

# Battling with Biofilms:

Know your enemy and defeat them in drains

**Deb Smith - Vikan**

Global Hygiene Specialist

**Aidan Davey – ACO Building Drainage**

Regional Specification Manager



# About Vikan and Remco



Leading provider of advanced hygiene and cleaning products and solutions for key sectors, with a global presence in over 90 countries.



Supplies color-coded sanitation and material handling tools for the food industry in North America.

Remco is Vikan's dedicated presence in North America (U.S. and Canada).

For more information, visit us at:

- [remcoproducts.com/about](http://remcoproducts.com/about)
- [vikan.com/int/about-vikan/who-we-are](http://vikan.com/int/about-vikan/who-we-are)



# About our presenters

## Deb Smith

Global Hygiene Specialist

Deb has over 35 years of food safety and research training and experience. Prior to Vikan, she worked as a microbiologist at a large poultry production site; with DEFRA as a Scientist in the Food Safety Division; & as a Food Hygiene Research Manager for CampdenBRI. Apart from being a qualified microbiologist, FSSC22000 Lead Auditor, an active committee member of EHEDG, and a Fellow of the IFST, she also Chairs the CBRI Microbiology group, and helped develop Benchmark requirements for the GFSI. Deb regularly presents her research at national and international food safety events and has authored numerous related publications. At Vikan Deb provides food safety and hygiene advice, training, and support to colleagues and customers.



# About our presenters

## Aidan Davey

Food Sector Specification Specialist

Aidan has over 10 years' experience in the building materials supply chain for food sector developments, predominantly supplying process drainage appliances and pipework for UK based projects. As a passionate drainage professional, Aidan has become a hygienic design evangelist and has made it his mission to protect consumers, protect brands and reduce cleaning times. With ever increasing moves towards centralised manufacturing and the prevalence of ready to eat products, Aidan is a strong exponent of a holistic approach to the hygienic design of factories and machinery and continues to raise the profile of hygienic design within industry.



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# What are biofilms?

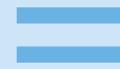
What are they made of?



Water 98-99%

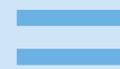


Microbes 1-2%



Complex mixture of many different micro-organisms working together, e.g., pseudomonads, listeria, staphylococci, coliforms (composition is dependent on many factors)

**SLIME**



Polysaccharides  
+ nucleic acids  
+ glycoproteins  
= *Extracellular or Exopolymer matrix*

# What are biofilms?

What is needed for them to form?



**Microbes**

\*Temperature  
\*Oxygen levels

+



**Water**

(minimise)

+



**Food**

+



**Surface**

+



**Time**

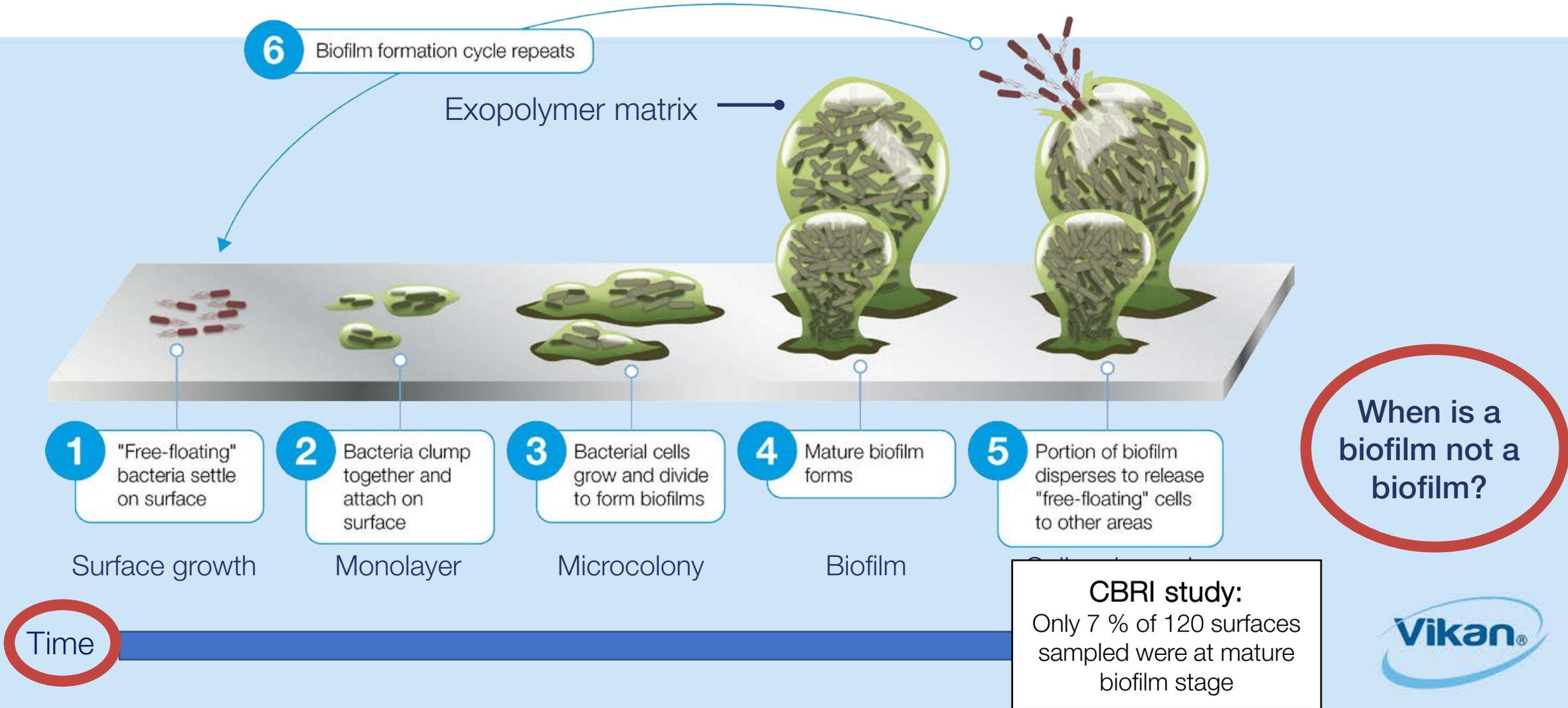
\*Temperature

**= Biofilm**

All will affect the composition, growth rate, and resilience of the biofilm – huge variation.

# What are biofilms?

How do they form?

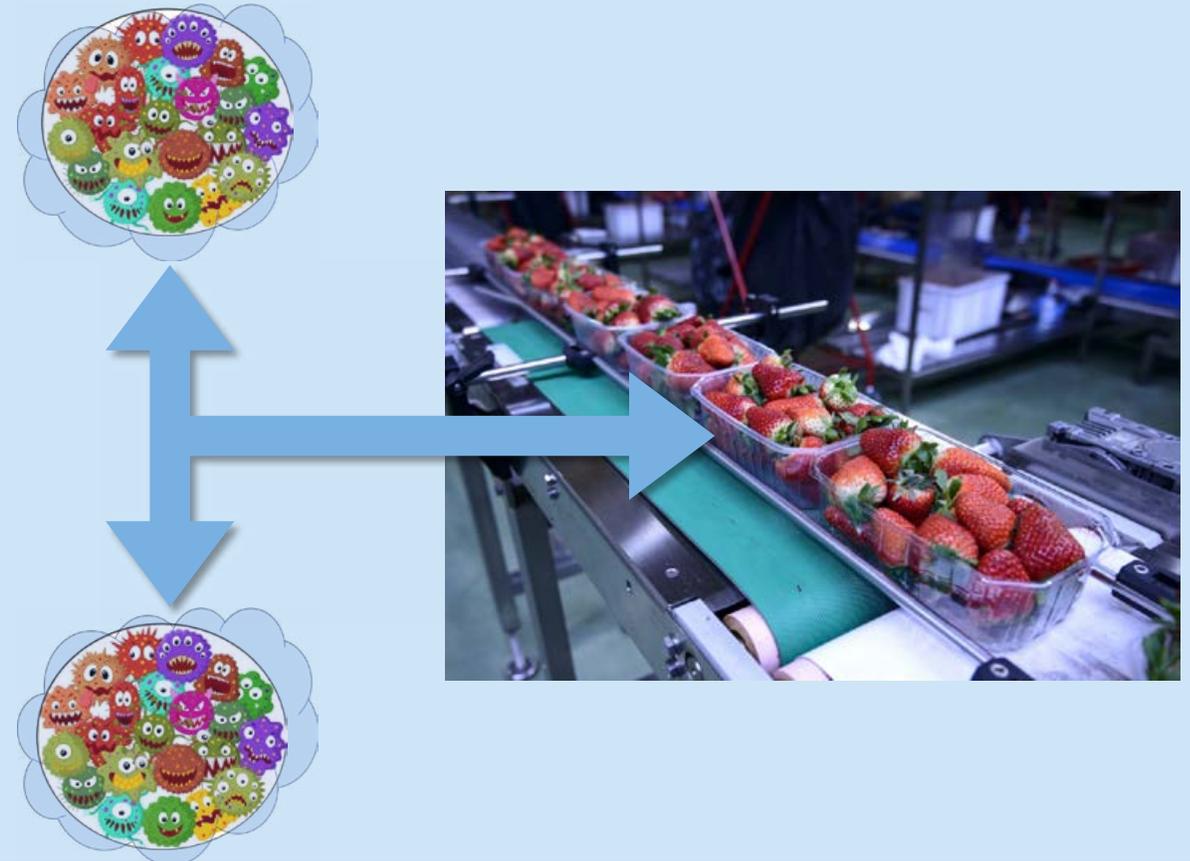


# Why are they a problem?

Biofilms aid the survival, growth and transfer of microbial contamination (including pathogens)

- from the environment to food contact surfaces
- from food contact surfaces to the food product

Via people, air, moisture, equipment, and pests.



# Why are they a problem?

## Biofilms protect microbes

from,

- detergents
- Disinfectants/sanitizers
- preservatives
- antimicrobials
- biocides
- heat
- radiation (UV)



\* Microbes in biofilms may be up to

# 3000

times more resistant to  
hypochlorous acid than free cells  
(Le Chevalier *et al*, 1988)

# Biofilms in food production

## Biofilms will form anywhere

- where conditions of time, temperature, nutrients and water allow.
- where poor hygienic design, damage, or wear and tear makes routine cleaning difficult or ineffective

## Common biofilm hotspots include in,

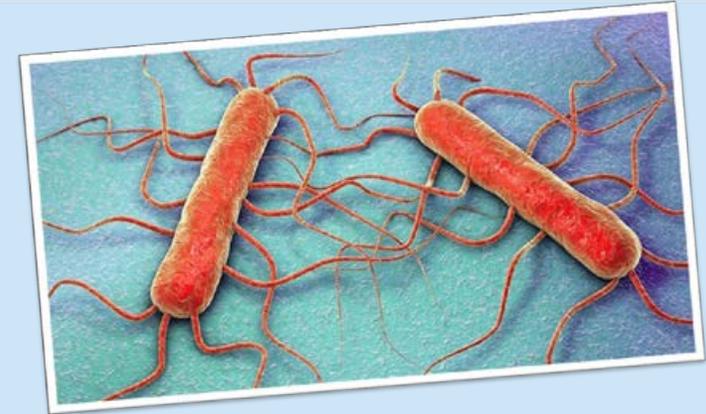
- complex food processing equipment
- poorly fitted, sealed, and damaged
  - wall coverings
  - door cladding, and
  - floors
- cleaning equipment and utensils
- leaky roof cavities and on damp ceilings,
- the backs and undersides of surfaces, and
- **drains** and pipework



# Biofilms and pathogens in drains

## CampdenBRI<sup>1</sup>

- Survey of cooked product areas for *Listeria monocytogenes* (10,000 samples)
  - Production equipment - very low
  - Floors - 17% positive
  - Drains - 25%
  - Cleaning equipment - 47%
- Drains (& cleaning equipment) as microbiological 'collectors'



1.Holah, J.T. (1998). Effective microbiological sampling of food processing areas. Guideline No. 20, Campden & Chorleywood Food Research Association.

