

DOC/LNT and SCR on Filter

Diesel emissions control with 2 components

Compliance to Euro 6 emission limits for diesel engines is a challenge for the exhaust system. Gaseous emissions such as carbon monoxide (CO), hydrocarbon (HC) and nitrogen oxides (NOx) need to be reduced as well as soot (PM). Our mission is to deliver cost effective solutions for the most challenging emissions control regulations.

Technology

On the first substrate a Diesel Oxidation Catalyst (DOC) and a Lean NOx Trap (LNT) are combined. This component has the high HC and CO removal efficiency of a fully formulated DOC, with the ability of a LNT to trap and reduce NOx.

The second component combines SCR (Selective Catalytic Reduction) catalyst with a Diesel Particulate Filter (DPF). The SCR reduces NOx to N₂ (nitrogen) and water in the presence of a reductant, while the DPF filters PM.

Operation

The exhaust from the engine flows through the DOC/LNT catalyst. This catalyst oxidizes HC and CO efficiently. In addition the catalyst traps NOx under lean engine operation conditions. Trapped NOx is released from the catalyst when the engine operation mode is switched to rich conditions.

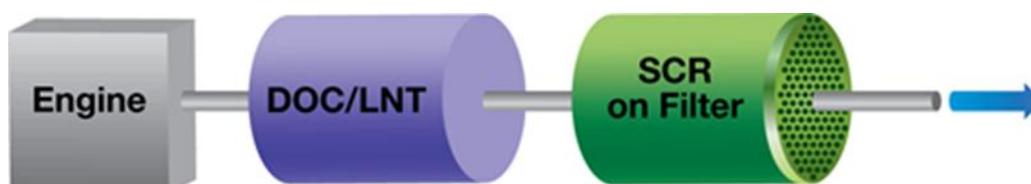
During rich regeneration, the NOx is converted into N₂, and NH₃ (ammonia) is generated over the DOC/LNT. This NH₃ is used by the SCR catalyst on the filter to remove excess NOx from the exhaust.

So the SCR on Filter can boost the DeNOx performance of the DOC/LNT while in addition reducing the NH₃ emissions created during the rich regeneration. Hence, a urea injection system is not needed.

The exhaust flows through the SCR on Filter where PM is filtered. The use of a filter may require active soot regeneration in order to keep the back-pressure of the system at the designed level. This is achieved via the engine management system by injecting excess fuel into the exhaust system. CO and HC are oxidized over the DOC/LNT catalyst and the exothermic heat generated accelerates the burning of the soot collected in the filter.

Benefits of BASF's technology

- Combining different catalyst functionalities on one substrate can enable the OEM to reduce weight by eliminating substrates and canning from the exhaust system.
- Removing substrates can also help lower the backpressure of the system, which can have a positive effect on the CO₂ emissions.
- No urea injection system, tank and controls are required, saving space, cost and weight.



About Us

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Americas

BASF Corporation
25 Middlesex/Essex Turnpike
Iselin, New Jersey, 08830, USA
Tel : +1-732-205-5000
Fax: +1-732-205-7725
Email: catalysts-america@basf.com

Asia Pacific

BASF (China) Company Limited
300 Jiang Xin Sha Road,
Pudong, Shanghai 200137
P.R. China
Tel: +86-21-2039 2549
Fax: +86-21-2039 4800-2549
Email: catalysts-asia@basf.com

Europe, Middle East, Africa

BASF SE
67056 Ludwigshafen, Germany
Tel: +49-621-60-21153
Fax: +49-621-60-43023
Email: catalysts-europe@basf.com



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