CRYSTIC® 397PA

Introduction
Crystic 397PA is a pre-accelerated, isophthalic/neopentyl glycol polyester resin, with a high heat deflection temperature and good water and chemical resistance. It is recommended for the fabrication of high performance laminates for critical applications in aggressive environments. Crystic 397PA is suitable for contact moulding and filament winding processes. A non-accelerated version of the resin is available as Crystic 397.

Approvals
Crystic 397PA is approved by Wine Laboratories Ltd for vessels to contain Wines and sherries up to 25% alcohol content.
Crystic Gelcoat 69PA backed with Crystic 397PA is approved by the WRC (Water Byelaws Advisory Service) for use in contact with potable water.

Formulation
Crystic 397PA should be allowed to attain workshop temperature (18°C - 20°C) before use. It requires only the addition of a catalyst to start the curing reaction. The recommended catalysts are Catalyst M (or Butanox M50) or, where mouldings are to be used with foodstuffs, Catalyst O (or Interox LA3). Either catalyst should be added at 2% into the resin and thoroughly dispersed.

N.B. For applications involving foodstuffs, thorough catalyst dispersion is vital, as any undercure in the laminate is a potential source of tainting.

Geltimes of Crystic 397PA can be approximately determined from the table below.

Pot Life

Parts of Catalyst to 100 Parts Resin	**M (or M50) 2.0**	**O (or LA3) 2.0**
Pot life in Minutes at 15°C	40	90
Pot life in Minutes at 20°C	20	45
Pot life in Minutes at 25°C	8	14

The resin, mould and workshop should be at, or above, 15°C before curing is carried out.

Applications
Surfaces in contact with aggressive environments should be made resin rich by incorporating a surfacing tissue, or a layer of Crystic Gelcoat 69PA. Alternatively, fabric backed polypropylene (e.g. Celmar®) or certain grades of uPVC can be used, backed with glass fibre reinforced Crystic 397PA.

Performance figures for fully cured Crystic 397PA laminates, in more than 200 chemical environments, are shown in Technical leaflet No. 145 “Safe Chemical Containment”.

Additives
Crystic 397PA may be pigmented by the addition of up to 5% Crystic Pigment Paste. Certain pigments, fillers or extra styrene can adversely affect the food taint, toxicity and chemical resistant properties of Crystic 397PA. Customers should therefore satisfy themselves that any additions made willl give the performance required.

Post Curing
Satisfactory laminates for many applications can be made with Crystic 397PA by curing at workshop temperature (20°C). However, for optimum chemical, water and heat resistant properties, laminates must be post cured before being put into service. Mouldings should be allowed to cure for 24 hours at 20°C and then be oven cured for 3 hours at 80°C.

Mouldings which are to be used with foodstuffs should be allowed to cure for 24 hours at 20°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
The following tables give typical properties of Crystic 397PA when tested in accordance with BS 2782.

Property		Liquid Resin
Appearance		Pinkish, mauve
Viscosity at 25°C 37.35 sec^{-1}	poise	5.0
Viscosity at 25°C 4500sec^{-1}	poise	2.4
Specific Gravity at 25°C		1.05
Volatile Content	%	49
Acid Value	mg KOH/g	13
Stability at 20°C	months	3
Geltime at 25°C using 2% Catalyst M	minutes	8
Property		**Fully *Cured Resin (unfilled casting)**
Barcol Hardness (Model GYZJ 934-1)		44
Deflection Temperature under load † (1.80 MPa)	ºC	117
Water Absorption 24 hrs at 23ºC	mg	19
Tensile Strength	MPa	60
Tensile Modulus	MPa	3300
Elongation at Break	%	2.5
Specific Gravity at 25°C		1.16
Volumetric Shrinkage	%	9.5

* 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

Property		CSM** Laminate
Glass Content	%	31
Tensile Strength	MPa	92
Tensile Modulus	MPa	7500
Elongation at Break	%	1.5
Flexural Strength	MPa	172
Flexural Modulus	MPa	6600

** Made with 4 layers 450g/m^2 PB CSM
Curing Schedule 24 hours at 20°C, 16 hours at 40°C

Property		CSM*** Laminate
Glass Content	%	30
Tensile Strength	MPa	95
Tensile Modulus	MPa	7000
Elongation at Break	%	1.7
Flexural Strength	MPa	170
Flexural Modulus	MPa	6400

*** Made with 4 layers 450g/m^2 PB CSM
Curing Schedule 24 hours at 20°C, 3 hours at 80°C

Storage
Crystic 397PA should be stored in the dark in suitable closed containers. It is recommended that the storage temperature should be less then 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 they are kept in a horizontal position to avoid the possible ingress of water.

Packaging
Crystic 397PA is supplied in 25kg and 200kg containers. Bulk supplies can be delivered by road tanker.

Health and Safety
Please see separate Material Safety Data Sheet

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