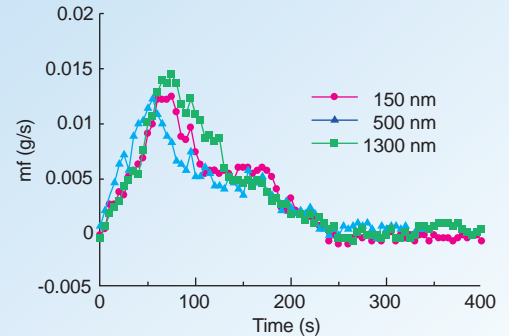


Fuel Supply System by Porous Ceramic Tube to Diesel Oxidation

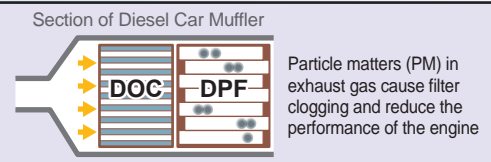
ABSTRACT

In the diesel exhaust after-treatment system, a diesel particulate filter (DPF) has been widely used. The filter must be cleaned periodically by oxidizing the deposited soot, which is called the filter regeneration. We have proposed a new fuel supply system. The fuel is vaporized on the surface of the porous ceramic tube filled with the diesel fuel, which is transported to the DOC. It is expected that the uniform fuel vapor is formed by the porous ceramic tube. The mass of the vaporized fuel by setting the porous ceramic tube in the mimic exhaust flow was evaluated. The temperature of the flow was controlled by the tubular furnace. We tested three kinds of ceramic tube, whose average pore size is 150, 500, 1300 nm. It is found that as the pore size is larger, more fuel is reasonably supplied. Moreover, it is confirmed that the amount of the fuel supply can be controlled by changing the pore size, the tube diameter, and the tube length.



In the diesel exhaust system, diesel particulate filters (DPF) catches and removes the PM from the exhaust gas before emission.

DPF becomes full and reduces the performance of the engine as the car is driven for some distance.



Conventional: Fuel Injection inside Engine

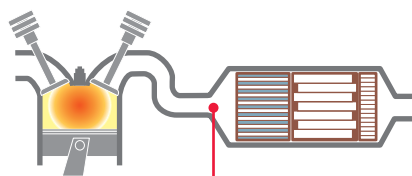
Fuel is injected into the engine cylinders to supply fuel to DPF

- Reduces the engine power during filter regeneration, and decreases fuel economy
- Oil dilution in crankcase occurs

Technology to supply fuel directly into the exhaust pipe to react with oxidation catalysts (DOC) and burn-off and regenerate the DPF was developed

New Technology : Fuel Supply in Exhaust Pipe by Porous Ceramic Tube

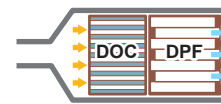
Porous ceramic tube in the exhaust pipe supplies fine mist of fuel to DPF



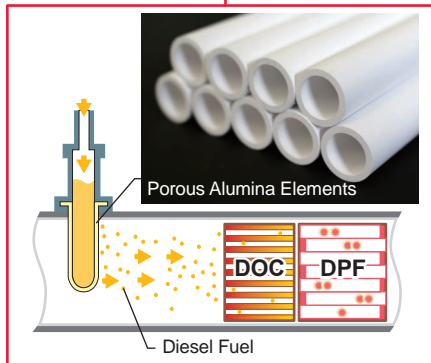
Section of Diesel Car Muffler



Fuel is supplied to oxidation catalyst (DOC) to burn-off and regenerate the DPF.



Clean air only is emitted.



- ◆ Supply through porous ceramic tube increases the diffusion and evaporation of fuel. → Enables efficient combustion of PM
- ◆ Supply into exhaust pipe → Maintains the engine power and improves fuel economy → Prevents oil dilution in the engine crankcase

[Joint development]

Noritake NORITAKE CO., LIMITED Engineering Group Heat Technology Dept.