

scheuch

TECHNOLOGY FOR CLEAN AIR

INNOVATIVE SCR TECHNOLOGIES FOR
NO_x – VOC – CO – ODOR - REDUCTION

- SCHEUCH COMPANY
- SCR TECHNOLOGIES - BASICS
- GERMAN EMISSION STANDARDS 17.BIMSCHV
- AVAILABLE SCR TECHNOLOGIES

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COMPANY DEVELOPMENT

Traditionally innovative

Worldwide working specialist for
Ventilation and Environmental Technology
Headquartered in Auroldmünster
780 employees

1963



Tinsmith in Ried/Innkreis; 6 employees

2016



WE ARE
TECHNOLOGY
FOR CLEAN AIR



PRODUCT PORTFOLIO

Components

Cooler

Dust Collectors

Emission
abatement



- High-dust SCR system
- Semi-dust SCR system

- De**CONOX**
- ex**mercury**

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NO_x - BASICS (SCR / SNCR)

Basic chemical reaction

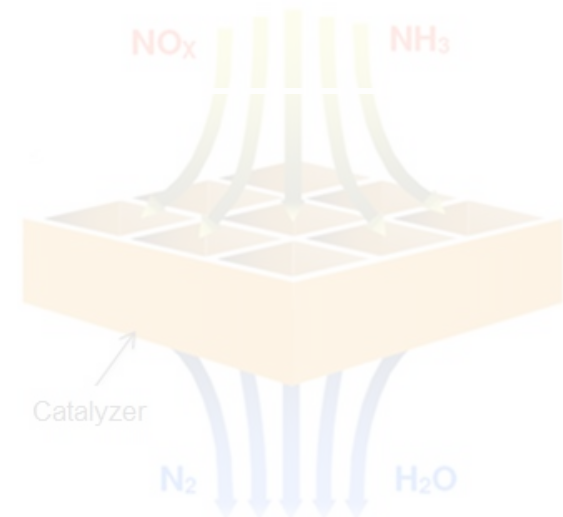


A **catalyzer** reduces the activation energy !

Definitions:

SCR Selective **C**atalytic **R**eduction

SNCR Selectice **N**on **C**atalytic **R**eduction



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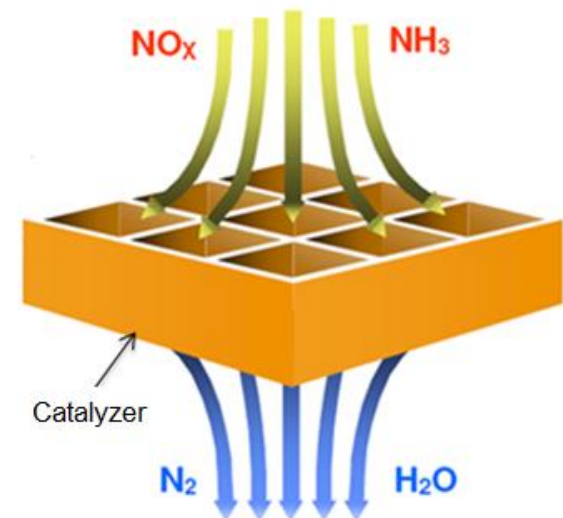


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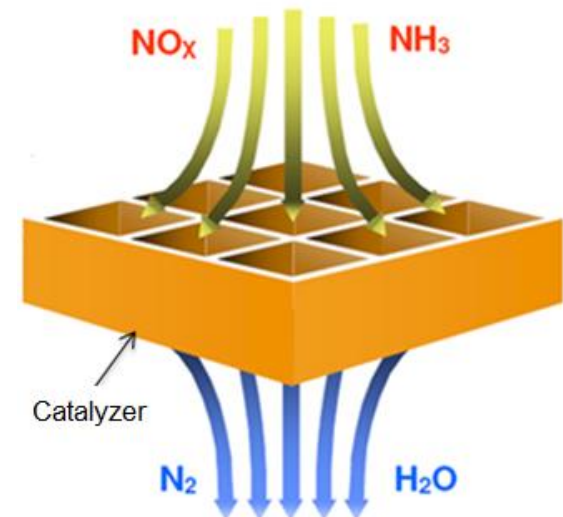


