Dentures … Printed In 3D

The future of 3D printing and manufacturing has some serious bite -- and the burgeoning sector of biotech has arrived at a mouth near you.

Founded in the spring of 2021, Newport Beach-based Desktop Health is at the forefront of additive manufacturing solutions for dental and orthodontic applications.

A sharp new incisor in the lineup of products and endeavors from industry leader in additive manufacturing Desktop Metal, Inc., the debut of Desktop Health comes at a juncture when the $12 billion industry of additive manufacturing eyes a tenfold growth over the next decade.

Michael Jafar, President & CEO of Desktop Health

Michael Jafar, President & CEO of Desktop Health, came to the new company after 20-plus years of what he calls a "traditional health care career." When asked by colleagues if he was delving into a "Sci-fi" or "Futuristic" endeavor, he let the numbers provide the answers.

According to Jafar, in 2019 alone, 50 additive manufacturing devices (defined by 3D printing) received FDA 510(k) clearance; that number might seem modest, but it actually represents a quarter of all 510(k) clearances in the past decade.

As the 3D printing industry as a whole grows toward a projected $150 billion annual business by 2030, personalized healthcare is a game-changing stage.

From the purview of scientists and engineers, the bold new world in the field of dentures has been unveiled in FDA-approved, proprietary resin technology -- the result of 200+ formulations of testing.

"There's an entire infrastructure being built around this modality, and the number one driver for future growth is customized patient applications," Jafar says. "Witnessing a regulatory agency recognizing this form of manufacturing with formal stamps of approval is a pivotal step forward for the industry."

Jafar adds that there are now 20 companies with FDA clearance to design additive manufacturing dental? applications for patients' mouths . . . with another 21 approvals to come in the next year.

Evidencing an affable bedside manner and unique ability to bring complex biotech to a personalized level, Jafar takes the view of those in the dentist's chair.

"The reality is that 3D printing is a form of manufacturing. Some consumers still see 3D printing as an avocation – people making stuff that never gets used with an expensive machine, therefore, whatever we're working on must be science fiction," he says. "Here's how 3DP is changing the equation: You're a patient in a chair getting a crown fixed; five years ago, a mold impression would be taken, and then be shipped out, you go home and two weeks later you reconvene in the dental chair to receive your crown. Today, you can sit in that same chair where a digital scanner sends a file to a 3D printer and the crown is printed 30 minutes later."

From the purview of scientists and engineers, the bold new world of dental work – namely in the field of dentures at present – is made possible by the unveiling of Flexera, an FDA-cleared, proprietary resin technology which is the result of over three years of research and development, and more than 200 formulations of testing.

"Whatever you're creating using additive manufacturing, it needs to have that ideal relationship between hardware and materials. The beauty of Flexera is that when we tested it against the market leader, it showed improved strength and water absorption," Jafar adds, "and both factors are vitally important because you don't want a

tooth that cracks or changes color."

In concert with aesthetics, the 3D printing process of new teeth also presents impressive alacrity; working with Flexera, when the patients' scans are passed on to EnvisionTEC 3D printers, eight sets of dentures can be produced in just two hours.

"When the consumer really begins to see the speed and efficiency of this ecosystem, people will start to realize the power of the manufacturing component," enthuses Jafar.

With the growth of the 3D printing across myriad industries, Jafar keeps his focus on the individual.

"Personalization means a lot – better fit, less failure, greater speed and cost savings. That's what really excites me about what we're trying to build here," the CEO says. "For all implants -- whether in your mouth, your ear, or knee – we continue to challenge ourselves by asking: 'Can it be done in a much more efficient and personalized way?' That's the question we want to answer for *every* aspect of healthcare."

Across the pandemic timeline, breaking down consumer barriers about 3D printing's possibilities and potential proved a successful test case for Desktop amid the nation's host of supply chain interruptions.

"We printed a million testing swabs a week during the height of the pandemic; we were able to print and sterilize them at a rate that couldn't be done with traditional manufacturing," Jafar says. "3D printing was suddenly looked at as a savior of getting these swabs done. The by-product of that being that people realized that this process is fast, personalized, and affordable if you're a producer of an end-product and it's a very efficient play on the whole ecosystem."

With Flexera now available in over 1,000 offices across the country, and Desktop Health having recently received CE Mark certification to extend its use overseas, Jafar says the present and future of additive manufacturing is in the biotech space.

"Five years from now, the crown jewel of this business is dentistry. From there, we will open up many other verticals, from dermatology, ophthalmology, plastic surgery, orthopedics and beyond. We have a great game plan looking ahead toward bone and cartilage regeneration -- having assessed over 400 materials and narrowing it down to 50 – so we'll see which one we acquire and build."

Further balancing macro and micro, the CEO's SoCal base has him readying to build new office space, which will soon result in a host of regional career opportunities for the budding personalized healthcare landscape.

"Over the past two decades, both Orange County and San Diego have turned into hotbeds of biotech," Jafar concludes. "The talent pool here, from the standpoint of healthcare knowledge, is rapidly increasing." — ***By Judd Spicer, Senior Writer, California Business Journal***