CRYSTIC® 199PA

Highly Heat and Chemical Resistant Isophthalic Polyester Resin

Introduction
Crystic 199PA is an isophthalic unsaturated polyester resin. It is recommended for use in high performance applications, such as the aircraft industry, where superior thermal and electrical properties are required. Fully cured laminates made with Crystic 199PA have excellent chemical and heat resistance. They can withstand long periods (1 year) at temperatures up to 150ºC, and shorter periods at temperatures up to 200ºC, with no serious loss of properties.

Approvals
Crystic 199PA meets the requirements of BS 3532: 1990 Type C, and is approved to DTD 5537 and 5549, Class MC and EC. It also meets the requirements of SANS 1668:2007 for use in underground petrol storage tanks, and SANS 713:2007

Formulation
Crystic 199PA should be allowed to attain workshop temperature (18ºC - 25ºC) before use. Stir well by hand, or with a low shear mixer to avoid aeration, and then allow to stand to regain thixotropy. Crystic 199PA requires only the addition of a catalyst to start the curing reaction. The recommended catalyst is Norox® KP9, which should be added at 1% into the resin. Norox® MEKP 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 199PA 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 199PA	100
Norox KP9 catalyst or Norox MEKP 925 H catalyst	1.0-3.0

The catalyst must be stirred thoroughly into the resin shortly before use. Curing should not be carried out at temperatures below 15ºC. 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 (15-30ºC) before being formulated for use.

Where mouldings are to be used with foodstuffs, Norox MEKP-925 H is recommended. This catalyst also gives a longer pot life at a given temperature and can be useful when working at high ambient temperatures.

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 be at, or above, 15ºC before curing is carried out. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended.

Additives
For use on large vertical or inclined surfaces, up to 20% of Crystic Pregel may be added to Crystic 199PA to give it thixotropic properties. Fillers and pigments can adversely affect the heat, chemical and weather resistance of Crystic 199PA, so should not be used if optimum properties are required. Customers should satisfy themselves that any additions made will give the performance required.

Post Curing
The post curing temperature will depend on the temperature which the laminate is to withstand. It should be increased in increments of 20ºC to the final operating temperature, with a minimum of five hours post curing time at each 20ºC increase.

Typical Properties
The following tables give typical properties of Crystic 199PA when tested in accordance with SANS 713-2007.

Table 2: Typical properties of liquid Crystic 199PA.

Property	Units	Nominal value
Appearance		Clear, pinkish
Viscosity @ 25ºC Brookfield RVT Sp.3 @100rpm	centipoise	635
Specific gravity @ 25ºC		1.10
Volatile Content	%	37
Acid Value	mg KOH/g	25
Stability in the dark @ 20ºC	months	3
Geltime @ 25ºC using 2%Norox KP9 catalyst	minutes	20

Table 3: Typical properties of fully cured* Crystic 199PA (Unfilled casting).

Property	Units	Nominal value
Barcol Hardness (Model GYZJ 934-1)		48
Water Absorption 24hrs @ 23ºC	mg	29
Deflection Temperature under load † (1.80 MPa)	ºC	127
Elongation at Break	%	2.0
Tensile Strength	MPa	55
Tensile Modulus	MPa	3300
Specific Gravity @ 25ºC		1.19
Refractive Index n 20/d		1.554
Dielectric Loss (tan δ at 1000Hz)		0.005
Dielectric Constant (at 1000Hz)		3.1

*Curing schedule - 24hrs @ 20ºC, 3hrs @ 80ºC
†Curing schedule - 24hrs @ 20ºC, 5hrs @ 80ºC, 3hrs @120ºC

Storage
Crystic 199PA should be stored in the dark in suitable, closed containers. It is recommended that the storage temperature should be less than 20ºC where practical, but should not exceed 30ºC. 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 199PA is supplied in 25kg kegs and 225kg drums. 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.

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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