

EXHAUST AIR TECHNOLOGY

# CLEAN AIR

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Cost-effective solutions for Air Pollution Control

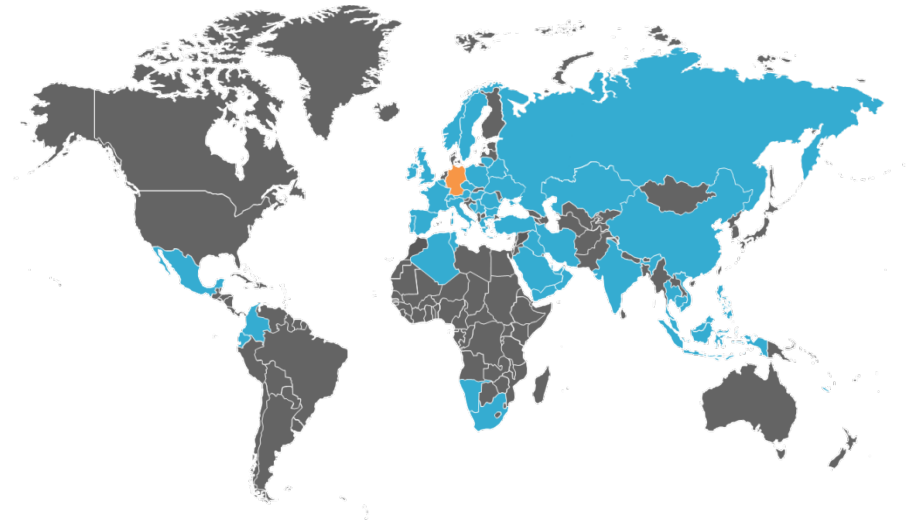
# THOLANDER ABLUFTECHNIK

As an ISO 9001:2015 certified company  
and a leading manufacturer of air pollution  
control plants we offer turn-key solutions  
for almost any waste air problem



- Success in air pollution control since 1986
- Specialist for odor removal in
  - Waste water treatment
  - Solid waste management
  - Industries
- More than 1000 plants worldwide

## BREATHE. EASILY.




## OUR CUSTOMERS

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- Waste water treatment
  - Waste treatment
  - Composting
  - Recycling
  - Food processing
  - Cigarette production
  - Chemical industry
  - Printed board production
  - Biogas plants
- 
- Three small, solid-colored squares are positioned to the right of the list: a green square, a purple square, and a blue square, arranged in a slightly overlapping pattern.

## ...AND THEIR PROBLEMS

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- Odour
  - Inorganic acids
  - Solvents
  - Poisonous contaminants
  - Dust
  - Organic sulfur compounds
  - Hydrogene sulphide
  - Aerosoles
  - Ammonia
- 
- Three small, solid-colored squares are positioned to the right of the list: a green square, a blue square, and an orange square, arranged in a slightly overlapping pattern.

# BREATHE EASILY.

## OUR SERVICES

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- Turn-key systems for air pollution control
- Consulting
- Design
- Engineering
- Project management
- Research and development
- Maintenance and spare parts

## OUR SOLUTIONS

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- Biofilters
- Biotrickling filters
- Counter-current scrubbers
- Cross-flow scrubbers
- Activated carbon filters
- Multiventuri scrubbers





# AIR POLLUTION CONTROL IN WASTE WATER TREATMENT

## Typical Odour Sources in Waste Water Treatment

- Screen building
- Pumping station
- Grit removal
- Aeration tanks
- Sludge dewatering





# SOLUTIONS

## ■ BIOFILTRATION



## ADVANTAGES

- Low invest costs
- Low running costs
- Natural method
- Low water consumption
- Excellent odour removal
- Easy maintenance
- Self controlled



