

voigtlaender

efficient clean waters



The next generation
of water treatment technology

Unrivalled efficiency
concerning costs, capacity and ecology
at a global industrial standard

Water, contamination risks and techniques to overcome them

Over the past several years there has been an increase in frequency and variety of bacterial contaminants found in all type of water ranging from drinking water, industrial process water and water used for recreational purposes.

Traditional methods employed to “treat“ water include:

Chlorine: Hazardous, odour, not completely effective

Acid: Expensive, not completely effective, time consuming to apply, surface treatment only

UV-Light: Limited effect on “bio-film“, must be used with another technique.

Ozone: Does not treat bio-film, must be used with other techniques.

Laser: Only effective at point of use. Must be used with other techniques

Heat: Expensive, requires 20 mins at 100c

Product overview

The Voigtlaender Generator

Sterilising – Desinfecting

- Innovative Technology
- Eco Friendly
- No chemical additives
- Reduced Operating Costs
- Future oriented
- Cost effective



AnoFluid: How it works

Combining Salt, water, and electricity

- Salt and water are activated by an electrical current to produce a disinfectant
- The disinfectant (AnoFluid), is a HOCL rich solution
- AnoFluid remains stable for extended periods of time
- HOCL is an extremely effective disinfectant (>100 times more effective than OCl-)
- AnoFluid penetrates the cell membrane by osmosis
- Destroys bacteria and virus from within
- Removes “bio-film” build up (breeding ground for bacteria)
- Always active

Cell Membrane Electrolysis (CME) The Process

AnoFluid

HOCL

(hypochlorous acid ca. 99%)

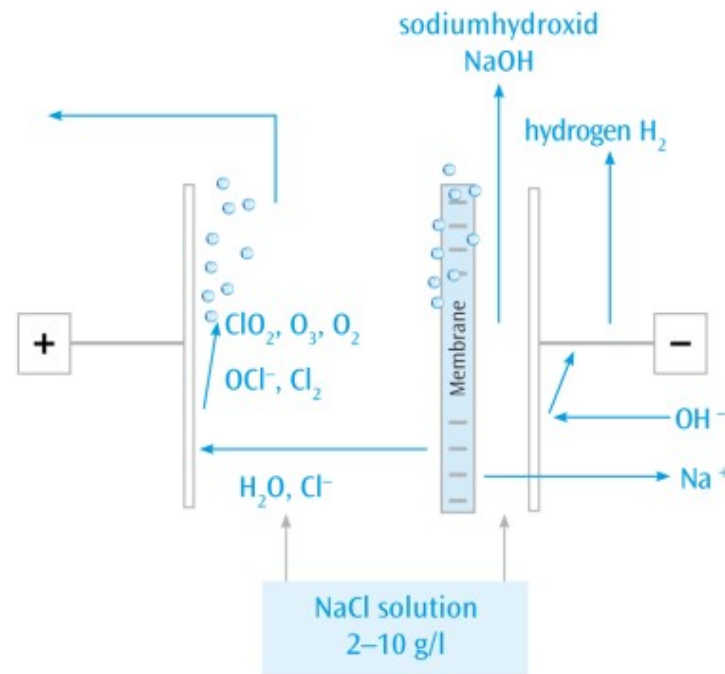
Other components:

