



PROJECT "THEORY AND APPLICATIONS OF SINTER-CRYSTALLIZATION" DN 19/7

Effect of microwave in glass powder sintering and sinter-crystallization

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Abstract: Microwave heating can be efficiently carried out during processing of low-thermal conductive ceramic materials. Both applicator's and sample's geometries should be adequately implemented to allow rapid and homogeneous heating within the ceramic sample. Sintering of glass powders as well as precursors of glass-ceramics are particularly difficult to process via MW irradiation to the "thermal runaway" phenomenon, that is commonly triggered at temperatures above 600°C. Once the electromagnetic field can penetrate the glass powder pellet or disk, then a mass transfer mechanism active at the surface of the particle can improve densification rate rather than crystallization.

It has been proved by SEM, XRD and X-ray tomography results that under microwave irradiation glass powders are easily densified while crystallization has not yet started. Evolution of porosity has been followed also by Hg intrusion porosimetry.