International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

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Honeycomb based wall flow filters

Overview

The basis for the design of wall flow filters is a honeycomb structure with alternate channels plugged at opposite ends. As the gases pass into the open end of a channel the plug at the opposite end forces the gases through the porous wall of the honeycomb channel and out through the neighbouring channel. The ultrafine porous structure of the channel walls results in greater than 85 percent collection efficiencies of these filters. Wall flow filters capture particulate matter by interception and impaction of the solid particles across the porous wall. The honeycomb design offers a remarkably high geometric surface area per unit volume and improves the chemical residence times for reactions to reach completion in high-flow conditions. Extrusion process is used to shape into honeycomb structures. Depending on the size of the particles, diffusion, inertial and interception mechanisms lead to the entrapment of suspended particles on the wall. The expertise gained in the extrusion process resulted in the successful development of one end closed ceramic honeycomb based wall flow filters. Cordierite-mullite and aluminium titanate composite formulations are explored in this study

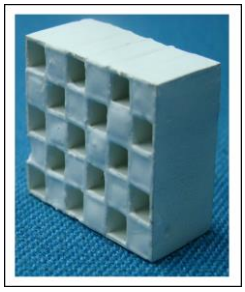
Key Features

- Ensured wall flow due to alternatively closed channels
- Cordierite-Mullite based honeycomb formulations
- Channel density up to 200 CPSI
- Optimized pore size distribution

Ram type extrusion Press

Potential Applications

- Particulate filters in stationary stacks
- Selective catalytic reduction



Honeycomb with alternative channels closed with one end open

Intellectual Property Development Indices (IPDI)

- Honeycomb fabrication and closing of alternative channels demonstrated
- Performance of particulate filtration study is in progress

Status	1	2	3	4	5	6	7	8	9	10

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