

# Press release



## **Linde and Bluefors to jointly develop cryogenic cooling solutions for large-scale quantum computing technology**

- Two global market leaders join forces, each bringing their expertise to the table
- Combined effort gets cryogenics ready for next steps of large-scale quantum computing
- Solution builds on a long-term relationship and close collaboration

Pullach, Germany, and Helsinki, Finland, March 15, 2021 – Linde (NYSE: LIN; FWB: LIN) and Bluefors have joined forces to create cooling solutions for large-scale quantum computers. Linde is contributing its vast experience as the world leader in large cryogenic installations. Bluefors brings to the table its ultra-low temperature interface needed for quantum computing. Their combined effort supports this emerging industry by ensuring cryogenics are ready for the next steps in large-scale quantum computing, in terms of cooling power, efficiency and robustness.

In the initial phase of the partnership, the companies focused on identifying how the technologies work best together. Currently, both partners are collaborating on implementing the results to get their joint product ready for market.

“I am happy that we, as two world leaders within their respective sectors, take on this challenge,” says John van der Velden, Senior Vice President Global Sales & Technology, Linde Engineering. “The market potential for the technology is significant, since quantum computing will enable complex or real-time task processing, to name just a few examples: in healthcare modelling, banking and finance, autonomous driving, machine learning, and artificial intelligence.”

“After our first meetings, it was clear to both Bluefors and Linde that this was a perfect match for the next phases,” comments Rob Blaauwgeers, CEO Bluefors. “Linde shares the same values regarding product quality and reliability and has a long experience in providing large scale cryogenics, which is a necessity in the next steps of quantum computing scale-up.”

Quantum computers have the potential for computational power that is unattainable by current computers. They can operate exponentially faster than conventional computers and could, thereby, be the solution to today’s insurmountable problems. Cryogenics is a critical component in harnessing this quantum power and the ability to cool down large-scale quantum circuits is essential. Together, Linde and Bluefors have embraced this challenge to ensure that the next stage in cryogenics is ready and able to meet this need.

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## About Linde

Linde is a leading global industrial gases and engineering company with 2020 sales of \$27 billion (€24 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 chemicals & refining, food & beverage, electronics, 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.

For more information about the company and its products and services, please visit [www.linde.com](http://www.linde.com).

## About Bluefors

Bluefors is the world leader in manufacturing cryogenic measurement systems for the field of quantum technology. With an anticipated revenue of over €100 million for 2021 and around 250 employees, we are dedicated to delivering the most reliable, easy-to-operate systems and versatile on the market. The quality of our products in combination with our scalable production capabilities, has made the quantum technology field recognize us as the preferred choice for their ultra-low temperature requirements.

We offer a variety of models of dilution refrigerator measurement systems to meet the specific needs of each customer. These models can be further equipped with a wide range of options. For example, experimental wiring, optical access, and magnet integration. Our systems can be customized to meet the requirements of each intended use by allowing the customer to get in direct contact with the scientists and engineers that design their system.

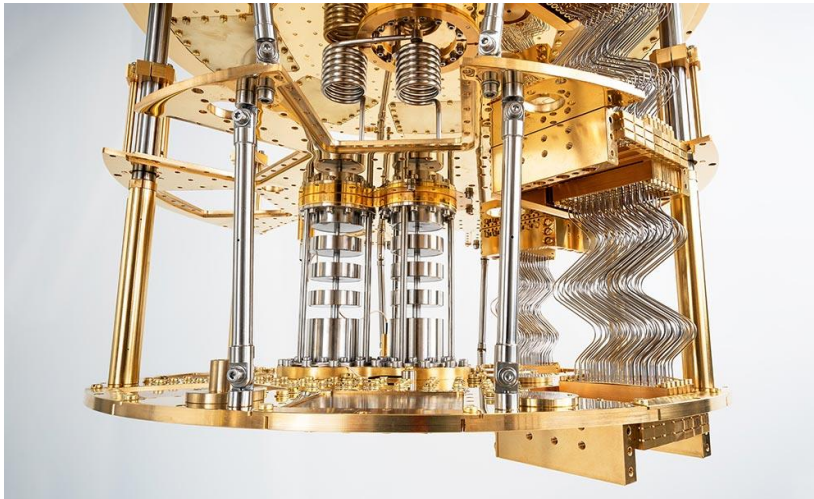
Bluefors – Cool for Progress. [www.bluefors.com](http://www.bluefors.com)

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**BLUE  
FORS**



Linde large-scale refrigeration unit



Bluefors high density wiring for quantum computers