# When biofilms attack!

2014: Listeriosis outbreak in Denmark

- Rolled lamb sausages (rullepølse)
- 41 cases of listeriosis (17 fatalities)
- Sausage was served health impaired and elderly people in care homes
- Production area drains contained *Listeria monocytogenes*
- Transfer from drains leading to cross-contamination of the cooked sausage

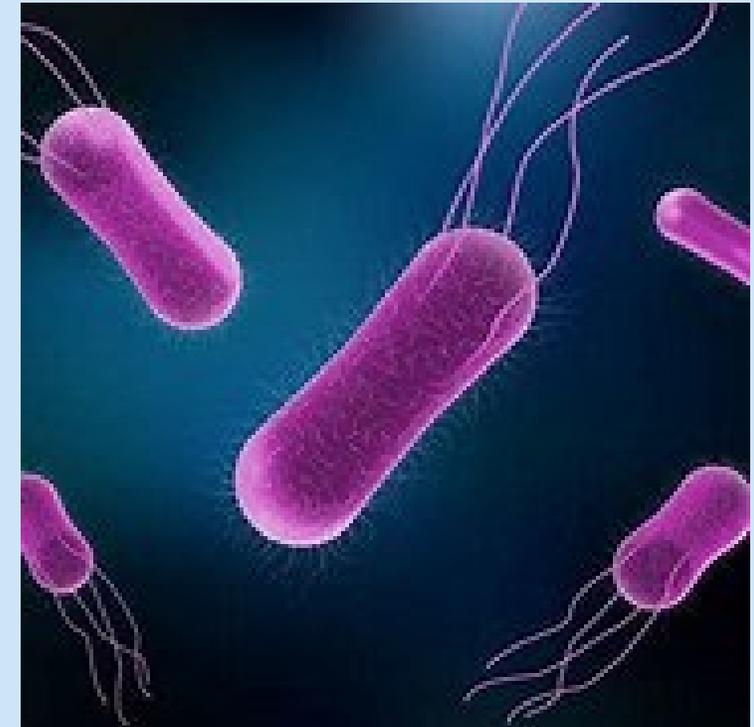


Photo: © DR Nyheder

# When biofilms attack!

2015/16: Salmonellosis outbreak in England

- 82 cases (72 confirmed, possible)
- Outbreak linked to contamination of a restaurant kitchen via
  - leakage from drains,
  - backflow from drains,
  - bio-aerosols from drains.
- Drain selection, installation, and maintenance (including cleaning) is critical to food safety



<https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.49.17-00037#f1>



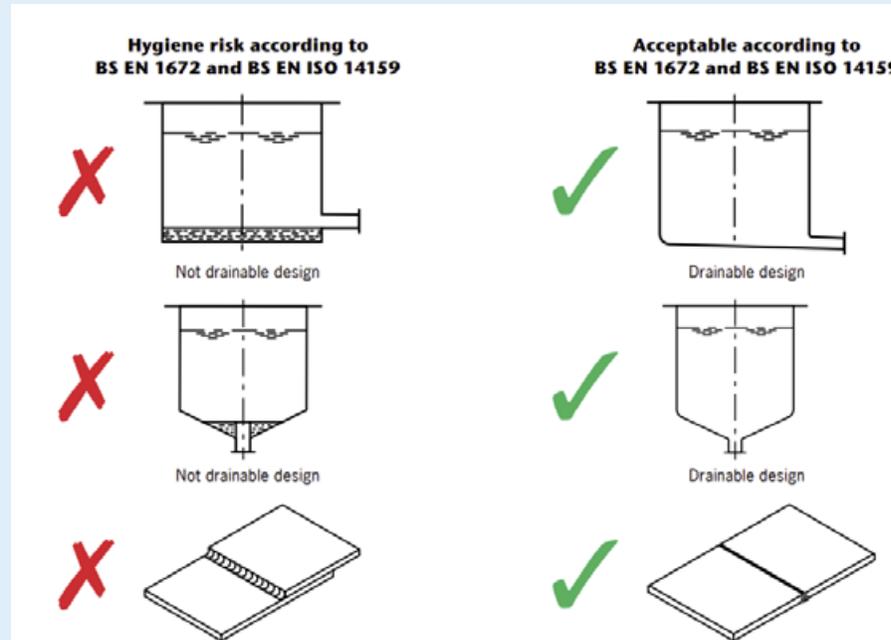
# Biofilm control in drains

## Back to basics

- Timely & effective sanitation practices



- Good hygienic design

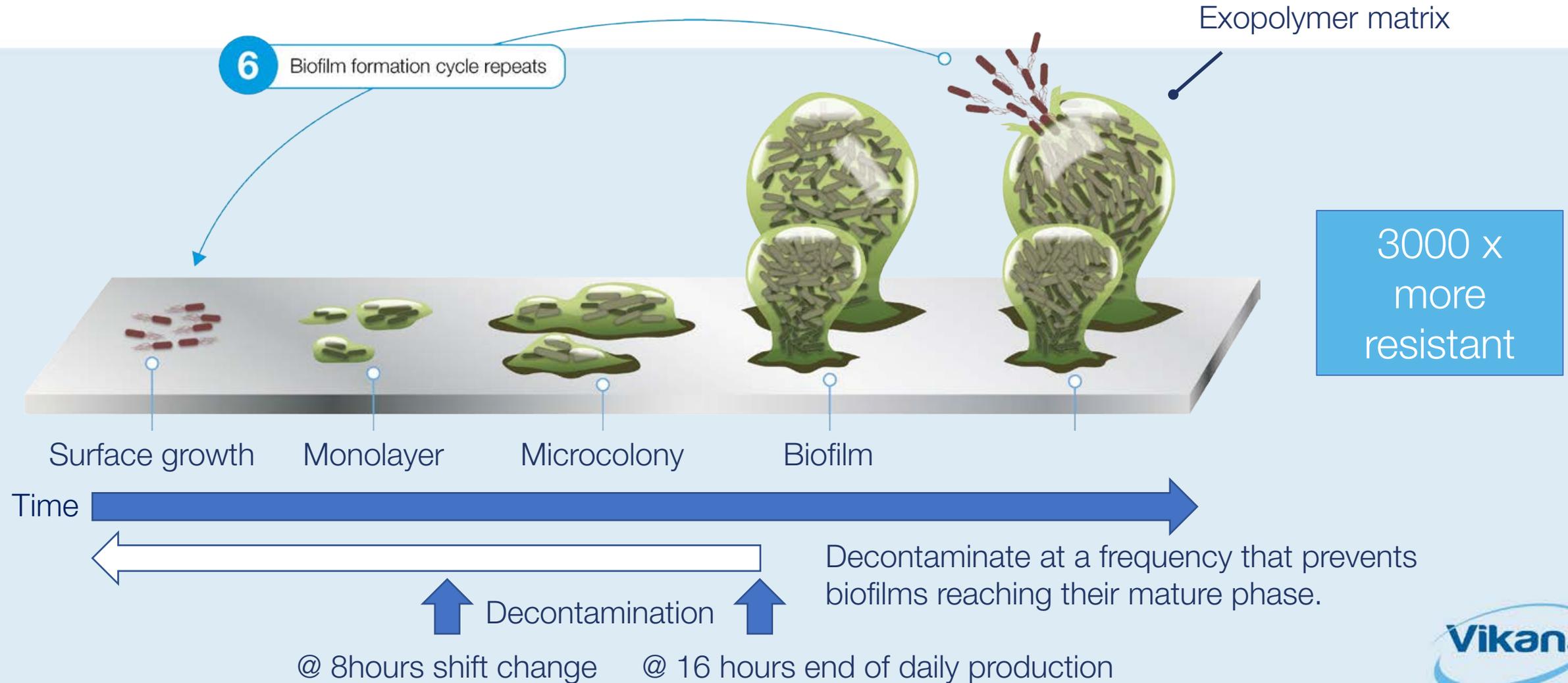


- Equipment & facility maintenance



# Effective sanitation

When?

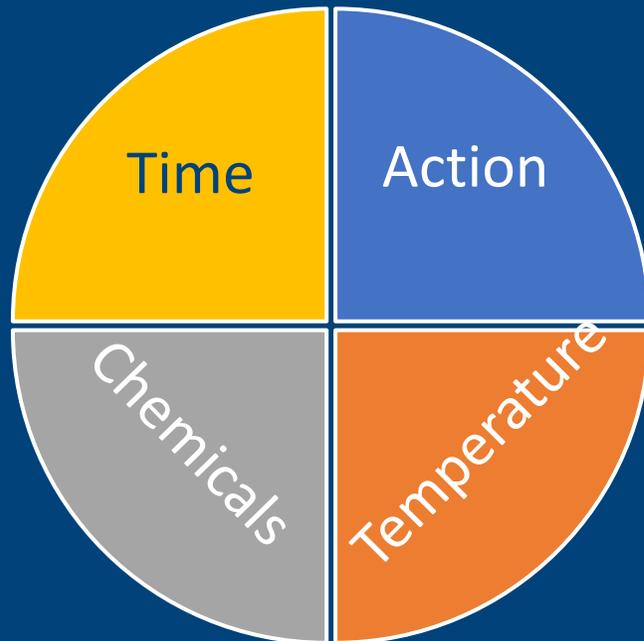


# Effective sanitation – how?

A multi-task force approach

A multi-task force approach that starts with cleaning

Cleaning removes most of the contamination and makes disinfection/sanitization more effective



Factory trial data – Courtesy of Campden BRI

Before cleaning	After cleaning	After cleaning and disinfection / sanitization
1,320,000 microbes	86,700 microbes	2,500 microbes
Microbial reduction	1,233,300 microbes 93.4%	84,200 microbes 6.4% (99.8%)



# Effective sanitation – how?

## Selection of chemicals

### Sanitation chemical suppliers can provide:

- advice (and training) on the types, concentrations, application, temperature, contact time, and health & safety information.
- dosing and foaming equipment



### Sanitation chemicals must be:

- made up and used as per sanitation chemical manufacturers instructions
- applied and left in contact with the item being cleaned/sanitized for long enough to be effective
- thoroughly rinsed from the surface after use (in most cases)

