INVESTIGATION OF PRESSURE SENSITIVE PAINT FOR HIGH-SPEED APPLICATIONS

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Use of Pressure Sensitive Paint and Temperature Sensitive Paint (PSP and TSP) is desirable in the Mach 6 wind tunnel H3. PSP and TSP will allow collection if both pressure and temperature measurements simultaneously at a large number of points without the complexity of embedding multiple separate sensors in a test article.

They also offer the advantage of being non-intrusive or minimally intrusive. The goal of this project was to get PSP working at VKI and to perform a demonstration test on a simple geometry. This would establish a basis of knowledge of PSP technology to allow it to become a regular part of VKI's testing suite.

The performance of the paint itself has been verified. Problems with wavelength selective filters have been discovered and investigated. The advantages of reflecting filters have been demonstrated.

Problems with photo-degradation experienced in previous attempts to implement PSP have been found to be small enough for this new paint to be manageable.

A successful test of PSP in H3 has demonstrated the capacity of the technology to handle the conditions in this facility.

Figure 1: Optical setup at VKI H3 M=6 wind tunnel

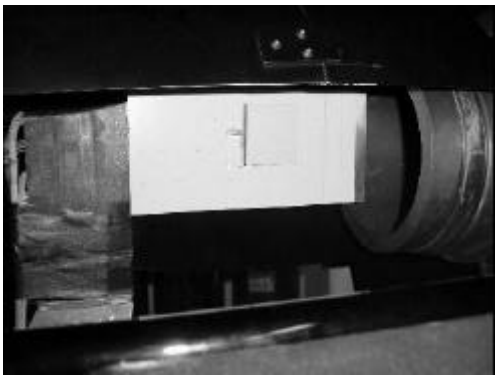

Figure 2 : PSP coated flat-plate/ramp model in H3