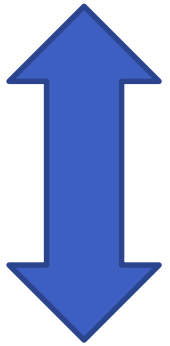
(Semi) Hard Cheese Line Solutions

High efficiency vs high flexibility

Danmarks Mejeritekniske Selskap 5 April 2018

Arjen de Boer

HIGH EFFICINECY CHEESE LINE



HIGH FLEXIBILITY CHEESE LINE NEW

Tetra Pak Semi-hard cheese line solution

Line segments

1

Pre treatment

2

Curd making

3

Draining/forming

4

Pressing/Moulds

5

Brining

6

Storage

(Semi) Hard High Efficiency line solution

P R O V E N T E C H N O L O G Y

Tetra Pak Semi Hard line solutions

▶ High Efficiency Semi Hard Cheese Line

Focus on high performance and high quality:

- First class whey quality (IF) – and maximum recovery
- Outstanding weight accuracy
- Very low moisture standard deviation
- Long running time – less down time
- Efficient CIP

High efficiency Semi Hard Cheese line

- **Good whey quality starts with good milk treatment**

  - Spore removal
  - Lower bacterial counts
  - No fat damage
  - Prevent growth of thermophiles in regeneration sections (limiting running times of PHE)

  Pasteurizer section maximum 4 – 5 hours running time by double execution enabling continuous production !!! (needed for whey quality, not for cheese quality)

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Tetra Pak Cheese vats family
Fit for wide set of requirements

Horizontal Shaft(s)