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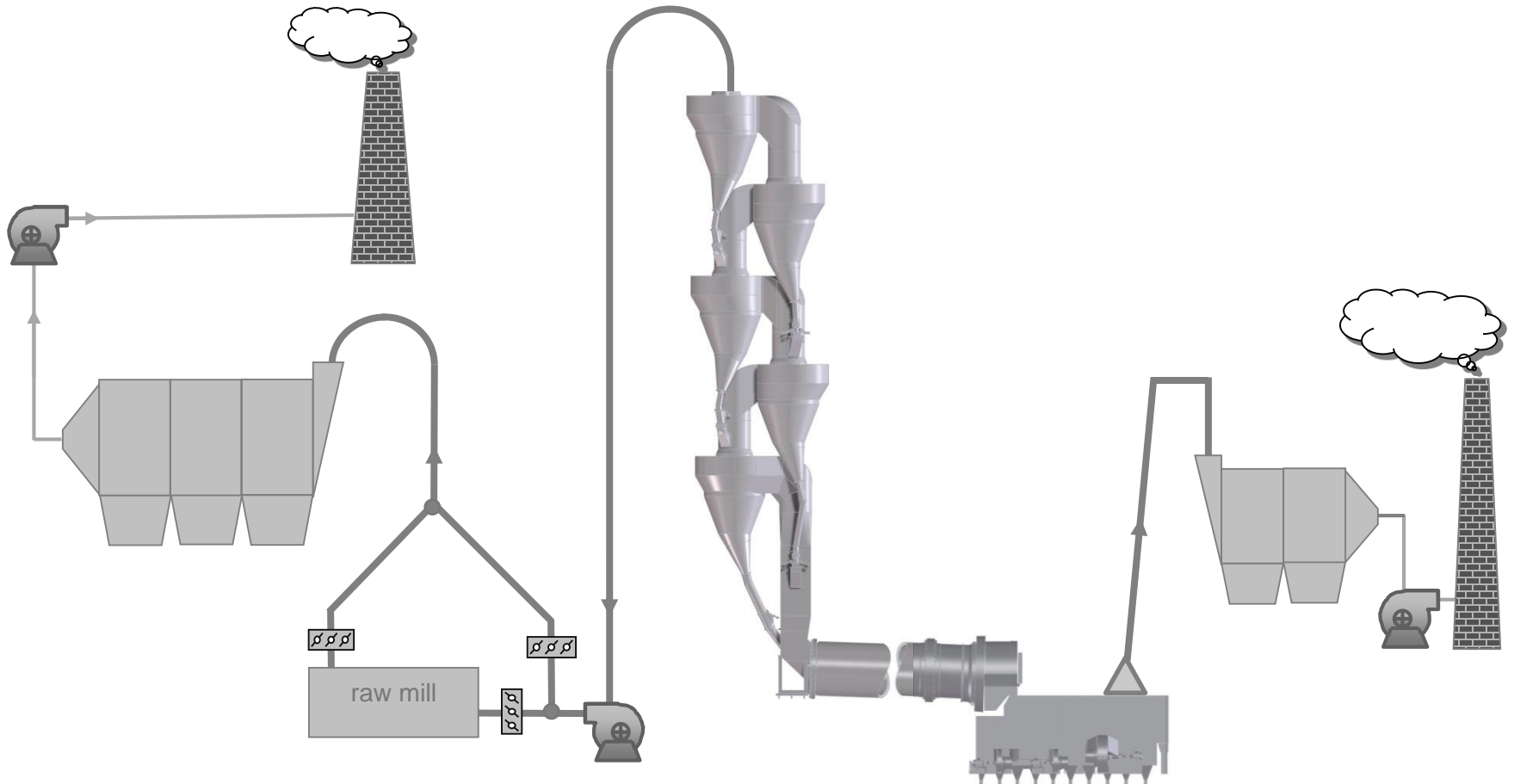
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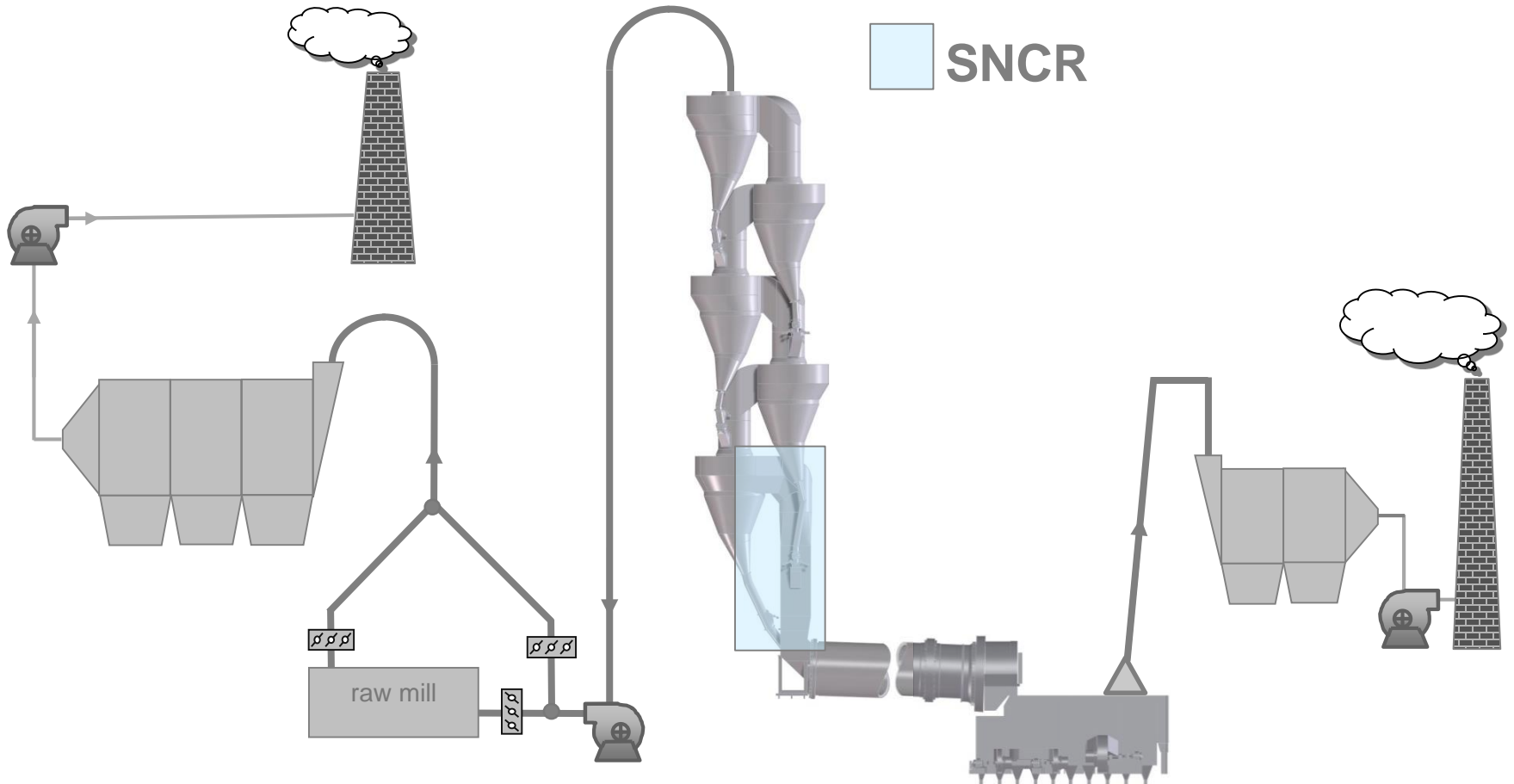
NO_x - BASICS (SCR / SNCR)

Where are SCR and SNCR installations in a cement kiln ?



