# Toray TCF4045

Toray Advanced Composites

PRODUCT DATA SHEET

## DESCRIPTION

Toray TCF4045 is a low dielectric, low density epoxy syntactic film. The material displays both good mechanical and dielectric properties. TCF4045's base resin chemistry features low moisture absorption with good high temperature properties.

## FEATURES

- **Good high temperature properties**
- **Lightweight core fill**
- **Good dielectric properties**

## PRODUCT TYPE

177°C (350°F) Cure, Low Dielectric Epoxy Syntactic Film

## TYPICAL APPLICATIONS

- Radomes and antennae core fill
- Low observables
- Radar transparent structures

## SHELF LIFE

| | |
|---|---|
| **Out Life:** | Up to 14 days at ambient |
| **Frozen Storage Life:** | 6 months at -18°C (< 0°F) |

Out life is the maximum time allowed at ambient temperature before cure.* Ambient is 18–22°C (65–72°F)

** Out life tested by handling and cure evaluation. Users may need to separately evaluate out life limits on thicker, more complex parts.*

## TYPICAL NEAT RESIN PROPERTIES

| | |
|---|---|
| Density | 0.61 g/cc (38 pcf nominal) |
| Dry $T_g$ | 180°C (356°F) |
| Wet $T_g$ | 166°C (331°F) |
| Dielectric Constant Per ASTM D 2520 | 1.57 at 10 Ghz (x-band) |
| Loss Tangent Per ASTM D 2520 | 0.0078 at 10 Ghz (x-band) |

## PRODUCT FORM

| | |
|---|---|
| Product Configuration | Film Thickness ~ 1.91 mm (75 mils)<br>(Other thicknesses may be available upon request) |
| Sheet Size | 30.5 cm x 61 cm (12"x 24") |

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## MECHANICAL PROPERTIES

| Property | Condition | Method | Results | |
|---|---|---|---|---|
| Compressive Strength | RTD | ASTM D 6641 | 50.3 MPa | 7.3 ksi |
| Tensile Strength (Dogbone) | RTD | ASTM D 3039 | 20.7 MPa | 3.0 ksi |
| Flexual Strength | RTD | ASTM D 790 | 26.9 MPa | 3.9 ksi |
| Average ply thickness 1.47 mm (0.058") | | | | |

## TYPICAL CURE PARAMETERS

- Apply full vacuum > 25 inHg, reduce vacuum to 9 inHg
- Add autoclave pressure to 25–50 psi
- Heat 1°C/min (2°F/min) to 127°C (260°F), hold for 3 hours
- Then heat to 179°C (355°F) for 3 hours, cool 3°C/min (5°F/min) to 66°C (150°F) then release vacuum and pressure





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