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University of Warwick Uses Stratasys Fortus 3D Printer to Build “Most 3D Printed Vessel on the Grid” for Upcoming European International Submarine Race

The ‘Godiva 2’ submarine features numerous 3D printed parts designed to withstand the harsh ocean environment, including the fins, feet, propeller, interior steering components and many other fixings

Using its Stratasys Fortus 3D Printer, the Warwick Submarine team was able to produce the final manufactured parts 90% faster than using conventional methods, while saving £2000-£3,000 in costs

Having won the prestigious innovation award at last year’s championship for the high-use of Stratasys 3D printing within the prototyping of the submarine, the team decided to this year go a step further

BADEN, Germany--(BUSINESS WIRE)-- Stratasys EMEA, a subsidiary of Stratasys Ltd. (Nasdaq:SSYS), the 3D printing and additive manufacturing solutions company, announced today that, using a Stratasys Fortus 3D Printer, six engineering students at The University of Warwick have built a 3D printed submarine which is set to race at the European International Submarine Races in Gosport, UK (July 6-15). Claimed to be the “most 3D printed vessel on the grid”, the ‘Godiva 2’ submarine features numerous 3D printed parts designed to withstand the pressures of racing. These include the fins, and the feet in which they sit, the propeller shroud and blades, as well as a number of fixings, housings and internal steering components.

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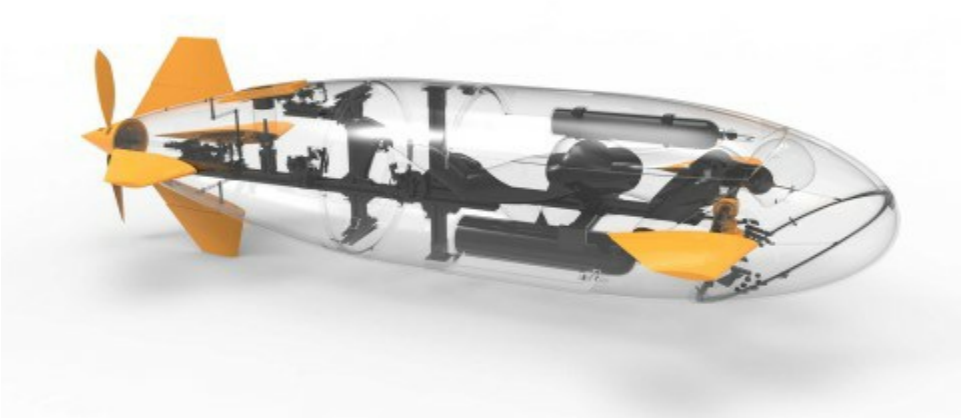
According to Josh Dobson, Project Leader of the Warwick Submarine team, the use of its Fortus 3D Printer has been integral to building the submarine in time for the race, as well as keeping costs within the university’s tight budget.

“Our extensive use of 3D printing remains one of our strengths,” says Dobson. “Our Stratasys Fortus 3D Printer is very much at the heart of our design and manufacturing process, providing significant benefits that simply could not be achieved via traditional methods. Using this technology, we were able to 3D print final parts for the submarine 90% faster than using conventional manufacturing and also saved £2,000-£3,000 in manufacturing costs. These are parts that can perform in the harshest waters, which is incredible given the speed and cost at which they can be produced.”

Running for its fourth year, the academic project challenges final year Masters engineering students to build and race a human-powered submarine at the annual European International Submarine Races. The project involves designing and manufacturing the submarine, which the students perform under the supervision of WMG's Dr Ian Tuersley and in their pit area within WMG's Engineering Hall. Having won the prestigious innovation award at last year's championship for the high-use of Stratasys 3D printing within the prototyping of the submarine, the team decided to this year go a step further. This saw them extend the use of 3D printing technology to include the manufacture of final production parts capable of performing in actual racing conditions. Using their Fortus 3D Printer, the students used Stratasys' advanced ABS-M30 material – ideal for end-use environments due to its strength, functionality and ability to perform under complex shapes.



