



Introduction

Crystic® 233PA is a versatile pre-accelerated unsaturated polyester resin with good water and chemical resistant properties.

Applications

Crystic® 233PA was developed for use in a wide range of critical applications which require toughness combined with water and chemical resistance. Crystic® 233PA is thixotropic and can be applied by either brush or spray equipment and may also be used in the pultrusion process to produce profile sections. Crystic® 233PA is suitable for the fabrication of high performance boat hulls destined for use in warm and tropical waters.

Physical data - uncured

The following tables give typical properties of Crystic® 233PA when tested in accordance with SB, BS EN or BS EN ISO test methods.

Property	Unit	Typical 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

Physical data - cured

Property	Unit	Typical value* on casting
Barcol hardness (GYZJ 934-1)		45
Deflection temperature under load† (1.80 MPa)	°C	79
Water absorption 24 hrs at 23°C	mg	21
Volumetric shrinkage	%	7.5
Tensile strength	MPa	77
Tensile modulus	MPa	3400
Elongation at break	%	4.5

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

†Curing Schedule - 24 hours at 20°C, 5 hours at 80°C, 3 hours at 120°C.

Recommended testing

It is recommended that customers test Crystic® 233PA before use under their own conditions of application to ensure the required surface finish is achieved.

Formulation

Crystic® 233PA 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® 233PA 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® 233PA 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:

Component	Parts by weight
Crystic® 233PA	100
Catalyst Norox® KP9 or Norox® KP-925 H	1.0-3.0

Table 1

N.B.: Peroxide catalysts are highly reactive and may decompose with explosive violence, or cause fires, if they encounter 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 catalyst or Norox® KP-925 H catalyst controls 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® 233PA.

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® 233PA by curing at workshop temperature (20°C). However, to develop optimum strength and chemical resistance, laminates made with this resin 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® 233PA is supplied ready for use. The addition of any additives may adversely affect the performance of this product and therefore should not be used.

Storage

Crystic® 233PA 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 must 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® 233PA is supplied in 25kg kegs, 225kg drums, and 1000kg flowbins. Bulk supplies can be delivered by road tanker.

Health and Safety

Please see separate Material Safety Data Sheet.

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