

CHEESE TECHNOLOGY



Flexible and cost-effective
solutions for cheese plants

Cheese equipment selection guide

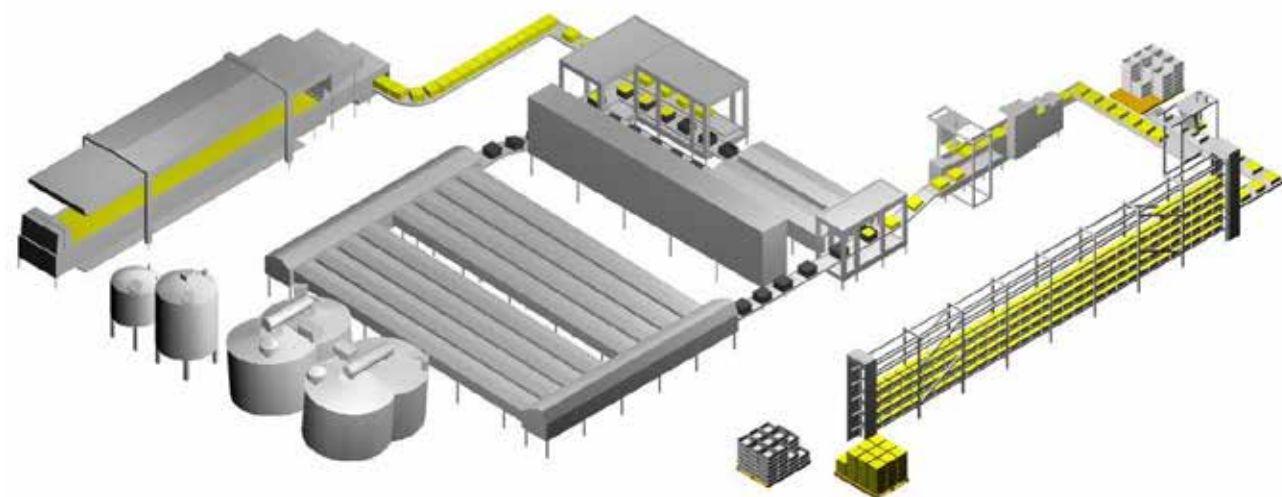
Primodan's experience in cheese enables us to offer a wide range of equipment and solutions. The key to choose the right equipment is the cheese type.

The below table may be of help. (Please note that only the main cheese categories are listed)

Main groups of cheese:	Types / varieties:	CurdMaster	CurdFinishing tank	FineSaving tank	OPD PrePress	Mould fillers	SaniPress system	Cheese mould washer	Mould emptier system	Rack filler	Rack brining system
	EUROPEAN PRESSED CHEESE										
Extra hard cheese	Parmesan	•	•	•	•	•	•	•	•	•	•
	Grana	•	•	•	•	•	•	•	•	•	•
Hard cheese	Gryère	•	•	•	•	•	•	•	•	•	•
	Emmental	•	•	•	•	•	•	•	•	•	•
	Swiss	•	•	•	•	•	•	•	•	•	•
	Gouda	•	•	•	•	•	•	•	•	•	•
Semi hard cheese	Edam	•	•	•	•	•	•	•	•	•	•
	Tilsit	•	•	•	•	•	•	•	•	•	•
Hard/ semi hard cheese	Manchego	•	•	•	•	•	•	•	•	•	•
	SPECIALITY CHEESE										
Semi hard / soft cheese	Havarti	•	•	•	•	•	•	•	•	•	•
	Port Salut/St. Paulin	•	•	•							
	Limburger	•									
	Blue mould	•									
Soft cheese	Gorgonzola	•									
Semi and soft cheese	Feta/Domiati	•									
Semi soft / fresh cheese	White cheese	•									
	PASTA FILATA										
Hard / semi hard cheese	Provolone	•									
Semi hard cheese	Kashkaval	•									
Semi hard / fresh cheese	Pizza cheese	•									
Soft / fresh cheese Italian	Mozzarella	•									

Cheese plant logistics and cheese technology

As a leading global supplier of complete cheese plants to the dairy industry, Primodan offers a comprehensive selection of flexible and cost-effective solutions for a wide range of cheese types and sizes with wide-ranging moisture content and fat in dry matter.



