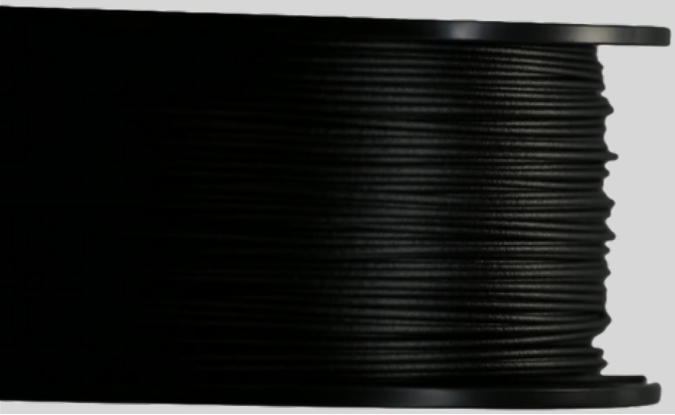
We're proud to represent the RIZIUM® line of advanced filaments. High-strength, high-performance parts and models with exceptional surface finish, durability, and reliability.

# RIZIUM™ Carbon Fiber

## Cyclic Olefin Copolymer (COC) blend withCarbonFiber3DPrintingFilament




Rizium™ CF is the only fiber-filled Cyclic Olefin Copolymer (COC) blend filament on the market—engineered specifically for engineers who need results, not problems.

It delivers fast, low-failure 3D printing with outstanding surface finish, dimensional stability, and near-isotropic strength—without the need for drying.

Ideal for demanding environments and production-ready applications where reliability, throughput, and cleanliness are critical.

## *1. Product Overview:*

Rizium™ Carbon Fiber is an advanced engineering-grade filament designed specifically for FFF 3D printing. Through its Cyclic Olefin Copolymer blend with Carbon fiber, it provides high throughput, hassle-free 3D printing creating parts that have stunning visual finish, near isotropic properties, very low moisture absorption, excellent chemical resistances, and certified printing safety.

Use Rizium™ to keep up with the demand and provide parts that are durable with a high-quality surface finish.

Rizium™ Carbon Fiber will work with any printer that has hardened gears and nozzles.

## *2. Why Choose Rizium™ CF:*

Material Advantages:

***Near-Isotropic Strength***

Superior layer adhesion ensures parts are strong in all directions—not just XY.

***High Rigidity for Structural Stability***

Maintains stiffness under load—ideal for precision parts and mechanically demanding applications.

***Outstanding Surface Finish***

Smooth, professional parts right off the printer with nearly invisible layer lines.

***No Drying Required***

<0.01% moisture absorption means Rizium™ CF is always ready to print—even in humid environments.

***High Strength at Low Density***

Strong, durable parts without added weight—ideal for aerospace and robotics.

***Dimensional Stability***

Minimal elongation and low shrinkage keep parts accurate, even in high-tolerance applications.

***Chemical Resistance***

Withstands acids, alcohols, and ketones—perfect for lab, industrial, or field use.

***Cold-Resistant***

Performs reliably in subzero and cryogenic environments.

***UV Stable and Rigid***

Maintains form and function in outdoor or UV-exposed applications.

***Low Outgassing***

Safe for use in cleanrooms, electronics, and controlled environments.

Printing Advantages:

***High-Speed Print Capability***
Supports flow rates up to 30 mm³/s and speeds up to 250 mm/s—without sacrificing quality.

***Warp-Resistant & Dimensional Accuracy***
Low to no warping means more successful large parts and better batch consistency.

***Low VOCs, Safe to Print Indoors***
UL GREENGUARD 2904 certified—clean enough for classrooms, labs, and offices.

***Support-Compatible***
Works with breakaway and tree-style supports; even better with Rizium™ Support.

***No Stringing & Clean Transitions***
Produces neat, clean prints with fewer artifacts—even at high speeds.

***Plug-and-Play Reliability***
A forgiving print window that works well on most modern FFF printers with a hardened nozzle.

## *3. Applications:*

### *Engineering, Manufacturing & Production*

***Prototyping & Functional Testing***
Quickly iterate and test designs with parts that mimic production-level mechanical performance.

