



European Hygienic Engineering & Design Group



Why EHEDG ?

Food-born diseases (1990 – 10Mio) as a result of not hygienically designed food processing equipment, process lines or plants forced the EU to react with regulations.

Although manufacturers and food companies comply with the documents

Directive 93/43/EC Food Hygiene

Directive 98/37/EC Hygienic Design of Machinery

EN 1672/2 Hygienic Requirements

ISO 14159 Safety of machinery

and implemented the GMP and HACCP,

there are two major gaps.

**Lack of practical guidelines
educational gap**



To fill these gaps,

EHEDG the European Hygienic Engineering & Design Group started in 1989, with experts from

Equipment Manufacturers

Food Industries

Research Institutes

Public Health Authorities

but voluntary.

To delivered more guidelines, new test methods and training material, the EU supported this volunteers out of the 5th Frame work program from 2000 to 2004.

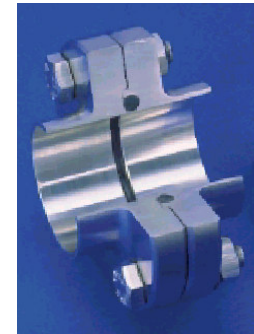
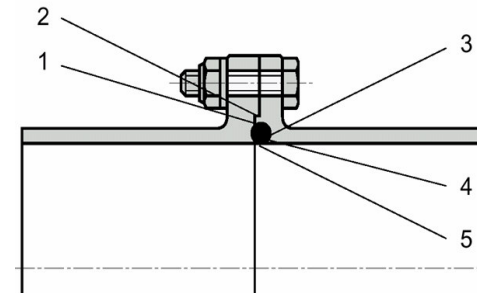
Doc. 16 Hygienic pipe couplings

EHEDG certified

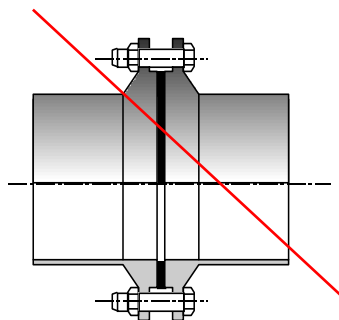
- Easy in-place cleanable
- Sterilisable in place
- Impervious to micro-organisms
- Easy installation
- Reliable

EHEDG Recommended Pipe Connection

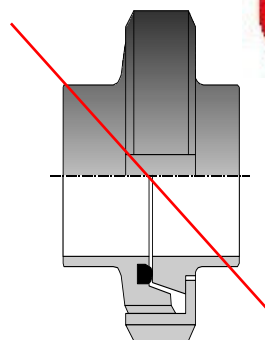
DIN 11864-2



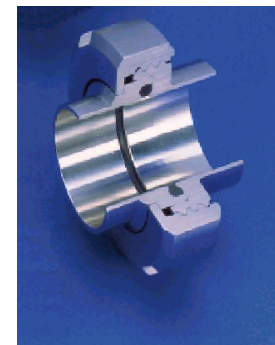
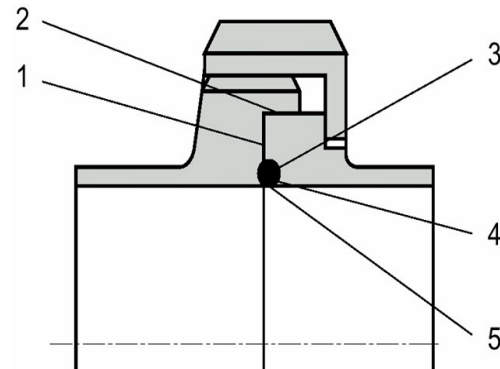
Not recommended

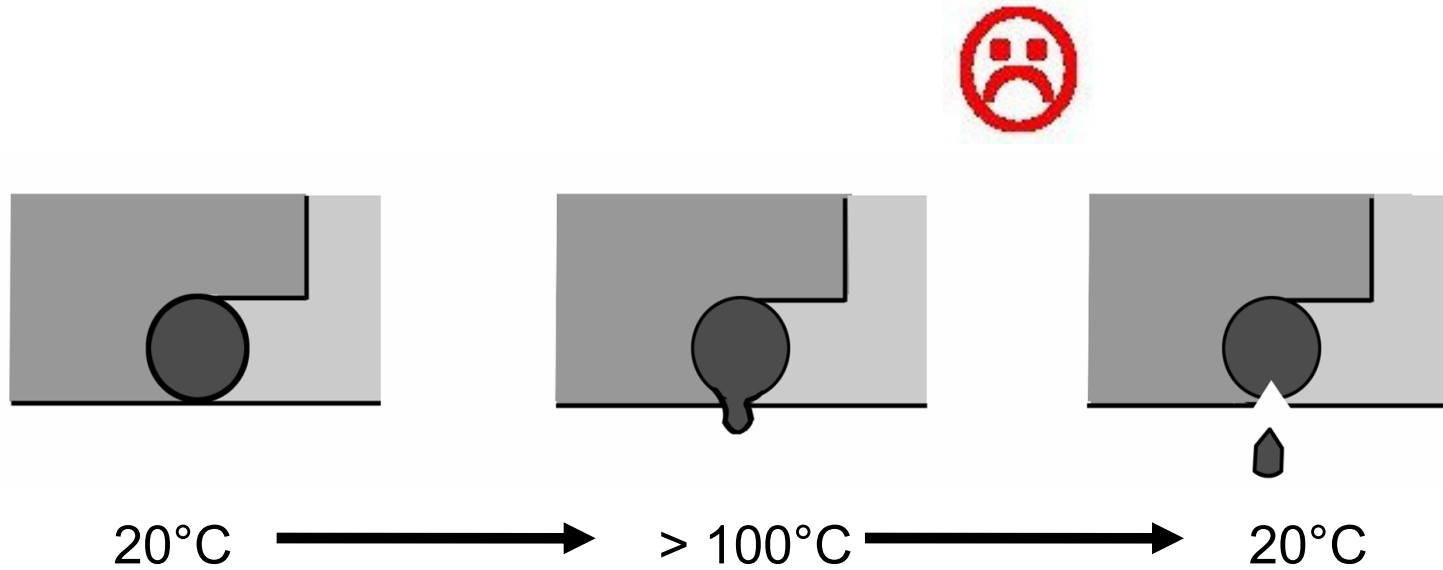


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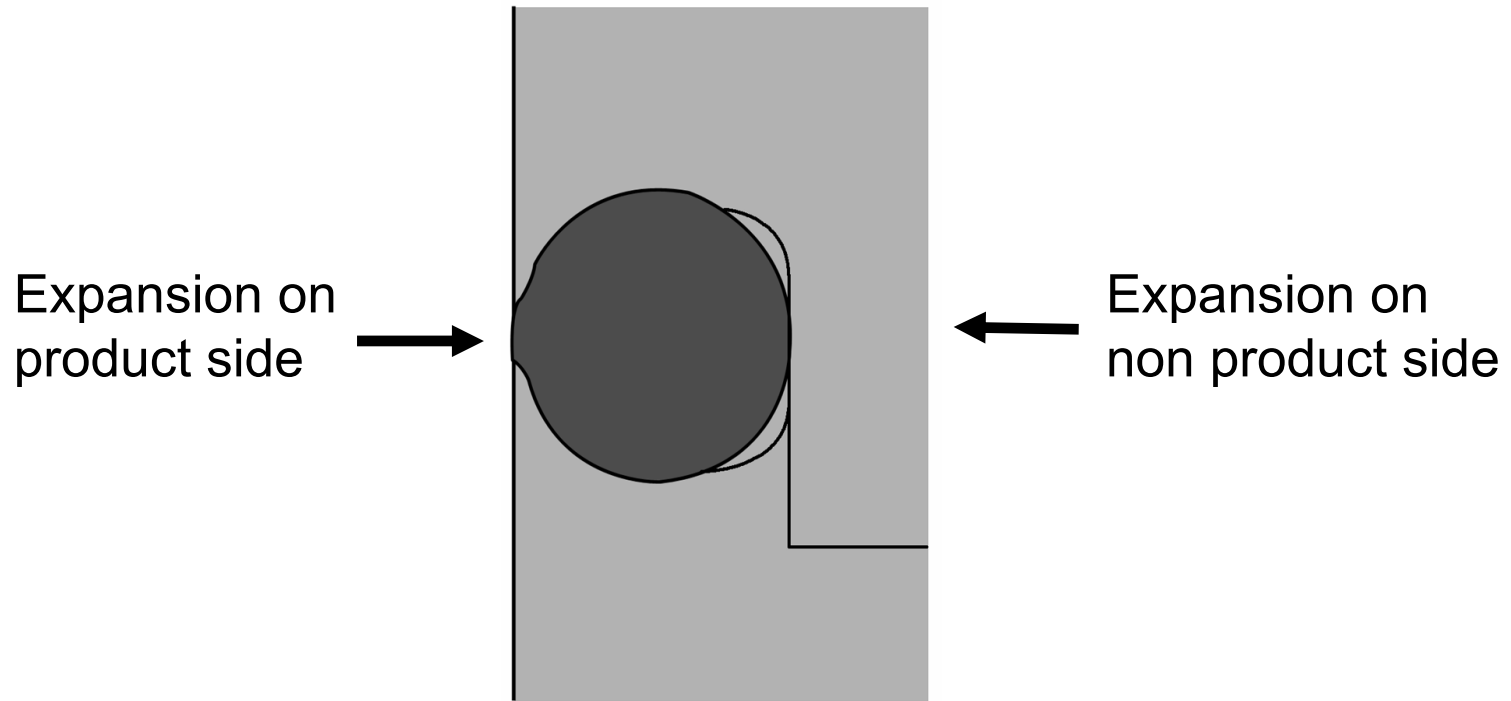


