

Versuchs- und Lehranstalt für Brauerei in Berlin (VLB) e.V.

Strategies for Microbiological Control and Contamination Risk Mitigation in beer Production

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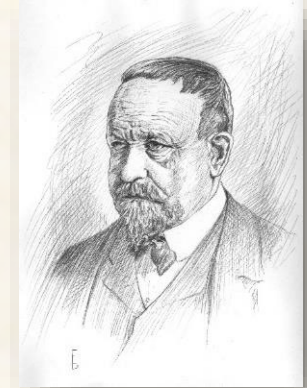
Jan Biering



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Versuchs- und Lehranstalt für Brauerei in Berlin (VLB) e.V.

VLB – Serving the brewing industry for 140 years

- + Founded by the brewing and malting industry in **1883**
- + The VLB is an **independent members' association** with around 370 members (mostly companies)
- + Aim of the registered association is to **promote science and education** in the brewing and beverage industry and in biotechnology
- + Working fields: Training&Education; Research and Consultancy
- + The VLB receives no regular public funding
- + Long-term co-operation with the **Technische Universität Berlin** in the field of brewing science
- + About **135 employees** (from 20 different countries / 48% women)
- + Located in **Berlin**



*VLB co-founder Privy Councillor
Prof. Dr. Max Delbrück
(1850-1919)*



Transport pool of the VLB Hochschulbrauerei around 1930

Overview

Theoretical part:

How to set – up a proper microbiological control

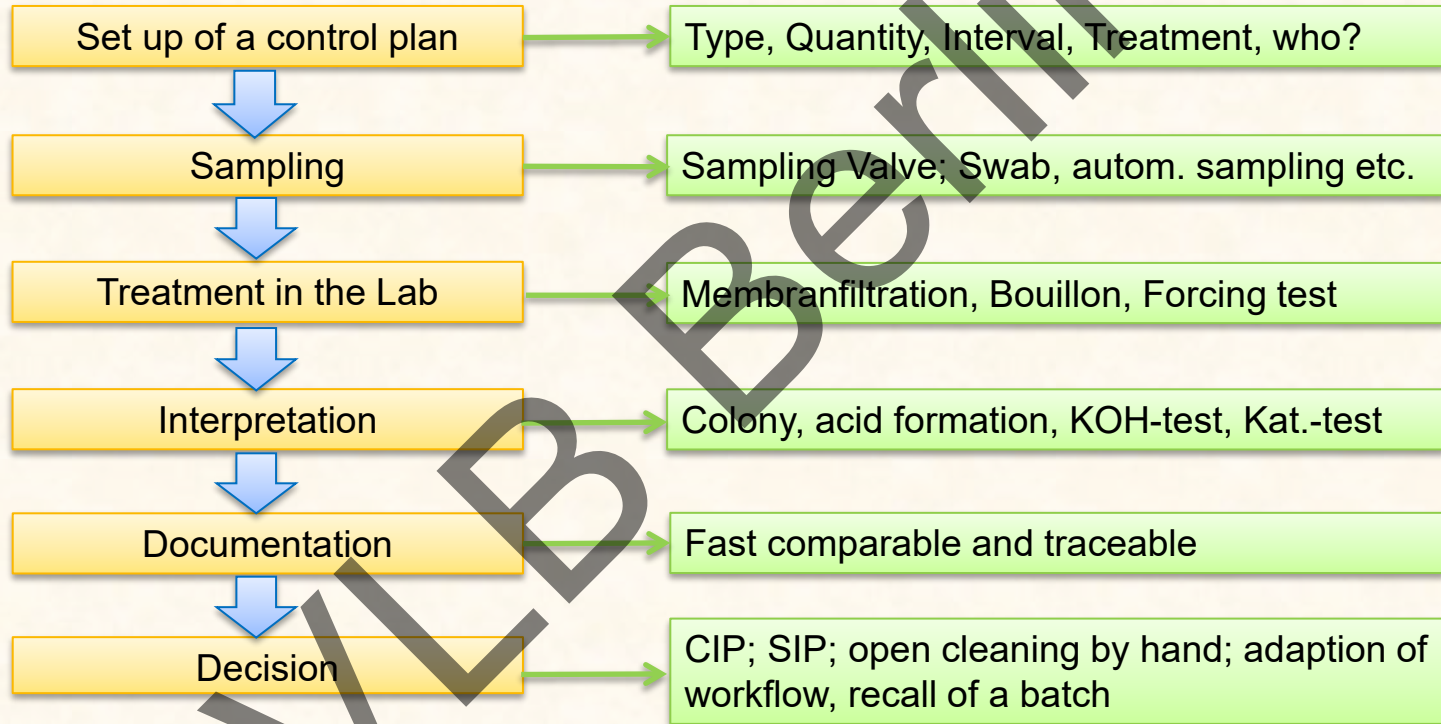
Practical part:

Findings on site



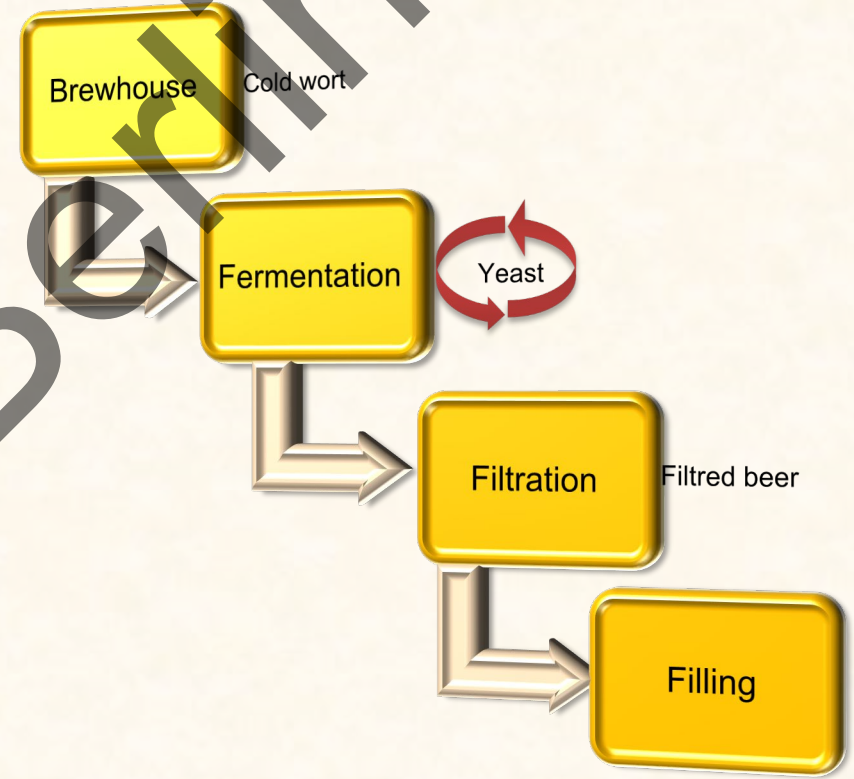
How to implement a microbiological control

General concept in the brewery



Set up of a control plan

- + Important production points
- + Influence on the product
- + Which MO is important
and how to control
- + Needed media and incubation conditions
- + Schedule for the sampling

