CRYSTIC® LS 451PA

DCPD based Low Styrene Content Polyester Resin

Introduction
Crystic LS 451PA is a pre-accelerated thixotropic resin suitable for brush or spray application.

Applications
Crystic LS 451PA is suitable for use in the marine industry and for all general moulding requirements.

Features and Benefits
Crystic LS 451PA is a DCPD based resin which typically contains 25% to 30% styrene. It therefore has a lower styrene emission than standard LSE resins and during the laminating phase, styrene emissions are typically 20% to 30% lower than conventional LSE resins.

The use of Crystic LS 451PA can significantly reduce the occurrence of print through, to produce mouldings with an enhanced surface finish.

Approvals
Crystic LS 451PA is approved by Lloyds Register of Shipping for use in the construction of craft under their survey.

Formulation
Crystic LS 451PA should be allowed to attain workshop temperature (18°C to 20°C) before use. It requires only the addition of a catalyst to start the curing reaction. The recommended catalyst is Catalyst M (or Butanox M50) which should be added at 2% into the resin and thoroughly dispersed, shortly before use. The geltime of the resin can be approximately determined from the table below:

Pot Life

Cure System	Temperature	Pot Life in Minutes
2% Catalyst M (Butanox M50)	25°C	20

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

Additives
The addition of certain pigments, ñllers or extra styrene may adversely affect the properties of Crystic LS 451PA. Users should seek advice from our Technical Service Department before making any additions.

Typical Properties
The following tables give typical properties of Crystic LS 451PA when tested in accordance with BS 2782.

Property		**Liquid Resin**
Appearance		Blue
Viscosity at 25°C 37.35 sec^{-1}	poise	4.0 – 6.0
Viscosity at 25°C 4500sec^{-1}	poise	2.0 – 2.4
Volatile Content	%	30
Acid Value	Mg KOH/g	20
Stability from date of manufacture when stored in accordance with storage recommendations.	months	6
Geltime at 25°C using 2% Catalyst M	minutes	18 - 22
Property		**Fully *Cured Resin (unfilled casting)**
Barcol Hardness (Model GYZJ 934-1)		38
Deflection Temperature under load † (1.80 MPa)	ºC	58
Water Absorption 24 hrs at 23ºC	mg	14.6
Tensile Strength	MPa	46
Tensile Modulus	MPa	2660
Elongation at Break	%	2.5

* Curing Schedule 24 hours at 20°C, 16 hours at 40°C
† Curing Schedule 24 hours at 20°C, 16 hours at 40°C

Property		**CSM** Laminate**
Glass Content	%	26
Tensile Strength	MPa	89
Tensile Modulus	MPa	6800
Elongation at Break	%	1.8
Flexural Strength	MPa	175
Flexural Modulus	MPa	5700
Compressive Strength	MPa	161
Compressive Modulus	MPa	6400

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

Post Curing
Satisfactory laminates for many applications can be made from Crystic LS 451PA by curing at workshop temperature (20°C). Some increase in properties may be obtained by post curing. The laminate should be allowed to cure for 24 hours at 20°C, and then be oven cured for 16 hours at 40°C or 3 hours at 80°C.

Storage
Crystic LS451PA should be stored between 5°C and 25°C in the original, unopened container in a dry, well ventilated place. Protect from freezing and direct sunlight. Avoid contact with oxidising agents. If stored outside of these recommendations, shelf life will be significantly reduced

Packaging
Crystic LS 451PA can be supplied in 25kg kegs 225kg drums & 1100kg IBCs.

Health and Safety
Please see separate Material Safety Data Sheet.

Version	Crystic LS451PA_resin_EN_Sep 18
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SCOTT BADER COMPANY LIMITED
Wollaston, Wellingborough, Northamptonshire, NN29 7RL
Telephone: +44 (0) 1933 663100
Facsimile: +44 (0) 1933 666623
www.scottbader.com