# Effective sanitation – how?

## Wet cleaning



### **Foaming:**

Good for decontaminating large areas such as walls & large production equipment



### **CIP:**

Commonly used to clean pipework used for liquid/semi-solid foods



### **Manual cleaning:**

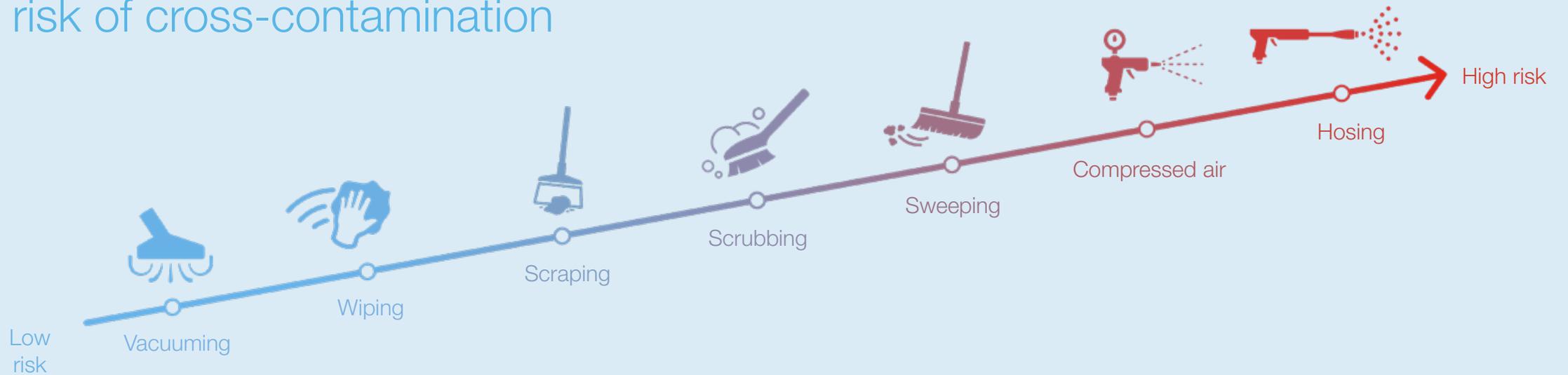
Good for,

- decontaminating small to medium sized production areas/equipment;
- deep cleaning
- detail cleaning; and
- cleaning of complex equipment

# Effective sanitation – how?

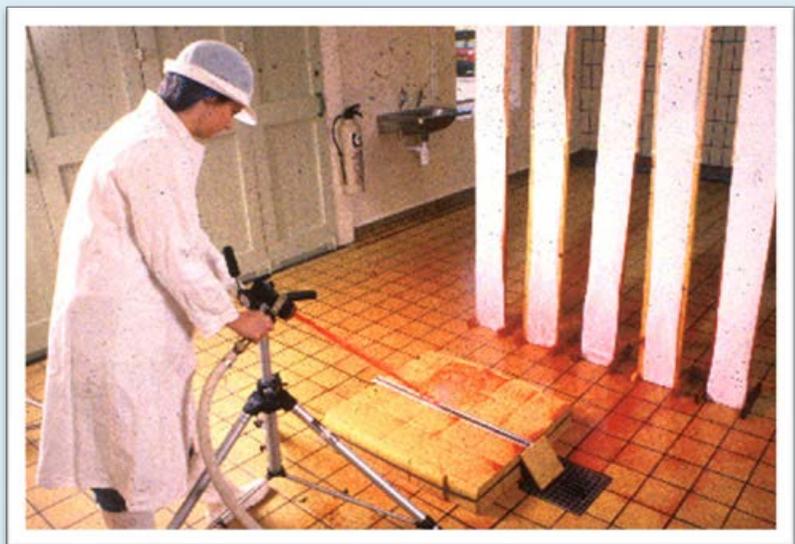
Minimising spread of contamination

Most cleaning activities increase the risk of cross-contamination

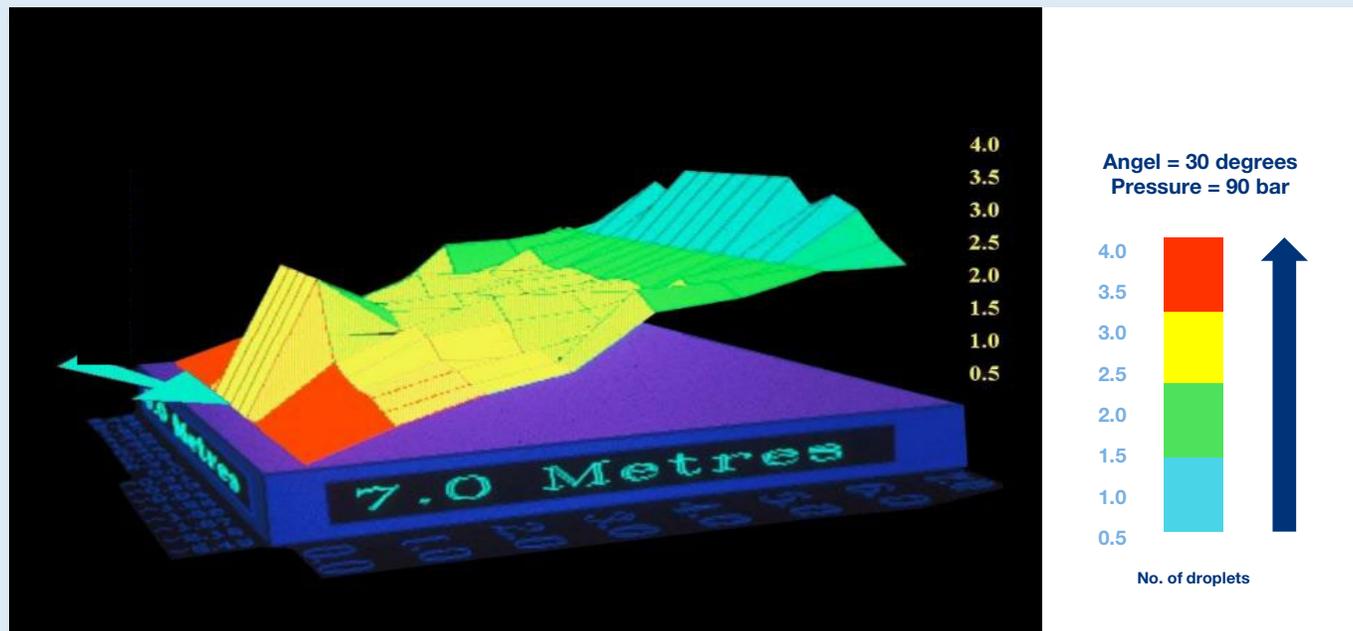


# Effective sanitation – how?

## Spread of contamination: High pressure hosing



Courtesy of Campden BRI



### Cleaning sequence:

- Remove gross debris from all surfaces.
- Clean drains and floors first, then food production surfaces.
- Allow time for aerosols to settle before disinfection/sanitization.



# Effective drain sanitation - how?

Courtesy of CampdenBRI -

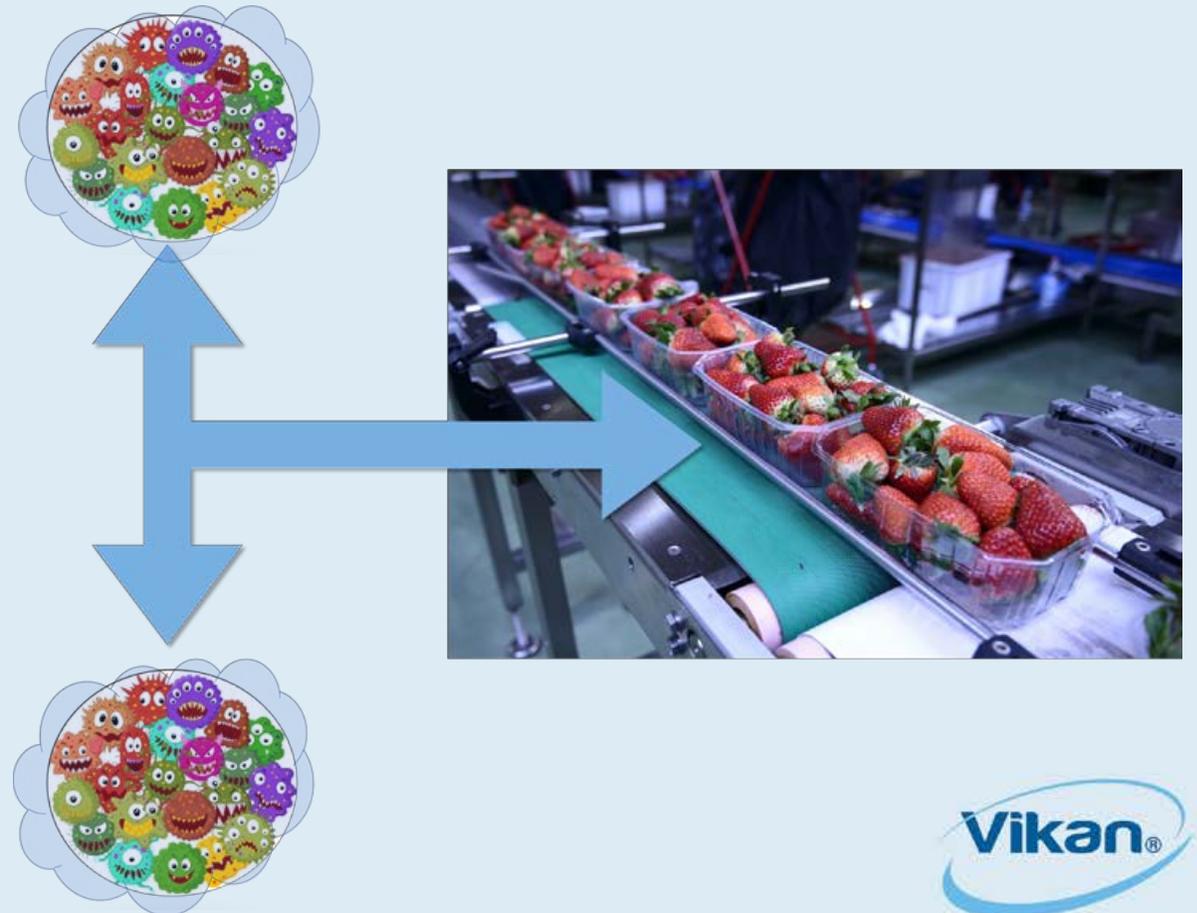


<https://www.youtube.com/watch?v=8Y7PZ-XHlys>

# Effective sanitation - how?

## Summary

- Conduct drain sanitation at a frequency that limits mature biofilm formation
- Use validated drain sanitation methods
- Choose drain sanitation equipment and methods that maximise contamination removal and minimise its spread
- Clean drains and floors first, then clean production surfaces, then disinfect/sanitize
- Avoid drain sanitation activities during production
- If you must conduct drain sanitation during production use screens to protect production surfaces from drain cleaning splashes



# Hygienic design

The ability to decontaminate something easily

## Good hygienic design principles\*

- No sharp internal angles
- All areas accessible for easy cleaning and disinfection / sanitization
  - avoid deep recesses, nooks and crannies
- Of one-piece construction, or quickly and easily dismantled / re-assembled
- Smooth surface finish
- Made of appropriate materials
  - Non-absorbent;
  - Food contact compliant
  - Temperature and chemical resistant
  - Well constructed and durable



\*EHEDG Guideline 8  
"Hygienic Equipment Design Criteria"  
<https://www.ehedg.org/guidelines/free-documents/>



<https://www.3-a.org/Knowledge-Center/E-learning-Modules/Overview-of-Principles-of-Hygienic-Design>



# Hygienic design

## Global food safety standard requirements

The logo for BRGS (British Retail Goods Standard) features the letters 'BRGS' in a bold, orange, sans-serif font. The 'G' is stylized with a white outline and a small registered trademark symbol.

4.11.6. '**Cleaning equipment** shall be:- **hygienically designed** and fit for purpose, suitably identified for intended use (e.g., Colour coded or labeled), cleaned and stored in a hygienic manner to prevent contamination'

The logo for FSSC 22000 features a green circular icon with a white swoosh on the left, followed by the text 'FSSC 22000' in a bold, green, sans-serif font.

ISO/TS 22002-1:2009 (2013) Prerequisite programmes on food safety Part 1: Food manufacturing

11.2 **Cleaning and sanitising agents and tools:** 'Tools and equipment shall be of **hygienic design** and maintained in a condition which does not present a potential source of extraneous matter.'

