



HYPERVELOCITY IMPACT TECHNOLOGY FACILITY

HITF *FLASH TEST REPORT*

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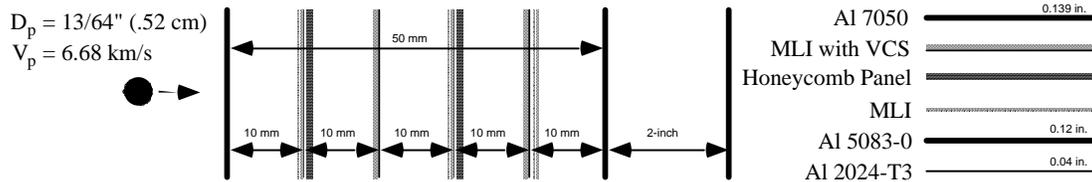
Test Program: Alpha Magnetic Spectrometer (AMS) II Testing December 5, 2001

HITF System Analyst: Frankel Lyons
(x45289)

Test #1 (WSTF No. 01-36695) (HITF TPS No. HD0120346)

Summary: Revised 01/07/02

The AMS II Test #1 was impacted normally (0°) by a 13/64-inch (5.2-mm) aluminum sphere traveling at 6.68 km/s. The White Sands Test Facility (WSTF) 0.50 caliber light gas gun was used for this test. The AMS II Test #1 configuration consist of a 3.54-mm (0.139-inch) thick 7050 aluminum bumper, 200 layers multi-layer insulation (MLI), (4)-0.125-mm (0.005-inch) 1100-0 aluminum vapor cooled shield plates, (2)-3.4-mm (0.134-inch) thick honeycomb support panels, a 3.06-mm (0.12-inch) thick 5083-0 aluminum rear wall and 0.040-inch (1.016-mm) thick 2024-T3 aluminum witness plate.



Projectile Shot Matrix

Material	Diameter	Mass	Impact Angle	Laser Velocity	Energy
Al 2017	13/64 in.	0.20100g	0°	6.68 km/s	4,484.6 J

Target Damage

The projectile impact created a 16.5-mm x 17-mm entry hole through the 7075-T6 aluminum bumper. Layer 2 MLI has a 22-mm x 23-mm entry and 34-mm x 35-mm exit hole. Layer 2 VCS4 has a 35-mm x 33-mm entry hole and 34-mm x 39-mm jagged shaped exit hole with multiple petals 10-mm high. The layer 3 honeycomb support panel has a 33-mm x 38-mm hole surrounded by a 7-mm high continuous petal. Layer 4 MLI has a 37-mm x 43-mm entry and 41-mm x 39-mm exit hole. Layer 4 VCS3 has a 47-mm x 42-mm entry hole and 49-mm x 45-mm jagged shaped exit hole with multiple petals 18-mm high. Layer 5 MLI has a 43-mm x 36-mm entry and 70-mm x 60-mm exit hole. Layer 5 VCS2 has a 55-mm x 72-mm entry hole and 54-mm x 45-mm jagged shaped exit hole with multiple petals 19-mm high. The layer 6 honeycomb support panel has a 55-mm diameter hole surrounded by a 17-mm high continuous petal. Layer 7 MLI has a 44-mm x 53-mm entry and 59-mm x 75-mm exit hole. Layer 7 VCS1 has a 61-mm x 50-mm entry hole and layer 8 MLI has an 88-mm x 87-mm exit hole with 7 petals. The 5083-0 aluminum rear wall is deformed a maximum of 6-mm and has a black residue that forms a 233-mm x 177-mm starburst with aluminum splash and several craters of which the largest measures 0.3-mm x 0.4-mm. The back of the rear wall has an 11.73-mm high bulge.

Conclusions

This target passed. The rear wall has no hole or perforation.
