

TCR Composites offers a **toughened** thermosetting epoxy matrix resin system featuring a **3-month shelf life without refrigeration**. This resin is currently used for tow/roving, unitape, and fabric; and is available for carbon, glass, aramid, and other fibers. Resin content, resin flow during cure, and tack levels can be tailored to suit your process requirements.

Neat Resin Properties and Applications

Density (g/cc)	Tg (°F/°C) (from E" DMA curve)	Tensile Modulus (ksi/GPa)	Tensile Strength (ksi/MPa)	Elongation at Break (%)	Tg after 24-Hr Water-Boil (°F/°C)	Water Absorption (%)	Available Fiber Form
1.17	232 / 111	390 / 2.69	11.3 / 77.9	2.9	160 / 71	4.5	Tow/Roving, Unitape, Fabric

Typical Use

TR1111 has the benefit of being approximately **35% tougher** than similar TCR™ Resins at room temperature.

Cure*

The recommended cure cycle for TR1111 resin is:

1. ≤ 5°F-per-minute ramp up to 250°F (121°C), hold for 4 hours, < 5°F-per-minute ramp down to at least 150°F (66°C) before removing from oven.

The following cure cycles should also produce similar properties:

2. ≤ 5°F-per-minute ramp up to 230°F (110°C), hold for 6 hours, < 5°F-per-minute ramp down to at least 150°F (66°C) before removing from oven.
3. ≤ 5°F-per-minute ramp up to 210°F (99°C), hold for 24 hours, < 5°F-per-minute ramp down to at least 150°F (66°C) before removing from oven.

*Higher temperatures and shorter hold times may also work, but have not yet been tested. The use of shorter cure times at the temperatures listed above can produce a well cured, highly cross-linked and solidified resin. While maximum Tg may not be obtained, this could be well suited for an application depending on what properties are critical.

Storage Requirements

The prepregged materials manufactured from this resin shall remain sealed and stored in the original package. The material is to be stored indoors, out of the weather.

The shelf life is 3 months from the date of manufacture when the maximum storage temperature shall not exceed 75°F (24°C).

The shelf life is 1.5 months from the date of manufacture when the maximum storage temperature shall not exceed 90°F (32°C).

The shelf life is 6 months from the date of manufacture when the maximum storage temperature shall not exceed 40°F (4°C), with an additional 2 months at <75 °F (24°C).

The values here represent expected ranges based on actual test data. Since the values are specimen-preparation- and test-method-dependent, TCR Composites cannot guarantee that these properties will be obtained in all cases. The data should be used as an indication only, since part or component properties are highly equipment- and process-dependent. It is recommended that end users determine the suitability of this material for each application through their own testing and evaluation. TCR™ is a trademark of TCR Composites, Inc.