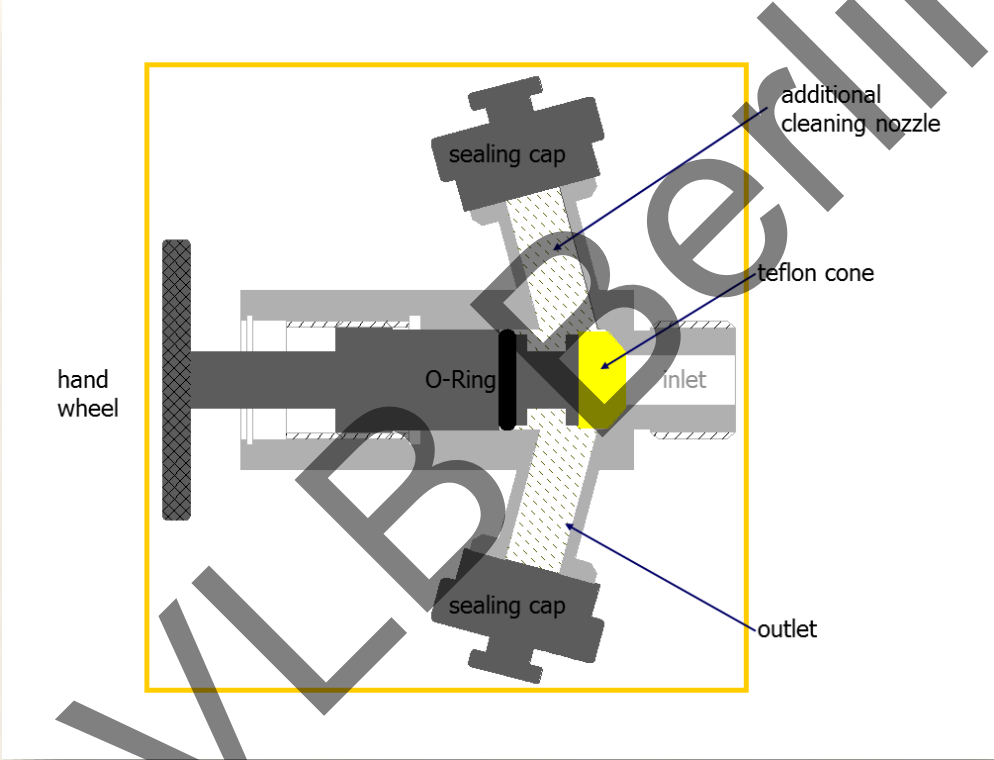


Set up of a control plan

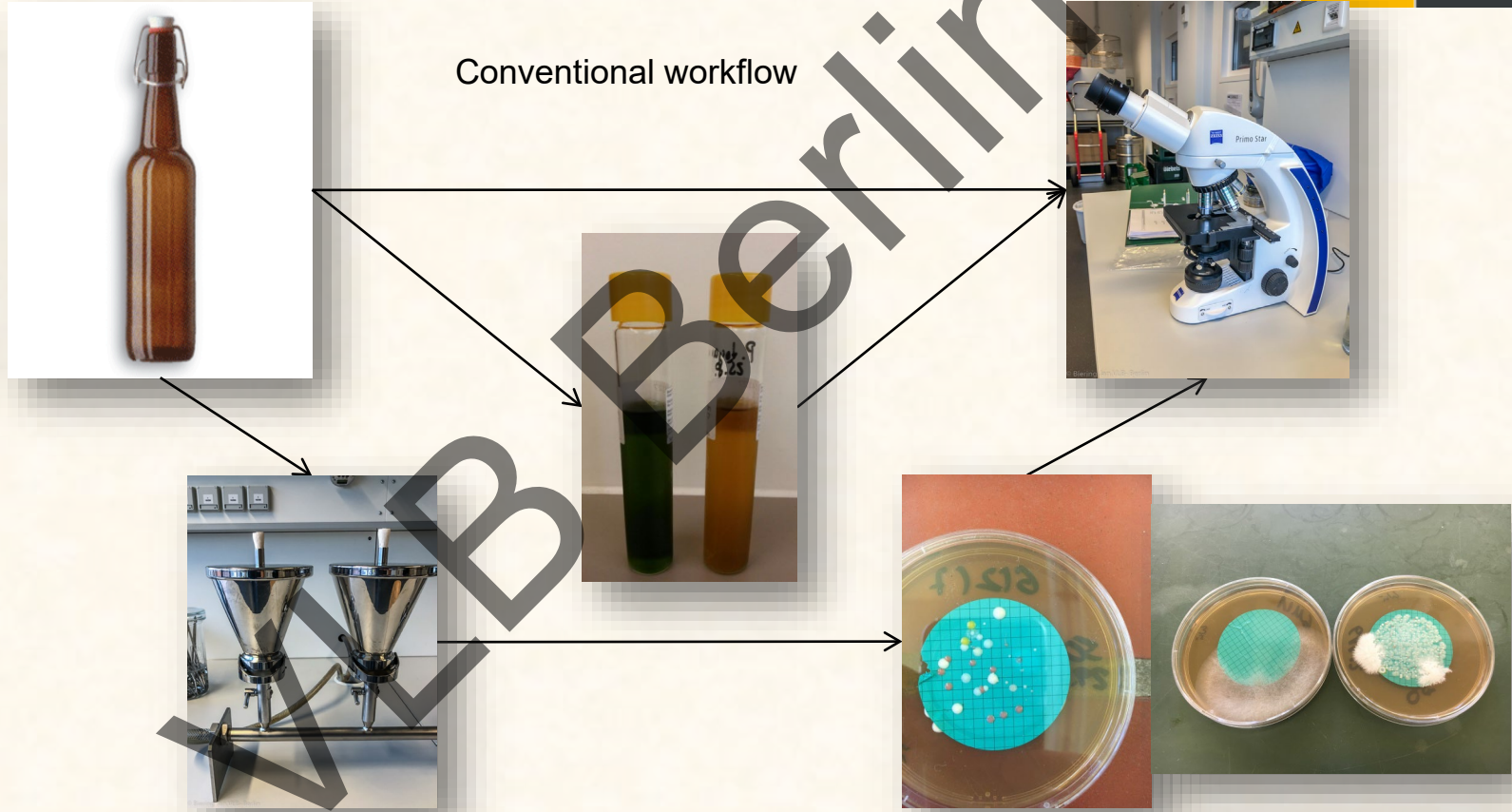


Sampling point	Test	Sample amount	Media	Treatment
Cold Wort	Forcing Test in swing top bottle	200 ml		7 day's at 26-28°C
Green Beer	Membranfiltration	if possible	Lysin Agar	aerob 3 day's at 26-28°C
	Liquid incubation	50-100 ml	VLB S-7 or NBB-Agar	anaerob 7 day's at 26-28°C
Yeast	Liquid incubation	1-2 ml	VLB S-7 or NBB Bouillon	anaerob 7 day's at 26°C
Beer- Filter outlet	Membranfiltration	minimum 100 ml	Wort agar	aerob 3 day's at 26-28°C
	or Forcing Test	up to 500 ml	VLB S-7 or NBB-Agar	anaerob 7 day's at 26-28°C
BBT	Membranfiltration	minimum 100 ml	Wort agar	aerob 3 day's at 26-28°C
	or Forcing Test	up to 500 ml	VLB S-7 or NBB-Agar	anaerob 7 day's at 26-28°C
Filler inlet	Membranfiltration	minimum 100 ml	Wort agar	aerob 3 day's at 26-28°C
	or Forcing Test	up to 500 ml	VLB S-7 or NBB-Agar	anaerob 7 day's at 26-28°C
