Hitachi Zosen Corporation

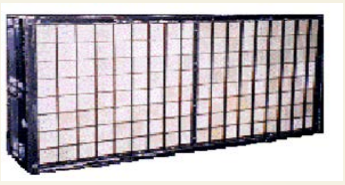
SCR NOx Removal Catalyst for Coal Fired Boiler

- **Cost effective NOx removal in exhaust gas**

Features

- **Ammonia reacts with NOx emitted from combustion and makes the NOx emissions harmless.**
- **Incorporates a high-density, lightweight, thin ceramic plate honeycomb structure that reduced the volume of the catalyst and realized the downsizing of the reactor.**
- **Catalyst's durability has been proven under the tough operating condition. Hitachi Zosen has >400 experiences including more than 50 coal applications up to gigantic 1000MW boilers.**

CATALYST UNIT



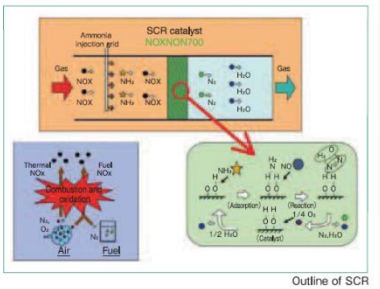
CATALYST MODULE

Overview (Technical principles, actions, etc.)

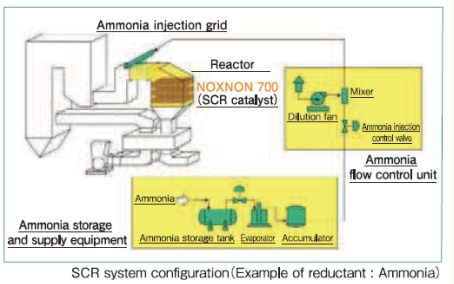
Selective Catalytic Reduction (SCR)
In order to NOx reduction in exhaust gas emitted as a result of combustion, appropriate amounts of ammonia, aqueous ammonia, or urea as reducing agent are injected through a injection grid into the exhaust gas and mixed.
A NOx removal system uses selective catalytic reduction (SCR), where a catalyst let NOx and ammonia react with nitrogen and water.

SCR System Configuration (Example of reducing agent: Ammonia)
Hitachi Zosen provides a total SCR System that mainly consists of a catalyst, reactor, ammonia injection grid, ammonia flow control unit, and ammonia storage and supply equipment.

Engineering
The production know-how, experience, and track records of Hitachi Zosen as a SCR catalyst manufacturer and plant engineering company in combination construct systems that respond to a variety of customer requests.



Outline of SCR



SCR system configuration (Example of reductant : Ammonia)

Introductory Track Record

• Hitachi Zosen commercialized its first denitration catalyst in 1973. Since then, Hitachi Zosen has delivered SCR catalysts for >400 stations applied to a wide range of NOx generation sources including coal fired boilers not only in Japan but also other countries including the USA, China, Korea, Taiwan.

Effects

• Hitachi Zosen manufactures SCR catalysts for a variety of gas emission properties, and offers optimum SCR catalysts to meet the client's specified NOx removal rate, ammonia leakage, pressure drop, and SO_2 oxidation rate.

• The catalyst in existing SCR reactor can be replaced with a lightweight, high-density catalyst that is larger in surface area without modifying the SCR reactor. Lightweight, high-density catalysts can replace old catalysts that are overdue. Furthermore, lightweight and compact reactors make it possible to retrofit new SCR reactor to existing facilities.

•For replacement applications, Hitachi Zosen's durable, lightweight and higher surface area catalyst can be installed into the any kind of existing SCR reactors without any modifications.

•Since SCR's performance will be determined by the catalyst's geometric surface area (= gas contact area) and NOT depends on the catalyst's volume (SV value), catalyst's higher surface area can squeeze the required catalyst volume with keeping the same surface area (= same performance).

•In addition, Hitachi Zosen's catalyst can utilize this reduced volume for "SCR's Upgrade" with keeping the total catalyst's weight.

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