## BIOFILTRATION - PROCESS

**Removing of contaminants from the exhaust and  
bio oxidation to carbon dioxide and water**

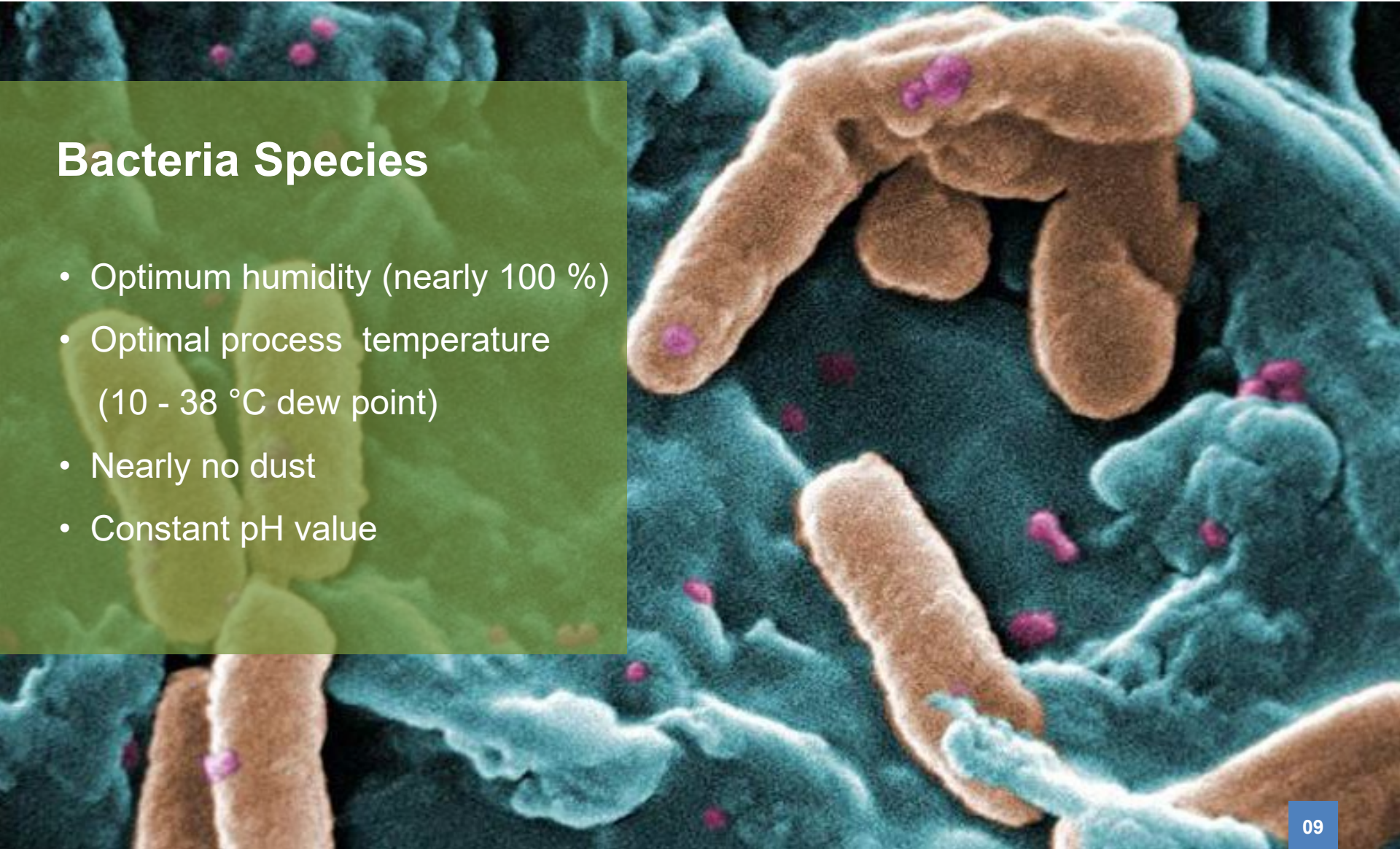






