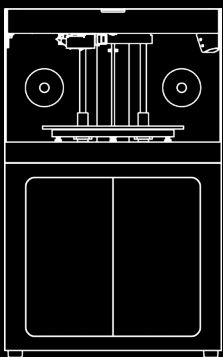


Roman Design Solutions

Scaling Jig Production
and Reducing Operator Strain



Industry
Application
Technology
Materials

Automotive
Jigs & Fixtures
X7
Onyx + Carbon Fiber

The Challenge

Roman Design Solutions is a relatively small designer and manufacturer of complex Jigs and Fixtures, located in the stunning moorlands of High Peak, not far from Buxton, England.

Primarily serving the British automotive industry, Roman's expertise are highly regarded due to their reliability and creativity when it comes to complex assemblies designed to deliver accuracy and precision in the automotive assembly process.

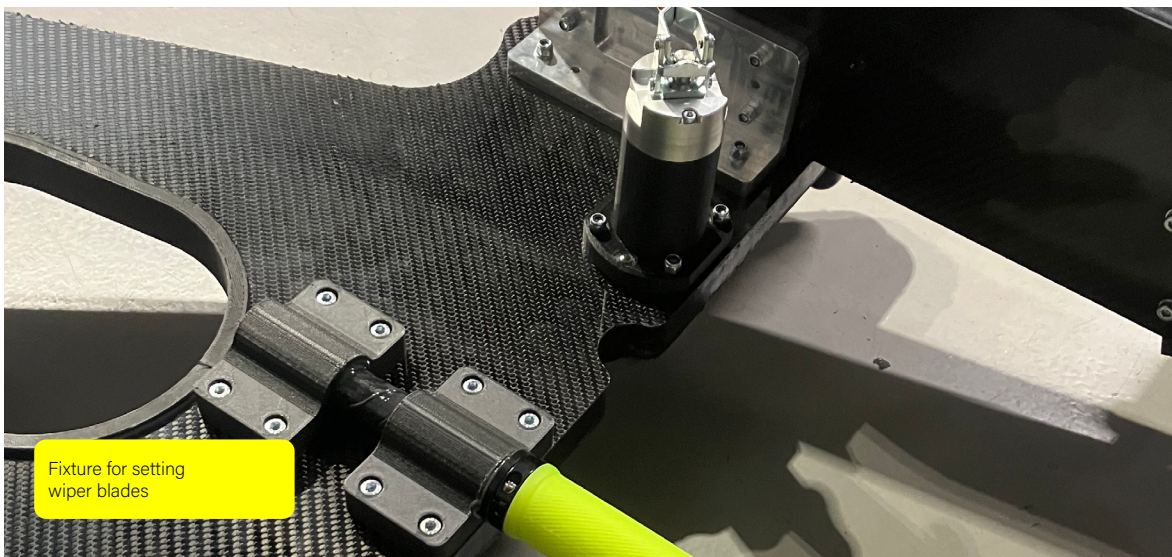
The team is led by Stuart Bowler, Director and Design Engineer, and user of Markforged's composite 3D printers since 2017. The company now has 5 printers, all of which run continuously, printing strong and precise parts in Onyx®.

They began printing because their CNC machine shop was already at full capacity, and customers were pushing for lighter fixtures to reduce operator strain and the risk of repetitive strain injuries (RSI).

Scaling by adding CNC machines and additional machinists wasn't a cost-effective or space-efficient option.

“The customers are always asking for lighter parts, and we can print parts lighter than we can machine them out of plastic, so increasingly it just makes sense to print them’

- Stuart Bowler
Director and Design Engineer



The Solution

Roman Designs' additive manufacturing journey began after meeting Markforged at a trade show in 2017, and they were immediately impressed by the strength and surface finish of the parts on display.

Immediately they invested in their first printer for a specific project for a British automotive company, and even offered a money back guarantee on the parts, to help build confidence in the idea of replacing machined aluminium with composite printed parts. The end user's nerves were quickly overcome, and as a result, both Roman Design Solutions AND the end user have continued to invest in Markforged technology ever since.

A typical production run for a Roman Designs project can be 30 - 60 units at a time, but is often much smaller for more specialised fixture assemblies. Whilst they have a capable machine shop and skilled machinists onsite, they are normally at capacity with regards to their CNC machines.