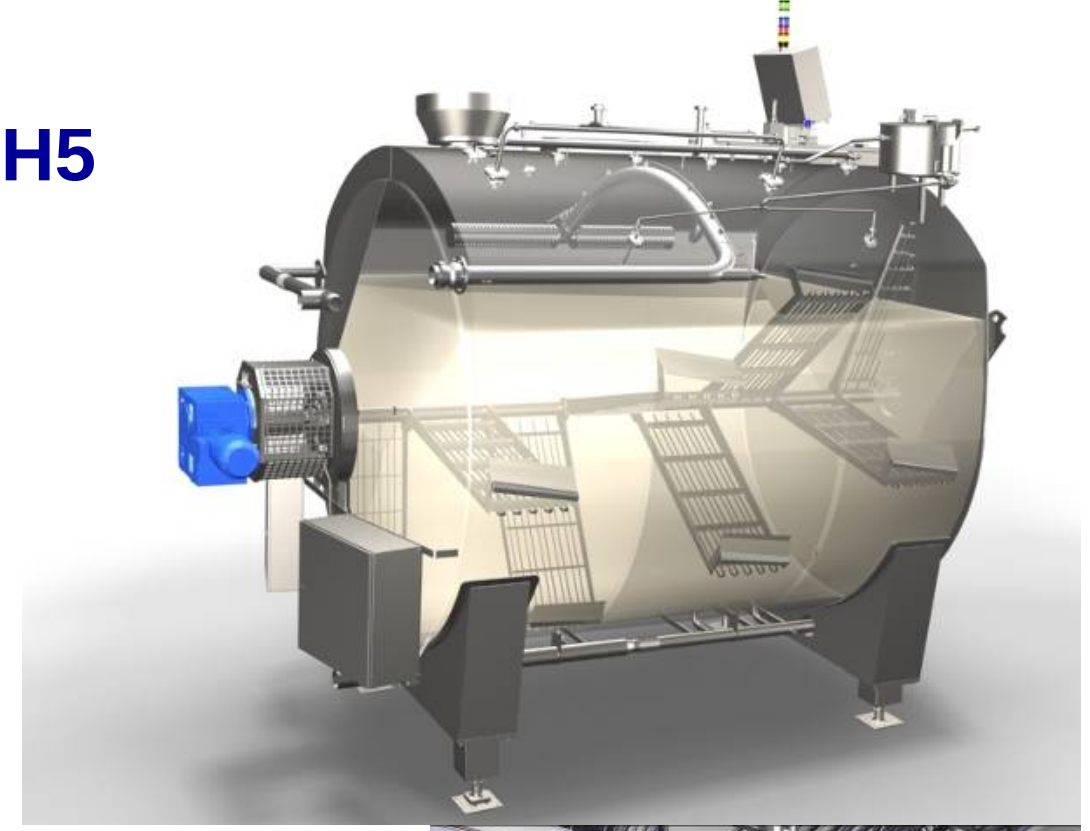
Vertical Shafts

Tetra Pak Cheese Vat OST SH5

Curd production for semi hard and hard cheese

Capacities 3.000 – 30.000 ltr

- Excellent performance
- Long operating time
- Reliable strong construction
- Low service costs

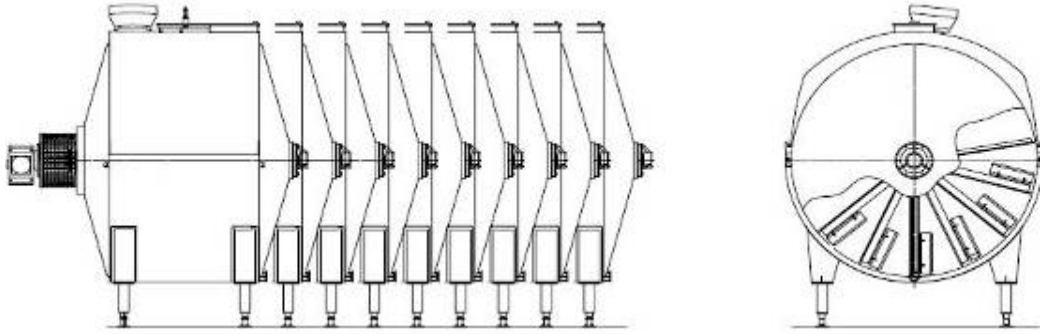


Tetra Pak Cheese Vat OST SH6

(see SH5) furthermore:

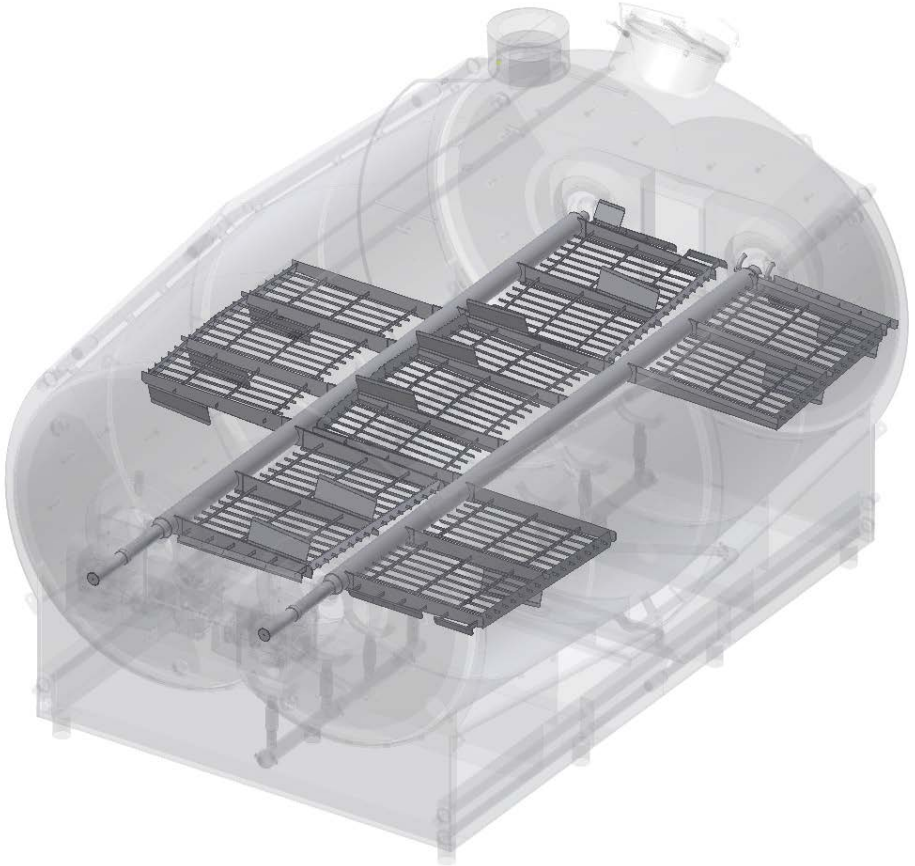
- Preferred for larger vat sizes (>15 KL)
- Heating with dimple jacket
- Controlled ΔT for gentle heating

