EMPRO™ LGC
For Gasoline Direct Injection (GDI) engines

The patented BASF Lean GDI Catalyst technology provides the additional NOx (nitrogen oxides) removal required from the exhaust of GDI engines.

GDI engines use lean combustion (excess of air) to deliver improved fuel economy. However NOx exhaust emissions can increase and are a challenge to remove under these lean operating conditions. The Lean GDI catalyst is designed to operate under lean conditions and can be placed after the TWC catalyst to provide additional NOx conversion.

Lean GDI Catalyst Technology
This technology combines three active components: Oxidation catalyst - platinum (Pt), Adsorbent - barium and/or other oxides, and Reduction catalyst - rhodium (Rh).

The adsorbers, which are incorporated into the catalyst washcoat, chemically bind NOx during lean engine operation. When the adsorber capacity is saturated, the system is regenerated during a period of rich engine operation, and the released NOx is reduced to nitrogen (N2) over the catalyst.

Cycle of Operation
- NO reacts with oxygen on active oxidation catalyst sites to form NO₂.
- Adsorption of NO₂ by the storage material in the form of barium nitrate.
- Once exhaust is switched to the rich condition, oxygen is replaced by reducing species, including hydrocarbons, carbon monoxide (CO), and hydrogen (H₂).
- When the engine runs under excessive fuel conditions or at elevated temperatures the nitrate species become thermodynamically unstable and decompose, producing NO or NO₂.
- Under rich conditions, the nitrogen oxides are reduced to N₂ over the reduction catalyst.

Benefits
- Exceptionally high thermal stability.
- High NOx removal activity at high temperature.
- High NOx storage capacity.
- High NOx reduction efficiency.
EMPRO™ Solutions
We are proud to introduce EMPRO as the new brand for BASF Mobile Emissions Catalysts. The EMPRO brand represents what makes BASF unique as a value added solutions provider. As the global leader in catalysis, BASF has unsurpassed expertise in developing innovative emission control technologies for a wide range of applications, to enable clean air for a sustainable future. We are the Emissions Professionals.

The focus of the BASF Emissions Professional is always on innovative, cost-effective solutions to meet the needs of OEMs and engine manufacturers globally. With a creative, open, responsible and entrepreneurial approach we help make our customers meet regulations and be more profitable. That’s the EMPRO way.

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