Filled bottle (Filler outlet)	Membranfiltration	minimum 100 ml	Wort agar	aerob 3 day's at 26-28°C
	or Forcing Test	up to 500 ml	VLB S-7 or NBB-Agar	anaerob 7 day's at 26-28°C

Sampling



Treatment in the Lab



Further Steps

Interpretation

Colony, acid formation, KOH-test, Kat.-test

Documentation

Fast comparable and traceable

Decision

CIP; SIP; open cleaning by hand; adaption of workflow, recall of a batch

If applied in a correct way, microbiological QA is a very powerful tool!

What's necessary / what's important?

- + Good ambient hygiene conditions in the working areas
- + Good hygienic Maintenance of equipment
- + Microbiological control plan
- + Well trained personnel
- + Representative Sample
- + Sterile working conditions in the lab
- + Enrichment and cultivation methods
- + Evaluation and interpretation
- + Documentation of results

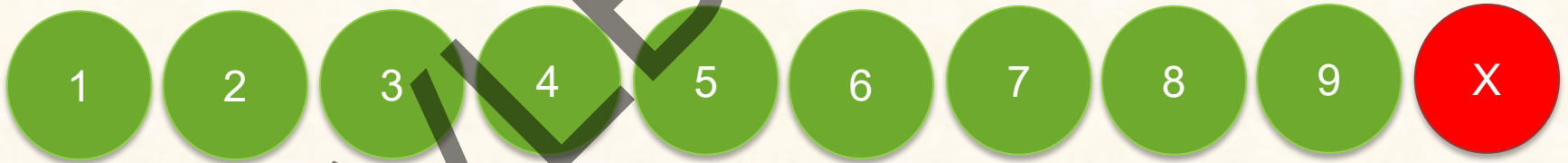
Representative Sample

+ Example 10 CFU/100ml (target for a filter acceptance test is < 5 CFU/100ml)

