

VarioClean®- NOx

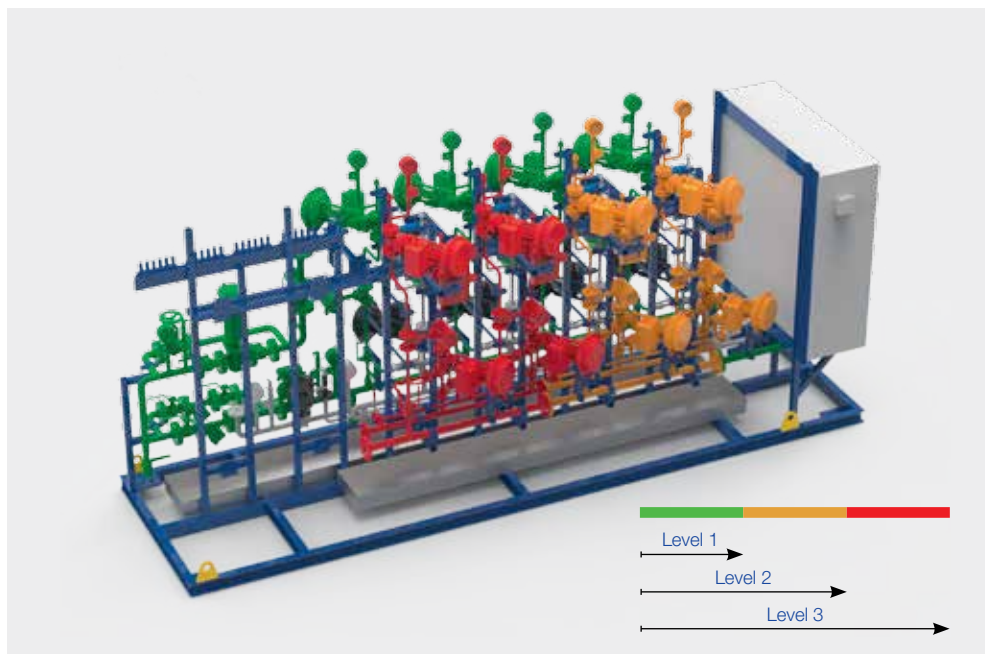
The denitrification solution that grows with you

The limit values for NOx emissions and ammonia slip (NH₃ slip) are expected to be reduced further in the coming years. To enable a profitable production of cement all the same, processes must be observed and optimized with intelligent control strategies.

For this purpose, Lechler has joined forces with STEAG to develop an SNCR concept that reliably ensures compliance with the limit values in force: VarioClean®-NOx.

Three steps for any requirement

Depending on (what is required by) the legal situation, the modular system VarioClean®-NOx can be flexibly upgraded across the three configuration levels Basic, Efficiency and High Efficiency SNCR. The base frame and the base modules are identical for all three configurations. The difference lies in the number of lances and injection levels, as well as in the software and sensor packages for the successful control of all necessary influencing factors.



BasicSNCR

The control of flue gas denitrification is based on a NOx measurement at the flue. Both aqueous ammonia and urea can be used as a reagent for the denitrification. All existing lances are controlled by the conventional control – depending on the NOx concentration measured. The Basic SNCR is primarily used where comparatively high NOx limit values or no limit values must be observed for the NH₃ slip and there are very stable temperature conditions.

The base frame of the valve skid unit and the installed fittings are designed for later upgrading. Further lances can be integrated using additional distributor pieces. Since individually controllable lances can be used from the start, a basic SNCR system can be extended to both of the next configurations without any problems.

Efficiency SNCR

In the case of higher requirements in terms of the limit values to be complied with and less stable temperature conditions, the "efficiency SNCR" (eSNCR) with a larger number of lances is ideal. The lances are installed on at least two levels and each lance is individually supplied with the reagent.

In addition, a software-based "intelligent controller" is connected with the PCS via an interface and supplied with current process signals. This allows the NOx concentration in the raw gas to be estimated and thus enables a more accurate and more economical dosing of the reagent.

High Efficiency SNCR

The "high efficiency SNCR" (heSNCR) meets the highest NOx reduction demands while at the same time keeping reagent consumption to a minimum. It has further lances, which are normally installed on at least three different levels. The control is extended to include online CFD simulating the temperature and flow conditions in the injection area. Together with the estimated amount of NOx in the raw gas and the NOx concentration measured in the clean gas at the flue, the spray behavior of each lance can be individually controlled for an optimal use of the reagent.

The scopes of delivery for the 3-level SNCR are as follows:

BasicSNCR

- Starter package with 4 nozzle lances
- Lances controlled as network by conventional control
- NOx measurement at stack required

eSNCR

- BasicSNCR
- 2-3 additional lances
- Lance installation on at least two levels with individual reagent supply
- Intelligent control with interface to the PCS
- Raw NOx soft sensor
- NOx and ammonia slip measurement at flue required

heSNCR

- eSNCR
- Optimal number of lances: 8-10
- Lance installation on at least three levels with individual reagent supply
- Online CFD for permanent modeling of temperature and flows in the injection area
- heSNCR control with continuous consideration of optimal temperature frame for the injection

A total of up to 10 lance units can be flexibly mounted on the base frame. Irrespectively of the respective SNCR level, the basic structure includes the junction box, the drip tray and all necessary brackets for the respective units.



Video: SNCR concept with STEAG

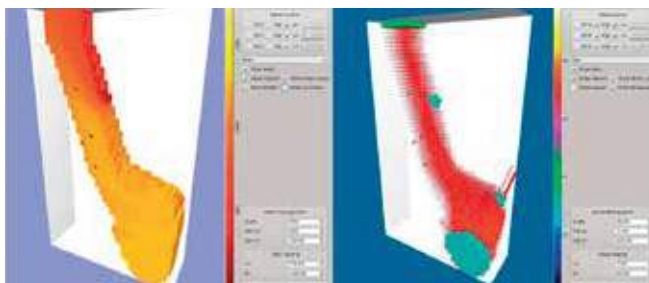
<http://www.lechler.de/lechlersteagsnscr>



Controlled section of a heSNCR

Benefits:

- Systems grow with the legal requirements
- No unnecessary investments
- Modular design in three upgradable configuration levels
- Optimal reagent use resulting in reduction of operating costs
- High NOx reduction (suitable solutions for requirements of differing complexity)
- Low NH₃ slip (adapted solutions for reduction of NH₃ slip)



Signal analysis and online CFD

Talk to us

Different systems require different strategies. The largest and most comprehensive solution is not always the best one. Let us discuss your requirements and work together to find the denitrification system that is a perfect fit today and will grow tomorrow to keep up with rising demand.

