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ARIANE 6 UPPER LIQUID PROPULSION MODULE THERMAL PROTECTION HARDWARE DEVELOPMENT AND TESTING

Abstract

This paper will cover the development and testing activities performed for the Ariane 6 Upper Liquid Propulsion Module (A6 ULPM) thermal hardware, including Thermal Tent and Cavity Segregation Membrane. The Thermal Tent covers the aft side of the ULPM from the hot engine nozzle fluxes, as well as protecting the avionics from the cold space environment. Temperatures in excess of 5000C experienced by the Tent in flight, large number of interfaces, as well as mass and performance requirements make it a complex system. The Cavity Segregation Membrane provides thermal insulation function in flight, as well as enables the ground conditioning concept, imposing challenging leak tightness requirements and design solutions. For both pieces of hardware, a broad testing campaign is necessary to verify the thermal, thermo-mechanical and physical characteristics, which will be covered.