# Hygienic design

## Global food safety standard requirements

- New GFSI Benchmarking requirements on Hygienic Design for food processing **buildings and equipment**
  - [https://www.ehedg.org/fileadmin/News\\_and\\_Events/EHE\\_DG\\_3A\\_SSI\\_Endorse\\_New\\_GFSI\\_Hygienic-Design-Benchmarking-Requirements.pdf](https://www.ehedg.org/fileadmin/News_and_Events/EHE_DG_3A_SSI_Endorse_New_GFSI_Hygienic-Design-Benchmarking-Requirements.pdf)
- BRCv9 Global Standard for Food Safety – due for release end Aug 2022
- Includes greater focus on hygienic design in line with these new benchmark requirements.



# Biofilms in cleaning equipment

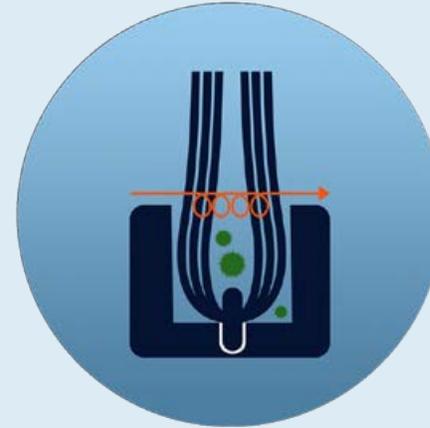
Bad hygienic design



# Biofilms in cleaning equipment

Good hygienic design

Fully moulded sanitation tools



Traditional drilled  
& stapled  
construction



UST fully  
moulded  
construction

# Cleaning tool decontamination



CampdenBRI<sup>1</sup>

- Cleaning equipment - 47% *L. mono* positive

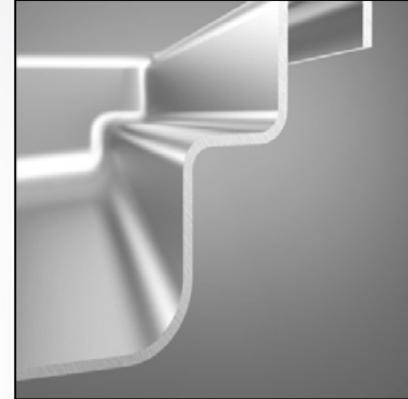
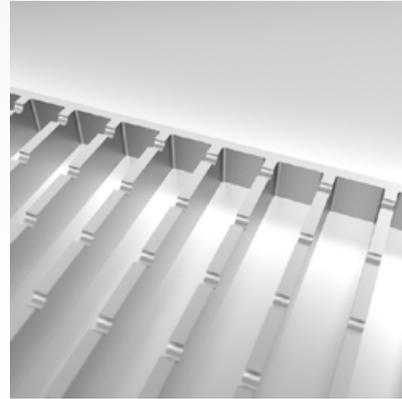
- Cleaning tools should be:
  - decontaminated,
  - inspected for damage, wear & tear, and
  - replaced, as appropriate, based on risk assessment



<http://viewer.ipaper.io/vikan/white-papers/cleaning-tool-maintenance/cleaning-tool-maintenance-whitepaper-en-300/#/>



# Hygienic Drainage for the Food & Drinks Industry



**Aidan Davey**

Food Sector Specification Specialist

**ACO Building Drainage**

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PRESENTATION

# ACO

TECHNOLOGIES  
PLC (UK)

ACO was founded over 30 years ago in the UK and the company has grown quickly on a reputation for design, innovation and customer service.



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INTRODUCTION

**Divisions of ACO  
Technologies plc (UK)**

**BUILDING DRAINAGE**

Commercial + Industrial  
Food + Drink  
Leisure + Hospitality  
Domestic

**WATER MANAGEMENT**



**ACO. creating  
the future of drainage**

# ACO Building Drainage

## Market sectors

### ■ Industrial & Commercial

- Factories, hotels, offices, airports, car parks, railways, chemical

### ■ Commercial Kitchens & Food and Drink Manufacture

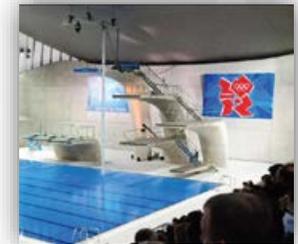
- Kitchens, food processing factories, brewing, distilleries, bakeries, restaurants, bars & pubs, coffee shops

### ■ Health, Education & Leisure

- Schools, libraries, hospitals, swimming pools, leisure centre, care homes, prisons

### ■ Domestic

- Residential developments, new house building, self-build homes



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About us



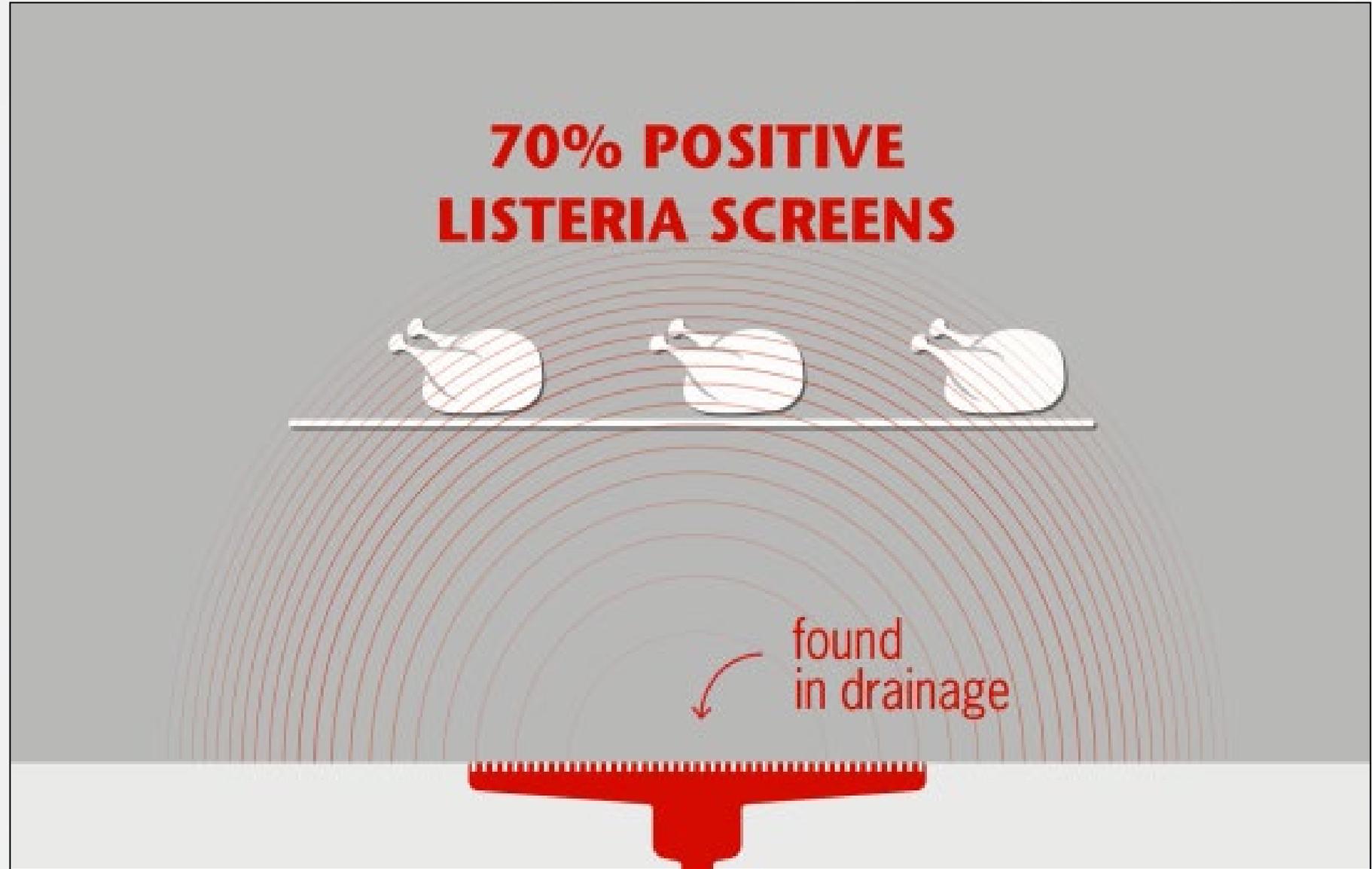
# Hygienic Drainage for the Food & Drinks Industry

- Why Drainage?
- Hygiene by Design
- Benefits

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AGENDA

# Why Drainage?



# Why Drainage?

“Floor drains in food processing facilities are a particularly important niche for the persistence of listeria and can be a point of contamination in the processing plant environment and possibly in food products”

“Drainage is a critical component affecting the hygienic performance of food production. Effective drainage helps mitigate hazards from the external environment and is central to the safe and hygienic operation internally”

*Applied and Environmental Microbiology Volume 72*

# Why Drainage?

“We report the detection of *Listeria* in 34 dairy plants. In total, 547 of food, product contact surface and floor drain samples were collected along the product lines. Nineteen cheese factories (55.8%) were contaminated by *Listeria*. *Listeria* was found in 6.8% of food samples, 11.3% of product contact surfaces and **40.6% of floor drains.**”

Food Control 29 (2013) 91-97

Food Control 29 (2013) 91-97

Contents lists available at SciVerse ScienceDirect

 **Food Control**

journal homepage: [www.elsevier.com/locate/foodcont](http://www.elsevier.com/locate/foodcont)

Short communication

Occurrence of *Listeria* spp. in dairy plants in Southern Italy and molecular subtyping of isolates using AFLP

A. Parisi<sup>a,\*</sup>, L. Latorre<sup>a</sup>, R. Fracalvieri<sup>a</sup>, A. Miccolupo<sup>a</sup>, G. Normanno<sup>b</sup>, M. Caruso<sup>a</sup>, G. Santagada<sup>a</sup>

<sup>a</sup>Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata, Foggia, Italy  
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*Listeria monocytogenes*  
*Listeria* spp.

