# Handling dairy fluids in 21st century

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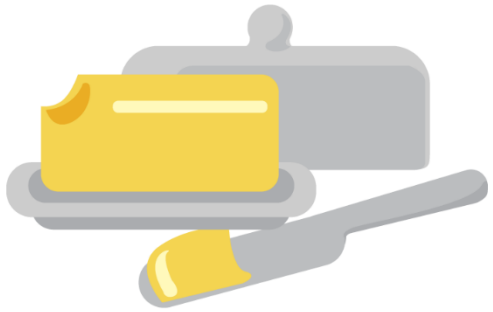
# Handling dairy fluids in 21st Century

## Agenda

- Introduction
- Consumer demand for safe and hygienic food
- Challenges of yogurt transfer - shear thinning
- Controlling costs - system efficiency
- Where we operate
- Case study
- Questions
- Close



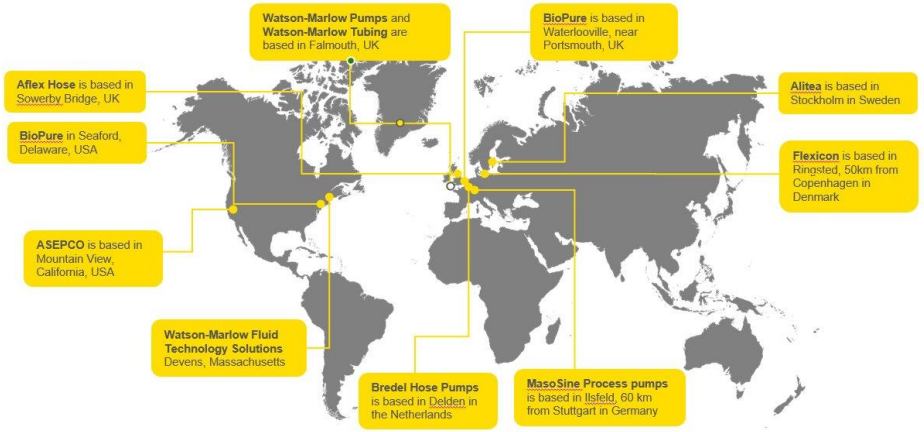
# Handling dairy fluids in 21st Century

## Introduction to Watson-Marlow

Watson-Marlow Fluid Technology Solutions (WMFTS) is part of Spirax Group, a multi-national industrial engineering Group.

We are a world leader in manufacturing peristaltic pumps and associated fluid path technologies for the life sciences and process industries.

- 11 manufacturing sites
- 6 brands
- Our smallest pump, operating at its lowest speed would take more than 13,000 years to pump what our largest pump, at its highest speed, can pump in just one minute




# Handling dairy fluids in 21st Century

## Introduction to an exciting market

- As consumers become more aware of healthy eating, the drive for healthy, low sugar and high protein foods continues to drive growth.
- Innovation of product driven by healthy eating trends will require agile and adaptive processes.
- Growth areas include demand for high protein yogurts (up 35%) plus steady growth for natural yogurt and functional health products which support gut health & immunity.
- Time poor consumers seeking quick & easy meal replacement products - growing market for meal replacement drinks.
- The rising cost-of-living is reported to be driving home cooked food and baking offering market growth for yogurt use in recipes.

**40% of the worldwide yogurt market is in Europe**
(Statista)

**2 out of 5 consumers are interested in yogurts to replace traditional desserts.**
(Mintel)

**Revenue looks set for another year of growth, driven by mounting sales of healthy, low-sugar and high-protein yoghurts**
(IBIS World)

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## Safe, hygienic foods

- Following the coronavirus pandemic, the need to meet customer standards is higher than ever. Consumers awareness of all aspects of hygiene have been heightened.

