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Presents

Cleaning solutions that make a difference

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We never compromise our Cornerstones

... ultimate hygiene

... at reduced cost

... with reduced environmental impact

... in an improved working setting

.. that harmonize with demands

Society

- Safe food
- Reduced cost
- Environmental impact
- Ergonomics & sick leave

Industry

- Safe food
- Reduced cost
- Environmental impact
- Ergonomics & sick leave

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Supporting Trends

- **Water is scarce!**
- **Water is expensive!**
- **Energy is expensive!**
- **Chemicals are needed!**
- **Waste is a costly problem!**
- **Work related illnesses are unnecessary!**
- **Time is money!**

Legislation - a Friend or Foe?

A Guiding Star to R&D

Keeps the Industry Honest

- **Hygiene standards**
  - **HACCP, BRC, GMP, ISO 2200**
  - **Audits**
- **Environment**
- **Energy and water consumption**
- **Ergonomical solutions and working environment**

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EFSA Says....

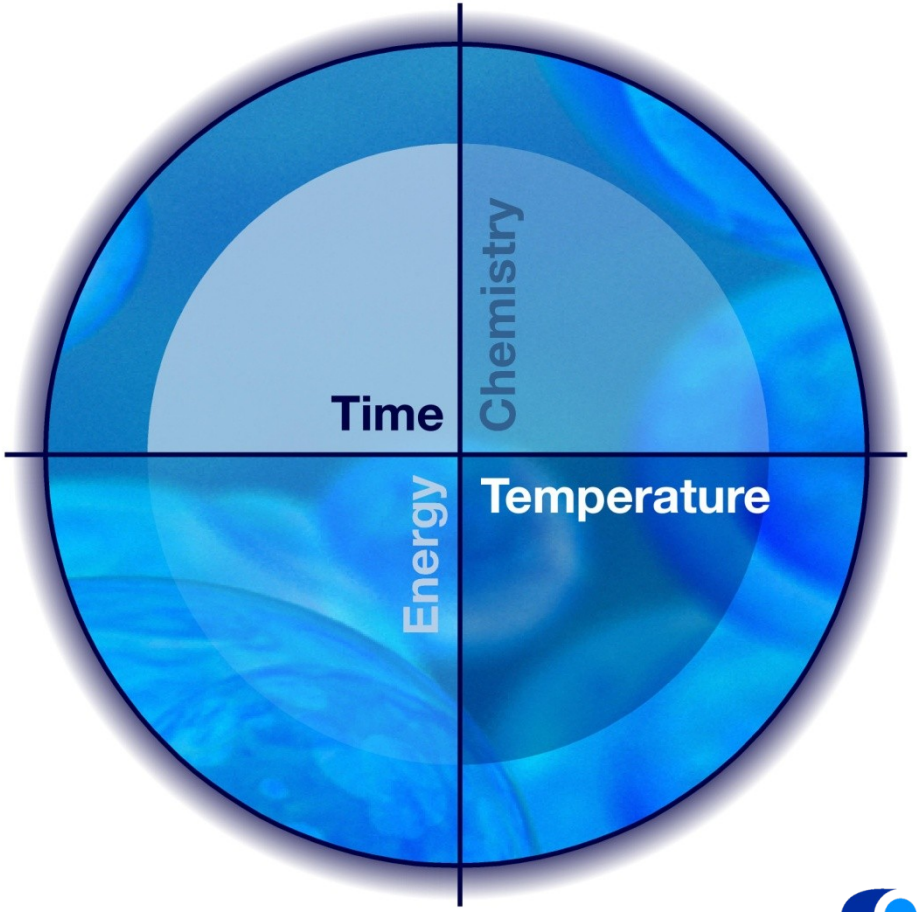
- 10/11/2006 - **Food processors should be monitored to ensure they apply proper manufacturing and hygienic practices throughout their plants says an EU food safety panel.**

The recommendation is one of a series of opinions published yesterday by the European Food Safety Authority (EFSA) as part of the bloc's programme to prevent and reduce animal diseases that can be transmitted to humans. Such foodborne zoonoses, such as Salmonella enteritidis, Campylobacter spp. and Listeria monocytogenes, cause about 380,000 EU residents to fall sick each year.