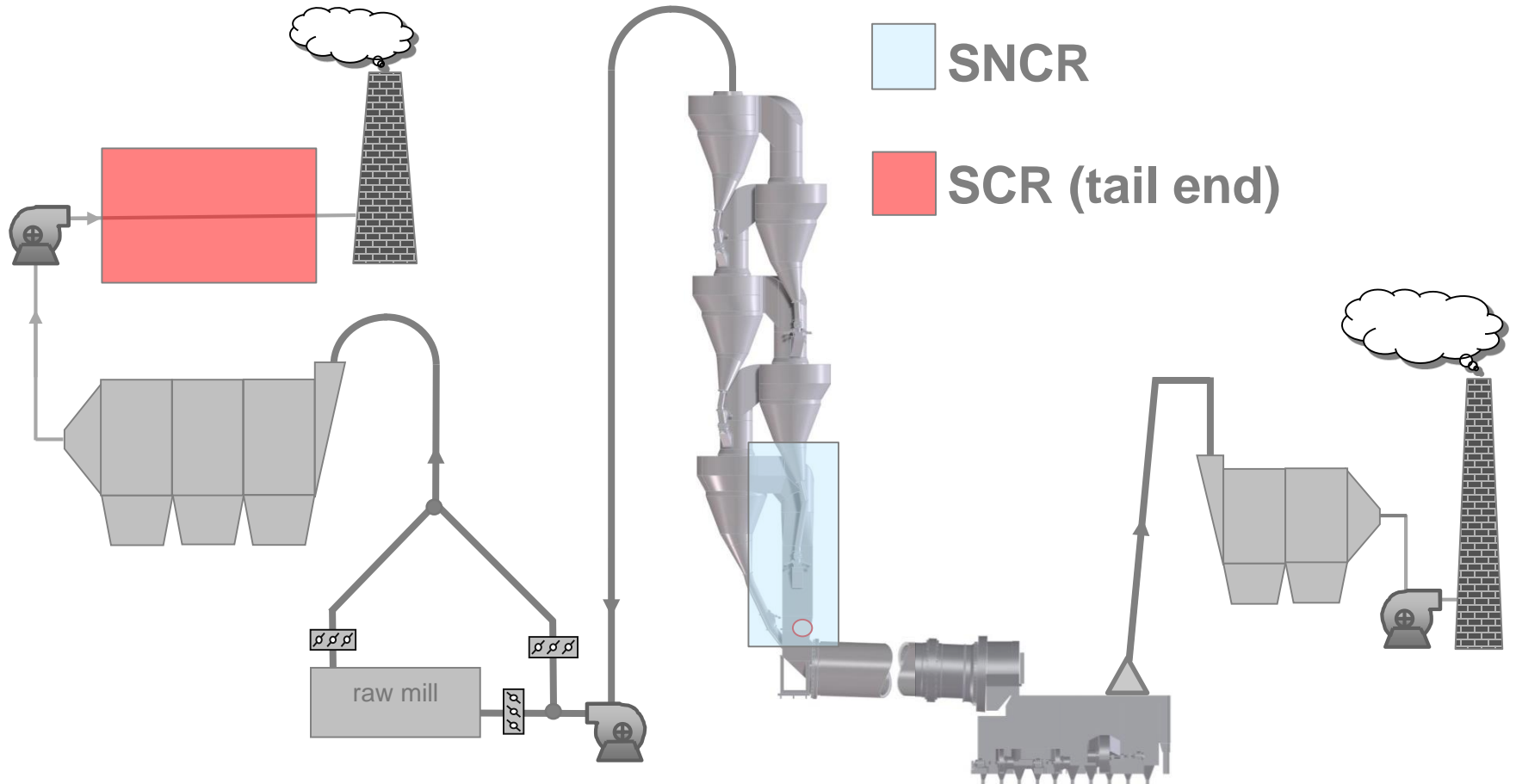
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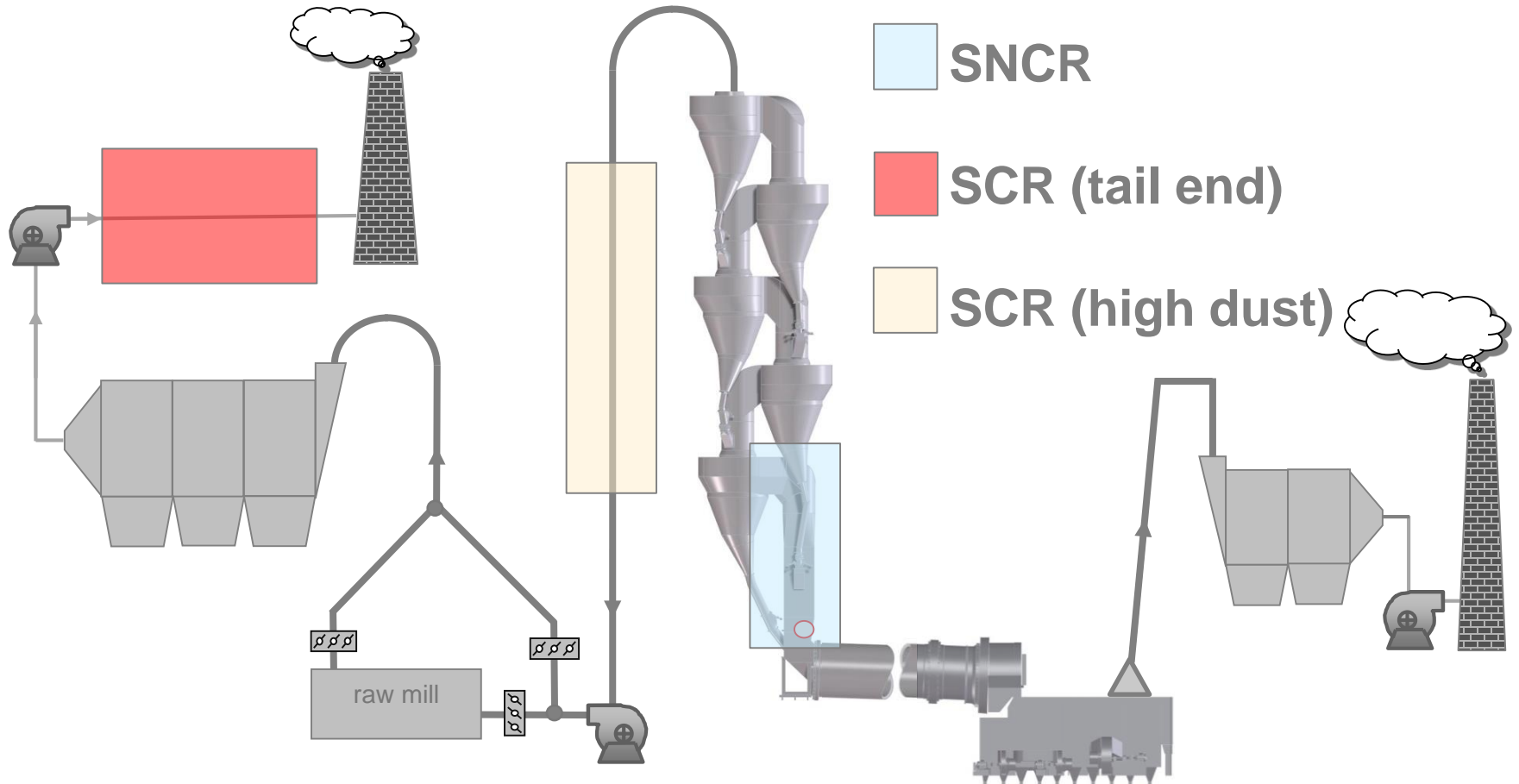
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NO_x - BASICS (SCR / SNCR)

Where are SCR and SNCR installations in a cement kiln ?



SCR

Selective Catalytic Reduction

Reaction Temperature

> 200°C < 400°C

Stoichiometry factor ≤ 1

Efficiency > 90%

Ammonia slip < 5 mg/Nm³ possible

SNCR

Selective Non Catalytic Reduction

Reaction Temperature

900°C – 1.000°C

Stoichiometry factor 2 - 3

Comment: part of NH₃ can be oxidized:



Efficiency up to 80% possible

Ammonia slip critical

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Emission limits as per 17. BImSchV without special permits in [mg/Nm³]

Emission Limits acc. 17. BImSchV		
	regular values	
	daily-average limit	1/2 hour-limit
NO _x	200	400
NH ₃	30	60
CO	50	100
TOC	10	20
SO ₂	50	100
dust	10	30
Hg	0,03	0,05

Special permits for cement plant possible ?

Emission limits – REDUCTION – POSSIBILITES – PERFORMANCE DATA

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special permits for cement plant possible ?

 Stack emission values after a DeCONOX and an SCHEUCH EMC bagfilter

 SO_x Reduction with DeCONOX not possible – however a bagfilter provides some “desulphiration effects”

 The SCR installation doesn't change the Hg load – however a bagfilter influence the circle behavior

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AVAILABLE SCR - TECHNOLOGIES

Low Dust -> versus High Dust Arrangement

LOW DUST (TAIL-END)

„end – of – pipe“ arrangement

Tail-End SCR

- Installation after bagfilter
- Heat transfer system necessary

SCHEUCH -  De CONOX

A combination between a RTO
(Regenerative Thermal Oxidizer and a
low-dust SCR

HIGH DUST

„process – integrated“ arrangement

High-dust SCR

- Installation after preheater tower
(exposed to dust load)

