

# Gel-casting of Ceramic Components for Wireless Communications

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## Abstract

Gel-casting is a novel ceramic forming process for fabricating products of complex-shaped ceramics. In this contribution, the gelcasting process is applied to manufacture green body of ceramic components for microwave resonators, oscillators and antennas. Calcined powders, dispersant and organic monomers are mixed together by ball-milling to acquire high solid loading slurry with low viscosity. After addition of initiator and catalyst, the slurry is cast into a non-pours mold and then polymerized. The slurry is thus solidified in situ and the green bodies with the desired shapes are obtained. The dried body is rather strong and can be machined so as to get more precise or complex-shaped components. Then the green bodies are sintered at high temperature. The microwave properties ( $\epsilon_r$ ,  $Q$ ,  $\tau_f$ ) and microstructures of the ceramics prepared by gelcasting are compared with those of die-pressed ones.

**Keywords:** Forming process; Gel-casting; Microwave ceramics