

Press Release

Colombes, 19th February 2016

Brewer Science and Arkema Announce a Production Milestone in Bringing Directed Self-Assembly Material to the Semiconductor Market

Brewer Science, Inc., and Arkema are pleased to announce the achievement of a production milestone in high-quality directed self-assembly (DSA) materials for use in semiconductor manufacturing.

Building on the partnership announced in October 2015, Brewer Science and Arkema have demonstrated pilot-scale production of DSA materials using Arkema's block copolymer (BCP) technology and Brewer Science's manufacturing expertise. This is a step toward bringing DSA from a research level up to mainstream semiconductor production. These initial pilot-scale DSA materials are based on polystyrene-polymethylmethacrylate (PS-PMMA) and are being used to support customer DSA process evaluations.

"We have progressed more quickly toward this milestone through our partnership with Arkema than either company could have done on their own," said Dr. Daniel Sullivan, director of Brewer Science's semiconductor Research & Development department. Sullivan added, *"We expect to similarly speed up customer process testing moving forward."*

"In addition to its intrinsic flexibility, the BCP blending technology is demonstrating better performance with respect to defects and DSA kinetics. This further allows faster process development as a wider range of process parameters can be investigated by the blended BCPs" said Ian Cayrefourcq, Scientific Director of Arkema.

Both companies will continue to combine their strengths—more than 30 years of experience in advanced semiconductor materials and process solutions and more than 20 years in BCP technology and manufacturing—to make DSA a reality for next-generation lithography applications.

*A designer of materials and innovative solutions, **Arkema** shapes materials and creates new uses that accelerate customer performance. Our balanced business portfolio spans high-performance materials, industrial specialties and coating solutions. Our globally recognized brands are ranked among the leaders in the markets we serve. Reporting annual sales of €7.5 billion in 2014, we employ approximately 19,200 people worldwide and operate in close to 50 countries. We are committed to active engagement with all our stakeholders. Our research centers in North America, France and Asia concentrate on advances in lightweight materials, renewable feedstocks, energy generation and storage, water treatment, electronics and 3D printing. For the latest, visit www.arkema.com*

***Brewer Science** is a global technology leader in developing and manufacturing innovative materials, processes, and equipment for the reliable fabrication of cutting-edge microdevices used in electronics such as tablet computers, smartphones, digital cameras, televisions, LED lighting, and flexible technology products. In 1981, Brewer Science revolutionized lithography processes with its invention of ARC® materials. Today, Brewer Science continues to expand its technology portfolio to include products enabling advanced lithography, thin wafer handling, 3-D integration, and chemical and mechanical device protection and products based on nanotechnology. Brewer Science recently unveiled a new high-volume manufacturing facility at the Rolla National Airport to accommodate increased product demand and demonstrate the company's commitment to continuous improvement. With its headquarters in Rolla, Missouri, Brewer Science supports customers throughout the world with a service and distribution network in North America, Europe, and Asia. As a 2014 SEMI Award for North America recipient for revolutionizing optical lithography with ARC® anti-reflective coatings. We're prepared for the next generation. Are you? Find out at <http://www.brewerscience.com>*

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