in 100 ml Sample → 10 Yeast cells

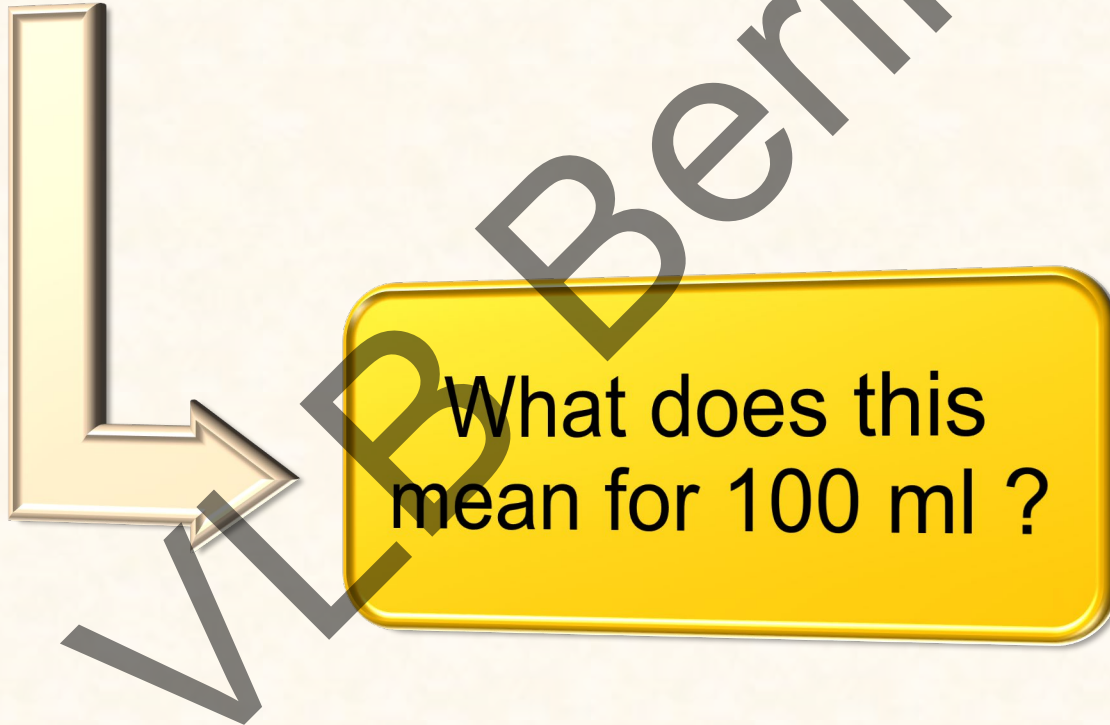
in 10 ml Sample → 1 Yeast cells

in 1 ml Sample → 0.1 Yeast cells



Home work

- + Example: Sample volume 0,2 ml – 1 CFU on the agar plate





Practical part:

welding quality ???



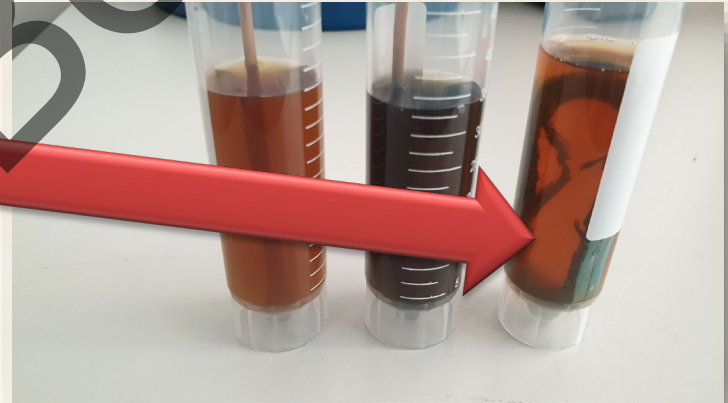
welding quality ???



