



NEUTRALOX®

working like the sun

NEUTRALOX® – ... and the air is clean.

> since 1999

Head office in Germany:



Lohestrasse 63,
53773 Hennef (Sieg)
Germany

Tel. + 49 - 2242 - 91364 - 0,

info@neutralox.de
www.neutralox.de



Office in Hennef

Subsidiary in Chicago



150 North Michigan Av., 35th floor
Chicago, IL 60601
USA

Tel. 312-377-6116

mail@neutralox.com
www.neutralox-inc.com



Partners in the world

NEUTRALOX® – Odour Control

NEUTRALOX® – Photoionisation



Emission source ventilation

Odour control – OU/m³

Health & Safety – e.g. H₂S

Corrosion control – H₂S

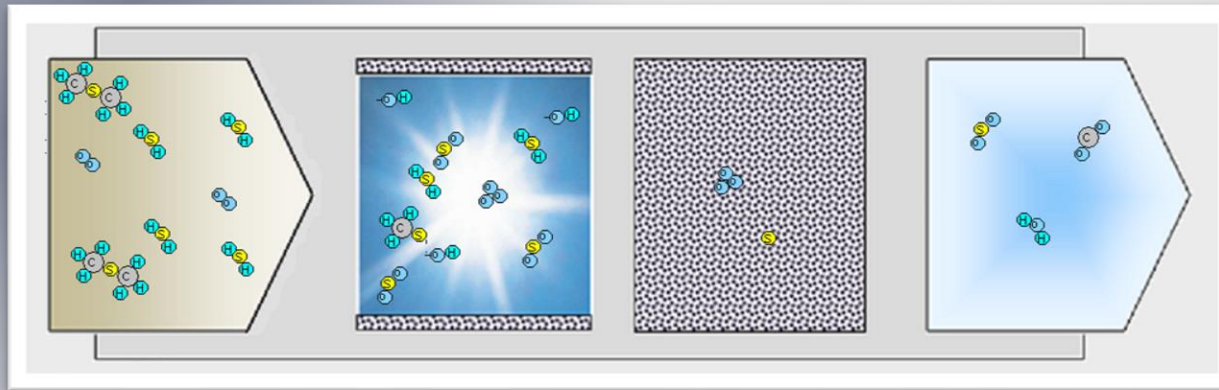
Ex-protection – CH₄



NEUTRALOX® – Photoionisation

Effective Odor Control

NEUTRALOX® Photoionisation is an effective odour treatment process, applied for all odours related to sewage and sludge treatment. Photoionisation copes well with high odour loads (e.g. several 100 ppm of H_2S) and fluctuating odour loads.



The process is based on the effective interaction of UV-light and a catalytic converter. In the UV-chamber the Photoionisation process is initiated by the generation of strong oxidants like oxygen radicals and hydroxyl radicals (O^- , $\text{OH}^\cdot$, O_3 , etc.). Simultaneously, the linkages of odour molecules are broken up. While some of the contaminants are oxidized immediately others are adsorbed to the surface of the catalyst and are degraded through the interaction of catalyst, oxidants and UV-light. The result is a constantly odourless cleaned gas which meets international environmental requirements.

NEUTRALOX® – Photoionisation

Odor control and off-gas treatment

NEUTRALOX® Photoionisation:

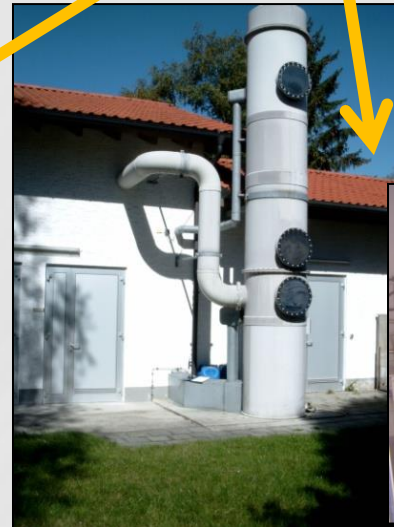
- very efficient odour reduction (> 99% efficiency)
- can handle very high concentrations (eg. 100's of ppm of H₂S)
- particularly effective on all reduced sulfur compounds
- easily handles spikes/peaks
- operates over a wide temperature range (-30 °C → 50 °C)
- low maintenance requirements (1/2 day/year)
- no water or chemicals required
- very stable process
- can easily be turned on or off, and begins working immediately
- low energy demand
- small footprint



Example: odour control at screen building

NEUTRALOX® – Photoionisation

Every technology has it's place



NEUTRALOX® – References

Working at the odour source

Pump Stations can be a source of odour complaints because they represent a point of potential odour release. Incoming wastewater may contain high levels of dissolved sulphide which result in elevated H_2S concentrations.

Further issues are turbulences of the incoming wastewater and changing water levels within the wet well which demand continuous ventilation to the atmosphere. Furthermore, depending on the age of the incoming wastewater and the detention time in the wet well, H_2S concentrations typically vary very much...