- The recommendations, some of which deal with in-plant processes, are sent to the European Commission and the bloc's legislative bodies, and if approved, could result in new regulations for the food industry.

Food Quality News 17/11/2006

Lagafors =
Clean with Optimized Parameters



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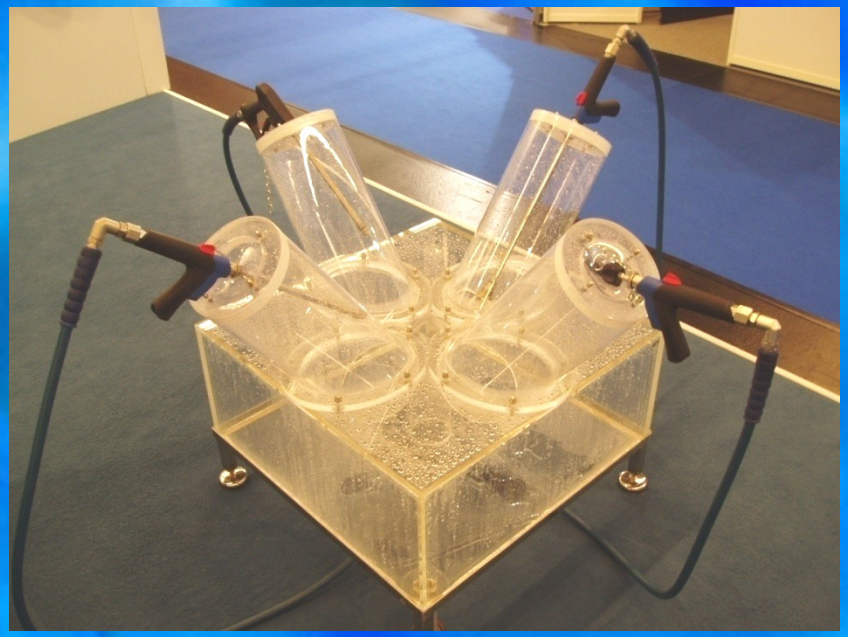
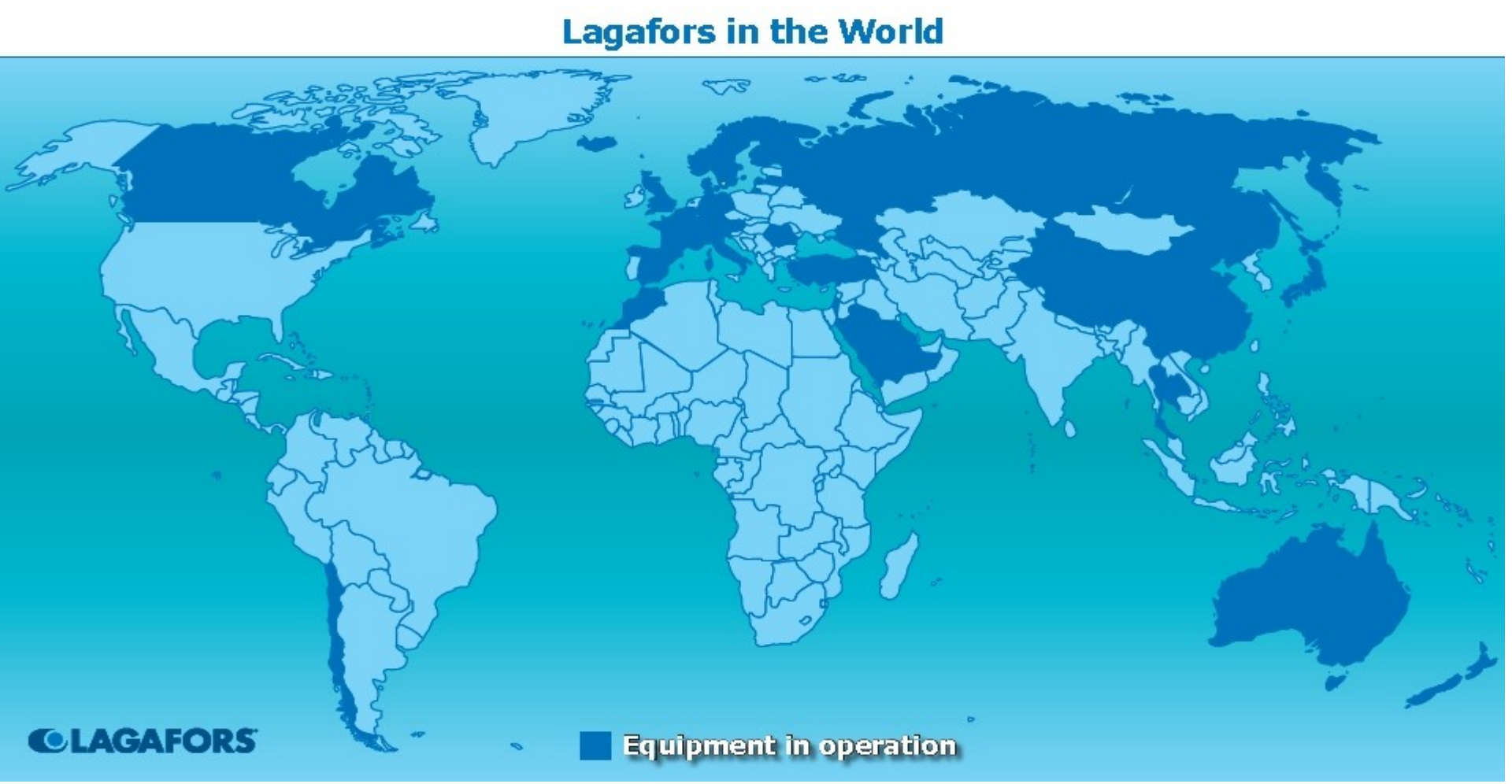
At Anuga FoodTech and IFFA



