

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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MULTILAYER ELASTOMERIC MODULE (MEM) REALIZATION AND TESTING FOR LAUNCH
VEHICLE THRUST OSCILLATION ISOLATION SYSTEM (TOIS)

Abstract

Large segmented solid motor boosters are used for heavy lift launch vehicles, and thrust oscillation is a common phenomenon for such boosters. These oscillations create low frequency vibrations which are critical for the mounted satellite. Since these thrust oscillations are inherent property of solid motors, isolation of such low frequency oscillations become essential for a launch vehicle. The Thrust Oscillation Isolation System (TOIS) should be capable of withstanding the static loads such as stage inert mass with propellant and dynamic loads such as thrust during the rocket thrusting phase. Elastomer based isolations systems is a good solution to mitigate the effect of these types of oscillations to the core vehicle. Multilayer Elastomer modules (MEMs), which is a combination of elastomer and metal sheets moulded into one, was developed to address the Thrust Oscillations for ISRO's LVM3 launch vehicle. Development and testing of MEM was a major technological challenge since similar product development was not attempted before. Custom made moulding elements and test rigs were developed during the process. This paper describes the challenges faced during the realisation of MEM, definition of test requirements, realisation of test rig as well as its testing and qualification.