

## عنوان مقاله:

3D Numerical Modelling of Turbulent Flow in a Channel Partially Filled with Different Blockage Ratios of Metal Foam

## محل انتشار:

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## خلاصه مقاله:

The aim of the present research work is to understand the intricacies of fluid flow through a rectangular channel that has been partially filled with a metal foam block of different blockage ratio (0.16-1), with a pore density (5-30 Pores Per Inch i.e. PPI), along with varying inlet velocity (6.5-12.5 m/s). For the porous region, numerical solutions are acquired using the Darcy Extended Forchheimer model. The Navier-Stokes equation is used in the non-porous zone. Different flow behaviours were seen as a function of PPI, height, and inlet velocity. The pressure drop increases with inlet velocity, PPI, and block height, with a maximum value of approximately 4.5 kPa for the case of 30 PPI, 12.5 m/s, and a blockage ratio of 1. Results show that the existence and location of the formation of eddies depends on the inlet velocity, PPI, and blockage ratio. Such studies have been reported less and will aid research on forced convection through a channel partially filled with metal foam and optimisation studies between increased heat transmission and the additional pressure drop for the same by providing a detailed fluid flow analysis.

## کلمات کلیدی:

Darcy Forchheimer, Metal foam, Pressure drop, Eddies, Partially filled channel, PPI

## لینک ثابت مقاله در پایگاه سیویلیکا:

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