Chlor Cl_2

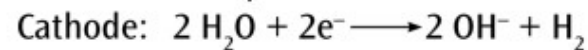
Ozon O_3

Sauerstoff O_2

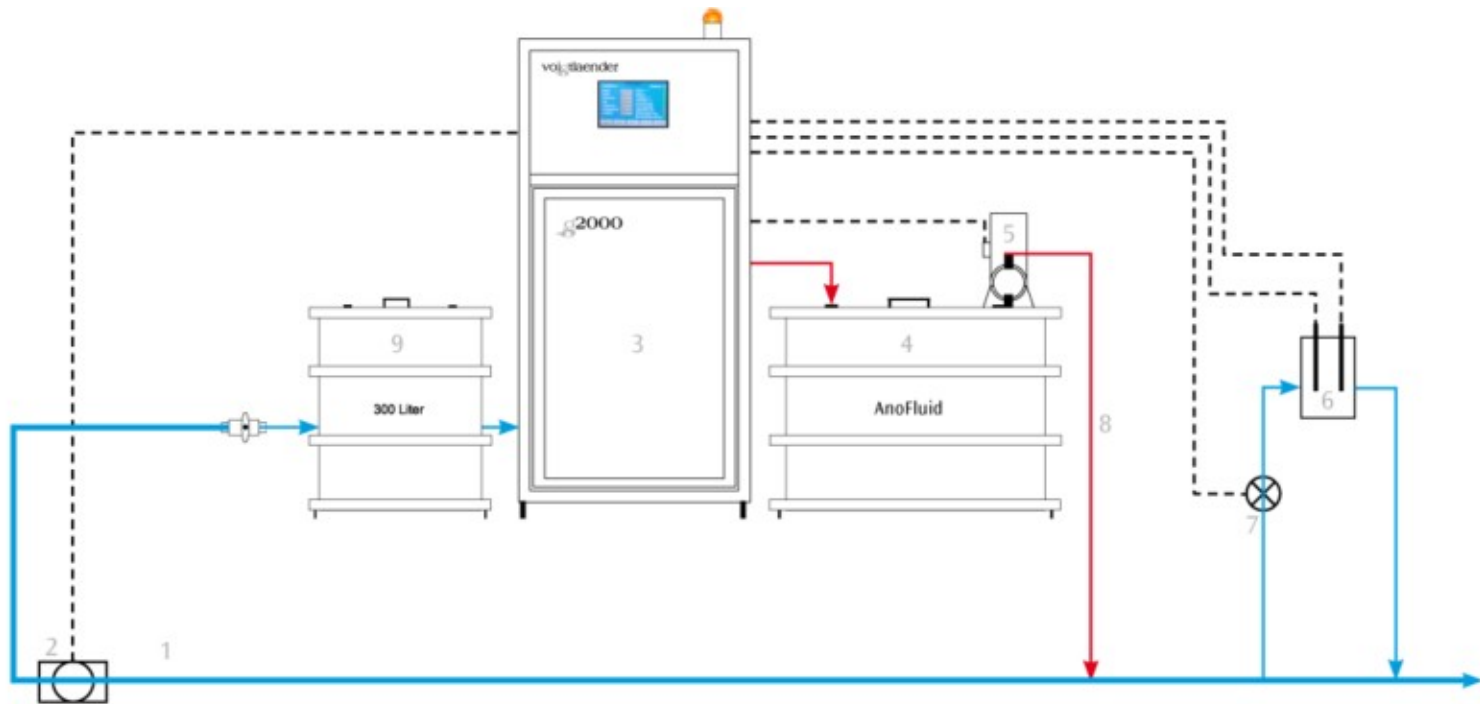
Radicals



Anode: catalytic reaction



The System Construction

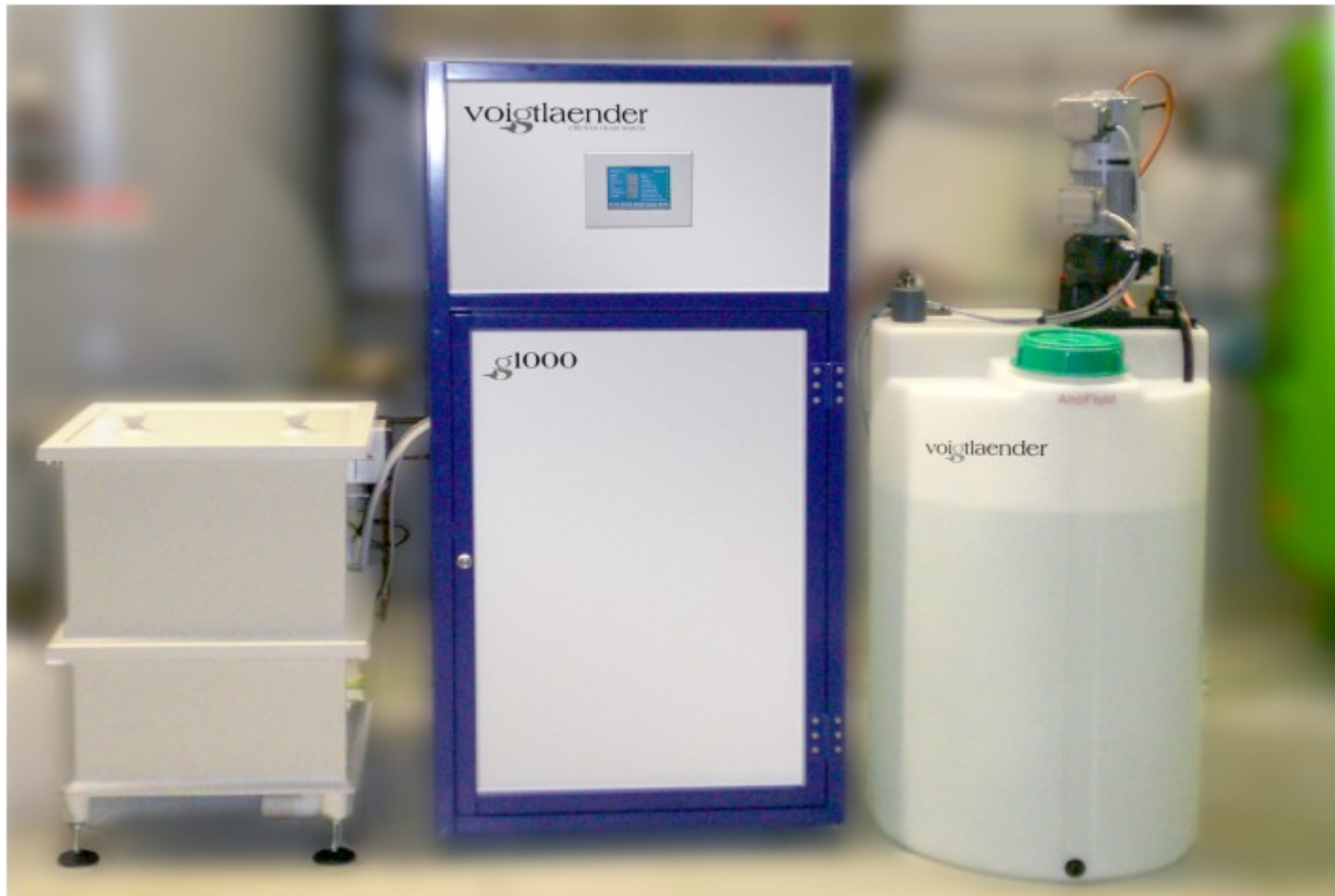


--- = Electrical Connection

- 1 Mains water
- 2 Water Meter FlowX3
- 3 Voigtlaender Generator
- 4 AnoFluid tank
- 5 AnoFluid dosing pump

- 6 Measurement and dosing controller
- 7 Water sampling fixture
- 8 Sampling pump
- 9 AnoFluid dosing line

The System Construction

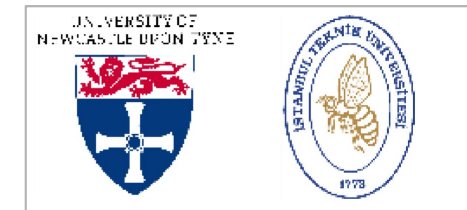


Inline electrolysis

Natural disinfection process

- Natural minerals (salt) in the water is converted via **inline** electrolysis into free chlorine.
- No additional tanks and dosing systems required.
- Applications
 - Circulating water (cooling towers, car washing systems, air washer).
 - Agricultural use (up to 20 cbm / day).
 - Waste water disinfection.
 - Entry level product for potable water (private household).





