

USE CASE:

Off-road go-kart with 3D-printed resin parts designed in the US

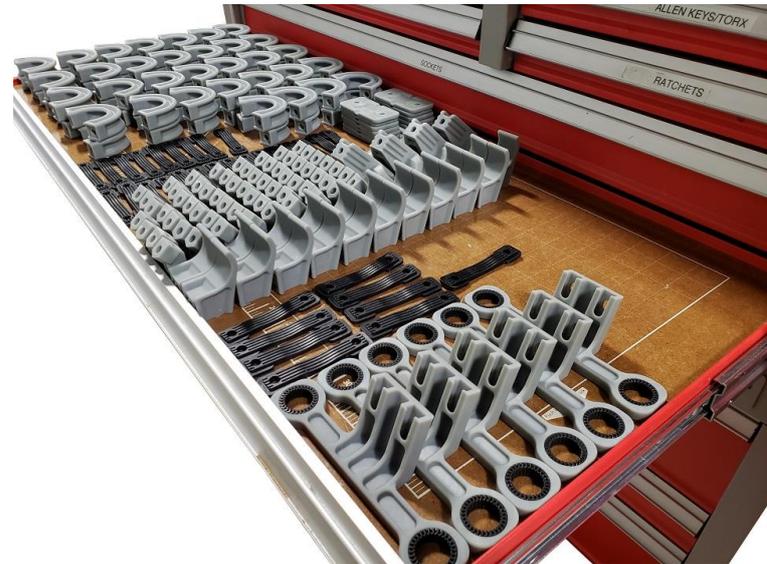
Torque Off-Road TQ390



Introducing the first go-kart designed for off-road recreational riding for the whole family! Fill out the form below to get notified when it's available for private purchase or if you are interested in becoming a dealer.

US based product design firm [Paul Hammerstrom Design](#) works together with off-road go-kart manufacturer [Torque off-road](#) to develop resin 3D-printed parts for their new TQ390 go-kart.

Paul Hammerstrom Design is a product design firm that understands that designs must be produced in a robust cost effective manner. While maintaining a rigorous adherence to engineering theory and principles, they understand not all clients need this. With many years of experience and many products on the market, PHD has a wealth of knowledge to draw from. This saves clients time and money. For the new design of Torque off-road, PHD was requested to develop robust parts in an efficient way.





“

All parts were printed with Liqcreate Strong-X, Tough-X and Flexible-X resin on EPAX3D X10's and X1 3D-printers. Mass manufacturing was easy due to reliable machines and materials

Paul Hammerstrom – Owner at Paul Hammerstrom Design LLC

With a workflow of design software, Epax3D printers, Liqcreate engineering resin and a Wicked Engineering Curebox, Paul's design firm was able to quickly design, print and test new iterations of the design until the final part was mass printed. When larger parts, or larger volumes are required, businesses can easily upgrade to a larger format Epax3D printer or a faster, more advanced 3D-printer like an UnionTech Cute300 4K, Asiga 4K 3D-printers.

Paul Hammerstrom continues: *“All parts were printed with Liqcreate engineering 3D resins: Strong-X, Tough-X and Flexible-X resin on EPAX3D X10's and X1 3D-printers. Mass manufacturing was easy due to reliable machines and materials”.*