***End-Use Parts***
Print durable, dimensionally stable components ready for real-world use.

***Tools, Jigs & Fixtures***
Create production-line aids and precision tools that hold up to industrial wear and chemical exposure.

***Replacement Parts & Field Repairs***
On-demand manufacturing of strong, moisture-resistant parts for maintenance and service.

### *Chemical & Environmental Applications*

***Chemical Processing Equipment***
Print components like fluid routing guides, housings, or brackets exposed to alcohols, acids, and ketones.

#### *Environments with Chemical Exposure*
Ideal for lab, industrial, or outdoor parts where aggressive cleaning or chemical handling occurs.

#### *Submersion & Wet Environments*
Low moisture absorption makes it suitable for splash zones, humid environments, or temporary submersion.

### *Cold Chain & Subzero Applications*

#### *Cold Storage Equipment*
Print parts for freezers, refrigerated warehouses, or cryogenic systems that remain dimensionally stable.

#### *Cryogenic-Compatible Components*
Reliable in environments well below freezing, ideal for scientific, aerospace, or medical use.

### *Aerospace, Robotics & Electronics*

#### *Drones & UAV Frames*
Lightweight, rigid parts with excellent surface quality for payload mounts, arms, or airframes.

#### *Robotic End-Effectors & Brackets*
Durable and impact-resistant for moving parts in automated systems.

#### *Electronics & Sensor Enclosures*
Clean, static-safe, and chemically resistant housings for industrial, consumer, or research electronics.

#### *Optical Devices & Enclosures*
Smooth surface finish and precision printing support light-sensitive or lab-grade equipment.

### *Medical, Cleanroom & Lab Use*

#### *Medical Device Prototypes (Non-Implantable)*
Rapidly iterate ergonomically accurate or functional components with chemical safety.

#### *Cleanroom-Safe Parts*
GREENGUARD 2904-certified base material; suitable for electronics manufacturing, pharmaceutical, and controlled environments.

#### *Lab Accessories*
Chemically inert and structurally stable tools for research, diagnostics, and wet chemistry.

### *Education, R&D & Field Applications*

***STEM & Engineering Education***

Easy-to-print, reliable filament for academic labs or student engineering programs.

***Research Fixtures***

Build one-off or iterative setups with confidence in part performance and printability.

***Field-Service Tools & Components***

Fast-printable parts for temporary or emergency use in remote conditions, with strong resistance to temperature and moisture variability.

***4. Mechanical Properties:***

| | | | |
|---|---|---|---|
| ***Flexural Strength*** | 85 MPa | 12.3 Kpsi (max strain 23°C) | ISO 178, Method A |
| ***Flexural Modulus*** | 4.8 GPa | 682 Kpsi | ISO 178, Method A |
| ***Tensile Strength*** | 56 MPa | 8.1 Kpsi | ASTM D638 |
| ***Tensile Elongation*** | 1.1% | 1.1% | ASTM D638 |
| ***Tensile Modulus*** | 6.7 GPa | 966 Kpsi | ASTM D638 |
| ***IZOD Impact, Unnotched*** | 225 J/m | 4.2 ft-lb/in | ASTM D256 |
| ***IZOD Impact, Notched*** | 75 J/m | 1.4 ft-lb/in | ASTM D656 |

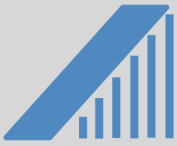
*Tests performed with parts printed on RIZE™ONE printer using solid infill in the X-Y Plane.

| | | |
|---|---|---|
|  | Glass Transition | 78°C |
| | Heat Deflection (HDT) | 73°C |
| | Flame Classification | UL94-HB |
| | | |
|  | Specific Gravity | 1.02 g/cm3 |
| | Moisture Absorption | <0.01% |
| | Chemically resistant to acids, alcohols, and ketones. See Section 5. | |
| | | |
|  | Venting Requirements | None |
| | Low VOC and Particulate Emissions | |
| | UL Greenguard2904 Certified<br>On Rize Printers | |
| | | |
|  | Filament Diameter | 1.75 mm ±0.02 mm |
| | Packaging<br>Shelf Life | 50 in3<br>820g spool |
| | | One Year |
| | Storage Requirements | Store in bag until ready to use and store in bag when not in use. |
| | Due to its low density, an 820g spool of Rizium™ CF offers a similar filament length to a 1kg PLA spool. | |

