

# CRYSTIC<sup>®</sup> 701PA

## Polyester Resin for Vacuum Injection

### Introduction

Crystic 701PA is a pre-accelerated, isophthalic polyester resin with low viscosity and controlled exotherm characteristics.

### Applications

Crystic 701PA was developed primarily as a Vacuum Injection resin, but its properties make it suitable for use in other, similar techniques. The viscosity and exotherm characteristics of Crystic 701PA make it particularly suitable for the manufacture of large structures by Vacuum Injection methods. Where longer geltimes are required, Crystic 701PA should be used.

### Features and Benefits

Fully cured laminates made with Crystic 701PA have excellent strength retention in wet environments. Crystic 701PA is compatible with most reinforcement types, including carbon fibre and polyaramids such as Kevlar

### Formulation

Crystic 701PA 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 catalyst is Catalyst M (or Butanox M50), which should be added at 1% - 2% into the resin. The catalyst should be thoroughly incorporated into the resin, using a low shear mechanical stirrer where possible. Geltimes of Crystic 701PAX and Crystic 701PA, using various catalyst levels, can be approximately determined from the table below.

### Pot Life

Temperature	Pot Life in minutes using Catalyst M (Butanox M50)					
	Crystic 701PAX			Crystic 701PA		
	1.0 M	2.0 M	3.0 M	1.0 M	2.0 M	3.0 M
Pot life in minutes at 15°C	-	-	54	-	-	149
Pot life in minutes at 20°C	85	48	34	233	158	105
Pot life in minutes at 25°C	-	-	21	-	-	59

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

### Additives

The addition of fillers or pigment pastes can adversely affect the Vacuum Injection process and also the properties of the cured laminate. Users should seek advice from our Technical Service Department before making any additions.

### Post Curing

Satisfactory laminates for many applications can be made from Crystic 701PA by curing at workshop temperature (20°C). For optimum properties, however, laminates should be post-cured before being put into service. 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.

### Typical Properties

The following tables give typical properties of Crystic 701PA when tested in accordance with BS or BS EN ISO test method.

Property		Liquid Resin
Appearance		Mauvish
Viscosity at 25 °C	Poise	1.6
Specific Gravity at 25 °C		1.08
Volatile Content	%	50
Acid Value	Mg KOH/g	22
Stability from date of manufacture when stored in accordance with storage recommendations.	months	6
Geltime at 25 °C using 2% Catalyst M (or Butanox M50), 4% Accelerator E	minutes	85
Property		Fully Cured* Resin (unfilled casting)
Barcol Hardness (Model GYZJ 934-1)		35
Deflection Temperature under load † (1.80 MPa)	°C	75
Water Absorption 24 hours at 23°C	mg	10
Tensile Strength	MPa	66
Tensile Modulus	MPa	3580
Elongation at Break	%	2.5
Specific Gravity at 25 °C		1.19

\* 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		C.S.M** Laminate
Glass Content	%	38
Tensile Strength	MPa	154
Tensile Modulus	MPa	8350
Elongation at Break	%	2.3
Flexural Strength	MPa	194
Flexural Modulus	MPa	8200
Notched Izod Impact Strength	kJ/m <sup>2</sup>	101
Charpy Impact Strength	kJ/m <sup>2</sup>	79

\*\* Made with 1 layer Rovicore 600 D3 600  
Curing schedule – 24 hours at 20°C, 16 hours at 40°C

**Storage**

Crystic 701PA 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 701PA is supplied in 25kg, 200kg and 1 tonne containers. Bulk supplies can be delivered by road tanker.

**Health & Safety**

Please see separate Material Safety Data Sheet.

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