

A waverider study, flat and curved shape designs at Mach 7 Hypersonic Flow.

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The theory of waveriders is that they use their shock wave to “ride” over it and the captured pressure below to enhance the performance, so here, the drag over lift ratio. Three models were designed and tested on the Kashiwa Hypersonic and High Enthalpy wind: Two similar flat models just differently designed and a curved model. The first goal is to observe the shock wave and to verify that this one is attached to the leading edge. To do so, the first model has been tested with two angles around the wind tunnel axis, 0 and 90 degrees. The second goal is to study the lift over drag for the 0 angle of attack and then to analyze the behavior for other angle between zero and ten degrees. Finally, the curved shape has been tested to in order to link shape and performances and see the impact of different designs.

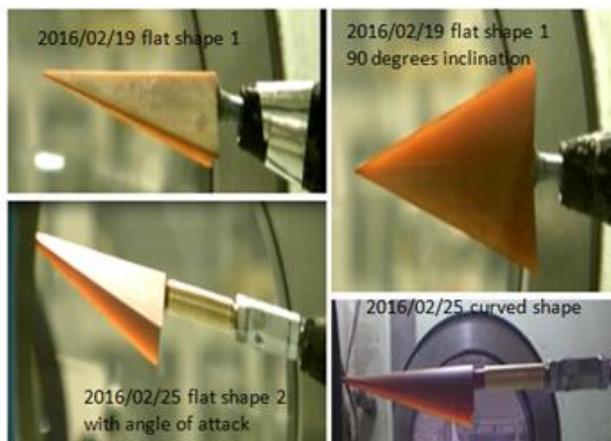


Figure 1: Experimental settings

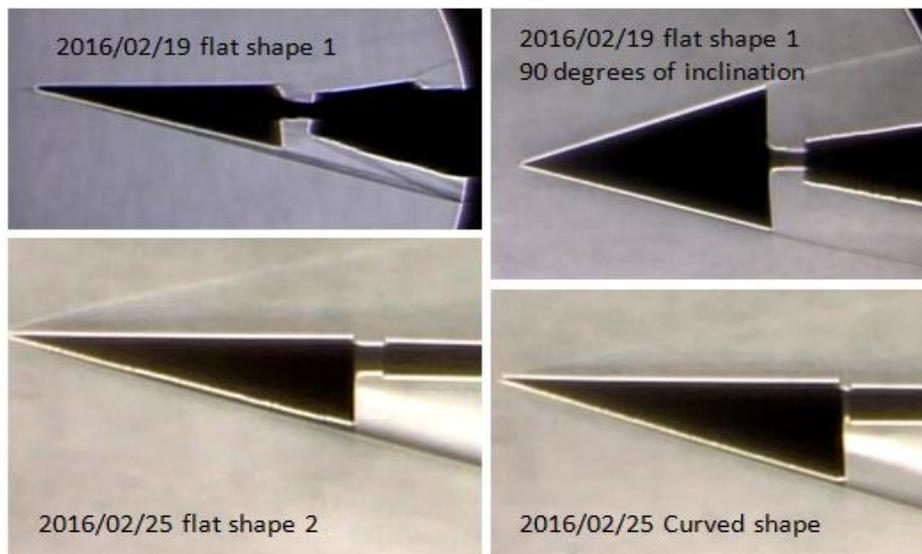


Figure 2: Zero angle of attack shock wave viewing