

CRYSTIC[®] 1381PA

Water Extendable Polyester Resin

Introduction

Crystic 1381PA is a low viscosity, isophthalic polyester resin into which water can be incorporated to form an emulsion.

Applications

Water filled Crystic 1381PA is suitable for general casting work or intricate detailed mouldings such as decorative articles and statuettes.

Features and Benefits

Water filled castings of Crystic 1381PA can be nailed, screwed, sawn or machined without splitting.

Decorative surface finishes can be obtained by the use of gelcoats or the post application of suitable stains and paints.

Formulation

Crystic 1381PA and the water to be incorporated into it, should be allowed to attain workshop temperature (18°C - 20°C) before use.

The minimum recommended water content is 40%, though levels up to 60% can be added. Although higher water contents decrease costs, it should be borne in mind that strength reduces and emulsion viscosity increases, with extra water. The water should be incorporated using a mechanical mixer. Although not essential, a high shear stirrer is desirable, as it will produce a more stable emulsion.

The recommended catalyst is Catalyst M (or Butanox M50). The catalyst should be added at 1.5% into the resin/water mix immediately prior to use, and thoroughly dispersed.

The potlife of a 50% water emulsion can be approximately determined from the table below:-

Pot Life

Temperature	Pot Life in Minutes 50% Water Emulsion
15°C	20
20°C	15
25°C	11

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

Additives

Crystic 1381PA emulsions may be pigmented by the addition of up to 5% Crystic Pigment Paste. Certain water soluble dyes may also be used.

The physical properties of Crystic 1381PA may be enhanced by the addition of reinforcements such as glass or mineral fibres.

Conventional fillers and aggregates may also be used though clay-like materials are not generally suitable as they can break the emulsion.

Users should satisfy themselves that any additions made do not adversely affect the stability, processing, or properties in service of the emulsion.

Typical Properties

The following tables give typical properties of Crystic 1381PA, in resin and emulsion form, when tested in accordance with BS 2782.

Property		Liquid Resin	50% Water Emulsion
Appearance		Dark Red/Brown	White
Viscosity at 25°C - 4500 sec ⁻¹	poise	4	-
Viscosity at 25°C - Rototinner	poise	-	8.5
Solids content	%	56	27
Specific Gravity		1.10	1.04
Stability at 20°C	months	3	-
Emulsion stability	minutes	-	30 minimum
Geltime at 25°C using 1.5% Catalyst M	°C	-	11
Exotherm Temperature at 25°C	°C	-	50
Time to peak	minutes	-	30

Property		Fully Cured* Emulsion (unfilled casting)		
		40% Water	50% Water	60% Water
Deflection temperature under load (1.80 MPa)	°C	57	57	55
Tensile Strength	MPa	29	14	10
Tensile Modulus	MPa	1275	750	390
Elongation at Break	%	4.1	2.9	2.3
Shrinkage	%	-	<1	-

* Curing Schedule 24 hrs at 20°C, 3 hrs at 80°C.

Property		Fully Cured* Emulsion (filled casting)		
		+ 80% by wt Limestone on Emulsion		
		40% Water	50% Water	60% Water
Flexural Strength	MPa	8.0	8.0	8.7
Flexural Modulus	MPa	1600	1400	1600

* Curing Schedule 24 hrs at 20°C, 3 hrs at 80°C.

Water Retention Characteristics

Water filled castings will gradually lose water by evaporation and diffusion. The rate of loss will depend on factors such as ambient temperature and original water content. The following table shows typical weight loss figures.

Cure Details	Weight Loss (%)		
	40% Emulsion	50% Emulsion	60% Emulsion
7 days at 20°C	5.2	6.2	9.2
28 days at 20°C	11.8	12.9	18.9
16 hours at 40°C	3.3	4.5	6.9
3 hours at 80°C	5.0	6.4	8.2

Post Curing

Satisfactory castings can be made with Crystic 1381PA by curing at room temperature. Some increase in properties may be obtained by post curing. Castings which are to be post cured 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.

Storage

Crystic 1381PA 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 1381PA is supplied in 25kg and 200kg containers.

Health and Safety

Please see separate Material Safety Data Sheet.

Technical Leaflet No 261

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