

# CRYSTIC 2-446PA

## Introduction

Crystic 2-446PA is a pre-accelerated, thixotropic, spray viscosity polyester resin with low styrene emission. Its rapid wet-out, low exotherm and fast hardening characteristics make it ideal for spray applications which require a fast mould turn round. Variants giving a range of geltimes and viscosities are also available. During the spray-up phase, styrene emissions from Crystic 2-446PA are considerably reduced compared to normal spray applied resins. Levels significantly lower than current or proposed legislation can be attained. This reduction in styrene emission is achieved with no loss of interlaminar adhesion.

## Approvals

Crystic 2-446PA is approved by Det - Norske Veritas and by Lloyd's Register of Shipping for use in the construction of craft under their survey.

## Product Characteristics

### FORMULATION

Crystic 2-446PA and its variants should be allowed to attain workshop temperature (18°C - 20°C) before use. They need only the addition of a catalyst to start the curing reaction. A colour change mechanism is incorporated into Crystic 2-446PA and its variants, to indicate the presence of catalyst. After catalyst addition, the resins will change from blue to green, then to a yellowish colour, before gelation. The recommended catalyst is Catalyst M (or Butanox M50) which should be added at 1% or 2% into the resin. The geltime of Crystic 2-446PA can be approximately determined from the table below

### POT LIFE

Table 1 - Catalyst M (or Butanox M50)

| <b>Parts of Catalyst M to 100<br/>parts of Crystic 2-446PA</b> | <b>1.0</b> | <b>2.0</b> |
|--|------------|------------|
| Pot life in minutes at 15°C                                    | 62         | 41         |
| Pot life in minutes at 20°C                                    | 39         | 29         |
| Pot life in minutes at 25°C                                    | 25         | 20         |

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

### ADDITIVES

Certain pigments, fillers or extra styrene may adversely affect the spraying and final properties of Crystic 2-446PA and its variants. Any additions should therefore be evaluated before any large scale use.

## POST CURING

Satisfactory laminates for many applications can be made from Crystic 2-446PA and its variants, by curing at workshop temperature(20°C). Some increase in properties may be obtained by post curing. The laminates should be allowed to cure for 24 hours at 20°C, then be oven cured for 16 hours at 40°C.

## TYPICAL PROPERTIES

The following tables give typical properties of Crystics 2-446PA and its variants when tested in accordance with BS 2782.

| Property  |             | Liquid Resin           |                          |                           |                           |                           |
|---|-------------|------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
|   |             | Crystic<br>2-446<br>PA | Crystic<br>2-446<br>PALV | Crystic<br>2-446<br>MPALV | Crystic<br>2-446<br>SPALV | Crystic<br>2-446<br>HPALV |
| Viscosity @ 25°C Ferranti<br>shear rate 37.35 sec <sup>-1</sup> | poise       | 4.0                    | 3.0                      | 3.0                       | 3.0                       | 3.0                       |
| Ferranti shear rate 4.500 sec <sup>-1</sup>                     | poise       | 2.2                    | 1.7                      | 1.7                       | 1.7                       | 1.7                       |
| Specific Gravity @ 25°C   |             | 1.10                   | 1.10                     | 1.10                      | 1.10                      | 1.10                      |
| Acid Value  | mg<br>KOH/g | 17                     | 23                       | 23                        | 16                        | 23                        |
| Volatile Content  | %           | 41                     | 42                       | 42                        | 43                        | 42                        |
| Appearance  |             | Bluish                 | Bluish                   | Bluish                    | Bluish                    | Bluish                    |
| Stability in the dark @ 20°C                                    | months      | 3                      | 3                        | 3                         | 3                         | 3                         |
| Geltime @ 25°C using<br>Resin 100 pbw<br>Catalyst M I pbw       | minutes     | 25                     | 25                       | 42                        | 18                        | 42                        |

| Property  |     | Fully Cured* Resin<br>(unfilled casting) |
|---|-----|--|
| Barcol Hardness (Model GYZJ 934-1)                |     | 42                                       |
| Deflection Temperature under load †<br>(1.80 MPa) | °C  | 67                                       |
| Water Absorption 24 hours at 23°C                 | mg  | 15                                       |
| Tensile Strength                                  | MPa | 50                                       |
| Tensile Modulus                                   | MPa | 3800                                     |
| Elongation at Break                               | %   | 1.5                                      |
| Specific Gravity at 25°C                          |     | 1.20                                     |
| Volumetric Shrinkage                              | %   | 8.3                                      |

\* Curing Schedule - 24 hrs @ 20°C, 3 hrs @ 80°C

† Curing Schedule - 24 hrs @ 20°C, 5 hrs @ 80°C, 3 hrs @ 120°C

| Property            |     | C.S.M** Laminate |
|---------------------|-----|------------------|
| Glass Content       | %   | 28               |
| Tensile Strength    | MPa | 98               |
| Tensile Modulus     | MPa | 7600             |
| Elongation at Break | %   | 1.7              |
| Flexural Strength   | MPa | 190              |
| Flexural Modulus    | MPa | 7400             |

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

### Storage

Crystic 2-446PA and its variants 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 only be opened 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 2-446PA and its variants are 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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