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## **Effect of ceramic-polymer blends on mechanical behavior of green bodies for abrasive tools**

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Tools for surface finishing of stones, tiles, and advanced ceramic-based components consist of ceramic-polymer blends. Such tools are made via two main production steps: the compaction of the blend and then, the hot die pressing of the compact blend, also known as the green body. Due to the poor intrinsic strength of the green body, its manipulation is critical. Even small loads applied to extract it from the die and to transfer it to the hot die pressing station may undermine its structural integrity. The green body exhibits a brittle fracture behavior with strengths strictly dependent on the applied loading condition. Therefore, knowledge of the mechanical behavior of these materials is crucial to minimizing material waste in manufacturing processes. This research addresses the characterization of the morphology and mechanical behavior of four different ceramic-polymer blends obtained by varying volumetric ratio and abrasive grain size. The aim is estimating the mechanical behavior under the stress states resulting from the loading conditions of the green body during its manipulation.

Preliminary, the chemical and morphological characterization of the blends was performed. Afterwards, for each blend composition, five specimens were prepared for mechanical testing and subjected to loading until fracture, monitoring the applied load and deformation. A fractographic analysis was, then, conducted on the most relevant specimens to identify the crack initiation site and the fracture mechanism. The experimental results were analyzed to determine the mechanical behavior of the green body as a function of the blend composition.

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