Semi-dust SCR

Additional pre-separator (hot gas ESP)
reduces the inlet dust concentration

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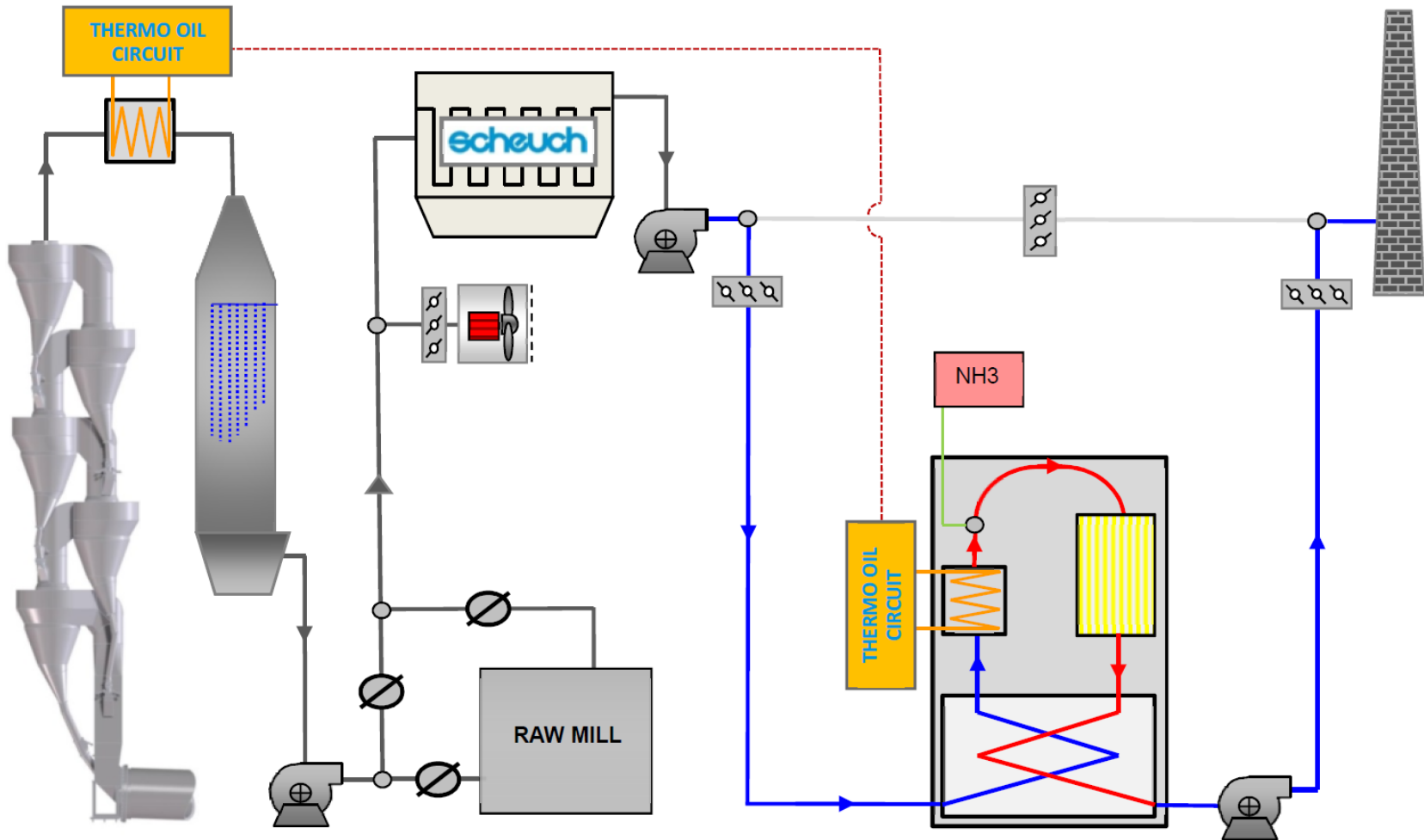
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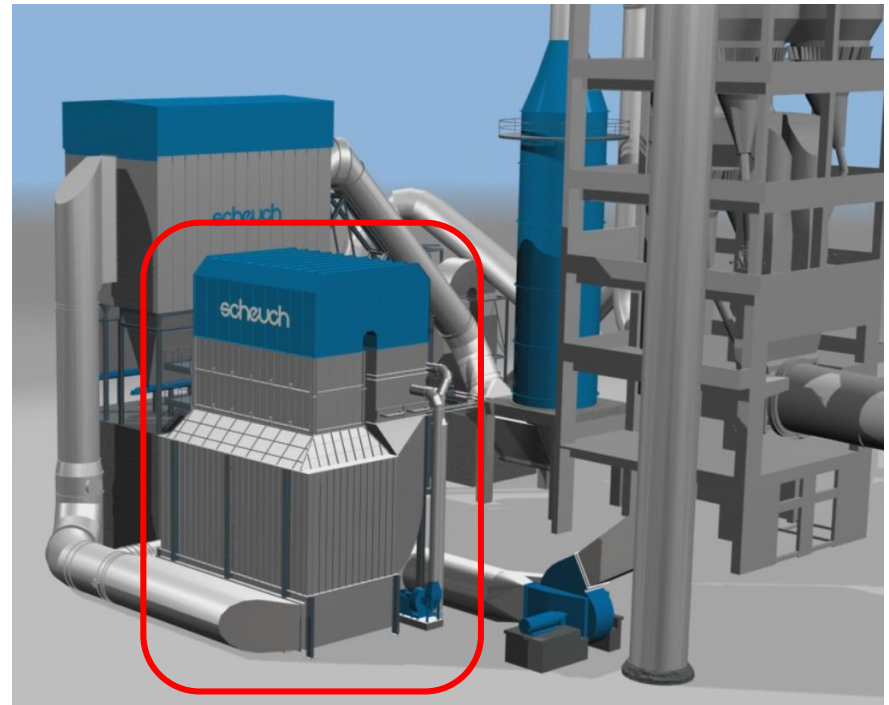
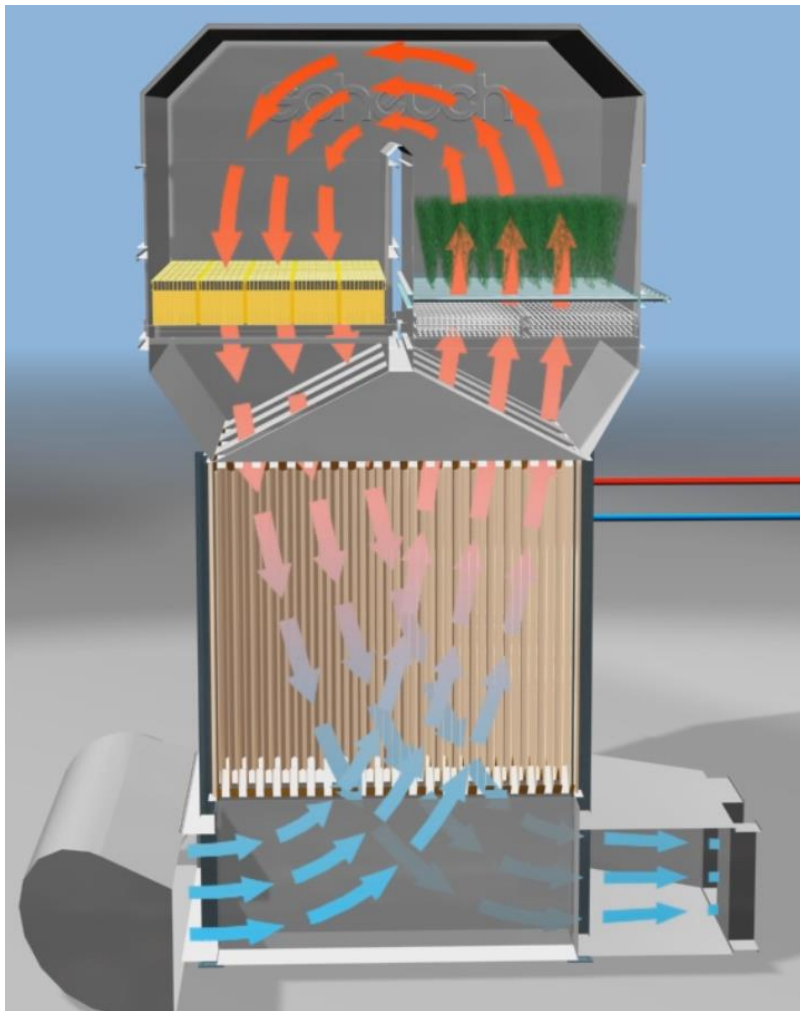
LOW DUST SCR "CLASSIC"

Typical integration of the SCR unit



LOW DUST SCR “CLASSIC”

Cross –section of the SCR unit with heat-exchanger



LOW DUST (TAIL-END)

