foodclean
INNOVATING YOUR HYGIENE PROCESS

Film vs Foam

Rethinking Chemical Application in Food Hygiene

In the food manufacturing industry, effective surface hygiene is non-negotiable. Achieving optimal cleaning results depends on two key factors: **chemical contact** time and **chemical coverage**. Traditional cleaning systems have long relied on foaming detergents, based on the assumption that foam clings to surfaces longer. But how effective is foam in delivering active cleaning agents to the surfaces where they're needed?

This white paper explores the science behind foams and introduces **Foodclean's film-based detergent technology** - a breakthrough solution designed for superior cleaning performance, cost-efficiency, and ease of use.

The Science Behind Foams

These are essentially bubbles filled with cleaning chemicals. However, bubbles are made from extremely thin films—essentially the "skin" of the bubble—which are often so delicate they're measured innanometres (billionths of a meter). The issue is that, in bulk, bubbles consist almost entirely of air, with only a minuscule amount of actual product contained within their thin outer layer.

To put this into perspective, the volume of a bubble is given by the formula $4/3\ \pi r^3$. For a bubble with a radius of 2 cm, that equates to roughly 33.5 cm^3 of air. If the bubble's skin is 1000 nm thick (or 0.0001cm — this is actually a generous estimate, as it's usually even thinner), then the volume of the skin can be approximated as: thickness × $4\pi r^2$, which gives around 0.1 cm^3. This means the bubble is made up of approximately 99.7% air and just 0.3% skin—the only part that actually contains the cleaning agent.

To make matters worse, when the bubble makes contact with a surface, it only touches a very small area. As a result, only a fraction of the chemical-containing skin actually comes into contact with the surface - perhaps just 10%, if we're being generous – so now the amount of chemical in contact with the surface is 0.03%.

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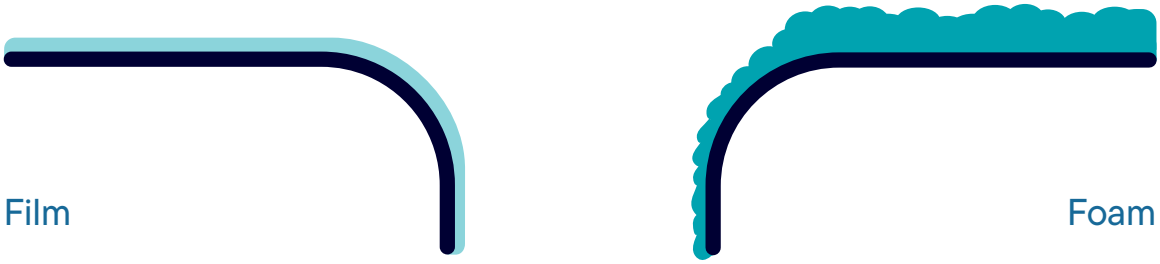
The Challenges of Foam Cleaning

- Minimal chemical-surface contact
- High product wastage
- Short dwell time on vertical surfaces
- Difficult rinsing, increasing labour and water use

Foams, while visually appealing, simply don't deliver enough chemical to where it's needed.
This makes them less effective and more costly over time.

The Difference Between Foam and Film

The difference between films and foams and how they interact with the surface to be cleaned can be seen below – on the left the film product has completely covered the surface with a relatively thick coating of detergent product. This coating will stay in place for an extended time during which the chemistry is working hard on cleaning the surface. On the right, is a standard foam. As we've discussed, the foam bubbles are mostly air with the chemical only present in the very thin skin of the bubbles and most of the foam isn't actually touching the surface – for the film product, the film completely covers the surface and sticks like glue whereas the foam will quickly slide off the vertical surfaces.



Foodclean Film-Based Detergents

To overcome the limitations of foam, Foodclean has developed an innovative range of film-based detergent products.

Key Features of Foodclean Films:

- **Extended contact time** - up to 40 minutes (on cool surfaces)
- **Enhanced surface cling** - ideal for vertical and hard-to-reach areas
- **Greater surface coverage** - creates a uniform, chemical-rich layer
- **Easy to rinse** - saving time, water, and labour
- **Lower concentration required** - improving safety and reducing costs

These film products can be applied using standard foaming equipment - no need for new tools.

Foam vs Film: A Visual Comparison

Feature	Foam	Foodclean Film
Chemical Contact	Minimal (0.03% per bubble)	Near-total surface coverage
Cling to Vertical Surfaces	Low – slides off quickly	High – adheres for up to 40 mins
Application Equipment	Standard foamers	Standard foamers
Rinse Effort	High – time-consuming	Low – quick and efficient
Product Efficiency	Low – mostly air	High – concentrated cleaning film

Often an issue with foams is that they can be hard to rinse away – costing you **time** and **wasted production** effort. Because our film products are not too foamy they are easy to rinse away – allowing you to start production earlier and use less man hours during the clean.

Conclusion

Foams may have been the go-to solution for decades, but science and experience now point to a more effective alternative. Foodclean's film-based detergents offer a **smarter, safer, and more efficient** way to clean food manufacturing surfaces. With greater surface coverage, extended dwell times, and reduced chemical usage, these products redefine what's possible in hygiene innovation.

Want to know more?

Get in touch with a team of experts to find out how switching to a **Foodclean Film-Based Detergent** could benefit your factory.

+44(0) 1522 703 703 sales@foodclean.com www.foodclean.com