

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
New Materials and Structural Concepts (4)

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DEVELOPMENT OF THERMAL PROTECTIVE SEAL FOR HOT STRUCTURE CONTROL
SURFACE ACTUATOR ROD

Abstract

For the European Intermediate eXperimental re-entry Vehicle (IXV) the deflection of the highly loaded ceramic body flap will be performed by an actuator system connected to the body flap by a rod. Beside the thermal and mechanical loads, the sealing of the inner vehicle against possible leaking hot plasma is a very important issue whereby the special challenge for the design results from the spatial movement of the rod. This requires an extraordinary design consisting of different components and various materials in order to satisfy the mechanical flexibility and the resistance against thermal and mechanical loads under the aspect of reusability. This paper describes the MT Aerospace approach for the thermal protection system of the actuator as presented for the critical design review of IXV. Starting from the technical requirements, important design issues will be presented including the most relevant analysis steps. Furthermore, the envisaged qualification approach will be discussed. Finally, a comparison between the current development steps for the IXV demonstrator's protection system and the former NASA/X38 vehicle will be presented.