Toray BTCy-2

Toray Advanced Composites

PRODUCT DATA SHEET

DESCRIPTION

Toray BTCy-2 is our lowest dielectric cyanate ester prepreg resin system. This resin system is valued in high-energy microwave applications due to the low loss tangent.

FEATURES

- **Low microcracking and outgassing**
- **Toray's lowest dielectric resin**
- **Ideal for high-energy radome structure**

PRODUCT TYPE

177°C (350°F) Cure Cyanate Ester

TYPICAL APPLICATIONS

- Aircraft
- Spacecraft
- Ultra-low loss radomes and antennae
- Radar transparent structures
- Low outgassing applications
- Low loss castings for horns and lenses
- High performance electronic substrates

SHELF LIFE

Out Life:	14 days at 25°C (77°F)
Frozen Storage Life:	6 months at -18°C (< 0°F)

Out life is the maximum time allowed at room temperature before cure.

TYPICAL NEAT RESIN PROPERTIES

Polymer T_g	191°C (375°F)
Moisture Absorption	0.6% at 100°C (212°F) saturation*
Dielectric Constant	2.7 (10 GHz)
Loss Tangent	0.001 (10 GHz)
G_IC Value	1.4 in-lb/in^2

* Moisture Absorption: 0.2%–0.3% (Quartz at 60% Vf) at saturation in boiling water

SERVICE TEMPERATURE

149°C (300°F) (Continuous)
182°C (360°F) (Short Term)

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ELECTRICAL PROPERTIES OF COMPOSITE LAMINATES

BTCy-2/4581 Quartz	C/X Band 8–18 GHz	Ku/K Band 18–26.5 GHz	Ka Band 26.5–40 GHz	Q & U Band 40–60 GHz
Dielectric Constant	3.17	3.13	3.14	3.12
Loss Tangent	< 0.010*	< 0.010*	< 0.010*	< 0.010*

* The loss tangent under focused beam testing is only accurate to 0.010. This material is less than 0.010. This material represents one of Toray's best for high energy radome applications.

BTCy-2/7781 Fg	1.0 MHz
Dielectric Constant	4.40
Loss Tangent	0.002

LAMINATE DATA–7781 FG REINFORCEMENT, 300gsm FAW

Property	Condition	Method	Results	
Tensile Strength 0°	RTD	ASTM D 3039	490 MPa	71 ksi
Tensile Modulus 0°	RTD	ASTM D 3039	22 GPa	3.2 Msi
Compressive Strength 0°	RTD	ASTM D 695	469 MPa	68 ksi
Compressive Modulus 0°	RTD	ASTM D 695	22 GPa	3.2 Msi
Flexural Strength 0°	RTD	ASTM D 7264	607 MPa	88 ksi
Flexural Modulus 0°	RTD	ASTM D 7264	21 GPa	3 Msi
Short Beam Shear Strength	RTD	ASTM D 2344	62 MPa	9 ksi

LAMINATE DATA–4581 AQIII WOVEN FABRIC REINFORCEMENT, 300gsm FAW

Property	Condition	Method	Results	
Tensile Strength 0°	RTD	ASTM D 3039	749 MPa	109 ksi
Tensile Modulus 0°	RTD	ASTM D 3039	25.5 GPa	3.7 Msi
Compressive Strength 0°	RTD	ASTM D 695	747 MPa	108 ksi
Compressive Modulus 0°	RTD	ASTM D 695	28.3 GPa	4.1 Msi
Flexural Strength 0°	RTD	ASTM D 7264	834 MPa	121 ksi
Flexural Modulus 0°	RTD	ASTM D 7264	21.4 GPa	3.1 Msi
Short Beam Shear Strength	RTD	ASTM D 2344	69.4 MPa	10.1 ksi

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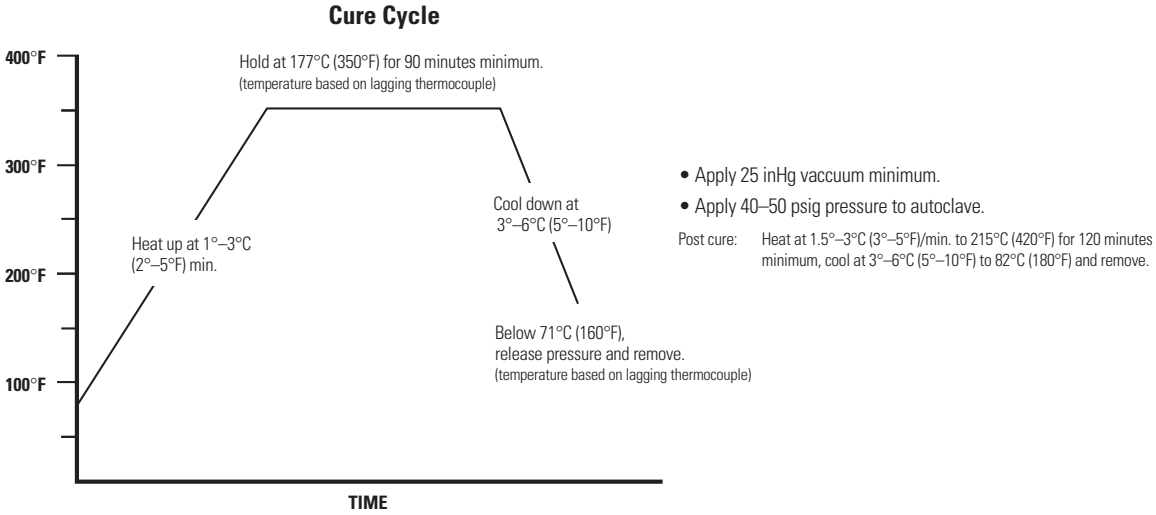


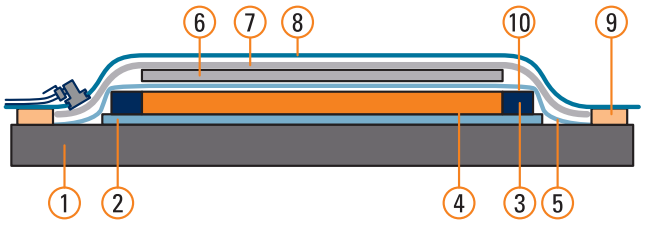
TYPICAL COMPOSITE LAMINATE STACKING SEQUENCE

List of Materials

1. Tool – aluminum, steel, Invar, composite (tool plates must be release coated or film covered).
2. Release coat or film – Frekote 700NC or 770NC, FEP, TEDLAR
   Lay-up part using standard debulking procedures
3. Silicone edge dams for cure – slightly thicker than laminate
4. Laminate
5. Release coat or film – Frekote 700NC or 770NC, FEP, TEDLAR
6. Caul plate – aluminum, steel, Invar, silicone rubber sheet (metal caul plates must be release coated or wrapped)
7. 2.2 oz/yd^2 polyester breather, 1 or more
8. Vacuum bag
9. Vacuum sealant
10. Glass yarn string (alternatively or additionally breather may wrap over top of dam to contact edge)

Follow the provided Toray Advanced Composites cure cycle for the particular resin system.

Figure 1



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