„end – of – pipe“ arrangement

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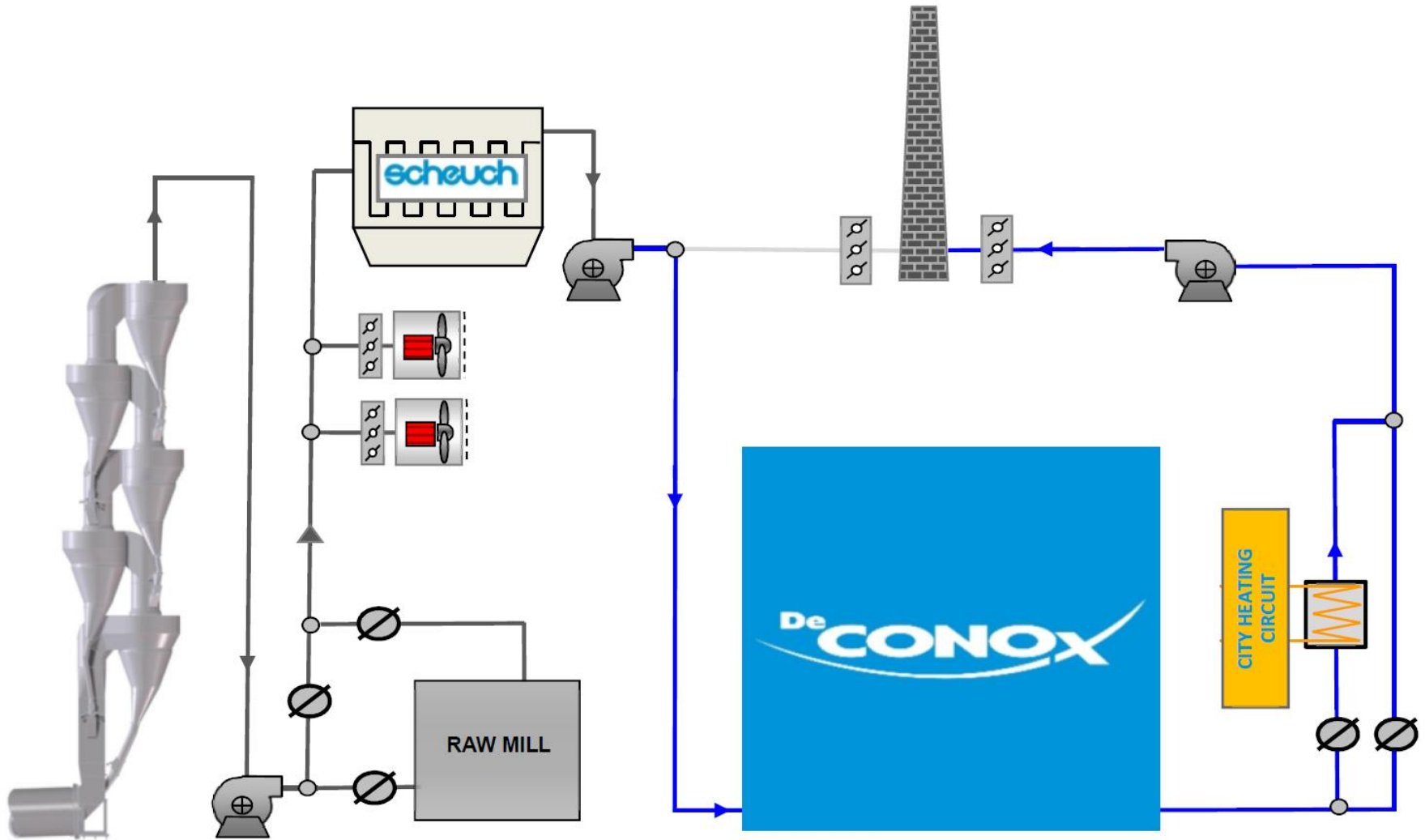
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LOW DUST SCR



Typical integration of the SCR unit (=Kirchdorfer Zement Plant)



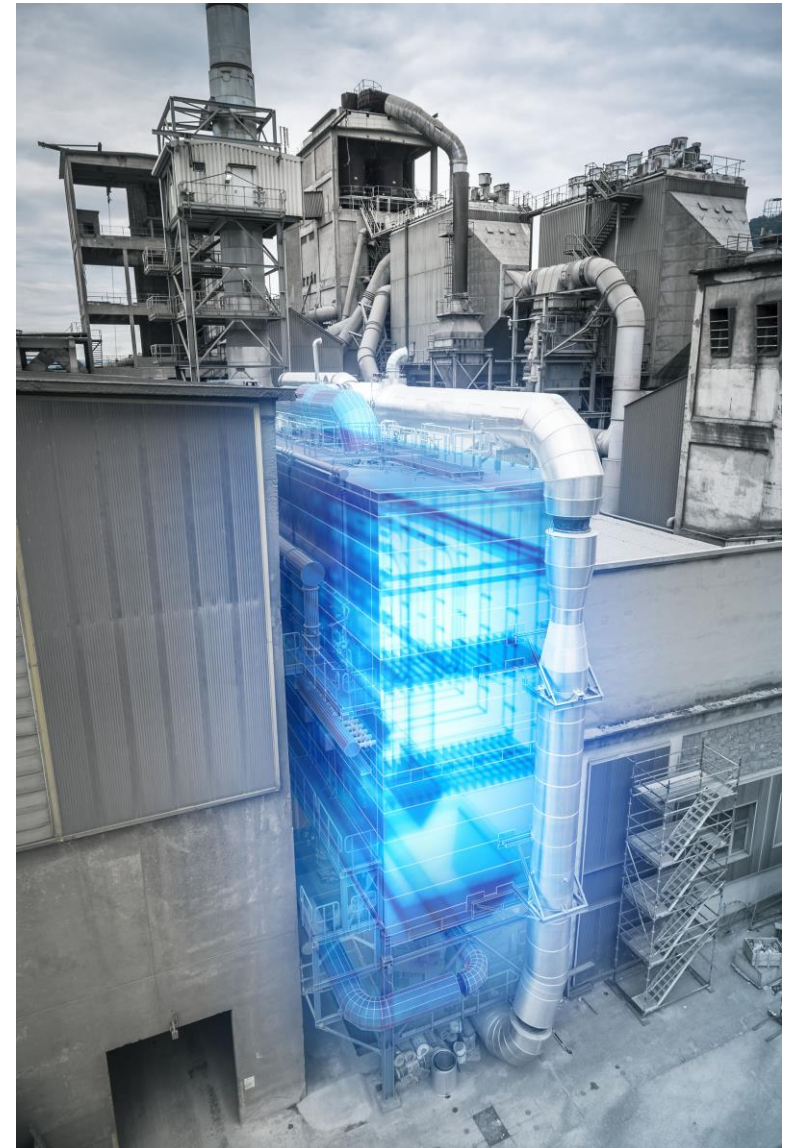
1st DECONOX worldwide at Kirchdorfer Zement - Austria

Design Data:

- 1100 t/d
- Flow: 151,000 Nm³/h
- Temp: 120°C – 220°C
- Dust: < 5 mg/Nm³

Target:

- < 200 mg/Nm³ NO_x
- < 20 mg/Nm³ NH₃
- < 10 mg/Nm³ VOC
- > 99% reduction of CO; max. 100 mg/Nm³



LOW DUST SCR



Site Impressions DECONOX - Kirchdorfer Zement



1st feedback since plant start end of 08/2015

- successful Start – Up
- DeCONOX now in permanent operation
- CO and VOC reduction > 99%



1st feedback since plant start end of 08/2015

- successful Start – Up
- DeCONOX now in permanent operation
- CO and VOC reduction > 99%
- DeCONOX operates **autotherm**



LOW DUST (TAIL-END)

„end – of – pipe“ arrangement

Tail-End SCR

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- Heat transfer system necessary

