DEPARTMENT OF CHEMISTRY AND PHYSICS OF MATERIALS

ANNOUNCEMENT

PARIS LODRON UNIVERSITÄT SALZBURG

Vortragsankündigung

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"Additive manufacturing of high-performance ceramic materials"

In recent years, additive manufacturing techniques have started to become increasingly relevant fabrication methods in the field of high-performance ceramics. Especially, vat photopolymerization of ceramic materials has established itself as one of the most promising technologies for producing complex ceramic components with high precision and isotropic mechanical properties that are on a par with those achieved by traditional forming processes.

This paper presents the achievable (thermo-)mechanical properties of various ceramics (e.g. aluminium oxide, zirconium oxide, silicon nitride). Furthermore, new material developments, such as piezoelectric ceramics, SiOC based on pre-ceramic polymers, or calcium phosphates for bone replacement are also presented. In this context, initial technical applications from the medical and chemical industries are presented, in which such 3D-printed components are already being used.

In addition, this paper also examines the extension of this process to the combination of different materials within a single printed component. Multimaterials in 3D printing are attracting significant attention due to the wide range of possibilities for manufacturing parts with greater functionality and improved properties. Initial results demonstrate that this technological approach holds great potential for moving from traditional single-material structures towards multi-material and fully functional components.