

CRYSTIC[®] 1141PA and CRYSTIC[®] 1142PA

Orthophthalic Polyester Resins for Closed Mould Use

Introduction

Crystic 1141PA and 1142PA are based on a tough, durable orthophthalic unsaturated polyester resin, 1141. They are designed for use in Resin Transfer Moulding (RTM) and may be used in other resin injection or vacuum assisted techniques. The two variants have different gel times - Crystic 1141PA for longer process times, and Crystic 1142PA for shorter process times.

Formulation

Crystic 1141PA and 1142PA should be cured using AAP (acetylacetone peroxide – Andonox[®] PD40). MEKP catalysts may be used, and will give similar gelltimes, but the resins will take appreciably longer times to cure.

Geltime

The geltime of the resins will be determined by the level of catalyst used, and the temperature of the workshop and mould (if heated). Tables 1 and 2 show examples of typical gelltimes for Crystic 1141PA and 1142PA. These were carried out on 100g samples. Geltime will be longer for thin laminates and shorter for large volumes of resin, and users are urged to make their own tests before proceeding.

Table 1: Typical gelltimes in minutes for Crystic 1141PA.

Temperature	1 % Andonox [®] PD40	1.5 % Andonox [®] PD40	2 % Andonox [®] PD40
20 °C	30	29	26
25 °C	22	18	17
30 °C	13	10	4.5

Table 2: Typical gelltimes in minutes for Crystic 1142PA.

Temperature	1 % Andonox [®] PD40	1.5 % Andonox [®] PD40	2 % Andonox [®] PD40
20 °C	15	13	12
25 °C	9.5	8.5	8
30 °C	7	6	5.5

N.B. Peroxide catalysts are highly reactive and may decompose with explosive violence, or cause fires, if they come into contact with flammable materials, metals or accelerators. For this reason they must never be stored in metal containers or be mixed directly with accelerators.

Curing of the resin should not be carried out at temperatures below 15°C. The resin, mould and workshop should all be at or above, 15°C before curing is carried out. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended.

Exotherm

The exotherm produced during the cure of the resin will depend on the amount of catalyst used. An increase in the temperature of the mould or the liquid resin will result in a higher peak exotherm. This will also be affected by other factors, such as the use of fillers, component thickness and the material from which the mould is constructed. For further recommendations please consult Scott Bader Technical Service Department.

Additives

Crystic 1141PA and 1142PA may be coloured using up to 5% of Crystic Pigment Paste. If other additives are to be used, please contact Scott Bader Technical Service Department before proceeding. Crystic 1141PA and 1142PA may be filled with up to 50% (100phr) of fine filler; grades such as Kulubrite[®] 5 (calcium carbonate) or Eggerding[®] M10LF (alumina trihydrate) are suitable. Higher filler loadings are possible but generally this requires the use of mixtures of coarse and fine fillers, or surface treated fillers.

Fillers should be dispersed in the resin using a high shear mixer such as a Cowles blade. If not used immediately, filled mixes of Crystic 1141PA and 1142PA must be kept gently agitated to prevent settling of the filler. Users should be aware that fillers affect the viscosity and geltime of the resin, and are advised to carry out tests before using them in production of parts.

Typical Properties

The following table gives typical properties of Crystic 1141PA and 1142PA when tested in accordance with SABS713-1999.

Table 3: Typical properties of liquid Crystic 1141PA and 1142PA.

Resin	Units	1141PA	1142PA
		Nominal value	Nominal value
Property			
Viscosity at 25°C	centipoise	180	160
Geltime at 25°C with 2% Andonox [®] PD40	Mins	17	8
Appearance		Pale grey	Pale blue-grey
Stability in the dark at 25°C	months	3	3

Storage

Crystic 1141PA and 1142PA 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 drums be kept in a horizontal position to avoid the possible ingress of water. Wherever possible they should be stored under cover.

Packaging

Crystic 1141PA and 1142PA are supplied in 25kg kegs, 225kg drums, and 1125kg intermediate bulk containers. Bulk supplies can be delivered by road tanker.

Health and Safety

Please see the applicable Material Safety Data Sheets, depending on the curing system used.

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