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COMAU, AUTODESK AND CONTINUOUS COMPOSITES DEMONSTRATE THE FUTURE OF MANUFACTURING AT AUTOMATICA 2018

June 19, 2018, Munich – Comau has teamed with Autodesk and Continuous Composites at Automatica (**Stand 331 - Hall B5**) to demonstrate a real-time digital manufacturing cell that combines virtual sensors, intelligent design software and Continuous Composites' patented Continuous Fiber 3D Printing Technology (CF3D™). The work cell uses rapid-curing continuous fibers and high-speed robotics to produce strong, lightweight factory-ready parts on demand. The companies will be printing live at Automatica a series of industrial parts ranging from a large airfoil to B-pillars and multi-tier bridges printed in free-space unsupported without fasteners.

This breakthrough manufacturing solution demonstrates a fundamental shift in manufacturing where the three companies have leveraged their respective competencies to develop a flexible manufacturing system that can cost-effectively create lightweight, high-strength objects with embedded functionality including fiber optic sensors, LED illumination and copper wire for powering electronics. As such, the 3D printed composite structures are able to sense themselves in real-time and react to environmental stimuli.

The system, which combines the factory-proven performance of Comau robotics with Autodesk's advanced-intelligence design software and Continuous Composite's Continuous Fiber 3D Printing (CF3D™) technology, can print structural and functional elements without the need for molds, supports, autoclaves, fasteners or the trimming of excess material. As a result, complex designs developed from Autodesk's AI driven design software can now be manufactured and the anisotropic properties of continuous fiber materials can be fully leveraged to optimize load paths.

The exceptional trajectory control and high repeatability of Comau robots, together with the instantaneous curing of the thermoset resins used in CF3D™, enables the system to rapidly print unsupported, large complex structures through free space, tubes, multi-layer carbon fiber panels and free space bridges with any continuous fiber material. What's more, the Autodesk design software interface explores all the possible variations of a project, while taking the key performance parameters into consideration, to optimize the best possible solution.

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Unlike traditional composite manufacturing techniques, which are highly labor intensive and require the use of molds, ovens, autoclaves, fasteners, supports, expensive pre-pregged fibers; the new system is both more flexible and less expensive. And because the continuous fiber is instantly cured as it is discharged using a 3D printing process, there is no need for trimming and no wasted materials. Finally, the solution can print large-scale structures as easily as complex pieces thanks to the ability to quickly attach multiple types of end-effectors to the Comau robot, making it highly effective for a wide range of industrial applications.

To demonstrate how this solution helps optimize production, visitors will be able to print spare parts at the Comau booth using Continuous Composites' CF3D™ print head mounted on the Comau robot NJ 60. Within a working factory, this solution allows companies to produce strong, lightweight factory-ready parts on demand, thus ensuring higher productivity, fewer bottlenecks and lower overall costs.

Benefits:

- Combines power of composite materials using robotics and 3D printing process
- Print complex composite structures – complete with power, lighting, sensors and more – in a single step
- High-speed, high-precision solution reduces manufacturing costs while eliminating material waste and the need for fasters and supports
- Instantaneous, UV-cure thermoset resins support high-speed, moldless printing for an unlimited number of industrial applications
- Reduce procurement time, allow for design adjustments and increase the potential for functionality improvements
- Embedded functional capabilities allow printed parts to sense and respond to external stimuli

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About Comau

Comau, a member of the FCA Group, is a worldwide leader in delivering advanced industrial automation products and systems. Combining innovative engineering solutions with enabling technologies, Comau helps companies leverage the full potential of digital manufacturing.

In addition to a vast range of modular, flexible and highly-configurable products, Comau offers interconnected digital service solutions able to transmit, elaborate and analyze important machine and process data, thereby increasing efficiency for smart manufacturing. The full portfolio includes: joining, assembly and machining solutions for traditional and electric vehicles, robotized manufacturing systems, a complete family of robots with extensive range and payload configurations, autonomous logistics, and asset optimization services with real-time monitoring and control capabilities. The offering also extends to project management and consultancy, IoT services, and maintenance and training for a wide range of industrial segments.

Headquartered in Turin, Italy, Comau has over 45 years of factory-proven experience and an international network of 32 locations, 14 manufacturing plants and 5 innovation centers that span 14 countries and employ more than 9,000 people. A global network of distributors and partners allows the company to respond quickly to the needs of customers of all sizes, no matter where they are located throughout the world. Comau is also committed to improving human - machine collaboration by developing competencies through the formation of individuals and groups as part of its open automation approach. This includes hands-on training programs by Comau Academy that develop the technical and managerial competencies necessary to face the challenges and opportunities of Industry 4.0.

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About Autodesk

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Autodesk makes software for people who make things. If you've ever driven a high-performance car, admired a towering skyscraper, used a smartphone, or watched a great film, chances are you've experienced what millions of Autodesk customers are doing with our software.

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About Continuous Composites

Continuous Composites is a privately held technology company owning the earliest granted patents in the world on 3D printing continuous fibers. The robust patent portfolio around Continuous Fiber 3D Printing (CF3D™) consists of at least 7 granted patents, 76 non-provisional patent applications, 11 provisional patent applications covering over 250 concepts and 39 international PCT patent applications.

Continuous Fiber 3D Printing (CF3D™) constitutes a fundamental shift in the manufacturing process of Advanced Composite Materials (ACM). CF3D™ leverages rapid curing resins paired with continuous fibers creating a moldless, Out of Autoclave (OOA) composite manufacturing process. CF3D™ can also embed functionality with fiber optics and copper wires creating a part that can sense and react to environmental stimuli.

Continuous Composites' patented technology combines the power of composites materials with a 3D printing process using robotics opening new design possibilities for manufacturers and consumers. Traditional 3D printing and the composites manufacturing industry are plagued with the limitation of only being able to stack 2D slices whereas CF3D™ technology can discretely print fibers in response to loads oriented in all 3 dimensions.

Headquartered in Coeur d'Alene, Idaho, Continuous Composites is bringing together the technology ecosystems comprised of industry leaders in the fields of robotics, software and materials to commercialize CF3D™ for customer's applications in every industry.

www.continuouscomposites.com

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