

produce parts down in the micron range—and do it at a throughput that can be both competitive and cost effective,” says BMF global CEO John Kawola. “There are no other companies at our scale that can do both.”

BMF’s micro 3D printers use a printing approach called projection micro stereo-lithography that enables rapid prototyping and produces precise, high-resolution parts more efficiently—be it a veneer that’s three times thinner than a traditional model or a biochip that mimics live tissue. Backed by significant funding, a global customer base, and offices in the U.S., U.K., Munich, Tokyo, and across China, BMF is routinely producing new one-of-a-kind parts and shaping the future of 3D printing.

Since the global launch of its platform in late 2018, BMF has expanded to 35 countries, installed more than 400 systems around the world, and served more than 1,800 customers, who apply its technology as either equipment users or paid-parts customers. The company recently raised \$24 million in Series D funding—building on \$42 million Series C funding raised in 2022—bringing its 12-month total to \$66 million. “This shows strong support from the investment community,” says Kawola.

Part of BMF’s success stems from its global perspective, which began at the company’s inception. “We decided to create a global footprint very early in our history to be able to accelerate growth,” says Kawola. To that end, BMF established regional offices, hired local staff, and customized its messaging strategy for each new market it entered.

Meeting Increasing Demand in Health Care

BMF’s unique microproducts, which are instrumental to developing key industries, have allowed the company to attract many customers. In electronics and optics, increasing radio frequencies require smaller antennas to expand processing power. Meanwhile, in the medical device industry, there is a continued effort to minimize the effects of noninvasive surgeries and drug delivery approaches. “In all of these cases, parts need to be smaller,” says Kawola.

Consider drug research, which has traditionally tested how a prospective drug interacts with live tissues through expensive, time-consuming, and often highly debated, animal testing. Researchers have attempted alternative methods, such as growing tissue outside of the body or producing chips that recreate tissues and organs. However, these approaches have a

fundamental defect: Cells grow best in an environment that’s most like the human body, with nutrients flowing in and waste flowing out.

Enter BMF’s biochips. Designed with small holes that mimic mass transport across capillary walls, this technology is better able to mimic true biological processes and better grow live tissue, creating potentially lifesaving opportunities and significantly reducing the time needed to screen, test, and validate new drugs. “We believe this concept and forthcoming sets of products will be the future for cell and tissue growth and associated drug testing,” says Kawola.

BMF has also pioneered vitally important and minimally invasive surgery devices. Through an ongoing partnership with Beijing Tongren Hospital, the Boston-based company’s China team designed and manufactured a stent to be inserted into the eye as part of the treatment for glaucoma, which is the second leading cause of blindness worldwide, according to the Centers for Disease Control and Prevention [CDC]. To date, the device, which measures fewer than three millimeters in length, has shown promising results in five Stage 1 clinical trials. It’s also reduced the number of steps required for glaucoma surgery, shortening a process that could last as long as 45 minutes to just three to five minutes. In addition, the company manufactures a dental veneer that’s one-third the thickness of its competitors, preserving more of a patient’s enamel than traditional veneers and making the process of straightening and whitening teeth simple and painless for many customers.

Expanding to New Markets

A constant eye on opportunities to innovate in other crucial industries is part of BMF’s culture. “There is increasing interest in micro-electromechanical system [MEMS] sensors, semiconductor testing and packaging, and microrobotics,” says Kawola. “We are learning of new applications for our technology every day.”

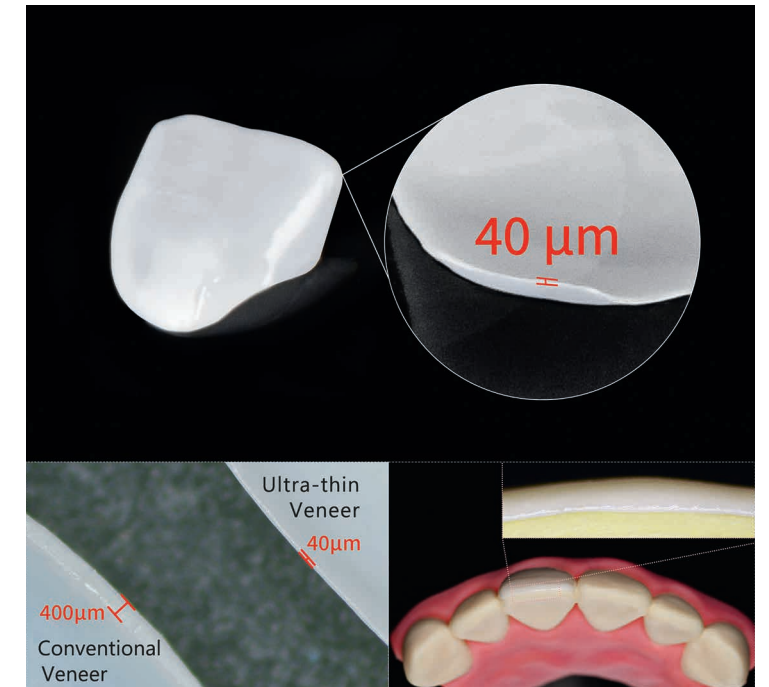
Over the next 10 years, the 3D-printing industry will continue to expand and improve upon its hardware, software, and materials. BMF is optimistic about the role it will play in engineering and manufacturing the next generation of products. “With its emphasis on application development as well as technology development,” says Kawola, “BMF expects to lead the way.” ■

REVOLUTIONIZING THE HIGH-PRECISION MANUFACTURING SPACE

Boston Micro Fabrication’s disruptive micro 3D-printing tech can now create small high-precision parts for key industries more efficiently and at a lower cost.

FROM ELECTRONIC COMPONENTS TO MEDICAL implants, there’s a growing demand for microscale parts worldwide. However, traditional manufacturing methods often struggle to do the job, as molding, machining, and stamping become more difficult and more expensive as the end product gets smaller. Boston Micro Fabrication [BMF] provides a unique solution.

“BMF’s 3D-printing technology is able to



ABOVE: BMF’S DENTAL VENEER IS ONE-THIRD THE THICKNESS OF ITS COMPETITORS, PRESERVING MORE OF A PATIENT’S ENAMEL. BELOW: DESIGNED WITH SMALL HOLES THAT MIMIC MASS TRANSPORT ACROSS CAPILLARY WALLS, BMF’S BIOCHIPS ARE BETTER ABLE TO MIMIC TRUE BIOLOGICAL PROCESSES THAN OTHER METHODS USED IN DRUG RESEARCH.

