

Institute of
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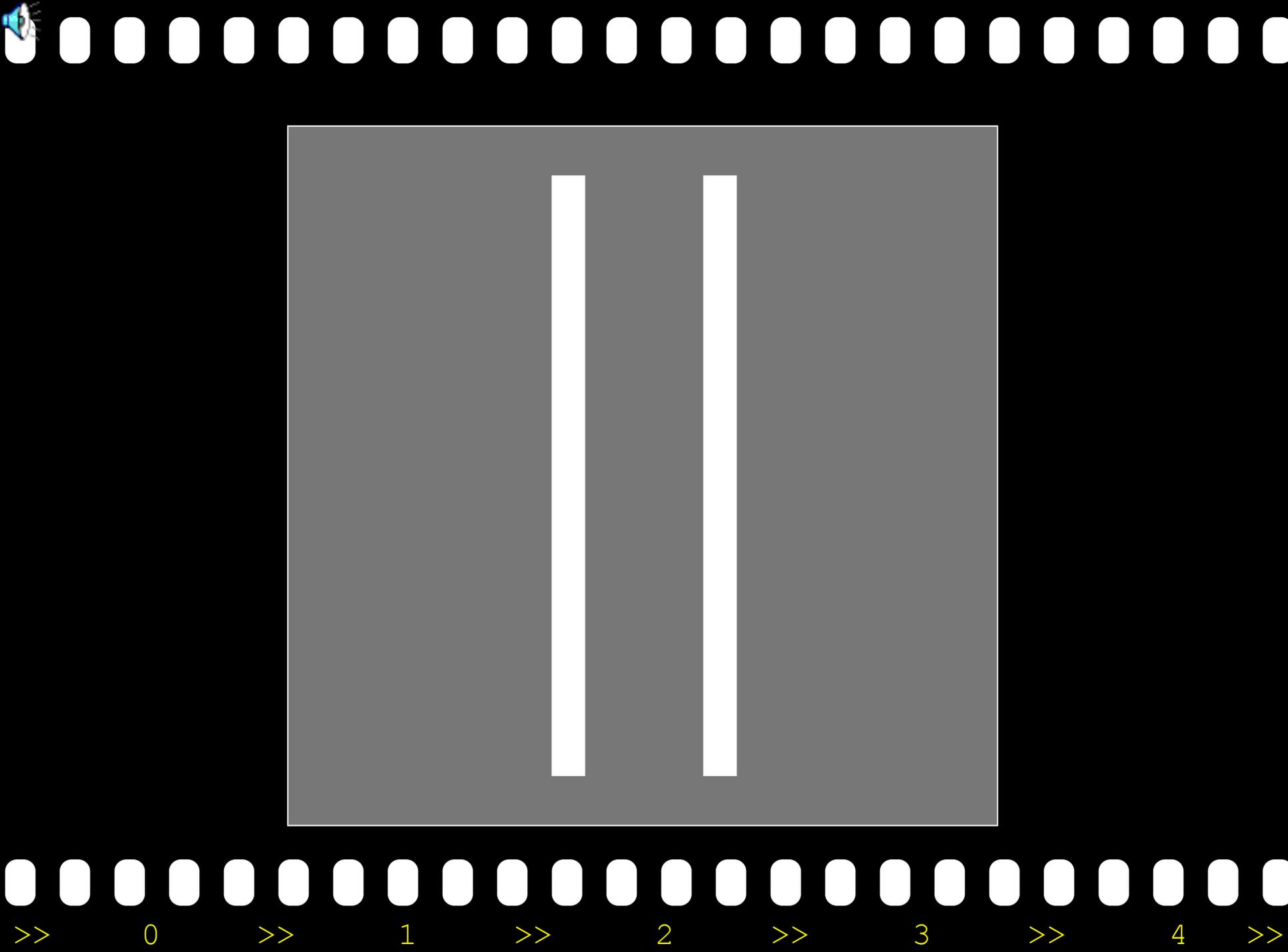
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Hygiene by Design



Building Drainage

Drainage!

Raising the profile...





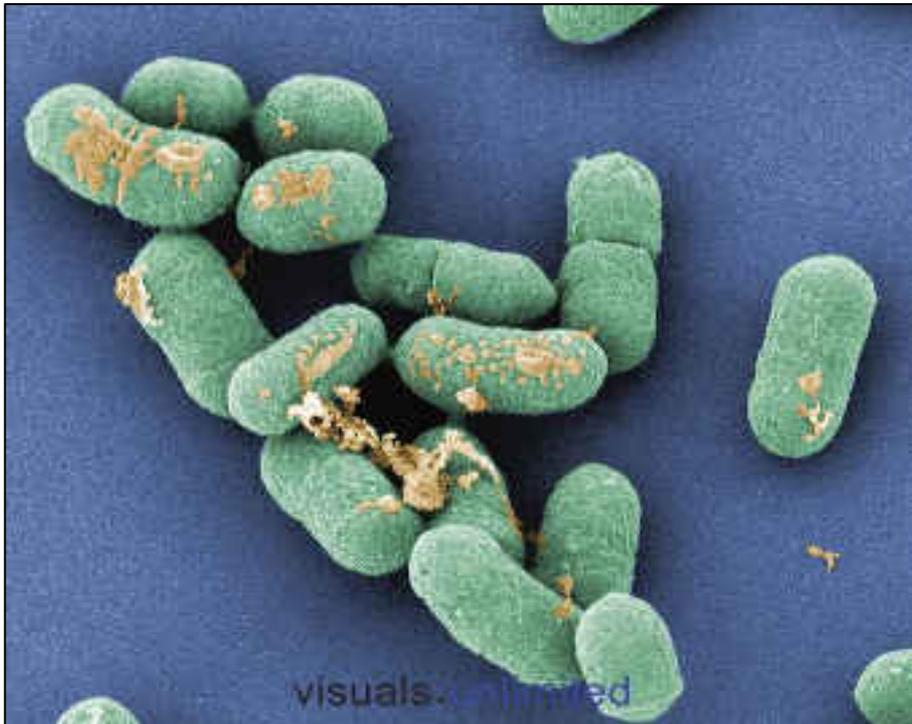
Why hygiene?