**ABSTRACT**

We report the detection of *Listeria* spp. and *Listeria monocytogenes* in 34 dairy plants. In total, 547 of food, product contact surface and floor drain samples were collected along the product lines. Nineteen cheese factories (55.8%) were contaminated by *Listeria* spp. Of these 20.8% were *L. monocytogenes* positive. *Listeria* spp. was found in 6.8% of food samples, 11.3% of product contact surfaces and 40.6% of floor drains. *L. monocytogenes* was found in 2.4% of food samples, 4.9% of product contact surfaces and 18.8% of floor drains. Twentyfive *L. monocytogenes* isolates were serotyped using commercial specific antisera and genotyped using Amplified Fragment Length Polymorphism (AFLP) analysis. AFLP genotyping discriminated the four species of *Listeria* isolated and different genotypes for each species, moreover it could identify persistent serotypes in some dairy facilities. *Listeria* spp. and *L. monocytogenes* are widely

# Why Drainage?

*The environmental isolates are mainly obtained from floors and drains, which are known “hotspots” for the detection of *Listeria monocytogenes**

*Published by ‘SafeFood’ July 2018  
ISBN: 978-1-905767-83-0*



# Guidance

# Business regulations

## Regulations & guidance

### Food Standards Agency– useful guidance document

#### Rooms where food is prepared, treated or processed

##### Floors

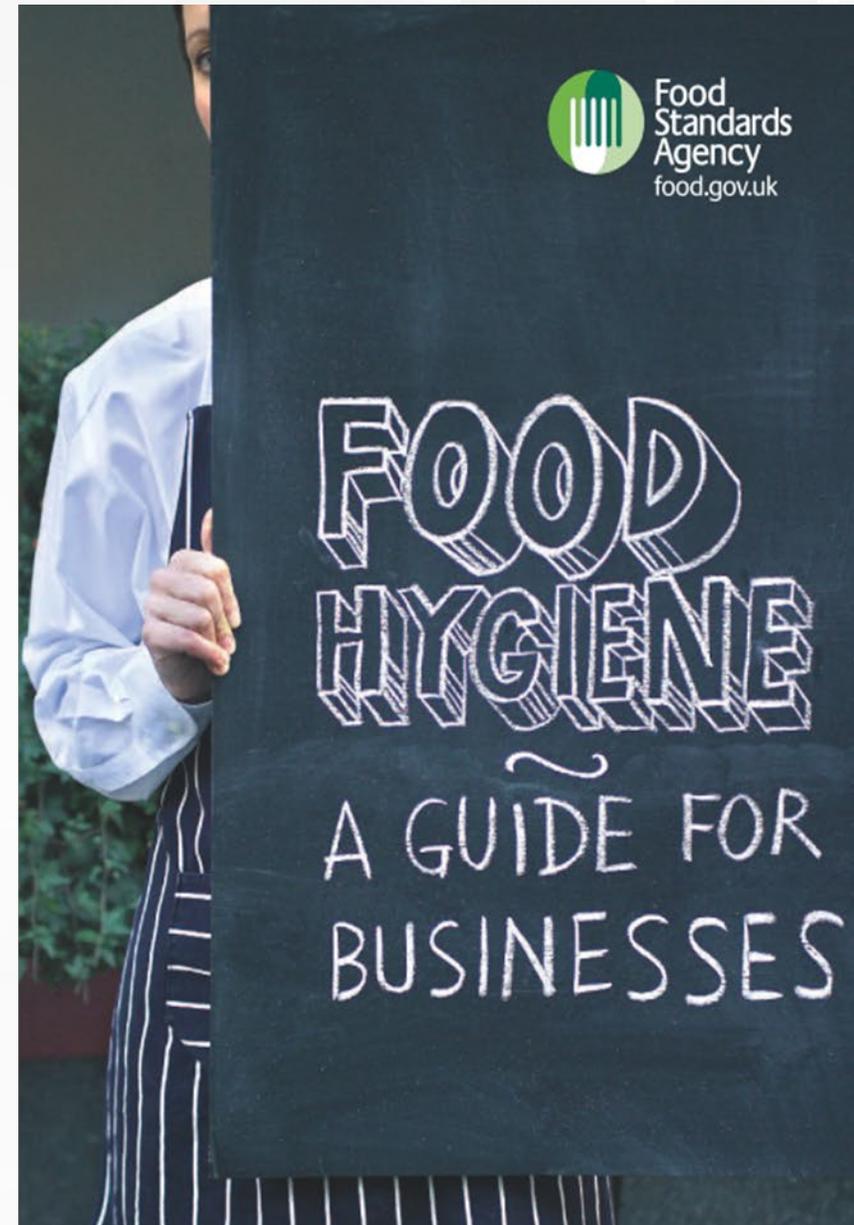
- > Floor surfaces must be maintained in a sound condition and be easy to clean and, where necessary, to disinfect.
- > This means that floor surfaces need to be made of materials that are impervious (i.e. do not allow fluid to pass through), non-absorbent, washable and non-toxic, unless you can satisfy your local authority that other materials are appropriate.
- > Where appropriate, floors must allow adequate surface drainage.

#### Other requirements

- > Drainage facilities must be adequate for the purpose intended. They must be designed and constructed to avoid the risk of contamination.

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# Guidance



# Guidance

## Business regulations



**GLOBAL STANDARD**  
FOR FOOD SAFETY

4.4.3

Drainage, where provided, shall be sited, designed and maintained to minimise risk of product contamination and not compromise product safety. Machinery and piping shall be arranged so that, wherever feasible, proces waste water goes directly to drain. Where significant amounts of water are used, or direct piping to drain is not feasible, floors shall have adequate falls to cope with the flow of any water or effluent towards suitable drainage.

# Guidance

## Important regulations

### Pre-Requisite Programme

The implementation of good hygiene and manufacturing practice:

Provide basic environmental and operating conditions

Underpin the HACCP system

Must be in place and fully operational

Is required for the production of safe, wholesome food.

#### Hygienic Infrastructure

- Hygienic design of factories
- Factory Site
- **Factory Buildings (inc. Drains)**
- Segregation
- Process Lines
- Design of equipment and utensils
- Personal hygiene
- Transport

#### Hygienic Practices

- Maintenance
- Personal Hygiene
- **Cleaning & Disinfection**
- Allergen control
- Environmental sampling methods
- Pest control
- Foreign body control
- Waste disposal



# Hygiene by Design

# Drainage philosophy

If you want the right outcome you have to do the right things:

- Product design, layout and capacity
- System integration
- Cleaning performance

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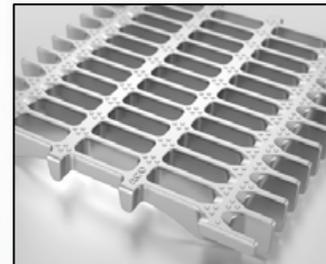
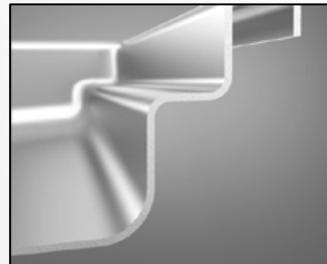
Hygienic  
drainage

# 1. Product design, layout and capacity

# Drainage philosophy

Success is in the detail

Apply standards reserved for food contact surfaces to the drainage design: EN1672 & EN ISO 14159



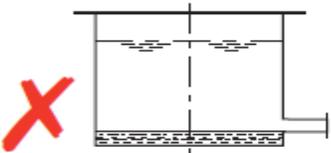
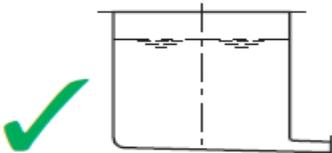
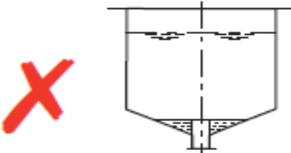
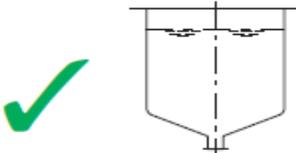
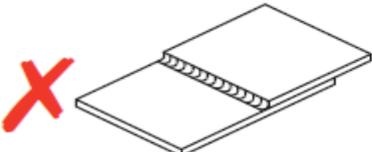
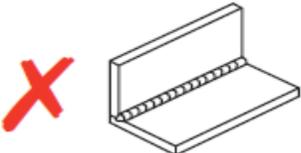
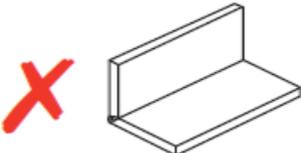
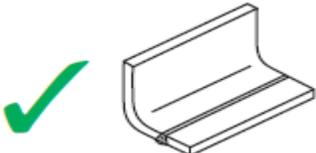
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Hygienic  
drainage

# Product design

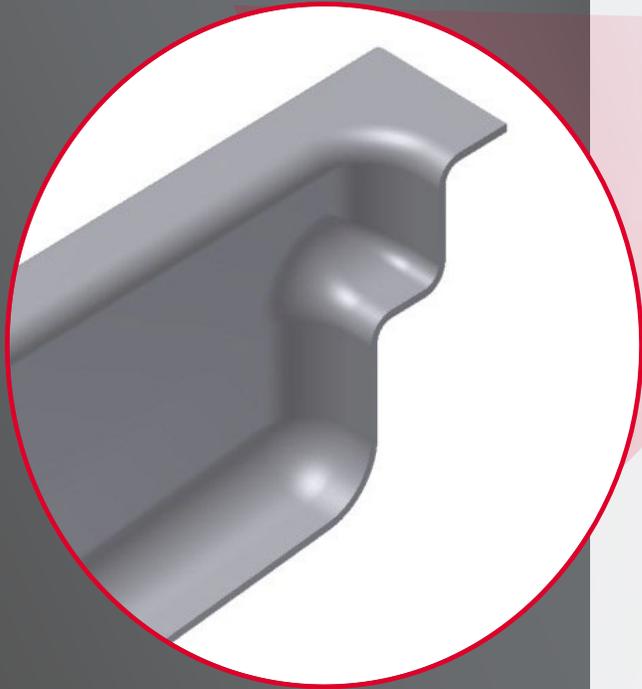
## Hygiene by design

**Avoid**

Hygiene risk according to BS EN 1672 and BS EN ISO 14159	Acceptable according to BS EN 1672 and BS EN ISO 14159
 <p data-bbox="1192 371 1396 392">Not drainable design</p>	 <p data-bbox="1717 371 1895 392">Drainable design</p>
 <p data-bbox="1192 602 1396 624">Not drainable design</p>	 <p data-bbox="1717 602 1895 624">Drainable design</p>
 <p data-bbox="1151 821 1431 842">Continuously welded lap joint</p>	 <p data-bbox="1676 821 1931 842">Continuously welded butt</p>
 <p data-bbox="1202 1049 1381 1071">Welded in corners</p>	 <p data-bbox="1702 1049 1916 1071">Round internal corner</p>
 <p data-bbox="1202 1273 1381 1295">Welded in corners</p>	 <p data-bbox="1702 1273 1916 1295">Welded in smooth area</p>

**Recommend**

# Product design

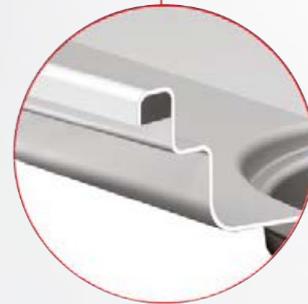


# Hygiene by design

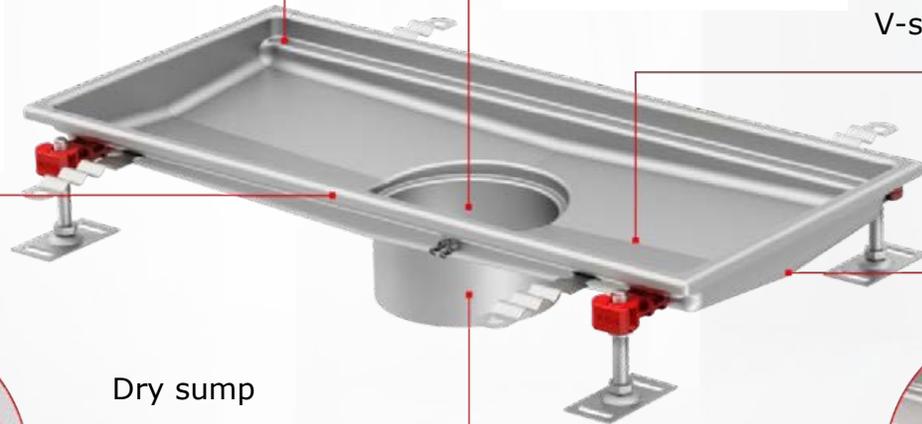
## Hygiene by design



Rounded corners



Edge in-fill



Hygienic joints

V-shape bottom

Dry sump

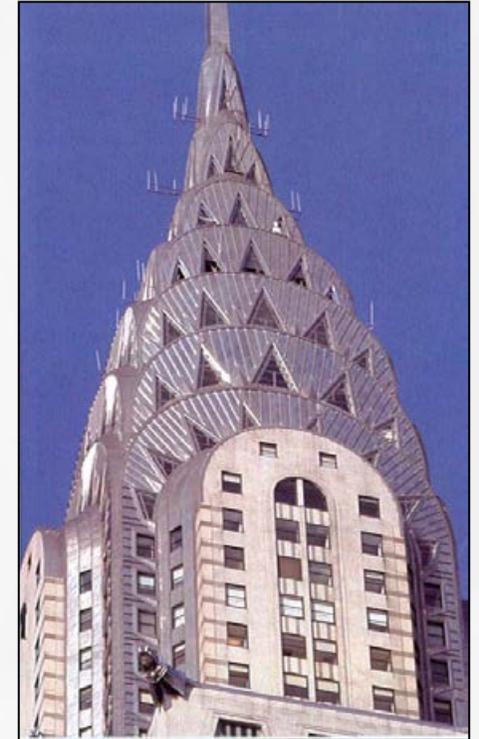


Reinforced bottom

# Product design

## Stainless Steel as a material

- There are more than 150 grades of Stainless Steel in distinct family groups
- Ferritic - Creates Iron Oxide (Rust) & is magnetic
- Austenitic – Creates Chromium Oxide & is non-magnetic
- Austenitic steel has a high level of nickel & chromium which creates a passive layer of Chromium Oxide. This passive layer seals & protects the material.
- Properly maintained austenetic steel can be easily cleaned.