DIN 1276

DIN 1650

DIN EN 901/ DIN 19643 – Swimming pool Conformance to WHO Standards

CE Conformance

MEBAK Band II 2.10.7

AOX – Test protocol



Agriculture

Disinfection of water

- pig industry
- chicken industry
- disinfection of stables
- internal and external
- treatment of the animals



Industry

Cleaning of waste water

- Disinfecting of drinking water
- Disinfecting of bottles and tins
- Disinfecting of animal carcasses
- Disinfecting of vegetables
- Disinfecting dairy plants
- Disinfecting food production facilities



Human sector

Disinfecting drinking water

- Hospitals
 - railway station
 - airports
- Disinfecting of swimmingpool water
- Disinfection of endoscopes



Application: Fraport AG

Extend “shelf life“ of drinking and process water provided to aircraft visiting Frankfurt Airport.
Disinfecting the tanker and water delivery systems.



The System:

Fraport AG disinfects the water provided to visiting aircraft with AnoFluid produced „on-site“ by the Voigtlaender Generator.

To meet Airline and local health and safety requirements AnoFluid is dosed so as to provide 0,8 – 1,0 mg free Chlorine in the treated water.

Application: Fraport AG

The Benefits:

- Fraport AG save approx 30 Mio. liter fresh and waste water each year.
- Reduced water truck fleet by two (2)
- Disinfection „turn around time“ for each truck reduced from 24 hrs to 15 mins.
- Health and Safety training is no longer required (2,400 man hours per year for Chlorine gas).
- AnoFluid is safe to use and poses no risk when located on the Airport facilities.

In summary: minimized risk to operator, improved quality of service, money savings

Application: Macau Airport

Ensuring quality of water (drinking and facilities) delivered to visiting aircraft at Macau (China)



The System:

CAM (Companie Aeroportu Macau) provide visiting aircraft with “safe“ clean, drinking water by using the Voigtlaender Generator to produce “on-site“ the disinfection fluid (AnoFluid) and treat the water before delivery to the aircraft.

The result:

The microbiological content of the water is reduced to meet the stringent health and safety standards set down by airlines and drinking water standards.

Application: Air Washer Tissue Production

To disinfect and remove bacteria from the re-circulated water and also remove bio-film build up within the water circuit



The System:

The Voigtlaender system produces AnoFluid (disinfectant) on site. The disinfectant is dosed directly into the cooling system. Redox measurements are used to control dosage. The Redox data is stored in the system and can be accessed when required.

The result:

The water now provided to the Air Washer system conforms to TVO drinking water standards (safe to use).

Reduces the need for maintenance (man hours) as well as reducing consumable costs (no chemicals required).

Application: Salad Washing

To reduce the contaminants present in agricultural water (typically well water exposed to various pollutants associated with farming). Also to extend the ‚Shelf life‘ of the picked produce by reducing the bacterial count after picking.



The System:

All water provided from the main facility is treated with the appropriate volume of AnoFluid to provide the correct washing environment. Picked salad is further treated with AnoFluid to help extend ‚Shelf life‘.

The result:

AnoFluid eliminates bacterial contamination in the washing machines and Water Storage tanks. Salad treated in this way has an extended ‚Shelf life‘ which benefits the consumer.

Application: Open Air Swimming Pool

Replace Chlorine gas as means to disinfect baby pools at one of Germany's largest water parks. Reduce Chlorine content to accepted minimum levels. Reduce THM (carcinogenic by products of Chlorine and uric acid)



The System:

AnoFluid is added directly to the circulating water by means of a dosing pump. All parameters are controlled by an in-line measurement and control system.

