

Medium Temperature Cure Resin System

RP542-1

80°C - 120°C Cure

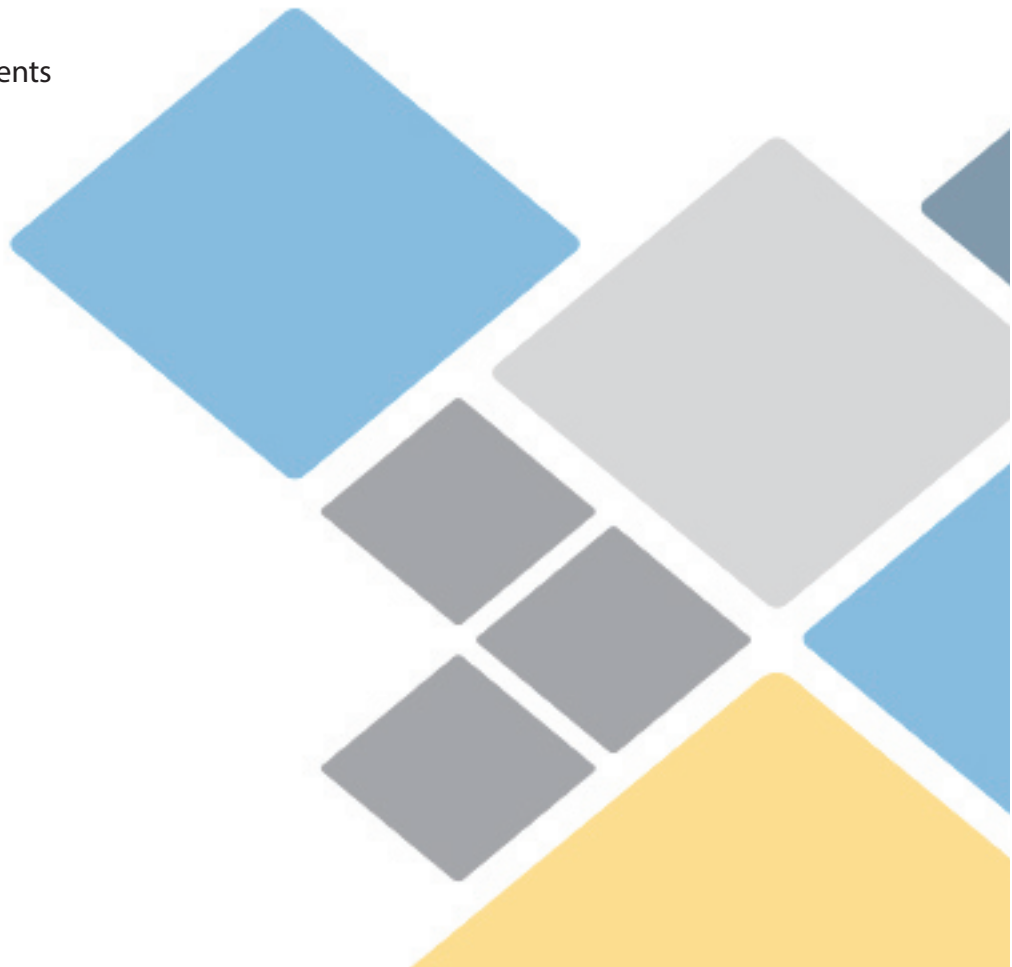
Applications

- Aerospace
- Automotive
- Motorsport Components
- Marine
- Defence

Processing Methods

- Vacuum bag
- Autoclave
- Press moulding
- Tube rolling
- Pressure bag

TDS007





Description

RP-542-1 is a controlled flow, tough epoxy prepreg system formulated for the manufacture of high performance structural composite parts requiring very good impact strength properties. The system has been formulated for a medium temperature cure of 80 - 120°C under vacuum or autoclave pressure and is also suitable for press moulding. Fully cured, this system has a dry service temperature capability up to 120°C. The component surface finish with this system is excellent.

The tack level of this system can be adjusted to meet the constructor's individual requirements and will be retained for up to 40 days at 22°C making this system suitable for the manufacture of large composite components.

RP-542-1 can be supplied on most of the vast range of PRF reinforcement materials in widths up to 1350 mm wide.

Main features

- Excellent surface finish
- Core bondable
- Standard Cure 80°C - 120°C
- Service Temperature up to 120°C
- Tg onset 117°C, Midpoint 126°C with post cure
- Controlled flow system
- Out life 40 days at room temperature
- Available on most of PRF's reinforcement fabrics

Storage

This product should be stored in refrigerated conditions.

Shelf life

| | |
|-------|---------|
| 30°C | 20 days |
| 5°C | 1 year |
| -20°C | 2 year |

Health and Safety - Refer to the full Material Safety Datasheet before use.



Processing

RP542-1 prepreg resin system may be processed at room temperature using established prepreg moulding techniques on properly prepared moulds. The cure cycle depends on the construction of the component and processing method. If honeycomb core is used in the part, the temperature ramp should be increased at a slower rate to enable a controlled flow of the resin to form a fillet between the core and skin.

Recommended cure cycle is to ramp from ambient to 110°C at 1-2°C/minute and then dwell for 2 hours. Part should then be allowed to cool naturally before demoulding.

Alternative cure temperatures and times are given in the table below:

| Temperature | Cure Time | Tg (DSC - ASTM D7426-08) |
|-------------|-----------|--------------------------|
| °C | Hours | Initial cure (°C)* |
| 80 | 12 | 97 |
| 90 | 6 | 102 |
| 100 | 4 | 111 |
| 110 | 2 | 120 |
| 120 | 1 | 120 |

*Initial cure by press.

Cure cycles

Laminates with honeycomb core

Elevate temperatures at 2 - 5°C per minute up to 110°C. Hold the final temperature for 2 hours then allow the component to cool naturally inside the oven/autoclave before demoulding.

Vacuum bagged monolythic laminates

Elevate temperature at 3 - 5°C per minute up to 110°C, hold for 2 hours then allow the component to cool naturally inside the oven/autoclave before demoulding.

Press moulded monolythic laminates

RP-542-1 system may be applied directly to hot press moulds at temperatures up to 130°C. The cure time at the highest temperature will be approximately 45 minutes. The mould and component temperatures should be cooled to below 80°C before demoulding. It is important, when manufacturing honeycomb sandwich panels without the use of adhesive films, to increase the resin content on the fabric plies being used as the first layers against the honeycomb. This ensures enough resin is available for the formation of the resin fillet between the honeycomb and the skins.



Post cure cycle

| | |
|-------------------------|-----|
| Temperature (°C) | 120 |
| Time (hours) | 1 |
| Tg (°C) | 125 |

A post cure can be carried out if the maximum Tg is required. The recommended post cure cycle is to ramp the temperature to 120°C at 1-2°C/minute and hold for 1 hour. Tg after this time will be 120-125°C (measured by DSC).

Mechanical Properties

Resin Properties

| | | |
|---|------------|------|
| Tensile Strength (MPa) ISO 527-2 | σ_T | 84 |
| Tensile Modulus (GPa) ISO 527-2 | ET | 2.9 |
| Poisson ratio ISO 527-2 | ν | 0.36 |
| Flexural Strength (MPa) ISO 178 | σ_F | 127 |
| Flexural Modulus (GPa) ISO 178 | EF | 3.0 |

Oven cured at 120°C for 1 hour

All values are nominal.

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Make an enquiry today at:

t: +44 (0) 1202 680022

e: enquiries@prfcomposites.com

www.prfcomposites.com

PRF Composite Materials

3 Upton Road

Poole

Dorset BH17 7AA

Important Notice

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