Chrysler Building New York, built circa 1929

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Hygiene by  
design

# Product design

## UK Grades 304 Stainless Steel & Grade 316 Stainless Steel

	Type 304	Type 316
Carbon	0.08% max.	0.08% max.
Manganese	2.00% max.	2.00% max.
Phosphorus	0.045% max.	0.045% max.
Sulfur	0.030% max.	0.030% max.
Silicon	1.00% max.	1.00% max.
Chromium	18.00-20.00	16.00-18.00
Nickel	8.00-10.50%	10.00-14.00
<b>Molybdenum</b>	-	2.00-3.00%



All stainless steels require a minimum of 10.5% chromium and they are alloyed with iron which makes up a large proportion of their final makeup. The various other elements present though have an impact on the properties and characteristics and ultimately, cost.

316 contains a minimum 2.0% molybdenum which makes it much more corrosion resistant than 304 however, as it is a more expensive element, generally makes 316 a more expensive grade of metal.

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Hygiene by  
design

# Product design

## The correct specification of materials

- Establish **ALL chemicals** to be exposed to the drainage system – including cleaners & sanitizers
- The **concentration of the chemicals**
- **Temperature** of the solution(s) – very important & often forgotten
- **Length of time of exposure** – continual, once per day wash-down, emergency catchment only etc.



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Hygiene by  
design

Product  
design

Pickle Passivation



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Hygiene by  
design

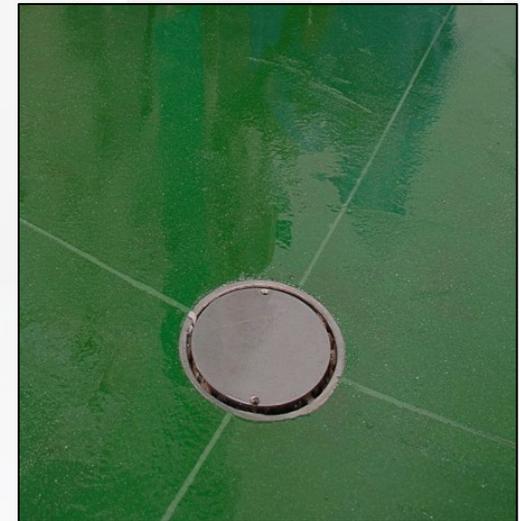
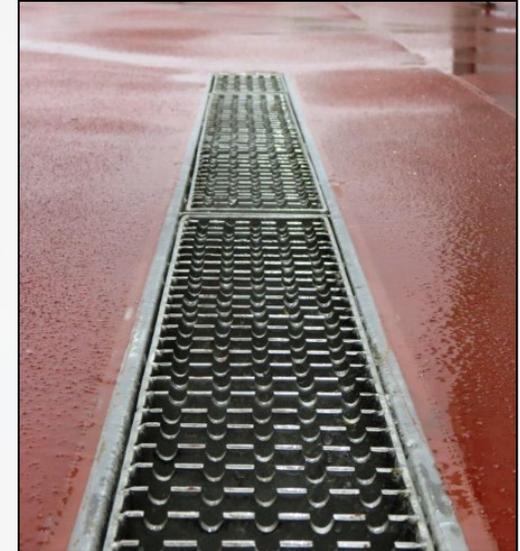
## Functionality...

Interception | Removing fluid

Transport | Pipe if possible

Barrier | From zone to zone

- Drainage design influences the floor....
- Channels tend to lead to simpler falls (min 1/60)
- Gullies tend to require more complex falls
- Layout is crucial for success
- Hydraulic capacity
- Installation and maintenance is KEY!



## Manufacturing Production Areas

### Product flow



#### Hygienic risk: **Low RISK**

Application: Raw Foodstuffs  
Hygiene not critical  
High flow rate  
Medium wastewater interception  
Slip & trip issues  
Load class

#### Hygienic risk: **High CARE**

Application: Prepared Ingredients  
Medium to high flow rate  
High wastewater interception  
Highly cleanable

#### Hygienic risk: **High RISK**

Application: Cooked & other RTE  
Finished Products  
Hygiene critical  
Low to medium flow rate  
Low wastewater interception  
Very highly cleanable  
Daily wet clean



Drainage direction

# Layout



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Hygienic  
Drainage

# Capacity



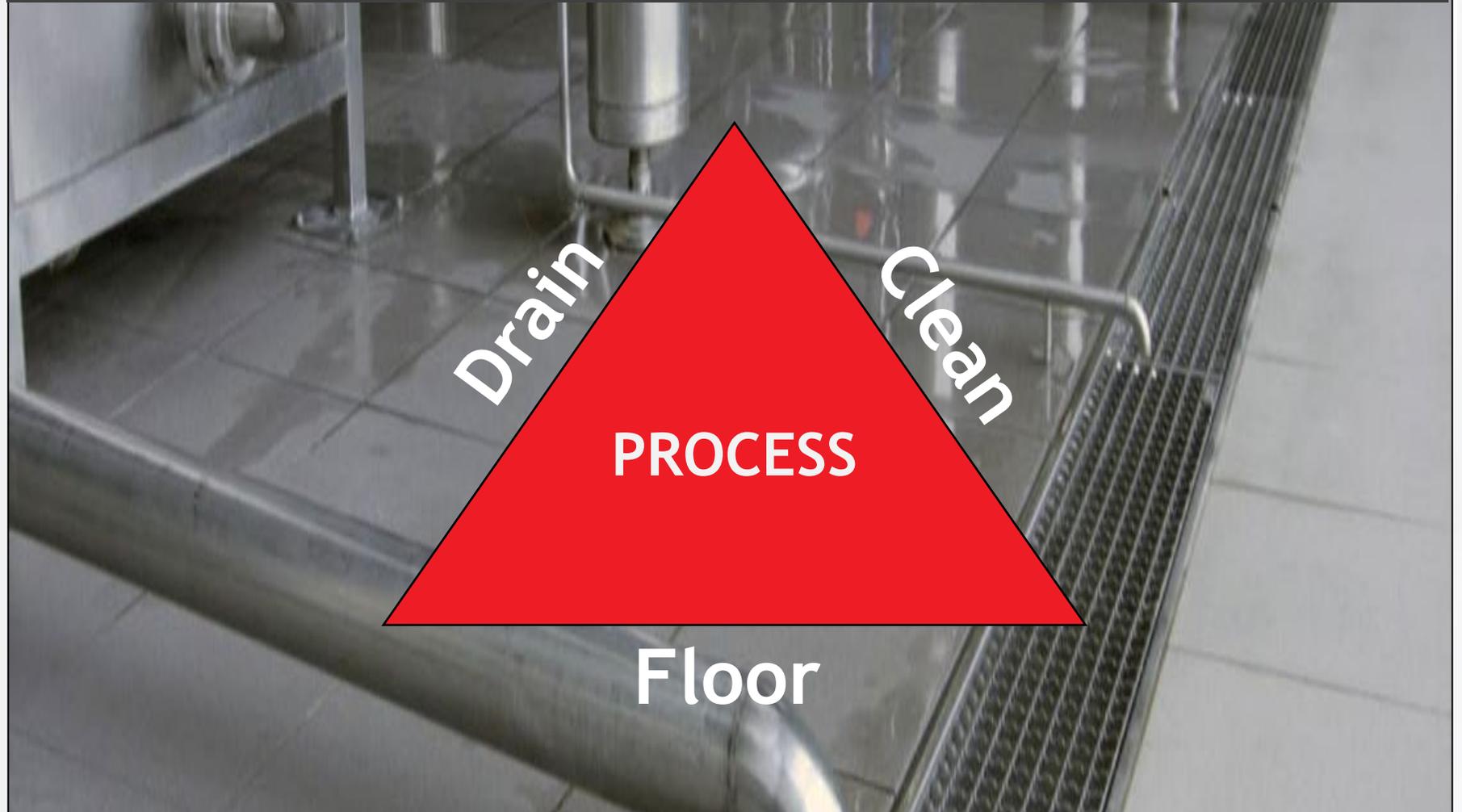
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Hygiene by  
design

## 2. System integration

Holistic  
approach to  
drainage

# Hygiene by Design



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Hygiene by  
design

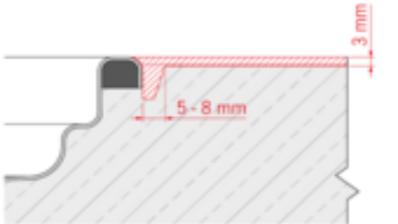
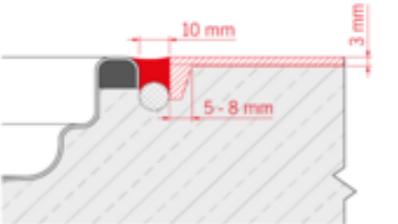
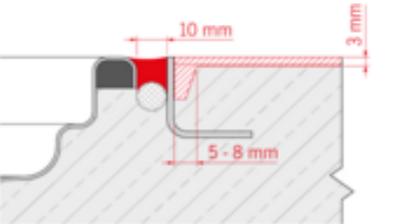
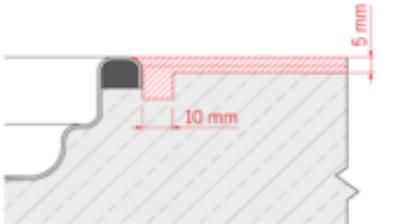
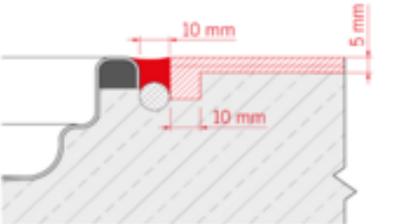
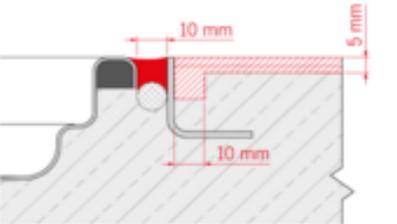
# System integration



