

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
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STRUCTURAL INVESTIGATIONS FOR A5 ME UPPER STAGE PDR DEVELOPMENT AT MT  
AEROSPACE

**Abstract**

In the context of ESA's Ariane 5 Midlife Evolution (A5-ME) program which is aiming to raise the payload capacity of Ariane 5 from 10 to 12 tons, the main focus is set on the development of an entirely new Upper Stage for the launch vehicle. As a part of the Upper Stage development process, MT Aerospace is responsible for the Bare Tank development and manufacturing. In order to achieve the increased payload capacity a redesign of the currently used ESC-A Upper Stage architecture is mandatory. Based on architectural trade off studies a structural Upper Stage design concept featuring an Orthogrid Common Bulkhead is the proposed way forward to reach the payload capacity range. As an essential part of the A5 ME development the engineering activities performed at MT Aerospace in the frame of the PDR Phase are in the focus of this paper. Mainly structural concept investigation as well as consequent optimization efforts have taken place to successful fulfill the required mass target considering stability, strength and damage tolerance analysis constraints of the Upper Stage Bare Tank.