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Resonac and Soitec Sign Agreement to Jointly Develop Bonded Substrates for SiC Power Semiconductors

Resonac Corporation (President: Hidehito Takahashi, hereinafter referred to as "Resonac") has signed an agreement with Soitec (CEO: Pierre Barnabé, hereinafter referred to as "Soitec"), a French manufacturer of advanced semiconductor substrate materials, to jointly develop 200mm (8-inch) silicon carbide (SiC) bonded substrates, which will serve as the material for SiC epitaxial wafers (hereinafter referred to as "SiC epi-wafers") used in power semiconductors. By combining Resonac's high-quality SiC single crystal substrates*¹ with Soitec's substrate bonding technology, we aim to improve the productivity of 8-inch SiC wafers and diversify the supply chain in the SiC epi-wafer business.

Power semiconductors are widely adopted in power applications such as electrified vehicles (xEVs) and industrial equipment, and the market is expected to expand further in the future. Especially, SiC is in high demand due to its advantages over silicon (Si), such as lower power loss and heat generation during power conversion, contributing to energy saving. However, SiC single crystal substrates, which are the main material for SiC power semiconductors, require uniform crystals, advanced technology for production, and time-consuming crystal growth, making productivity improvement a challenge.

Resonac produces SiC epi-wafers with epitaxial layers grown on SiC single crystal substrates, which are highly regarded by device manufacturers both domestically and internationally for their world-class quality. We are also developing 8-inch large-diameter wafers and have started shipments of samples.

Soitec possesses a unique technology (SmartSiC™ technology) that processes high-quality SiC single crystal substrates, bonds the processed surface to a polycrystalline SiC wafer*² as a support substrate, and then splits the single crystal substrate into thin film, enabling the production of multiple high-quality SiC wafers from one SiC single-crystal substrate. This technology not only improves productivity but also reduces CO₂ emissions during SiC wafer manufacturing by up to 70%, offering environmental and cost benefits. The bonding substrate technology has already been commercialized for Si wafers, and Soitec has expertise in its practical application.

In this joint development, Resonac will supply SiC single crystals to Soitec, which will then manufacture SiC bonded substrates using these single crystals. Through the collaboration of the two companies, we aim to improve production efficiency of 8-inch SiC wafers and diversify the supply chain in the SiC epi-wafer business.

The Resonac Group, as a "Co-creative Chemical Company," aims to contribute to sustainable development of the global society and positions SiC epi-wafers business, which realize efficient use of energy, as a core growth business. Moving forward, Resonac will continue contributing to the proliferation of SiC power semiconductors by supplying high-performance and highly reliable products under the motto of "best-in-class."



Resonac's SiC epitaxial wafers

*1. SiC single crystal substrate: A material with a crystal structure in which atoms are arranged in a regular pattern. It has uniform physical properties and requires advanced manufacturing technology to form single crystals.

*2. Polycrystalline SiC wafer: A material composed of many small crystals (grains). Each of the small grains is a single crystal, and polycrystalline materials are aggregates of these grains. The overall crystal structure is random, making it easy to manufacture and cost-effective, and thus widely used in various applications.

[About the Resonac Group]

The Resonac Group is a new company established as a result of the integration of the Showa Denko Group and the Showa Denko Materials Group (former Hitachi Chemical Group) in January 2023. The Group's annual sales of semiconductor and electronic materials amount to about 340 billion yen. The Group especially has an extensive lineup of semiconductor materials for back-end process which have global top market share. The integration of the two companies has enabled the Resonac Group to design functions of materials as well as to develop them in-house, going all the way back to raw materials. The new trade name "RESONAC" was created as a combination of two English words, namely, the word of "RESONATE" and "C" as the first letter of CHEMISTRY. The Resonac Group will make the most of its co-creative platform, and accelerate technological innovation with semiconductor manufacturers, material manufacturers, and equipment manufacturers inside and outside Japan.

For detail, please refer to our Website.

Resonac Holdings Corporation: <https://www.resonac.com/>

[About Soitec]

Soitec (Euronext - Tech Leaders), a world leader in innovative semiconductor materials, has been developing cutting-edge products delivering both technological performance and energy efficiency for over 30 years. From its global headquarters in France, Soitec is expanding internationally with its unique solutions, and generated sales of 1 billion Euros in fiscal year 2023-2024. Soitec occupies a key position in the semiconductor value chain, serving three main strategic markets: Mobile Communications, Automotive and Industrial, and Edge and Cloud AI. The company relies on the talent and diversity of its 2,300 employees, representing 50 different nationalities, working at its sites in Europe, the United States and Asia. Soitec has registered over 4,000 patents.

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For more information: <https://www.soitec.com/en/> and follow us on X: @Soitec_Official

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