In 1989 EHEDG was formed, their vision:

*"The aspirational goal that drives our foundation is to be the leading source of hygienic design and engineering expertise, and enhance food safety and quality across the whole industry. This is the shared ambition that shapes our role in the outside world."*

- EHEDG equipment certification:

*"The European Hygienic Engineering & Design Group (EHEDG) has developed standards and methods for testing and certifying equipment in accordance with the latest research and state-of-the-art technologies."*

CERTIFIED HYGIENIC ENGINEERING & DESIGN EUROPEAN GROUP EHEDG
TYPE EL - ASEPTIC CLASS I
JUNE 2011

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## Safe, hygienic foods

- EHEDG certification supports guidelines that help you reduce food safety risks through high-quality equipment and lower cleaning costs with clean-in-place (CIP) technology.

- Aseptic certified pumps reduce the risk of contamination while extending product life without the need for additional preservatives

- A fully certified pump ensures sterility is maintained during the transfer and packaging process. This reduces the risk of contamination preventing the loss of product for the manufacturer and also reducing the risk of contaminated product reaching the end user

# Handling dairy fluids in 21st Century

## Safe, hygienic foods

***EHEDG Certification Scheme***

| Certificate Type* | EL CLASS I | EL ASEPTIC CLASS I | EL CLASS I AUX | EL CLASS II | EL ASEPTIC CLASS II |
|---|---|---|---|---|---|
| Cleaning procedure | wet | | | | |
| | *cleaning without dismantling* | | | *cleaning with dismantling* | |
| Processes | closed | closed | open | closed / open | closed |
| Fulfilled requirements according EHEDG EHEDG GL. | 8, (9, 10, 16, 32, 35) ** | 8, (9, 10, 16, 32, 35, 39) ** | 8, (9, 13, 32, 35) ** | 8, (9, 10, 13, 32, 35) ** | 8, (9, 10, 16, 32, 35, 39) ** |
| Design evaluation and relevant area*** | area inside the equipment<br>roughness Ra / radii / microscopic examination | area inside the equipment<br>roughness Ra / radii / microscopic examination | area outside on the equipment<br>roughness Ra / radii / microscopic examination / accessibility | area inside or outside on the equipment<br>roughness Ra / radii / microscopic examination / accessibility | area inside the equipment<br>roughness Ra / radii / microscopic examination / accessibility |
| EHEDG Test methods | cleanability (EHEDG GL 2) | cleanability (EHEDG GL 2) + sterilisability (EHEDG GL 5) + bacteria tightness EHEDG GL 7) | none | none | Sterilisability (EHEDG GL 5) + bacteria tightness (EHEDG GL 7) |
| Equipment Examples | pipeline equipment like pumps, valves, sensors | pipeline equipment like pumps with double mechanical seal, bellow valves, sensors | auxiliary equipment like vision sensors, machine levelling feet, gear drive unit | draining channel, blender, dosing pump, tank mounted relief valve conveyor, meat mincing, slicing machine | cleaned by dismantling and sterilisable and bacteria tight like pressure relief valve with double seal |