The result:

By dosing with AnoFluid the volume of chlorine present in the water is reduced from 0.6mg/l (previously) to 0.1mg/l without impacting the microbiological efficiency as well as meeting the Swimmingpool standards for water quality. The results have been confirmed by the University of Kiel.

Application: Chicken Rearing

Disinfection of drinking water and barn surfaces to reduce mortality and improve food / weight efficiencies.



The System:

AnoFluid produced on-site with the Voigtlaender-System is dosed directly into the water supply fed to the barns as well as the “fogging” systems.

The result:

CFU content in barn water (drinking) reduced to “0”, less antibiotics, less mortality, better food to weight efficiencies

Application: Dairy / Food Processing



The System:

AnoFluid is dosed directly into the mains water pipe. The measurement and control system stores the operating parameters for audit purposes.

The result:

AnoFluid guarantees that water treated conforms to TVO (National) drinking water standards reduces maintenance and annual disinfection bill.

Application: Continuous sterilisers

One of the largest producer of canned food in Germany plans to replace the existing cooling water disinfection of the continuous sterilisers. The use of chlorine dioxide has resulted into major damages (corrosion) in the stainless steel piping infrastructure.



Solution:

The mains water in the production facility is disinfected by dosing AnoFluid® resulting in a concentration of free chlorine of approx 0,6 ppm. The concentration of free chlorine in the 3 sterilisers is controlled by a decentralized control hub, on demand AnoFluid® will be added to maintain the correct chlorine level. AnoFluid® is produced centrally and distributed to the sterilisers. All relevant operational data are logged locally and forwarded automatically to the central production control and quality control systems.

Results:

Complete automation of cooling water disinfection with minimal use of a on-site produced disinfectant. Compliant with highest safety standards. No corrosion in piping infrastructure.

Application : Dairy / Food Processing

Empirical vidence: effect of AnoFluid after a four week period. (Bacterial count reduced to almost “0“)

Measurement points			Date tested	Total count 22°C CFU/ml	Total count 36°C CFU/ml	Pseudomonas(ml)
Technikum gegenüber Treppenhaus	04B08		23.04.2007	53	77	>100
Technikum gegenüber Treppenhaus	04B08		21.05.2007	1	0	0
Butterei/Schreibtisch Buttermeier	07B03		30.04.2007	>300	>300	0
Butterei/Schreibtisch Buttermeier	07B03		21.05.2007	0	0	0
Frischprodukte/gegenüber Linie 11	12A10SL		02.05.2007	>300	>300	>100
Frischprodukte/gegenüber Linie 11	12A10SL		22.05.2007	0	3	0
Frischprodukte mitten auf der Bühne	12C02SA		16.04.2007	171	>300	>100
Frischprodukte mitten auf der Bühne	12C02SA		23.04.2007	3	0	0
H-Milch / Säule bei Linie5	14T05		24.04.2007	0	>300	17
H-Milch / Säule bei Linie5	14T05		22.05.2007	0	0	0

Application: Brewery / CIP

Reduce costs (time, chemicals, and water) in the CIP (Cleaning in Place) process



The System:

AnoFluid (produced on-site) is dosed directly into the disinfection tank.

The brewery approved measurement and control system monitors the key operating parameters to ensure

water is at the correct quality. Information on system performance is stored for audit purposes.

The result:

Cost savings (time to clean, reducing cleaning steps in process and water used).

