

CRYSTIC[®] 491PAT

Tough Isophthalic Resin With Good Chemical Properties

INTRODUCTION

Crystic[®] 491PAT is a versatile pre-accelerated unsaturated polyester resin with good water and chemical resistant properties.

APPLICATIONS

Crystic[®] 491PAT was developed for use in a wide range of critical applications which require toughness combined with water and chemical resistance. Crystic[®] 491PAT is thixotropic and can be applied by either brush or spray equipment and may also be used in the pultrusion process for the production of profile sections. Crystic[®] 491PAT is suitable for the fabrication of high performance boat hulls destined for use in warm and tropical waters.

FORMULATION

Crystic[®] 491PAT should be allowed to attain workshop temperature (18°C - 20°C) before use. Stir well by hand, or with a low shear mixer to avoid aeration, and then allow to stand to regain thixotropy. Crystic[®] 491PAT requires only the addition of a catalyst to start the curing reaction. The recommended catalyst is Norox[®] KP9, which should be added at 2% into the resin. Norox[®] KP-925 H will increase the pot life. The catalyst should be thoroughly incorporated into the resin, with a low shear mechanical stirrer where possible.

Crystic[®] 491PAT is formulated for room temperature curing applications. It requires only addition of the correct amount of catalyst to start the curing reaction. The recommended formulations are given in Table 1:

Table 1

Component	Parts by weight
Crystic [®] 491PAT	100
Catalyst Norox [®] KP9 or Norox [®] KP-925 H	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 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.

POT LIFE

The temperature and the amount of Norox[®] KP9 catalyst or Norox[®] KP-925 H catalyst control the gel time of the resin formulation and can be approximately determined from Table 2.

Table 2: Effects of varying temperature on the pot life of **Crystic[®] 491PAT**.

Norox [®] KP9 Catalyst addition rate	Temperature °C	Gel time in minutes
2%	15°C	29
2%	20°C	20
2%	25°C	14

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.

POST CURING

Satisfactory laminates for many applications can be made from **Crystic[®] 491PAT** by curing at workshop temperature (20°C). However, in order to develop optimum strength and chemical resistance, laminates made with this resins should be post cured. After release from the mould, laminates should be allowed to mature for 24 hours at workshop temperature (20°C). They should then be post cured for a minimum of three hours at 80°C, or 15 hours at 50°C. When laminates are required to withstand temperatures between 50 and 80°C in service, the post curing temperature should always be at least as high as that at which the laminate is required to operate. The post cure is most effective if it is carried out immediately after the 24 hour maturing period.

ADDITIVES

Crystic[®] 491PAT can be pigmented with up to 5% **Crystic[®] Pigment Paste**. Since the addition of certain pigments 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.

TYPICAL PROPERTIES

The following tables give typical properties of **Crystic® 491PAT** when tested in accordance with BS2782.

Table 3: Typical properties of liquid **Crystic® 491PAT**.

Property	Units	Nominal value
Appearance		cloudy mauvish
Viscosity @ 25°C Brookfield RVT @ 100rpm	centipoise	485
Thixotropic index	ratio	2.0
Specific gravity @ 25°C		1.06
Acid value	mgKOH/g	17.5
Volatile Content	%	43
Stability in the dark at 20°C	months	3
Geltime @ 25°C using 1% Andonox® KP9 catalyst	minutes	25

Table 4: Typical properties of **Crystic® 491PAT** Fully cured* resin (unfilled casting)

Property	Units	Nominal value
Barcol Hardness (GYZJ 934-1)		45
Deflection Temperature under load † (1.80 MPa)	°C	79
Water Absorption 24hrs @ 23°C	mg	21
Volumetric shrinkage	%	7.5
Tensile Strength	MPa	77
Tensile Modulus	MPa	3400
Elongation at Break	%	4.5

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

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

STORAGE

Crystic® 491PAT 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® 491PAT is supplied in 25kg kegs, 225kg drums, and 1000kg flowbins. 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.

Technical Leaflet No. SBPTY102.0
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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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