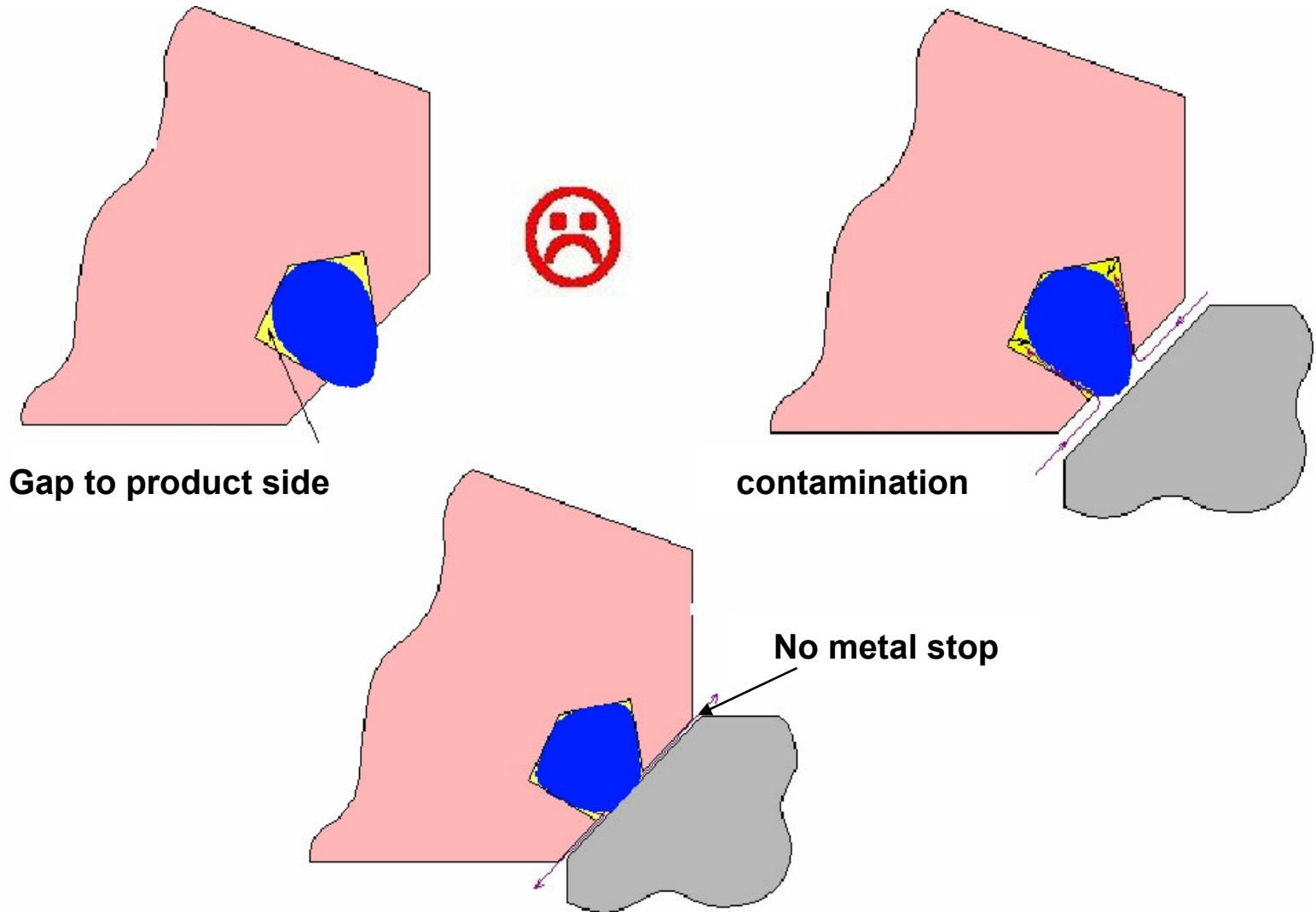
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Expansion of elastomers: 15 times higher than stainless steel



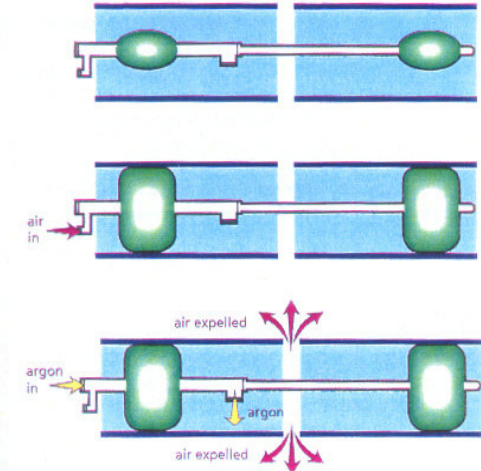
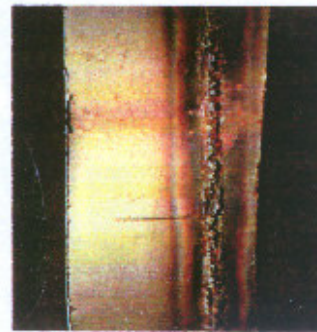
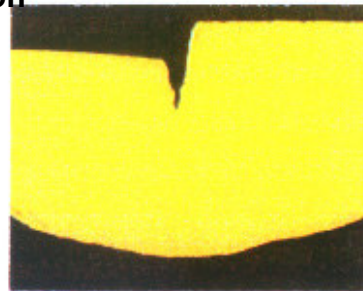
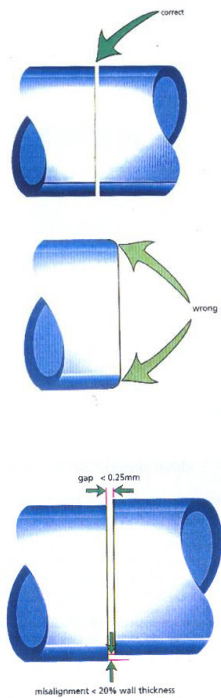


Hygienic installation of the segments to a functional system by welding

Doc. 9 Welding stainless steel to meet hygienic requirements

Doc. 35 Hygienic welding of stainless steel tubing in the food processing industry