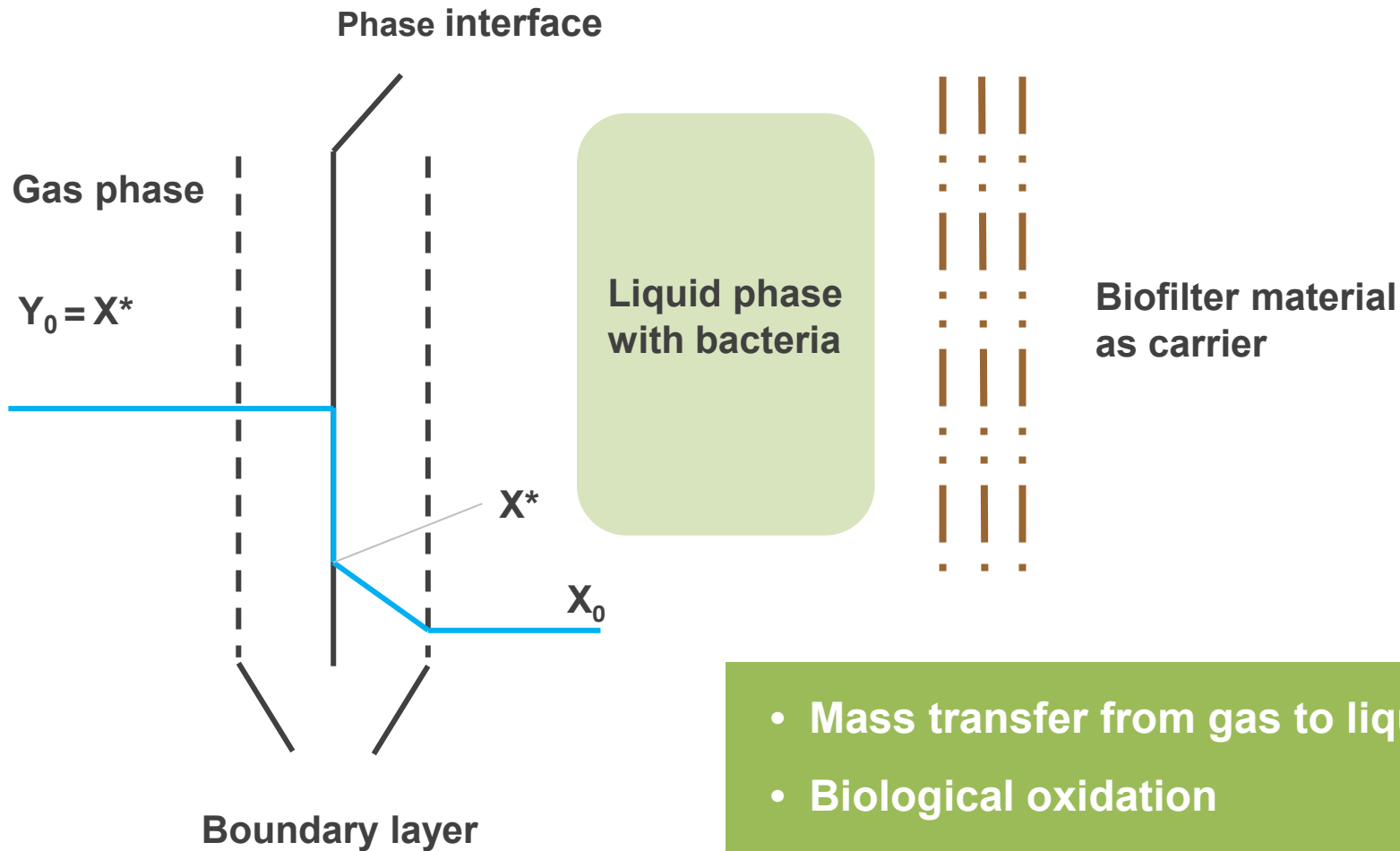
## Bacteria Species

- Optimum humidity (nearly 100 %)
- Optimal process temperature  
(10 - 38 °C dew point)
- Nearly no dust
- Constant pH value