Lagafors around the world



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Lagafors Reference Installations

e.g.

- Arla Foods AB
- Abdon Mills
- BBH, Baltika Beverage Holding, Russia
  - St Petersburg, Tula, Rostov, Samara
  - Chelyabinsk, Krasnoyarsk, Khabarovsk
  - Novosibirsk
- Kraft Foods
- Orcla
- Marine Harvest
- Atria
- Scan
- Findus
- Kronfågel
- Dafgårds
- Danish Crown
- Astra Zeneca
- Unilever
- Philip Morris
- JBT Food Tech (Frigoscandia Equip.)
- Swedish Match
- Stora Enso
- ISS
- Gilde
- Abelmann

Our Cleaning Philosophy

As little as possible
As much as necessary

The Lagafors Method

1. **Pre wash**
   - wash away large particles and soaking of areas to be cleaned using low to medium pressure of water (~30 l/min) at ~ 45°C. Long distance from nozzle to surface!
2. **Apply Chemical Foam**
   - Dissolving grease, protein and other unwanted substances using automatic dosing for optimized concentration. Temperature ~ 15°C, time to work ~15 minutes
3. **Pressure Washing**
   - Wash away chemicals using medium to high pressure water at ~45°C. The bio-film is broken! Short distance from nozzle to surface!
4. **Disinfecting**
   - Apply desired disinfection agent using automated dosing for optimized concentration. Remaining micro organisms are extinguished
5. **Rinse**
   - Wash away disinfection agent with water

