



FHS SCANDINAVIA

FOOD HYGIENE SOLUTION.

Your supplier of solutions for decontamination 24/7 while the production runs, without using chemicals.

FHS Scandinavia have 20 years of experience in solutions, our suppliers even longer.

Our suppliers are the leading companies in innovation and knowhow in their technology.

FHS Scandinavia's knowhow, is to combine those technologies and use the best of them all, in order to satisfy and reach our clients goals.



FHS offer decontamination in following areas:



Air



Surfers



CIP



Floor



Packing



Water

Decontamination of all areas, while the production runs, without chemicals.

FHS Scandinavia's goal is to reach same bacteriological level at production end as required before production starts.

FHS Scandinavia offer our solutions on No Cure No Pay basis.



Our Technologies

- UV-C light:
- Ionization:
- decontamination mats and flooring:
- Ozone:

Our solutions are besides being good decontamination solutions:

- Green solutions.
- Longer shelf life.
- Help you lower your production cost.
- Safe and environmentally food production.



Today we focus on how to use Ozone in the Food Industry as a Solution.

John Lindam.

ozonetech.

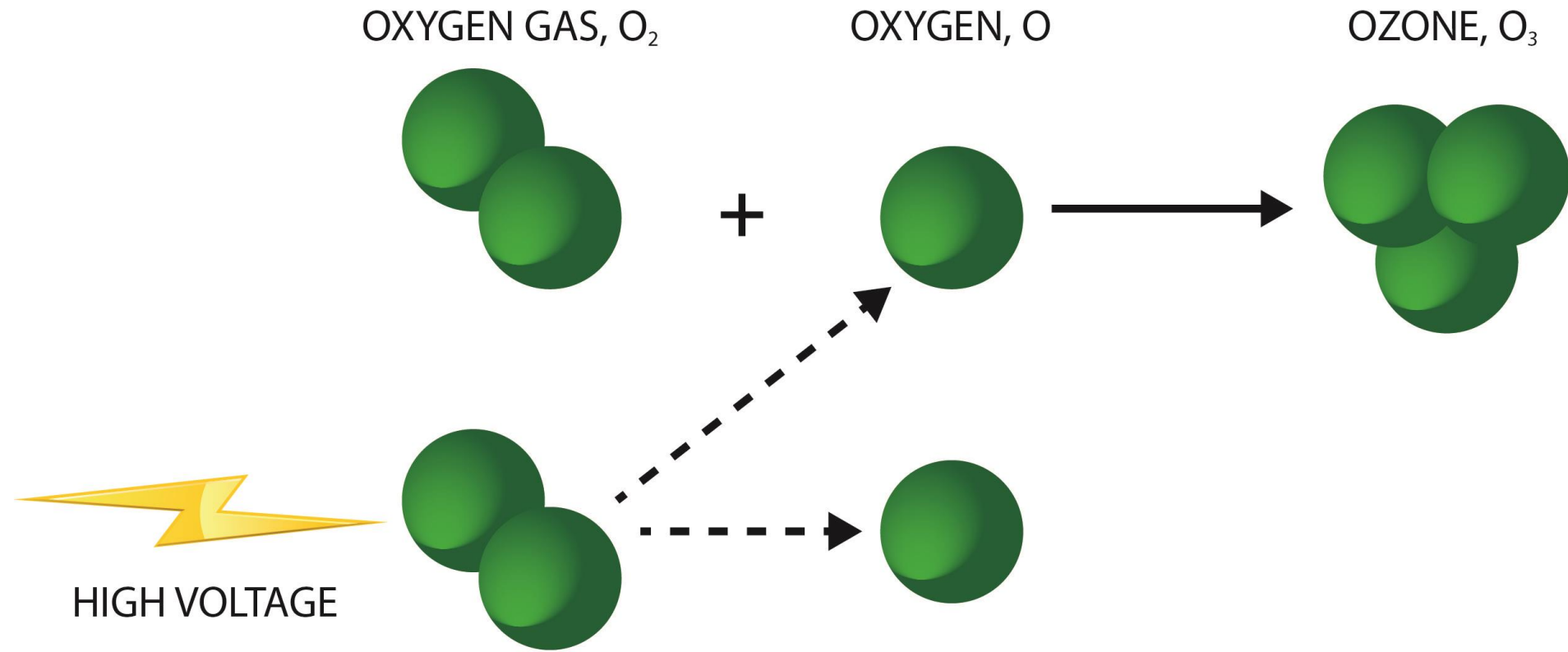
BILLUND | 6 DECEMBER 2018

OZONE SANITATION FOOD & BEVERAGE PLANTS

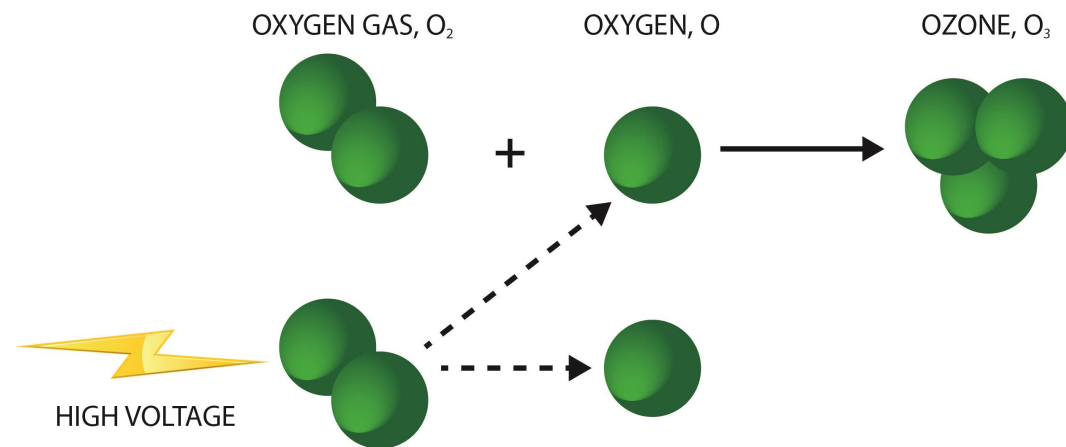
OZONE 101 – THE BASICS



Nature is our inspiration



Corona discharge





Odor & Sanitation



Kitchen Exhaust

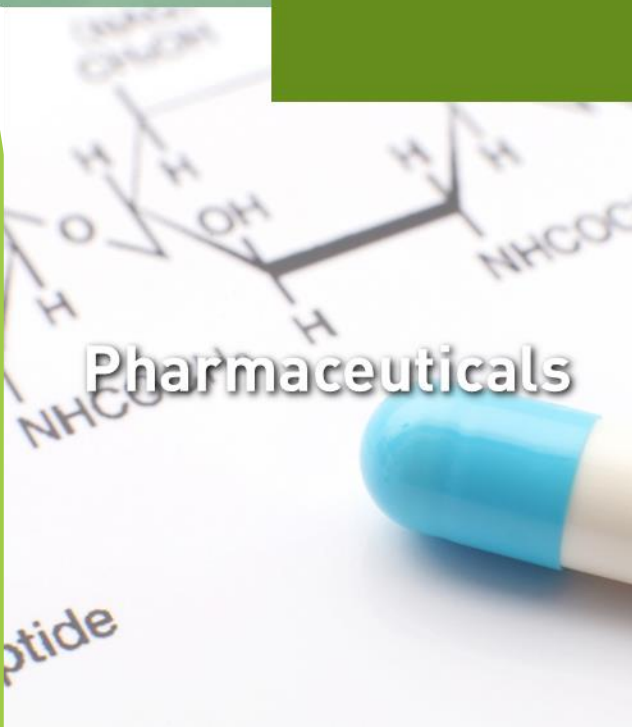


Industrial Air



Disinfection

Application areas



Pharmaceuticals



Food & Hygiene

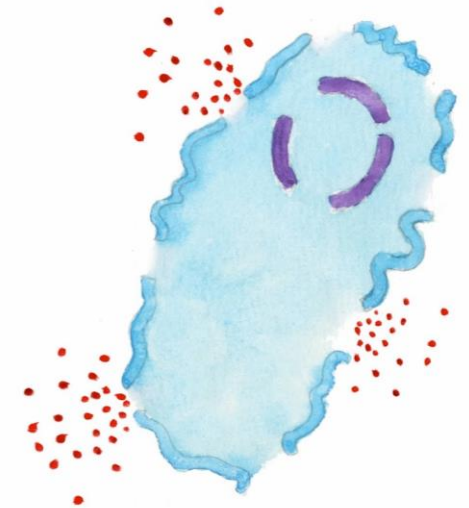
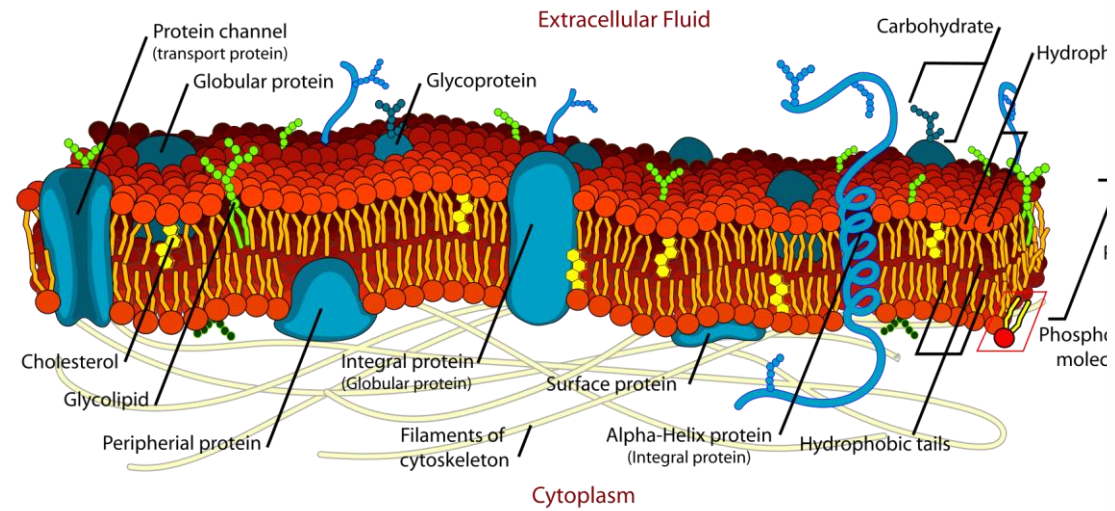
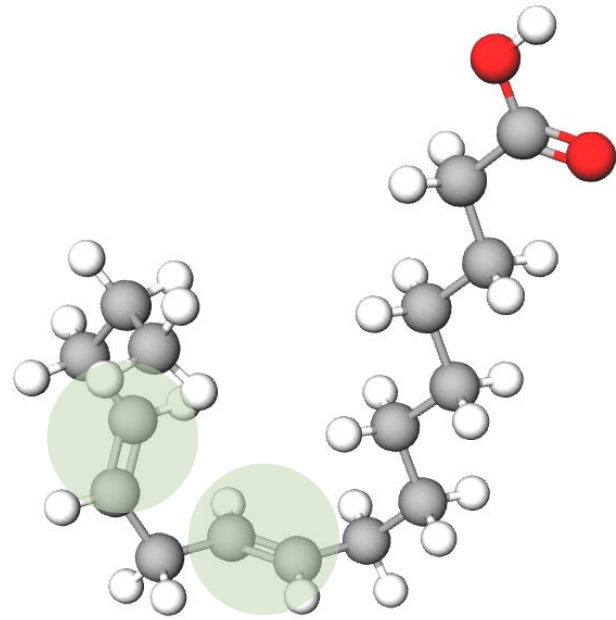


Wastewater



Brewery

Desinfection mechanism



HOW EFFECTIVE IS OZONE?

Concentration (mg/L)



$$CT = C \times T$$



Time (min)

HOW EFFECTIVE IS OZONE?