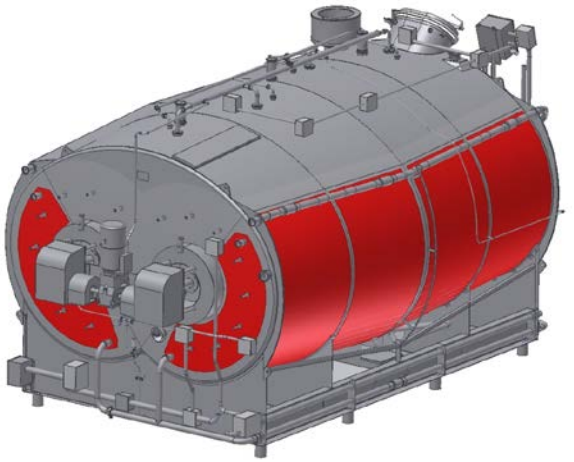
15.000 - 30.000 L
in steps of 2.500 L



Tetra Pak Cheese Vat YMV (American style vats)

The Yield master high performance vats





Tetra Pak Cheese Vat OO (vertical shafts)

Curd production for (semi) soft, semi hard and hard cheese

Types:

SH8 and SH9; with whey strainer

SH8 Range 2.000 – 30.000 l

SH9 Range 14.000 – 19.000 l

Tetra Pak Cheese Vat OO SH9

Cheese maker’s choice

- High performance at different fill levels
  - Low fat and fines losses
  - Predictable curd size distribution
  - High yield
- Precise process control
  - Effective cutting
  - Gentle stirring
  - Quick whey discharge
  - Soft heating profile
- Tune-able cheese make recipe
- Up to 60% whey pre-draw of nominal volume
- Mechanical and thermal stress resistant

