



## Shuttle

### Effects of MOD Impact on RCC Panels

There are 22 wing leading edge panels on each wing of the Space Shuttle Orbiters. Each panel is made for a specific location. The panel shown here in the photograph is made for location 17 on the right wing.

The material used to make the wing leading edge panels is reinforced carbon-carbon (RCC). RCC is a structural composite which also serves as a thermal protection system (TPS). The TPS protects the Shuttle Orbiter against the very high temperatures generated on its leading edges during re-entry. A silicon-carbide (SiC) coating covers both sides of the RCC.



Shuttle wing leading edge

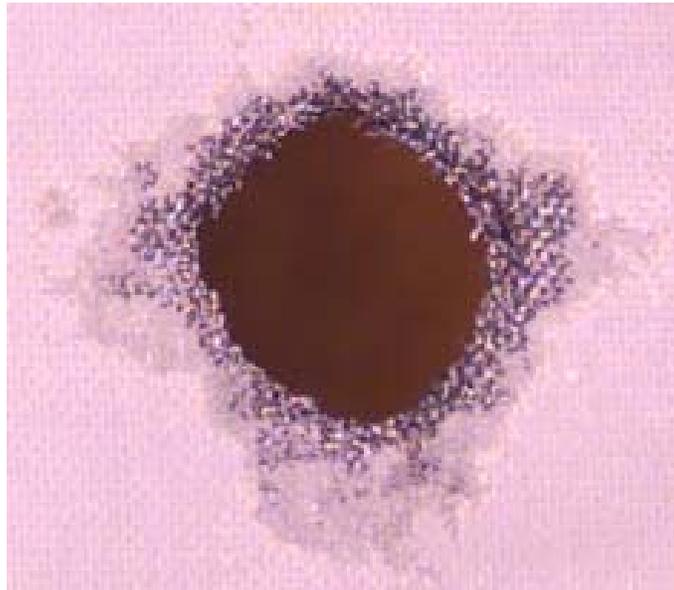


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Due to the brittle nature of the RCC SiC coating, the effect of meteoroid and orbital debris impact damage on the thermal and structural performance of the RCC is of serious concern. Meteoroids and man-made orbital debris represent a source of hypervelocity impact damage to spacecraft structures.

This panel was impacted at approximately 7 km/sec. with aluminum projectiles that range in size from 15/64" to 5/16" in diameter. The experimental data allows for a correlation of projectile size to hole size through the top leading edge of the panel, and secondary damage to the front and back face of bottom leading edge of the panel.



Close up of hypervelocity impact in STS RCC panel