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THERMAL STRUCTURE ANALYSIS OF NOZZLE THROAT TO BRAIDED C/C COMPOSITE

Abstract

The mechanical and thermal properties of braided C/C composites are obtained by experiments. Based on the theory and tests of material strength, linear stress-strain relations and envelope of strength are established. Then, according to the high temperature environment and throat erosion of solid rocket motor, a finite element approach for thermal stress analysis of structures with moving boundary for erosion is described. The stresses of throat analyzed using finite element method are compared with envelope of strength theory and theoretically results. The results indicate that stress distribution of throat as well as including in the envelope. It is shown the thermal structure of throat manufactured by C/C composite is stabilization in serving's process. But the hoop stress of throat is higher, the compressive strength of throat should be observed for application.