

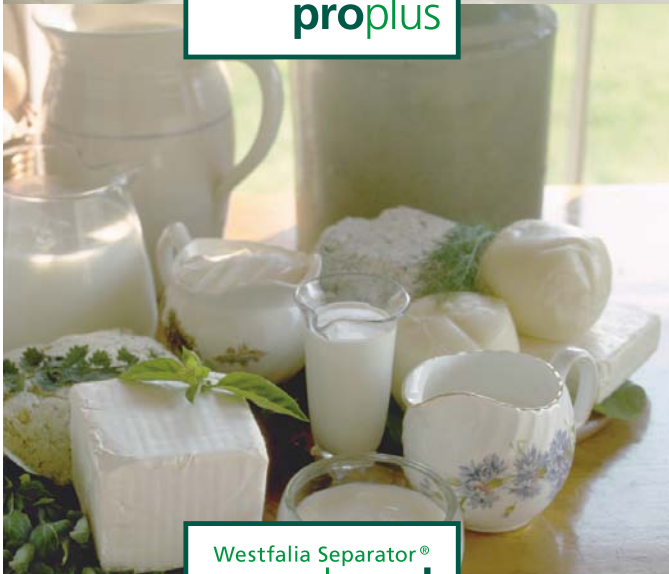


**Process Stages, Systems and Equipment for  
the Dairy Industry from GEA Westfalia Separator**



Westfalia Separator®  
**proplus**

Westfalia Separator®  
**procool**



Westfalia Separator®  
**hyvol**



Westfalia Separator®  
**ecoplus**



# A Powerful Partner to the Dairy Industry Since 1893 – Now More Innovative than Ever

Mechanical separation technology from GEA Westfalia Separator has characterized the dairy industry from the outset. Experiences gained over the course of more than 115 years form the basis for production lines and processes which set new standards.

Whether it's butter, yoghurt or quark: there is hardly another natural product from which as many foods can be produced as raw milk. For dairies, this product variety is coupled with a range of different processes used for raw milk preparation and post-processing. GEA Westfalia Separator has long been a sought after partner in this respect.

In 1893, the year the firm founded its dairy technology division, GEA Westfalia Separator made significant advances to the development of the field as a whole. Today, dairies profit more than ever from the unique experience and innovative strength of the technology leader. Systems, processes and production lines provide valuable impulses for greater efficiency and higher returns under any conditions and in a tough competitive environment.

Westfalia Separator® **absolute separation** promises a broad value-addition for our customers:

- It communicates a superlative, which permits no improvement
- It makes the claim of being “the best” in every area of centrifugal separation technology
- It makes **best**practices available for all production processes
- It brings together more than 100 years of experience from practical applications carried out by trailblazing, hand-selected technical specialists and the latest technologies

- It creates profit oriented processes – far beyond the centrifuge process itself – which improve added value.

Westfalia Separator® **procool** separation allows the dairy industry to skim cream from both cold milk as well as from warm.

The Westfalia Separator® **hyvol**® **proplus** system permits separators from GEA Westfalia Separator to harvest additional valuable protein from solid residue.

Process technology from GEA Westfalia Separator supports the following processes:

- Milk and whey cream skimming
- Clarification of milk and whey
- Bacteria removal from milk and whey
- Cream concentration
- Standardization of milk, cream and whey cream

Special processes for the manufacture and yield increase of:

- Butter/butter oil
- Soft cheese
- Whey proteins
- Calcium phosphate
- Phospholipids
- Lactose
- Casein
- Cheese fines

# Together We Get the Most Out of Milk and Whey

GEA Westfalia Separator process technology has proven itself at every level.

Because the products' quality is ensured and nothing more is left to be desired with regard to the process economy.

## Skimming cream from milk

Raw milk contains around 4 percent fat. In order to produce non-fat milk, this cream must first be separated. Here, a differentiation is made between warm milk separation at temperatures between 50 and 60°C and cold milk separation which takes place at temperatures between 4 and 30°C. GEA Westfalia Separator supports both these processes with the Westfalia Separator® **procool** system having been developed as a future oriented element for cold milk separation. The cream skimming separators from the Westfalia Separator® **hyvol**® **proplus** line set new standards when it comes to product protection and yield maximization. All separators are equipped with the Westfalia Separator® **hydrosoft** system. For your milk this means the lowest possible feed pressure, gentle product intake, the lowest possible shearing forces and therefore the highest possible separation efficiency. The Westfalia Separator® **hydrosoft** system employs no maintenance intensive, mechanical seals and requires no additional cooling water.