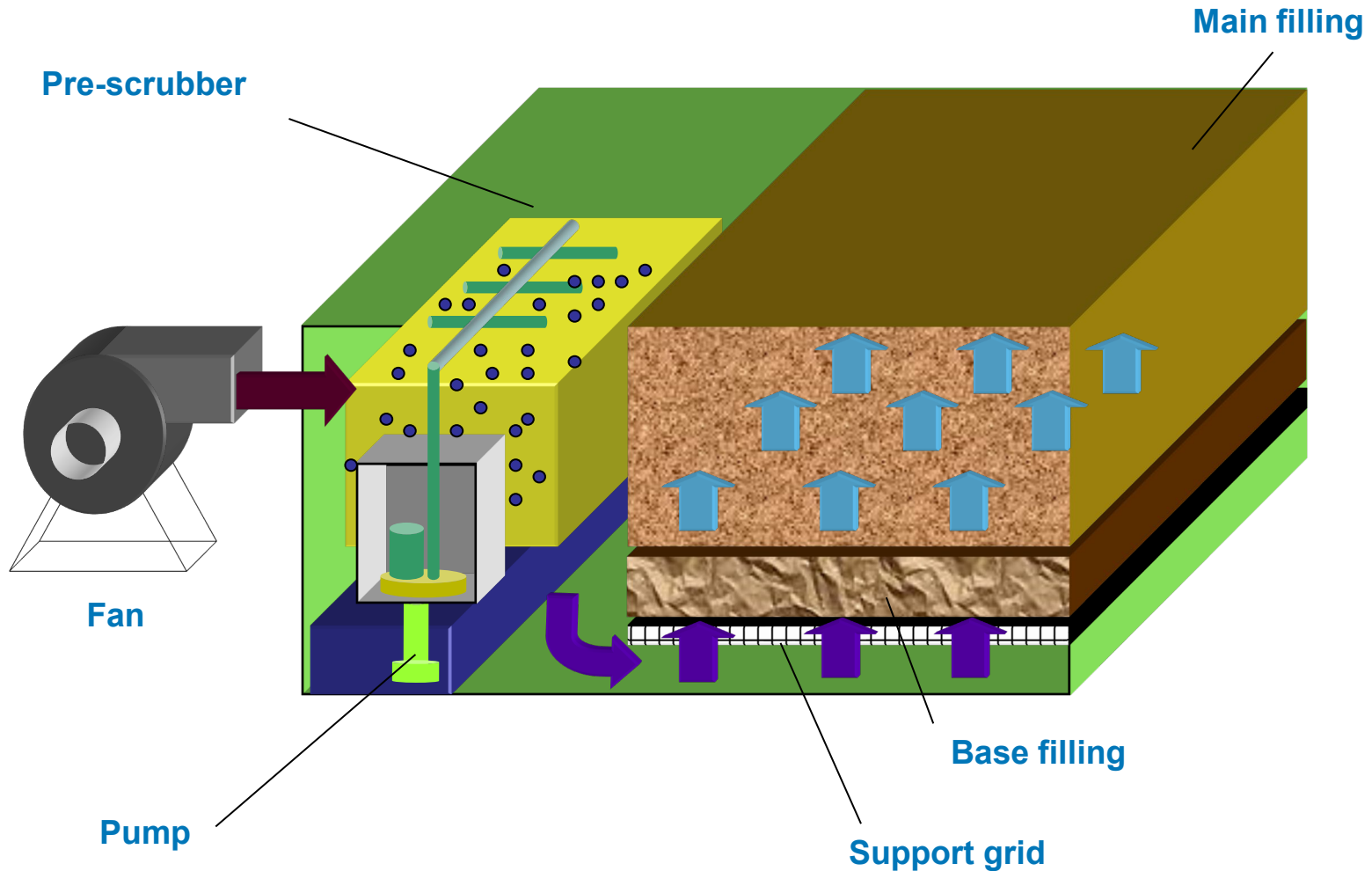


# BIOFILTRATION



# BIOFILTRATION

## BIOFILTER – BASIC FLOWCHART







# BIOFILTRATION

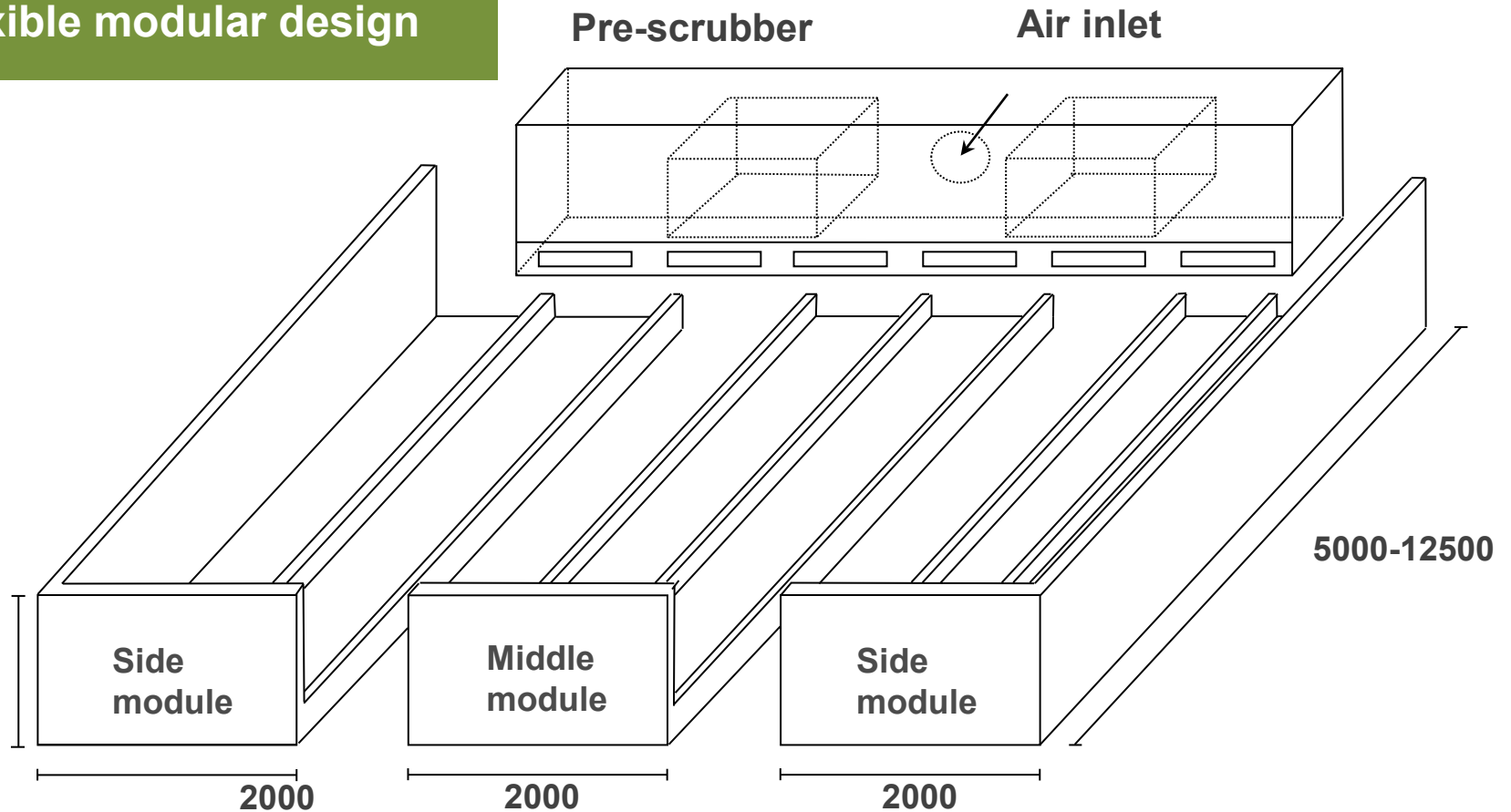
## Biofilter Filter Material



9 6 2005



## Flexible modular design







## Biofilter Pre-scrubber | Tropical Island

Integrated air conditioning

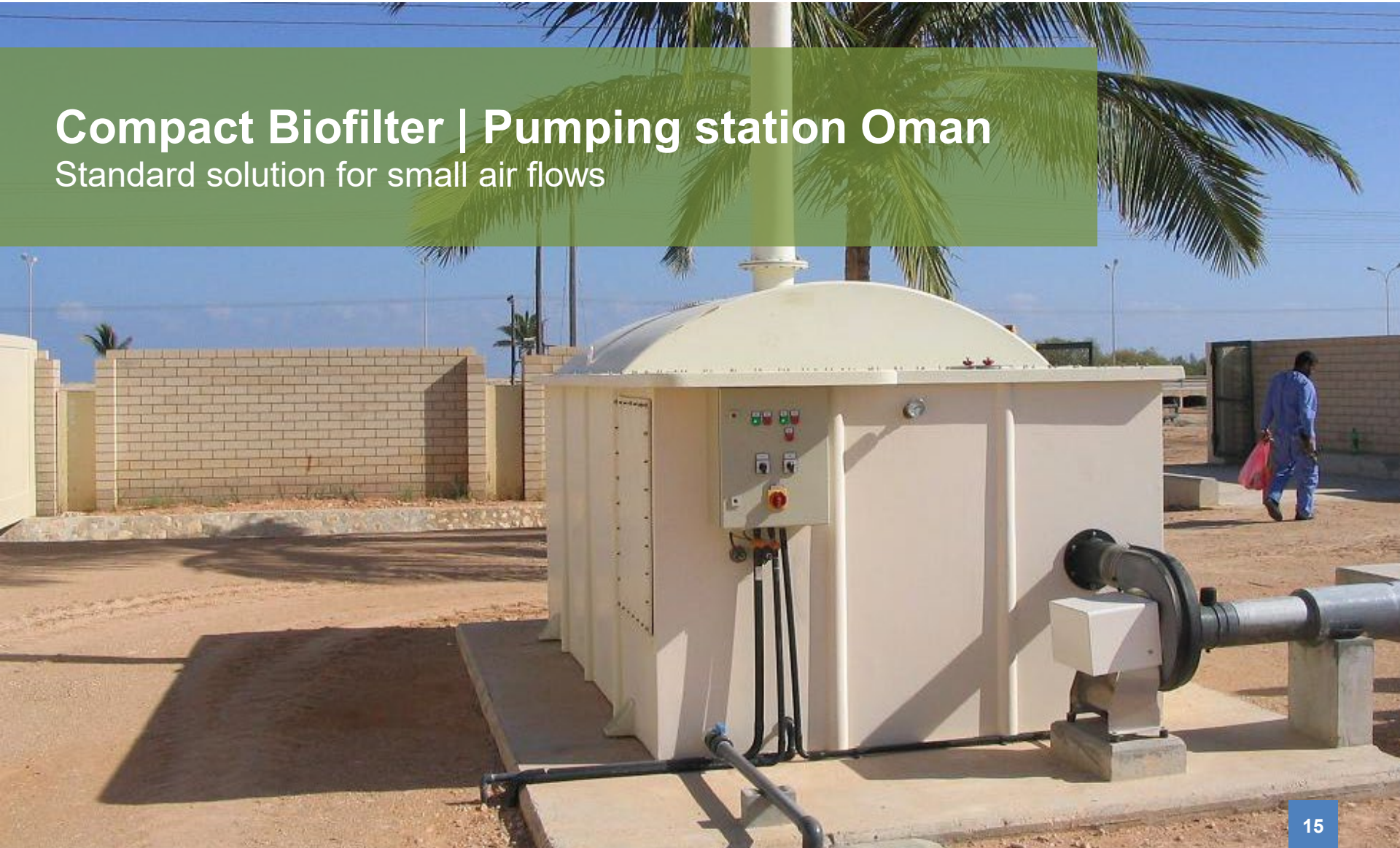






## Compact Biofilter | Pumping station Oman

Standard solution for small air flows





# BIOFILTRATION

## Waste Water Treatment Bern – Switzerland (60.000 m<sup>3</sup>/h)







# BIOFILTRATION

## Waste Water Treatment WWTP Budapest (2 x 14.0000 m<sup>3</sup>/h)





## Doha Solid Waste Management Center

Biofilter with integrated pre-scrubber







# BIOFILTRATION

## Doha Solid Waste Management Center

Biofilter with integrated pre-scrubber

المرشح الحيوي  
**BIOFILTER**





## Waste Treatment | Germany

Covered Biofilter with integrated pre-scrubber







# BIOFILTRATION

## Biofilter

Composting plant in France (82.500 m<sup>3</sup>/h)





## Waste Treatment

Covered Biofilter, Montpellier (180.000 m<sup>3</sup>/h)





# SOLUTIONS

## ■ CHEMICAL SCRUBBING

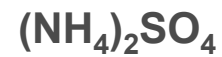


## ADVANTAGES

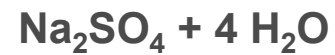
- Flexibility
- Low space demand
- High efficiency at high concentrations
- High buffer capacity
- No adaption time
- Full automatic operation



