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Bengaluru-based venture adds another dimension to 3D printing

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Navin Jain and Kaushik Mudda, co-founders, Ethereal Machines

Ethereal Machines get CES award for its Halo 3D printer, which introduces the concept of hybrid manufacturing

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We've heard of 3D printers printing shoes or even prosthetic legs and hands. They can even cook your regular fries in the shape of your favourite animal. Yet 3D printing, a more than 40-year-old technology, has seen very little use in real manufacturing beyond the stages of creating machine prototypes or 3D models of houses.

This is where a small Bengaluru-based 3D printing start-up, Ethereal Machines, caught the eyes of large technology companies in New York last month, when it was selected for the Best of Innovation Honourees at Consumer Electronic Show 2018.

Ethereal Machines was among 31 companies selected from across the world, and the only one so far from India to win the award for its newly developed five-axis 3D printer — Halo. The young company shared the stage with the likes of Nissan Motors, AMD, HP and Bang & Olufsen to receive the coveted prize.

More than 3D

What makes Halo special? It combines the concept of subtractive manufacturing, which is usually undertaken by large CNC (Computer Numerical Control) machines, with additive manufacturing, which is typically done by 3D printers on three axes, which means there's strength only on one side of a prototype. And all this is achieved through a desktop-scale machine.

"Ethereal Halo has been designed to bring about a metamorphosis to the world of manufacturing and usher in the concept of hybrid manufacturing. It is the world's first consumer-oriented five-axis 3D printer and five-axis CNC router," said Kaushik Mudda, CEO and co-founder, Ethereal Machines. "A regular 3D printer allows you to print a part that has strength on one side. There is no lateral strength on that part. Cross-sectional strength can be achieved using five axes. We took the subtractive manufacturing machine (CNC machine) and made it into a additive manufacturing machine."

Making it simple

What makes Halo interesting is how this ₹15 lakh product can be used to build high-strength parts for aviation and construction sectors, turning manufacturing of small components nearly as simple as giving a print command for a desktop printer.

The 5D printing capability of the machine ensures that the final output is several times stronger than it's three-axis 3D printed counterpart. The interlocking pattern of 5D printing enabled by Halo ensures higher tensile strength of the final part, the firm claims.

The self-funded start-up is already profitable by selling its CNC routers and now Halo. The three-year-old firm took shape in 2014 when co-founders Mudda and Navin Jain were in the final year of their studies at RV College of Engineering, Bengaluru.

The duo were enthusiastic about making hovercrafts and robots. But while working on those machines, they realised they needed more precision in their cut parts to make their robots better. This required a CNC router, which cost nothing less than ₹6-7 lakh.

"As we couldn't afford to buy a CNC router, we built our own, and started selling it at ₹2-4 lakh a piece," Mudda said. But creating just another product, which was cheaper than the ones already available, wasn't something the two engineers were excited about.

Since getting funding for a hardware start-up is a lot harder than that for an app, Ethereal had to go step by step by earning from every single piece of machine they sold, and use that money to expand further.

“In the past one year, we put a stop to everything, and spent time in developing the mechanics and coding of the machine (Halo). We thereby grew from a mechanical engineering firm to a electronic, design team of 22 people,” Mudda said.

Ethereal Machines has already bagged a partnership with the University of Sheffield, UK, wherein the university will use Halo and work towards creating new possibilities for aviation and other sectors.