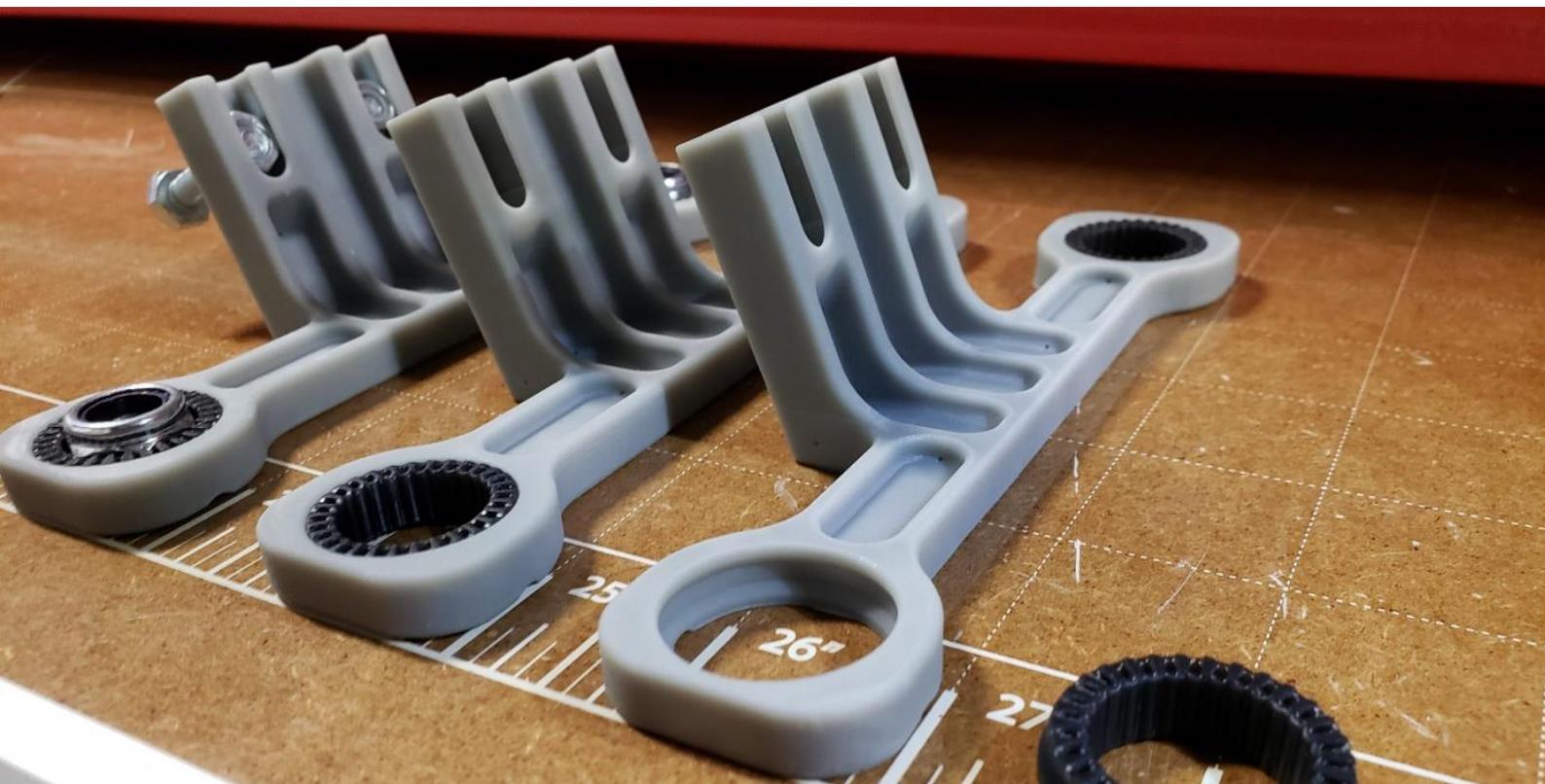


Image: 3D-printed go-kart parts printed in engineering resins Strong-X and Tough-X resin for the Torque Off Road TQ390.

3D-printing with Liqcreate engineering resins

[Paul Hammerstrom Design LLC](#) used the [Epax3D X10 and X1](#) MSLA 3D-printers to manufacture engineering grade parts with Liqcreate resins. Rigid parts were manufactured in Strong-X resin, tough parts made from Tough-X and the soft and elastic parts with Flexible-X. 3D-printing parameters were developed and published in cooperation with Paul and Epax3D. Print settings for these and other 3D-printers can be found [here](#). After printing, the parts were washed and post-cured in the Wicked Engineering Curebox.