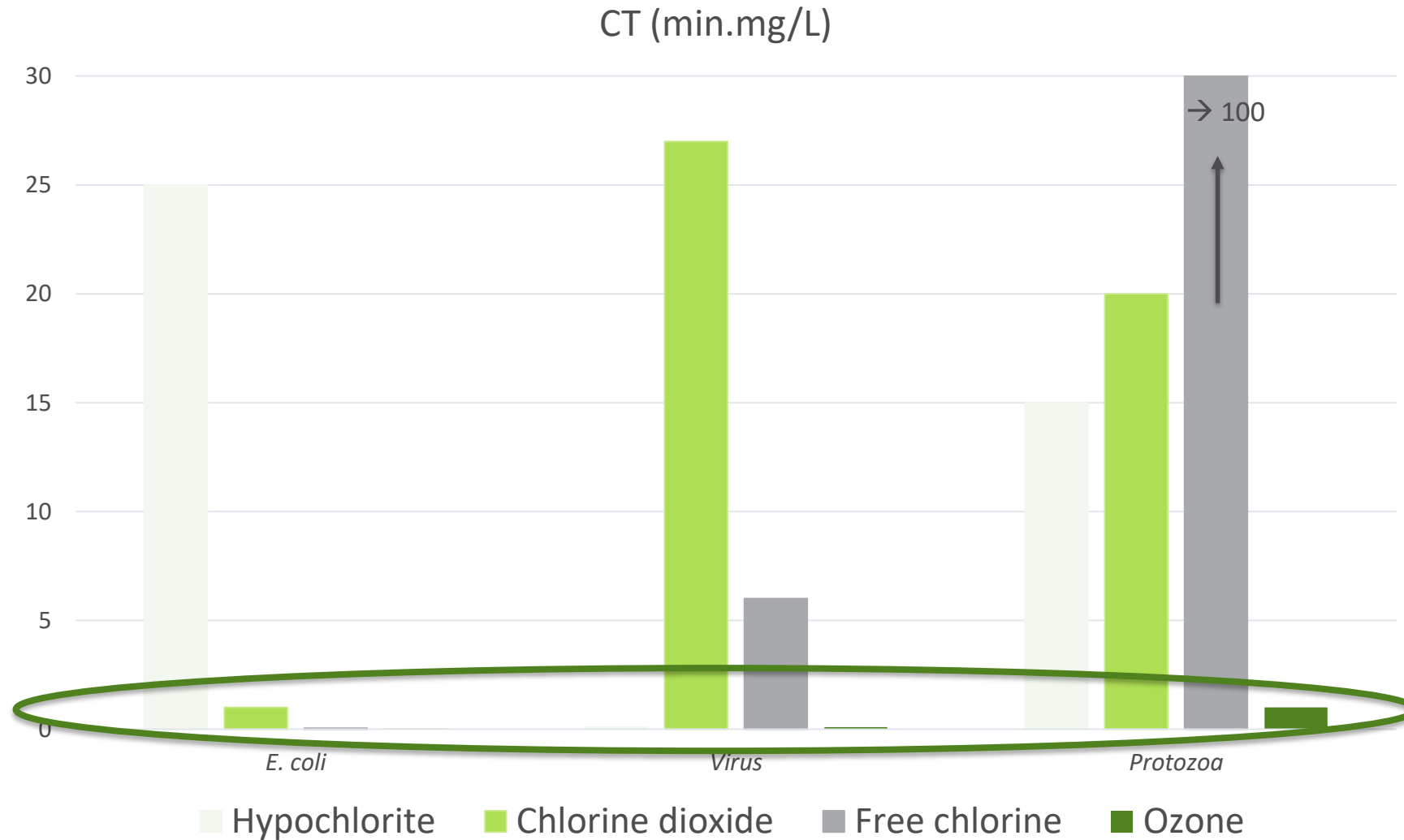
Low CT = effective

$$CT = C \times T$$

Increase T or C

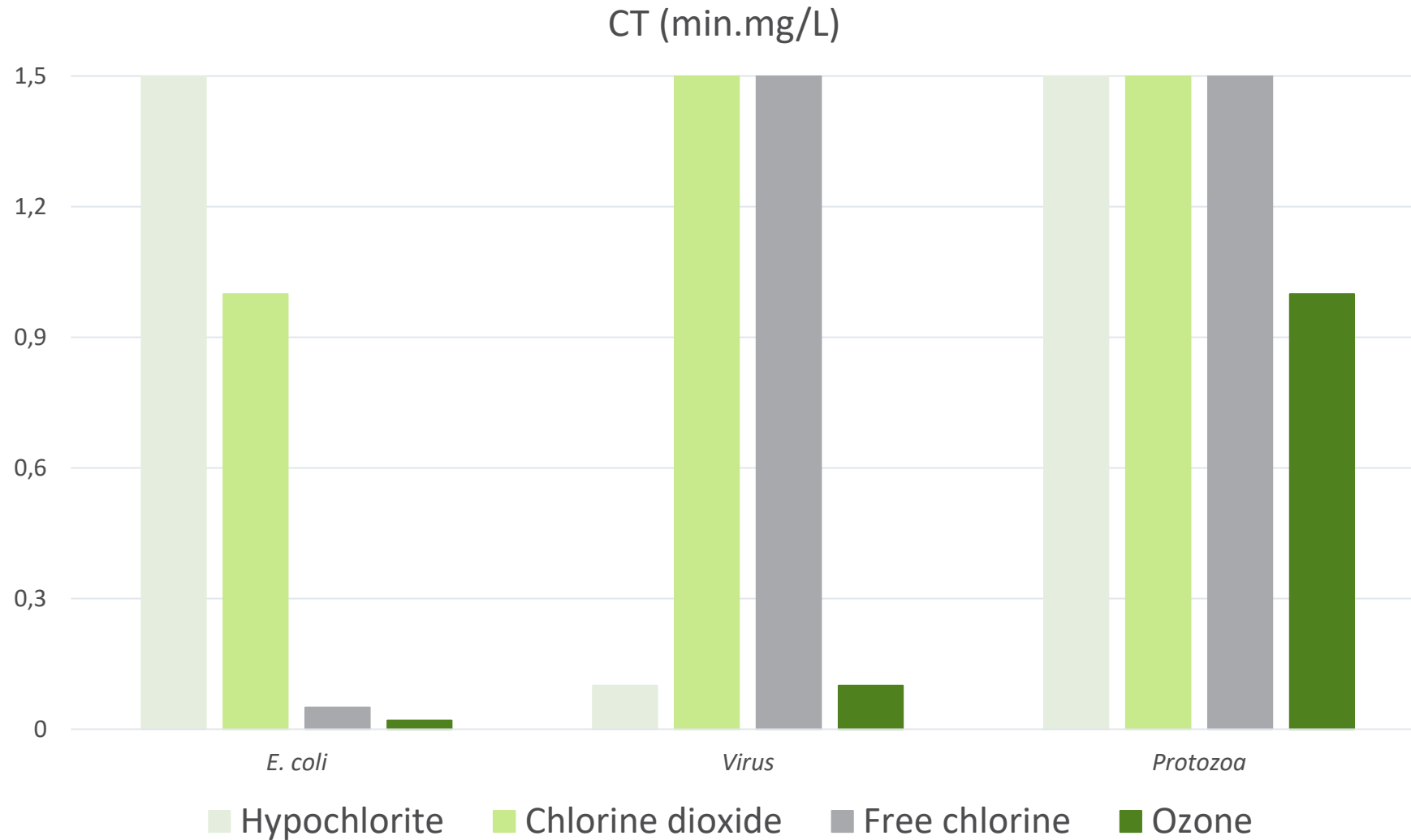
HOW EFFECTIVE IS OZONE?

"The required time and concentration to deactivate a microbe to a certain level"



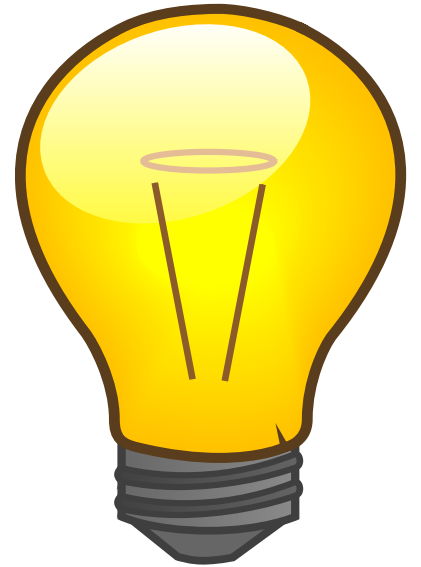
HOW EFFECTIVE IS OZONE?

