

Modelling of diesel particulate filtration in wall-flow traps

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Description

The present work addresses the modelling aspects of soot deposition inside diesel particulate filters (DPFs). These wall-flow monoliths are commonly employed in the automotive sector to reduce particulate emissions of Diesel engines. Simulations were carried out using computational fluid dynamics under different operating conditions by varying the exhaust-gas inlet velocity, the filter permeability and the soot particle size. The numerical results show that the flow field inside the filter is highly responsible for the soot distribution along the axial coordinate: the velocity of the soot laden gas through the porous wall of the bare filter is not constant along the channel, which in turn promotes an uneven deposition of particles inside the filter itself. Moreover, it has been shown that the fraction of the particles that impact the wall surface and are trapped by the porous media is sensitive to the particle size: the collection ...

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