Yeast Propagation



Gaskets



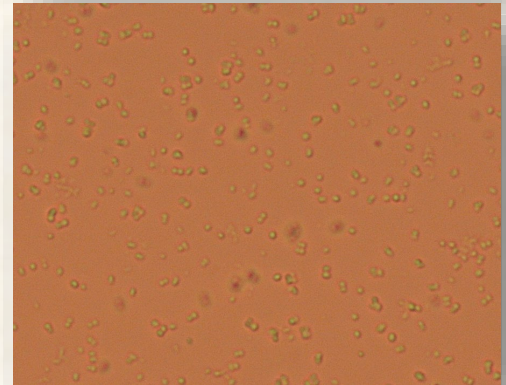
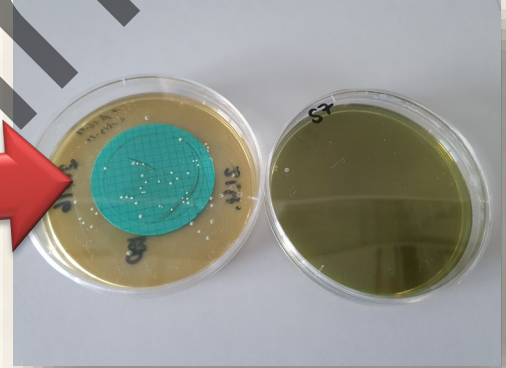
CCT Outlet