## *5. Chemical Resistances:*

| O – Good | X – Poor | ! – Use with caution |
|---|---|---|
| Alcohol | Methanol | O |
| | Ethanol | O |
| | IPA (isopropyl alcohol) | O |
| Ketone | Acetone | O |
| | MEK (Methyl Ethyl Ketone) | O |
| | Cyclohexanone | X |
| Ether | Ethyl Ether | X |
| | THF (Tetrahydrofuran) | X |
| Aromatic | Xylene | X |
| Hydrocarbon | n-Pentane | X |
| | n-Hexane | X |
| | Toluene | X |
| | Hydrocarbon Oil | X |
| | DOP (Dioctylphthalate) | X |
| Other Solvents | DMF (Dimethylformamide) | O |
| | DMSO (Dimethyl Sulfoxide) | O |
| | Methyl Cellosolve | O |
| | Limonene | X |
| | Hydrochloric Acid (10%) | O |
| Acid | Concentrated Hydrochloric Acid | O |
| | Sulfuric acid (10%) | O |
| | Concentrated Sulfuric Acid | X |
| | Acetic Acid (10%) | O |
| | Formic Acid (10%) | O |
| | Nitric Acid | O |
| | Phosphoric Acid | O |
| | Hydrofluoric Acid (7%), Nitric Acid (42%), Pure Water (51%) | O |
| | Caustic Soda (50%) | O |
| Base | Aqueous Ammonia (10%) | O |
| | Formaldehyde (40%) | O |
| Other Chemicals | Hydrogen Peroxide Water (30%) | O |
| | Ethylene Oxide | O |
| | Fluorinated Oil | O |
| | Silicone Oil | X |
| | 1,2-Dichloroethane | X |
| | Salad Oil | X |
| Foods | Margarine | O |
| | Lemon Juice | O |
| | Hair Liquid | O |
| Personal Care | Hair Tonic | ! |
| | Hair Shampoo | O |
| | Hair Rinse | |
| Detergent | | |
| | | |

### *6. Printing Guidelines:*

| ***Printer*** | | |
|---|---|---|
|  | Enclosure | Not Necessary |
| | Nozzle | 220°C - 260°C<br>Hardened Steel or Wear Resistant |
| | Bed | 90°C<br>PEI, Textured, G10 |
| | Cooling | 20-70% |
| | Not idealforsystemswith tight filament tube curves.<br>Onlyusein multi-materialsystems that arerated fiber filledmaterials. | |
| ***Suggested Printing Parameters*** | | |
|  | Layer Height | .1mm to .3mm |
| | Part Cooling | 20%-70% |
| | Print Speed | 40mm/s to 250mm/s * |
| | Volumetric Flowrate | 30 mm3/s * |
| | Flow Ratio | 1-1.05 |
| | Infill Overlap | 30% |
| | *Depending on hotend setup, measured on a Bambu Lab X1C | |
| ***Support*** | | |
|  | Support Type | Tree (preferred) |
| | Interface Layers | Min. of 3 |
| | Interface Distance<br>Support Threshold | .14 mm<br>(0mm if using Rizium™ Support) |
| | | 45° |
| | Need to support all bridges and angles for surface finish | |

### *7. Storage & Shelf Life:*

Store in supplied bag when not in use.

Shelf life of one year.

### *8. Considerations for Best Performance:*

Due to its poor chemical resistance to hydrocarbons (oil and gas products), it is not an ideal material for automotive applications.
Not ideal for high temperature applications with its 73°C HDT.

The material does not excel at bridging and overhangs. Please support bridges and overhangs well and if you are using a dual nozzle system consider using Rizium™ Support, a breakaway support material, to give clean and smooth undersurfaces on parts.