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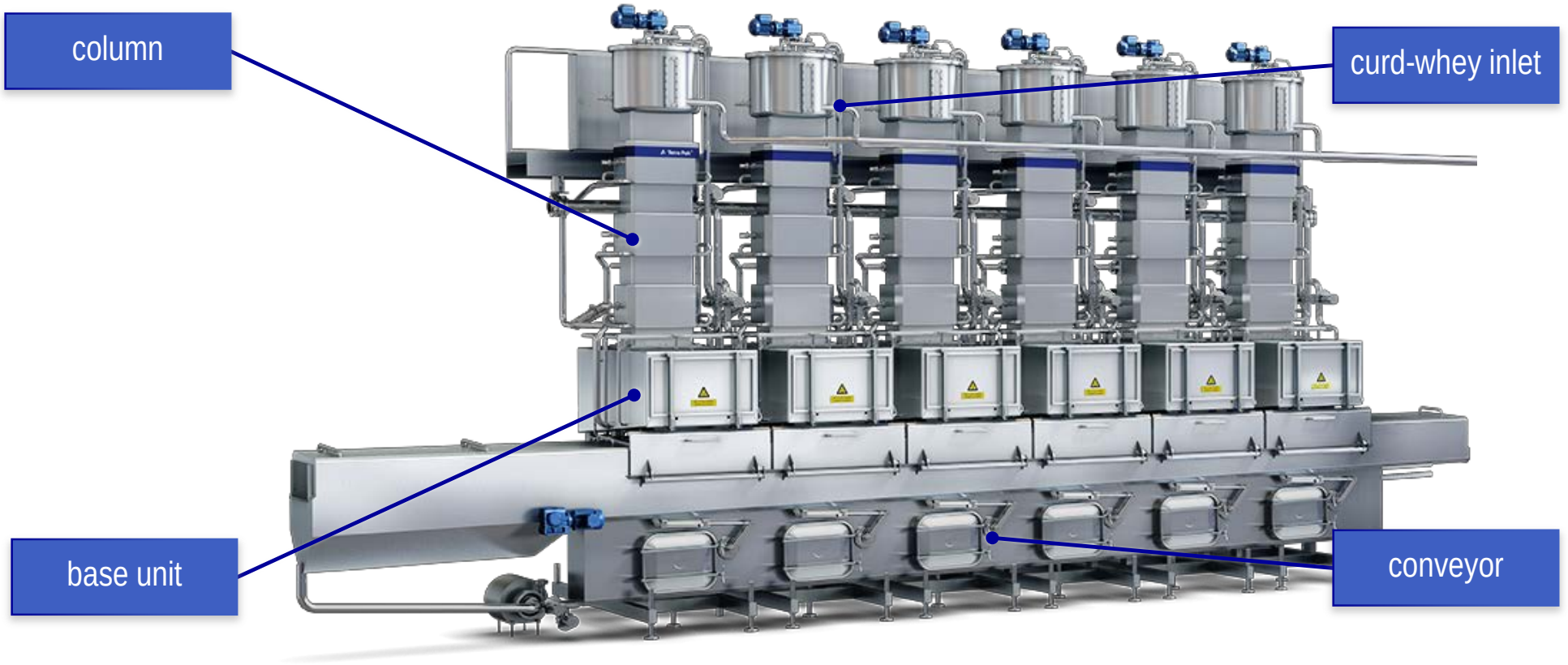
Tetra Pak Casomatic system SC7

Continuous whey drainage and portioning machine for efficient semi hard and hard cheese for 1 cheese size