**Cleaner than any lobe pump or circumferential piston pump**

EHEDG Type EL – Class 1

EHEDG Type EL Class 1 Aseptic

Reduce CIP cycle and the amount of cleaning agents required

All contact parts FDA and EC1935 compliant

CERTIFIED HYGIENIC ENGINEERING & DESIGN EHEDG GROUP EUROPEAN
TYPE EL - ASEPTIC CLASS I
JUNE 2011

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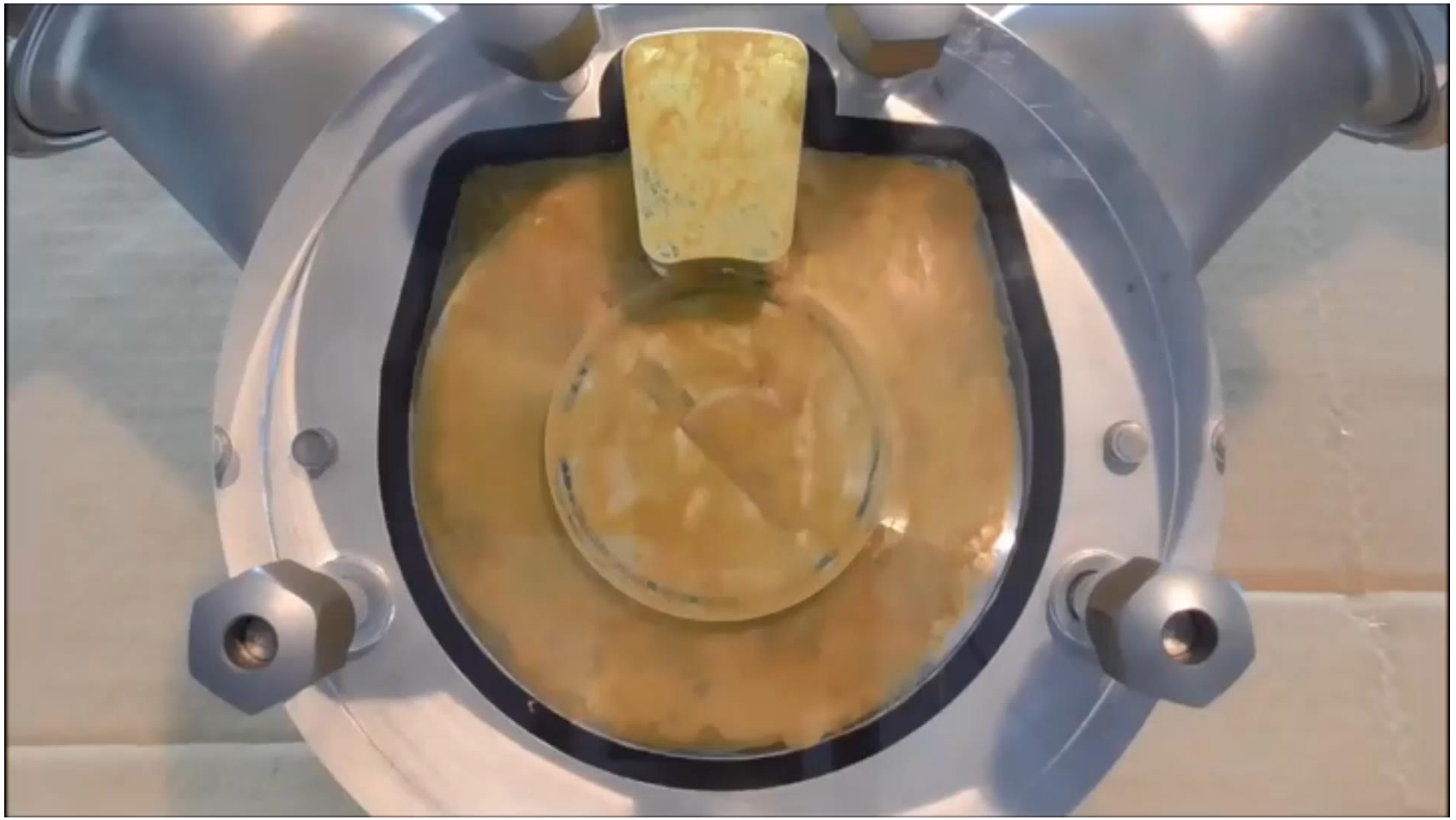
# Handling dairy fluids in 21st Century

## Safe, hygienic foods



# Handling dairy fluids in 21st Century

## Challenges of yogurt transfer - shear thinning

As Yoghurt producers, you tell us that you add viscosity to account for process losses.