Surface preparation



Gas shielding

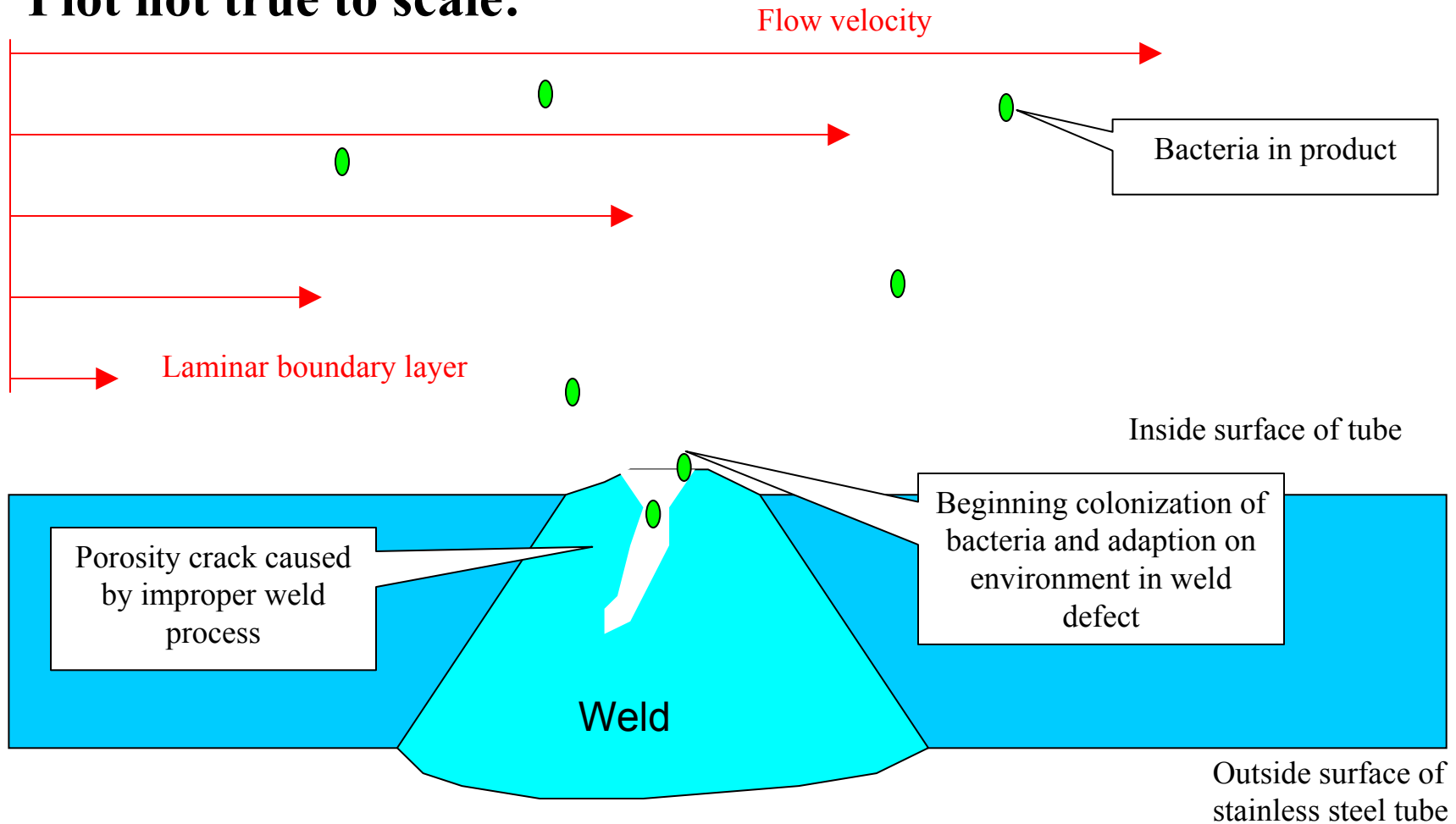
Orbital vs. Manual

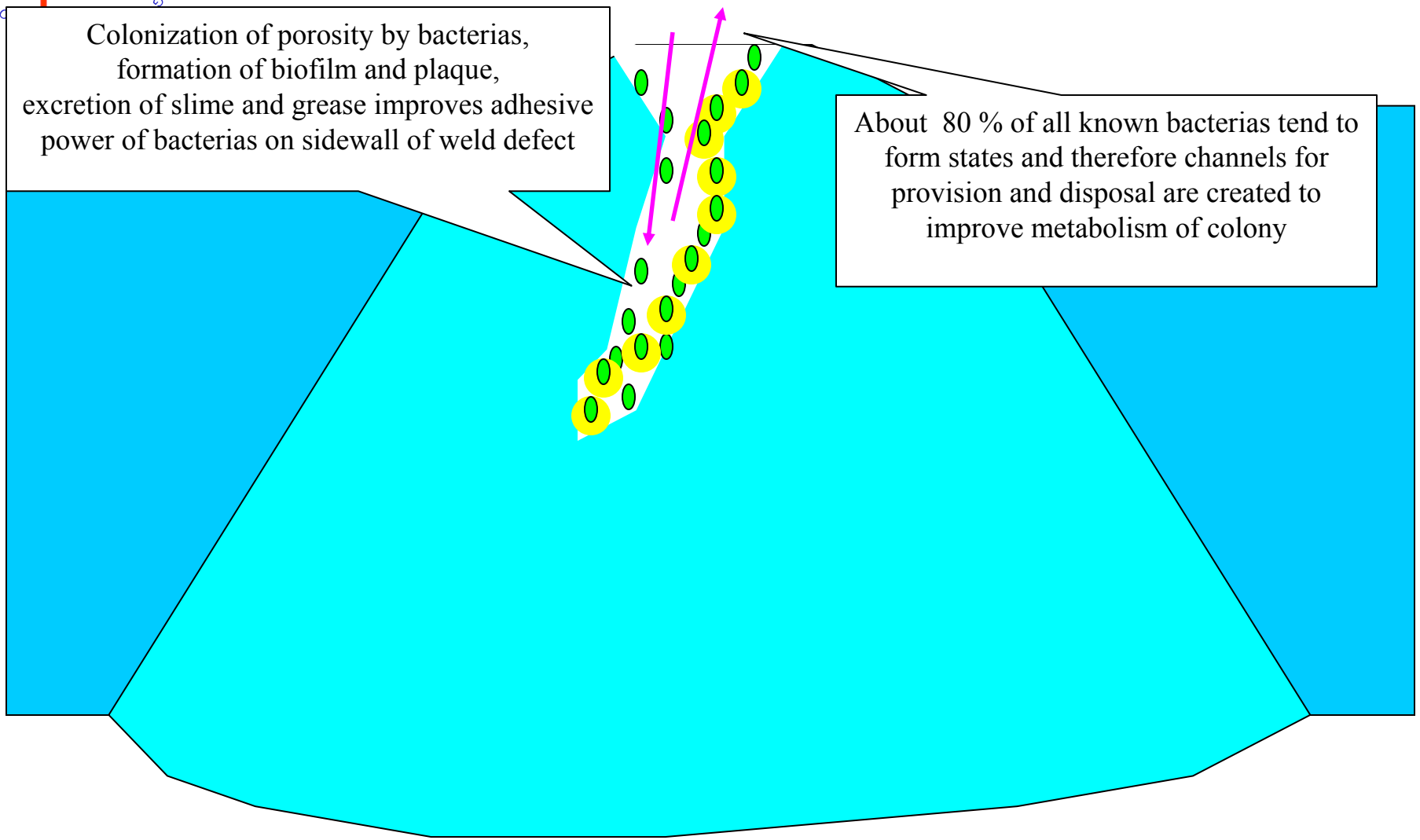
butt weld, no filler wire

A - Plan and cross section showing misalignment and lack of penetration. Crevices will harbour micro-organisms

B - Plan and cross section showing effects of lacking gas shielding. Roughened weld and heat affected zone promote adhesion of soiling

