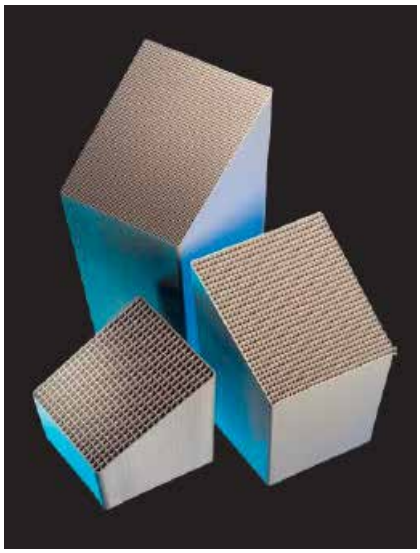
JM

Ammonia slip catalyst

Johnson Matthey's advanced Ammonia Slip Catalyst (ASC) improves NOx reduction with low NH_3 slip to improve the overall SCR system's perform

Even the best SCR catalyst will not achieve maximum NOx reductions in a system with non-uniform NH_3 distribution. For stationary engines, significant variation in load, exhaust flow rate and NOx concentration make it difficult to deliver NH_3 to the catalyst in the 1:1 ammonia NOx ratio (ANR) required by reaction stoichiometry. Non-uniform NH_3 distribution can result in incomplete NOx conversion where localized ANR is low, and in NH_3 slip where ANR is high.



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To overcome the difficulty of attaining ideal stoichiometry, Johnson Matthey developed advanced ASC technology that combines highly active oxidation catalyst and SCR catalyst functions to improve NOx reduction while maintaining low NH_3 slip. This technology was first proven on thousands of mobile engines and is now successfully operating on stationary engines. The ASC allows continuous operation at higher ANR, compensating for non-uniform NH_3 distribution and boosting NOx conversion while maintaining low NH_3 slip. As an added bonus, the ASC delivers CO conversion which is not achieved over SCR catalyst alone. The SCR+ASC are usually installed in a single housing which results in lower material costs.

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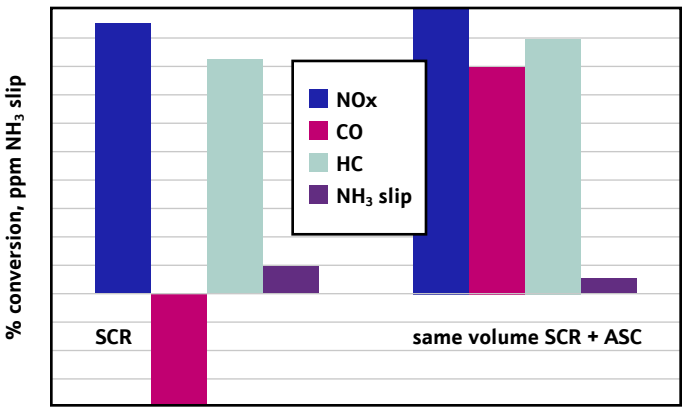
Performance without and with ASC; same total catalyst volume

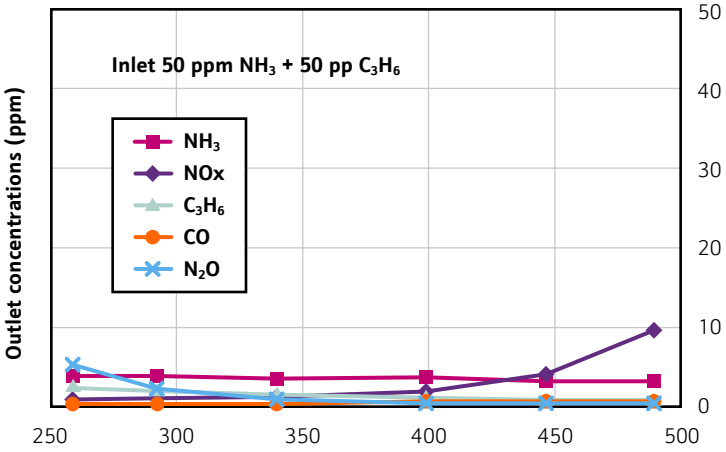


ASC improves overall SCR system performance:

- ASC allows operation at higher ANR with low NH_3 slip
- Better NOx and HC conversions with SCR+ASC
- CO forms from HCs over the SCR catalyst alone
- CO conversion achieved with SCR+ASC

The advanced ASC is very selective to N_2 which means that almost all of the NH_3 slip is converted to N_2 rather than NOx. The ASC also converts hydrocarbons and CO to CO_2. The overall performance of the SCR catalyst system is improved by addition of ASC. And better SCR performance can mean reduced catalyst volume, which translates to lower system costs.

ASC converts NH_3 to N_2 and converts HC and CO to CO_2



ASC converts NH_3 to N_2, not back to NOx:

- Nearly complete conversion of NH_3 slip
- Formation of NOx and N_2O, very low
- ASC is highly selective for N_2
- HC is converted to CO_2, no CO formed