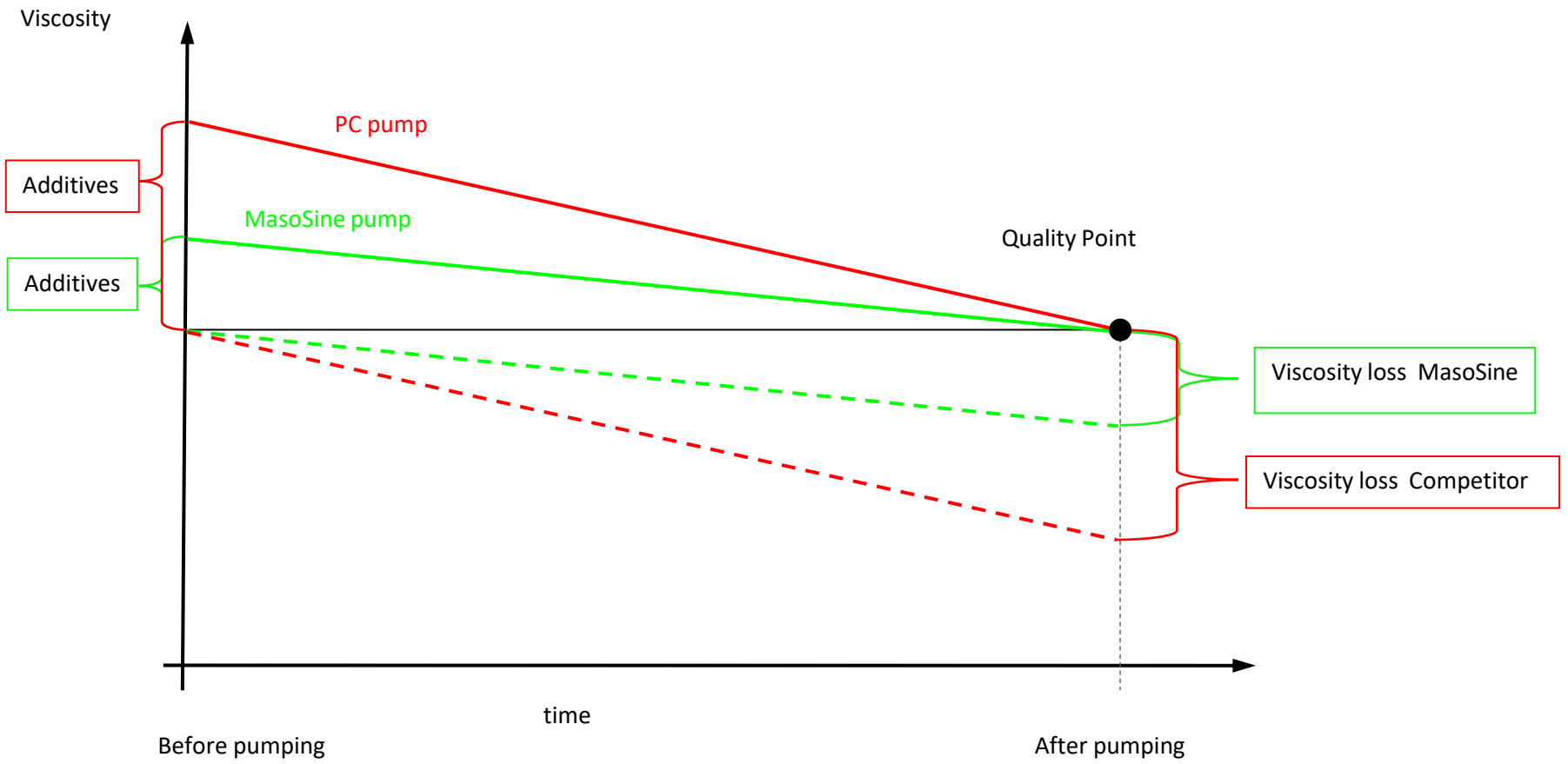
Fat or protein are common additives

- Fat is not desired by the consumer
- Proteins cost money

Better process equipment can reduce the need and hence the costs.