CheeseMaster plant

The CheeseMaster line is an automated, modularised processing line for manufacturing all variations of EPC cheeses (European Pressed Cheese) – hard and semi-hard, round and rectangular, round eyed and with irregular eyes – in sizes from 2 kg to 50 kg (4.4 to 110 lbs/h) or more.

The CheeseMaster line has a proven track record for its outstanding performance and yield.

Cheese technology and support

Primodan's cheese process technology is the result of many years of experience and close co-operation with cheese manufacturers throughout the world.

Our experience and wide range of technologies means that we can configure and modularise a world-class solution for a particular cheese production line, and provide all necessary support and service.



A dedicated team of specialists

- World-class innovation, engineering, sales and service competence
- Powerful and versatile technology platform
- Pioneers in innovative dairy applications and engineering solutions
- Experienced Dairy technologists for cheese production.

CurdMaster – a vertical double O cheese vat



Cheese vats including various options to fit any type of cheese production.

Field of application:	Cheese plant
Capacity:	Up to 30,000 L (8,000 US gal)
Temperature:	Dependent on individual cheese types

Vertical double O type

Advantages

- Fast foamless filling
- Rapid mixing of all added components including rennet
- Gentle and precise cutting
- High yield
- Fast whey draw
- Controlled and fast heating and cooling
- Vertical vat with two outlets for fast emptying
- Efficient and gentle stirring
- Fully automated with touch screen
- CIP cleanable vats.

SoftCurd – a horizontal cheese vat, OCC



Horizontally enclosed cheese vat, filled only up to below the central, horizontal shaft. Two sets of cutting tools for vertical and horizontal cutting to create uniform curd cubes, followed by proven high-quality, downstream system for whey draining, washing and cooling, curd draining and creaming.

Field of application:	Mainly cottage cheese plants
Capacity:	Tank size from 6,000 L to 18,000 L (1,585 - 4,755 US gal) filling volume Line capacity up to 5,000 kg (11,000 lbs) cottage cheese per hour
Temperature:	PLC controlled cottage cheese cooking programme

Cottage cheese production

Advantages

- Enclosed cheese tank with horizontal and vertical cutting tools
- Horizontal cutting frame parked outside product area when not in use
- Dedicated stirring shovels for gentle curd agitation
- Unique soft curd agitation programme
- Low product level
- Well-proven downstream equipment
- Fully CIP cleanable equipment
- High product quality and hygiene standard
- Tank also applicable for Blue Cheese, Feta and other cheeses.

CurdFinishing tank



The CurdFinishing tank is used for gentle final agitation as well as for the second whey draw which can be performed without stopping the agitator. This will minimise the lumps in the cheese mass to be pre-pressed which again will give a better cheese base without irregular holes.

Final stirring and second whey draw between the cheese vats and the Pre-Press system

Advantages

- Improved cheese quality – better cheese base with minimum lumps and no irregular holes
- Shorter cheese processing time
- Very gentle, efficient and homogeneous agitation to eliminate feed variations in the Pre-Press system
- Continuous whey suction system enabling whey draw from the tank without stopping the agitator
- Separate in- and outlets
- Tangential inlet
- Enables high concentration of cheese curd before emptying to the Pre-Press system.

Field of application:	Cheese plant
Capacity:	Any
Temperature:	Process dependent

FinesSaving tank



During the second whey draw, the cheese fines in the whey are sedimented in a FinesSaving tank. The sediment fines will continuously be in motion to prevent fines lumps until they are forwarded to the Pre-Press, where they are distributed in the cheese mat and joint with the cheese grains.