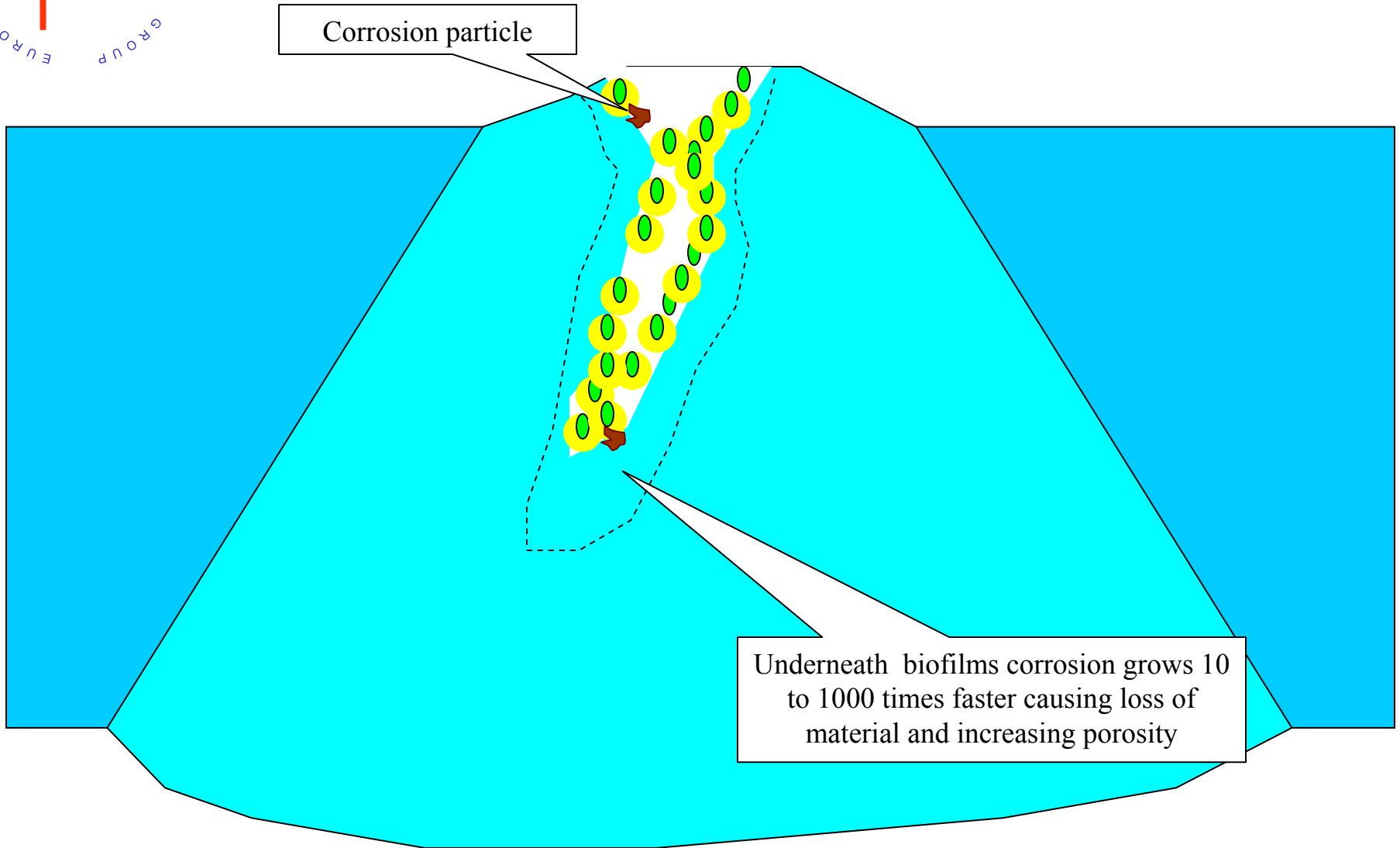
Plot not true to scale:



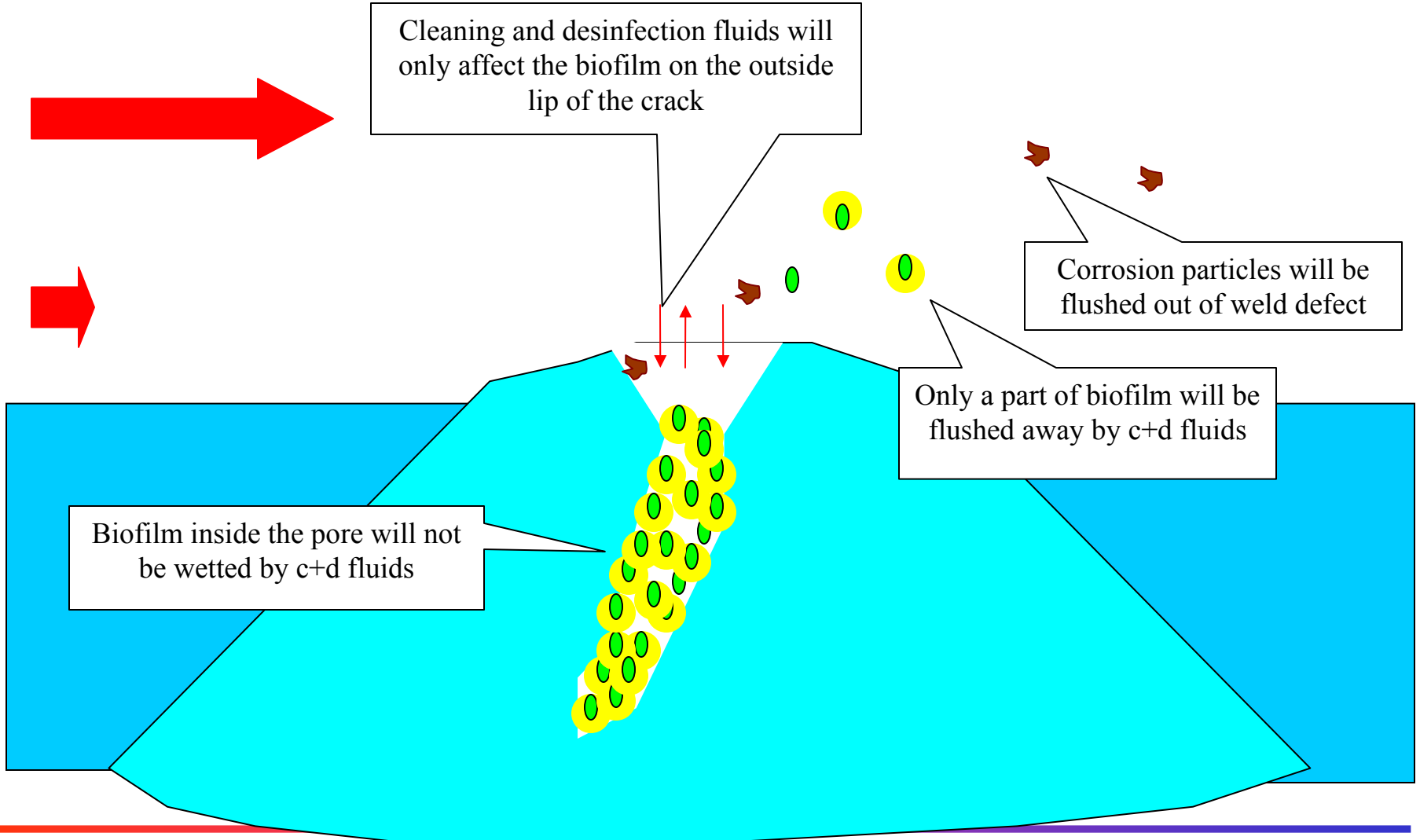


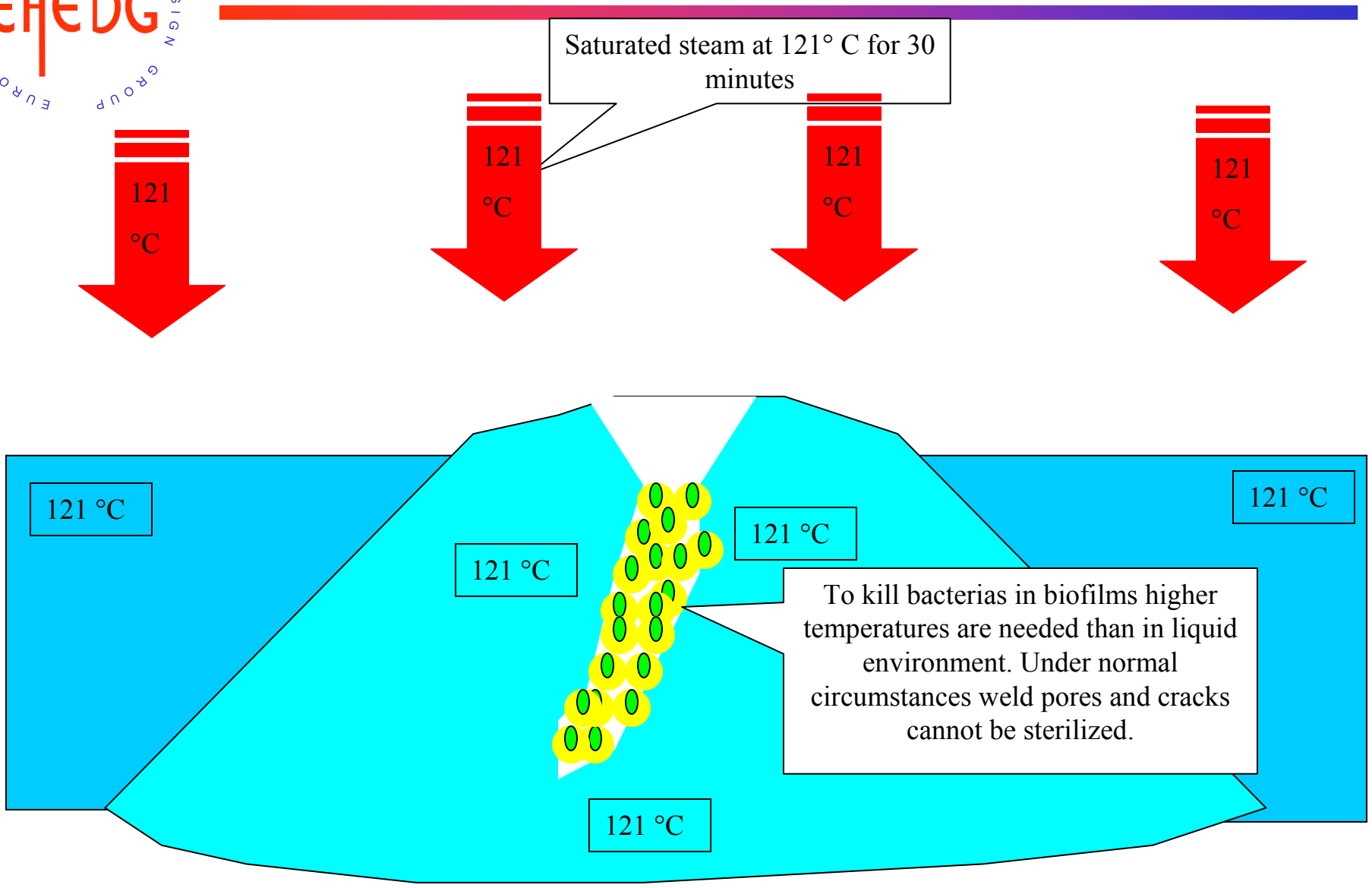
Colonization of porosity by bacteria, formation of biofilm and plaque, excretion of slime and grease improves adhesive power of bacteria on sidewall of weld defect

