



» APPLICATION BULLETIN

Nylon Alternatives Offer Consistent Performance for Powersports Applications

Edgetek™ PKE and Complēt™ PKE Polyketone Formulations

By definition, aliphatic polyketone (PK) is a semi-crystalline engineering resin. It has good tensile, thermal, flex, and impact properties like nylon (PA) while maintaining excellent wear and chemical resistance. The polymer structure of PK is very similar to PA6 and PA66, which explains their similar performance. While PK and PA are both semi-crystalline and contain an abundance of carbon and oxygen, polyketone lacks the nitrogen present in the amide bond of the nylon backbone. This makes PK much less hygroscopic and less sensitive to moisture conditioning than PA6 and PA66.

In addition, PK can improve the sustainability of a product through a lower carbon footprint because the production of the resin emits up to 61 percent less carbon dioxide (CO₂) than nylon.

The improved chemical resistance and lower moisture absorption properties combine with the eco-conscious benefits to make Edgetek™ PKE and long fiber Complēt™ PKE polyketone composites an excellent choice for powersports applications that require consistent performance across different and demanding environments.



KEY CHARACTERISTICS

IMPROVED CHEMICAL RESISTANCE

Engineered polyketone delivers excellent performance against aggressive chemicals, like H_2SO_4 for batteries (Figure 1), and performs similarly to nylon against typical chemicals tested in powersports, such as gasoline* (Figure 2).

Concentrated Acid - 30% H_2SO_4 , 24 HRS, 23°C

Nylon samples were almost completely dissolved after one day, while the Edgetek PKE bars are still visible.

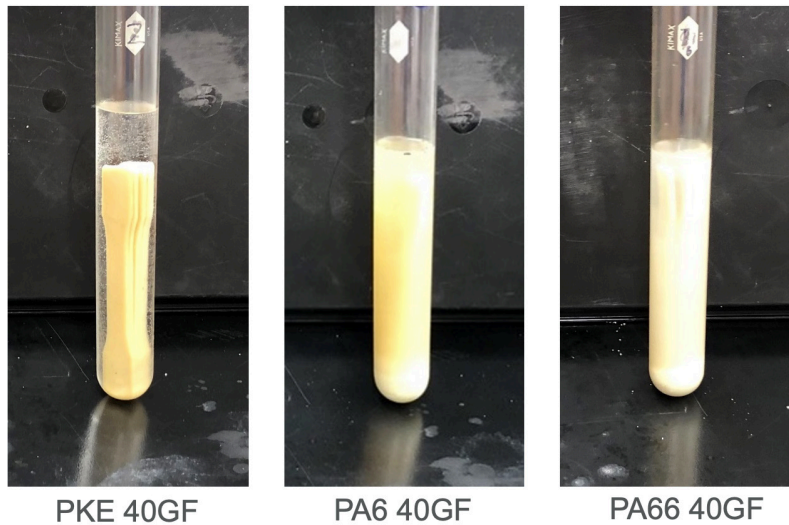


Figure 1

Gasoline - 30% glass-filled (GF) grade, dry as molded (DAM), room temperature

Testing methodology is an adaptation from ASTM D543

- Reapply freshly soaked gauze pad every 24 hours to prevent from drying out
- Repeat for a total of 72 hours
- Tensile properties recorded