"The required time and concentration to deactivate a microbe to a certain level"



TAKE AWAY POINTS

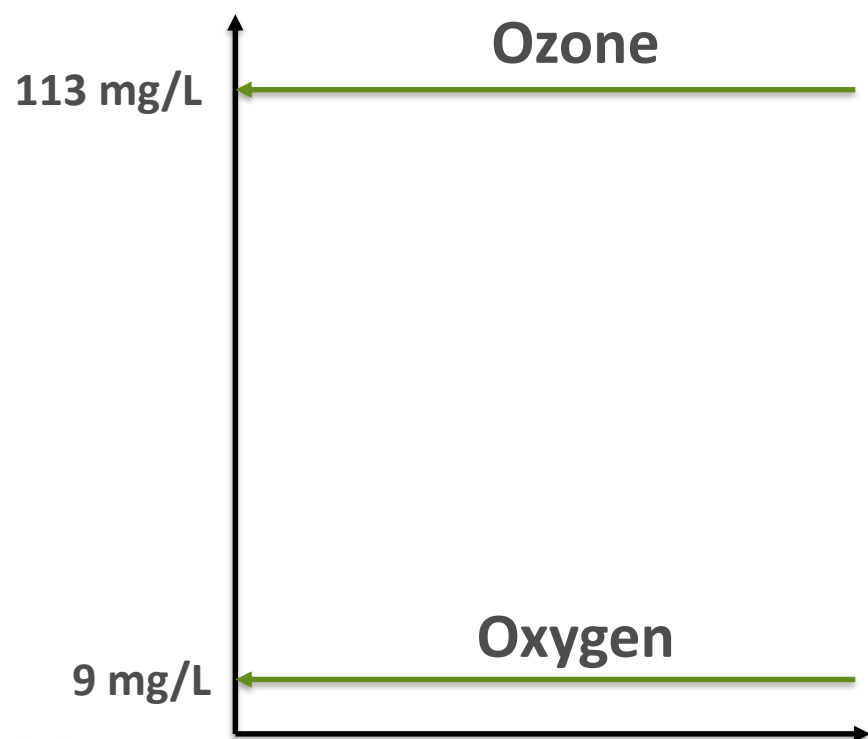
- Broad spectrum disinfectant – no chemical mix required
- The most effective sanitation agent available



HOW TO APPLY IT

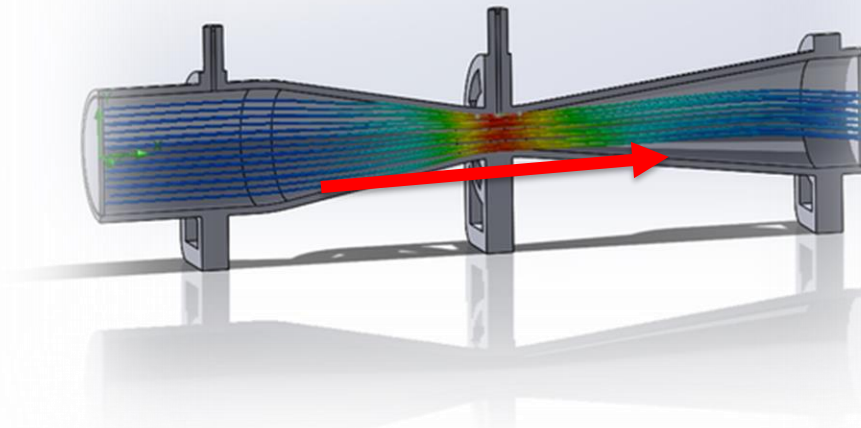


OZONE IS SOLUBLE



OZONE IS SOLUBLE

- Injection of ozone gas
- High transfer efficiency
 - High pressure
 - Turbulent gas-liquid interaction
- Compact