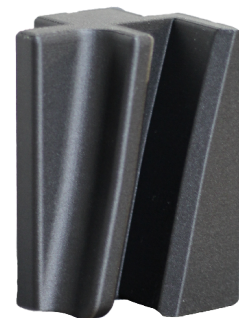
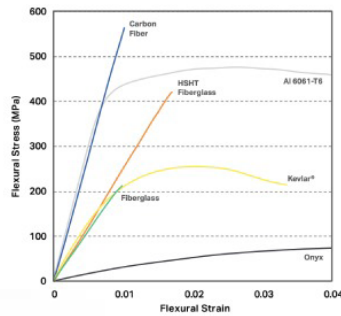
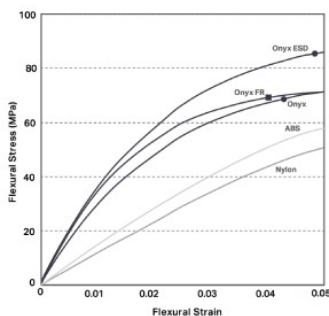
Squeezing more CNC machines into the facility and employing more machinists wasn't preferable, and so it has proven far easier for Roman Designs to meet demand by gradually expanding their fleet of Markforged Printers.

“There’s a real risk of repetitive strain injury in this environment.

Plus, for the larger fixtures, we can reduce the weight so much that it takes one person to lift instead of two, which is an obvious benefit’

- Jim Hardy
Design Engineer

Onyx and CF versus Al 6061-T6



Showcased above is the fixture component.

The Future

Roman Design Solutions maintains very strong working partnerships with their clients. So much so that they share all CAD with the end users, who can then maintain and repair their own fixtures onsite when needed. By sharing users with the locked and encrypted Markforged print file (.mfp), the end user can replace printed components without invalidating their fixture warranty; automotive clients love this because printing parts is much less hassle than scheduling machining hours.

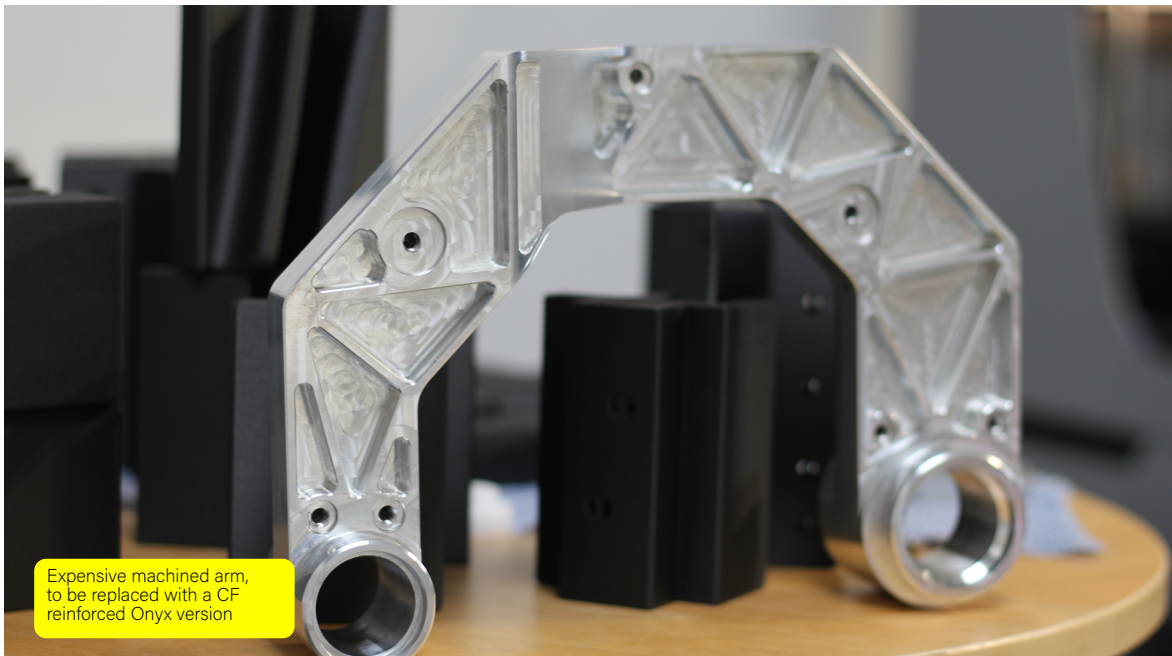
Stuart, Jim and the team are looking forward to printing more materials in the future, including Onyx® ESD and Nylon White. They'd also love a coloured version of Onyx® for colour coded left / right fixtures, which the Markforged Product Team have been made aware of.

“We used to design parts for machining mostly. Now that we design for printing, we add things like chamfers and radii to reduce shear stresses at corners and improve printability.

We’re always learning, but we very rarely see failures these days’

- Jim Hardy

Design Engineer



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