THE  TIMES

Contaminated
sausages 'kill 15
people' in Denmark
listeria outbreak

Why Drainage?



Because it matters...

and there is a link!



**Food Control 29
(2013) 91-97**

“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 Safety News

Breaking news for everyone's consumption

Home Foodborne Illness Outbreaks Food Recalls Food Politics Events Subscribe About Us

K-State Food Safety Professor: Don't Take Chances With Listeria

BY NEWS DESK

Listeria contamination in just two months, and a Kansas State University food safety specialist says the bacteria typically not associated with the place. Because it survives in cold, wet environments, it can be found in drains or other areas of condensation within a plant.

"Listeria is a group of bacteria that can multiply under refrigerated conditions."

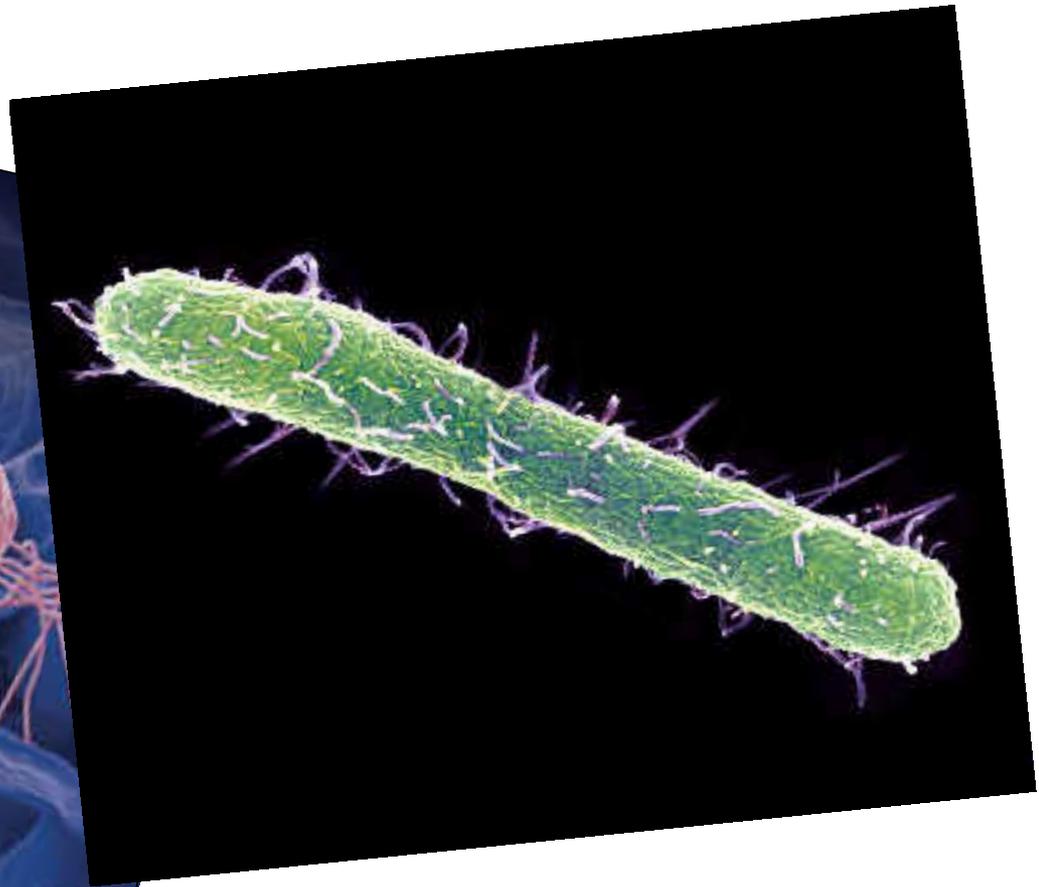
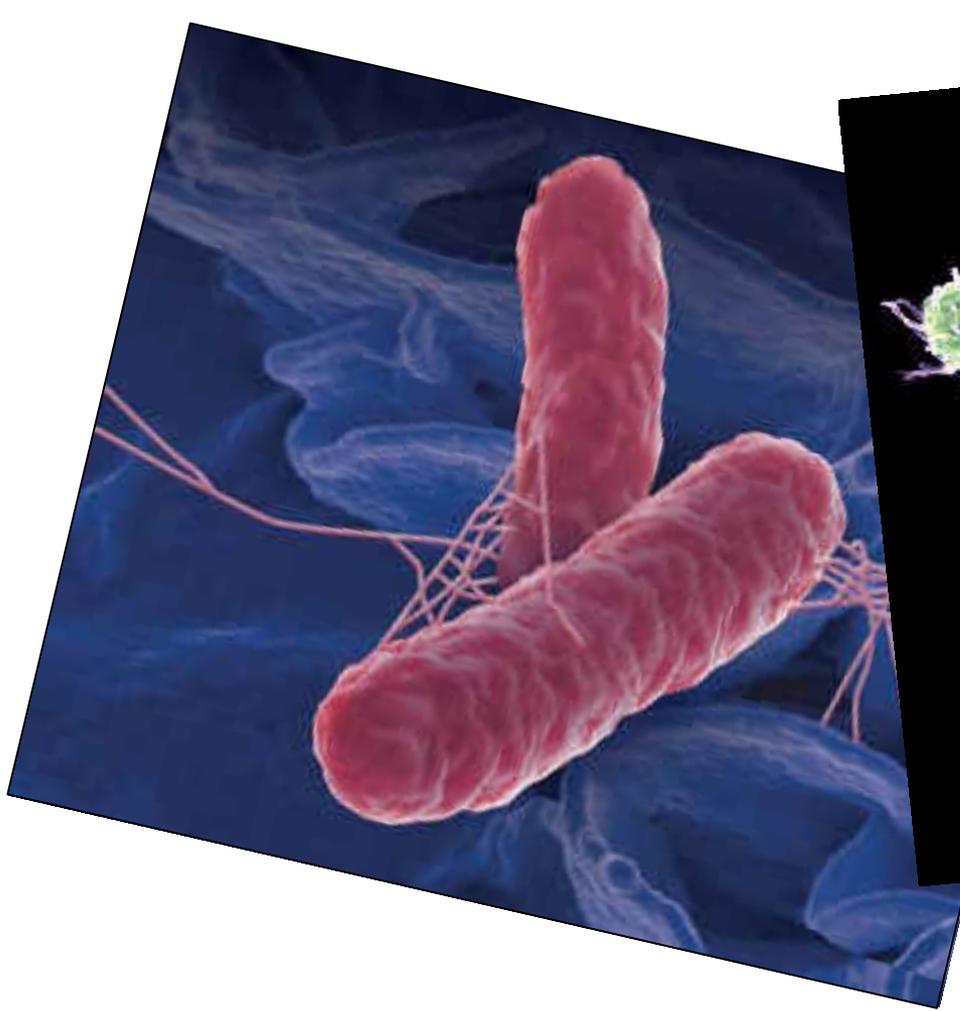
...in just two months, and a Kansas State University food safety specialist says the bacteria typically not associated with the