prewa_01

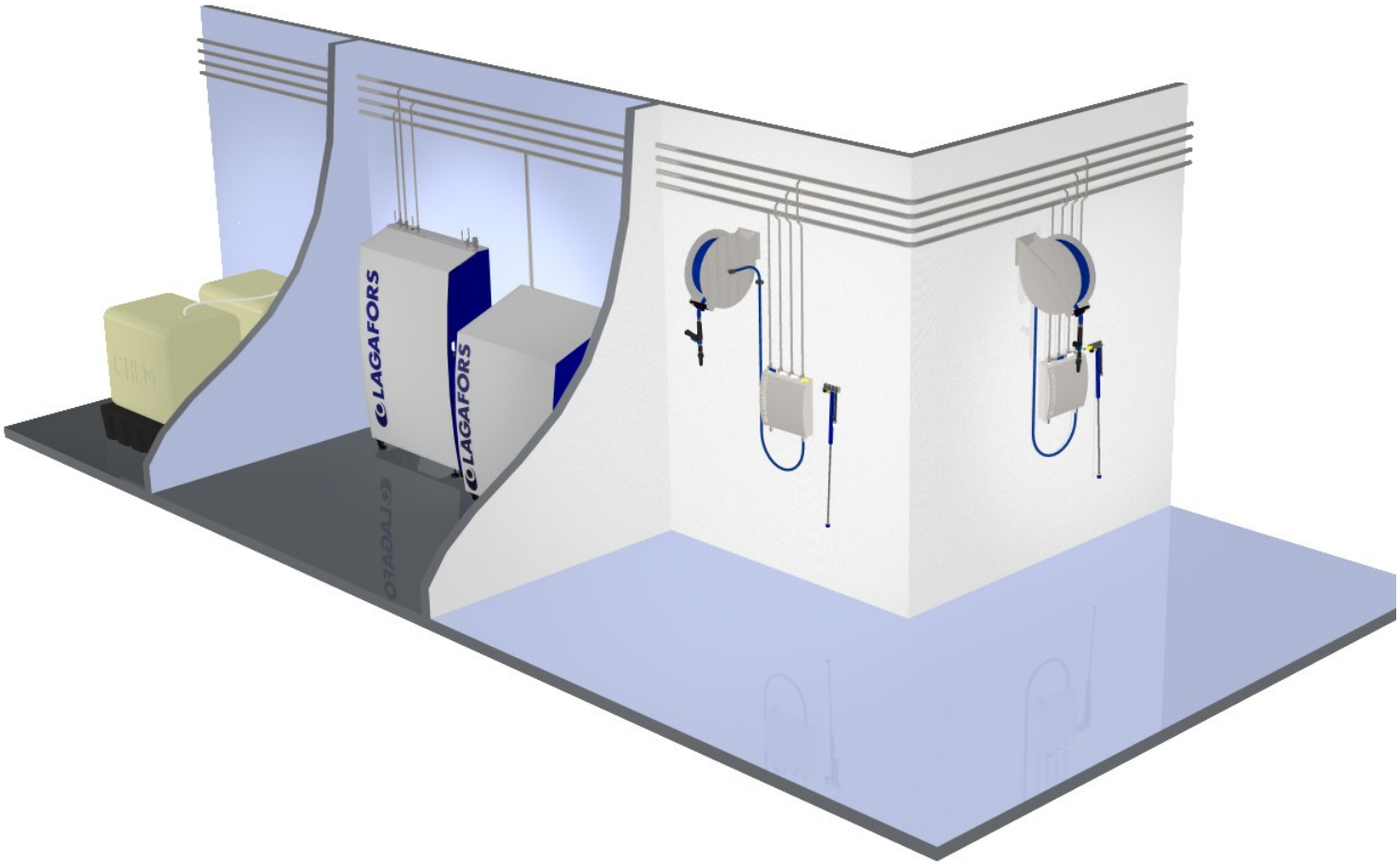
foam_03

flushoff_0333

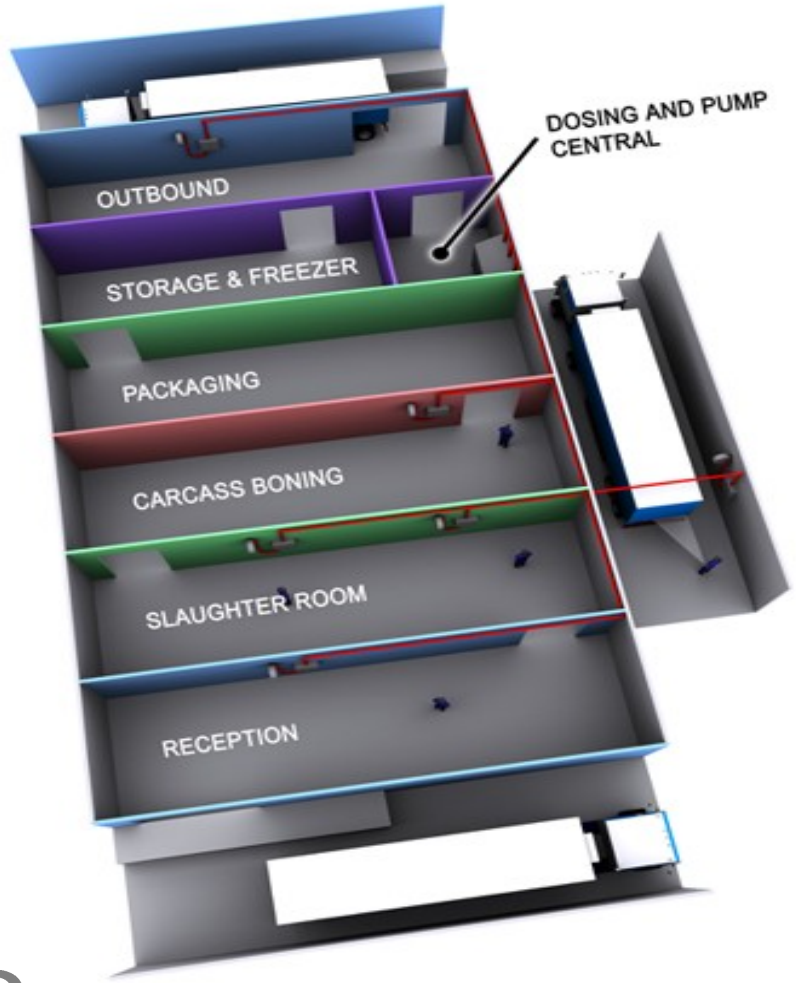
disinfect_01

rinse_01

Advantages of the CCS concept (Central Cleaning System)



Sampel of an Abottoir



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+ / - Chemical dosing

+ De-central chemical system

- Flexibility in choice of chemicals.
- If one satellite fails, the others will function.

- De-central chemical system

- If the water system fails, the whole hygiene system will fail.
- Flexibility with choice of chemical => a higher risk for dangerous mixtures of chemicals when changing the containers.
- Higher maintenance costs with de-central satellite stations.
- Low dosing accuracy ± 1,0% => high chemical consumption.
- E.g. 4% foam concentrate in 12 l/min compared with 7 l/min => 40% higher chemical consumption.
- Concentrate container 25 litres => higher cost/litre
- Manual handling of concentrate containers => inefficient and dangerous.
- Warm water for all chemicals increases the condensate (Increased consumption/worse working environment - respiratory tract, reduced impact of chemicals), increased energy costs and corrosion risks.
- Increased application pressure => increased risk that warm chemicals penetrate the machines.
- Chemical concentrates are not allowed in production areas during production. (Will probably be banned altogether)

+ Variable Chemical Centre, VCC

