Thursday 19th May at 10:30 – 11:00
How to upgrade the hygienic level of an existing filling line
by Mr. Peter Christiansen, CEO
Different Hygiene Levels of Filling Lines

Hygiene requirements

- Product-sensibility

Septic Standard Filling Line
  - Simple Beverages
  - Conventional filling technology
  - Longer shelf life

Sanitary Filling Line
  - Innovative Ingredients

High Sanitary Filling Line
  - Microbiologically sensitive beverages

Ultraclean Filling Line
  - pH < 4.5
  - pH > 4.5

Aseptic Filling Line
  - pH < 4.5
  - pH > 4.5

Increasing of hygiene standard means:

- Reducing of preservatives and costs
- Possibility to produce higher sensitive beverages
- Better market chance, higher profit

Hygiene requirements
Since 2003 we have helped beverage industry to upgrade the hygienic standard for an existing glass-, PET bottle and canning lines with following results:

- reduce preservatives from the product
- reduce production costs
- produce higher sensitive beverages
- reach higher profit
Cases 2003 – 2015
Proven concept obtained by
BIOCID Hygiene Solution provides

- High level of micro-biological product safety
- Active process hygiene 24/7
- Increased production efficiency

Clean Air  Clean Water  Clean Surfaces
OFFLINE vs ONLINE disinfection

Traditional offline disinfection
- Hygiene level varies
- Production downtime
- Uncertainty

BIOCID Hygiene Solution
- Constant hygiene level
- Reduced production downtime
- Increased efficiency

Whilst graphs are imaginary, they illustrate the differences
Typical UVC-doses

Dose (J/m$^2$) = energy/area
Intensity (W/m$^2$) = power/area
Time needed (s) = dose/intensity

<table>
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<tr>
<th>Microbe</th>
<th>J/m$^2$ 90%</th>
<th>J/m$^2$ 99.9%</th>
<th>J/m$^2$ 99.99%</th>
<th>Author</th>
<th>Year</th>
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<td><strong>Yeast</strong></td>
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<td>1964</td>
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<tr>
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<td>1964</td>
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<td>Yeasts (average)</td>
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<td>Jepson (Rev.)</td>
<td>1973</td>
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NEW! BIOCID 16XT UVC module
IP67
Oxygen-Ions

- $O^- \text{ja} O^{--}$, negative oxygen-ions (atoms)
- $O_2^-, O_2^{--}$, negative oxygen-ions (molecules)
- $O_2^+, O_2^{++}$, positive oxygen molecules

- These are called "active oxygen"
  - generated by ion-generators from air oxygen
  - form water molecule clusters
  - remove particles from air
Active Oxygen generator

- Small size generators can be placed almost anywhere
- The system can be automated

Duct (HVAC)

Dielectric discharge tube
BIOCID Patented method

Breaking the microbes DNA-RNA structure with UVC technology, active oxygen and a combination of these.

\[ \text{O}_2 \quad \rightarrow \quad \text{UVC (253,7 nm)} \]
BIOCID AIR 1500 - 432

Patented combination of Filtration – UVC disinfection - Ionisation
Case: CSI 8000 Capper machine
PET line, Saku Ölletehas, Estonia 2015
“With our help Carlsberg could produce microbiologically sensitive beverages resulting in better food safety, reduced water, energy and chemical consumption, 2010”

“All the needed disinfectants are produced on site during production”
**Case**

**Semi-aesthetic installation at the Carlsberg factory in Falkenberg**

- **Superstructure**
  Roofs and cornices for the doors. Prevents contaminated air from entering into the filling machine.

- **Clean-air unit**
  Clean, filtered and particulate free air with added oxygen ions. Injected into the superstructure, generating an overpressure and yielding an active disinfecting effect.

- **Disinfectant water center**
  A generator which produces on site an environmentally friendly cleaning and disinfecting agent. The agent is produced from brine in an electrolysis procedure. Sprayed on critical surfaces during production in progress. The agent is also added to the process water to ensure high water quality.

- **Hand disinfection**
  Hand disinfectant dispensary with required hand disinfection prior to gaining access inside the machine doors.

- **UVC -Light and Activated oxygen**
  Lighting critical surfaces during production in progress using UVC light. This is done with the help of IP68 classified and BRC approved UVC light modules.

- **Foot bath and floor disinfection**
  With disinfectant water. Prevents the entry of dirt via the shoes and via trolley wheels to the filling machine and the area.
Microbiological results before installation, Y/M and CFU pc/m³ of air.

After installation < 1 CFU/m³

“The microbiological results before installation are marked to the left of the star. After BIOCID Hygiene Solution installation the results has been excellent : < 1 CFU/m³”
BIOCID Hygiene Solution
Your guarantee of product quality

Air disinfection with a patented method

Critical Spot Disinfection

Packaging Disinfection with a patented method

Air rinsing and can disinfection before filling with a patented method

BIOCID Air is filtered, disinfected and activated high quality air to improve hygiene

Hygiene Control Unit

Food Safety and Production Efficiency
Hygiene Solution for can seamer with activated oxygen and critical sopot disinfection with UVC light. Same solution can be tailor made for PET and glass bottle corks.
Can seamer with critical spot disinfection during the production
Air rinsing and can disinfection before filling with a combination of activated oxygen and UVC light.
On-site disinfectant production
Desinfectant Water Center

A generator which produces an environmentally friendly cleaning and disinfecting agent hypochlorous acid (HCLO). This is produced from brine in an electrolysis procedure. The system is controlled by a disinfectant water center and the disinfectant is sprayed on critical surfaces during production. The agent is also added to the process water and is used for disinfecting shoes and floors.
UVC light and OCCUPATIONAL SAFETY report will be done.

The effective energy density of ultraviolet radiation directed at the skin must not exceed 30 J/m² in a day, and the effective energy density of ultraviolet radiation directed at the eyes in a day must not exceed 30 J/m² in the wavelength range 180 – 400 nm (DIRECTIVE 2006/25/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2006)

30 J/m² = 3000 µJ/cm²
BIOCID Hygiene Solution – Delivery Process

1. Pre-study
2. Proposal of a hygiene solution
3. Implementation
4. Follow up
Contact

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