SCHEUCH -  De CONOX

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HIGH DUST

„process – integrated“ arrangement

High-dust SCR

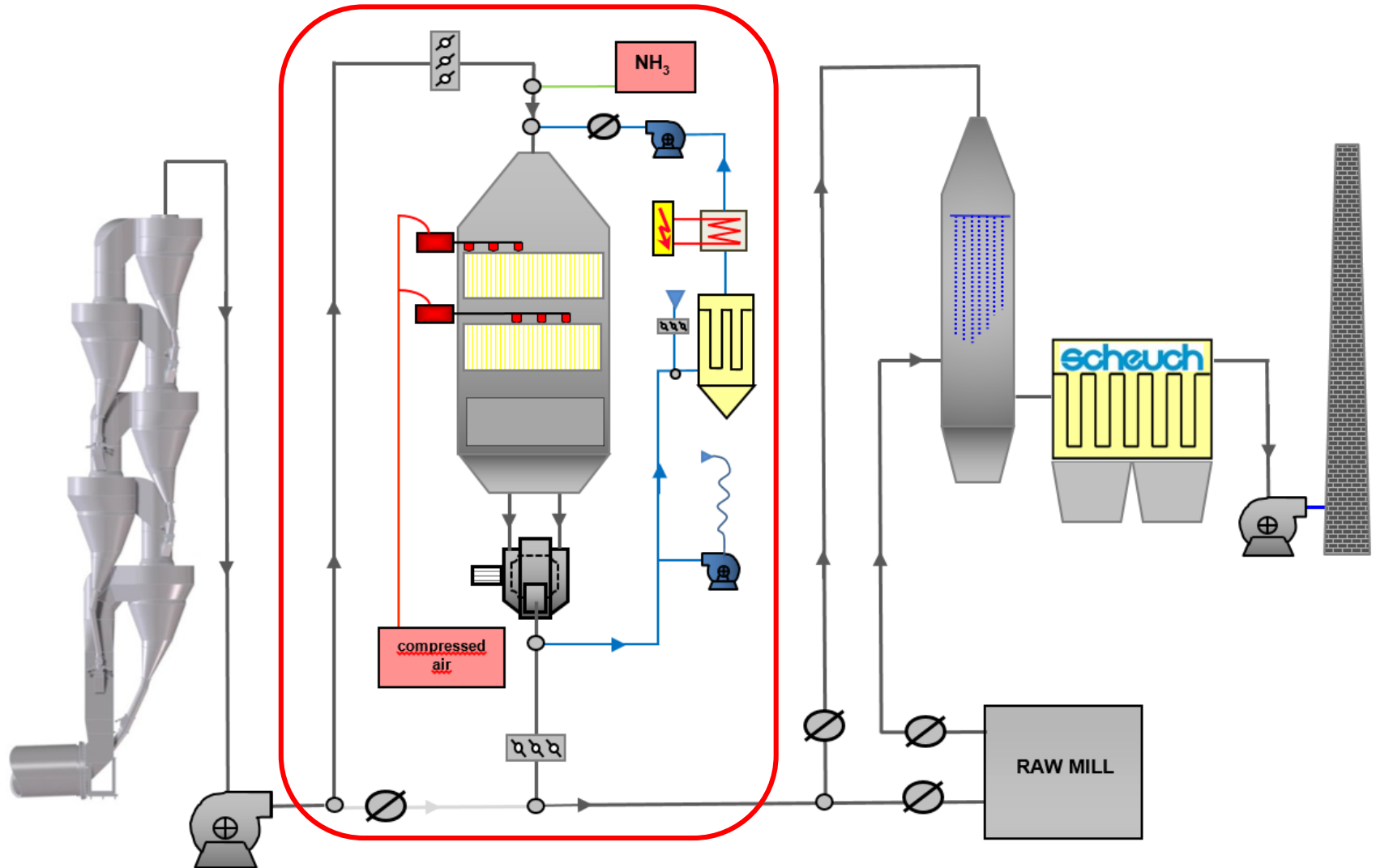
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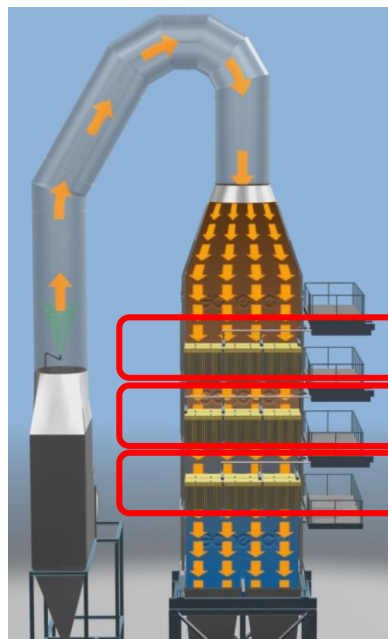
HIGH DUST SCR

Typical integration of the High Dust - SCR unit

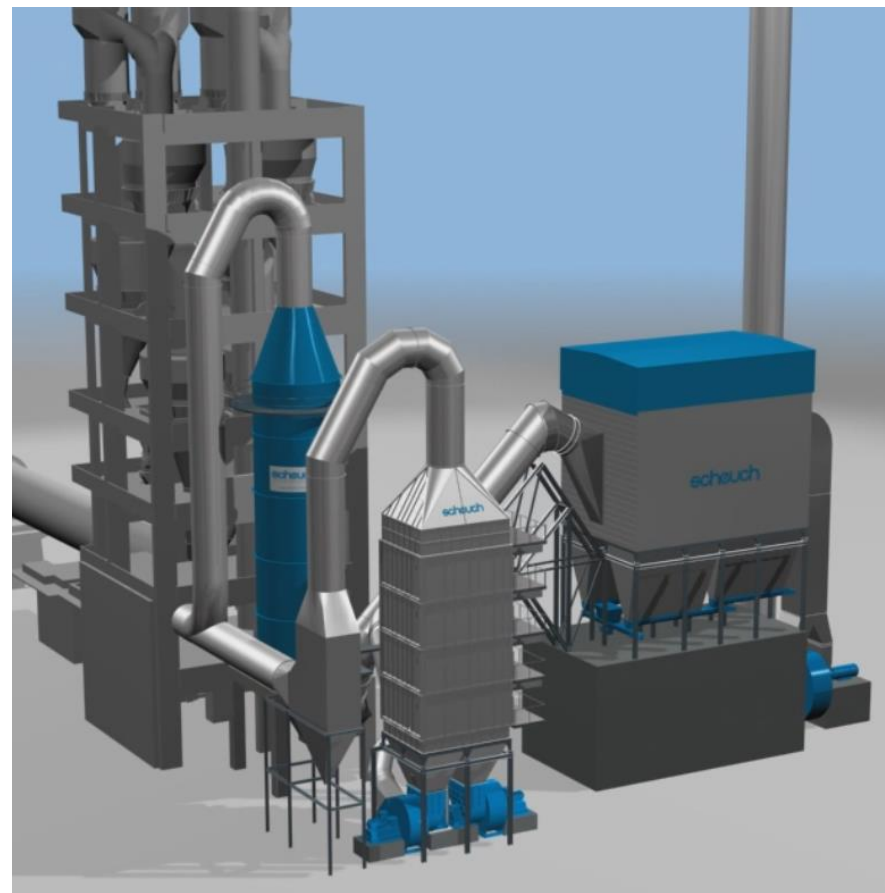
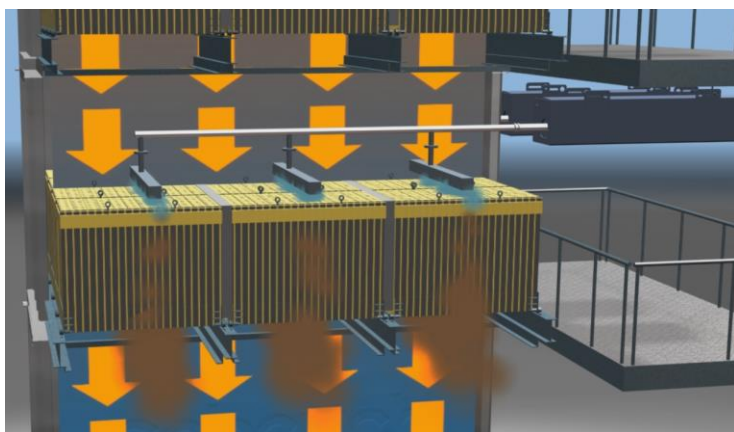