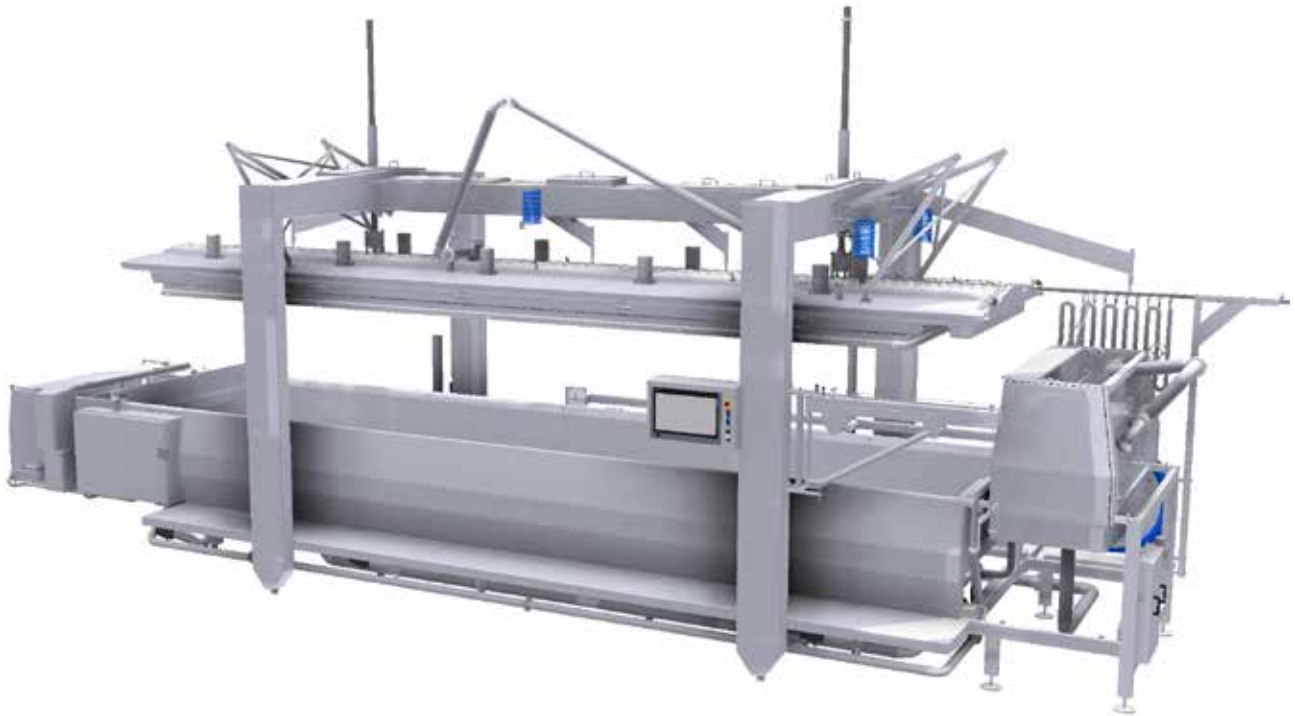
For recovery and reintroduction of cheese fines into the cheese

Advantages

- Increased yield through recovery and reintroduction of cheese fines
- Ability to flush out the filling line with clear whey
- Elimination of any increased fines losses from the second whey draw
- Improved cheese quality in connection with the second continuous whey draw
- Quick filling of the bottom of the Pre-Press with clear whey
- Less fines sediment in the bottom of the Pre-Press.

Field of application:	Cheese plant
Capacity:	Any
Temperature:	Process dependent

OPD Pre-Press



Pre-pressing of all types of semi-hard and hard cheese in all shapes and sizes between 850 x 600 mm and 106 x 200 mm (33.5 x 23.6 inch and 4.2 x 7.9 inch). Available with a number of cheese production optimisation features such as laser scanning and adjustable knives.

Field of application:	Cheese plants for production of semihard and hard cheeses from about 2.0 kg to 50 kg (4.4 to 110 lbs)
Capacity:	5,000 - 20,000 L/batch (1,320 - 5,280 US gal/batch) Maximum batch size 13,000 x 1,700 x 200mm (512 x 67 x 8 inch)
Temperature:	Dependent on cheese type

Flexible pre-pressing of all kinds of semi-hard and hard cheese types

Advantages

- Flexible Pre-Press for all cheese types and a wide range of shapes and sizes
- Adapts easily to variations in fat and water content
- Physical separation between the individual batches for clear batch identification
- Fewer cheese vats required
- Easy change of cheese dimension and shape
- Same unit can make Gouda and Tilsit type cheeses
- Long production time between CIP cleaning
- Higher yield
- Uniform water content
- High weight accuracy due to uniform curd distribution, laser scanning and adjustable knives.

