

3D print CASE “CEAD opens Maritime Application Center for 3D printing of ships”

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CEAD AM machine maritime

The Delft-based company CEAD, known for its innovative solutions for additive manufacturing (AM), is opening a new maritime application center this fall. With a focus on the maritime sector, this FME member company not only wants to make 3D printing technology more accessible, but also offers a place where the maritime manufacturing industry can work together on sustainable and efficient production methods.

The new application center has been set up to promote collaboration within the maritime sector. "With this center, we want to offer a platform where companies can jointly take steps towards the future of shipbuilding," explains Charléne van Wingerden, Chief Commercial Officer of CEAD. "By sharing knowledge and resources, we want to accelerate innovation and make the benefits of 3D printing widely accessible."

Advantages of 3D printing in shipbuilding

CEAD's AM machines use thermoplastic composites, often reinforced with glass fibre, which offers significant advantages. These materials are easier to recycle than traditional materials, such as carbon fibre reinforced polyester, which is often difficult to recycle. Production time is greatly reduced because there is no need to make moulds, which eliminates the need for labour-intensive manual work such as applying polyester layers.

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“The production time of a custom-made ship is reduced,” Charléne explains. “For example, you no longer have to make and store plugs or moulds. In addition, there is less material waste because you build the entire hull shape directly from the required material.”

The new AM machine in the application centre is 12 metres long and equipped with a six-axis robot arm with an extruder at the end, which processes fibre-reinforced thermoplastic material. This material is heated in stages using a patented system and then deposited precisely via the machine's nozzle. This precise system makes it possible to build complex ship hulls without having to rely on molds, which allows for unprecedented design flexibility.

A unique approach to sustainable innovation

The application center offers a unique space to develop and test new 3D printing applications for the maritime industry, inviting companies from the sector to collaborate and share knowledge.

"We want to take steps together in regulations and certification."

CEAD is working on the further development of AM applications in shipbuilding, which still faces a number of challenges. "A major challenge is the combination of calculations from the naval architect with the way the material is printed in the AM machine," says Charléne. "After all, the glass fiber reinforcement is applied in layers, which requires us to think carefully in advance about how we are going to print the boat."

CEAD also sees challenges in the use of new materials, an aspect in which the maritime sector is still cautious. "The maritime sector is a rather conservative business," admits Charléne. "Partly right, because as a shipowner and shipbuilder you want to make safe choices. But by opening the centre to collaboration, we want to help companies integrate these technologies and materials into their processes and jointly take steps in regulations and certification," says Charléne.

Future plans

The centre was set up to support the maritime sector in the transition to sustainable production methods. At a time when shipbuilders are confronted with stricter environmental requirements and increasing pressure on production times, 3D printing can play an important role in optimising the use of materials and accelerating the production process. "By opening the centre to collaboration, we want to help companies integrate these technologies into their processes and jointly take steps in regulations and certification," says Charléne.

"The introduction of AM technology could well be the start of a new era in Dutch shipbuilding."

The new application centre is just the beginning of what CEAD wants to achieve in the maritime sector. "We want to make the business case conclusive for our customers," says Charléne. "An AM machine is still a major investment, it requires a different way of thinking from your designers and the material is usually still very expensive. But the advantages are also great. The Netherlands is a maritime country with a rich history, and I want to take the next step with this new technology. In a way that shipyards can print the best boats with new materials."

With the new application centre, CEAD not only offers a new technology, but also a platform for collaboration and innovation within the maritime industry. The introduction of AM technology could well be the start of a new era in Dutch shipbuilding, in which innovation and sustainability go hand in hand.