

Experimental Study of Flow Effects of Solid Particles' Size in Porous Media

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Abstract : Transpiration cooling combined to regenerative cooling is a technique that could be used to cool the porous walls of the future ramjet combustion chambers; it consists of using fuel that will flow through the pores of the porous material consisting of the chamber walls, as coolant. However, at high temperature, the fuel is pyrolysed and generates solid coke particles inside the porous materials. This phenomenon can lead to a significant decrease of the material permeability and can affect the efficiency of the cooling system. In order to better understand this phenomenon, an experimental laboratory study was undertaken to determine the transport and deposition of particles in a sintered porous material subjected to steady state flow. The test bench composed of a high-pressure autoclave is used to study the transport of different particle size (35

Keywords : experimental study, permeability, porous material, suspended particles

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