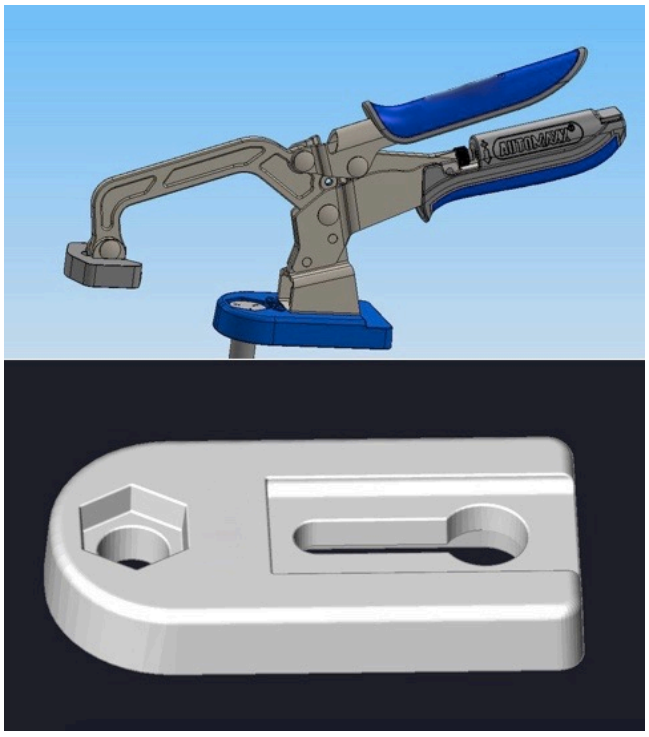
RIZE THERMOPLASTIC PARTS BEAT CARBON FIBER AND NYLON IN INDEPENDENT FUNCTIONAL STRENGTH TEST

Recently, a global tool manufacturer conducted a comparative functional strength test that combined compression strength, flexural strength and bearing strength on a 3D printed part produced on Rize, Markforged, Dimension and Fortus systems, as well as a machined version of the part.

To conduct the test, a design engineer at the company first bolted the 3D printed plate to a table and inserted the bench clamp into the slot. He then clamped the clamp onto a pressure sensor and increased the pressure through each level until the part broke.



The results speak for themselves. The Rize 3D printed part not only performed as well as the machined part, it outperformed every other 3D printed part tested - most notably both Markforged parts, including the one reinforced with carbon fiber.

FUNCTIONAL STRENGTH TEST

3D Printer	Dimension 1200	Markforged X	EnvisionTec Xtreme 3SP		Rize One	Markforged X	Fortus 380	Fortus 380
Material	ABS	Onyx	ABS	Machined Nylon	Rizium One	Nylon w/Carbon Fiber	Nylon	PC ABS
Clamping Force								
40	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
60	Pass	Pass	Pass	Pass	Pass	Fail	Pass-bowing	Pass
80	Pass-started to bow	Started to crack	Pass-started to bow	Pass-flexing	Pass	Flexing to the point where we can't get it above 70 pounds and it's cracking	Pass	Pass
100	Pass	Fail	Pass	Pass	Pass-bowing		Pass	Pass
120	Pass		Pass	Pass	Pass		Pass	Pass
140	Pass		Pass	Pass	Pass		Pass-major bowing	Fail
160	Pass		Fail	Pass	Pass		Pass	
180	Pass			Pass	Pass		Pass	
200	Pass			Pass	Pass		Fail	
220	Started to crack			Pass	Pass		Won't go above 210	
240				Head of bolt pulling through the bottom	Fail			
260								

How is this possible? Carbon fiber-reinforced parts *must* be stronger than thermoplastic parts, *right*?

Wrong.

Unlike all the other 3D printing technologies tested, Rizium™ One, Rize's own compound of engineering- and medical-grade thermoplastic, is isotropic, meaning, it is uniform in x, y and z axes (see Rizium One spec sheet). In fact, the other 3D printer manufacturers included in the test either don't publish their material specifications or, if they do, they don't include their Z-axis strength. Given that real-world parts, such as machined or molded parts, have isotropic properties, Rize's isotropic part capability makes our technology uniquely suited to creating prototypes for functional testing, tooling and one-offs of customized end-use parts.

The company's testing underscores that a part is only as strong as its weakest point and we can't assume that just because a part is made of carbon fiber or nylon, it is stronger than Rizium One thermoplastic; in fact, the reverse is true by a wide margin.

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