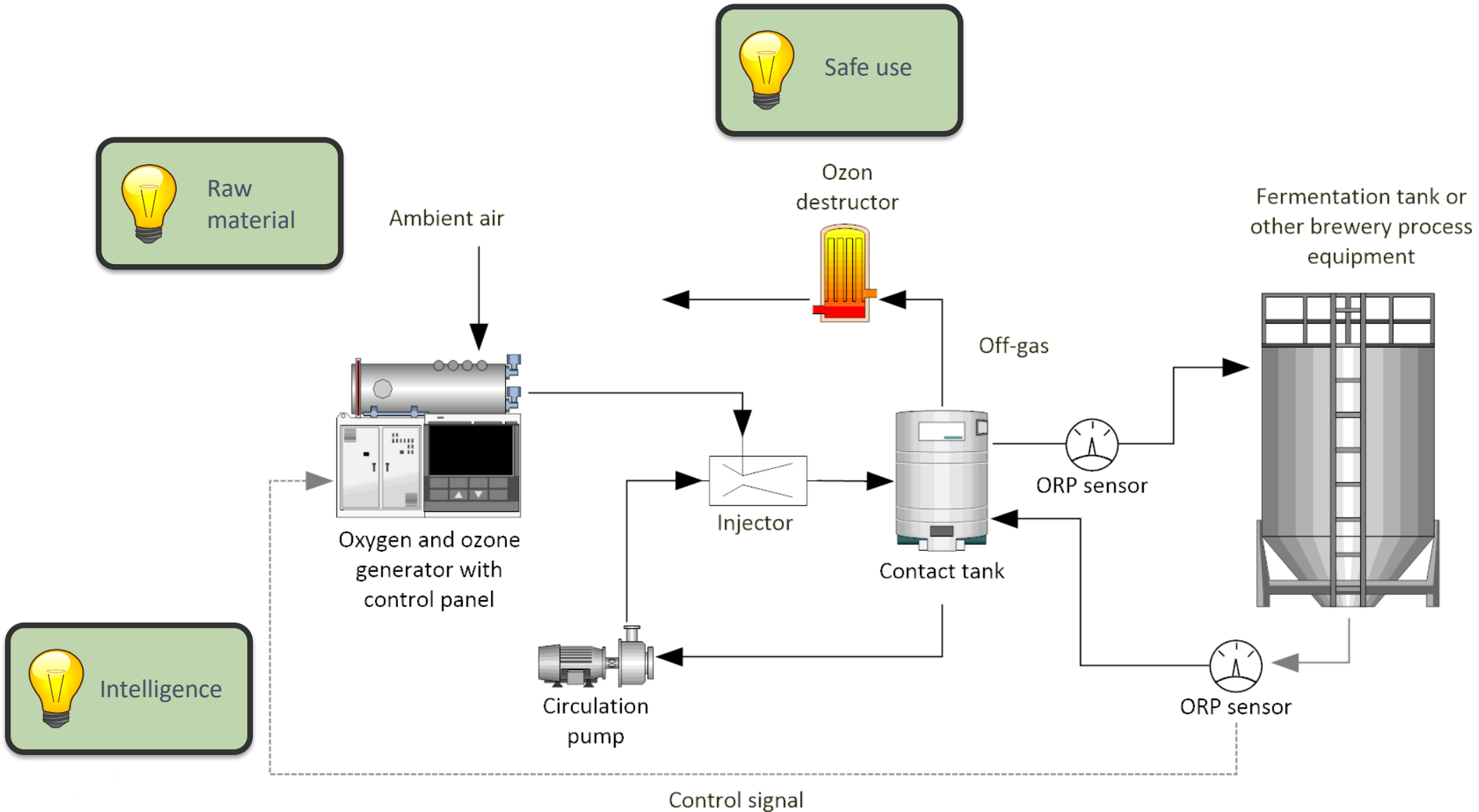


OZONE IS SOLUBLE

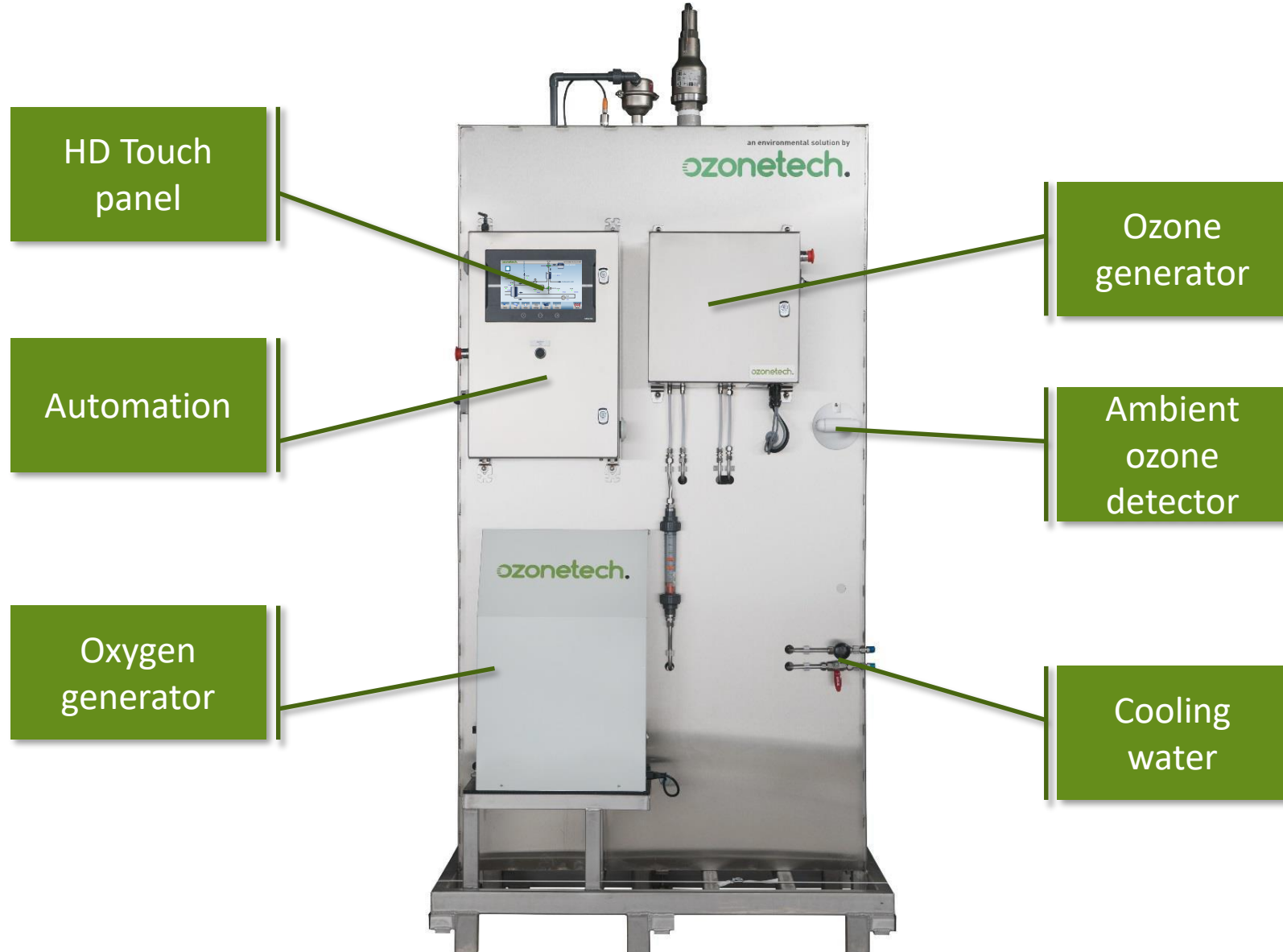
- BOTTLE = OZONE GAS
- SODA STREAMER = OZONE DISSOLUTION
- CARBONATED WATER = OZONATED WATER



