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COMPRESSIVE AND TENSILE STRENGTH EVALUATION OF A LAYERED-MATERIAL COMPOSED OF LUNAR REGOLITH SIMULANT AND EPOXY RESIN FOR THE CONSTRUCTION OF LUNAR SETTLEMENTS.

Abstract

Human curiosity and the need to explore the solar system in search of answers to our challenges as a civilization proposes for this and the next decade to return to our satellite. One of the objectives is to establish camps on the lunar surface that will allow human beings to spend long periods of research and experimentation. It is well-known that in-situ resources are vital elements for the technical and economic feasibility of the objectives. The purpose of this research is to evaluate the mechanical properties of compression and traction of a material composed of regolith simulant and epoxy resin to establish human habitats on the moon. The material was molded using a layering method that was selected as the result of the contrast among the three variants of this method. Then, the material was exposed to aggressive conditions such as vacuum, temperature gradient, and radiation, simulating the lunar environment. Finally, this paper presents the affectation the material suffered from these conditions based on its compressive and tensile strength evaluation.