

Introduction

Crestafire® P1-8001 is designed for where fireproof performances and natural origins are key to the final product.

- It is derived from sugar cane waste and therefore bio sourced without affecting the planet resources dedicated to animal or human being consumption.
- It is capable of rail EN45545-2 standard highest HL3 requirement performances when appropriately combined with Scott Bader gelcoat.
- Due to its inherently excellent fire, smoke & toxicity properties (FST), the product can be used in the most demanding FST applications in the railway, building & construction and other public transport industries.
- Crestafire® **P1-8001** is halogen free, does not contain heavy metals. Resin system colour is dark brown / black.

Applications

Crestafire® **P1-8001** has been designed for use in contact moulding techniques, such as hand lay-up and spray moulding and is typically used in non-structural or semi-structural components.

The reticulation process is similar to phenolic resins, with a better mould turnaround time and a better aspect of parts once out of the mould.

Features and benefits

Crestafire® **P1-8001** is a versatile bio-resin with excellent fire, smoke & toxicity, and good mechanical properties.

It provides excellent handling properties and wetting of the reinforcements. It is recommended for use when eco-composites with excellent low smoke, low toxic fume emissions and fire-resistant laminates is desired.

Key features are:

- 100% Plant-based resin
- Highly ecological (carbon neutral) and fully non-toxic matrix material
- VOC-free
- Inherently fire resistant with very low flammability and low smoke release properties
- Low toxicity and emissions for improved operator health and safety
- Low environmental impact
- High Tg and stiffness
- Similar mechanical properties to conventional phenolic resins
- Low water uptake in composite applications
- REACH compliant polymer
- Short processing/cycle times and cure temperature as low as 80°C possible
- Compatibility with natural and mineral fibres (e.g., Flax, Hemp, Sisal, Jute, Kenaf, wood-cellulose based fibres such as Rayon, recycled carbon fibre, E-glass)
- Compatibility with Scott Bader Crystic® and Crestafire® gelcoats.

Typical properties

| Property | Unit | Liquid Resin |
|---|--------|--------------|
| Appearance | | Dark Brown |
| Viscosity at 25°C | mPa.S | <5000 |
| Water content | % wt | 5,0 – 7,5 |
| Stability from date of manufacture when stored in accordance with storage recommendations | Months | 6 |

| Property | Unit | Cured Resin |
|---|-------------|------------------|
| Hardness | Barcol | 45 -50 |
| Curing Shrinkage | % by volume | 5 to 6 |
| Deflection temperature under load (1,80MPa) | | Under definition |
| Flexural strength | MPa | 60 to 70 |
| Flexural Modulus | GPa | 3,2 to 3,7 |
| Tensile modulus | GPa | 2,0 to 2,8 |

Catalyst cure system and Pot life

Three possible acid catalyst cure systems and curing cycles are shown in the table below. The catalysts should be added to the resin using a medium/high shear mechanical stirrer to ensure thoroughly dispersion within the resin.

| Cure system | Parts resin | HM 1448 | S-type+ (65% wt) | H3PO4 (85% wt) | Potlife (min) | Curing cycle (hrs) |
|-------------|-------------|---------|------------------|----------------|---------------|-----------------------------|
| 1 | 100 | 0 | 1 | 4 | 40 | 2 hrs @ 50°C + 8 hrs @ 80°C |
| 2 | 100 | 0 | 1 | 3 | 60 | 2 hrs @ 50°C + 8 hrs @ 80°C |
| 3 | 100 | 1.5 | 1 | 4 | 30 | 2 hrs @ 50°C + 8 hrs @ 80°C |

- S type+ (65 wt% Para toluene sulfonic acid)
- H3PO4 (85 wt% Phosphoric acid)
- HM 1448 (65 wt% 2-hydroxyethyl)ammonium nitrate)

Please, consult the safety data sheets for information on safe handling of these catalyst systems.

Note: Scott Bader has a range of catalyst formulations available as well as alternative curing cycles, tailored to suit a variety of applications. The catalyst types and curing cycles suitable are not limited to those listed above, - for more details please seek assistance from our Technical Support Department.

Before use

Crestafire® P1-8001 should be allowed to attain workshop temperature (18°C - 20°C) before use. It requires only the addition of a catalyst to start the curing reaction. The catalyst should be thoroughly incorporated into the resin, using a low shear mechanical stirrer where possible.

Additives

The addition of fillers or pigment pastes can adversely affect the properties of the cured laminate. Users should seek advice from our Technical Support Department before making any additions.

Formulation

The backbone of Crestafire® P1-8001 is formed by condensation reaction of furfuryl alcohol. To reduce the viscosity and thus to enhance the process ability, typically water is added as a solvent – around 4% w/w of water is recommended for optimum HLU processing. It requires the addition of acid catalysts and heat to start the curing reaction.

Storage

Crestafire® P1-8001 should be stored between 5°C and 25°C in the original, unopened container in a dry, well-ventilated place. Protect from freezing and direct sunlight. Avoid contact with oxidising agents. If stored outside of these recommendations, shelf life will be significantly reduced.

Packaging

Crestafire® P1-8001 is supplied in 27kg plastic kegs, 225kg drums & 1100kg containers.

Health and safety

Please see separate Safety Data Sheet.