HIGH DUST SCR

Typical arrangement of the High Dust - SCR unit



LEVEL 1
LEVEL 2
LEVEL 3 (spare layer)



CAT cleaning with soot blowers

LOW DUST (TAIL-END)

„end – of – pipe“ arrangement

Tail-End SCR

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- Heat transfer system necessary

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HIGH DUST

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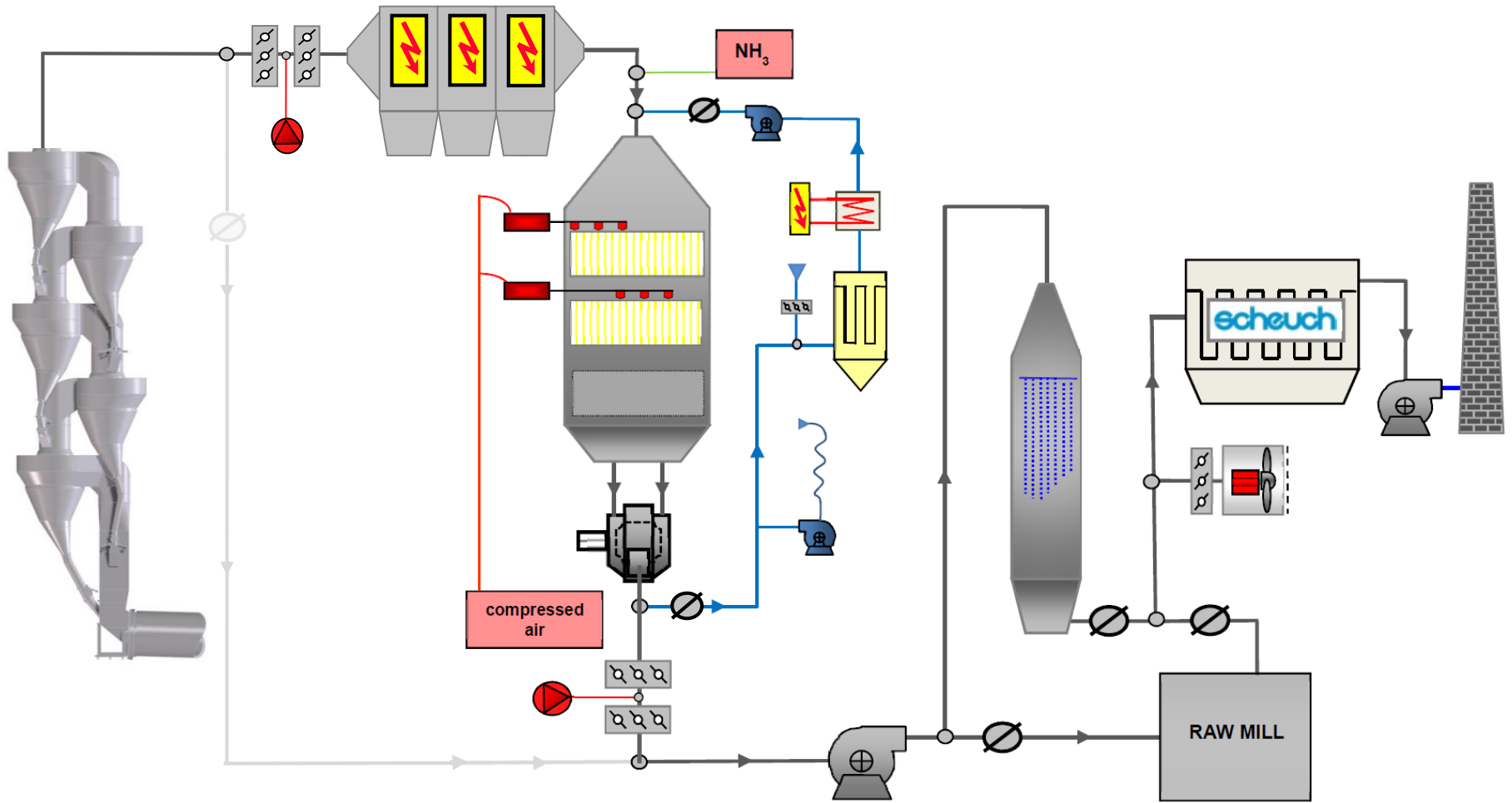
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Semi-Dust SCR

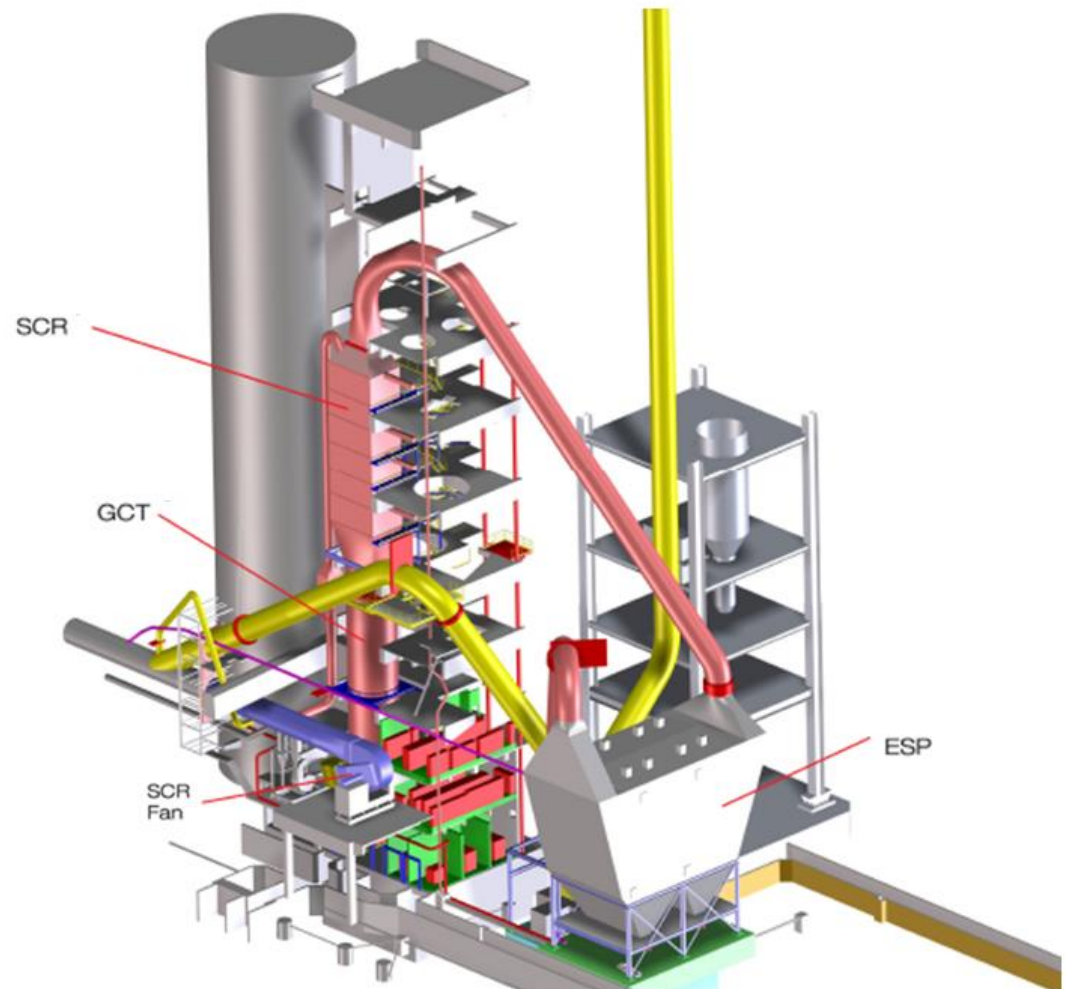
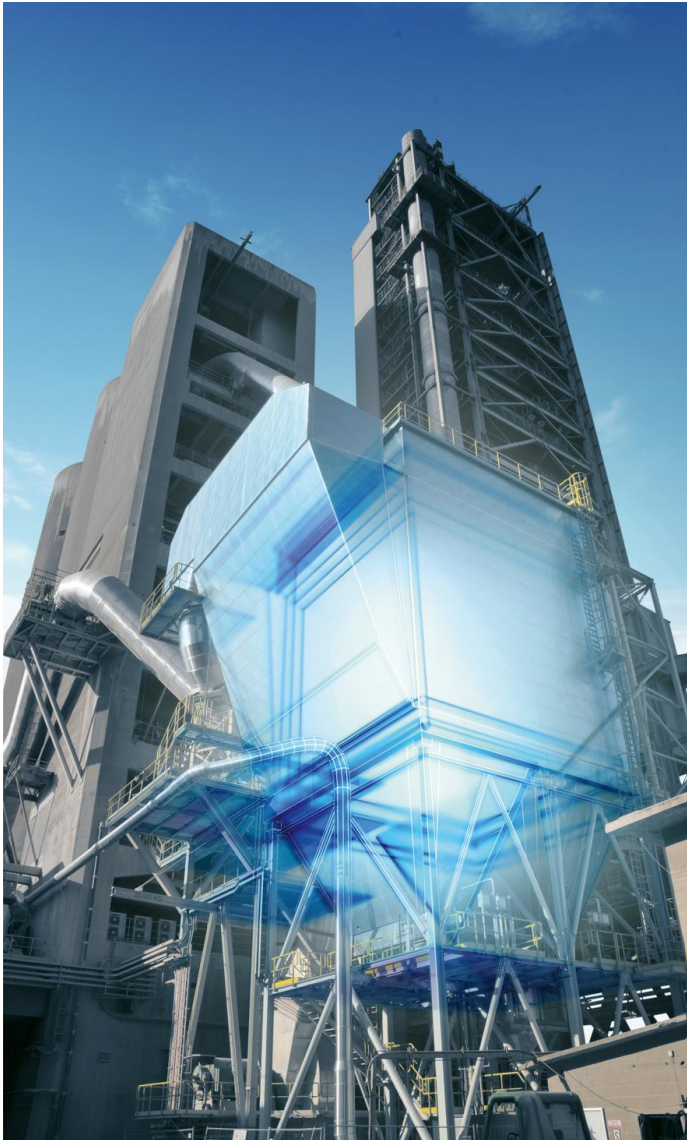
Additional pre-separator (hot gas ESP /
cyclone) reduces the inlet dust
concentration