## Standardization

With the latest generation of Westfalia Separator® **standomat** standardization systems, GEA Westfalia Separator is able for the first time to offer a standardization unit for milk fat to milk protein. The inline and online system regularly measures and regulates the defined specifications directly during the production process. Limit values are precisely maintained and resources are better employed. Sampling is no longer required – laboratory checks can be eliminated. The newly developed optical process used for this can be flexibly applied to consumer milk, standardized cheese milk, yoghurt products, standardized cream products, recombined milk products as well as condensed milk and coffee cream.

## Whey clarification and skimming

In order to achieve the greatest level of process technological and economical processing, whey must first be separated from milk fat and cheese fines. Separators from GEA Westfalia Separator safely and efficiently perform this task. In doing this they not only perform their underlying separation functions but also increase overall plant yields thanks to their recovery and preparation of contents such as cheese fines or lactalbumin.

## Bacteria removal from milk

Bacteria, yeasts and mold spores can heavily contaminate milk products. This makes reliable bacterial clarification of milk that much more important. The range of applications runs from single-stage bacteria removal, across a two-stage process and up to special bacterial clarification of milk and a targeted bacterial clarification of cheese milk as well as the treatment of whey concentrate. Beyond this, separators employing the Westfalia Separator® **proplus** module to recover valuable proteins from solid residue can also be employed in conjunction with bacteria removal.

## Soft cheese

Soft cheese is among the trend products for health conscious nutrition. GEA Westfalia Separator enables manufactures to profit from this trend in a particularly economical manner. The company offers a wide variety of complete production lines including all required components for soft cheese production. In order to extract quark, GEA Westfalia Separator has developed the so-called "Thermo Quark" process which ensures safe recovery and longer shelf life than the traditional extraction process.

Baker's cheese can also be produced in an extremely economical manner using complete production lines from GEA Westfalia Separator.

### Butter and butter oil

GEA Westfalia Separator is the leader in process technology for the production of butter and butter oil. Today's range of buttermaking machines are convincing thanks to their broad performance spectrum and high levels of automation.

### Lactose

Lactose can be economically produced thanks to concentration, crystallization and washing on the production line. A particularly high yield of up to 80 percent can be attained if de-calcium phosphatization based on the GEA Westfalia Separator principle, nanofiltration together with electrodialysis and an ion exchanger are integrated into traditional processes.

### Casein

Isolated casein forms a valuable raw material for many industrial branches. The nutrition industry employs casein as a high quality protein. It is also important as a bonding agent to the paint industry, as a photographic covering agent and in the manufacture of adhesives. Production lines from GEA Westfalia Separator support the recovery through acid or rennet precipitation with a low wash water content.

### Special processes

GEA Westfalia Separator has also developed processes which permit economical processing with unvaryingly high quality for special requirements such as defatting whey retentate, fractionating whey proteins or calcium phosphate separation.



### An overview of your benefits:

- Gentle product treatment
- High product quality
- Increased protein yield
- Optimal skimming efficiency
- Standardization according to recognized standards
- Reliable bacteria removal
- High solids concentration
- CIP capability
- Reduction in water consumption
- Lower energy requirements
- 3-A standard



# Milk Related Products

Procedures and processes developed by GEA Westfalia Separator have proven themselves in a wide variety of applications:

Skimming/standardization of milk and whey			
Separators Production lines	Skimming Standardization	300 – 60,000 l/hr. 5000 – 65,000 l/hr.	<ul style="list-style-type: none"> <li>■ Westfalia Separator® hydrosoft inlet</li> <li>■ Gentle product treatment</li> <li>■ Optimum skimming efficiency</li> <li>■ 3-A standard</li> </ul>
Cleaning/clarification of milk and whey			
Separators Production lines	Milk Whey	3000 – 75,000 l/hr. 3000 – 75,000 l/hr.	<ul style="list-style-type: none"> <li>■ 3-A standard</li> </ul>
Bacteria removal from milk			
Separators Production lines		3000 – 60,000 l/hr.	<ul style="list-style-type: none"> <li>■ Recirculating system</li> <li>■ Optimal bacteria removal efficiency</li> <li>■ Minimization of product losses</li> <li>■ 3-A standard</li> </ul>
Soft cheese			
Separators Production lines		800 – 3500 kg/hr. 600 – 6000 kg/hr.	<ul style="list-style-type: none"> <li>■ For low fat quark and soft cheese (low fat)</li> <li>■ For soft cheese (full fat)</li> </ul>
Butter			
Production lines Buttermaking machines		1000 – 13,000 kg/hr.	<ul style="list-style-type: none"> <li>■ Sweet and sour cream</li> <li>■ Broad performance spectrum</li> <li>■ High level of automation</li> </ul>
Butter oil			
Production lines Separators Decanters		500 – 15,000 kg/hr.	<ul style="list-style-type: none"> <li>■ Flexible process control</li> </ul>



Butter oil fractionation		
Production lines Separators	On request	
Spreads		
Production lines	On request	
Casein		
Production lines Decaners Separators	On request	<ul style="list-style-type: none"> <li>■ Completely closed systems</li> </ul>
Caseinate		
Production lines	On request	
Lactose		
Production lines Decaners	On request	<ul style="list-style-type: none"> <li>■ Nutritional and pharmacy quality</li> <li>■ Special product washing in the decanter</li> </ul>

## Special processes

DCP		
Production lines Decaners Special separators	On request	<ul style="list-style-type: none"> <li>■ Calcium and phosphate removal or recovery from whey and whey permeates, improved whey production processes</li> </ul>
DPL (phospholipid separation)		
Production lines Special separators	On request	<ul style="list-style-type: none"> <li>■ Additional whey defatting for particularly high-value whey protein concentrates (WPCs)</li> <li>■ Utilization of the phospholipids as food additives</li> </ul>
Egg processing		
Special separators	2000 – 15,000 l/hr.	
Cheese fines concentration		
Decaners	On request	

# Westfalia Separator® **hyvol**® Separators with Integrated **proplus** System

Wherever a decision regarding new investments in dairy plant technology has to be made, GEA Westfalia Separator offers optimal dairy product processing.

Westfalia Separator® **hyvol**® **proplus** characterizes the new separator generation and combines the outstanding performance characteristics of Westfalia Separator® **hyvol**® separators with the Westfalia Separator® **proplus** system. Significant increases in protein yields coupled with significant cost reductions form the system's principle characteristics. Rapid amortization and higher profits from the employed raw milk represent the results on which you can count from the very outset.

Westfalia Separator® **hyvol**® **proplus** separators give you the following benefits:

- The Westfalia Separator® **proplus** system:  
Increased protein yield, reduction in water consumption, reduced solids volume
- Absolute availability  
High throughput, high efficiency, high levels of economy, universally employable

- Absolute Integration  
Flexible process control, high levels of product quality
- Absolute product care  
Gentle feed system, gentle product treatment
- Absolute intelligence  
Easy operation, unvarying solids discharge, high levels of solids concentration, optimal yields
- Absolute economy  
Low maintenance expenditures, low operating expenses, reduced water consumption, low energy requirements
- Absolute robustness  
Problem-free operation, service friendliness, long service life



MSE 600-01-177 with Westfalia Separator® **hyvol**® **proplus** system



# Minimal Energy Requirements, Outstanding Product Quality

Wherever decisions regarding new investments in dairy plant technology have to be made, GEA Westfalia Separator offers a new optimum for milk processing.