Weights: 8 – 30 kg
Capacity: 1000-1300 kg/h
Running time: > 22,5 hrs

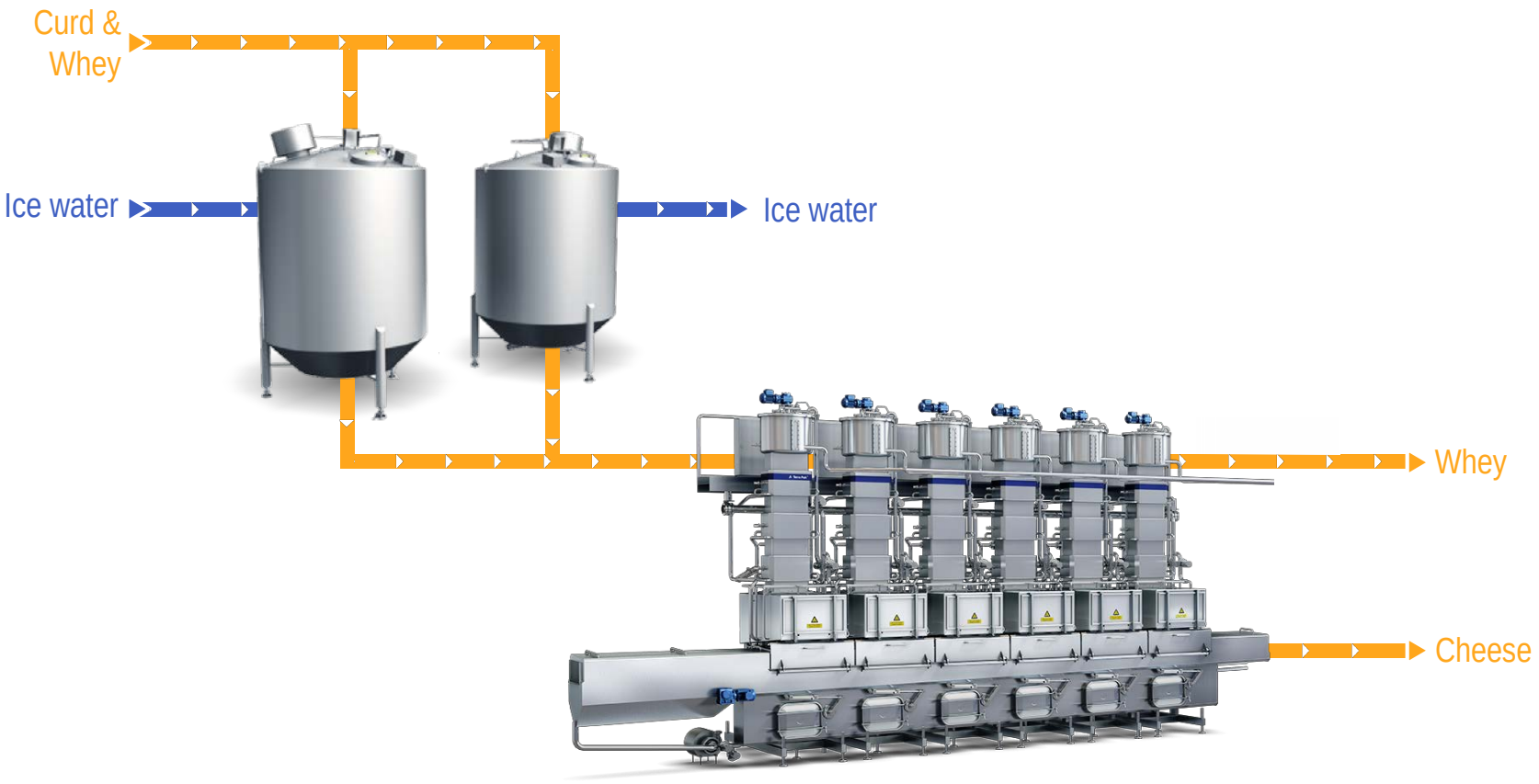
Machine overview

Tetra Pak® Casomatic system SC7



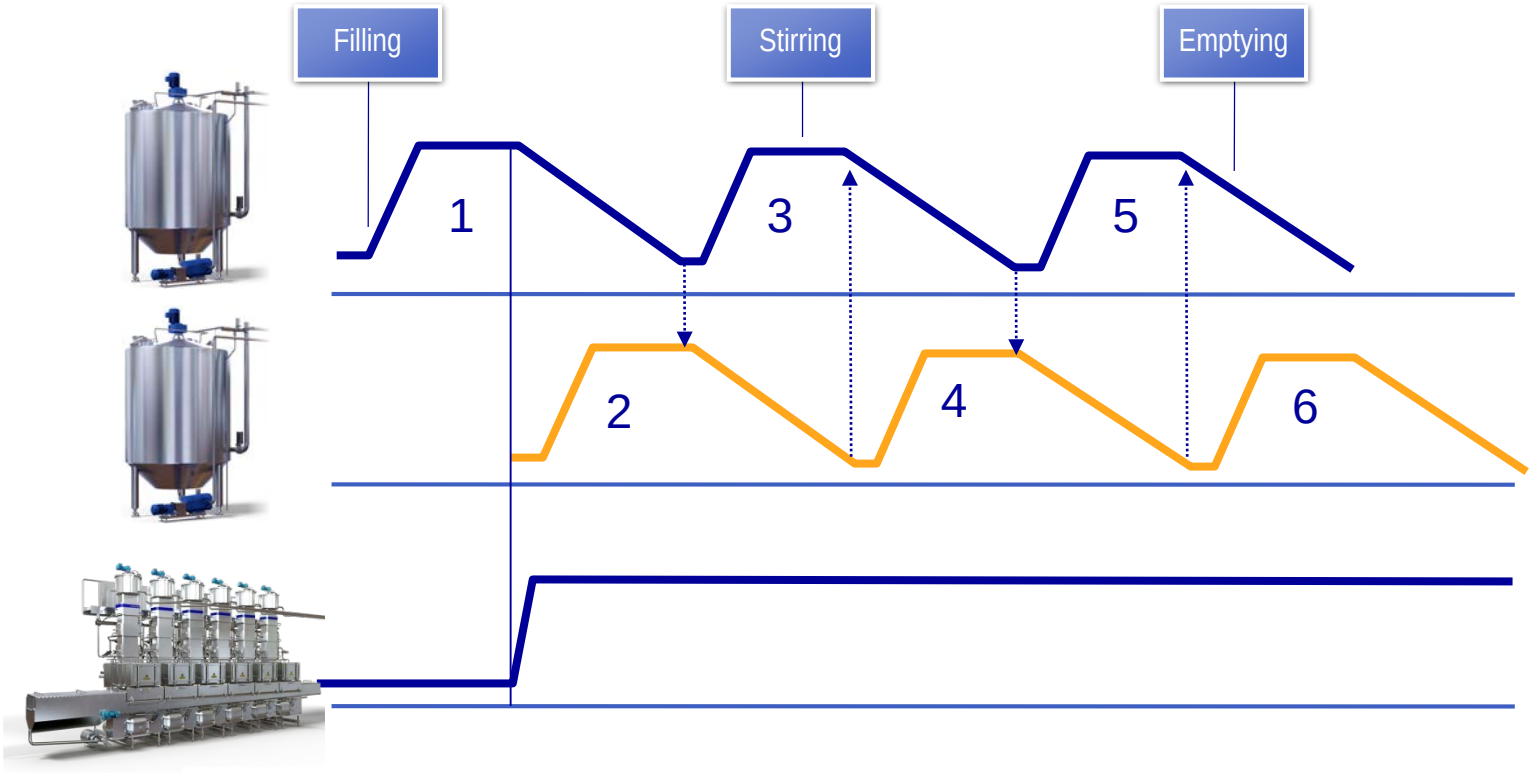
Flow chart

Tetra Pak® Casomatic system SC7



Buffer tanks principle

Tetra Pak® Casomatic system SC7 is continuously filled from the buffer tanks



Buffer tank

Tetra Pak® Casomatic system SC7

- Excellent stirring
- Low losses
- Complete emptying
- Level controlled speed of agitator
- Ice water cooling till the last drop