- High dosing accuracy, ± 0,1% => reduced consumption of chemicals
- E.g. 4% chemical concentration in 7 l/min compared with 12 l/min => -40% chemical consumption
- Concentrate containers 200 – 1000 litres => lower cost/Litre
- No wasted time replacing smaller containers
- Cold water is used in VCC => lower energy costs, improved impact of chemical cleaning, reduced risk for corrosion and a better working environment.
- Low application pressure =>Reduced risk that chemicals will penetrate machines.
- Safe handling of concentrated chemicals.
- No chemical concentrate in production areas.
- Hygiene staff can not adjust the settings for concentrate %.
- If one system, water or chemicals, fails the other one will function.

Easy and efficient maintenance work in a central place.
At approx. 15 satellite stations less investment/station.

- Variable Chemical Centre, VCC

- The chemical choice is limited to two different varieties.

+ / - Pressurized water systems

+ Low pressure systems, LWP

(Recommended for the beverage industry and for some applications in the fish and prepared food industries)

- Competitively prized
- Reliable

- Low pressure systems, LWP

- Higher costs/consumption of water
- Higher costs/consumption of waste water
- Very limited possibility to change pressure/flow
- High costs for stainless steel pipes (large dimensions).
- Increased application pressure => increases the risk of water penetrating the machine.