...Fadi Aramouni, a food safety specialist and professor of food science, says the bacteria is they actually

This bacterium can be deadly

Don't take chances.





Listeria & drains...

- 10,000 environmental swab samples in high risk for Listeria
- Levels
 - Cleaning equipment 47%
 - Drains 23%
 - Floors 17%
 - Food production surfaces 2%



“Floor drains in food processing facilities are a particularly important niche for the persistence of listeriae 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

Drain Interface



The cause of
factory
closure....!

Campden BRI 
food and drink innovation

BRITISH STANDARD

**BS EN ISO
22000:2005**

**Food safety
management systems —
Requirements for any
organization in the food
chain**



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.

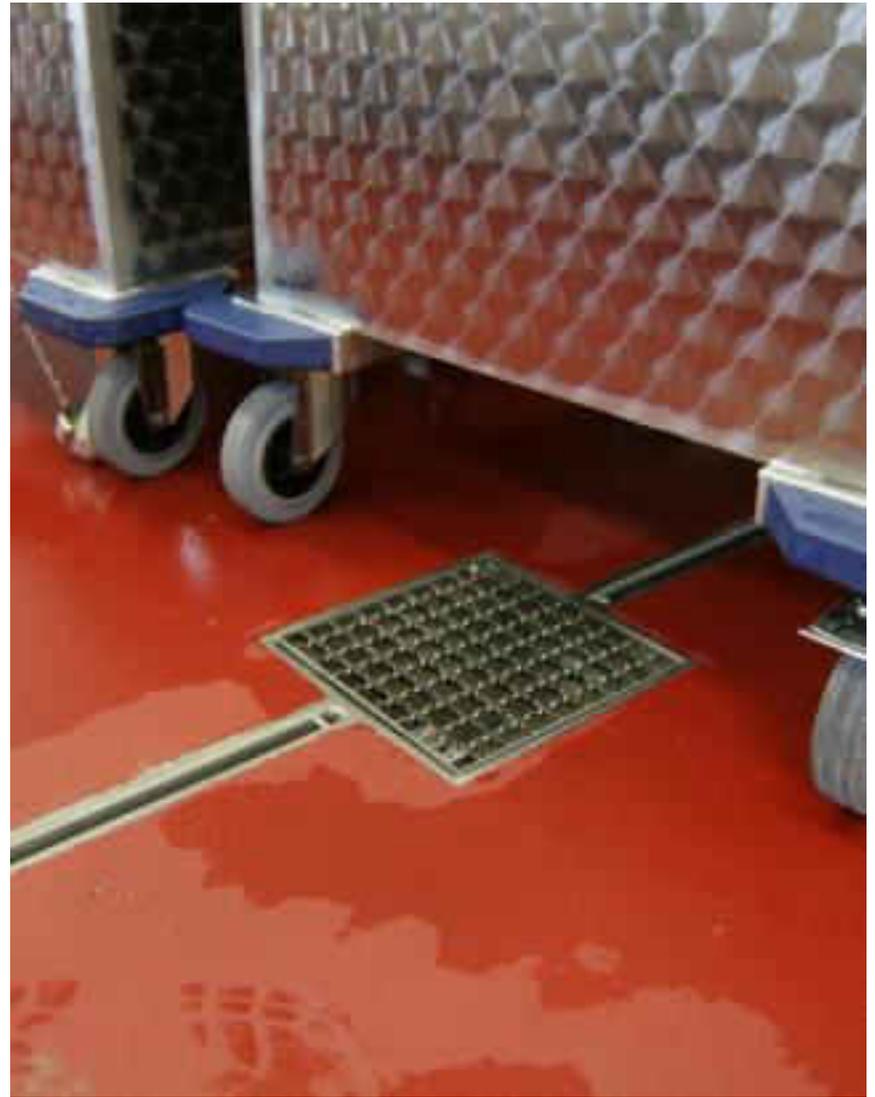
Hygienic Infrastructure

