25°C in the original, unopened container in a dry well ventilated place. Protect from freezing and direct sunlight. Avoid contact with oxidising agents. If stored outside of these recommendations, shelf life will be significantly reduced.

PACKAGING

Crystic® 272 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.

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SCOTT BADER (Pty) Ltd
Reg. No. 93/00466/07
1 Lubex Road, Hammarsdale
P.O. Box 1539, Hillcrest, 3650
South Africa
Telephone: +27 (0) 31 736 8500
Telefax: +27 (0) 31 736 8511

Gauteng
11 Belgrade Avenue
Aeroporto, Spartan Ext.2
Kempton Park
Tel: (011) 974 7104
Fax: (011) 974 1300

KwaZulu Natal
1 Lubex Road,
Hammarsdale
Tel: (086) 167 3746
Fax: (086) 107 3746

Eastern Cape
Corner Ries & Burman Roads
Deal Party
Port Elizabeth
Tel: (086) 117 3746
Fax: (086) 107 3746

Western Cape
4 Beverly Road
Montague Gardens
Cape Town
Tel: (021) 552 0970
Fax: (021) 552 1031