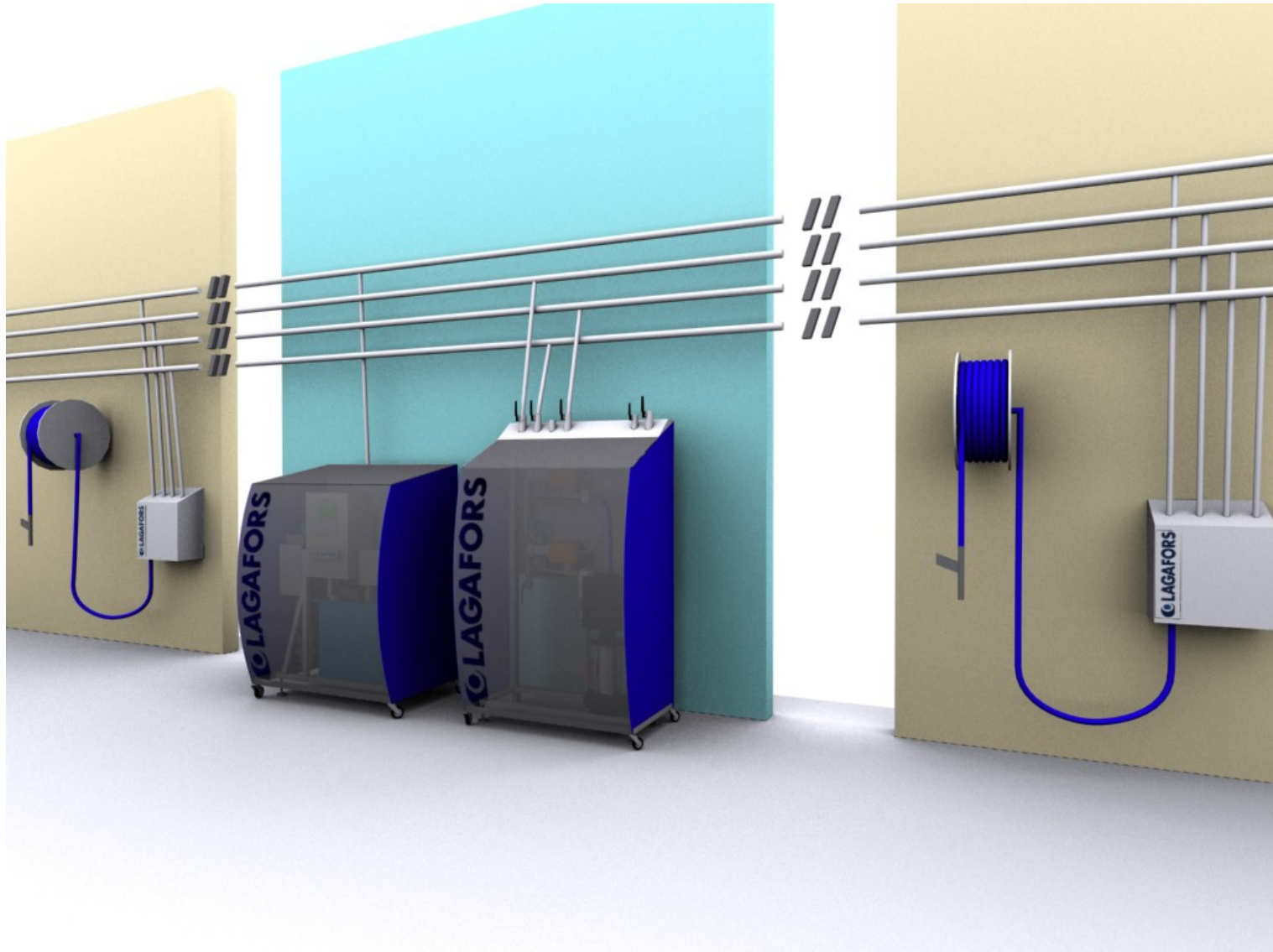


Advantages of the CCS concept (Central Cleaning System)



+ / - 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 $\pm 1,0\%$ => 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, $\pm 0,1\%$ => 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 priced
- Reliable

- Low pressure systems, LWP

- High costs/consumption of water
- High costs/consumption of waste water
- Very limited possibility to change pressure/flow
- High costs for stainless steel pipes (large dimensions)
- Much higher maintenance costs with de-central satellite stations
- Increased application pressure => increases the risk of water penetrating the machine

+ Medium pressure system, VPP

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

- VPP compared with hose => 22 - 35% lower costs/consumption of water, electricity and waste water
- VPP 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, VPP

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

N.B.

- No difference in aerosol quantity between low and medium pressure systems.

+ / - 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 priced
- If one pump fails, the other will function
- 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, VPP

(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 system, VPP

- Increased investment

Specific examples

Project description	Torsåsen AB Sweden Poultry slaughterhouse Complete hygiene solution	BBH Group Russia Brewery Hygiene solution i.e. tanks, brewery and waste handling	Procordia Food Sweden Largest food manufacturer in Scandinavia Complete hygiene solutions
Location	Falkenberg, Sweden	5 factories i.e. St Petersburg, Tula, Rostov, Samara, Chabarovsk	4 factories in Sweden i.e. Eslöv, Örebro, Kumla, Vansbro
Equipment	VPP 8090 2xVCC-D 35 VMS Satellite stations Crate dishwasher	12 x CCS plants for water and chemicals 300 VMS Satellite stations	9 x CCS plants for water and chemicals 150 VMS Satellite stations Crate dishwasher
Production area (m²)	10,000	Approx. 50,000	Approx. 4 x 10,000