About 80 % of all known bacteria tend to form states and therefore channels for provision and disposal are created to improve metabolism of colony



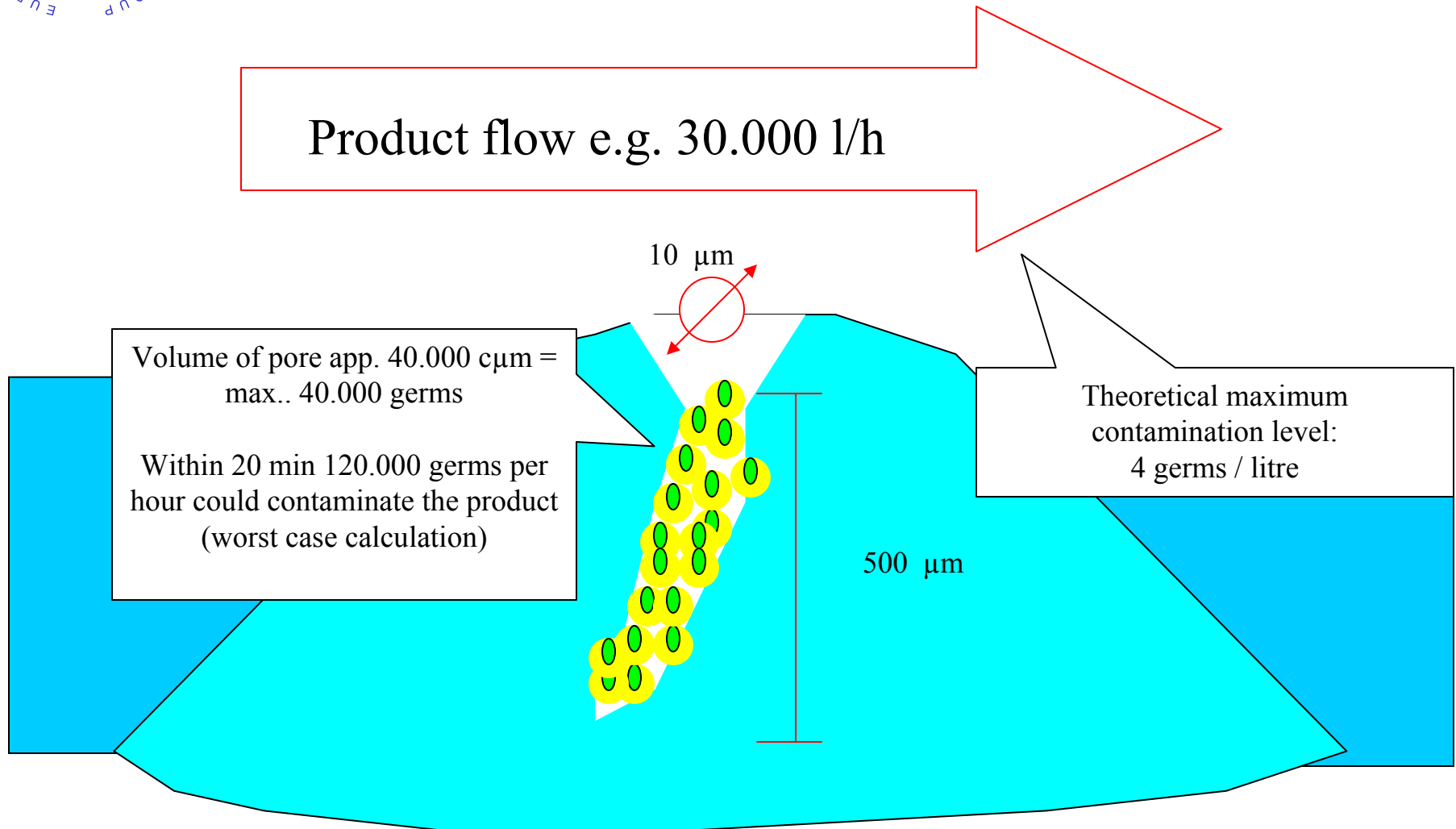
Flow of cleaning and disinfection fluids



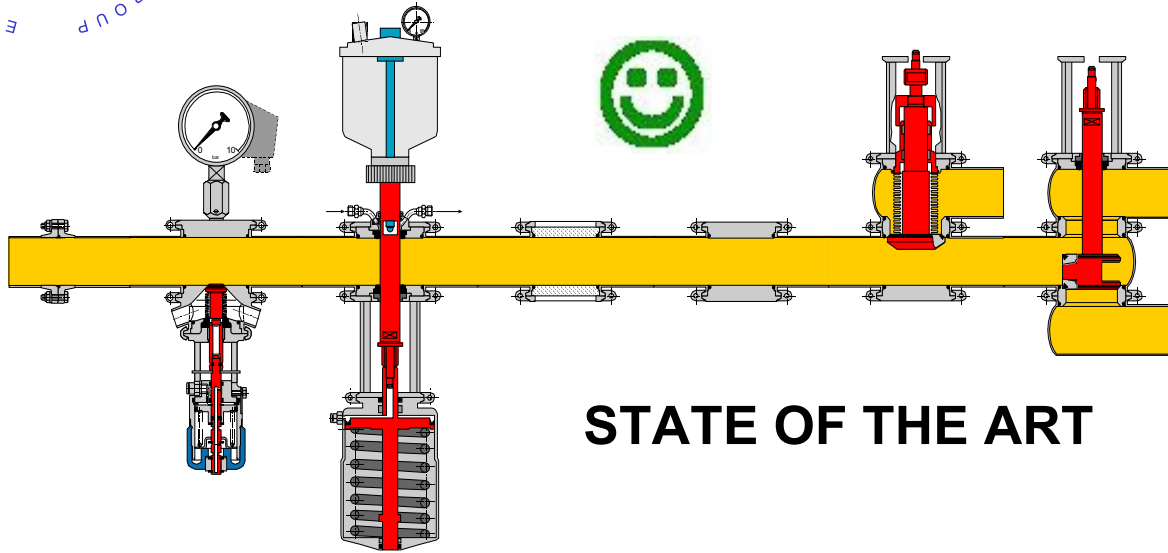


Arithmetic estimation:

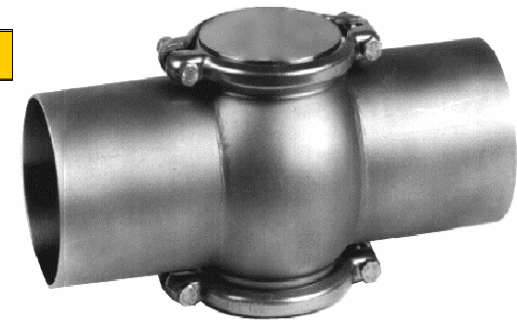
Product flow e.g. 30.000 l/h



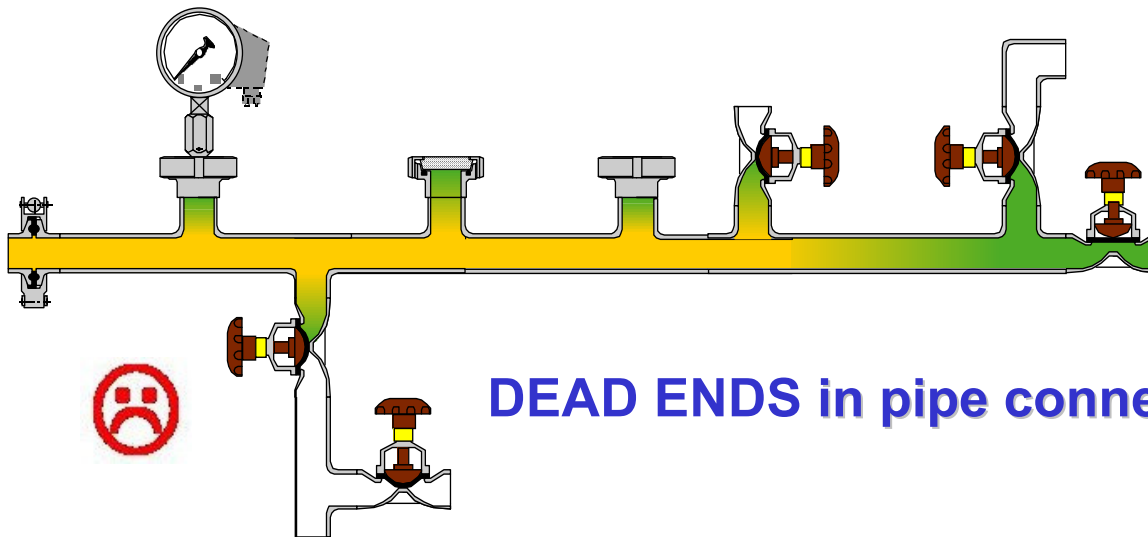
Doc. 10 Hygienic design of closed equipment for the processing of liquid food



STATE OF THE ART

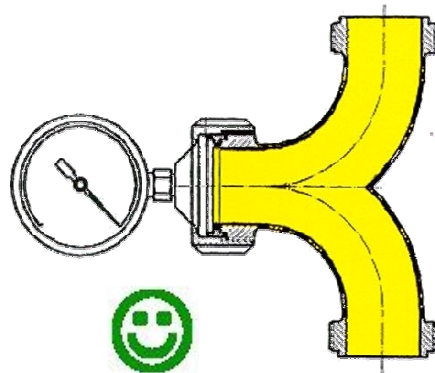
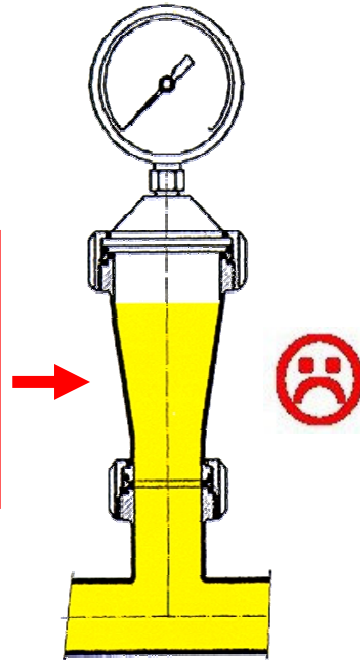


