



Press Release

3D printing and titanium – a life-changing combination

Additive manufacturing and titanium powder will disrupt medical implant production

3D printing is delivering customisation options that make it possible to create almost any shape using additive manufacturing (AM) technology. In fact, the possibilities of 3D printing are so game-changing, so it is even possible to create carbon copies of our own skulls. Sandvik's additive manufacturing and metal powder specialists are exploring the potential of AM in the medical field, and are preparing for the future of medical implants.

Life-threatening accidents, vertebral damage, chronic osteopathic conditions and side-effects from medical treatment can all cause irreparable damage for the patients. The consequences can be painful, debilitating and even fatal, so we must develop solutions to help the human body overcome challenges, enhance the healing process and improve the prognosis for the patient. Medical implant technology has developed vastly over the years, and one of manufacturing's most disruptive technologies is set to transform the way we treat patients.

Medical implant developers require a manufacturing technology that delivers speed, individualisation and the ability to produce complex designs. 3D printing, paired with bio-compatible materials like titanium, is demonstrating its evident potential as the medical industry's manufacturing technology of choice for life-changing solutions. In the past, surgeons used metal mesh to replace areas of the body such as skull bones, which tended to be weak and lacked precision. 3D printing eliminates these flaws because it uses medical imaging to create a customized implant, shaped exactly according to the individual's anatomical data. This means that the patient can be fitted with an exact match to replace the lost or damaged area of the skull.

In Sandviken, Sweden, lies one of the world's most cutting-edge titanium powder plants. At the plant, Sandvik's experts are unlocking the potential of 3D printed titanium devices for the medical industry. "Titanium, 3D printing and the medical sector are the perfect match," explains Harald Kissel, R&D Manager at Sandvik Additive Manufacturing.

"Titanium has excellent properties and is one of few metals accepted by the human body, while 3D printing can rapidly deliver bespoke results for an industry where acting quickly could be the difference between life and death."

In addition to titanium's material benefits, AM can help overcome some of the challenges when producing medical implants and prosthetics. Typically, the process of being fit for a prosthesis involves several visits to create a device that fits a patient and their needs. As a result, the time between a patient's life-changing surgery and them receiving their device can be painstakingly slow.

Postal address:

Sandvik Additive Manufacturing
Åsgatan 1
SE-811 81 SANDVIKEN
SWEDEN

Websites:

www.metalpowder.sandvik
www.additive.sandvik

Telephone:

+46 70 633 83 08

“If a patient undergoes a serious accident, one that destroys areas such as the skull or spine beyond repair, they simply do not have time to spare to ensure their reconstructive devices fit correctly. Instead, they’re given solutions that work, but aren’t to their bodies,” Kissel explained.

“Long waiting times and a lack of customisation can really impact how a patient feels after they’ve undergone a life-changing event or procedure. Even in 2020, there are still prosthetic patients using devices that do not move, or are simply just hooks.”

“Using computer tomography, it is now possible to optimise designs that simply cannot be produced using other manufacturing methods than additive manufacturing. What’s more, we can make our designs lighter, with less material waste and in shorter lead times. Patients could receive a perfectly matching device, in less time and using a high-performing, lightweight material.”

In summer 2020, Sandvik’s specialist powder plant was awarded the ISO 13485:2016 medical certification for its [Osprey® titanium powders](#), positioning its highly automated production process at the forefront of medical device development. As AM disrupts many areas of manufacturing, it’s clear that it’s potential in the medical sector will be life changing.

Sandvik is also part of one of the most ground-breaking research projects within the medical segment to date, contributing with its extensive material expertise. The Swiss M4M Center in Switzerland is a public-private partnership initiated by the Swiss government, aiming to evolve medical 3D printing to a level where patient-specific, innovative implants can be developed and manufactured quickly and cost-effectively. “The Swiss M4M Center is intended to build up and certify a complete end-to-end production line for medical applications, like implants. Being able to facilitate this initiative through the unique material knowledge that is found within Sandvik is an empowering experience. Joining forces with an array of experts, to reinvent the future of medical devices as well as the lives of thousands of people – is an experience out of the ordinary.”

Custom cranial implants and bespoke medical prosthesis are not for the distant future — the technology needed to develop and manufacture them already exists. To learn more about how Sandvik’s additive and powder experts are preparing for the future of medical devices, visit metalpowder.sandvik.com/medical

For further information: www.metalpowder.sandvik.com or www.additive.sandvik.com

Press contact: Lena Berg, VP Marketing and Communications, Sandvik Additive Manufacturing.
+46 70 633 83 08 or lana.berg@sandvik.com

Sandviken, Sweden, 8 October 2020

SANDVIK ADDITIVE MANUFACTURING

Sandvik Additive Manufacturing has a world-leading position in metal powder with the widest range of AM-alloys on the market, and the company has also made sizeable investments into a wide range of AM printing technologies for advanced metal components since 2013. Adding 158 years of leading expertise in materials technology, 75 years in post processing methods like metal cutting, sintering and heat treatment, Sandvik has well-established and leading competence across the entire AM-value chain. In 2019, Sandvik acquired a significant stake in **BEAMIT**, a leading European AM service provider with the largest printing facilities in Europe, and in August 2020 BEAMIT acquired 100% of **ZARE**, bringing together the two leading AM service bureaus in Europe – to create one of the largest AM service providers in the world – servicing the most demanding industries.

Sandvik AB is a high-tech and global engineering group with approximately 40,000 employees and sales of approximately 100 billion SEK in more than 160 countries (2019). The company was founded in Sweden in 1862.

Postal address:

Sandvik Additive Manufacturing
Åsgatan 1
SE-811 81 SANDVIKEN
SWEDEN

Websites:

www.metalpowder.sandvik.com
www.additive.sandvik.com

Telephone :

+46 70 633 83 08