

Subject:

Latest Developments and Trends for the Industrial Application of the FAST/SPS Technique

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Abstract:

In the past two decades, the Field Assisted Sintering Technique (FAST), also known as Spark Plasma Sintering (SPS), has been successfully established for rapid sintering applications. The scientific results gathered in the past in the area of R&D were implemented step by step in practical industrial applications. Together with a multiplicity of industrial partners and based on its own R&D activity with practical applications at its in-house technology center FCT Systeme GmbH could implement this knowledge in the past years successfully in customized plant concepts. Exclusive examples will be introduced and future prospects regarding the trend of development will be illustrated.

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FCT SYSTEME GMBH

FCT Systeme GmbH designs and manufactures high-temperature plants to produce modern high-performance materials such as non-oxide ceramics, powder metallurgical materials and composites at its site in Frankenblick, Germany.

The company has more than 40 years of experience and focuses on spark plasma sintering systems (also known as Field Assisted Sintering), hot pressing, gas-pressure sintering (Sinter HIP) and vacuum sintering covering the complete range from the laboratory plant to the highly specialized industrial plant.

The company is committed to the development of customized and efficient plants that achieve maximum performance and service life. A team of highly skilled technicians, engineers and scientists works in close cooperation with the customer to develop solutions for process optimization.

Innovative hybrid plant concepts are the latest trend in sintering technology: in the FAST/Hybrid trend-setter the classic hot pressing method has been complemented with an additional direct heating of the compacted powder part using impulse-direct current (FAST/SPS). Compared to hot pressing, this combination goes beyond the possibilities of FAST/SPS allowing heating rates to be further increased and at the same time achieving optimised temperature homogeneity.

Combining gas pressure and uniaxial pressing pressure is necessary for the development and optimisation of materials that are increasingly being used e.g. in the compacting of high-purity materials or the synthesising of materials.

The new FCT hybrid plants allow previously unrealisable opportunities for the development and optimisation of innovative materials used in energy technology, electric mobility, aerospace industry as well as other areas relevant for the future.