## CHEMICAL SCRUBBING



or

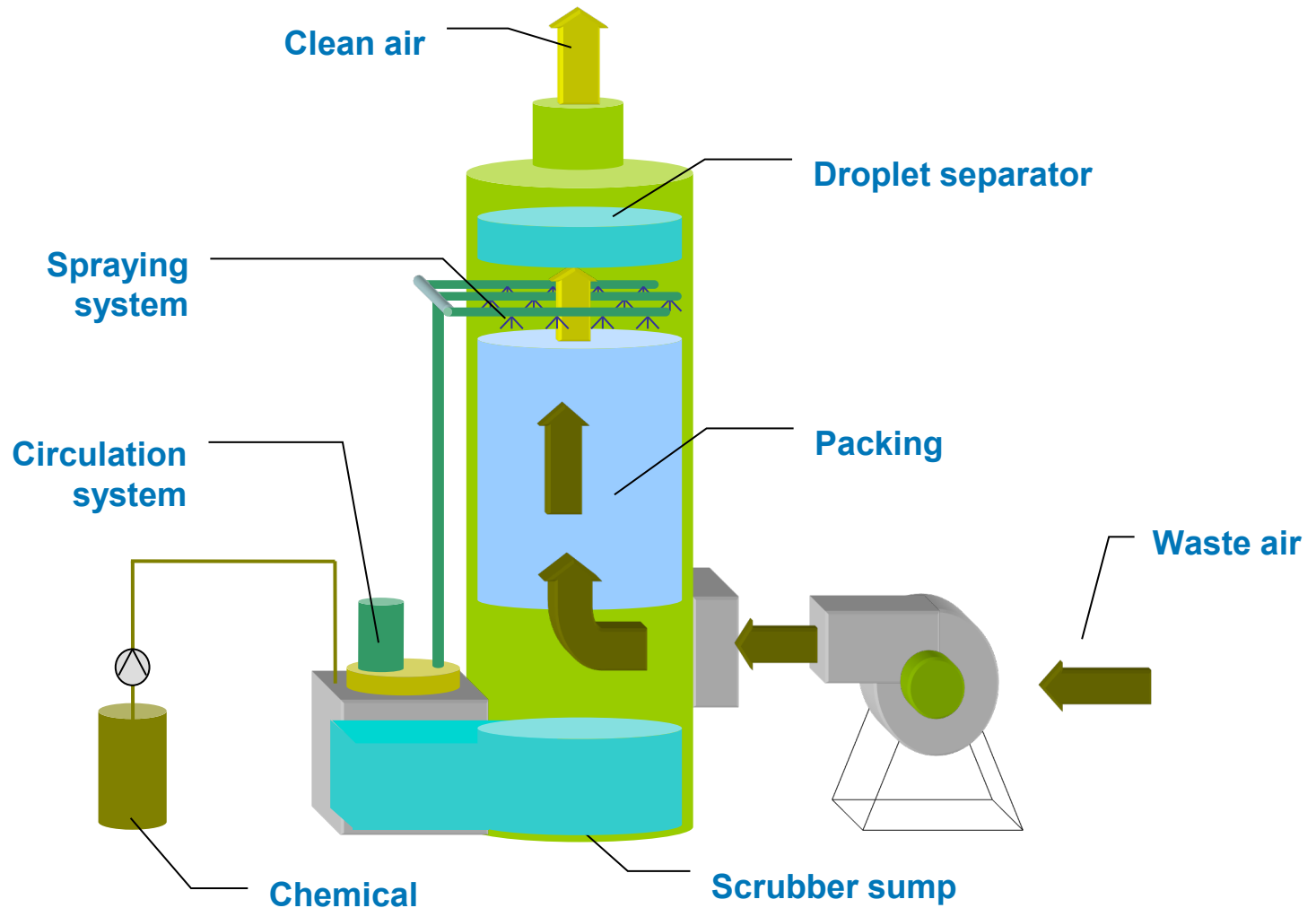


or





# COUNTER-CURRENT SCRUBBER







# COUNTER-CURRENT SCRUBBER

## Counter-current Scrubber | Abu Dhabi H<sub>2</sub>S removal at pumping station





# COUNTER-CURRENT SCRUBBER

## Counter-current Scrubber

Packed scrubber as pre-treatment  
in front of a RTO

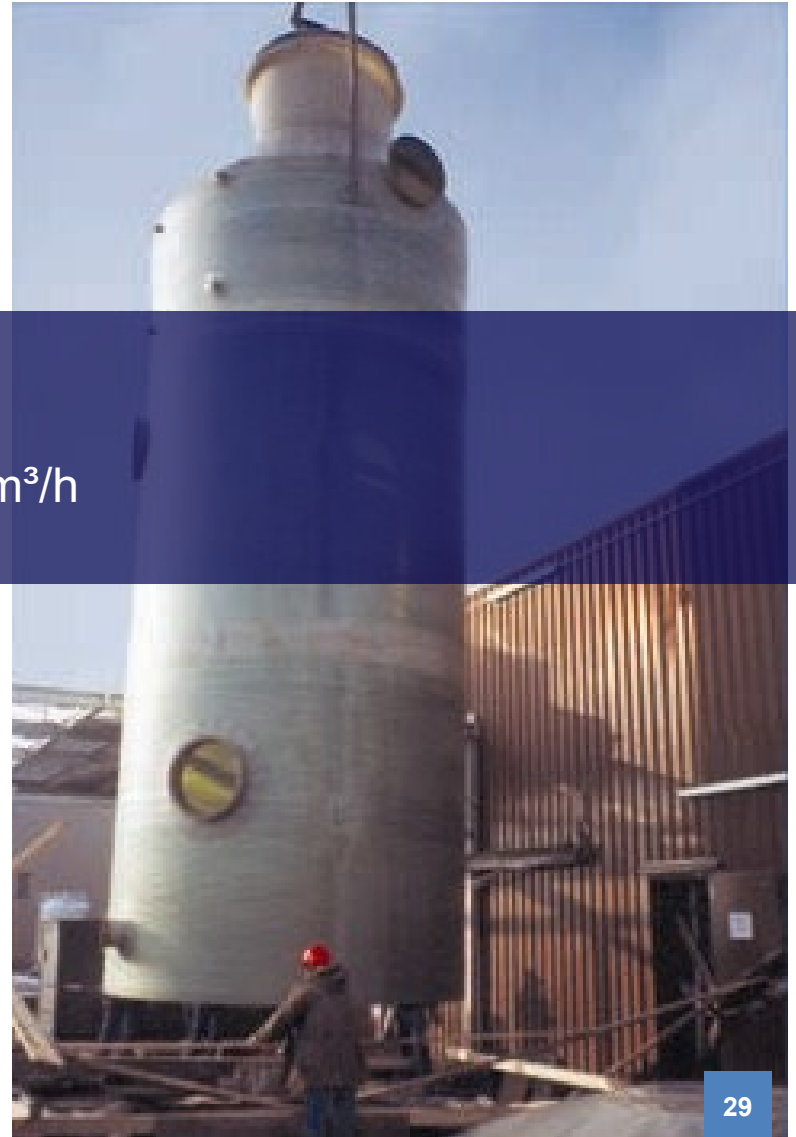




# COUNTER-CURRENT SCRUBBER

## Counter-current Scrubber

Scrubber housings designed for up to 90.000 m<sup>3</sup>/h