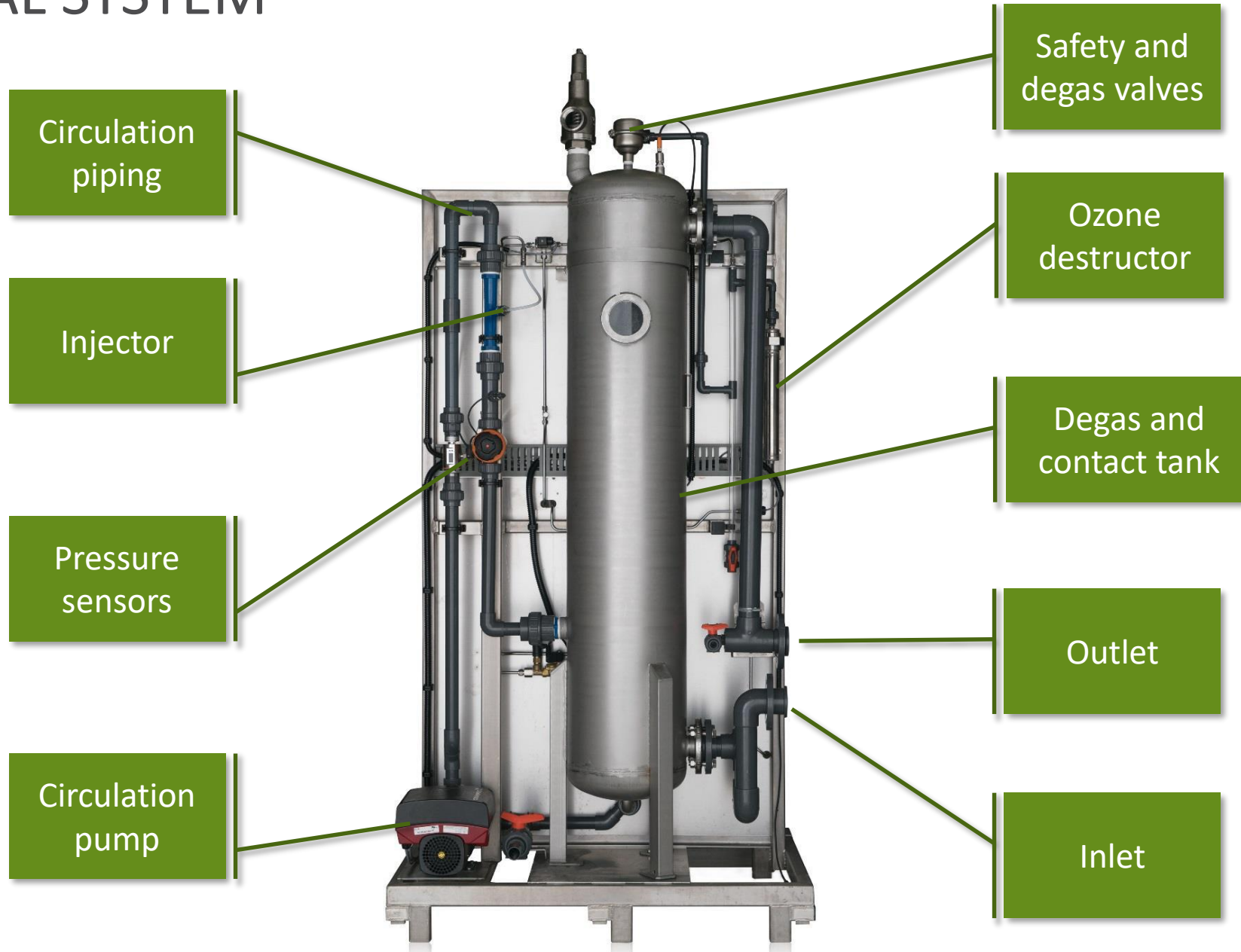
ON-SITE GENERATION



ACTUAL SYSTEM



ACTUAL SYSTEM



VALUE

€30-80



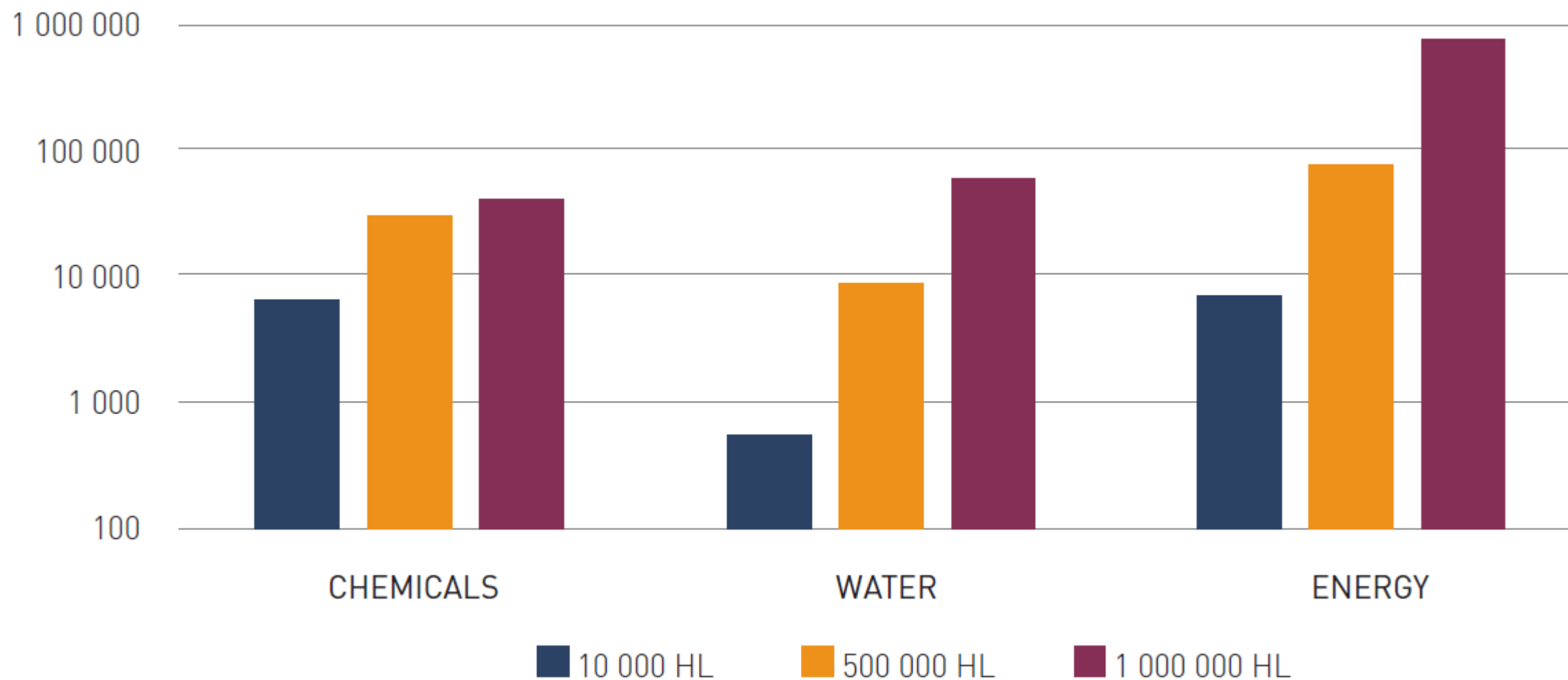
Peracetic acid (PAA) 100-500 ppm

€0.1



Dissolved ozone 1 ppm

VALUE



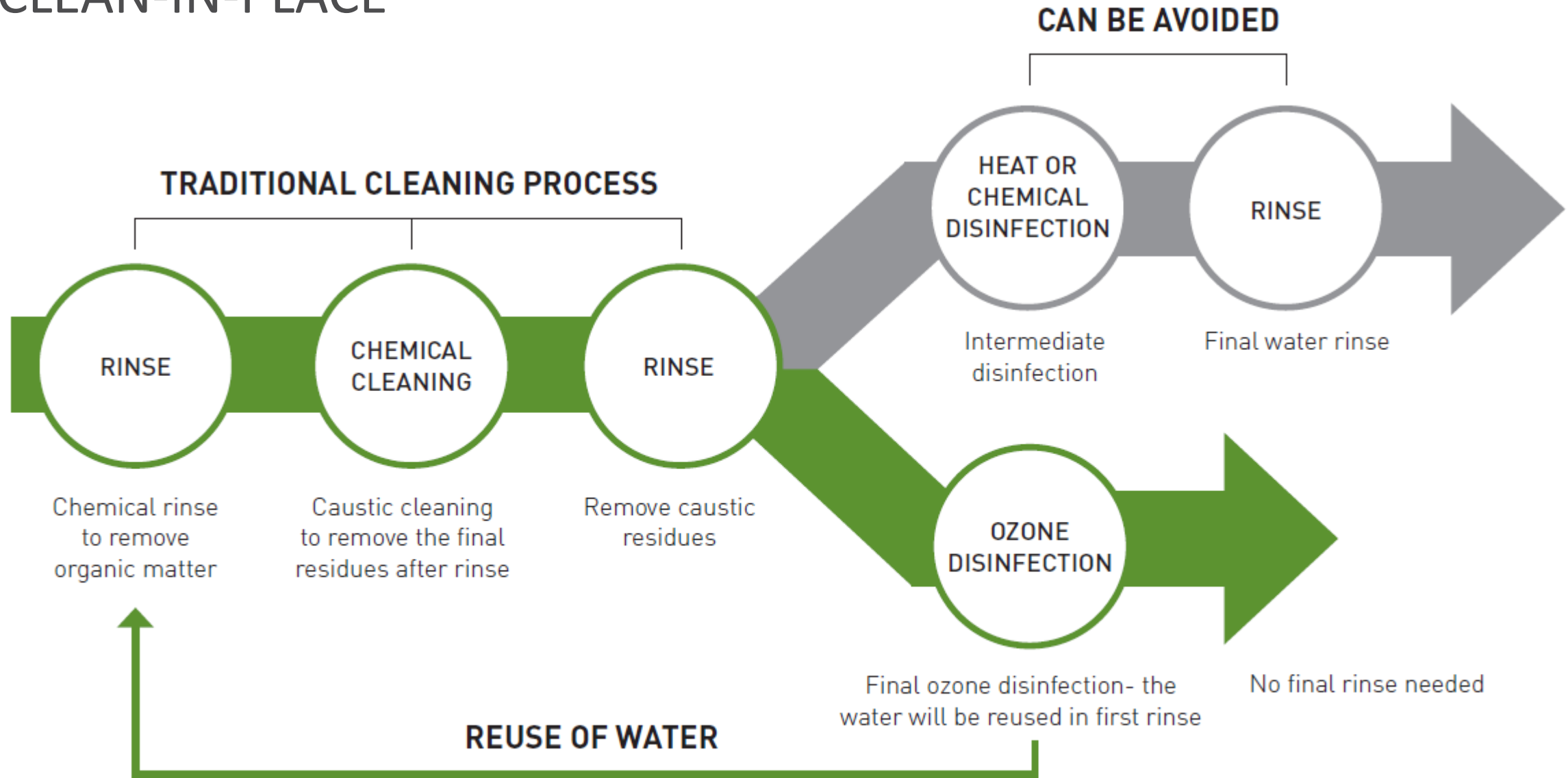
PROCESS EQUIPMENT



CLEAN-IN-PLACE

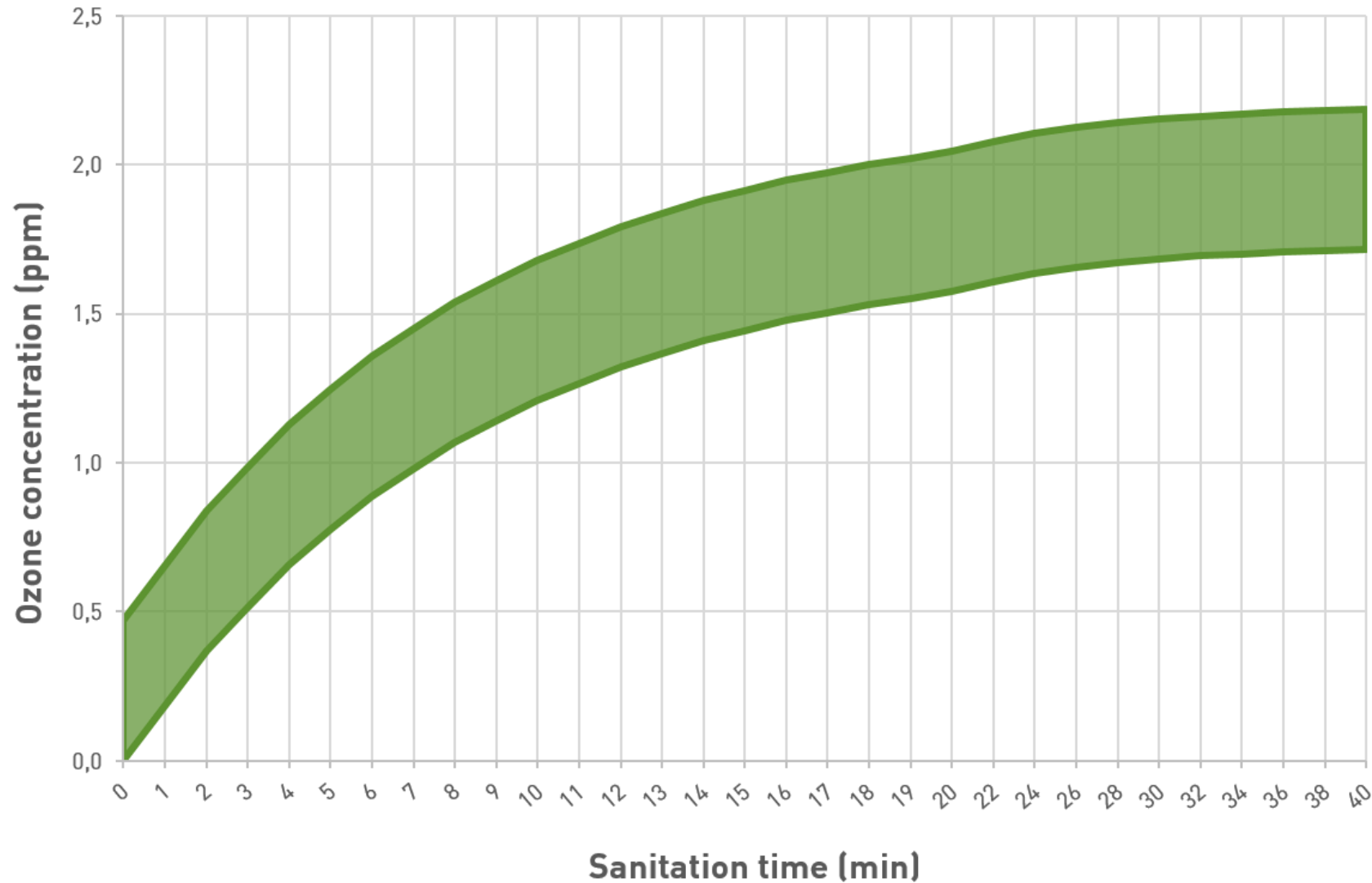


