

SPACE DEBRIS SYMPOSIUM (A6)
Hypervelocity Impacts and Protection (3)

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DAMAGE INVESTIGATION OF WOVEN OF BASALT FIBER AND AL- SPHERE PROJECTILE IN
HYPERVELOCITY IMPACT

Abstract

Basalt fiber is one of the high strength, high modulus, and flexible materials to be noticed in the space debris shielding field in recent years. The perforation equations of woven of basalt fiber were developed and the damage of the Al sphere projectiles at high velocity impact with woven of basalt fiber was studied in the paper. The flash x-ray hypervelocity imaging system was used to observe the damage of the projectile. The experimental results showed that the basalt fiber woven can make the projectile break, melt and soften at high impact velocity. The groove type failure on the front surfaces of the projectile was observed in the radiographs. The molten materials of aluminum projectile caused by hypervelocity impact were observed from the digital microscope. The initial molting velocities of aluminum projectile were determinate. The study is beneficial to the application of woven of basalt ceramics fibers to the space debris shielding.