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# M4Or1B-03: Piezometric properties of 3D-printed composites at cryogenic temperatures

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Type-V cryogenic storage tanks, made from composite materials, have recently utilized 3D-printed composites reinforced with short carbon fibers. These materials combine lightweight design with excellent structural integrity while also exhibiting electrical conductivity and a piezometric response under applied loads. Despite these advantages, their piezometric properties remain unexplored, especially at cryogenic temperatures. This study examines the mechanical and piezometric properties (resistivity, surface conductivity) of these 3D-printed composites at cryogenic temperatures. The effects of various processing parameters—including print orientation, print temperature, and layer height—on these properties were examined and compared to their behavior at room temperature. New testing protocols have been developed to study the evolution of piezometric properties under applied strain at cryogenic temperatures. The findings reveal significant changes in piezometric characteristics at cryogenic conditions, presenting a novel approach for structural health monitoring of storage tanks without requiring additional sensors.

**Author:** MOJUMDER, Satyajit (Washington State University)

**Co-authors:** DODGE, Reagan (Washington State University); BEADLE, Zachary (Washington State University)

**Presenter:** MOJUMDER, Satyajit (Washington State University)

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