

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

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THE ANTI-WETTING DEVICE : A NEW PMD CONCEPT FOR FUTURE CRYOGENIC UPPER
TANKS

Abstract

PMD are well known in the satellite community to maintain liquids in the desired location even with adverse acceleration. Retention capacities are mainly based on capillary forces. For a future cryogenic tank in ballistic phase, these capillary forces have to be used with care : the bubble point can be changed dramatically because of local evaporation/condensation phenomenon. Furthermore, for classic GTO+ mission, the insulation used will not prevent from vapor creation inside the PMD. In the same way, the needed depressurization occurring during the ballistic phase to get right temperature conditions will generate vapor bubbles within the PMD.

In order to avoid these kind of problems, a new concept has been studied by AL through RT and national programs on one side (CNES funding) and in the frame of FLPP/CUST program (ESA funding) on the other side with new objectives. This new concept of Anti-Wetting Device is presented in this paper with the different objectives which can be fulfilled.