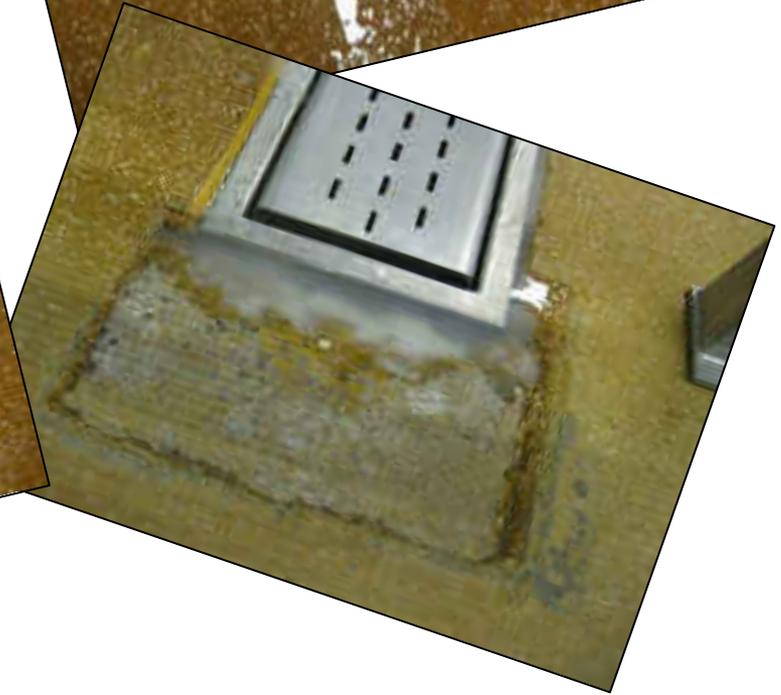
1. Hygienic design of factories
2. Factory Site
3. **Factory Buildings (inc. Drains)**
4. Segregation
5. Process Lines
6. Design of equipment and utensils
7. Personal hygiene
8. Transport

Hygienic Practices

1. Maintenance
2. Personal Hygiene
3. **Cleaning & Disinfection**
4. Allergen control
5. Environmental sampling methods
6. Pest control
7. Foreign body control
8. Waste disposal







Design Issues...

- Area of application
 - Hygiene requirement
 - Loading issues
 - Use (fluid type)
- Grating requirements
- Capacity (Hydraulic)
- Installation & Cleaning
 - Thermal shock
 - Chemical attack
- **Change of use | Durability | Future Proof**

Understand the relative importance of the issues to make the correct specification...

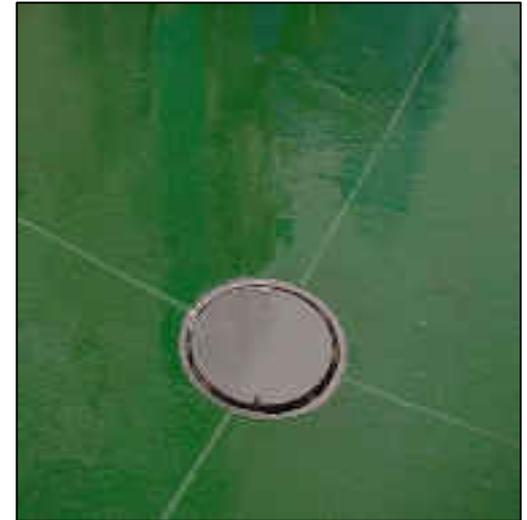
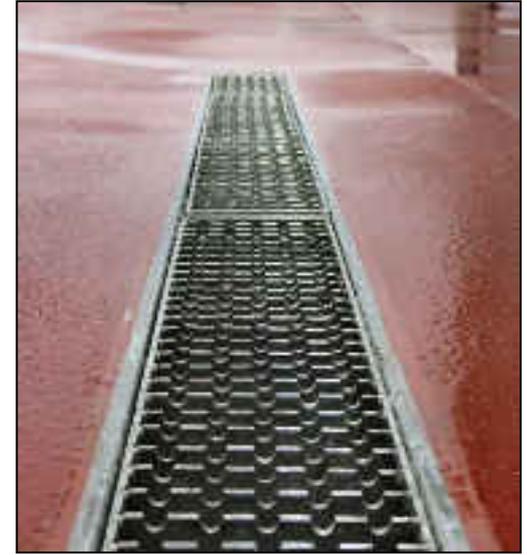


Functionality...

