

The Industry's Only Integrated
SCR

SELECTIVE CATALYTIC REDUCTION



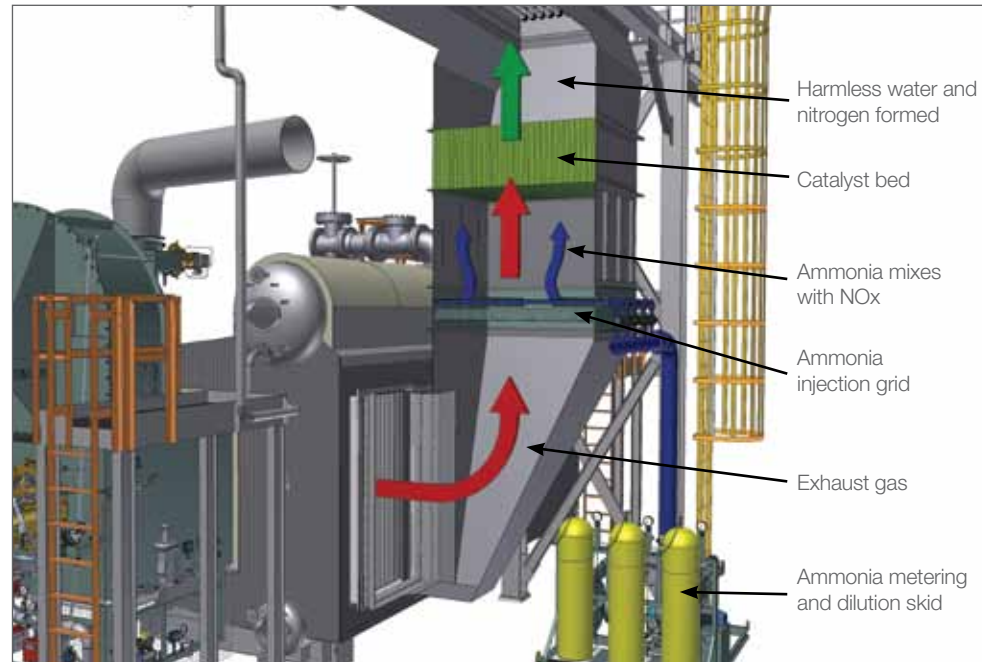
Achieve the lowest NO_x emissions possible

REDUCE YOUR NO_x EMISSIONS WITH SCR

Selective Catalytic Reduction, or SCR, is a post-flue gas treatment that is capable of reducing NO_x emissions from a wide variety of boiler systems. SCR is one of the most effective ways of reducing NO_x in a flue gas stream, with **reductions up to 95%**.

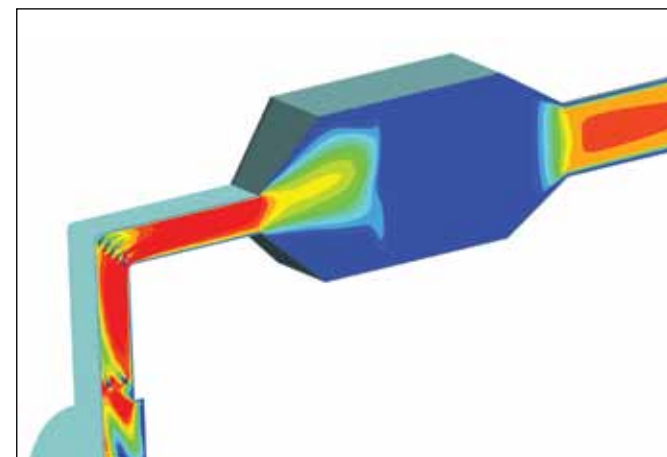
SCR uses ammonia as a reducing agent, which is introduced into the flue gas stream. This mixture then comes in contact with a catalyst, selectively transforming the NO_x into harmless nitrogen and water.

With the addition of SCR, NO_x emissions can be reduced **down to 1 ppm**. It's a viable option to help meet current or future environmental regulations or your company's sustainability goal.



SCR – INTEGRATED BY CLEAVER-BROOKS

Since Cleaver-Brooks is the only manufacturer that can offer complete, integrated boiler systems, we're also the only manufacturer that can provide an SCR system integrated with your boiler. Not only does that mean a single-source solution with a streamlined engineering process and better value, but a better system with more flexibility to meet the needs of your application.



