

CRESTOMER® 1152PA

Structural Fillet Paste For FRP Boats

INTRODUCTION

Crestomer®1152PA is pre-accelerated, highly thixotropic material based on an unsaturated urethane acrylate in styrene monomer. It is used as a highly impact resistant structural filleting material for FRP (fibre reinforced polyester) marine applications. These fillets are usually used in an undercut to make a radius at the base of a foam former. **Crestomer®1152PA** has excellent adhesion to cured FRP laminates, core materials and metals.

APPROVALS

Crestomer®1152PA has DNV approval and Lloyd's Statement of Acceptance for craft built under their Survey. After extensive testing for impact resistance and long term resistance to sea water, it has been approved by the MOD for use under NES 166.

REFERENCE INFORMATION

Crestomer®1152PA has been used worldwide as a structural filleting and jointing material in the construction of minehunters and minesweepers from FRP. This construction technique can be applied to other large vessels. A number of technical papers are available which discuss and evaluate **Crestomer®1152PA** in jointing and bonding applications.

LIST OF PAPERS RELATING TO CRESTOMER®1152PA WITH BOND/JOINT DESIGN

- Bashford, David
"Development of Improved Frame to Hull Bonds for GRP Ships"
Fulmer Research Lab. (1985)
- Hawkins, Holmes, Dodkins & Sheno
"Strength of Bonded T joints in FRP Ships"
PRI, Fibre Reinforced Conference March 1992 (Newcastle)
- Dodkins, Sheno & Hawkins
"Design of Joints and Attachments in FRP ship structures"
The Charles Smith Memorial Conference (DRA Dunfermline July 1992)
entitled Recent Developments in Structural Research
- Violette, F
"Study of Structural Composites T joints in small boats"
Journal of Composite Materials - Vol 24 June 1990, Issue 6

FORMULATION

Crestomer®1152PA is fully compounded and requires only the addition of Catalyst M (Curox® M200 or Butanox® M50) or Catalyst O (Curox® M100 or Butanox® LPT) to cure it. Curing should not be carried out at temperatures below 15°C. The paste, parts and workshop should both be at, or above, this temperature. Temperatures below 15°C must be avoided since styrene evaporation from the surface may lead to cracking. Scott Bader (Pty) Ltd. will not be liable for problems caused by use at lower temperatures than recommended.

Pot Life

The geltime (i.e. pot life) of **Crestomer®1152PA** is affected by the temperature and by the amount of Catalyst M added. Table 1 gives pot lives for **Crestomer®1152PA**.

Table 1: Pot lives for Crestomer®1152PA.

| Catalyst type | | Curox®M200 | | | Curox®M100 | |
|-------------------|------|------------|----|----|------------|----|
| Catalyst addition | | 3% | 2% | 1% | 2% | 1% |
| Temp. | 35°C | | | | 21 | 25 |
| | 30°C | | | | 31 | 36 |
| | 25°C | | 50 | 55 | | |
| | 20°C | 60 | 70 | 80 | | |
| | 15°C | 69 | 88 | | | |

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.

APPLICATIONS

To use as a fillet, **Crestomer®1152PA** can be applied with a spatula or from a cartridge gun, taking care to keep air entrapment to a minimum. Once applied, **Crestomer®1152PA** can be shaped with appropriately contoured metal or plastic formers. Thicknesses greater than 2.5 cms should be applied in multiple layers to avoid excessive exotherm. A time lapse of 1 hour from gelation should be allowed between layers. **Crestomer®1152PA** has excellent adhesion to fully cured material provided that the surface has been maintained free of dust and grease. This can only be guaranteed by the use of proprietary strippable cloths (without lubricant contaminates). If the fillet or laminate surfaces are more than 7 days old, it is recommended that they are lightly abraded. They should then be wiped with acetone or styrene on a fresh, clean cloth. Due to its excellent adhesion to a wide range of materials, 1152PA can also be used as a general purpose adhesive. It is also used to contour joints in FRP components and to build up damaged areas.

PERFORMANCE

A fillet is effectively a structural member in stiffener applications. It is therefore recommended that cure in production should be assessed by reference to its Shore D hardness prior to overbonding. Bondline thickness will vary with the application. The following are recommended:

| | | |
|----------------------|---|-------|
| Structural fillets | - | 25 mm |
| Core bedding/bonding | - | 1 mm |
| FRP to FRP bonding | - | 1 mm |

The properties of cured **Crestomer®1152PA** will vary with temperature. This is shown in Table 2.

Table 2: Mechanical properties of **Crestomer®1152PA** at varying temperatures.

| Property | Temperature °C | | | |
|----------------------|----------------|----|-----|-----|
| | -10 | 0 | 20 | 50 |
| Tensile Strength MPa | 40 | 35 | 25 | 25 |
| Tensile Elongation % | 3.5 | 50 | 100 | 140 |

TYPICAL PROPERTIES

The following tables give typical properties of **Crestomer®1152PA**, tested according to BS2782: 1980.

Table 3: Typical properties of liquid **Crestomer®1152PA**.

| Property | Units | Nominal value |
|-------------------------------------|---------|---------------|
| Viscosity at 25°C | | Non slumping |
| Specific gravity at 25°C | | 1.03 |
| Volatile content | % | 47 |
| Appearance | | Hazy gel |
| Stability in the dark at 20°C | months | 3 |
| Geltime at 25°C using 2% Catalyst M | minutes | 50 |

Table 4: Typical properties of cured **Crestomer®1152PA** (unfilled casting).

| Property | Units | Nominal value |
|---------------------------|---------|---------------|
| Hardness | Shore D | 65 |
| Ultimate Tensile Strength | MPa | 26 |
| Initial Tensile Modulus | MPa | 50 |
| Elongation at Break | % | 100 |
| Water Absorption (24 hrs) | % | 0.36 |
| Gardner Impact Strength | kg/cm | 200 |
| Yield Stress at 7% strain | MPa | 17 |
| Volume shrinkage on cure | % | 5 |

STORAGE

Crestomer®1152PA 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. 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

Crestomer®1152PA is supplied in 5kg, 25kg and 225kg containers.

HEALTH AND SAFETY

See separate Material Safety Data Sheet, depending on products used.

Technical Leaflet No. 308.6SA
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Before you use this information, kindly verify that this data sheet is the latest version.

All information is given in good faith but without warranty. We cannot accept responsibility or liability for any damage, loss or patent infringement resulting from the use of this information.



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