



Diamfab and HiQuTe Diamond, two French synthetic diamond startups announce a world-first technological partnership

The first-of-its kind technological partnership positions France as a leader in the emerging synthetic diamond sector dedicated to power electronics applications

Grenoble, 21 November, 2024 - Diamfab, the semiconductor diamond deeptech, and HiQuTe Diamond, the plasma-assisted CVD synthetic diamond startup, have announced a strategic technological partnership. This partnership covers the key stages in the value chain, from substrate production to the manufacture of electronic components, via the epitaxy of doped layers. HiQuTe Diamond will contribute its unique expertise in the production of high-quality diamond substrates, optimised to maximise the performance of power electronics devices. Diamfab will be responsible for the epitaxial growth of doped layers using advanced crystal growth processes, as well as the manufacture of high-performance components.

A partnership rooted in research and innovation

Both companies come from world-renowned CNRS laboratories: the Institut Néel for Diamfab and the LSPM (Laboratoire des Sciences des Procédés et des Matériaux) for HiQuTe Diamond. With more than 30 years of combined research, these two companies benefit from unique expertise that puts France at the forefront of innovation in the field of semiconductor diamonds.

A unique partnership to make diamond semiconductors an industrial reality

This partnership is the first in the world to combine mastery of the three key stages - substrate, epitaxy and manufacturing - at such a high level of quality, in both academic and industrial spheres.

Thanks to their geographical proximity and industrial agility, the two companies will be able to accelerate iteration cycles to rapidly achieve unprecedented technical and financial performance, with the aim of making diamond semiconductors an industrial reality.

“Power semiconductors are at the heart of the growth of the world's economies. With performance levels between 10 and 40 times higher than components based on conventional materials, diamond semiconductors are key to widespread adoption of electrification and the decarbonisation of entire sectors of the economy.





By working with HiQuTe Diamond, we have the will and the technological, human and geographical resources to create this sector of excellence in France".
Commented Gauthier Chicot, CEO of Diamfab.

Florent Alzetto, CEO of HiQuTe Diamond, shares this enthusiasm: "The plasma-assisted CVD growth process makes it possible to produce boron-doped diamonds that are specifically adapted to the demanding applications of power electronics. This sustainable process ensures rigorous control of physical properties, while meeting performance challenges. The convergence of our expertise and that of Diamfab offers unprecedented opportunities to meet global industrial challenges in terms of performance and energy efficiency".

Next steps

The two companies plan to begin the collaboration with the manufacture of a first series of vertical Schottky diodes on HiQuTe Diamond substrates using diamond epitaxy optimised by Diamfab. The first prototypes, expected in Spring 2025, will mark a decisive technological breakthrough, paving the way for the industrialisation of diamond semiconductors, a real turning point for the high-performance industries.

About Diamfab

Diamfab is an internationally recognized pioneer in semiconductor diamonds. Founded in 2019 and based in Grenoble (France), Diamfab is a spin-off from the Centre National de la Recherche Scientifique (CNRS) headed by Gauthier Chicot, Khaled Driche, Ivan Llauro and currently employs 15 people. The company synthesizes high value-added diamond wafers for the semiconductor industry. It also designs diamond-based electronic component architectures, and develops the corresponding manufacturing processes. The startup has been recognised by the i-Lab prize (2019) and i-Nov prize (2024).

With electrical and thermal performance superior to SiC and GaN, record efficiency (99%), compactness, and a reduced carbon footprint throughout the process (from material manufacture to component use), Diamfab's high value-added diamond wafers are designed to play a major role in the electrification of society. From electric cars to the future high-voltage grid, from hybrid aircraft to batteries for connected objects, diamond will be at the heart of the energy transition.

For more information visit: www.diamfab.com

About HiQuTe Diamond

HiQuTe Diamond is Europe's leading producer of synthetic diamonds, designed to meet the most demanding technological challenges. Founded in 2022 by Technofounders and five LSPM researchers, HiQuTe Diamond, led by Florent Alzetto and Riadh Issaoui, is revolutionising strategic sectors such as power electronics, quantum computing, quantum and high-performance sensors.





HiQute Diamond's unique expertise covers the entire production process, enabling it to deliver high-performance diamonds with perfectly controlled physical and optical properties. By combining innovation and technological mastery, HiQute Diamond offers solutions that surpass traditional materials, contributing to the industrialisation of new high-impact technologies.

With an unwavering commitment to European technological sovereignty, HiQute Diamond is positioning itself as a catalyst for industrial innovation, enabling the most advanced industries to meet the major challenges of tomorrow: energy transition, enhanced performance and sustainability.

For more information visit: www.hiqute-diamond.com

HiQute will be at this year's [Materials Research Society](#) Fall Meeting, November 30 - December 5, 2024 in Boston, MA

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