CFD model of ammonia injection grid and catalyst face velocity.

Cleaver-Brooks manufactures every major component of the boiler system, which enables us to provide an optimal solution for your needs. We use Computational Fluid Dynamics (CFD) and other advanced modeling software to ensure flawless design. Equipment integration allows precise adjustment to the boiler, burner, and controls, resulting in the most cost-effective and efficient SCR system.



1 Controls

A single integrated system that controls the boiler, burner, and SCR. Control the entire system from one simple-to-use HMI.

2 Boiler

The SCR system can be paired with any new or existing:

- Firetube
- Industrial Watertube
- Heat Recovery Steam Generator

With a complete, single-source Cleaver-Brooks boiler system, we can choose the right boiler to optimize the system that best meets your application.

3 Ammonia metering and dilution skid

Three types of reducing agent systems available:

Anhydrous Ammonia NH ₃	Aqueous Ammonia NH ₃ +H ₂ O	Urea (NH ₂) ₂ CO
<ul style="list-style-type: none"> • Pure ammonia liquefied under pressure • Suitable for smaller size applications • Most economical reducing agent system 	<ul style="list-style-type: none"> • Ammonia in 19%–29% water • Easy and safe to handle • Requires storage tank and vaporization equipment 	<ul style="list-style-type: none"> • Powdered urea converts to ammonia prior to catalyst stage • Easiest to handle • Zero-contingency

4 Ammonia injection grid and flow conditioning devices

AIG strategically located to inject ammonia into the flue gas stream. Boiler outlet transition designed for best distribution.

5 Catalyst reactor

Ammonia mixes with flue gas in reactor, resulting in a uniform distribution to optimize catalyst performance. For each application, the catalyst bed geometry is optimized. The highest quality corrugated catalyst is used with vanadium, titanium, or tungsten oxides as active agents.

6 Heat recovery

A custom heat recovery system allows flue gas temperatures to be optimized, resulting in the most effective reduction of NO_x emissions. Recovering the waste heat of the flue gas with an economizer increases the efficiency of the boiler.

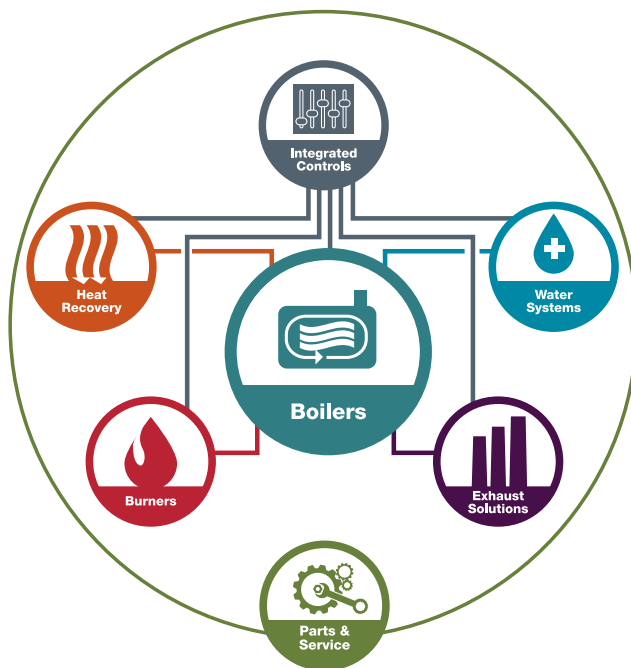
7 Structure, platforms, ladders, and piping

Complete engineering of all ancillary walkways and structures is included in our comprehensive integration.

8 Exhaust systems

An exhaust system designed specifically for your application, with both installation-ready and freestanding stacks available.





Total Integration goes far beyond exhaust solutions.

Efficiency and quality don't end with exhaust solutions. Cleaver-Brooks complete integration produces the most efficient boiler solutions in the world. Completely designed, engineered, manufactured, integrated, and serviced by one company, our systems don't have a single outsourced component to jeopardize compatibility or performance. If you're looking for the best-quality boiler systems with the lowest emissions and highest efficiencies, you're looking for Cleaver-Brooks.



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