Lean NOx Trap

NOx emissions control solutions

Lean NOx Traps (LNT), also known as NOx adsorbers, can control NOx (nitrogen oxides) emissions from lean burn gasoline or diesel engines.

**Technology**
The LNT technology combines three active components:

- Oxidation catalyst - platinum (Pt)
- Adsorbent - barium and/or other oxides
- Reduction catalyst - rhodium (Rh)

**Operation**
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.

The overall cycle of operation is:

- 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**
The advantages of BASF’s LNT technologies include:

- High NOx removal activity
- Low light-off temperature
- Cost-effective emissions control

**SCR**
BASF has also developed advanced SCR (Selective Catalytic Reduction) technologies for NOx removal, providing more options to meet challenging emission requirements.
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