SEMI - DUST SCR

Typical integration of the SCR unit



SEMI – DUST SCR LAFARGE - MANNERSDORF



1st SEMI-DUST SCR worldwide at Lafarge Mannersdorf - Austria

Design Data:

- 2500 t/d
- Flow: 180,000 Nm³/h
- Temp: 290°C – 350°C
- Dust: 180 g/Nm³ (before ESP)
< 2 g/Nm³ (after ESP)

Concept:

ESP instead of cyclone-upgrade

(idea to adjust SCR inlet dust concentration for test –
purpose to receive design data for other Lafarge plants)

Target:

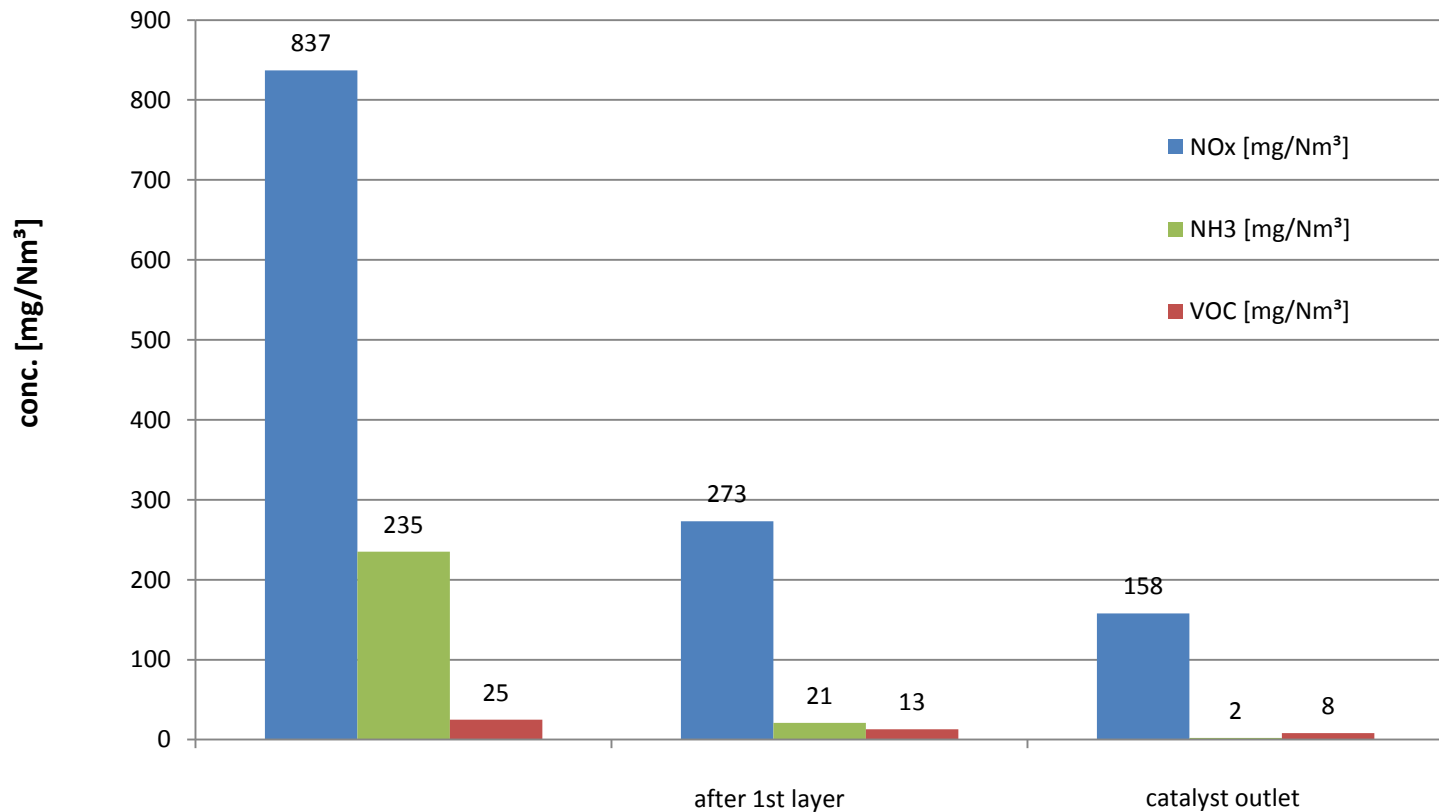
- < 200 mg/Nm³ NO_x (at the main stack)
- < 20 mg/Nm³ NH₃



Results: emission measurement June -2012

Project Targets

TÜV measuring campaign June 2012



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TECHNOLOGY FOR CLEAN AIR

WE CREATE
TECHNOLOGY
FOR CLEAN AIR



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