

CRYSTIC[®] 198

Heat and Chemical Resistant Polyester Resin

Introduction

Crystic198 is a medium viscosity orthophthalic polyester resin with good heat and chemical resistant properties. A thixotropic, pre-accelerated version of this resin is available as Crystic 474PA.

Applications

Crystic 198 was developed for use in a wide range of applications throughout the chemical industry. It is particularly suitable for the construction of tanks, pipes and fumestacks to operate in environments where heat and chemical resistance are both required. Crystic 198 is a versatile resin suitable for use in contact moulding and automated processes such as pultrusion.

Features and Benefits

Crystic 198 can be used in conjunction with glass fibre backed polypropylene (Celmar[®]), and suitably treated uPVC, to produce dimensionally stable composites with high heat and chemical resistance.

Approvals

Crystic 198 meets the requirements of BS 3532:1990, for a Type C (heat resistant) polyester resin.

Formulation

Crystic198 can be used in both hot and cold curing formulations.

Hot Curing

The recommended catalyst is Catalyst Powder B (or Lucidol CH50) which should be added at 2% into the resin and thoroughly dispersed. The catalysed mix will remain usable for several days at workshop temperature (18°C - 20°C). Cure should take place between 80°C and 140°C, but for most applications 120°C will be satisfactory.

Cold Curing

Crystic 198 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.

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

The recommended catalyst is Catalyst M (or Butanox M50) which should be added at 2% into the resin, and thoroughly dispersed. The catalysed mix will remain usable at workshop temperature (18°C - 20°C) for approximately 8 hours. 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 below.

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 15°C | 51 | 32 | 24 | 19 |
| Pot life in minutes at 20°C | 30 | 20 | 16 | 12 |
| Pot life in minutes at 25°C | 19 | 13 | 10 | 7 |

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

Additives

Crystic 198 can be pigmented by the addition of up to 5% of Crystic Pigment Paste. However, fillers and pigments can adversely affect the heat and chemical resistance of Crystic 198, and customers should satisfy themselves that the required properties will be obtained before any large scale use.

When reduced fire hazard laminates are required, up to 20% by weight of Crystic 198 can be replaced by Crystic Prefil F.

Chemical Resistance

Performance figures for Crystic 198 laminates in over 200 chemical environments are contained in the current edition of our Chemical Containment Brochure.

Post Curing

In order to develop optimum heat and chemical resistance, cold cured Crystic 198 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. Where laminates are to withstand higher service temperatures than 80°C, a further period of post cure at the operating temperature should be given. Post curing is not normally necessary for heat cured laminates, provided that the moulding cycle is adequate.

Typical Properties

The following tables give typical properties of Crystic 198 when tested in accordance with BS 2782.

| Property | | Liquid Resin |
|--|----------|--|
| Appearance | | Yellowish |
| Viscosity at 25°C 37.35 sec ⁻¹ | poise | 5.5 |
| Specific Gravity at 25°C | | 1.11 |
| Volatile content | % | 36 |
| Acid value | mg KOH/g | 24 |
| Stability at 20°C | months | 6 |
| Geltime at 25°C using 2% Catalyst M, 4% Accelerator E | minutes | 12 |
| Property | | Fully cured* Resin (unfilled casting) |
| Barcol Hardness (Model GYZJ 934-1) | | 48 |
| Deflection temperature under load † (1.80 MPa) | °C | 112 |
| Water absorption 24 hrs at 23°C | mg | 28 |
| Tensile strength | MPa | 57 |
| Tensile modulus | MPa | 3700 |
| Elongation at break | % | 1.8 |
| Specific Gravity at 25°C | | 1.22 |
| Volumetric shrinkage | % | 8.2 |

*Curing schedule - 24 hrs at 20°C, 3 hrs at 80°C

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

| Property | | CSM **Laminate |
|---------------------|-----|----------------|
| Glass content | % | 28 |
| Tensile strength | MPa | 74 |
| Tensile modulus | MPa | 7100 |
| Elongation at break | % | 1.7 |
| Flexural strength | MPa | 189 |
| Flexural modulus | MPa | 7300 |

** Made with 4 layers 450g/m² EB CSM.
Curing schedule 24 hrs at 20°C, 3 hrs at 80°C.

Storage

Crystic 198 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.

Packaging

Crystic 198 is supplied in 25kg and 200kg containers. Bulk supplies can be delivered by road tanker.

Health & Safety

Please see separate Material Safety Data Sheet.

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