

DESIGN, DEVELOPMENT AND QUALIFICATION OF CARBON-CARBON NOSE CAP FOR REUSABLE LAUNCH VEHICLE APPLICATION

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Abstract

Reusable Launch Vehicles are the ultimate solution to reduction in cost of access to space. To demonstrate the technological capabilities of Indian Space Program in the realm of such reusable launch vehicles, one of the prime focuses was design and development of Carbon- Carbon(C-C) composite for thermal protection system of the vehicle. This paper outlines the detailed design, development cycle and qualification of C-C Nose Cap for the RLV-TD mission of ISRO. Critical technological challenges overcome for the purpose include: the development of carbon-carbon material and processing the final hardware, the 3D FE thermo-structural design and analysis, and the developmental and qualification tests.

Keywords: Carbon-Carbon Composite, Nose Cap, Reusable Launch Vehicle, Thermo-structural Analysis, FE Analysis