Varivent Inline Access Unit



DEAD ENDS in pipe connections

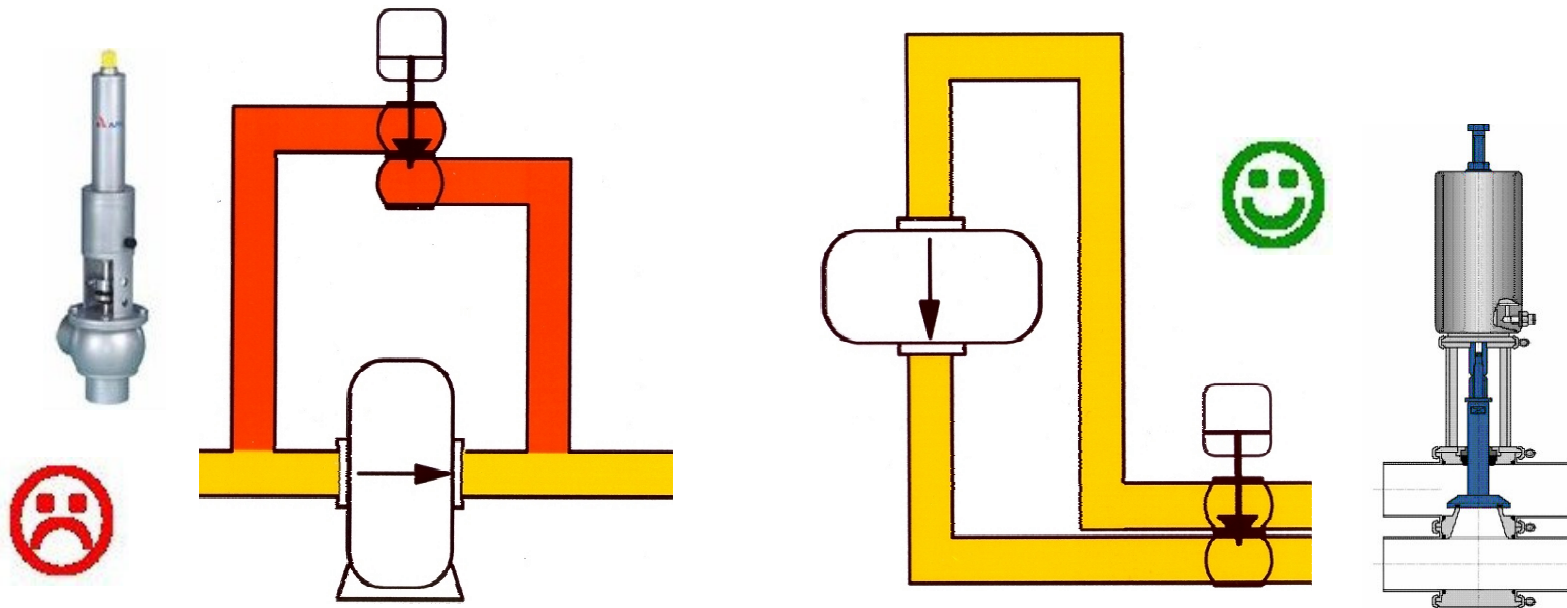
**LIVELY
DEAD
AREAS**



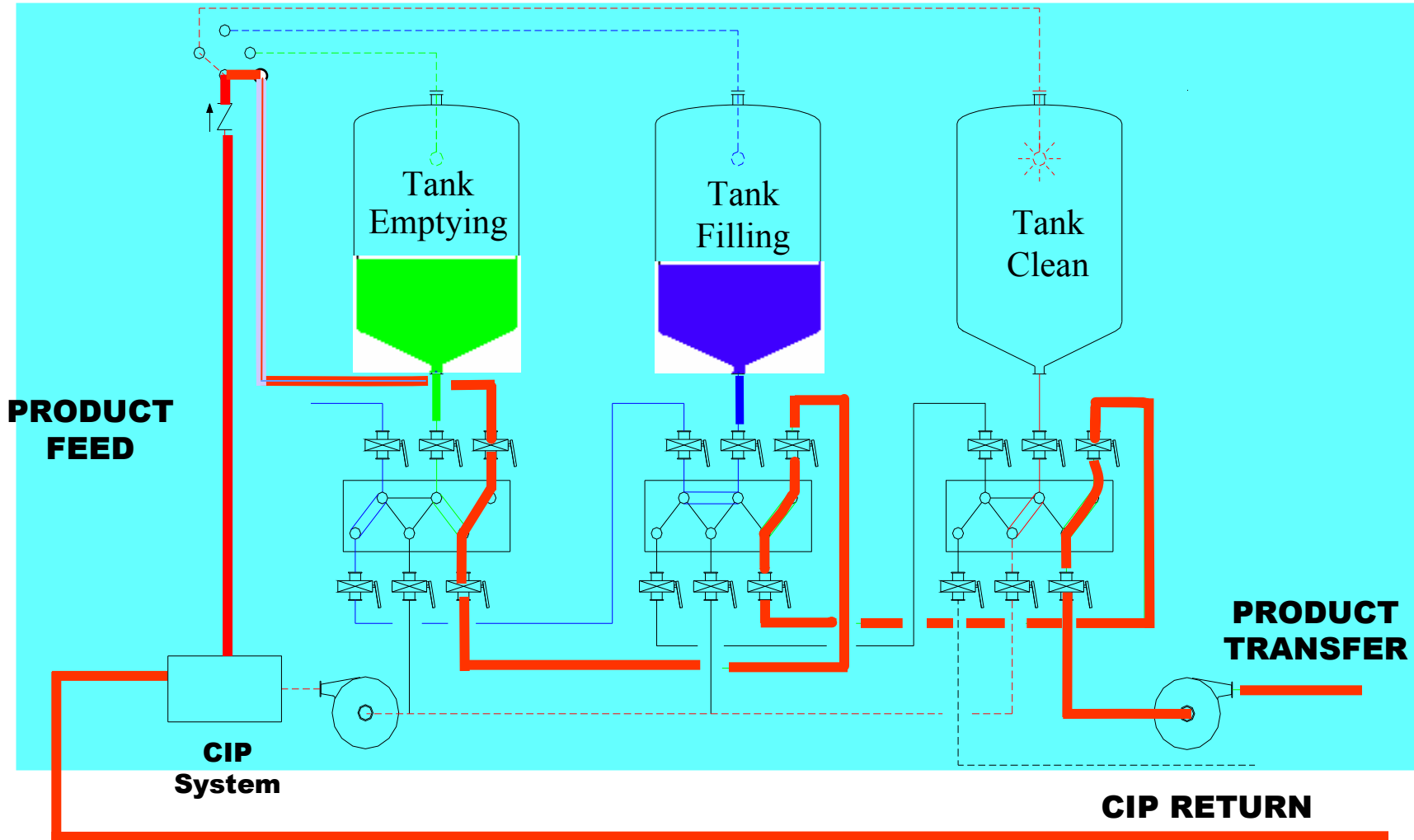
EASY TO AVOID!!

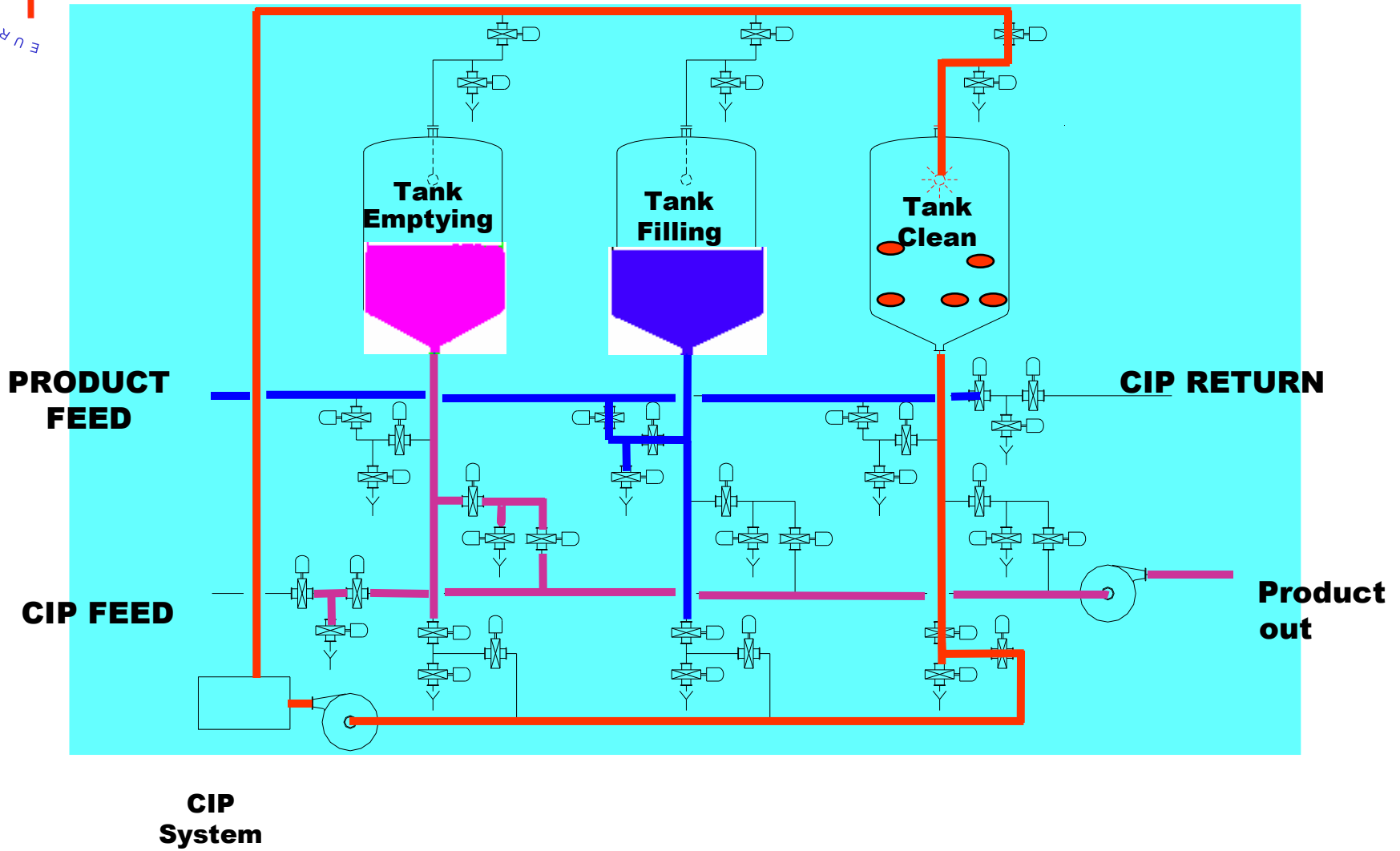
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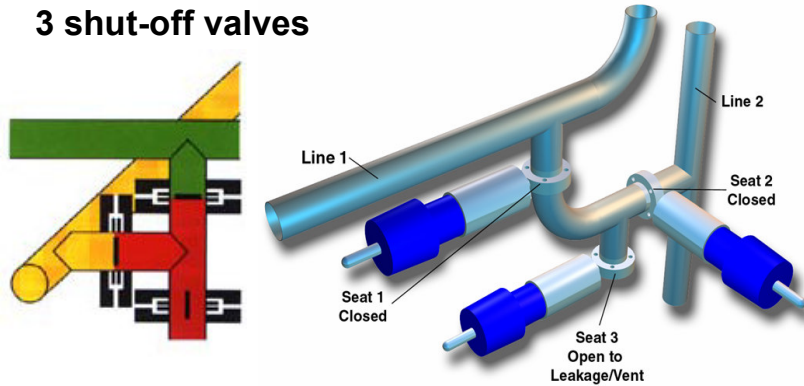
Doc. 34 Integration of hygienic and aseptic systems



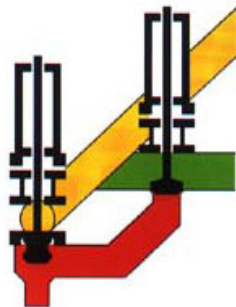


Mixproof intersections can be designed by a suitable combination of shut-off valves and / or shuttle valves

