Press release

Linde Partners with 3D Medlab in Pioneering Research to Optimize 3D Printing of Complex Structures for Medical Devices

- Complex, latticed structures are key to the success of future medical implants
- Industrial gases are vital for high quality, repeatable products
- Linde and 3D Medlab are collaborating to test optimal atmospheric solutions

 Guildford, UK, July 27, 2020 - Linde (NYSE: LIN; FWB: LIN) today announced it has started pioneering research into how atmospheric conditions in the additive manufacturing process can be optimized to produce complex latticed structures for medical devices. In collaboration with 3D Medlab, a leader in additive manufacturing for the medical sector, the joint project is the first of its kind and represents a milestone in the field of orthopedic device development.

Multifaceted, latticed components aim to mimic human body parts and can better assimilate into the patient’s own bone and tissue structure, leading to fewer rejections and quicker healing times. Additive manufacturing can optimize production of such components ensuring high-quality repeatability of the process and requiring less post-print finishing. However, the atmosphere in the printing chamber needs to be optimal and reproducible.

Atmospheric gases play a fundamental role in the printing process and any impurities that remain in the chamber, even once purged, can have a detrimental effect on the part being manufactured. Additionally, fumes created during the production process can remain on the part, requiring post-production cleaning.

Even extremely small variations in oxygen content can impair the mechanical or chemical properties of metals sensitive to oxygen – such as titanium and aluminum alloys - and can affect the composition of the end product. For the Linde/3D Medlab research trials, the titanium alloy in question is Ti-6Al-4V.

“We are proud to be collaborating with 3D Medlab on this important and forward-looking project,” said Pierre Forêt, Senior Expert Manufacturing, Linde. “As a customer at the forefront of medical device manufacturing, anything less than optimal product outcomes is critically important to avoid, so it is testament to our gases expertise and know-how that we have been selected to partner in this endeavor.”

The atmospheric trials involve a new helium/argon gas mixture created especially by Linde for the project to make the process smoother and cleaner, along with use of Linde’s ADDvance O2 precision, a first-of-a-kind oxygen measuring and analysis technology to ensure the optimal mix of gases within the print chamber. Along with the new gas mixture, ADDvance O2 precision will give 3D Medlab precise, granular control over the oxygen concentration and humidity levels in the print chamber.
Press release

“Our experience with Linde shows that they are as committed to the same high standards of precision and excellence in additive manufacturing that we are,” said Gaël Volpi, CEO, 3D Medlab. “Full regulatory compliance is a fundamental cornerstone in our engineering and design process and our customers trust us to ensure all proper measures and controls are in place.”

Linde began its association with 3D Medlab originally through the supply of its ADDvance powder cabinet, designed to retain the quality of valuable, sensitive metal powders used in the additive manufacturing process by protecting them from exposure to ambient air and humidity. While the current collaboration between Linde and 3D Medlab is focused on Ti-6Al-4V lattice structures, future efforts will include the potential of nickel titanium (also known as nitinol) in view of its excellent shape memory and super elasticity, making it an ideal candidate for next generation stents.

For further information on Linde’s gas and technology solutions for additive manufacturing, visit www.linde-am.com

About Linde
Linde is a leading global industrial gases and engineering company with 2019 sales of $28 billion (€25 billion). We live our mission of making our world more productive every day by providing high-quality solutions, technologies and services which are making our customers more successful and helping to sustain and protect our planet.

The company serves a variety of end markets including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing and primary metals. Linde’s industrial gases are used in countless applications, from life-saving oxygen for hospitals to high-purity & specialty gases for electronics manufacturing, hydrogen for clean fuels and much more. Linde also delivers state-of-the-art gas processing solutions to support customer expansion, efficiency improvements and emissions reductions.


Media contact:
Susan Brownlow
Public Relations Consultant
Linde
Telephone: +44 7739 456292
Email: susan.brownlow@wordsforindustrypr.com