# Handling dairy fluids in 21st Century

## Challenges of yogurt transfer - shear thinning



# Handling dairy fluids in 21st Century

## Avoiding Shear - Introducing Certa, the low shear pump

| Low shear handling | Low cost of ownership | Energy efficient |
|---|---|---|
| Smooth product flow, no need for ancillary dampeners | Greatly reduced electricity consumption, reduced carbon footprint | Up to 50 % less power consumption than lobe or circumferential pumps |
| Virtually pulse free | | |
| Prevents aeration foaming | | |
| Up to 255,000 L/h, 8 million cP and 15 bar | | |

# Handling dairy fluids in 21st Century

## Masosine Sinusoidal Pumps - Certa


**Sheer simplicity, not Shear loss**

# Handling dairy fluids in 21st Century

## Masosine Sinusoidal Pumps – Certa Compact



- Maximise space on site & skids
- Flexible and simplified design
- Same design principles & certification as existing Certa
- Cost advantages

# Handling dairy fluids in 21st Century

## Controlling costs – system efficiency

System efficiency and cost control is important to any production facility. Even simple changes to commonly overlooked items such as hoses can have a significant impact.

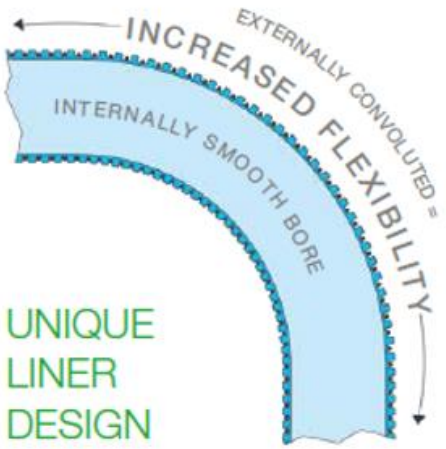
| CHARACTERISTIC | CUSTOMER ISSUES | PTFE HOSE ADVANTAGE |
|---|---|---|
| Viscous Media Gentle Handling | Pump cavitation Hose collapse Reduced flow | Vacuum and kink proof Smoother inner bore Low friction, high flow |
| High speed dynamic filling | Downtime cost & kinking of hoses | High flexibility Kink resistant Longevity |
| CIP and SIP cleaning / sterilization | Elastomer damage Contamination | Chemical resistance No contamination Fewer hose changes |

**PTFE hoses deliver:**

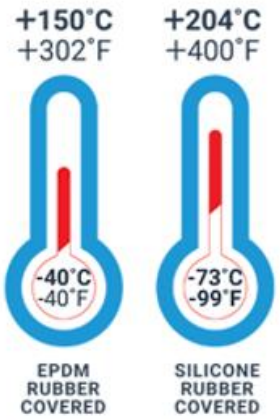
- Higher production capacity
- Lower production costs

# Handling dairy fluids in 21st Century

## Controlling costs – system efficiency












### Hygienic by design

- High flexibility with kink resistance
- Smooth bore for uninterrupted fluid flow and ease of cleaning
- High temperature and pressure capability
- Chemical resistant
- PTFE-lined and non-lined end fittings with laser etched ferrule for ultimate traceability

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# Handling dairy fluids in 21st Century

## Controlling costs – system efficiency

Testimonial:

*Marin Ćosić, Deputy Head of Maintenance at Dukat Dairy Industry Inc, part of the Lactalis Group, said: "On the yoghurt and fruit filling machine, the working conditions are demanding in terms of high sterilisation temperatures (138℃ / 280°F), and exposure to acids and alkalis for washing the hoses through which the product passes.*

