

# Failure of Sandwich Beams Consisting of Alumina Facesheet and a Aluminum Foam Core

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## ABSTRACT

Aluminum foams are lightweight, recyclable and have high corrosion resistance, high specific strength, and good formability. The structural performance of these foams can be enhanced by sandwiching them between two thin face sheets of high stiffness and strength materials such as alumina and/or aluminum sheets. Depending upon the geometry and the material properties of the core and face sheets, various competing failure modes occur in sandwich structure, when subjected to external load. After the physical and mechanical characterization of a aluminum foam (Alporas), sandwich beams comprising Alporas foam core and alumina face sheets were subjected to four-point bending to identify the failure modes. Three failure modes named as core shear, indentation and face sheet cracking were identified as failure modes. Numerical simulations using a finite element code were carried out to check the failure loads and modes. The experimentally measured failure load is in good agreement with the numerical simulation studies.