Product Overview

PyroKarb

Thermo-Structural Composite
(300°C / 572°F)

www.high-temperature-composites.com

Pyrokarb is a class of composite materials based on advanced glass-ceramic matrices and reinforced with carbon fibers. Pyrokarb composites are used for the production of lightweight composite parts exposed to flames and to high temperatures, especially in the following situations:

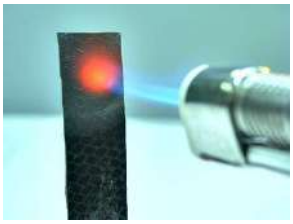
- **Parts operating at low temperatures in normal conditions, but requiring resistance to flames and fires (typically coming from batteries thermal runaway).**

- Parts requiring simultaneously good mechanical properties and long-term resistance to moderate temperatures, up to 300°C (572°F).

- Parts operating at very high temperatures, in excess of 1000°C (1832°F) for single-use applications, on a short-term basis.

Unlike carbon fiber reinforced polymers (CFRP), PyroKarb composites are completely incombustible. They do not release any smoke or harmful gases when exposed to elevated temperatures and successfully comply with the most stringent fire safety requirements: UL2596, ISO2685.

A distinctive property of PyroKarb composites is their ability to be processed at low temperatures, with techniques and tools similar to those used for conventional CFRP materials. This unique approach, developed and introduced by Pyromeral Systems, not only reduces lead times, it also eliminates the need for expensive processing methods such as those traditionally associated with high temperature composites, ultimately resulting in affordable parts, both for prototype manufacturing and full scale production.



Features:

- Proprietary glass-ceramic matrix based on thermoset inorganic polymers
- Reinforced with Carbon fibres
- Low density (<1.7 kg/dm^3)
- Short-term service temperature in excess of 1000°C (1832°F)
- Good mechanical properties
- Low coefficient of thermal expansion
- Outstanding fire, smoke and toxicity (FST) performance
- Compatible with large and complex shapes
- Environment-friendly
- Affordable

Motorsports

Aerospace

Defense

Parts made of Pyrokarb composites are commercially available from Pyromeral Systems, which operates three autoclaves, one hydraulic press, one filament winding machine and several ovens and furnaces at its facilities. Please contact us to discuss your requirements. Development grades for specific needs or applications are also available upon request.

Updated: 05/02/2025

TECHNICAL DATA

Glass-Ceramic Matrix Composite
Carbon Fiber Fabric – 2D – 0/90 Lay-Up

Property	25°C / 77°F	350°C / 662°F
Density	1.65 g/cm^3	
CTE	3.0 x 10^{-6} m/m.K	
Thermal Conductivity	1.0 W/m.K	
Tensile Strength	270 (±25) MPa	250 (±25) MPa
Tensile Modulus	75 (±5) GPa	73 (±5) GPa
Flexural Strength	200 (±25) MPa	220 (±25) MPa
Flexural Modulus	55 (±) GPa	50 (±5) GPa
Compressive Strength	140 (±10) MPa	-
Compressive Modulus	80 (±5) GPa	-

The data in this table reflects typical properties. Actual properties depend on the grade and processing methods used for sample preparation

Fire Resistance

PyroKarb composites meet the requirements
Of the FAA AC 20-135 and MIL-STD-2031 for Fire Safety

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Updated: 05/02/2025