CCT spraying shadow



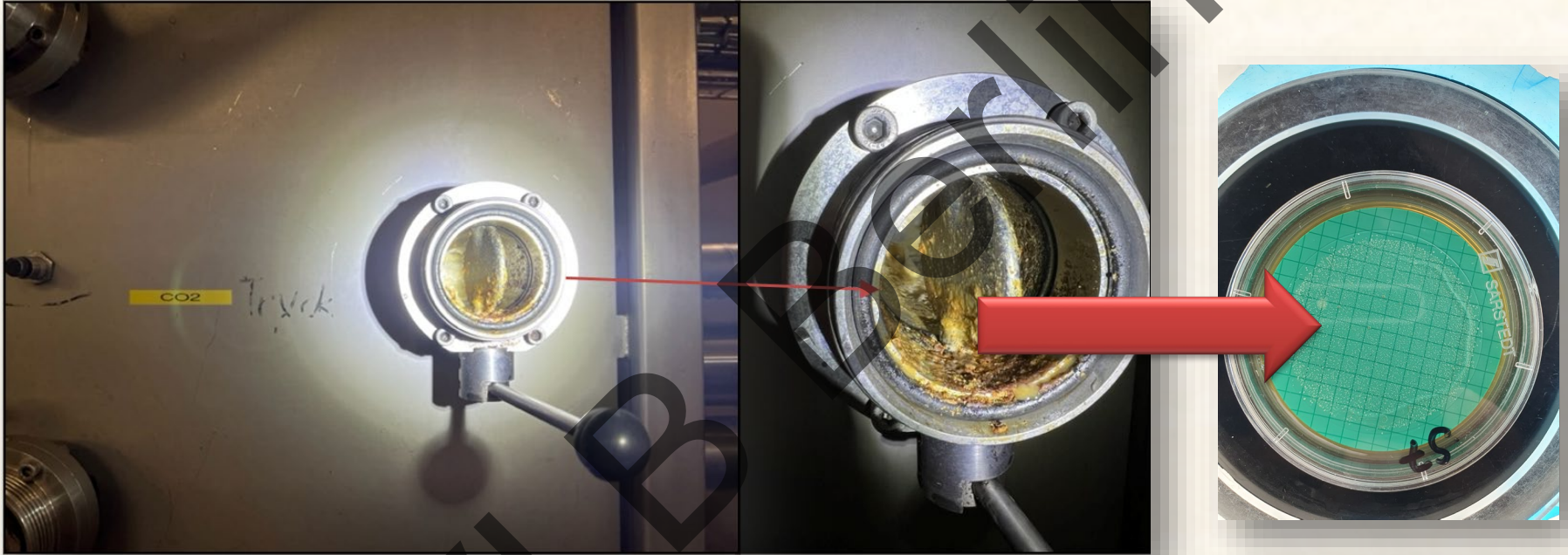
Sampling valves



CO₂ supply- line



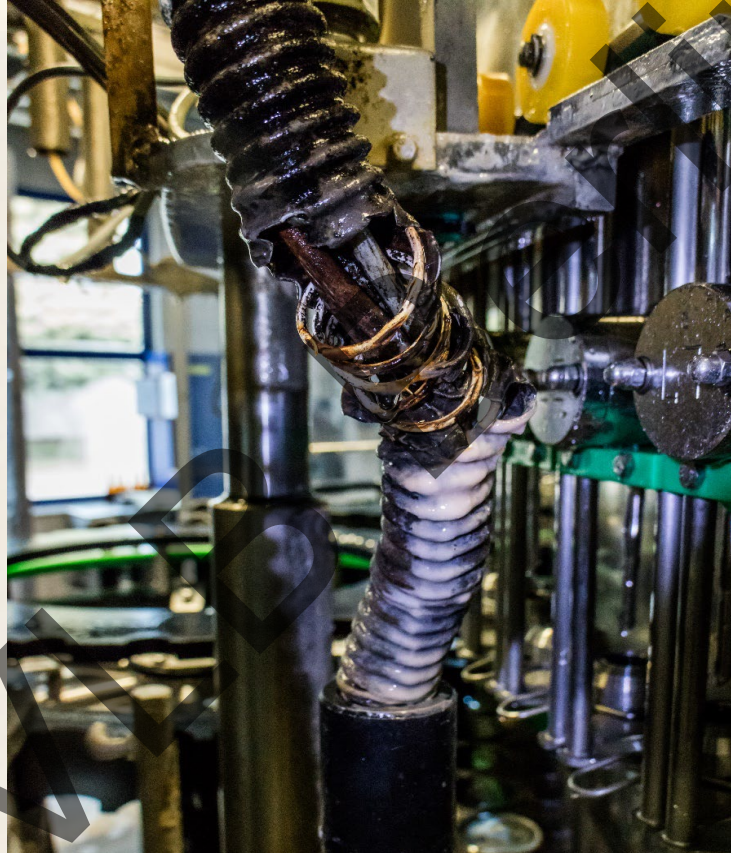
CO₂ supply- line- another brewery



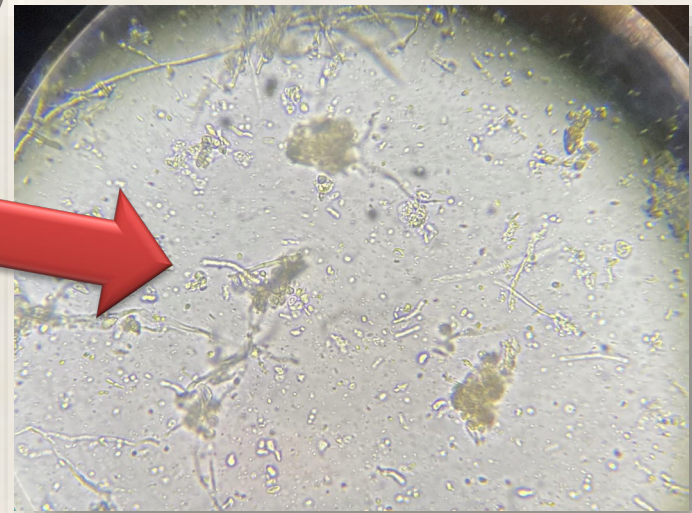
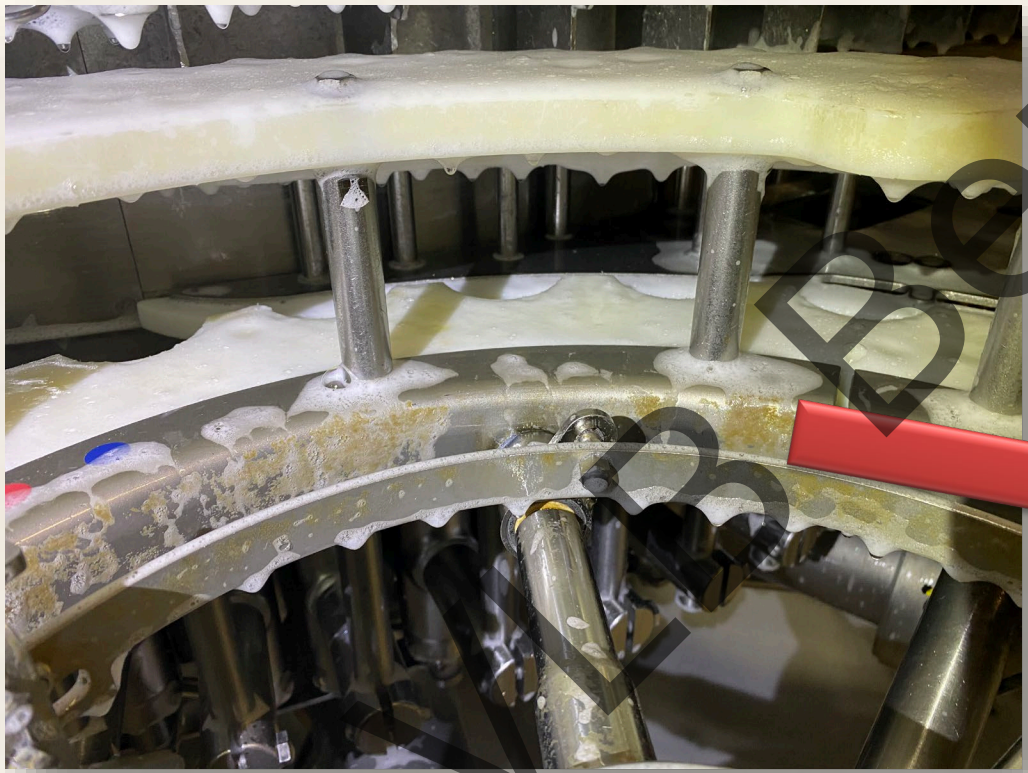
Cellar- Hygiene and Design