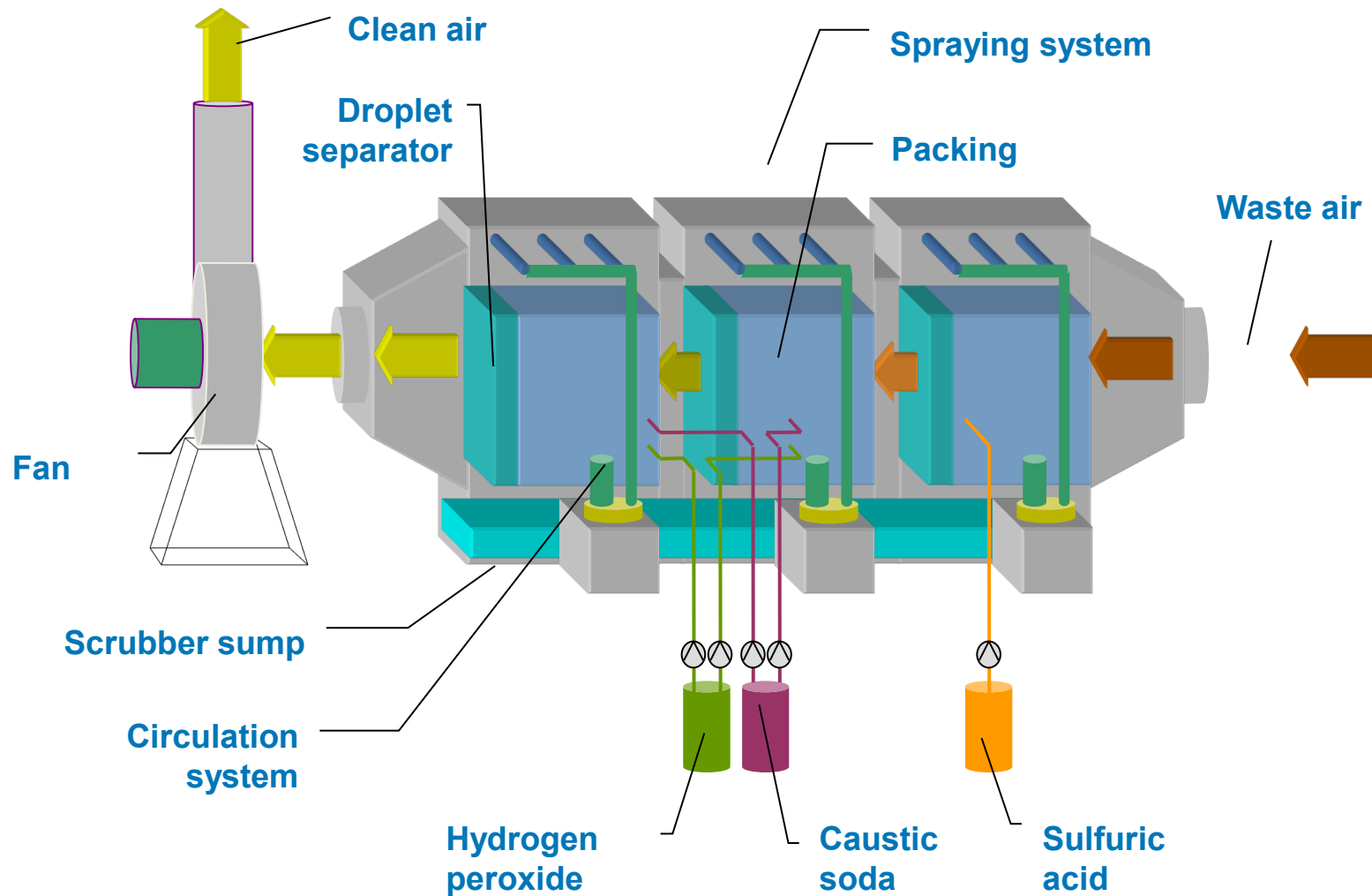


# COUNTER-CURRENT SCRUBBER





## 3-STAGE CROSS-FLOW SCRUBBER





# CROSS-FLOW SCRUBBER

## 3-stage Cross-flow Scrubber | Germany

40.000 m<sup>3</sup>/h







# CROSS-FLOW SCRUBBER

## 3-stage Cross-flow Scrubber | Germany

Waste air from WWTP (2 x 40.000 m<sup>3</sup>/h)





## CROSS-FLOW SCRUBBER

### 3-stage Cross-flow Scrubber

Waste air from WWTP (80.000 m<sup>3</sup>/h)