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Hygiene by  
design

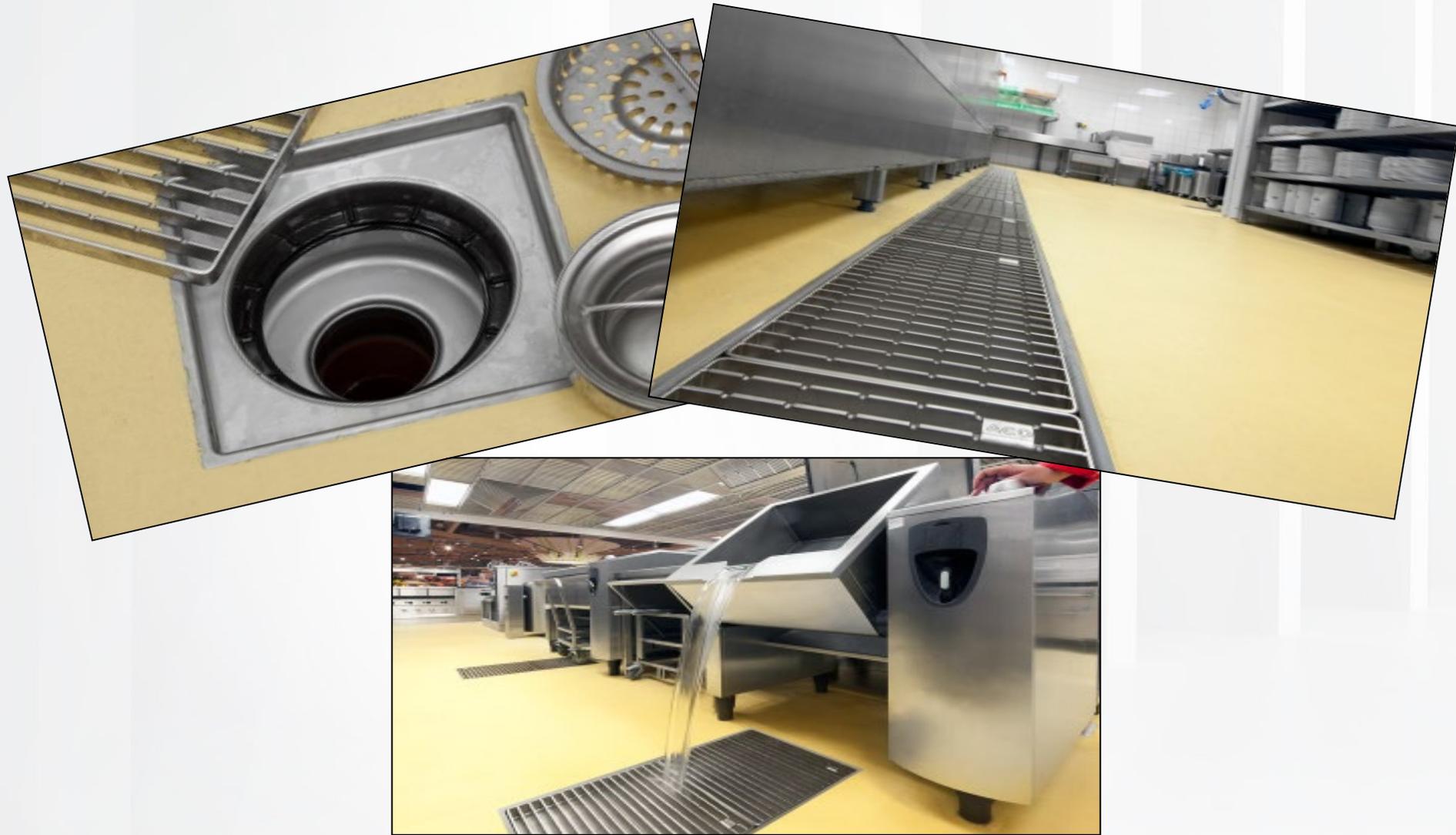
# System integration

Floor type	Resistance to exposure scenarios <sup>1)</sup>		
	<p><b>Standard edge connected directly to the floor</b></p> <ul style="list-style-type: none"> <li>Resistant to dynamic stress (thermal load &lt; +25°C)</li> <li>For areas with frequent heavy traffic</li> </ul> <p><b>Typical applications:</b></p> <ul style="list-style-type: none"> <li>Warehouse</li> <li>Corridors</li> </ul> 	<p><b>Standard edge connected to the floor with flexible joint</b></p> <ul style="list-style-type: none"> <li>Resilient to temperature extremes caused by alternating hot and cold water</li> </ul> <p><b>Typical applications:</b></p> <ul style="list-style-type: none"> <li>Cleaning in place (CIP)</li> <li>Kitchen</li> </ul> 	<p><b>L shape edge</b></p> <ul style="list-style-type: none"> <li>Resistant to both thermal and dynamic shocks</li> </ul> <p><b>Typical applications:</b></p> <ul style="list-style-type: none"> <li>Beverage production</li> <li>Packaging plant</li> <li>Bottle washing plant</li> </ul> 
<p>Sikafloor®-327 + ColoredQuartz + Sikafloor®-169</p>			
<p>Sikafloor®-21 PurCem®</p>			

- 1) The results are according to a floor to drain connection testing carried out by ACO and SIKA
- 2) Water exposure directly into the channel < +90°C (Max. exposure of the flooring system < +50°C)

Hygiene by design

# System integration

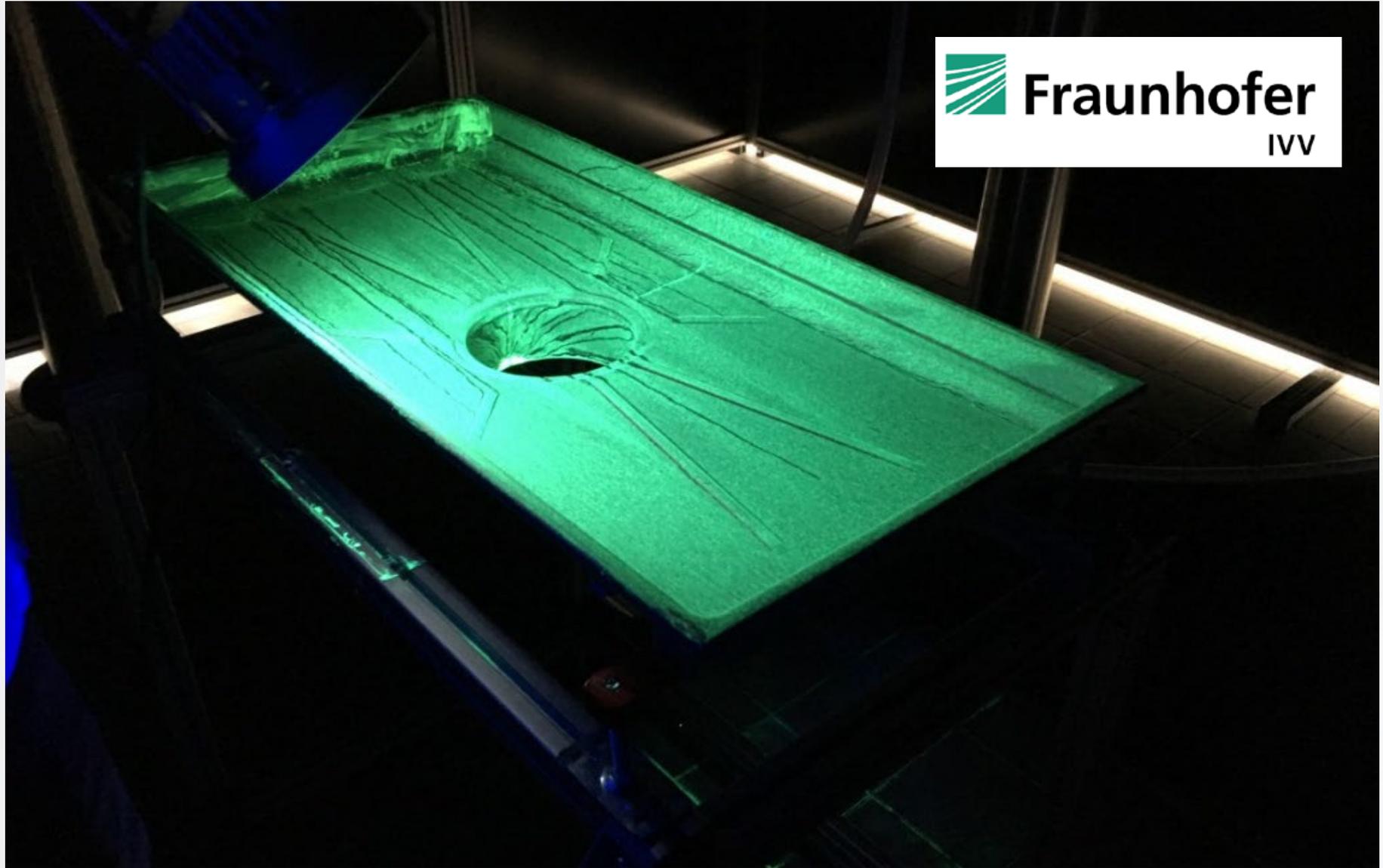


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Hygiene by  
design

### 3. Cleaning performance

# Cleaning



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Hygiene by  
design

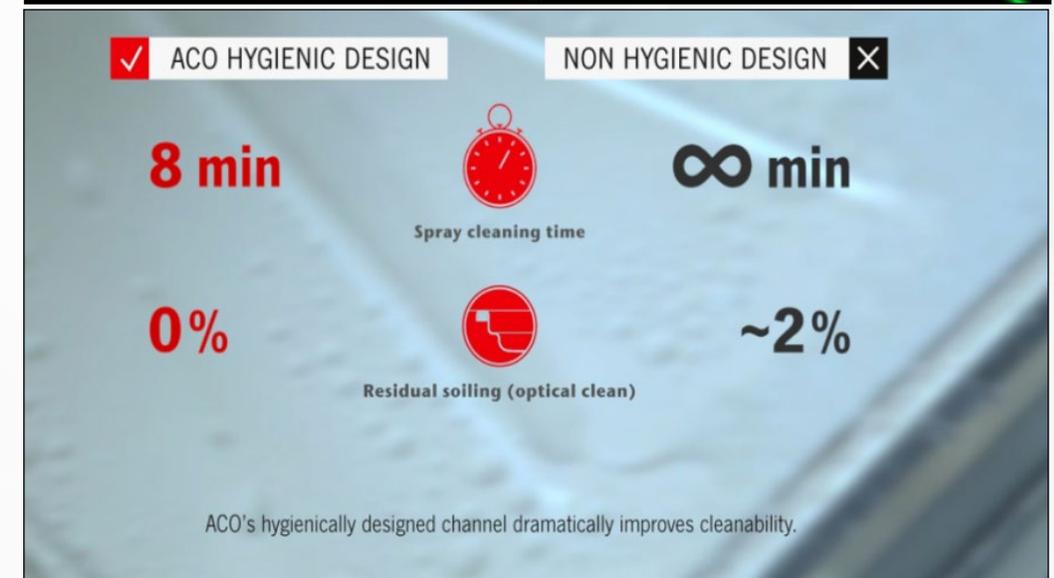
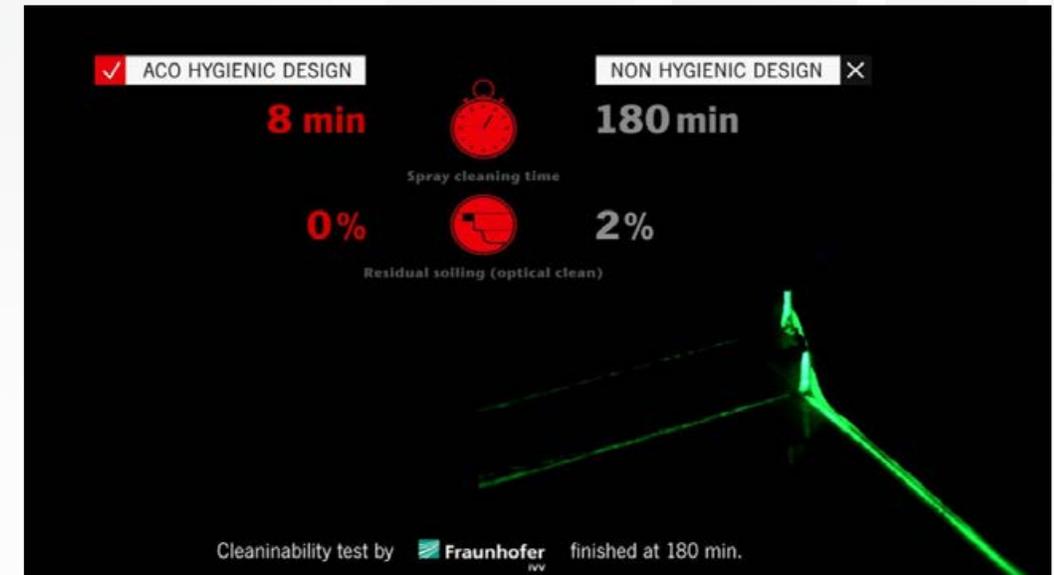
# Cleaning

## REPETITIVE TEST

- Hygienic channel was always cleaned to zero level of residual soiling.
- Non hygienic channel contained residual soiling in critical areas.

