

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialised Technologies, Including Nanotechnology (8)

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ADVANCED THERMAL CONTROL OF LAUNCHER EQUIPMENT BAY USING PHASE CHANGE
MATERIAL

Abstract

In the frame of ESA's Future Launchers Preparatory Programme (FLPP), attention has been paid to the use of Phase Change Materials (PCM) for thermal control of Launchers. Among various possible applications, the avionics equipment bay of Ariane 5LV has been chosen to assess the performance of a Phase Change Material Heat Storage Device. Generally, the thermal control of the electronic units is passive and simply defined by their thermal inertia. In some specific case, an extra thermal inertia is added by using a spreader (thick Al plate) and the coupling with the platform is optimized. The price to pay is an extra mass for the launcher. A new concept of Phase Change Material device, using organic PCM, has recently been developed to improve the thermal control of spacecraft. This concept has been extended to the specific environment of a Launcher and to inorganic salt hydrates. The main results of this study are presented in this paper.