# SOLUTIONS

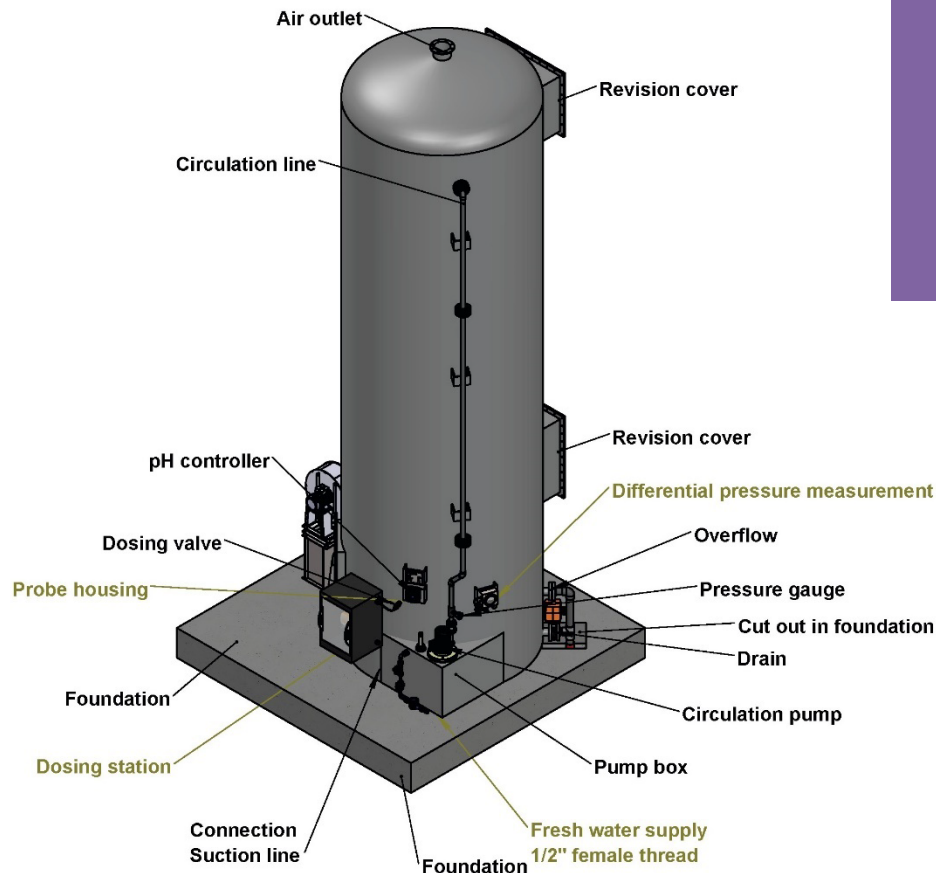
- BIOLOGICAL OXIDATION  
(BIOTRICKLING)





## ADVANTAGES

- Biological treatment
- High efficiency at high concentrations
- No consumables needed
- Automatic operation
- Natural method
- Easy maintenance



## Example for saving of chemicals for removal of H<sub>2</sub>S

- 0 - 200 ppm inlet - average 80 ppm
- pH 1,5 - 2,0 in pump sump
- Saving: ca. 20 m<sup>3</sup> 50 % NaOH / year



## Biotrickling Plant

Removal of  $\text{H}_2\text{S}$  (3.000 ppm)  
at an anaerobic sewage process

1. Biotrickling filter

2. Chemical Scrubber

3. Biofilter



## Biotrickling Filter

3-stage process



1. Biotrickling filter

2. Chemical Scrubber

3. Biofilter





# SOLUTIONS

- ADSORPTION – ACTIVATED CARBON

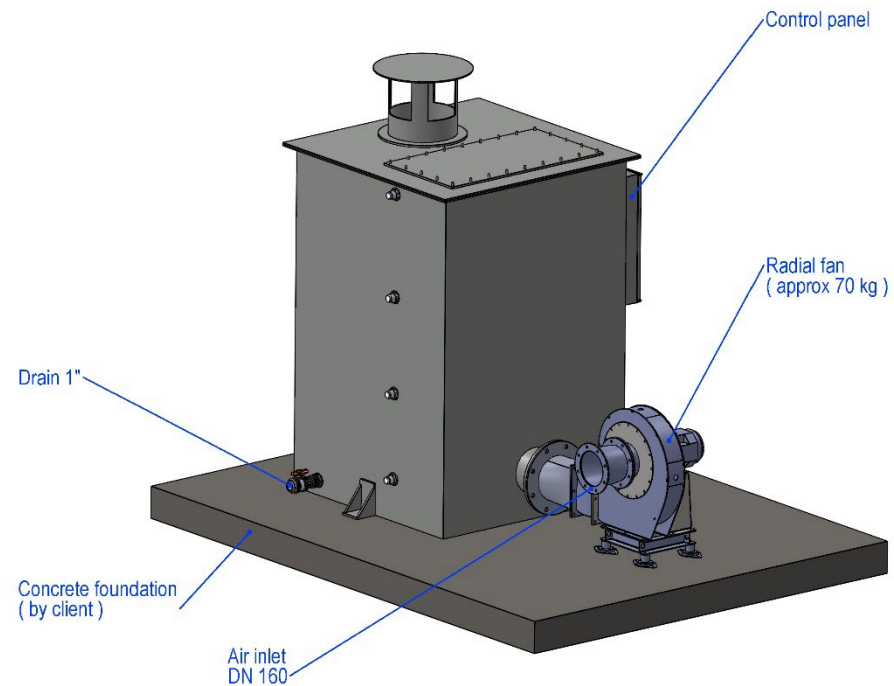
# ADSORPTION – ACTIVATED CARBON

## ADVANTAGES

- Low space demand
- High efficiency at high concentrations
- Automatic operation
- No adaption time
- Easy maintenance
- Mobile air treatment unit

# ADSORPTION – ACTIVATED CARBON

## Container adsorber unit



# ADSORPTION – ACTIVATED CARBON

## Adsorption with activated carbon Container adsorber unit





## ADSORPTION – ACTIVATED CARBON

### Activated Carbon Filter

Polishing carbon filter



# ADSORPTION – ACTIVATED CARBON

## Activated Carbon Filter

Polishing carbon filter



# THOLANDER ABLUFTECHNIK

More than 1,000 references from a wide range of application areas around the globe are testimony to the trust our satisfied customers have in us.



*“Every hour, we can clean more than 5 million m<sup>3</sup> of waste air worldwide”.*

## HELPING THE WORLD BREATHE EASILY AGAIN

