VitroGeoWaste III

Zero-Waste Tile Production: Exploring the Potential of 100% Recycled Substrates via Dry Processing

Oral presentation ☐ / Poster presentation ☑

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Abstract: The ceramic tile production industry faces significant challenges related to raw material availability and environmental sustainability. This study introduces an innovative approach focusing on the development of ceramic substrates using 100% recycled materials such as glass, fireclay and calcium carbonate. It also adopts a dry production process as an alternative to the conventional spray drying process, which can consume more than 500 m3 of water per day.

This research explores the advantages of using recycled ceramic materials in the manufacture of substrates, reducing dependence on raw materials and mitigating the environmental impact associated with the extraction and processing of clays and minerals. In addition, the transition to a granulation process, rather than spray drying process, significantly reduces energy and water consumption, resulting in a lower carbon footprint.

This study presents a methodology for sintering materials at temperatures below 1000°C, which is lower than the current industry temperature of around 1200°C. This enables the production of materials suitable for coatings. This allows the production of materials suitable for porous ceramic coatings with porosities above 10% or highly sintered ceramic laminates with porosities below 0.05%. This breakthrough represents significant progress in efficiency and sustainability within the ceramics industry.