SM13L_11180

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Damage Tolerance of Composite Structures with Thermal Shield

Christophe Bouvet[(1)], Sandrine Petit[(2)], Alain Bergerot[(3)], Jean-Jacques Barrau[(1)]

(1) *LGMT, Université Paul Sabatier, Toulouse, France*
(2) *LMS, IPPT PAN, École Nationale Supérieure de l'Aéronautique et de l'Espace, Toulouse, France*
(3) *EADS Space Transportation, Saint Médard en Jalles, France*

Accidental damages, like impact of foreign objects, on the aeronautical and spatial composite structures cause drastic reductions in the residual strength. Consequently, it is essential to define a damage tolerance concept during the project design. The aim of this paper is to study the influence of the cork thermal shield on the damage tolerance concept of composite panels. Indeed, cork thermal shield stuck on the composite panels used for civil and military launchers' fairing, modify the structure mechanical behaviour during impact of foreign objects. The results show the good mechanical behaviour of the thermal shield during the impact. Indeed, the thermal protection acts like a mechanical protection during the impact and reveals it before having damage in the laminate. In particular, with the studied thermal shields, damage threshold appears at a higher permanent indentation than the BVID (Barely Visible Impact Damage) aeronautic threshold of 0.6 mm.

View the extended summary