

N0x Control on Gas Turbines

Selective catalytic reduction (SCR) technology uses ammonia injected into the gas stream to react and form harmless nitrogen and water using a catalyst.

Overall System Responsibility

- Branch Environmental will provide the components or design for the complete SCR package.
- Each system is custom engineered to fit the specific site.
- Components required include:
 - A dilution skid to premix the ammonia with air and inject it uniformly into the exhaust gas housing.
- Branch Environmental provides a single point of responsibility for the proper performance of the dilution system and injection system (critical to the operation) plus the proper selection of the best catalyst for the specific project.

To minimize the use of ammonia and avoid any slip (un-reacted ammonia escaping), a monitoring system is critical. This is incorporated into the overall package and regulates the feed of ammonia to the system.

The ammonia slip is normally maintained at less than 10 ppm, but even better results can be achieved depending on operating conditions.

SCR Catalyst

- A semi-precious metal catalyst is most often used. Metal is coated onto the surface of a honeycomb catalyst which provides high surface and low pressure drop. The sizing of the catalyst is selected to achieve the required removal efficiency of N0x. The higher the volume of catalyst, the better the efficiency.

Operating Conditions

- The system has a wide range of operating temperatures but typically from 300°C to 400°C. Hotter conditions favor better performance.

The volume of the catalyst is critical to the operating performance as well as the initial distribution of the ammonia to assure that it is evenly placed across the entire gas flow pattern. Depending on the details of each specific project, the best configuration will be selected.

Pressure drops across the components are typically 759 Pa to 1000 Pa.

Ammonia Consumption

- Ammonia consumption is about 65% of the N0x removed on a weight basis. Higher efficiencies will require higher consumption levels.

Typical actual expected life from the catalyst is 3 – 5 years.

EXAMPLE: GAS TURBINE