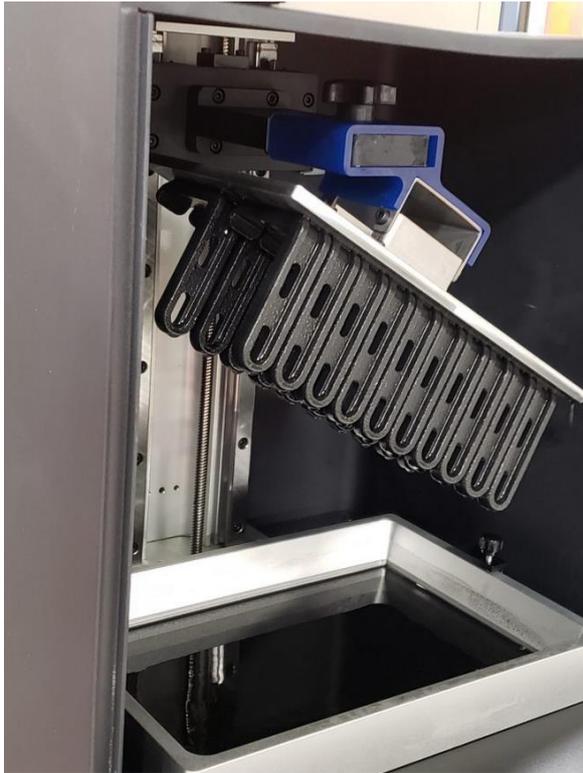


Image: printing parts in the [Epax3D X10](#) and post-curing engineering resin [Liqcreate Strong-X](#) in the [Wicked Engineering Curebox](#).

Functional parts for the off-road go-kart 3D-printed with Liqcreate engineering resins

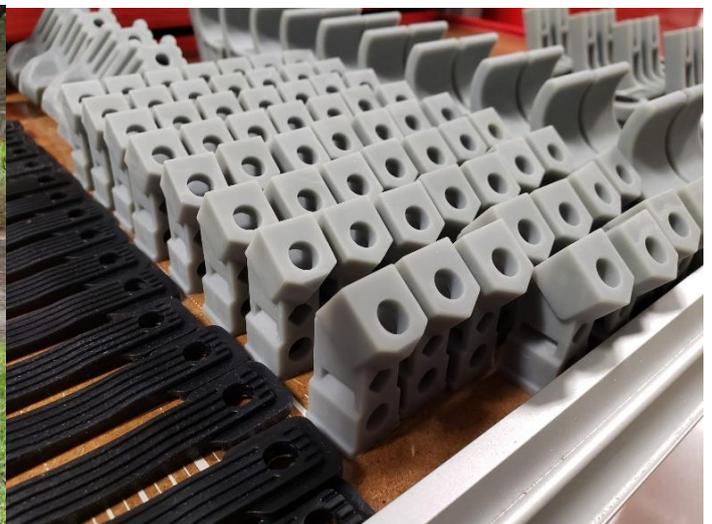




Image: 3D-printed go-kart parts printed with engineering 3d resins: Strong-X and Tough-X resin for the Torque Off Road TQ390.

Manufacturing partner

Paul Hammerstrom Design recently joined Liqcreate's certified production partner program. Find your local certified production partners [here](#). Reach out to our partners for projects like Torque off-road, or when you simply need parts manufactured with Liqcreate resins.



About the used resins:

Liqcreate Flexible-X

[Liqcreate Flexible-X](#) is an opaque black photopolymer with great processability and print speed on MSLA, DLP and laser based 3D-printers. 3D-printed parts from this material have exceptional flexibility and great rebound properties. Liqcreate Flexible-X is easy to use on all open source DLP, LCD and SLA 3D-printers in the range of 385 - 420nm. Its low hardness of 55 Shore A and elongation up to 160% makes it perfect for the production of a diversity of industrial applications. More info go to www.liqcreate.com



Liqcreate Strong-X

[Liqcreate Strong-X](#) is one of the strongest materials available in the market. Its flexural strength of 135MPa is comparable to industry's leading dual-cure cyanate ester resins. Liqcreate Strong-X is easy to use on all open source SLA and DLP 3D-printers in the range of 385 - 405nm and only requires UV post-curing. This material has excellent features like high strength, high stiffness and high temperature resistance which makes it ideal for injection molding and heavy duty applications.



Liqcreate Tough-X

[Liqcreate Tough-X](#) is an opaque black photopolymer. 3D-printed parts from this material have exceptional durability. Liqcreate Tough-X is easy to use on all open source DLP, LCD and SLA 3D-printers in the range of 385 - 420nm. This material has excellent properties like high impact strength and up to 150% elongation, making it perfect for the production of industrial spare parts and functional ABS type products.

