

Title: Research and development of surface heat flux sensor for high speed aircraft

Abstract: A water-cooled high temperature and high heat flow sensor was developed to meet the requirements of high heat flow measurement under ultra-high temperature conditions on the surface of high speed aircraft. This type of sensor is based on the measurement principle of circular foil heat flow sensor. Cooling water is introduced through structural design optimization to ensure that the structure, measurement accuracy, sensitivity, linearity and other indicators of the sensor do not change at ultra-high temperature of 1600°C, so as to achieve extremely high heat flow measurement on the surface of the aircraft. Through the test verification, the heat flow sensor can withstand 1600°C, heat flow measurement range up to 1000KW/m², measurement accuracy is better than 5%.