

News Release

P213/19e
May 20, 2019

BASF and Paxis collaborate to advance innovative materials for new 3D printing technology

- **BASF's photopolymer materials for advanced manufacturing applications qualify for early development access in new WAV™ technology**
- **BASF's Ultracur3D ST 45 reactive urethane photopolymer fulfills the requirements of functional applications**

BASF 3D Printing Solutions is to provide innovative additive manufacturing materials to Paxis LLC for their new WAV™ technology. This is currently in development and is designed to meet the needs of additive manufacturing users, advanced manufacturing as well as traditional manufacturing markets. The WAV™ (Wave Applied Voxel) process was created with the end-user firmly in mind in an effort to solve trapped volume issues of current liquid resin-based technologies.

"The combination of BASF materials and Paxis's system will revolutionize the way end-applications are designed, manufactured and integrated into production", states Arnaud Guedou, Business Director Photopolymer Solutions, BASF 3D Printing Solutions. "With the new WAV™ technology, Paxis extends the application possibilities of additive manufacturing to a much broader scope than current technologies allow. What's more, equipment and processes can be adapted to requirements that were previously unimaginable in additive manufacturing. BASF's

innovative photopolymer materials are a perfect match for Paxis's WAV™ technology."

BASF's Ultracur3D ST 45 reactive urethane photopolymer for tough applications has been designed to fulfill the requirements of functional applications for high accuracy and mechanical strength, where existing 3D printing materials often reach their limitations. Ultracur3D ST 45 can be used to produce high performance functional parts by using a wide variety of equipment, such as stereolithography (SLA), digital light processing (DLP), or Liquid Crystal Display (LCD).

Paxis's primary focus are commercial manufacturing applications in the aerospace, automotive, dental and medical sectors, as well as identifying potential vertical markets within advanced manufacturing that have so far been ignored due to the limitations of existing technologies.

Commercial manufacturers will benefit from a scalability of size and speed previously unknown in current additive-manufacturing resin-based systems. Hand-selected companies will be invited during the early stages of hardware and product development to work closely with industrial producers on solving their application requirements. Adaptability to specific commercial manufacturer needs coupled with a system capable of far greater scalability will further accelerate additive manufacturing beyond mass customization, with the goal of opening up new untapped vertical markets.

"Pairing innovative materials at the earliest stages of designing the WAV™ technology is critical to meeting the needs of end-users – that is, the commercial manufacturers", explains Mike Littrell, CEO, co-inventor of WAV™ and Founder of Paxis LLC. "Too often, the material is modified to work within the limitations of existing technologies. Through our early access program our approach is to work with progressive material manufacturers like BASF, as well as commercial manufacturers at the earliest stages of product development in order to push system capabilities and forge future hardware improvements. Developing the materials prior to launching the WAV™ technology will enable end-users to integrate the technology quickly into their operations."

“BASF’s collaboration with Paxis will enable customers to access a modular additive manufacturing technology, whether they are producing large quantities of small parts, small quantities of very large parts, or anything in between”, says Oleksandra Korotchuk, Business Development Manager BASF 3D Printing Solutions. "The combination of BASF materials and Paxis’s WAV™ technology will revolutionize the way end-applications are designed, manufactured and integrated into scalable production.”

Learn more about Paxis at RAPID + TCT in the CIDEAS Booth #1441 in Detroit from May 20 to 23, 2019 featuring samples made with BASF’s photopolymer Ultracur3D ST 45. Come see us to discuss your application needs!

For more information, please visit: www.ultracur3d-photopolymer.com

About BASF 3D Printing Solutions

BASF 3D Printing Solutions GmbH, headquartered in Heidelberg, Germany, is a fully owned subsidiary of BASF New Business GmbH. It focuses on establishing and expanding the business with 3D printing materials, system solutions, components and services. BASF 3DPS is organized into startup-like structures to serve customers in the dynamic 3D printing market. It cooperates closely with the global research platforms and application technologies of various departments at BASF as well as with leading research institutes, universities, startups and industrial partners. Potential customers are primarily companies that intend to use 3D printing for industrial manufacturing; typical industries include automotive, aerospace and consumer goods.

For further information please visit: www.basf-3dps.com.

About BASF

At BASF we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 122,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of around €63 billion in 2018. BASF shares are traded on the Frankfurt Stock Exchange (BAS) and as American Depositary Receipts (BASFY) in the U.S. For further information please visit: www.basf.com.

About Paxis LLC

The WAV™ (Wave Applied Voxel) process was created with the requirements of the commercial manufacturer in mind, in an effort to solve trapped volume issues within current liquid resin-based technologies. The success in solving one problem opened the doors to solving many, which include: Scalability in size and speed, significant reduction in post processing requirement, multiple material

production, exotic material management, lower cost of operation, the elimination and need for a large vat during large-part production, as well as the ability for embedded components and many more. Founded in 2016, Paxis LLC, headquartered in Crystal Lake, IL, announced the development of the WAV™ (Wave Applied Voxel) process, with commercialization timing to be announced at a later date. Designed to meet advanced manufacturing needs within the Additive Manufacturing (AM) and 3D Printing industry, while expandable to non-AM industries WAV™ is a completely new, ground-up AM process. Designed without constraints, the new, patent-pending WAV™ technology is fully scalable in the X, Y, and Z axis, and deploys material in a unique way that allows for the production of extremely large part(s) or larger quantities of smaller parts, with as little as 1 liter of material loaded in the machine at any given time. The technology is designed to embrace the use of multiple materials of different viscosities within the same part build.

For more information on the WAV™ additive manufacturing process and technology, please visit: www.paxis.com.