Toray EX-1510

Toray Advanced Composites

PRODUCT DATA SHEET

DESCRIPTION

Toray EX-1510 is a highly modified two-part toughened cyanate ester resin formulated to have extremely low viscosity at room temperature. Its viscosity allows resin transfer molding (RTM) to take place without the application of heat to the resin. This feature provides long resin pot life and mold filling time for difficult and/or large RTM structures and helps increase manufacturing efficiency and reduces waste. EX-1510 displays excellent mechanical and thermal properties in addition to low moisture absorption. Finally, the material is unique in that it develops full mechanical properties from its initial 177°C (350°F) cure. A freestanding post cure increases the heat resistance.

FEATURES

- **Low microcracking even under severe thermal cycling**
- **Low moisture absorption**
- **Low dielectric constant and dissipation factors**
- **Low stress-free cure temperature with high level of cure**
- **Outstanding mechanical properties**
- **Compatible adhesive is EX-1516**

PRODUCT TYPE

177°C (350°F) Curing Toughened
Cyanate Ester for RTM Applications

TYPICAL APPLICATIONS

- Aircraft structures
- Reflectors
- Radomes and antennae
- Low observables
- Space structures
- Missile structures
- Higher performance and high heat commercial applications

SHELF LIFE

Pot Life:	4 hours at 25°C (77°F)
Storage Life in Unopen Containers:	Part A - 6 months at 25°C (77°F) Part B - 6 months at 25°C (77°F) Part A - 12 months at -18°C (< 0°F) Part B - 12 months at -18°C (< 0°F)

TYPICAL NEAT RESIN PROPERTIES

Glass Transition (T_g)^ after cure at 177°C (350°F)	Dry T_g	200°C (392°F)
	Wet T_g#	168°C (334°F)
Glass Transition (T_g)^ after additional postcure at 249°C (480°F)	Dry T_g	260°C (500°F)
	Wet T_g#	208°C (406°F)
Dielectric Constant	2.85 at 1 MHz	
Loss Tangent	0.005 at 1 MHz	
CTE	64 ppm/°C (°F)	
Outgassing	TML	0.82%
	CVCM	0.01%
	WVR	0.64%
Moisture Absorption*	1.4	
Viscosity at 25°C (77°F)	150 cps	
Viscosity at 77°C (170°F)	20 cps	

^ Tested by DMA - E' onset.# Conditioned in deionized water at 71°C (160°F) for 14 days.

* At saturation after 64-hour water boil.

TYPICAL CURE PARAMETERS

- 2 hours at 177°C (350°F) in mold

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MIXING

The mix ratio of EX-1510 is 100 Part A to 3 Part B by weight. Put the correct amount of Part A in the mix vessel first. Add Part B and mix using a high-speed dispersion mixer. Mix for 5 minutes, stop and spatula the walls and bottom of mix vessel, then mix an additional 5 minutes.

MIXED POT LIFE

Typical pot life of the mixed resin is 4 hours at 25°C (77°F). The pot life is the length of time a 150 gram mass of resin can be stored at a given temperature before doubling in viscosity. Any mass over 150 grams should have the temperature monitored after mixing and should have the appropriate safety procedures followed if the resin temperature increases by 17°C (30°F) over room temperature.

CRYSTALLIZATION

Part A has the potential to crystallize during storage depending on storage conditions. If this occurs, Part A should be heated to 66°C (150°F) maximum until the crystallization is no longer evident. Multiple de-crystallization cycles to 66°C (150°F) have not evidenced decreases in the room temperature shelf life of Part A. The de-crystallization temperature of 66°C (150°F) is well below the temperature required to cure the uncatalyzed cyanate ester resin.

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