

# Evaluation of Laser-Assisted Sintering as an Advanced Processing Technique in Traditional Ceramic Industry

Monday, 31 August 2026 14:40 (20 minutes)

Traditional ceramic products are widely used in the construction sector due to their high mechanical strength and chemical resistance. Owing to their ability to maintain performance throughout the lifetime of a building, these products offer significant sustainability advantages compared to alternative materials. However, the ceramic industry is an energy-intensive sector, mainly because of the high sintering temperatures required during production. In the ceramic industry, sintering energy supplied by natural gas-fired kilns, which leads to substantial carbon dioxide emissions. In addition, the thermal efficiency of continuously operated industrial kilns is relatively low due to substantial heat losses, which increases both production costs and emission levels. This situation constitutes a major constraint with respect to the sector's objectives for reducing its carbon footprint. Within the scope of this study, the feasibility of laser-based energy sources in conventional ceramic manufacturing processes was investigated for both vitrified sanitary ware and ceramic tile products. The physical properties of the laser-assisted sintered samples were examined in terms of physical properties and microstructure. The integration of laser-based applications into ceramic manufacturing processes offers an alternative processing route that enables improved energy efficiency while aligning with strategies aimed at reducing sector-wide carbon dioxide emissions.

## Professional Status of the Speaker

Senior Scientist

## Interest in submitting a paper in a special issue of

No interest

## Invitation letter for visa

Yes

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**Session Classification:** Photonic sintering

**Track Classification:** Group 3: Photonic sintering