

KDT PolyTem™ 1800

High Temperature PMC Hybrid Matrix Resin

(Product Code: K-1072)

KDT PolyTem™ 1800 is a low viscosity polysilazane resin designed to be used as a matrix resin for polymer matrix composite (PMC) applications. KDT PolyTem 1800 is reactive toward a variety of organic functional groups. Organic-Inorganic hybrid systems in which the inorganic polysilazane PolyTem 1800 is combined with an organic resin such as an epoxy, phenolic, or polyisocyanate resins are easily prepared. In general, PolyTem 1800 is added to increase the thermal performance of PMC matrices while maintaining the strength and toughness associated with the purely organic system.



KDT PolyTem 1800 used for non-burning structures

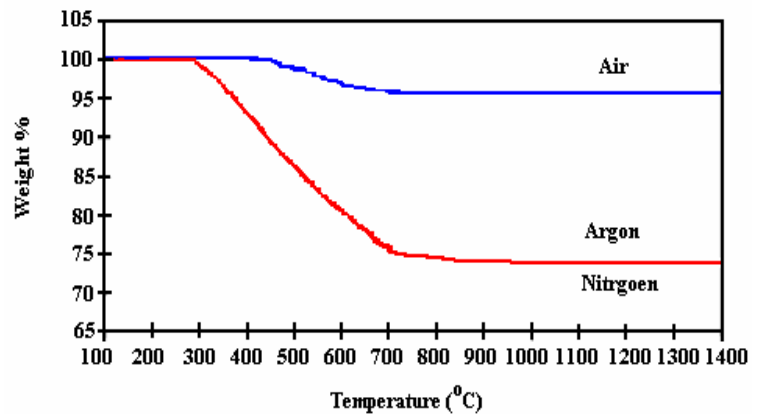
Major Applications:

Polymer Matrix Composites (PMCs), Non-Burning Composites, Organic/Inorganic Hybrids, Coatings, Cast Elastomers, Rigid Cast Objects

Physical Properties of Resin

Color	Clear to pale yellow liquid
% Resin	100 % solids as a liquid
Flash Point	29 °C [84 °F]
Density of Liquid	1.020 g/cm ³
Density of Cured Material	1.120 g/cm ³
Solubility	Soluble in common organic solvents including aliphatic and aromatic solvents
Viscosity	80 cps @ 19 °C [67 °F]

TGA of KDT PolyTem 1800



Fabrication and Processing:

The preparation of a PMC matrix resin incorporating KDT PolyTem 1800 is relatively straightforward and typically involves simple blending of the polysilazane with the organic resin, followed by mild heating to thermoset the mixture. Depending on the organic resin used and the application of interest, a variety of processing techniques can be used, including casting, RTM, vacuum bag/autoclave, etc. The addition of KDT PolyTem 1800 to organic PMC matrix resins does not alter the fabrication procedure; thus, there is no need to change the manufacturing process.

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Glass Fiber Reinforced HDI/KDT PolyTem 1800 Composite

Glass Fiber	Tensile Strength (MPa)	Tensile Modulus (GPa)	Flexural Strength (MPa)	Strain to Failure (%)
E-Glass	384	20.3	402	2.1
S-Glass	584	28.3	572	2.1

KDT Non-Burning Composite

Test Method	ASTM C293	ASTM E84	ASTM E84	ASTM D658	
Test	Flexural Strength, MPa	Flame Spread Index	Smoke Density	Abrasion (in/60sec)	Tg (°C)
Result	178	20 (Class A)	105 (Class A)	0.0058	77

Clean Up:

Clean tools immediately after use with acetone or mineral spirits. Solvent cleaning can be followed by a wash with soapy water. Cured material cannot be removed with solvent. Proper clean-up of equipment is essential.

Handling:

Storage Life: Minimum of 2 years for unopened containers.

Pot Life: Usable life will be determined by the precautions taken to keep containers tightly sealed and protected from moisture.

Solvents:

KDT PolyTem 1800 is miscible with dry aprotic solvents such as alkanes, aromatic hydrocarbons, ethers, ketones, and esters. KDT PolyTem 1800 is hydrolytically sensitive and will slowly generate ammonia upon contact with moisture. The polymer will also react with other protic substances such as acids, bases, and alcohols.

Safety:

Use safety glasses and adequate ventilation. Protect skin from exposure using gloves and appropriate clothing. Seek medical attention if ingestion or overexposure is suspected. Keep uncured product from flame, all ignition sources, and moisture. This product is intended for professional use by persons familiar with this product data sheet, the Material Safety Data Sheet (MSDS) that accompanies product shipments, and applicable health, safety, and environmental practices and regulations. Contact KDT for advice concerning this product's suitability for specific applications.

Disclaimer:

Information on this product sheet is subject to change without notice as a result of experience and ongoing product development. It is the user's responsibility to verify that this sheet is current prior to use. The user accepts all risk associated with any use of this product for any purpose other than as recommended herein.

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