Measured Results in “Rinse water“ (CIP)

Laboratory based analysis

Dose rates	conductivity	pH-Value	Chloride content	Free chlorine
0,5%ig	0,7	7,58	Not measurable	0,03mg/l
1%ig	0,74	7,56	298mg/l	0,14mg/l
3%ig	0,86	7,57	315mg/l	0,41mg/l
5%ig	0,99	7,4	475mg/l	0,98mg/l

Microbiological results / Chemical analysis

ZKG 14	1%	AnoFluid (no further rinsing required)	Nothing present
ZKG 9	1%	AnoFluid (no further rinsing required)	Acid bacteria.
ZKG 8	3%	AnoFluid (no Further rinsing required)	Yeast
ZKG 10	3%	AnoFluid (no further rinsing required)	Acid bacteria
ZKG 15	3%	AnoFluid (no further rinsing required)	Nothing present
RZT 3	5%	AnoFluid (no further rinsing required)	Nothing present

The “positive“ finding are due to external influences not related to the use of AnoFluid. In 24 minutes AnoFluid Rinses , neutralises and disinfects in one step (previously three discrete steps) No further steps are required and the tank is available for use.

Application: “Uni-Klinik Würzburg“:

Disinfection of cold water in cooling water loop and removal of Bio-film from system



The System:

Redox measurement is used to determine the quality of the water in the cooling loop and AnoFluid is added in a controlled manner to ensure that the Redox remains within acceptable operating parameters.

The result:

The water after being treated with the Voigtlaender Generator is clear of all microbiological content. Further this water remains “fresh” and to the highest drinking water standards for up to 72 hours after treatment.

Application: Saarbrücken Airport

Ensure optimum quality of Drinking water to be delivered to visiting aircraft as well as ensuring That water delivery trucks and equipment meet regulatory Health and Safety standards disinfection



The System:

The Airport Authority employs the Voigtlaender System to disinfect and maintain a high quality of disinfection within the water to be delivered onto visiting aircraft. This is achieved by adding Voigtlaender Generator produced AnoFluid to the mains water.

The result:

The water after being treated with the Voigtlaender Generator is clear of all microbiological content. Further this water remains “fresh” and to the highest drinking water standards for up to 72 hours after treatment.

Application: Drinking water disinfection

Drinking water disinfection within a flat according to Passivhaus standards (low energy profile)



The system:

Temperature reduction in the warmwater cycle from 65° C to 45°C saves up to 30% of energy costs and complies to Passivhaus standard. Low water temperature induces high risk of contamination especially with legionella. A VL solution maintains a healthy water quality by constant dosing of AnoFluid into the main water.

The result:

Significant cost saving (ROI within 4 years), excellent water quality, all criteria of German Trinkwasserverordnung (potable water regulation) are met.

Application: Drinking water disinfection

A company operating several large senior retirement homes is interested into securing the potable water hygiene, several of their facilities are failing potable water regulations on a regular base by violating limits for bacterial contamination. Despite classical countermeasures (thermal disinfection, regular flushing) problems reocce.



The system:

During a months intense testing period in one facility customer operates a Voigtlaender system for drinking water disinfection. Water probes are examined on a regular base.

The result:

All relevant parameters of potable water regulations (Trinkwasserverordnung) are met especially with respect to the microbiological limits. No health risk for consumers. Because of the excellent results the customers extend to use of Voigtlaender solutions to another 10 locations. Reduction of warm water temperature contributes significantly to the overall reduction of energy costs.

References (except)

Fraport AG,	Frankfurt International Airport	Drinking water for aircraft
C.A.M.,	International Airport	Fresh Potable water for airplanes
Saarbrücken Airport	Regional Airport	Drinking water for aircraft
Mecklenburger Ernte	Salad Producer	Salad washing
Weihenstephan	Dairy	Micro-biological control fresh water
Tnuva Dairies	Cottage Cheese and Yoghurt	C.I.P. with AnoFluid
Gazit Chicken farm	chicken rearing	Drinking water treatment
Millouff Chicken Farms	chicken rearing	Drinking water treatment
University of Iraq	Research and development	disinfection applications (potable water)
University Hospital Würzburg	Hospital	Cooling Tower water disinfection
Boecklunder Group	Meat Processing plants	Disinfection of Process water and cleaning
HatchTech B.V.	Supplier of incubation solutions	Disinfection of water for incubators

Sample References:

