

Best values for new energies and e-mobility

CeramTec launches Rubalit® ZTA, a ceramic substrate tailored to high-performance applications

Plochingen, Germany, March 1, 2023 - Very high flexural strength, good thermal conductivity, excellent electrical insulation and top values for dielectric strength: all this is offered by the new high-performance substrate Rubalit® ZTA, which ceramics specialist CeramTec is presenting at PCIM in Nuremberg. ZTA stands for Zirconia Toughened Alumina - and for a material that is also predestined for high-performance applications such as electromobility and power generation due to the properties mentioned.

With Rubalit® ZTA and another high-tech substrate announced for this year, CeramTec is expanding its substrate portfolio to include solutions specifically tailored for use in highly electrified industries and e-mobility. The power electronic modules in this environment must meet increasingly stringent requirements in terms of their temperature resistance and miniaturization. With these key specifications in mind, CeramTec has developed a substrate with impressive properties.

Compared to the widely used aluminum oxide as a substrate material, the flexural strength has been improved by 40 percent to more than 625 MPa. In practice, this means a significantly higher fatigue strength of power modules built on Rubalit® ZTA. Thermal conductivity is more than 26 W/mK, and in dielectric strength the new substrate reaches 25 kV/mm. This makes Rubalit® ZTA clearly superior to common PCB materials, for example. Its thermal conductivity, temperature resistance and insulating properties also make the substrate an ideal material for use in passive components or chip resistors.

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Why manufacturers of power electronics use the need the new Rubalit® ZTA ceramic substrate.

Three questions for David Hassler, Product Manager Electronics at CeramTec

David, how do you answer manufacturers of power electronics when asked why they need the new Rubalit® ZTA ceramic substrate?

Reinforced alumina offers strong thermal and mechanical performance at a good price/performance ratio. Current levels in power electronics are getting higher and higher. Ideally, the conversion of ever higher currents must be prevented from causing excessive heat loss and thermal stress for the simultaneously ever smaller modules. Rubalit® ZTA meets these requirements outstandingly well.

Almost 40 percent increase in flexural strength is quite something. How was this achieved?

Rubalit® ZTA is the result of intensive development work. A high flexural strength ensures that the conductive metallisation does not detach from the ceramic substrate even during extreme temperature cycles, making the power converters very durable. To ensure this, we have carried out many elaborate life tests on Rubalit® ZTA - and improved the product until we reached this value.

When will Rubalit® ZTA be available on the market?

We will launch the product as a substrate in the masterplate format of 138 x 190.5 x 0.32 mm at the start of the PCIM in Nuremberg - i.e. in mid-May. In addition, D-samples for qualification are available immediately. In the near future, however, we will of course also offer other thicknesses. Interested parties can find interesting information about Rubalit® ZTA in advance at www.ceramtec-industrial.com/de/produkte-anwendungen/substrate/zta-substrate.



David Hassler is responsible for the Electronics Division in CeramTec's Product Management. (Photo: CeramTec)

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About CeramTec

CeramTec is a leading global medical technology platform focused on solutions made of advanced ceramics (HPC) and specialises in the development, manufacture and distribution of parts, components and products made of ceramic materials. With more than a century of development and production experience in the HPC industry, CeramTec is a global leader in the manufacture of advanced ceramics and develops these materials for use in a wide range of applications. CeramTec's advanced ceramics are used in a number of areas, including medical applications such as hip prostheses, other orthopaedic implants, dental implants and medical devices, as well as in the mobility and electronics industries, and also in other industrial applications. With production sites and subsidiaries in Europe, North and South America and Asia, CeramTec has a global presence as a manufacturer and supplier. CeramTec's headquarters are located in Plochingen near Stuttgart. In 2021, CeramTec generated sales of more than 640 million euros. CeramTec employs almost 3,500 people worldwide, including around 2,000 in Germany.

More information: www.ceramtec-group.com

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