Mould fillers



Filling of pre-pressed cheeses. Simultaneous filling of more than one cheese depending on the capacity requirements of the processing line.

Flexible filling solutions for cheeses of various dimensions and shapes, and with different structures and firmness

Advantages

- Gentle handling of the cheeses
- Possibilities for laser controlled filling for accurate placement of the cheeses in the moulds (large cheeses)
- Can fill up to 24 cheeses in the same operation
- All fillers are product adapted according to cheese type
- Choice of filling heads and filling systems
- Choice of type and amount of filling heads
- Several filling tools can be integrated in the automatic filler or changed for production of various dimensions and shapes of cheeses
- Operation with single or multiple moulds
- Optional: Fully CIP cleanable filling unit.

Field of application:	Cheese plants
Capacity:	Up to about 5,000 cheeses per hour
Temperature:	Process dependent

SaniPress system



Pressing takes place in closed tunnels by means of a diaphragm pressing on the entire surface of the mould lid.

Highly exible system for final pressing of semi-hard and hard cheeses

Advantages

- Even pressing of cheeses in individual moulds or multiple moulds without using spring-loaded lids
- A specific pressure of 400 g/cm² (5.7 lbs/sq.in.) is achieved at only 0.3 bar (4.3 lbs/sq.in. air pressure)
- Optional available with pressing cylinders
- Applicable to a wide variety of cheese types
- Applicable to a wide variety of shapes and sizes
- Integrated mould storage
- Collecting of whey and CIP liquid.

Field of application:	Cheese plants
Capacity:	Tailored to cheese processing line
Temperature:	Dependent on individual cheese types

Mould emptier system



Compressed air emptying: The moulds are turned 180 ° and fixed after which the cheese is released by blowing compressed air through the micro-perforated holes in the bottom and sides of the mould.

Highly flexible system for final pressing of semi-hard and hard cheeses

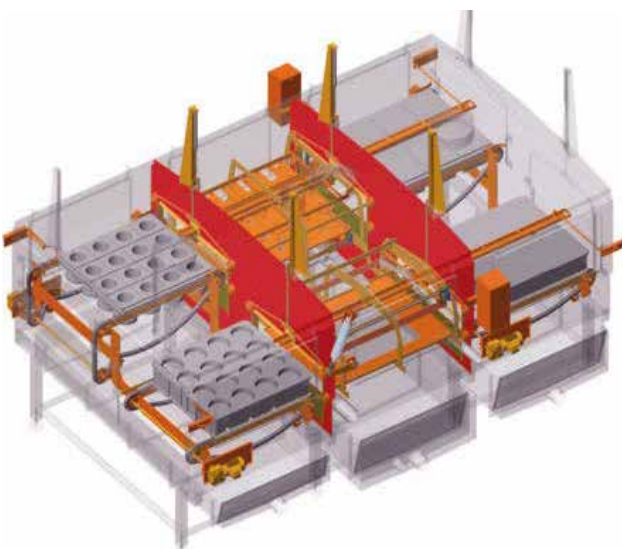
Advantages

- Customised to individual cheese types, shapes and sizes
- Additional emptying tools can be integrated in the automatic filler or changed to accommodate various cheese shapes and sizes
- Choice of two methods enables the optimum solution for any cheese type
- Works with single and multiple moulds
- Available with full CIP cleaning.

Field of application:	Cheese plants
Capacity:	Adapted to the individual cheese plant
Temperature:	Dependent on cheese types

Vacuum emptying: Specially designed, fixed vacuum heads on the mould are lowered on the cheese. The cheese is lifted out of the mould.