## LONG RUN TEST

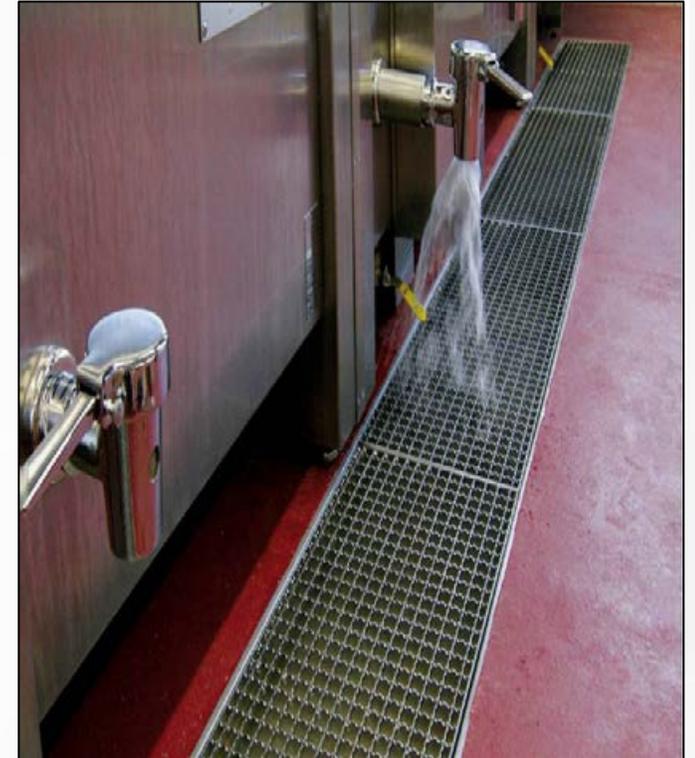
- Hygienic channel was cleaned completely
- Non hygienic channel was cleaned with extended rinsing time (up to 3 hours!) and even this there was some 2% of residual soiling.



# Benefits

# Benefits

- ☑ Reduce the risk of slips by your operatives by removing excess fluid from the floors
- ☑ Correctly specified drainage will reduce the risk of trips on drains that are bent or rocking
- ☑ Ensure grates can be removed without cutting your hands



# Benefits

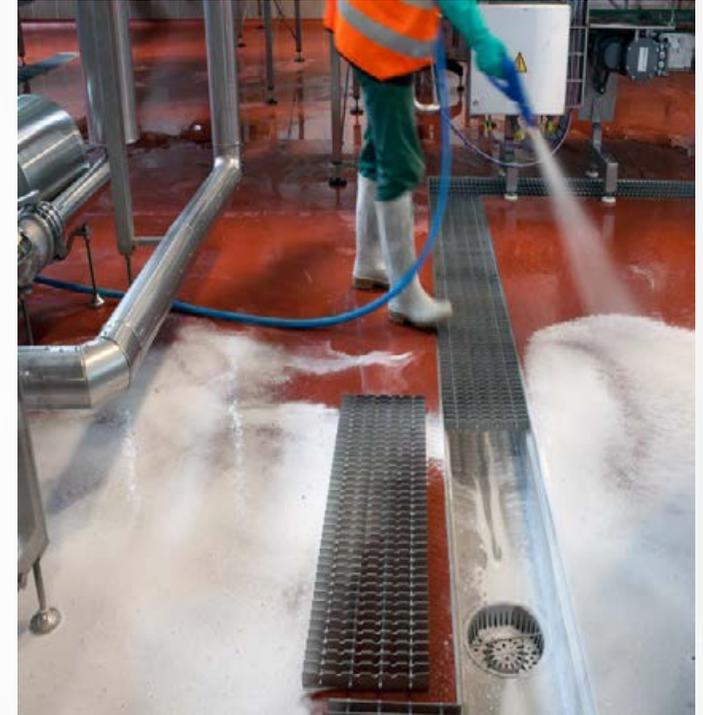


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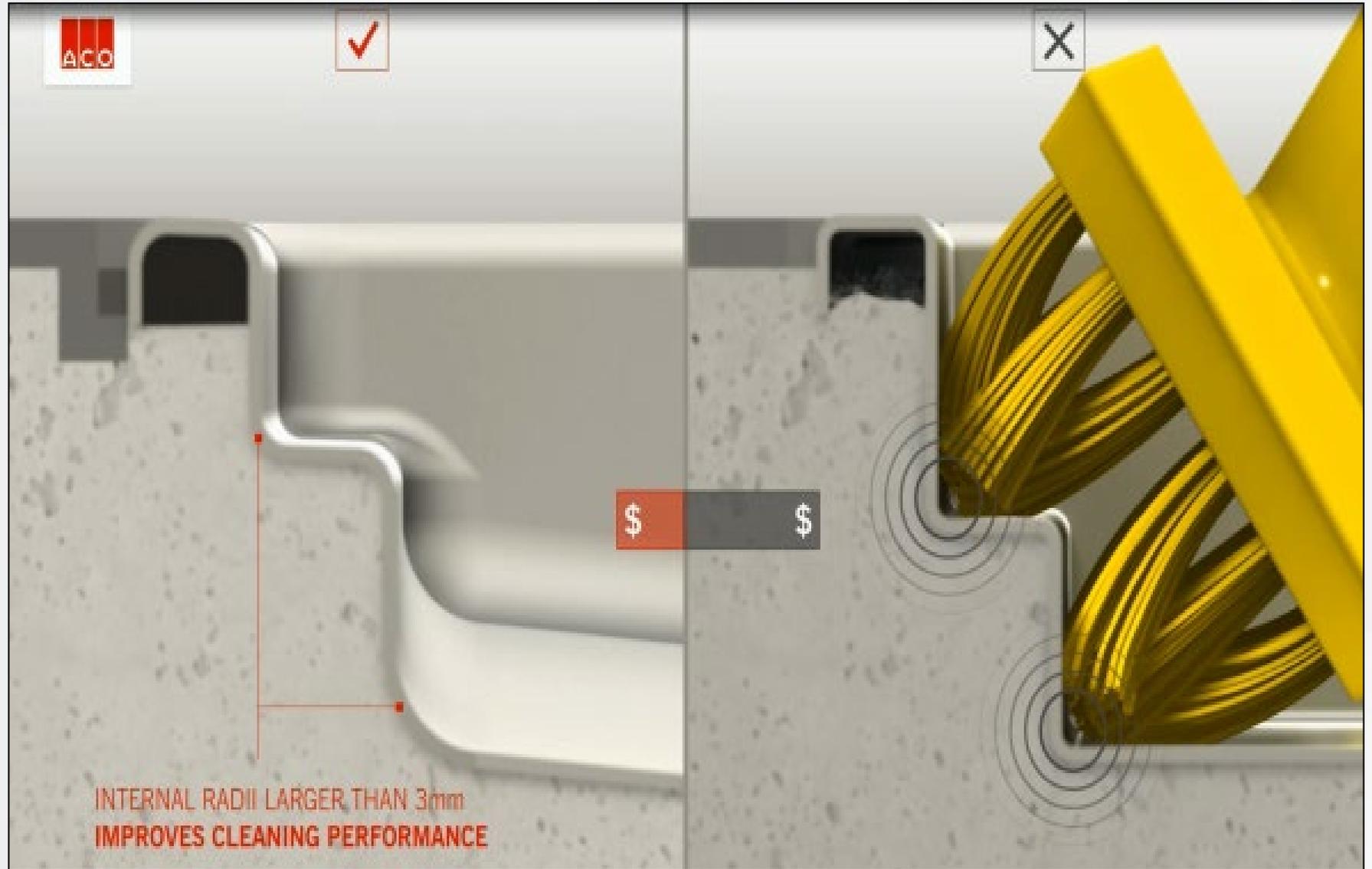
Health &  
Safety

# Benefits

- ☑ Make drainage easy to access and clean and it will get done and not ignored
- ☑ Well planned drainage will reduce your cleaning time and your cleanings costs
- ☑ Properly cleaned drainage will reduce the risk of poor hygiene



# Benefits



Creating the  
right  
outcomes...

## Hygienic Drainage



- ☑ Ignore drainage and take a risk!
- ☑ Drainage is a fundamental part of HACCP / PRP (**check it out!**)
- ☑ There is no easy solution when it goes wrong! Plan for drainage!
- ☑ The role & **specification** drainage is hugely important
- ☑ A good outcome requires linkage with **floors** and **cleaning**
- ☑ Remember to think about **drainage first** before its too late!

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Hygiene by  
design

# Top tips for biofilm control

## 1. Understand your biofilm challenges

- Where and how biofilms are formed
- Why they are such a problem

## 2. Back to basics

- Understand the decontamination process - a joint task force approach
- Cleaning is an essential pre-requisite to effective disinfection/sanitization
- Appropriate frequency is key

## 3. Use appropriate controls

- Chemical
- Methods
- Equipment

## 4. Understand the importance of

- Hygienic design
- Good installation, and regular inspection, replacement, maintenance and repair of equipment and facilities, especially sanitation tools and drains! based on risk assessment.



# Further information and support



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Please visit:  
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Food Sector Specification Specialist

**ACO**  
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Please visit:  
<https://www.aco.co.uk/food-&-drink-manufacturing>

A screenshot of the Vikan Biofilms Hub website. The page has a dark blue header with the text "Biofilms Hub" in white. Below the header is a navigation bar with the Vikan logo and links for "Products", "Sectors", "Services", and "About Us". There is a search bar and a "Book a meeting" button. The main content area features a large image of a red brush cleaning a surface. Text on the page includes "Biofilms", "Manual cleaning has never been more important!", and "Mechanical action – an essential factor in biofilm removal". At the bottom of the screenshot, the URL <https://www.vikan.com/uk/services/biofilms/> is displayed in white text on a dark blue background.

# Vikan Food Safety Webinar Series

What's Next?



## Topic:

Dry Cleaning

## Date & Time:

25th August 2022,  
3 PM CEST (9 AM EST)

## Presenter:

Deb Smith, Vikan



Questions?