+ Medium pressure system, MPP

(Recommended for the meat processing industries and most applications in the fish, animal food and waste destruction industries)

- MPP compared with hose => 22 - 35% lower costs/consumption of water, electricity and waste water.
- MPP compared with LWP => 13 - 25% lower costs/consumption of water, electricity and waste water.
- Variable pressure and water flow => optimized costs for desired cleaning energy.
- Lower maintenance costs compared with other medium pressure systems.
- Lower costs for pipes (smaller dimensions)
- Less chemical use with optimized removal of biofilm.
- Less water
  - => less condensate
  - => reduced areas for bacterial growth

- Medium pressure system, MPP

- Increased application pressure => increases the risk of water penetrating the machine.
- Increased investment.

+ / - Pressurized water systems

+ Medium pressure, Multi Pump System, MWP

(Recommended for the meat processing industries and most applications in the fish, animal food and waste destruction industries)

- Competitively prized
- If one pump fails, the other will function
- Reliable

+ Medium pressure system, MPP

(Recommended for the meat processing industries and most applications in the fish, animal food and waste destruction industries)

- Variable pressure and water flow => optimized costs for desired cleaning energy.
- Lower maintenance costs compared with other medium pressure systems.
- No pressure peaks or pressure variations, even with many users.
- Very reliable.

- Medium pressure, Multi Pump System, MWP

- Limited flexibility in pressure and water flow.
- Strong (dangerous) pressure peaks and pressure variations
  - increases wear and tear on entire system,
  - increases muscles strain on operator
  - can be hazardous.
- Higher maintenance costs

- Medium pressure system, MPP

- Increased investment

Product Range

We offer

- Idea generation, trouble shooting
- Component based cleaning solutions
- Automatic washing systems
- Installation/Service/Maintenance
- Unique accessories
- Spare parts
- Training

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Product Groups

- Central Systems
- Satellite Stations
- Automatic Systems
- Automatic Washers
- Accessories, e.g. Spray Guns & Nozzles

We take a “Farm to Fork” approach to hygiene

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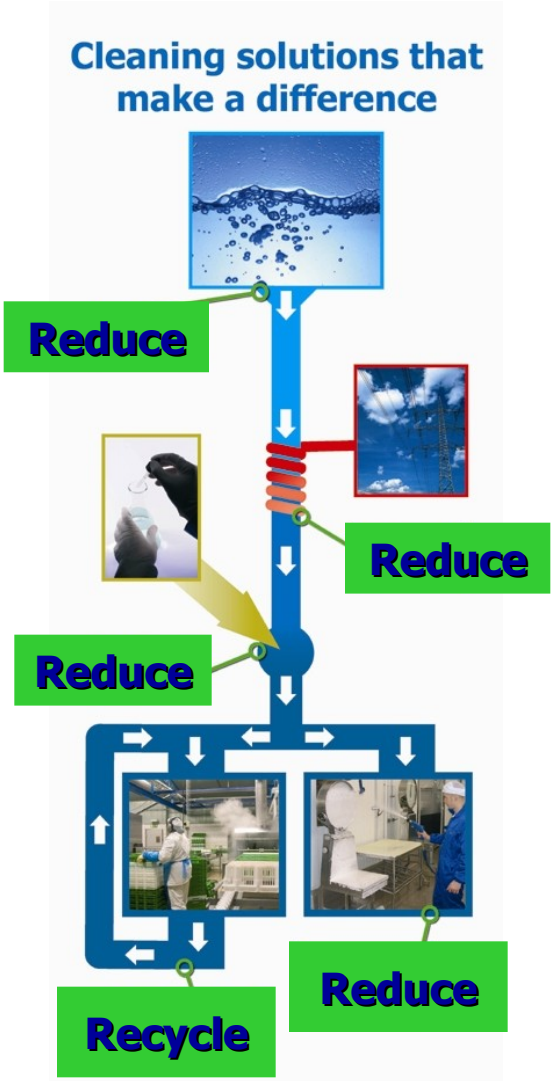
We mean "Clean and Lean"



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Safer Food!
-
Better Business!