Cheese mould washer



The cheese mould washer consists of three sections – pre-rinse, pressure washing and final rinse. Cheese particles and whey residues are removed by simple flushing in the pre-rinse section. The moulds are fixed

Special, patented design for cleaning micro-perforated plastic cheese moulds

Advantages

- Patented pressure washing system for efficient cleaning of all micro-perforated drain channels, thus preserving the whey draining capacity of the moulds.

Field of application:	Cheese plants
Capacity:	Adapted to the individual cheese plant
Temperature:	75° C (167° F) in the pressure washing section

in an upside down position in the pressure washing section and detergent is circulated through the microperforation. Finally the moulds are rinsed with fresh water, which is recycled to the pre-rinse section.

Rack filler



Pressed cheeses are conveyed on a belt conveyor from the mould emptier to the rack filler where they are loaded on the roller conveyor in the rack loading vat. After the roller conveyor is lowered below water level, the rack elevator pulls an empty rack from the rack storage system, and places it with the lowest shelf in the loading position on a level with the roller

Gentle loading of cheeses on the rack

Advantages

- Specially designed rack filling system with filling below water level for gentle treatment of soft, pressed cheeses
- Flexible to accommodate various cheese shapes and sizes.

Field of application:	Cheese plants
Capacity:	Adapted to the individual cheese plant
Temperature:	Dependent on the various cheese types

conveyor. One shelf is loaded at a time by means of a pneumatically controlled pushing device, after which the rack elevator steps the rack to the next position. When the rack is loaded and all cheeses under liquid, the rack is pulled out of the elevator to the position for crane collection to the brining vat

RackBrine system



A flexible modular system made of stainless steel (Al S I316) consisting of brining racks, cooling/brining vats , and an overhead crane for rack conveyance. The brining racks consist of a frame with perforated profiled shelves equipped with safety gratings, as well as grip fittings for crane transportation and for hanging from the edge of the vat. The cooling/brining vats are made of stainless steel, and the edge of

For round and rectangular hard and semi-hard cheeses – water cooling and brining

Advantages

- Highly flexible to accommodate various cheese types, shapes and sizes
- Suitable for both cheese cooling and cheese brining
- Available with full CIP to enable full batch control.

Field of application:	Cheese plants
Capacity:	Adapted to the individual cheese plant
Temperature:	Dependent on the individual cheese process

the vats feature rack fittings to make sure the racks do not touch the vat during lowering/lifting. The overhead crane is mounted on epoxy-covered steel pillars and covers the area containing the loading/unloading systems and the cooling/brining vats. It features a special gripper that fits closely with the grip fittings on the racks, and a semi or fully automatic PLC system.

Rack unloader and rack washer



The automatic unloading system consists of an elevator with a slat conveyor and a pneumatically controlled cheese pushing device, a chain conveyor positioning the rack for unloading, and a gripping device to lift the safety grating during unloading. After unloading, the rack is conveyed by the chain conveyor to the washing cabin. Unloading and rack washing are controlled by an integrated PLC system.

Field of application:	Cheese plants
Capacity:	Tailored for the actual brine plant
Temperature:	Dependent on the various cheese types

Automatic unloading of brined cheeses to cheese conveyor system prior to rack cleaning

Advantages

- Highly flexible unloading system for a wide variety of cheese types, shapes and sizes
- Precise positioning of cheese pushing device
- Assurance that all racks are cleaned after each circulation – fresh cheeses always loaded on clean racks
- The system is fully controlled by a PLC system.



Zoe Schaeffer on Unsplash

Full support to ensure your succes



The Primodan cheese department has a long tradition of working with cheese customers in order to find the best solution and equipment for your cheeses.

This involves a lot of Primodan's core technologies, such as milk reception and standardization, culture preparation, whey treatment, CIP plants, automation, spares and service, as cheese plants involve many technologies as shown.

Primodan offers all from; pre-projects, consultants work, equipment, line concepts, cheese technologists, project management to after sales service.

In close co-operation with the customer and with an effective teamwork we offer the whole range from single units to green-field projects.

Automation ties it all together with visibility of key factors for the cheese production performance.

+ 60 YEARS OF CHEESE MAKING HISTORY

Gadan



Pasilac



APV



Invensys



SPX



Primodan