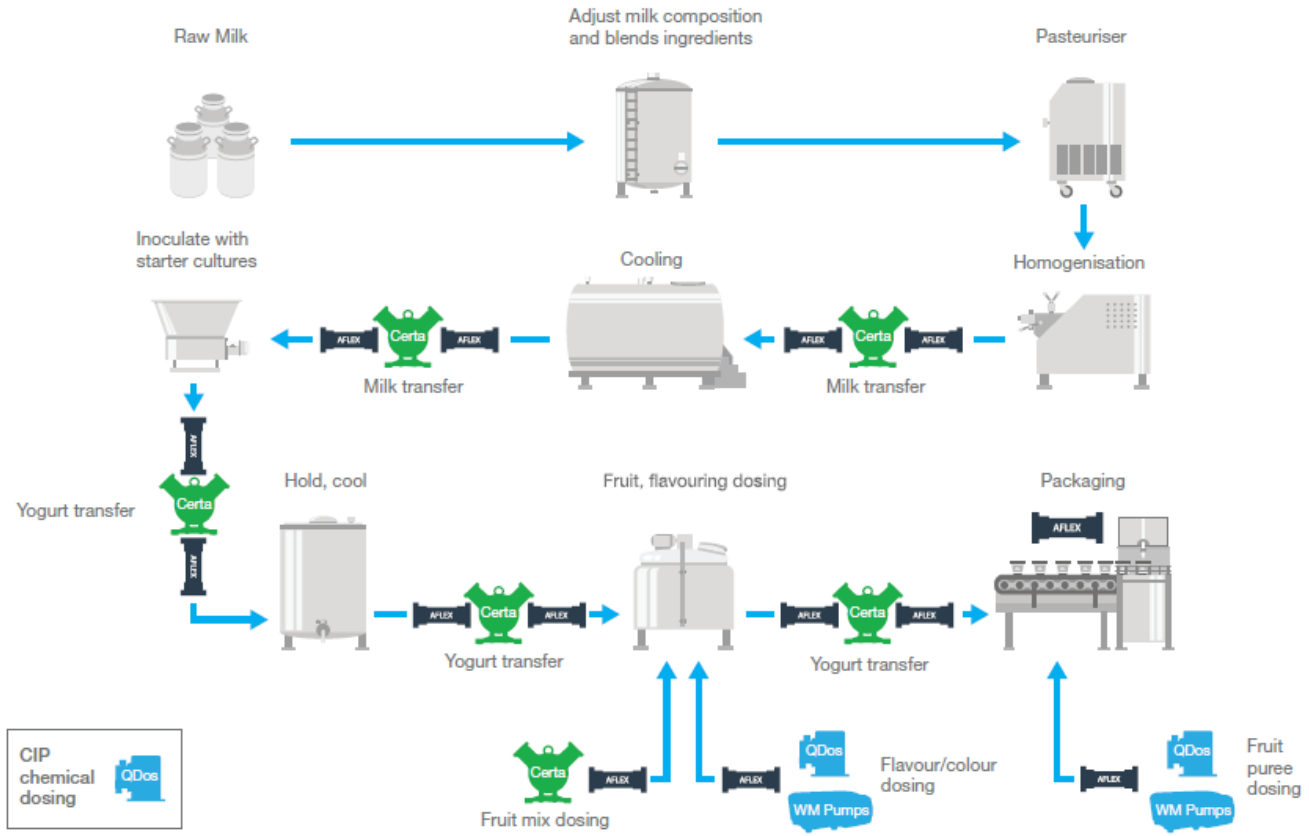
*With the aim of avoiding the possibility of contamination of the product, we decided to install the FaBLINE hose on the machine for filling yoghurt and fruit yoghurts.*

*The hoses turned out to be very good and long-lasting.*

# Handling dairy fluids in 21st Century

## Where we operate

### Yogurt process flow




**Fluid transfer solutions for:-**

- Milk transfer
- Yogurt transfer
- Flavour dosing
- Colour dosing

- CIP chemical dosing
- Waste water treatment

# Handling dairy fluids in 21st Century

## Where we operate

# Handling dairy fluids in 21st Century

## Where we operate

WATSON MARLOW Fluid Technology Solutions

### How to improve production yields in the dairy industry

An applications guide



wmfts.com

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## EXECUTIVE SUMMARY


The dairy sector is at turning point. Slow growth, shifting consumer tastes, growing demand for sustainability and price pressure is pushing dairies to consider changing mature and proven processes. But this trend is not about huge investments in complete processing line reconfigurations. Instead, increasing numbers are finding a quick return on investment and a boost to bottom-line profitability, by switching technologies for targeted tasks such as cheese curd processing and yogurt transfer.

