MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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SPACE SIMULATION CHAMBERS STATE-OF-THE-ART

Abstract

The space Simulation chambers, also known as thermal-vacuum chambers, are systems used to recreate as closely as possible the environmental conditions that satellites experience in space, as well as also serve to space components qualification and material research used in spacecraft. These systems analyze satellites behavior, evaluating its thermal balance and functionalities to ensure mission success and survivability. The objective of this paper is to describe, which are the environmental parameters of space can be simulated in this type of ground test facilities, types of the facilities, class of phenomena generate inside, and the evolution of these systems from conception (at the beginning of the 60s) to present, where it is possible to identify the conventional operational requirements of various state-of-the-art commercial chambers (found in different laboratories and research institutions) their morphology, type of manufacturing, structure materials, supplies necessary for its operation, internal and external interfaces, data acquisition systems, pumping systems (low, medium, high and ultra-high vacuum), ways and means of heat transfer, temperature ranges, operating pressure and general operation and monitoring requirements. The study allowed the definition and classification of operation, states, modes, passive and active operations and control and monitoring philosophy of the analyzed chambers.