Sintered materials are perfectly suited for the engineering industry

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Abstract: *Sintered materials are perfectly suited for the engineering industry, for sintering is considered as a fast and cost-saving manufacturing process, enabling the forming of parts with complex geometry. The use of powdery product as raw material advocates the integration of sintering in the recycling loop, even more relevant in raw materials depletion's context. Laser impact is used in the sector of surface hardening (shot peening) that increases the surface hardness of a ductile material through cold working (strain hardening). This process produces a hardness and finish similar to these obtained by sand blasting, with better repeatability. The laser sublimates matter in the impact area, and the expansion of the plasma thus created generates a wave of rapid compression in the material, which can stiffen in shock, even stronger than the plasma is confined. This phenomenon is governed by the physical shock propagation in matter, and is therefore affected by the porosity.*

Numerical methods and models allow computer codes to treat various phenomena observed in the field of shock and detonation (dynamic compaction, shock to detonation transition, blast wave propagation over long distances). The propagation of shock waves in porous media has been extensively studied in the vocation of establishment of the laws of behavior of metallic foams and ceramics, but also damping of shock waves. In order to assess the relevance of these tools and their models, modellings based on experimental work from the bibliography are to be conducted.

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