- Interception
- Conveyance
- Barrier

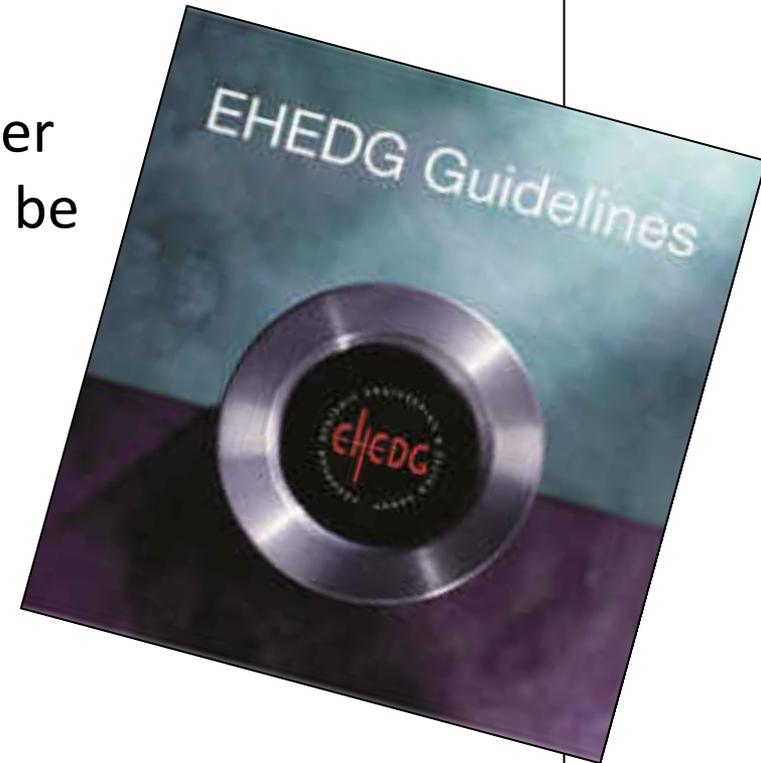
The choice of drainage influences the design of the floor....

- » Channels tend to lead to simpler fall design.
- » Gullies tend to require more complex fall design.
- » Impacts floor design and functionality.



2015

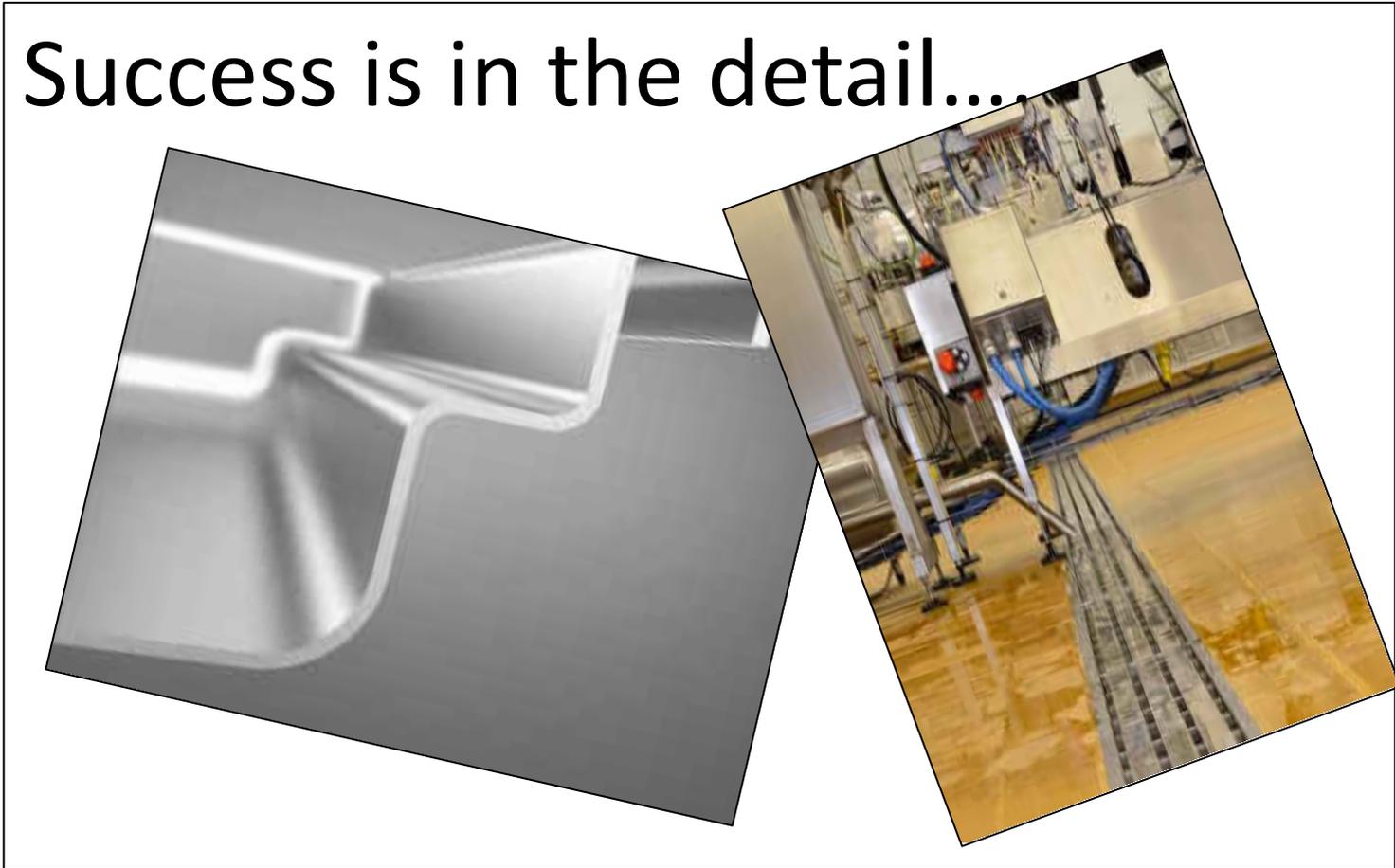
- Guidance documents now number **44** with the latest information to be launched
- “Hygienic Principles for Food Factories”



