

## Structural Analysis of Multi-Pressure Integrated Vessel for Sport-Multi-Artificial Environment System

**Authors :** Joon-Ho Lee, Jeong-Hwan Yoon, Jung-Hwan Yoon, Sangmo Kang, Su-Yeon Hong, Hyun-Woo Jeong, Jaeick Chae

**Abstract :** There are several dedicated individual chambers for sports that are supplied and used, but none of them are multi-pressured all-in-one chambers that can provide a sports multi-environment simultaneously. In this study, we design a multi-pressure (positive/atmospheric/negative pressure) integrated vessel that can be used for the sport-multi-artificial environment system. We presented additional vessel designs with enlarged space for the tall users; with reinforcement pads added to reduce the maximum stress in the joints of its shells, and then carried out numerical analysis for the structural analysis with maximum stress and structural safety. Under the targeted allowable pressure conditions, maximum stresses occurred at the joint of the shell, and the entrance, the safety of the structure was checked with the allowable stress of its material.

**Keywords :** structural analysis, multi-pressure, integrated vessel, sport-multi-artificial environment

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