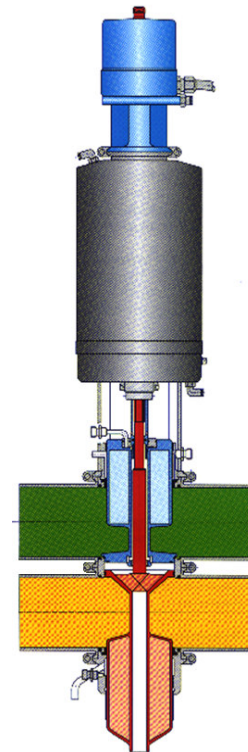
3 shut-off valves



1 shut-off valve 1 shuttle valve



or one Varivent Mixproof valve

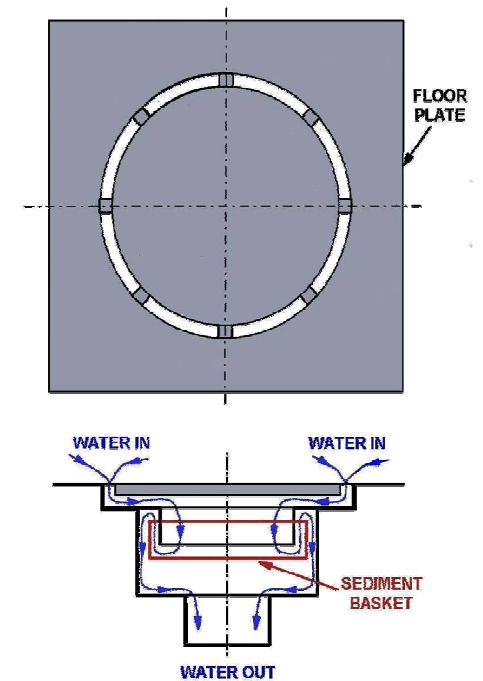


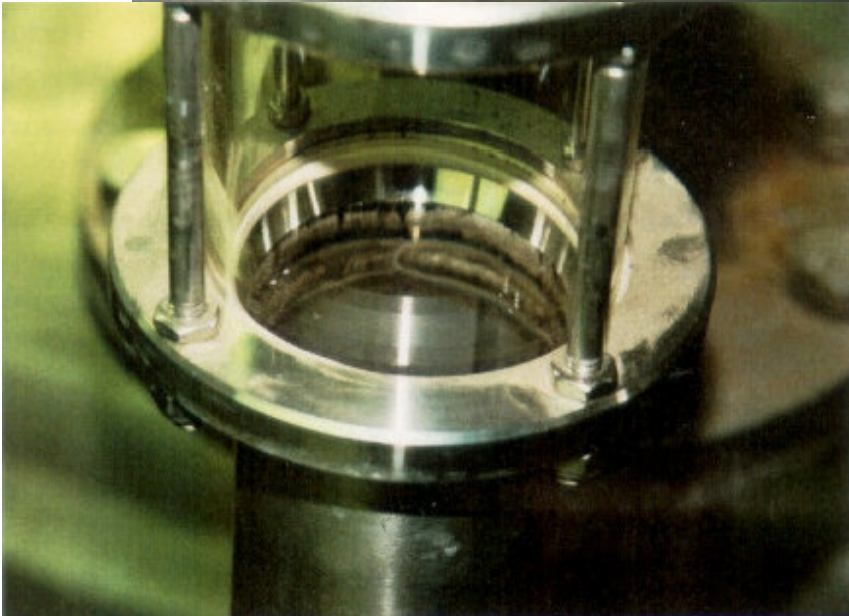
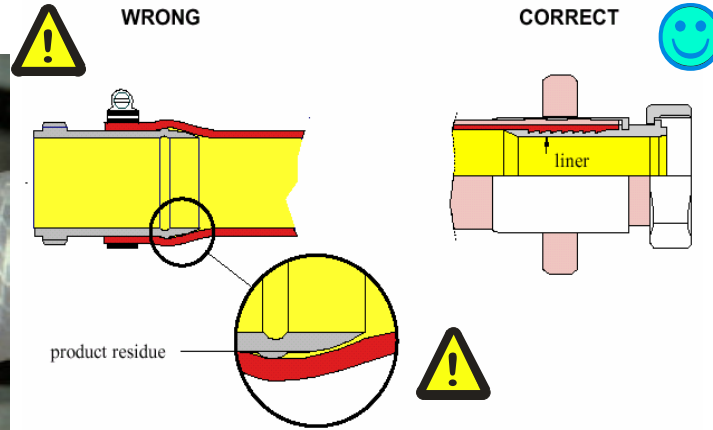
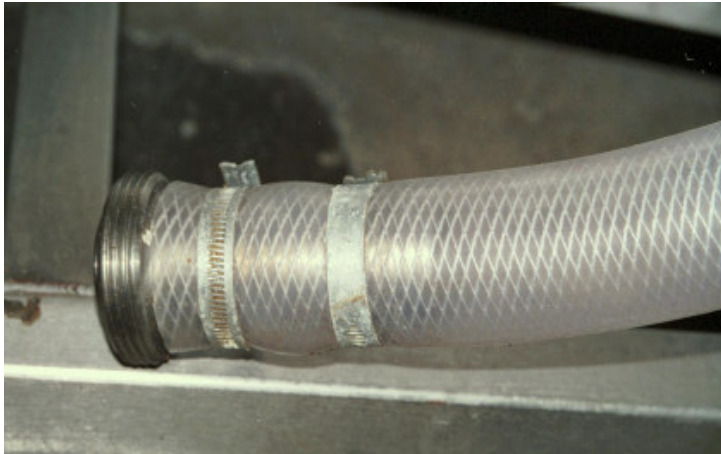
Mixproof valves permit establishing mixproof intersections with the least possible contamination risk

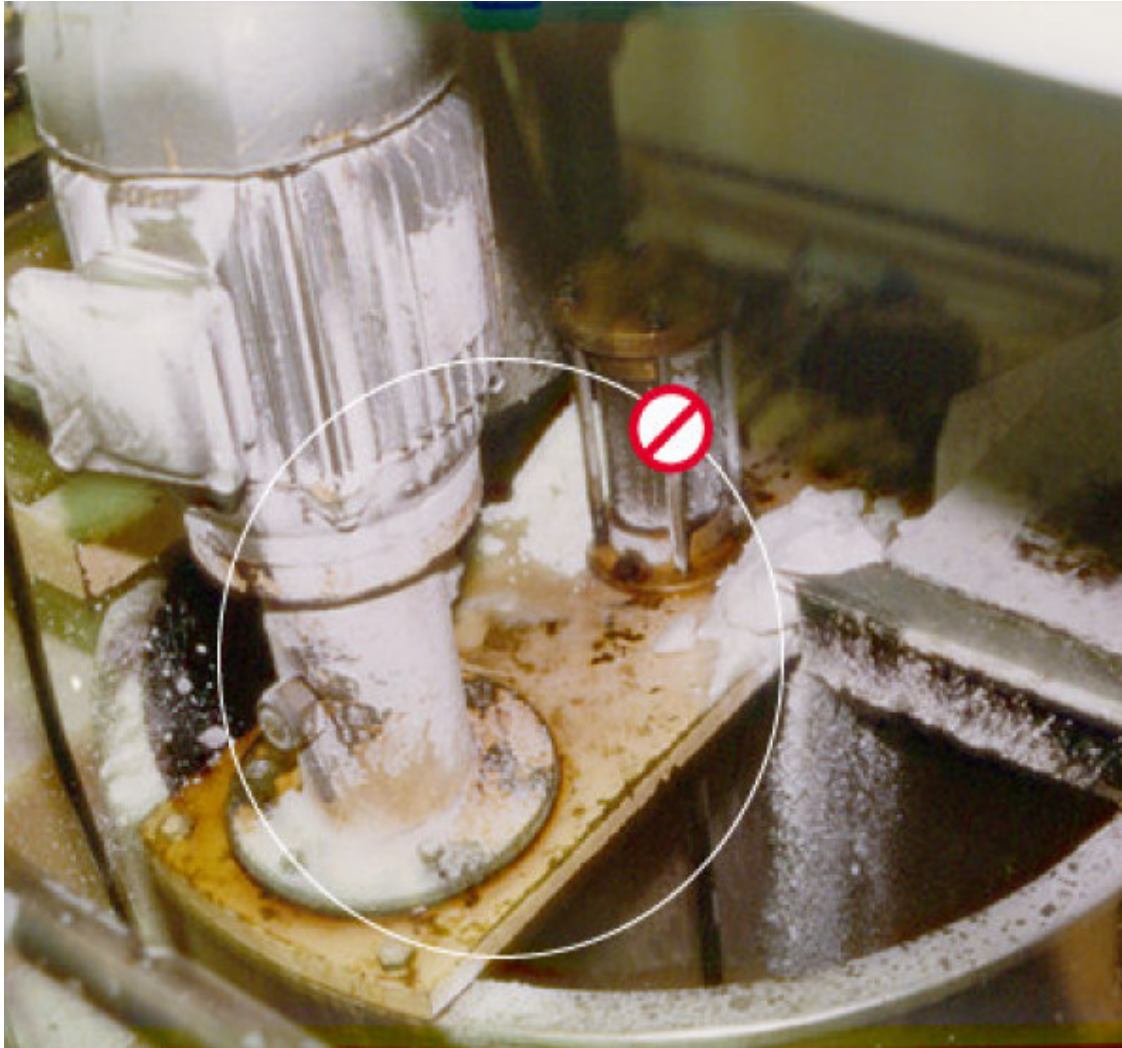
FLOOR DRAINS



Drainage under equipment is inaccessible







Motor must not drip lubricant onto product.

Drip tray have to be cleaned regularly



Thank you for your attention.