Helping Hygiene | Drainage

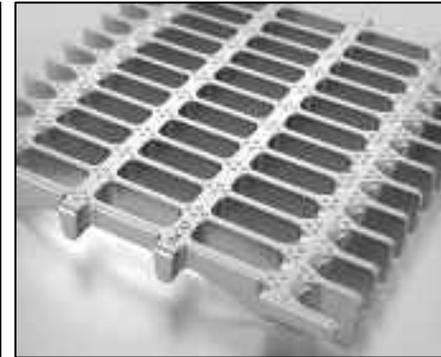
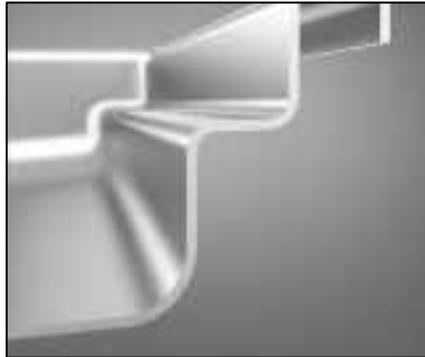


Success is in the detail...



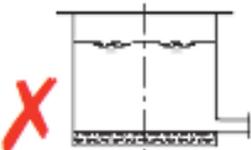
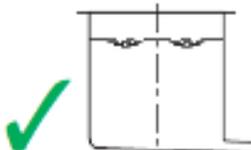
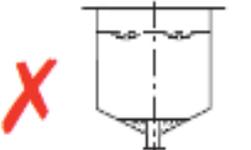
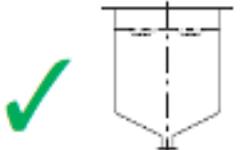
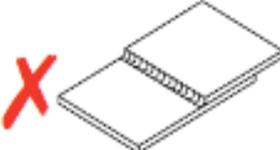
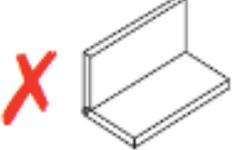
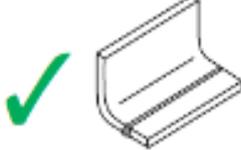
Helping Hygiene | Drainage

- Apply standards reserved for food contact surfaces EN 1672 and EN ISO 14159 to the drainage design.



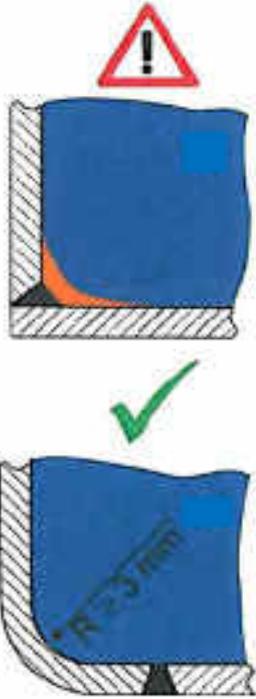


Avoid

Hygiene risk according to BS EN 1672 and BS EN ISO 14159	Acceptable according to BS EN 1672 and BS EN ISO 14159
 Not drainable design	 Drainable design
 Not drainable design	 Drainable design
 Continuously welded lap joint	 Continuously welded butt
 Welded in corners	 Round internal corner
 Welded in corners	 Welded in smooth area