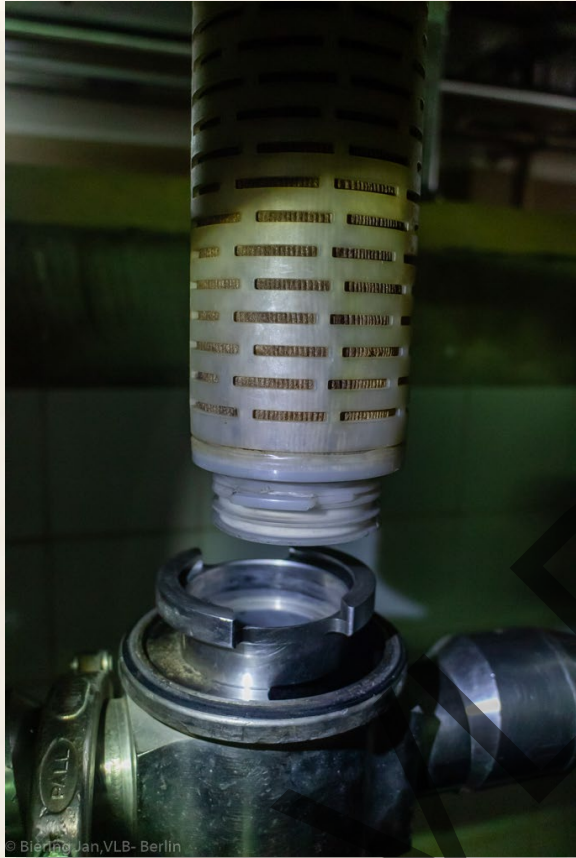
Ambient hygienic conditions



Filler



sterile filter?



Home work

- + Example: Sample volume 0,2 ml – 1 CFU on the agar plate



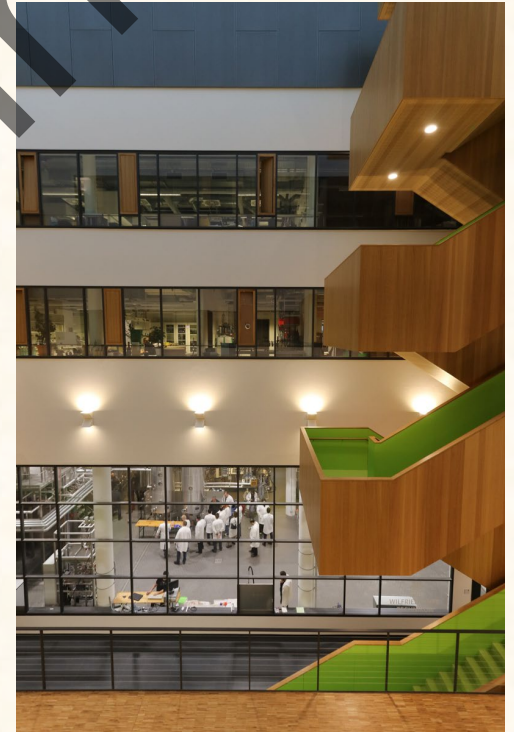
Thank you for your attention!

VLB Berlin FI Bier- und Getränkeproduktion

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