

ENTEGRIS ASIA PTE LTD. AND SIMTECH ESTABLISH A JOINT RESEARCH LABORATORY FOCUSED ON EXPANDING AND ENHANCING ENTEGRIS' PRODUCT DEVELOPMENT CAPABILITIES USING ADDITIVE MANUFACTURING (3D Printing)

In collaboration with SIMTech, the company will explore new product design capabilities and expanded market opportunities in 3D Printing

SINGAPORE, Aug. 3, 2020 – Entegris, Inc. (NASDAQ: ENTG), a world-class supplier of advanced materials and process solutions for the semiconductor and other high-technology industries, announced today that it is launching a joint research laboratory with the Agency for Science, Technology and Research's (A*STAR) Singapore Institute of Manufacturing Technology (SIMTech). The laboratory will serve as a technology center where Entegris will explore capabilities for developing new products using 3D printing technologies with state-of-the-art modeling and simulation.

According to Entegris' Chief Technology Officer, Jim O'Neill, the joint endeavor will make it possible for Entegris to explore a much broader array of innovations in product designs and simulate their performance before creating prototypes. "3D printing has the potential to make our product design capabilities more robust by enabling more complex designs than traditional manufacturing processes can facilitate. For example, clean delivery of gases in the manufacturing process is critical to our customers in the semiconductor industry. Using 3D printing, we can explore more complex geometric designs for the membranes in our filtration solutions," he said.

"Combining a deep understanding of fundamental materials properties with models of novel design configurations, we will enable new products with unique performance characteristics. In the case of gas filters, for example, using 3D printed components to improve or control certain characteristics opens the door to enhance gas flow without compromising particle removal efficiency.

"Since eliminating particles that can cause defects in the manufacturing of integrated circuits maximizes yields for our customers, more advanced filtration solutions represent a competitive advantage for us," O'Neill said.

3D printing also reduces the waste from materials such as steel and plastics that are used when assembling models in the traditional manufacturing setting. In addition, it increases the speed with which designs can be modified based on simulated performance tests.

The research collaboration also includes cooperative efforts with several leading global technology companies and research consortia. These collaborations will enable Entegris to explore the use of novel materials with Hitachi Metals, Ltd; state-of-the-art characterization techniques with Professional Testing Services (PTS); traceable measurement methods and reference standards with A*STAR's National Metrology Centre (NMC); and next generation modeling and simulation capabilities with Ansys, ESSS North America Inc., and CAD-IT Consultants (Asia) Pte Ltd.

SIMTech's executive director Dr. David Low said, "The role of technology and innovation in transforming businesses and industries is more important now than ever. Through public-private partnerships such as our exciting new joint lab with Entegris, A*STAR works hand in hand with industry players to co-innovate and develop new solutions to help them become more competitive. The Entegris-SIMTech Joint Lab will create new possibilities through innovation in additive manufacturing as well as co-creation opportunities with other players in the additive manufacturing ecosystem."

By working with SIMTech, Entegris will have the opportunity to investigate with the participants in the research laboratory emerging market opportunities to support 3D printing technologies. The company will utilize its advanced materials science expertise to research the characterization of metal powders and redesign of novel metal-based products through 3D printing. Such research could identify ways to overcome the current design constraints in traditional manufacturing and lead to discoveries in 3D printing that benefit a wide range of industries in addition to the semiconductor industry, including the aerospace, medical and energy industries.

The joint research laboratory with SIMTech builds on Entegris' commitment to establish a global network of technology centers in close geographic proximity to its customers worldwide. "In our technology centers we collaborate locally with our customers to explore new product designs and respond in real time to find solutions that meet their critical yield, reliability, and performance challenges in a fast-paced and quickly evolving marketplace," O'Neill said. In addition to the newly created Singapore Technology Consortia, Entegris has technology centers in Taiwan, Korea, China, and North America.

About Entegris

Entegris is a world-class supplier of advanced materials and process solutions for the semiconductor and other high-technology industries. Entegris has approximately 5,300 employees throughout its global operations and is ISO 9001 certified. It has manufacturing, customer service, and/or research facilities in the United States, Canada, China, France, Germany, Israel, Japan, Malaysia, Singapore, South Korea, and Taiwan. Additional information may be found at www.entegris.com.

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