CLEAN-IN-PLACE



CLEAN-IN-PLACE

Ozone concentration at target process equipment

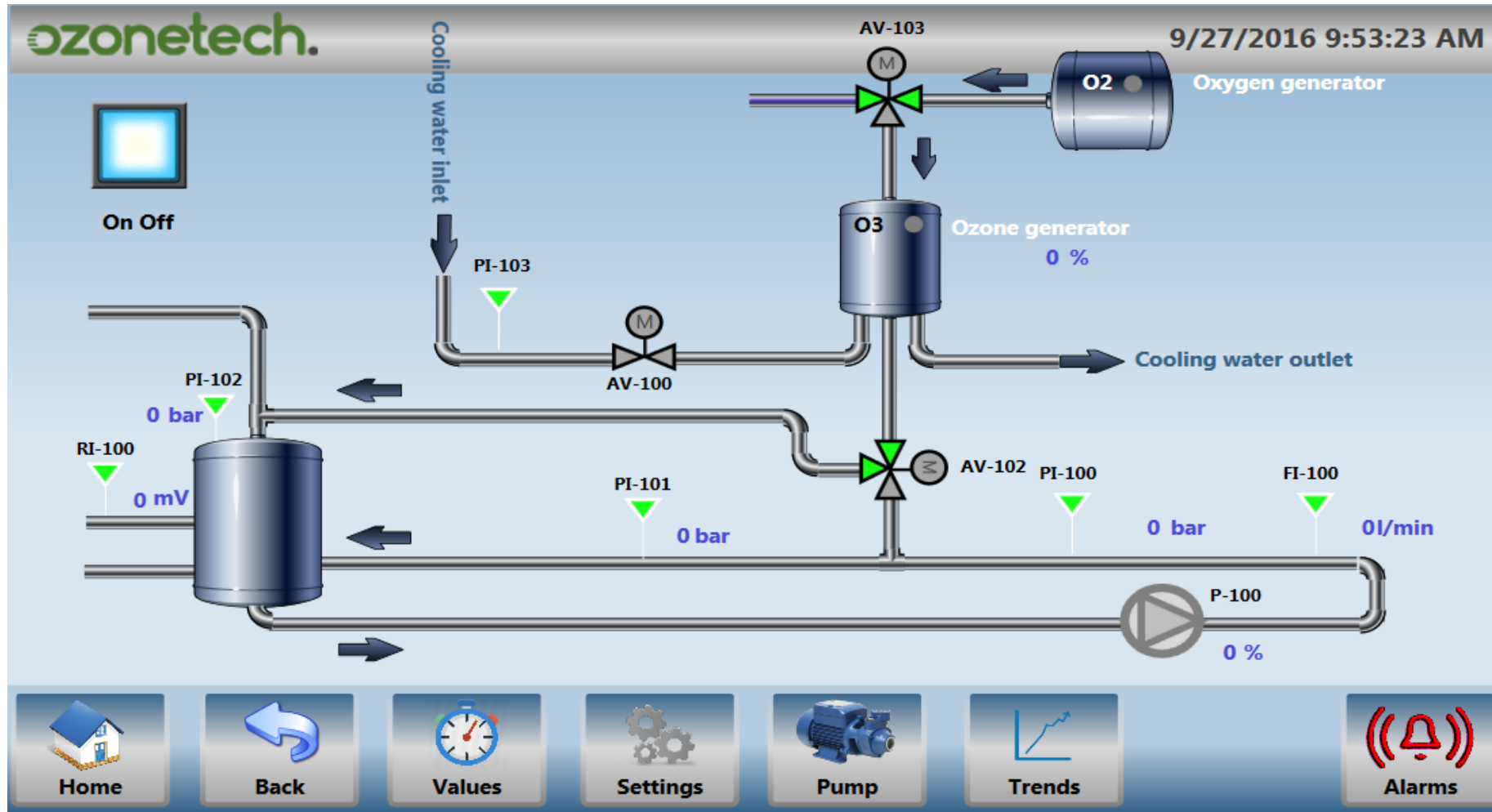


SURFACE RINSING

Water connection



COMPLETE OPERATIONAL CONTROL



BENEFITS

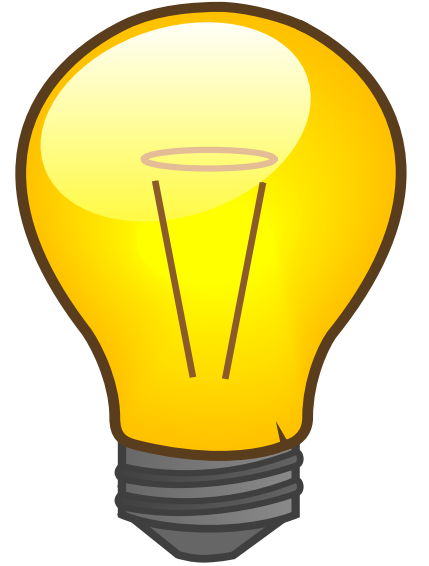
No chemical sanitizer

Substantial energy reduction

20-40 minutes time saving per cycle

