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WING LEADING EDGE ABLATION TESTS IN ARC TUNNEL

Abstract

This paper reports the results of ablation tests conducted in FD04 arc tunnel of China Academy of Aerospace Aerodynamics (CAAA) for the development of wing leading edge thermal protection materials. The models are made of High Temperature Ceramic(HTC), with swept angle 53, height 75mm, long 55mm, leading edge radius 2mm and symmetric cross section made up of a 5wedge on each side. The test facility included 20MW arc heater, mixing chamber, rectangular supersonic nozzle, test box, trajectory simulation and vacuum system etc. The rectangular supersonic nozzle with Mach number 3.6 was used in tests. The aero-heating conditions of the wing leading edge were simulated by a test trajectory with flow field parameters of three steps. The test duration is 77.0 s. The results show that HTC has well ablation performance, and two models had no breakage during the tests. The inner temperature responses were attained in tests.