



Pall Corporation

FB1793



Pall in the Brewery (more value per hectolitre)

Cluster Filter System for Cold Sterile Filtration



Filtration. Separation. Solution.SM

The Pall World

Pall Corporation is a world leader in the design, production and supply of filters, membranes and systems for the filtration and separation of liquids and gases. With an annual turnover of two billion dollars, we are able to handle major projects on a safe and sustainable platform.



The principal of CFS

Pall® CFS (Cluster Filter System) has been in industrial use since 1995, and is today the brewing industry's reliable, economic successful technology for the cold stabilization of beer. Successful membrane filtration of beer requires two somewhat opposite processes to take place:

- Low and gentle flux during beer filtration, to ensure the beer is not affected by the dynamic forces across the membrane
- High and robust flux during rinsing and cleaning

Generally, membrane systems are a compromise of these two requirements. The patented CFS technology offers the brewery an alternative that optimizes both criteria.

Cluster filtration, groups filter elements into clusters. With each cluster having its own individual outlet valve.

During filtration all clusters are open. Cleaning, sterilization and integrity testing is done cluster by cluster.

The advantages of the CFS principle

The unique cluster principle offers the brewery significant advantages, primarily these are:

- Prolonged service life
- In-situ integrity testing
- Individual cluster integrity diagnosis
- Specific rinsing
- High specific flux velocity
- Short rinsing time
- Constant stream over all cartridges
- Minimized water consumption
- Fast changing of the filter element
- Controlled backflush
- Minimized beer losses
- High biological safety
- Permanent availability

The combination of the in-situ integrity testing of the cluster filter and the 100% integrity testing of the membrane cartridges during manufacture lends the CFS to form a robust part of any brewery's HACCP procedures.

The system not only ensures the microbiological consistency of the brand produced for consumers, but also acts as an effective indicator of any manufacturing process variation.

System engineering

The **Pall** CFS system is designed as a stand alone unit, to be installed directly upstream of the filling line without any requirement for a buffer plant. It is a complete independent process unit which comprises of:

- Filter vessel
- Piping and connections
- Membrane cleaning unit (CIP)
- Integrity testing
- Control panel

Pre-manufacturing programming and full skid SAP testing results in a very short installation and start up time for the skid based equipment.

Once installed the effective **Pall** cleaning procedure allows long life of the Ultipor® N66 cartridges and if necessary the recovery of blocked cartridges.

The brewery can be assured of the microbiological security of the system due to its hygienic design, ease of integrity testing and full automation, that allows the line to typically be handled by filling staff.

Sizing	Cartridges	Performance
CFS 05	25	80-140 HI
CFS 07	49	140-220 HI
CFS 10	72	220-300 HI
CFS 14	98	> 300 HI

Pall in the Brewery - Cluster Filter System for Cold Sterile Filtration

CFS - Cold sterile filtration at the very last stage of brewing process, directly in front of the filling line for the safe and complete removal of all beer spoiling micro-organisms from the product



Consistent high quality beer and reduced operational costs

The beer quality through a **Pall** membrane system is unquestionable, there is no impact on:

- Taste
- Foam
- Color

Oxygen up take is < 0.02 ppm from the process start.

Cost savings begin with:

- Reduced product losses in comparison to flash or tunnel pasteurization
- Reduced water consumption in comparison to traditional filtration and pasteurization
- Reduced energy costs in comparison to pasteurization

Further benefits can be measured in terms of:

- Availability of the system, which is maximized by the individual shutdown of clusters, for offline integrity testing
- Biological safety and risk management by on-line documentation of all relevant process parameters
- High sensitivity integrity testing carried out in cluster formation
- Hygienic design of the system
- Compact engineering, minimizing floor space requirements

Significantly the CFS system can offer unprecedented traceability of product batches. This is carried out by continuous data logging and documentation of the process through the automated system.

More value per hectolitre

CFS offers value to the brewery in an individual way it offers:

- High quality beer
- A low overall cost option in comparison to traditional filtration and pasteurization
- Superior biological control given by the cluster integrity testing technique
- Maximum availability of the system, due to cluster cleaning, sterilization and integrity testing optimization
- Minimum manpower can be realised through full automation



Pall Corporation

Pall Food and Beverage

New York - **USA**

800.360.7255 toll free
+1 516 484 5400 telephone
+1 516 625 3610 fax

Bad Kreuznach - **Germany**


+49 (0)671 88 22 0 telephone
+49 (0)671 88 22 200 fax
infobk@europe.pall.com

Portsmouth - **UK**

+44 (0)23 9230 2269 telephone
+44 (0)23 9230 2509 fax
processuk@pall.com

Contact us on the web at www.pall.com/foodandbev

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