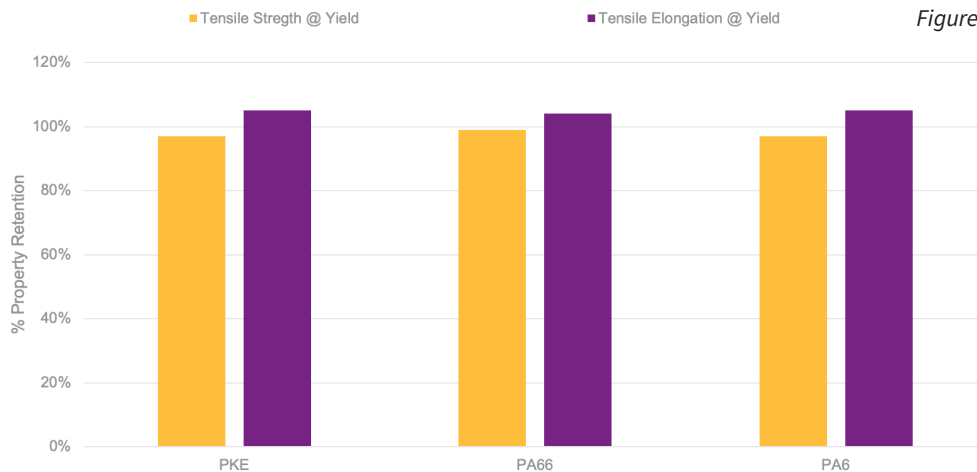


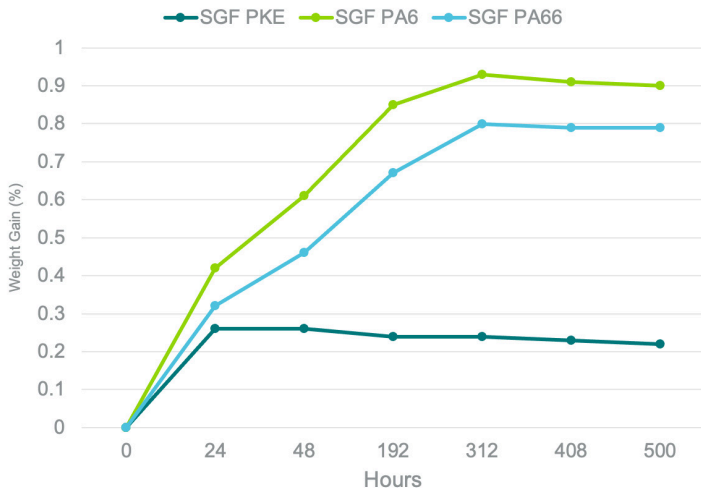
Figure 2

*Chemical resistance data for DEET, motor oil, glass cleaner, and sunscreen available upon request

LESS MOISTURE ABSORPTION THAN NYLON

30% Short Glass Fiber (SGF) Comparison

Moisture uptake, environmental chamber 62% RH, 70°C



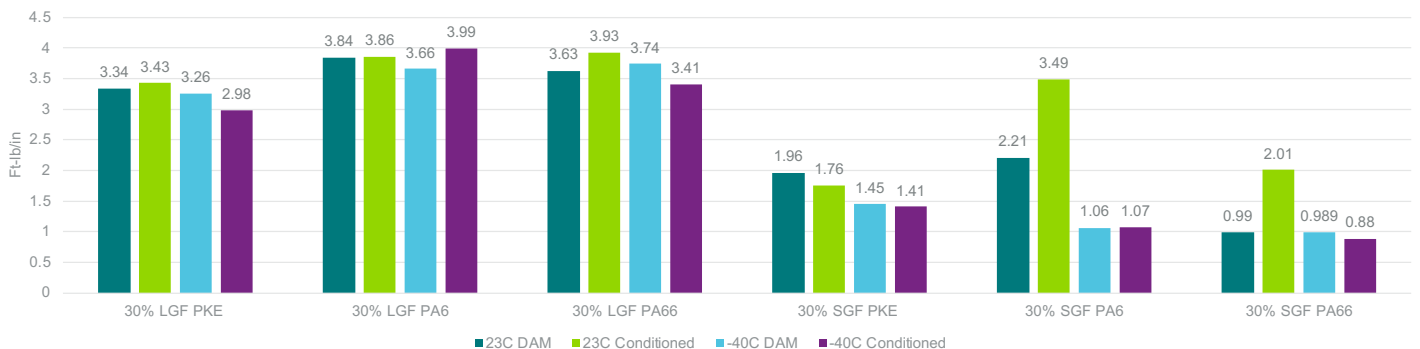
SIMILAR DENSITY TO NYLON

ASTM D792



COMPARABLE AND CONSISTENT IMPACT PERFORMANCE*

Notched Izod Impact (ASTM D256) of LGF and SGF for DAM and Conditioned Materials



*3,000 hr weathering data available upon request

FEATURED PRODUCTS

Edgetek™ PKE Glass-Filled Portfolio

Polyketone formulations with 20, 30, or 40% short glass fiber reinforcement available in natural or black

ET8900-0001 20GF NAT

ET8900-0002 30GF NAT

ET8900-0003 40GF NAT

ET8900-0004 20GF BLK

ET8900-0005 30GF BLK

ET8900-0006 40GF BLK

Complēt™ PKE Portfolio

Long fiber reinforced polyketone formulations with 30, 40, or 50% fiber loading and available in natural or black, and with or without a UL 94 V-0 flame rating at 1.5 mm

LGF30-PKE 1088 NAT

LGF30-PKE 2020 BLK

LGF40-PKE 1088 NAT

LGF40-PKE 2020 BLK

LGF50-PKE 1088 NAT

LGF50-PKE 2020 BLK



1.844.4AVIENT
www.avient.com



Copyright © 2024, Avient Corporation. Avient makes no representations, guarantees, or warranties of any kind with respect to the information contained in this document about its accuracy, suitability for particular applications, or the results obtained or obtainable using the information. Some of the information arises from laboratory work with small-scale equipment which may not provide a reliable indication of performance or properties obtained or obtainable on larger-scale equipment. Values reported as “typical” or stated without a range do not state minimum or maximum properties; consult your sales representative for property ranges and min/max specifications. Processing conditions can cause material properties to shift from the values stated in the information. Avient makes no warranties or guarantees respecting suitability of either Avient’s products or the information for your process or end-use application. You have the responsibility to conduct full-scale end-product performance testing to determine suitability in your application, and you assume all risk and liability arising from your use of the information and/or use or handling of any product. AVIENT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, either with respect to the information or products reflected by the information. This literature shall NOT operate as permission, recommendation, or inducement to practice any patented invention without permission of the patent owner.