

EX1541 Syntactic Foam

PRODUCT TYPE

149°C (300°F) to 177°C (350°F)
Curing Cyanate Ester Syntactic Foam

TYPICAL APPLICATIONS

- Low Dielectric/Low Loss Core for Radomes, Antennae and Structures
- Low Moisture Pickup, Low Outgassing Foam Core for Space Structures
- Aircraft Interiors
- Net Molded Foam Parts
- High Temperature Potting
- Ablatives
- High Temperature Tooling Masters
- High Temperature Tooling Backup Structures

SHELF LIFE

Out Life* ⁽¹⁾
14 days @ 24°C (75°F)

Frozen Storage Life
6 months @ < -18°C (0°F)

*Out Life is limit for packing of foam when decrystallized. *See notes below.*

⁽¹⁾ *Important Product Instructions*

Resin may crystallize in freezer storage or after several days of room temperature storage at 24°C (75°F). To remove crystals, heat resin to 52°C (125°F) and gently stir until crystals return to solution before using. This step will also make the system more pliable for core fill applications.

PRODUCT DESCRIPTION

TenCate EX-1541 cyanate ester syntactic foam is extremely unique in the industry due to its coupling of extremely low density and good structural properties. If packed well, the material does not require pressing during cure to achieve its mechanical properties and is easily machined to shape if required. EX-1541 is simply packed or injected into tooling cavities and can also be extruded with the proper tooling.

EX-1541's inherently low dielectric/low loss performance makes it ideal for radomes, antennae and radar transparent structures, while its cyanate ester backbone chemistry assures low moisture absorption and low outgassing. These latter two features coupled with EX-1541's low isotropic CTE make it ideal for spacecraft and other dimensionally stable structures and tooling.

EX-1541 can be accurately machined and hand-finished. Sanding and fairing is easily performed on cured EX-1541 and is similar to working with balsa wood. Variants from 11-24 lb/ft³ (pcf) are available.

PRODUCT PROPERTIES

- Postcurable for higher T_g (please see cure guidelines)
- Available in multiple density versions
- Low dielectric properties

NEAT RESIN TYPICAL PHYSICAL PROPERTIES

Density 11 lbs/Ft³ (176 kg/m³) – 24 lbs/Ft³ (384 kg/m³)

Cure Temperature..... 177°C (350°F)
232°C (450°F) (with optional post cure)

	Dielectric Constant	Loss Tangent*
11 & 13 pcf.....	1.32	0.0093
CTE (at 10 GHz) (24 pcf).....	7.4x10 ⁻⁶ in/in/°F (In x, y, and z planes) Isotropic	

*At 10 GHz

NEAT RESIN TYPICAL MECHANICAL PROPERTIES

Compression Strength vs Temperature (11 pcf/nom.)

25°C (77°F)..... 300-500 psi (2.1-3.4 MPa)

60°C (140°F)..... 300-500 psi (2.1-3.4 MPa)

177°C (350°F)..... 150 psi (1 MPa)

PRODUCT DATA SHEET



TENCATE ADVANCED COMPOSITES

TYPICAL MECHANICAL PROPERTIES OF CURED EX-1541 AS A FUNCTION OF DENSITY ⁽¹⁾ ⁽²⁾ ⁽³⁾

Properties ⁽¹⁾ ⁽²⁾ ⁽³⁾	Condition	Method	Results	
Compression Strength - 11 pcf (0.18 g/cc)	RTD	ASTM C297	300 - 500 psi	2.1 - 3.4 MPa
Compression Strength - 13 pcf (0.21 g/cc)	RTD	ASTM C297	500 - 700 psi	3.4 - 4.8 MPa
Compression Strength - 17.5 pcf (0.28 g/cc)	RTD	ASTM C297	850 - 900 psi	6.1 - 6.3 MPa
Compression Strength - 20 pcf (0.32 g/cc)	RTD	ASTM C297	900 psi	6.2 MPa
Compression Strength - 20 pcf (0.32 g/cc)	ETD	ASTM C297	850 psi	5.9 MPa
Flatwise Tensile Strength - 11 pcf (0.18 g/cc)	RTD	ASTM C365	300 - 500 psi	2.1 - 3.4 MPa
Flatwise Tensile Strength - 13 pcf (0.21 g/cc)	RTD	ASTM C365	500 - 800 psi	3.4 - 5.5 MPa
Flatwise Tensile Strength - 17.5 pcf (0.28 g/cc)	RTD	ASTM C365	650 - 800 psi	4.5 - 5.5 MPa

⁽¹⁾ Compression Specimen: 2" diameter puck, 1" thick

⁽²⁾ Cure: 1°F/min to 177°C (350°F). Hold for 2 hours. Cool at <5.5°C/min (10°F/min).

⁽³⁾ All densities are nominal. Property ranges listed are typical for expected range of densities about the nominal values noted. Contact TenCate regarding specification values for density, mechanical properties, and tolerances.

TYPICAL CURE PARAMETERS

- 0.6°C/min (1°F/min) to 177°C (350°F)
- Hold for 2 hours
- Cool at < 5.5°C/min (10°F/min)
- For post curing, use 0.3°C/min (0.5°F/min) to prevent exotherm from 177°C (350°F) to 249°C (480°F). Plus a dwell for one hour at 204°C (400°F) and another one hour dwell at 232°C (450°F) is advisable for thick parts, > 1/2" thick (12 mm).

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All data given is based on representative samples of the materials in question. Since the method and circumstances under which these materials are processed and tested are key to their performance, and TenCate Advanced Composites has no assurance of how its customers will use the material, the corporation cannot guarantee these properties.

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TENCATE ADVANCED COMPOSITES

18410 Butterfield Blvd.
Morgan Hill, CA 95037 USA
Tel: +1 408 776 0700

2450 Cordelia Road
Fairfield, CA 94534 USA
Tel: +1 707 359 3400

Amber Drive, Langley Mill
Nottingham, NG16 4BE UK
Tel: +44 (0)1773 530899

www.tencatecomposites.com
info@tcac-usa.com (USA)
tcacsales@tencate.com (Europe)