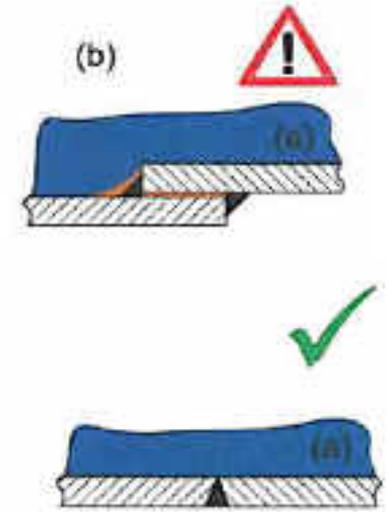
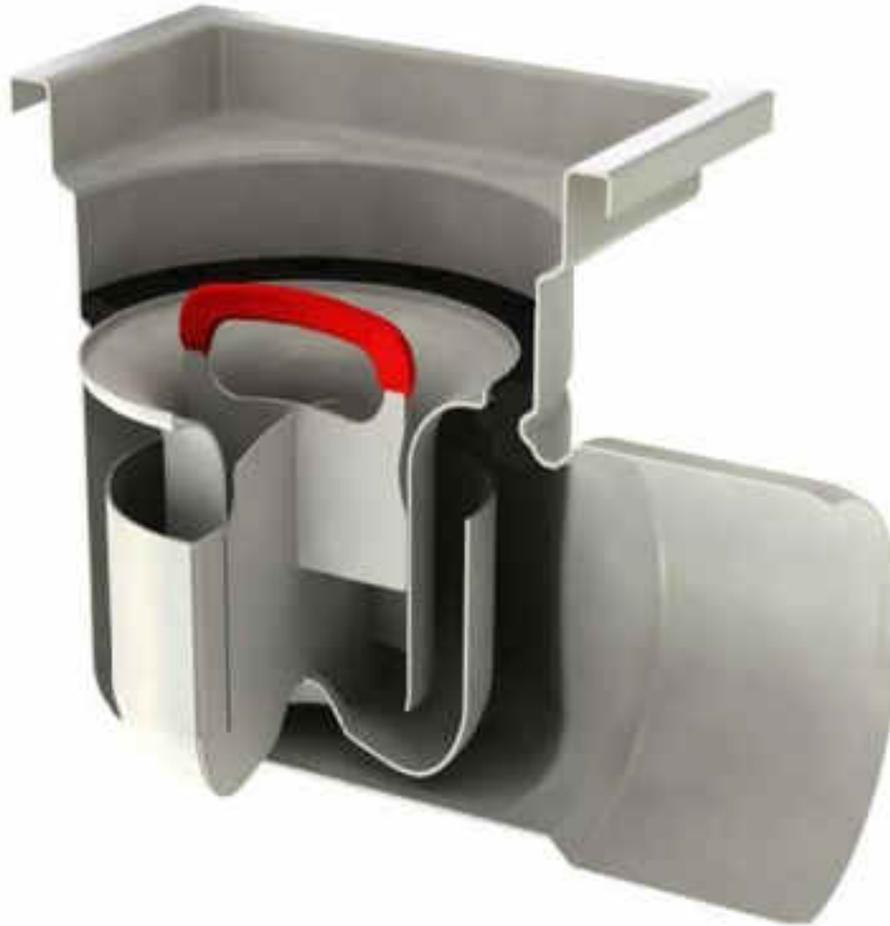
Recommend

Helping Hygiene | Drainage



Rounded component features generated using advanced deep-drawn metal cold forming techniques

