

Making the maths work

The strategic partnership between Belotti SpA and CEAD Group has been established to combine the expertise of additive and subtractive manufacturing into one hybrid technology that integrates Large Scale Additive Manufacturing (LSAM) with the milling process.

The acquired know-how and experience in both fields, combined with the innovative drive of both companies, is the strong basis of the partnership. Standing alone, LSAM cannot deliver the finish and tolerances subtractive manufacturing offers. On the other hand, subtractive manufacturing is accompanied with a lot of waste, which is negated by large scale additive manufacturing.

The BEAD machine exploits the best of both worlds combining the speed and creative potential of 3D printing with the precision and reliability of a CNC centre in a single system.

Through the integration of a CEAD extruder for additive manufacturing (of variable dimensions and capacity) into a Belotti 5-axis CNC machining centre, the BEAD system allows the production of parts that are sufficiently oversized to be finished to the required tolerances with times and raw materials consumption lower than traditional methods.

With this machine, the overall business investment in new machinery will be lower. The BEAD requires less space

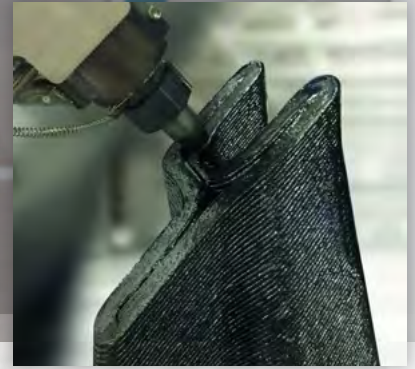
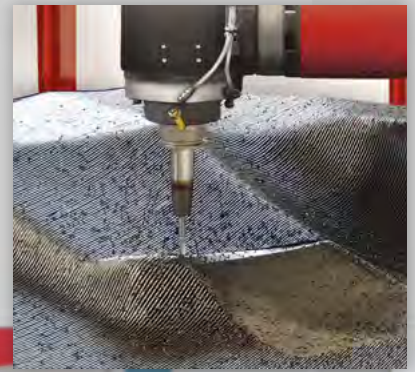
and programming than two separate systems, and because there is no need to move the produced parts between machines, handling time, set up errors and work in process are reduced.

“This partnership is a great opportunity for the development of our companies both for technological and business growth. The young spirit of our companies and the passion for ground-breaking solutions are the ingredients of the co-operation”, explains Loris Valsecchi, Sales Director at Belotti.

This new BEAD solution is available in different configurations with variable build volumes, extrusion outputs and printing orientations. The extruders may have different sizes and printing orientations. One of the key feature is the 45° orientation, that enables it to print fully enclosed shapes without supports for undercuts, reducing printing time and improving interlayer adhesion.

Various nozzle sizes and designs can be specified to vary the print layer dimension. The extrusion temperature goes up to 400 °C in order to process a wide variety of materials. The BEAD system operates with composite pellets made of a thermoplastic polymer matrix and different types of fibre as reinforcement, from glass to carbon and even natural fibres.

Polymers range from commodity such as PP and PETG, to high performance materials including PESU and PEEK. Unlike thermosettings, thermoplastics could be recyclable and re-used, making the process even more sustainable



and less environmental impact.

The application potential of this solution is endless: the first sectors already targeted are the marine, automotive and aerospace for which moulds, patterns, tools and final parts have been produced.

“For us, the partnership with Belotti is very important. We have started our focus on the maritime, automotive and aerospace sectors, producing moulds, tooling, or even end parts, but this is only the beginning. We see many applications to which this solution can make a sustainable and time-effective change,” explains Lucas Janssen, CEO at CEAD.

There's also another aspect that it is really important, which is the software and the control system controlling the extruder itself, and this also highlights one of the big benefits on where Belotti and CEAD really found each other, because both companies use the same methodology when it comes to the control mechanisms, which they could in the end really integrate completely into one system.

New application solutions are constantly tested in the Belotti showroom at its headquarters in Italy, where the BEAD machine is in operation and on display for all companies wishing to discover the advantages and features of this technology. It will also be on display at JEC World event that will take place in Paris, 3 to 5 May 2022.

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