

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Technologies for Future Space Transportation Systems (5)

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ARIANE 6 - NEW AEROSTRUCTURES FOR THE NEW EUROPEAN LAUNCHER

Abstract

In the frame of the development of the ARIANE 6 MT Aerospace AG is responsible for design, analysis, test and qualification as well as for later series production of the main metallic aerosttructures of the new heavy European launcher. Due to new market needs this development is strongly driven by performance and cost requirements.

As design definition authority (DDA) MT Aerospace AG has the full technical responsibility for the development of those highly loaded structures as well as for the propellant tanks of upper and lower stage with strong interactions between these main components with regard to the overall launcher needs.

Due to increased launch rate and ambitious cost requirements new manufacturing processes as well as automated assembly technologies are key topics within the running development program using a design-to-manufacturing approach.

At each design step, starting from preliminary configurations, applicable manufacturing technologies and concepts have been considered and will be presented. In many instances, the manufacturing aspects have been the design driver. As an integral element of the design approach, dedicated cost engineering with respect to both non-recurring and recurring cost has been applied for concept assessment and optimisation. This has enabled an identification of cost drivers and the definition of cost reducing steps.

This paper will present main results of performed trade-offs and design studies including process development and industrialization aspects for the different lightweight structures as well as applied engineering methods with the focus on Upper and Lower Inter Tank Structure (ULPM ITS & LLPM ITS), Vulcain Aft Bay (VuAB) as well as the metallic skirts of the Equipped Solid Rocket Motor (ESR) which have strong impact on the overall launcher architecture and performance.