UltiMaker guide

Nylon CF Slide

Introduction

Nylon CF Slide, UltiMaker's new tribological material, provides the perfect solution for demanding applications exposed to wear, friction and movement. Its unique chemical structure offers both strength and stiffness, as well as reduced moisture uptake compared to other Nylon 6 composites available on the market. Nylon CF Slide proves to be the ideal material for replacing Polyoxymethylene (POM) applications. Its special formulation outperforms all other PFAS-free alternatives available on the market. POM, up to now, has been the go-to material for these types of applications. Therefore, it serves as an excellent starting point for exploring potential uses of Nylon CF Slide. It's important to note that this material may offer additional advantages over POM.

Key applications

With exceptional wear-resistance and low friction properties, Nylon CF Slide is particularly well-suited for a wide range of applications involving motion and movement. These properties ensure components made from this material will maintain their dimensional stability and surface finish even under demanding conditions, enhancing service life and reduced maintenance.
Example applications are:

- Conveyor components as guides, wedges, dividers, and sprocket wheels
- Infeed, scroll, and starwheels
- Transition blocks/plates
- Gripper fingers
- End-of-arm tooling
- Gears
- Jigs and fixtures

Key properties

Nylon CF Slide is a durable, wear-resistant material with the rigidity of a composite, requested by customers and partners working with UltiMaker. Its non-marring quality, especially in contact with stainless steel, makes it an ideal replacement for POM material in various industries and applications. Key material highlights:

- Wear-resistant
- Low friction
- Chemical resistant against industrial solvents and oils
- Temperature resistant (135 °C before annealing, 180 °C after annealing)
- Tensile Z strength >40 MPa
- PFAS-free formulation

Key industries

Every industry can benefit from having a non-marring, wear-resistant but still stiff material for more demanding applications not possible with other 3D printing filaments. These industries include:

- Automated packaging (food and beverage, consumer products)
- Automotive
- Defense
- Railway
- Industrial machine builders/suppliers
- Agriculture
- Mining

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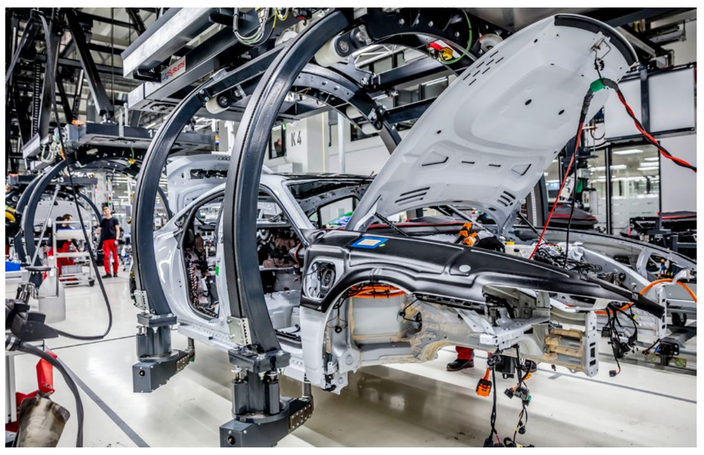

Material drying

While it has reduced moisture absorption, and thus produces high-quality 3D prints right out of the box, it is still crucial to store the filament correctly, as it may absorb moisture over time. The UltiMaker Material Station provides optimal storage conditions. If you are printing from the back spool holder of the UltiMaker 3D printer, be sure to monitor the filament's condition.

If you don't use the filament often, it is best to store the spool in a sealed container (ideally a vacuum sealed container with desiccant) or print directly from a filament dryer. If you notice a change in the quality of your prints, be sure to dry the filament in either a filament dryer or an oven at a temperature of 70 - 100 °C for a duration of 8 - 12 hours.

Post-processing capabilities

To enhance the unique properties of this material, Nylon CF Slide parts can be post-processed. It is possible to mill (lathe/CNC), drill, sandblast and sand/polish the 3D printed part to the desired end results. Exposure to moisture/liquids did not show significant changes in the dimensional accuracy of the 3D model. Please note this case was monitored with perfectly pre-dried filament.

Compatibility

Nylon CF Slide is compatible with both S and Factor series UltiMaker 3D printers and can be printed with the CC and HT print cores. Compatible with self, breakaway and water-soluble PVA supports for full design freedom.

Spooled on a cardboard spool and sealed in an aluminum reusable vacuum bag with desiccant. With the provided NFC sticker, the material is automatically recognized by the UltiMaker 3D printers for easy and hassle-free synchronization between hardware and software.

Annealing capabilities

Annealing is a heat treatment process traditionally used in metallurgy and glassmaking to relieve stresses, increase ductility, and improve material properties. The basic principle involves heating a material to a specific temperature using a specialized oven and then cooling it at a controlled rate.

When applied to 3D printed parts, particularly those made from semi-crystalline materials like PET CF and Nylon (CF Slide), annealing can improve mechanical properties such as tensile strength, stiffness, and heat-resistance. The results of annealing will vary depending on the material used. For this reason, the process can be complicated and may yield unexpected results. UltiMaker Nylon CF Slide, however, was designed specifically with annealing in mind. Increasing strength and stiffness up to 60%.

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