

# CRYSTIC<sup>®</sup> 199

## Introduction

Crystic199 is an isophthalic 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 199 have excellent chemical and heat resistance. They can withstand long periods (1 year) at temperatures up to 150°C, and shorter periods at temperatures up to 200°C, with no serious loss of properties.

## Formulation

Crystic199 can be used in both hot and cold curing formulations.

## Hot Curing

The recommended catalyst is Perkadox CH50X (or equivalent) which should be added at 2 % into the resin. The catalyst must be thoroughly dispersed into the resin, and the catalysed mix will remain usable for approximately 6 days at workshop temperature (18°C - 20°C). Cure will take place at temperatures between 80 °C and 130 °C, but for most applications 120 °C will be satisfactory. For optimum heat resistant properties, the laminate should be cured at a temperature of 80 °C – 100 °C for half an hour to one hour, and then post cured.

## Cold Curing

Crystic 199 should be allowed to attain workshop temperature (18°C-20°C) before use. It requires the addition of a catalyst and an accelerator to start the curing reaction.

*N.B. Catalyst and accelerator must not be mixed directly together, as they can react with explosive violence.*

The recommended catalyst is Butanox M50 (or equivalent) which should be added at 2 % into the resin. The catalyst must be thoroughly dispersed into the resin and this mix will remain usable for approximately 8 hours at workshop temperature (18 °C – 20 °C). Shortly before use, the correct amount of Accelerator E should be stirred into the catalysed resin. The amount of Accelerator E can be approximately determined from the table overleaf.

## Pot Life

Parts of Accelerator E to 100 parts of Catalysed Resin	1.0	2.0	3.0	4.0
Pot life in minutes at 20°C	70	52	38	30

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

## Additives

For use on large vertical or inclined surfaces, up to 20 % of Crystic Pregel 27 may be added to Crystic 199 to give it thixotropic properties. Fillers and pigments can adversely affect the heat, chemical and weather resistance of Crystic 199, 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 - Hot Cured Laminates

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

## Post Curing - Cold Cured Laminates

For optimum heat resistant properties, the laminate should be cured for seven days at workshop temperature (18 °C – 20 °C). The post curing temperature should be increased in increments of 20 °C, to that which the laminate is to withstand. A minimum of five hours post curing time should be given at each 20 °C increase.

## Typical Properties

The following tables give typical properties of Crystic 199 when tested in accordance with BS 2782.

Property		Liquid Resin
Appearance		Clear, yellowish-brown
Viscosity at 25°C 37.35 sec <sup>-1</sup>	poise	6
Specific Gravity at 25 °C		1.10
Volatile Content	%	37
Acid Value	mg KOH/g	27
Stability at 20 °C	months	6
Geltime at 25 °C using: 2 % Butanox M50, 4 % Accelerator E	minutes	16
Property		Fully cured* Resin (unfilled casting)
Barcol Hardness (Model GYZJ 934-1)		48
Water Absorption 24hrs at 23°C	mg	29
Deflection Temperature under load † (1.80 MPa)	°C	127
Elongation at Break	%	2.0
Tensile Strength	MPa	55
Tensile Modulus	MPa	3300
Specific Gravity at 25°C		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 at 20 °C, 3hrs at 80 °C

† Curing schedule - 24hrs at 20 °C, 5hrs at 80 °C, 3hrs at 120 °C

Property		CSM **Laminate
Glass Content	%	26.5
Tensile Strength	MPa	113
Tensile Modulus	MPa	5600
Elongation at Break	%	1.8
Flexural Strength	MPa	179
Flexural Modulus	MPa	5600

\*\* Made with 4 layers 450g/m<sup>2</sup> PB CSM.  
Curing schedule 24 hrs at 20 °C, 16hrs at 40°C

**Storage**

Crystic 199 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 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 199 is supplied in 25kg and 200kg containers. Bulk supplies can be delivered by road tanker.

**Health & Safety**

Please see separate Material Safety Data Sheet.

Version 2 : February 2013

All information on this data sheet is based on laboratory testing and is not intended for design purposes. Scott Bader makes no representations or warranties of any kind concerning this data. Due to variance of storage, handling and application of these materials, Scott Bader cannot accept liability for results obtained. The manufacture of materials is the subject of granted patents and patent applications; freedom to operate patented processes is not implied by this publication.

**SCOTT BADER COMPANY LIMITED**

Wollaston, Wellingborough, Northamptonshire, NN29 7RL

Telephone: +44 (0) 1933 663100

Facsimile: +44 (0) 1933 666623

[www.scottbader.com](http://www.scottbader.com)