
The Equilibrium Temperature of the Uncooled Muzzle Envelope for Liquid Rocket Engine Nozzle

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The article presents a mathematical model of convective-radiant heat transfer of an uncooled relatively short muzzle envelope for liquid rocket engine nozzle, allowing us to estimate the equilibrium temperature value of the envelope at a steady state engine operation. This temperature determines the choice of nozzle structural material and affects the envelope performance. According to the calculation example with input data close to actual, it follows that the resulting value of the equilibrium temperature for engines with a high degree gases expansion in the nozzle is feasible for some existing and future heat-resistant structural materials.

Keywords: *mathematical model of convective-radiant heat transfer; uncooled muzzle envelope, equilibrium temperature.*

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