

## Press Release

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### Laser Cutting Glass-Filled Nylon Gears

Nylon gears are commonly used in many automotive, electronic, and medical applications, as well as in various industrial machines. Nylon gears offer increased service life because they wear less than metal gears (even though they require less lubrication) and reduce gear noise, which is important in consumer products. Adding a 20% to 30% glass fill to the nylon blend increases the material's stability, rigidity, and wear-resistance.

This application demonstrates the ability of a Synrad CO2 laser to precisely remove the machining hub from the centre of this helical-cut gear after the last manufacturing step.

The laser cutting set-up consisted of a Synrad *Firestar f201* laser delivering the beam via XY "flying optics" into a cutting head containing a 127 mm (5.0") plano-convex focusing optic. This optic produces a 203-micron (0.008") spot with a 6.3 mm (0.25") depth of focus. During the cutting process, 2.8 bars (40 PSI) of breathing-grade bottled air was supplied coaxially, with the beam as gas assist.



The machining hub, which measures 2.4 mm (0.093") thick, was cut from the front face of the gear by trepanning a 30.7 mm (1.21") diameter hole that matches, and is aligned to, the bore of the gear. Using 200 watts of power at a cut speed of 2.54 meters per minute (100 inches/minute), the hub was removed in a cycle time of 2.3 seconds per gear. As seen in the photo, the cut edge exhibits slight charring due to the glass fill but has no effect on the finished product.

**Picture:** A 0.093" thick hub was cut from this glass-filled nylon gear using 200 watts of power at a speed of 100 inches per minute.

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