No chemical residues – no final rinse

Less chemical handling



SAFETY & ENVIRONMENT



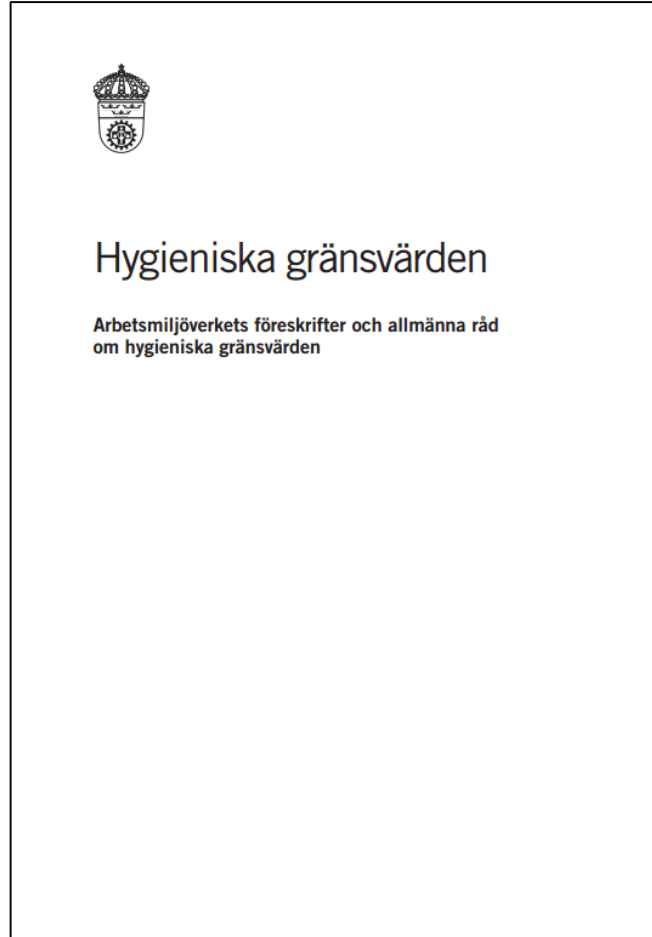
Rules of engagement

- **Lower limit: 0,1 ppm**

Hygienic limit for 8 hours of exposure

- **Maximum limit: 0,3 ppm**

Hygienic limit for 15 minutes of exposure



Ozone system will automatically shut down at lower limit

QUESTIONS?

