UF3376 TCR™ Resin

Technical Data Sheet

UF3376 Resin Summary

- Solvent-free epoxy resin
- **3-month shelf life** without refrigeration
- Resin content, flow during cure and tack levels tailored to suit your process needs
- **Available reinforcement materials:** carbon, glass, aramid, and other fibers
- **Available fiber forms:** tow (roving) and fabric
- **Typical use:** Rocket motor cases, sporting goods, high pressure tanks, large structures, infrastructure repair, and a variety of other products. UF3376 resin is suitable where a moderately-low cure temperature is required.

Neat Resin Properties

Properties	121°C for 4 hours*	121°C for 1.5 hours	Test Method
Density	1.18 g/cc	1.18 g/cc	ASTM D792
Tensile Strength	97.2 MPa / 14.1 Ksi	101 MPa / 14.7 Ksi	ASTM D638
Tensile Modulus	3.3 GPa / 478 Ksi	2.6 GPa / 375 Ksi	ASTM D638
Elongation at Break	6.3%	6.9%	ASTM D638
Tg – from E'' DMA curve	139°C / 282°F	133°C / 271°F	ASTM E1640
Tg after 24-Hr Water-Boil	83°C / 181°F	83°C / 181°F	ASTM E1640
Water Absorption	4.0%	4.0%	

*Highest Tg temperatures are acquired with a 4 hour hold time during cure.

T800 Tow Carbon Composite Properties**

Properties	Metric	English	Test Method
0° Tensile Strength	3,400 MPa	496 Ksi	ASTM D3039
0° Tensile Modulus	190 GPa	28 Msi	ASTM D3039
0° Tensile Strain	1.8%		ASTM D3039
0° Tensile Poisson's Ratio	0.25		ASTM D3039
0° Compressive Strength	1,280 MPa	185 Ksi	SACMA SRM 1R-94
0° Compressive Modulus	76 GPa	11 Msi	SACMA SRM 1R-94
90° Tensile Strength	31 MPa	4.5 Ksi	ASTM D3039
90° Tensile Modulus	7.6 GPa	1.1 Msi	ASTM D3039
Short Beam Strength	63 MPa	9.2 Ksi	ASTM D2344
Flexural Strength	2,120 MPa	307 Ksi	ASTM D0790
Bottle Burst Translation	95%		Netting Analysis

**Normalized to 60% Fiber Volume. Cured at 121°C for 4 hours.

TCR Composites, 219 North 530 West, Ogden, Utah 84404 USA 1-800-827-3746 1-801-622-3800

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7781 E Glass Fabric Composite Properties**

Properties	Metric	English	Test Method
0° Tensile Strength	478 MPa	69.3 Ksi	ASTM D3039
0° Tensile Chord Modulus	26.50 GPa	3843 Ksi	ASTM D3039
0° Tensile Strain	2.2%		ASTM D3039
Max In-Plane Shear Stress	101.7 MPa	14.75 Ksi	ASTM D3518
In-Plane Shear Stress at 5% Strain	55.3 MPa	8.02 Ksi	ASTM D3518
In-Plane Shear Modulus	3.756 GPa	544.8 Ksi	ASTM D3518
Flexural Shear Strength	58.3 MPa	8.45 Ksi	ASTM D2344
0° Tensile Compressive Strength	505.9 MPa	73.37 Ksi	ASTM D6641
0° Compressive Modulus	31.14 GPa	4517 Ksi	ASTM D6641

**8 Harness Satin Weave, 8.81 oz/yd^2. Cured at 121°C for 4 hours.

6781 S Glass Fabric Composite Properties**

Properties	Metric	English	Test Method
0° Tensile Strength	669 MPa	97.0 Ksi	ASTM D3039
0° Tensile Chord Modulus	29.78 GPa	4319 Ksi	ASTM D3039
0° Tensile Strain	2.3%		ASTM D3039
Max In-Plane Shear Stress	105.8 MPa	15.35 Ksi	ASTM D3518
In-Plane Shear Stress at 5% Strain	57.5MPa	8.34 Ksi	ASTM D3518
In-Plane Shear Modulus	3.708 GPa	537.8 Ksi	ASTM D3518
Flexural Shear Strength	48 MPa	7.0 Ksi	ASTM D2344
0° Tensile Compressive Strength	409.8 MPa	59.43 Ksi	ASTM D6641
0° Compressive Modulus	31.36 GPa	4549 Ksi	ASTM D6641

**8 Harness Satin Weave, 8.92 oz/yd^2. Cured at 121°C for 4 hours.

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Dielectric Constants

Material	Dielectric Constant (ε')	Loss Tangent (ε''/ε')
UF3376 Neat Resin	2.96	0.021
7781 E Glass with UF3376	4.48	0.017
6781 S Glass with UF3376	3.73	0.018
4581 Quartz with UF3376	3.08	0.010

Average X Band values from 8.2 to 12.4 GHz.

Cure Profiles*

Options	Ramp Up	Hold Temperature	Hold Time (Hours)	Ramp Down
1	≤ 2.5°C/min (5°F/min)	121°C / 250°F	4	≤ 2.5 °C/min (5°F/min) to 66°C (150°F) or less
2**		121°C / 250°F	1.5	
3		110°C / 230°F	6	
4		99°C / 210°F	24	

*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.

**This cure cycle may not produce the maximum Tg; but will be suitable for a well-cured, highly cross-linked and solidified resin.

Storage Requirements

The pre-impregnated 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.

Maximum Storage Temperature	Shelf Life (Months)	Additional Life at Ambient Temperatures After Refrigeration (Months)
24°C / 75°F	**3**	-
32°C / 90°F	**1.5**	-
-18°C / 0°F	**18**	3 (at Temps ≤ 24°C / 75°F)

For additional technical information regarding TCR Composites' products, please visit our website for a list contacts.

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