

CRYSTIC[®] 356PA

High Performance Filled Flame Retardant Resin

Introduction

Crystic 356PA is a pre-accelerated, filled unsaturated polyester resin, recommended for the production of opaque fire retardant laminates.

For laminates with excellent weather resistance and no significant reduction in fire performance, Crystic 356PA can be combined with Crystic Gelcoat 65PA or 90PA. A maximum wet gelcoat thickness of 0.5mm is recommended for such applications.

The unique properties of Crystic 356PA make it ideal for use in the building, marine and land transport industries.

Approvals

Fully cured laminates moulded with Crystic 356PA can obtain a Class 1 rating to BS 476 Part 7 : 1987 and i and l indices less than 6 and 12 respectively to BS476 Part 6 : 1989. A similar degree of fire retardancy can be achieved if Crystic[®] Gelcoat 48PA, 65PA or 90PA is used on the laminate surface.

These systems all therefore meet the requirements of Section E 15 of the Building Regulations 1985, and those for a Class O structure.

Formulation

Crystic[®] 356PA must be thoroughly stirred and allowed to attain workshop temperature (18°C - 20°C) before use. It needs only the addition of a catalyst to start the curing reaction. The recommended catalysts are Norox[®] KP9 or, where ambient temperatures are high, Norox[®] MEKP 925H. The catalyst should be added at 2% into the resin and thoroughly stirred, shortly before use. The geltime of Crystic[®] 356PA using Catalyst M can be approximately determined from the Table 1 below. NB, Norox MEKP 925H will give longer geltimes than Norox KP9 .

Table 1: Pot life of Crystic 356PA catalyzed with Norox KP9.

Norox KP9 addition	2.0%
Pot life in minutes at 15°C	30
Pot life in minutes at 20°C	20
Pot life in minutes at 25°C	12

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 356PA can be pigmented by the addition of up to 5% of Crystic Pigment Paste. It is difficult to obtain dark colours due to the white, opaque nature of the resin. Customers are advised to test pigments for colour stability before any large scale use.

Resin: Glass Ratio

A resin to glass ratio of 2.8 to 1 is recommended, due to the high specific gravity of Crystic 356PA.

Post Curing

Satisfactory fire retardant laminates for many applications can be made with Crystic 356PA by curing at workshop temperature (20°C). However, for optimum dimensional stability, mechanical and fire retardant properties, mouldings should be post cured before being put into service. The mouldings should be allowed to cure for 24 hours at 20°C, then be oven cured for a minimum of 3 hours at 80°C or 15 hours at 50°C.

Typical Properties

The following tables give typical properties of Crystic 356PA when tested in accordance with BS 2782.

Table 2: Typical properties of liquid Crystic 356PA.

Property	Units	Nominal value
Appearance		Opaque, pinkish white
Viscosity @ 25°C 37.35 sec ⁻¹	centipoise	480
Viscosity @ 25°C 4500 sec ⁻¹	centipoise	300
Specific Gravity @ 25°C		1.54
Volatile Content	%	24
Acid Value	mg KOH/g	15
Stability in the dark @ 20°C	months	3
Geltime @ 25°C using 2% Norox KP9	minutes	12

Table 3: Typical properties of fully cured* Crystic 356PA (unfilled casting).

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		56
Deflection Temperature under load † (1.80 MPa)	°C	79
Water Absorption 24 hours at 23°C	mg	12
Tensile Strength	MPa	45
Tensile Modulus	MPa	7400
Elongation at Break	%	0.7
Specific Gravity @ 25°C		1.62

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

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

Table 4: Typical properties of Crystic[®] 356PA C.S.M** Laminate

Property	Units	Nominal value
Glass Content	%	30
Tensile Strength	MPa	77
Tensile Modulus	MPa	8100
Elongation at Break	%	1.3
Flexural Strength	MPa	168
Flexural Modulus	MPa	6900

**Made with 4 layers 450g/m² EB CSM

Curing schedule - 24hrs @ 20°C, 16hrs @ 40°C

Storage

Crystic 356PA 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.

Packaging

Crystic[®] 356PA is supplied in 25kg and 200 kg containers.

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.

SCOTT BADER COMPANY LIMITED

Scott Bader (Pty) Ltd
Reg. No. 93/00466/07
1 Lubex Road,
Hammarisdale
P.O. Box 1539, Hillcrest,
3650. South Africa
Tel: +27 (0) 31 736 8500
Fax: +27 (0) 31 736 8511

Gauteng
Broadacres Business
Centre
Cnr Cedar Rd and 3rd
Ave
Broadacres, Sandton
Tel: (011) 064 5673

KwaZulu Natal
1 Lubex Road,
Hammarisdale
Tel: (031) 736 8500

Eastern Cape
Freightpak Building
Chevrolet St
Markman Industrial
Port Elizabeth
Tel: (041) 409 783

Western Cape
Unit 4B
Tyger Lake
Niagara Way
Tyger Valley
Cape Town
Tel: (021) 914 6011