This report looks at the growth of the dairy processing sector and sets out the achievements delivered by a number of real-life application examples. Intended as a 'best practice' guide, the report will be of value to anyone charged with delivering efficiencies within their dairy.




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# Handling dairy fluids in 21st Century

## Case studies

CASE STUDY

masosine Process Pumps

### Frimesa maintains yogurt viscosity and reduces additive costs

- Low shear handling cuts viscosity losses
- Reduced manufacturing costs

**A major Brazilian yogurt manufacturer has successfully shown that Sine pumps reduce yogurt viscosity losses on average by more than 20%, compared to progressive cavity (PC) pumps in the same duty.**

During transfer with their previous PC pumps, Frimesa noted that the viscosity of the yogurt was breaking down during transfer, necessitating the use additives to retain the thick and creamy quality. This was adding a further process and extra cost. When trials of a MasoSine pump were conducted, viscosity loss was dramatically reduced. Instead of the 41.2% loss experienced with the PC pump (850 cP down to 500 cP), the Sine pump only lost 2.4% (850 Cp down to 830 cP) - an improvement of 330 cP. A large improvement was also witnessed on a thicker product. This time an improvement of 650 cP.

Changing yogurt transfer to Sine pumps has led to a reduction in the amount of additives used at Frimesa, lowering manufacturing costs and resulting in product quality improvements.

*To learn more about our solutions for your applications please contact your local sales company:*

**wmftg.com/global**

CASE STUDY

masosine Process Pumps

### High volume cheese manufacturer increased profits with Sine pumps

- Certa pumps reduce fines loss by 27%
- High suction capability cuts cavitation and maintenance requirements

**Cheese curd is a delicate product and damage can occur as a result of the pumping process. Damaged cheese curd leads to increased 'fines' that are lost to the whey stream, which in turn reduces cheese yield.**

Additionally, for cottage cheese, damaged curd is often more resistant to dressing, which means increased volumes of dressing or cream are required to improve the product's appearance and consistency.

This major Danish dairy discovered that certain pump types such as lobe pumps break down the cheese curd into small particles (fines), which then passed through whey screens on drain tables where they collected. Cheese fines loss relates to production loss, which meant less cheese was produced from a certain quantity of milk.

A change to the pumping process was required and MasoSine Certa pumps were selected for the duty. The decision to install Sine pumps enabled the dairy to reduce cheese fines by 27% and therefore produce an extra 80 tonnes of cheese per annum. The typical advantages delivered by MasoSine sinusoidal technology include virtually no pulsation, low shear and superior viscous handling.

**Further benefits of Certa pump installation**

Lack of suction experienced by lobe pumps caused cavitation which damaged pipe work. Since installation, the Certa pumps have cut maintenance and unplanned downtime.

CASE STUDY

masosine Process Pumps

### Energy efficiency prompts creamery to invest in second MasoSine pump

- Low shear gentle handling important attributes
- Certa three times more energy efficient than pneumatic pumps
- Extremely quiet operation

**When a creamery from Cornwall installed a new depositing machine at its factory, the company's previous success with a MasoSine pump ensured it returned to the same source for a second unit. An energy efficient Certa 100 was recommended to transfer a range of double and single cream.**

#### Previous success

Rodda's installed a MasoSine SPS 200 sine pump several years ago as part of a clotted cream line. Its reliable performance impressed the maintenance team. "Over the past six years of hard work we've had virtually no maintenance issues with the SPS 200; it has basically looked after itself," states Maintenance Supervisor Paul Johnson.

This same approach was needed for the company's new pouring cream production facility: low shear, gentle handling. "Using a centrifugal pump, for example, would effectively churn the cream into something like butter," says Mr Johnson. "A sine pump was clearly the way forward and we were keen on Certa from WMFTG, especially because of its energy efficiency attributes."


# Thank you

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