Press Information

Improved high-performance material for gas-lubricated seals: Kyocera presents silicon nitride StarCeram® N3000 P

Kyoto/Esslingen, 07th August 2025. Kyocera is launching StarCeram® N3000 P, an optimised high-performance silicon nitride material that offers clear advantages for use in gas-lubricated mechanical seals and bearing elements. This technical ceramic is designed for applications subject to high mechanical and thermal loads, making it ideal for use in extreme operating conditions.

Advantages of gas-lubricated sealing systems

Thanks to its exceptional material composition, StarCeram® N3000 P ensures reliable sealing with even pressure distribution and minimal leakage – even under high stresses. Its extremely high wear and thermal shock resistance enables long-lasting, stable operation even under changing temperature conditions.

High demands on materials and manufacturing

Gas-lubricated mechanical seals are used in systems where rotating components need to be sealed permanently and without media – often at high temperatures, pressures and speeds. Typical areas of application include high-performance pumps, compressors, turbines and systems for water treatment, in the chemical industry or in oil and gas extraction.

The requirements for materials used in mechanical seals are correspondingly high: besides high dimensional stability, thermal shock resistance and low abrasion, a low-porosity microstructure is particularly important. This is the only way to achieve gas-carrying structures such as sealing grooves with minimal leakage and maximum running smoothness.

Characteristics of StarCeram® N3000 P

Kyocera's new material meets these requirements at the highest level and stands for the following properties:

- High bending strength even at high temperatures
- Outstanding fracture toughness and wear resistance
- Low density
- High thermal shock resistance
- Electrical insulation properties – crucial for applications in vacuum technology
- Very fine, almost pore-free structure

The exceptional material quality with extremely low porosity enables particularly precise and damage-free laser processing, for example for the integration of gas-conducting grooves or special surface structures. It is up to the customer to decide whether the gas-conducting structures are incorporated by them or directly at Kyocera. For this purpose, Kyocera utilises highly advanced laser systems that enable different microstructures, such as recesses or grooves, for flexible and reproducible implementation.

Seals made of silicon nitride StarCeram® N3000 P for gas-lubricated sealing systems

Technology partnership for tailor-made solutions

As an experienced manufacturer of technical ceramics, Kyocera not only offers the material, but also comprehensive technical support as well as the development of customer-specific components. Thanks to many years of expertise and a high level of vertical integration, the company supports its partners with the implementation of ceramic-based solutions for demanding applications.

The press material is available for download via the following link:
https://spgroup.box.com/s/hb0s8auqtucjtcx5argifc45xow4oo6a

For more information on Kyocera: www.kyocera-fineceramics.de

About Kyocera

Kyocera has been successful in Europe for over 50 years. From its European headquarters in Esslingen am Neckar, KYOCERA Europe GmbH operates 28 sites including manufacturing facilities, with products ranging from fine ceramics, automotive, semiconductor and optical components to components for medical products, industrial tools, LCDs, touch solutions, industrial printing components, and consumer goods such as kitchen and office products.

Kyocera's high-performance ceramic products are produced and distributed by KYOCERA Fineceramics Europe GmbH, a subsidiary of KYOCERA Europe GmbH. The Kyocera Group is one of the world's leading providers of high-performance ceramic components for the technology industry, offering over 200 different ceramic materials, as well as state-of-the-art technologies and services tailored to the specific needs of each market.

KYOCERA Europe GmbH is a company of the KYOCERA Corporation headquartered in Kyoto/Japan, a renowned supplier in semiconductor, industrial and automotive components as well as electronic components, printing and multifunction systems, smart energy systems, and communications technology. Kyocera is one of the most experienced technology producers, with more than 65 years of industry expertise. The Kyocera Group comprises 288 subsidiaries (31 March 2025). In England, With around 77,200 employees, Kyocera generated net annual sales of around EUR 12.43 billion in the 2024/2025 fiscal year.

Kyocera is ranked 874 on Forbes magazine's 'Global 2000' list for 2024, and ranked as 'The 100 Most Sustainably Managed Companies in the World' according to the Wall Street Journal. For the second year in a row, Kyocera qualified for the Dow Jones Sustainability Index (Asia-Pacific). As well, Kyocera receives a Bronze rating on EcoVadis Sustainability Survey and was acknowledged as a 'Top 100 Global Innovator 2025' for the ninth time by Clarivate, being one of the world's leading innovators.

Kyocera also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation — established by Kyocera founder Dr Kazuo Inamori — to individuals worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind (equivalent to approximately €596,500 per prize category).

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