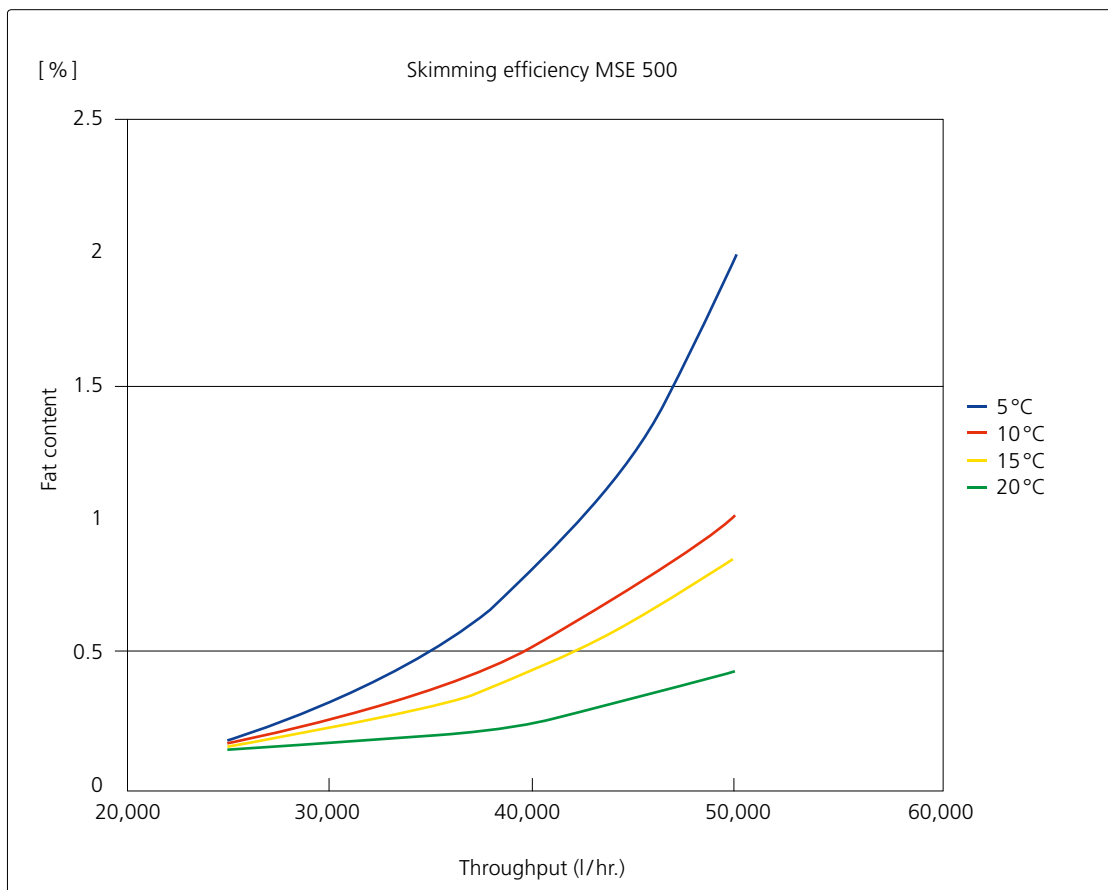
Supported by more than 115 years of experience as a partner to the milk processing industry as well as technological leadership in mechanical separation technology, the Westfalia Separator® **procool** fully integrates the advantages of cold milk separation:

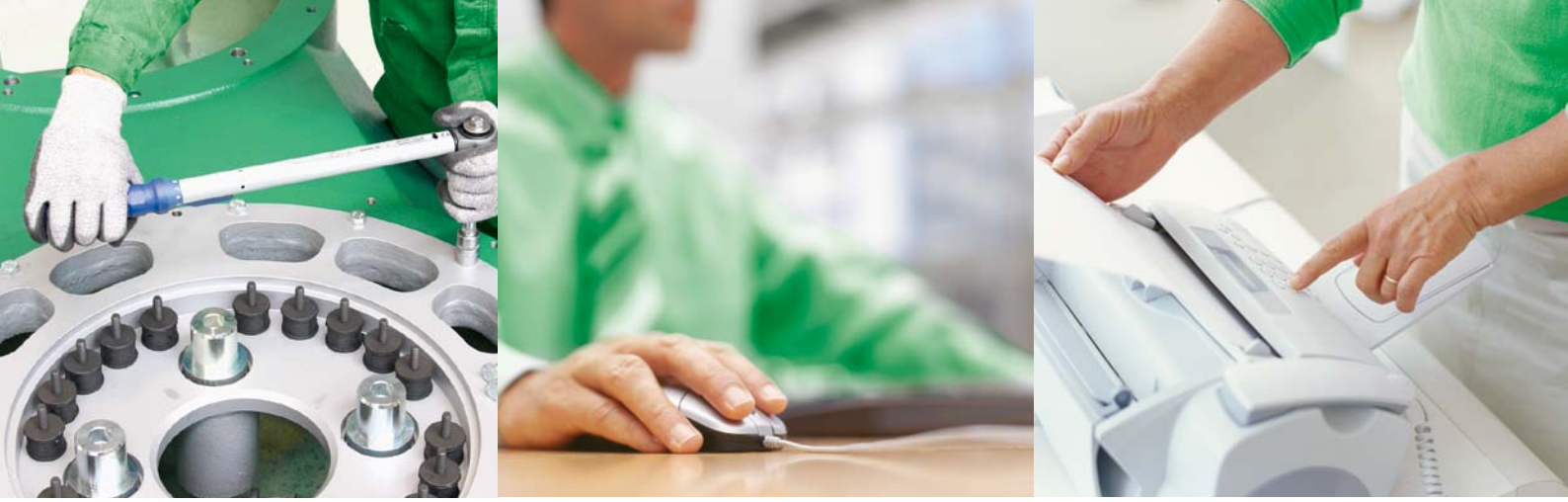
- Improved bacteriological characteristics of the final product thanks to raw milk being handled while cold
- Energy savings through the elimination of any heat addition
- Reduction in protein denaturation (WPNI  $\geq$  6 mg N/g)
- Production of specific products based on user specifications

Beyond these benefits, Westfalia Separator® **procool** also sets new standards with respect to throughput, skimming efficiency, process safety and economy when it comes to cold milk separation!

Facts and figures surrounding the Westfalia Separator® **procool**

- Throughput: 10,000 – 50,000 l/hr.
- Product temperature  $>$  4 °C
- Skimming efficiency: 0.08 – 1.0 percent
- Long-term availability thanks to the employment of low maintenance and low wear belt drive
- Permanent reduction of operating and maintenance costs
- Improvement of the final product's bacteriological properties thanks to cold milk separation
- Energy savings thanks to the elimination of any heat addition
- Reduction in protein denaturation (WPNI  $\geq$  6 mg N/g)
- Fast, problem-free changeover between warm and cold process control in the same separator
- Separator is fully CIP capable





## Westfalia Separator® capital**care** – Maximum Process Efficiency, Installation Availability and Budget Security

Westfalia Separator® capital**care** combines decades of service experience for mechanical separation technology.

Wherever separating technology tasks have to be carried out, Westfalia Separator® capital**care** assures comprehensive services right from the very beginning. In close cooperation with the customer, solutions are identified to meet their needs.

The partners benefit not only from traditional services such as inspection, maintenance, original spare parts and repair work provided by the original manufacturer; they also benefit from pro-active solutions which avoid risk, e.g. online and offline monitoring with Westfalia Separator® **wewatch**®.

Accompanying modernization or upgrading to state-of-the-art technology also offer the option of boosting performance as required.

Training provided on site or in the modern training centre of GEA Westfalia Separator ensures that the customer's employees receive training in the proper handling of the high-tech installations. This provides additional safety.

### Authorized workshops worldwide

And if problems occasionally occur or if a spare part is required at short notice, the specialists are able to attend to the customer quickly. This is ensured by a global network with more than 50 sales and service companies as well as 60 further sales partners. Authorized workshops are able to service every location in the world at short notice.



Westfalia Separator® capitalcare accordingly makes for maximum process efficiency and installation availability as well as budget security. And these benefits are provided throughout the entire life cycle of the entire installation.

#### Service from the original manufacturer:

- Service engineers quickly on site
- Extensive service network
- Risk avoided by service provided by the original manufacturer
- Pro-active solutions which avoid risk
- Upgrading to boost performance
- Staff training

Maximum availability  
Absolute budget reliability  
Permanent efficiency

In addition to traditional services such as maintenance or repair, Westfalia Separator® capitalcare also provides solutions which avoid risk and with which the installation availability can be pro-actively assured.



*We live our values.*

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

## GEA Mechanical Equipment

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