Helping Hygiene | Drainage

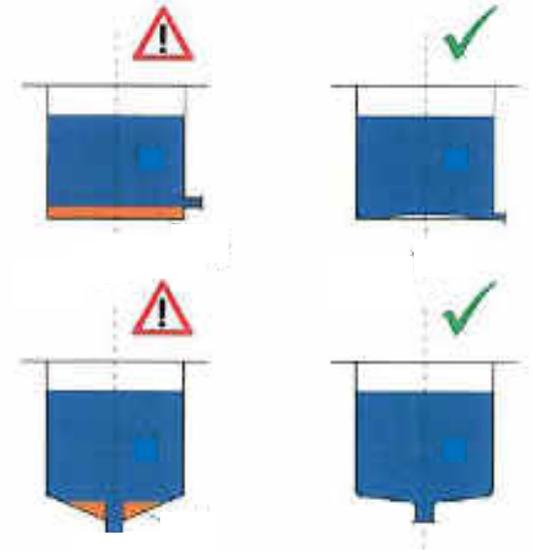


Deep drawn forming used to minimise welded joints

Lapped joints eliminated using advanced robotic automated welding techniques

Helping Hygiene | Drainage

Good gully design eliminates residual standing wastewater in body



Helping Hygiene | Design

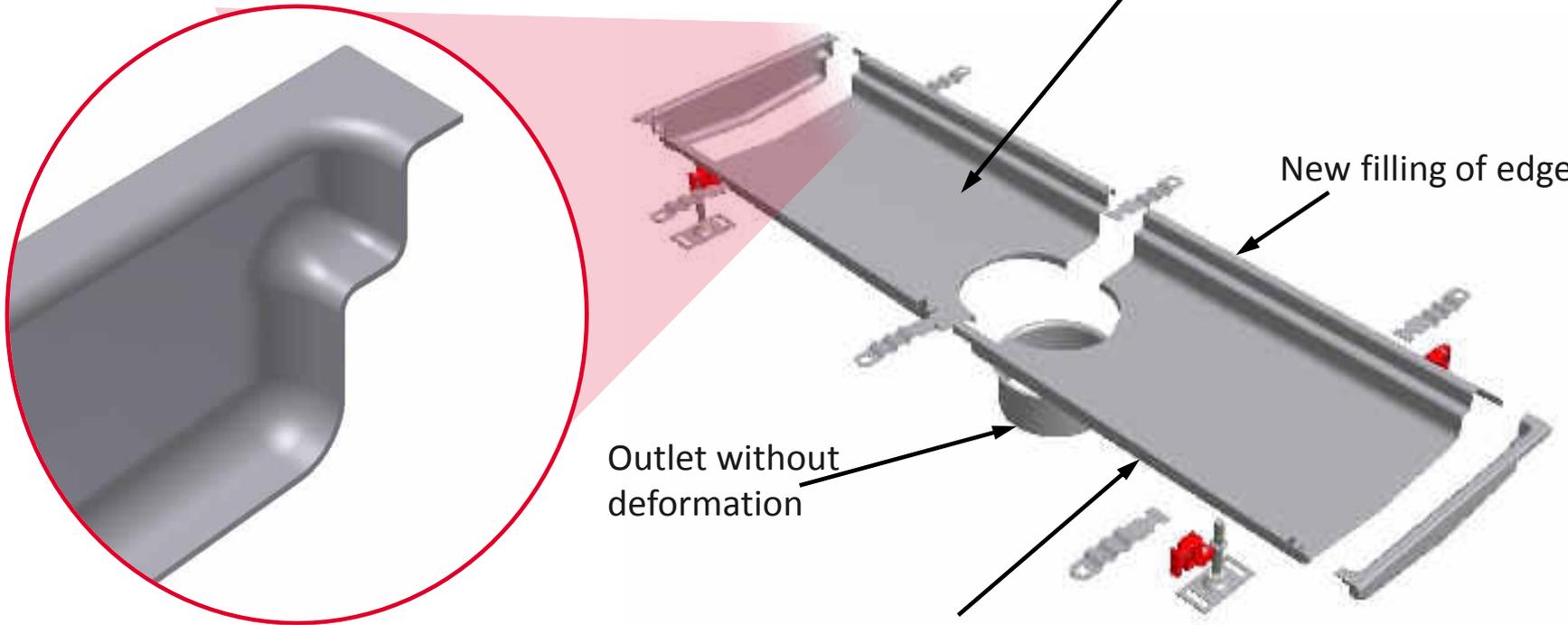
Round corners
minimal 3 mm

Minimal slope 1%
longitudinal and cross
on all areas

New filling of edge

Outlet without
deformation

Reinforced bottom
for width > 300mm



Helping Hygiene | Pickle Passivation



BS EN 2516 - Passivation of Corrosion Resisting Steels and Decontamination of Nickel Base Alloys

Helping Hygiene | Health & Safety



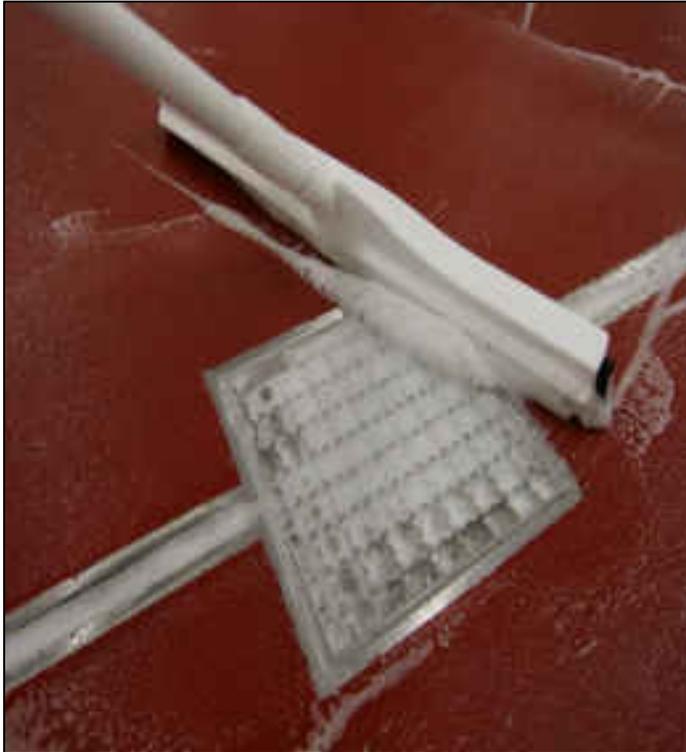
- ☑ Reduce the risk of slips by your operatives by removing excess fluid from the floors
- ☑ Correctly specified drainage will reduce the risk of trips on drains that are bent or rocking
- ☑ Ensure grates can be removed without cutting your hands

Helping Hygiene | Operational Cost



- ☑ 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

Helping Hygiene | Specification



- ☑ Choosing the right steel
- ☑ Welding Process
- ☑ Pickle Passivation
- ☑ Product design considerations
- ☑ PAS99 Certification
- ☑ Food industry knowledge
- ☑ Operational considerations

Hygiene by Design

Drain

Clean

PROCESS

Floor





Hygiene by Design | Key Messages

- ☑ Ignore drainage and take a risk!
- ☑ Drainage is a fundamental part of HACCP / PRP
- ☑ 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 | IFST | February 2016