Photoionisation represents the ideal treatment method for pump station odour because:

- Varying air-flow rates can be treated
- High and varying inlet H_2S concentrations can be treated
- Treatment of further components in various concentrations possible
- Low operation and maintenance demand
- Reliable operation
- Small footprint, silent operation



NEUTRALOX® Photoionisation at sewage pumping station

NEUTRALOX® – References

Working at the odour source

Installation of rather small **NEUTRALOX®** Photoionisation units, close to odour sources, provides important advantages in contrast to single central plants treating off-gas from a number of different odour sources. The modular build-up of Photoionisation based on small footprint, allows for this decentred design approach.

Decentred plants:

- Operation flexibility
- Cost savings (no ducting)



NEUTRALOX® Photoionisation at sludge holding tank

NEUTRALOX® – References

Big central NEUTRALOX® Photoionisation plants

While some clients prefer decentralized installed small units in order to avoid (and save) excessive ducting, other rather prefer single central plants in order to have all odour control in one place.

Whatever is preferred, our modular build-up system allows a high degree of flexibility.



12,000 m³/h of off-gas from different sources

NEUTRALOX® – References

Example: Off-gas treatment – sludge dryer

In Germany, sludge dryers require an operation approval and the off-gas from sludge dryers has to meet strict environmental standards.

The picture shows NEUTRALOX® Photoionisation for sludge dryer in Munich.

Off-gas flow rate ca. 9,000 m³/h

	Unit	Required by law	Achieved by NEUTRALOX®
Total-C	mg/m ³	20	8
HCl	mg/m ³	20	< 0.3
	kg/h	0.10	< 0,003
NH ₃	mg/m ³	10	0.1
Total dust	mg/m ³	10	1
Odour	OU/m ³	500	150

Table: Clean gas data



Off-gas treatment sludge dryer

NEUTRALOX® – References

Example: Replacement of conventional odour control

ATAD sludge treatment with raw-gas peaks:

H₂S: 100 ppm

NH₃: 1,200 ppm

(CH₃)₂S: 150 ppm

Mercaptans: 80 ppm

Odour: > 60,000 OU/m³

A biofilter applied on an ATAD sludge treatment plant caused significant odour complaints of the neighbourhood. After installation of the **NEUTRALOX®** Photoionisation unit, complaints stopped. Air-flow rate: 3,000 m³/h.

Biological Treatment



Clean-gas:

Odour: < 500 OU/m³
and no complaints !

NEUTRALOX® Photoionisation



NEUTRALOX® – References

Example: Replacement of conventional odour control

Chemical scrubbers typically cause an enormous operation and maintenance demand. Chemicals handling may be an issue. However, in the given case complaints of the neighbourhood were the reason to shut down the scrubber. Odour is always a complex mixture of many different components but scrubbers focus on treatment of single compounds (like H_2S). Insufficient odour treatment is the result.

Air-flow rate here: 2,500 m³/h

Chemical Scrubber



NEUTRALOX® Photoionisation



NEUTRALOX® Photoionisation references



Sudbury biosolids: sludge hygienisation, NH_3



NEUTRALOX® Photoionisation references



Sudbury headworks and pumping station, H₂S

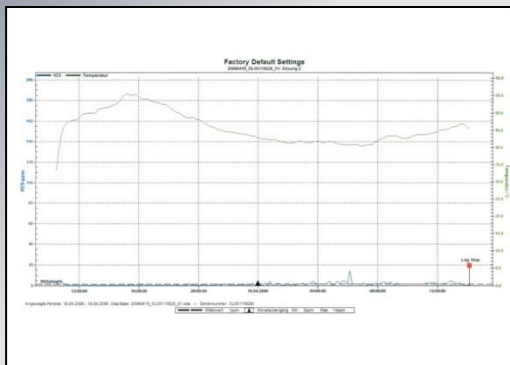
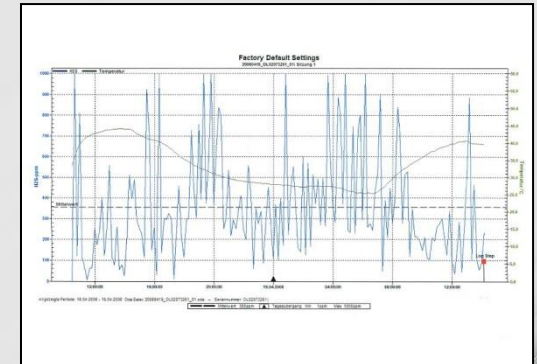
NEUTRALOX® – Research and development

Pilot units

NEUTRALOX® possesses a number of pilot units, to demonstrate the process technologies at site.

Depending on the application, test runs may be conducted for several weeks, accompanied by intensive odour and component analysis.

All test units are mobile, easy to handle and simple in application.





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