The Godiva 2 will race at the European International Submarine Races as the "most 3D printed vessel on the grid", produced using Stratasys' Fortus 3D Printer (Photo: Business Wire)

"The material development over the last few years at Stratasys has been integral to the evolution of 3D printing from beyond solely a prototyping tool right through to where we are today; 3D printing parts for direct use on our submarine," continues Dobson. "All the parts were produced from ABS-M30, apart from the propeller blades which were 3D printed by Stratasys in the USA.

"Having access to this technology gives us the flexibility to produce extremely complex and multi-functional parts cost-effectively and on-demand," continues Dobson.

"For example, our fixing feet are an incredibly complex piece of geometry and have been 3D printed to perfectly fit the hull at virtually no additional cost, yet remain as functional and strong as a traditionally manufactured part. In addition, by creating the part using 3D printing, we've reduced material wastage by about 75% compared to machining the part traditionally from a solid piece of metal, which bodes well for a future of more sustainable manufacturing," he adds.

Known as 'WarwickSub', the team of six students derive from various multi-disciplinary backgrounds including mechanical and manufacturing engineering. In addition to building a one-of-a-kind submarine, the students spend a significant amount of time engaging with other school pupils to encourage the uptake of STEM subjects, as well as working with industry partners internationally to learn more about the latest innovations in engineering.

"The Warwick Submarine team is a credit to their university which exemplifies the exciting future of British engineering," concludes Sig Behrens, General Manager, Global Education at

Stratasys. “We are seeing rapid growth in the number of applications that disrupt traditional manufacturing processes to increase speed and reduce costs leveraging our Fortus line for final part production. It’s an exciting future – and for the engineers of tomorrow – it is critical that they learn this technology now as much as possible, as the demand for 3D printing design skills becoming increasingly common.”

For more than 25 years, Stratasys Ltd**. (NASDAQ:SSYS)** has been a defining force and dominant player in 3D printing and additive manufacturing – shaping the way things are made. Headquartered in Minneapolis, Minnesota and Rehovot, Israel, the company empowers customers across a broad range of vertical markets by enabling new paradigms for design and manufacturing. The company’s solutions provide customers with unmatched design freedom and manufacturing flexibility – reducing time-to-market and lowering development costs, while improving designs and communications. Stratasys subsidiaries include MakerBot and Solidscape, and the Stratasys ecosystem includes 3D printers for prototyping and production; a wide range of 3D printing materials; parts on-demand via Stratasys Direct Manufacturing; strategic consulting and professional services; and the Thingiverse and GrabCAD communities with over 2 million 3D printable files for free designs. With more than 2,700 employees and 800 granted or pending additive manufacturing patents, Stratasys has received more than 30 technology and leadership awards. Visit us online at: www.stratasys.com or http://blog.stratasys.com/, and follow us on LinkedIn.

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Stratasys Media Contacts
Stratasys
Arita Mattsoff / Joe Hiemenz
Tel. +972-(0)74-745-4000 (IL)
Tel. +1-952-906-2726 (US)
arita@stratasys.com
joe.hiemenz@stratasys.com
or
North America
Stratasys
Craig Librett
Tel: +1-518-494-3442
craig.librett@stratasys.com
or
Europe
UK Incus
Jonathan Wake / Miguel Afonso

Tel: +44-1737-215200
stratasys@incus-media.com
or
Germany
Rheinfaktor
Philipp Budde
Tel: +49 221 88046-0
stratasys@rheinfaktor.de
or
Asia Pacific
Stratasys AP
Janice Lai
Tel. +852 3944 8888
Media.ap@stratasys.com
or
Japan
Stratasys Japan
Aya Yoshizawa
Tel. +81 90 6473 1812
aya.yoshizawa@stratasys.com
or
Korea
Stratasys Korea
Janice Lai
Tel. +852 3944 8888
media.ap@stratasys.com
or
Greater China
Stratasys Shanghai
Icy Xie
Tel: +86-21-26018886
icy.xie@stratasys.com
or
Mexico, Central America, Caribe and South America
Stratasys Mexico
Erica Massini
Tel: +55 11 2626 9229
erica.massini@stratasys.com
or
Brazil
GAD Communications
Tatiana Fonseca
Tel: +55-11-3846-9981
tatiana@gadcom.com.br

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