Process in column

Tetra Pak® Casomatic system SC7

- Whey flow
- Static pressure
- Fusion
- Filtering effect

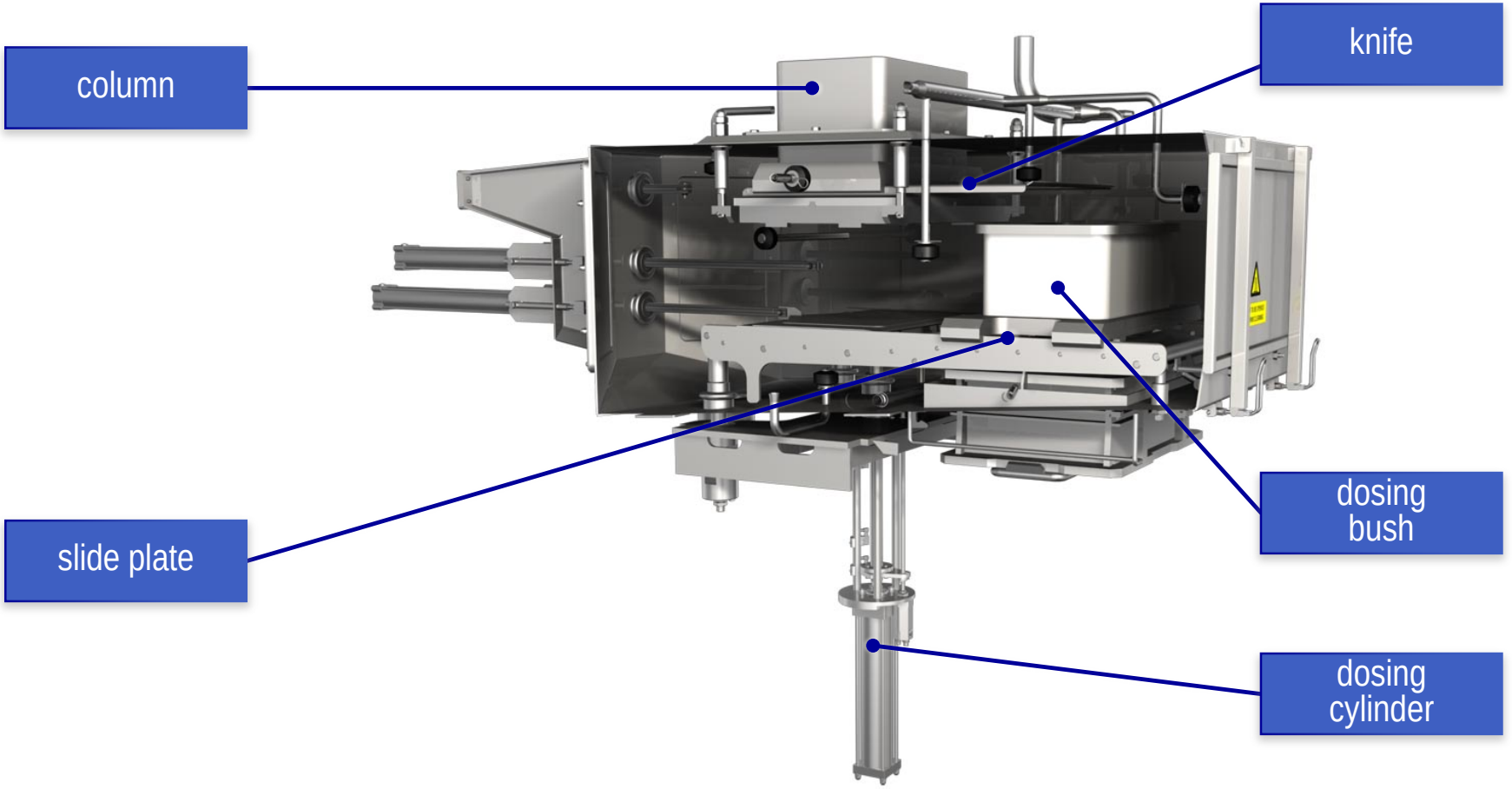
Drainage system

Tetra Pak® Casomatic system SC7

- Pressure between curd and whey is measured
- Required pressure is maintained by controlling flow
- Flow is regulated by PID controlled membrane valve

Dosing part

Tetra Pak® Casomatic system SC7



The expert’s choice

Tetra Pak® Casomatic system SC7

- Efficient solution
- Long production runs
- Reliable performance
- Excellent whey quality
- Accurate moisture content
- Outstanding weight accuracy
- Good cheese quality
- Improved environmental performance

Tetra Pak Casomatic system SC7

Key performance indicators:

- Weight accuracy (VC < 0,8%)
- Moisture accuracy (VC < 0,9%) – in combination with pressing configuration – pressing per batch – batch separation.
- Whey quality at start and end of production run (> 22.5 hr)
- Long running time (>22.5 hour without CIP)
- Minimum curd losses
- Bacteriological quality of cheese and whey

Tetra Pak Semi-hard cheese line solution

Line segments

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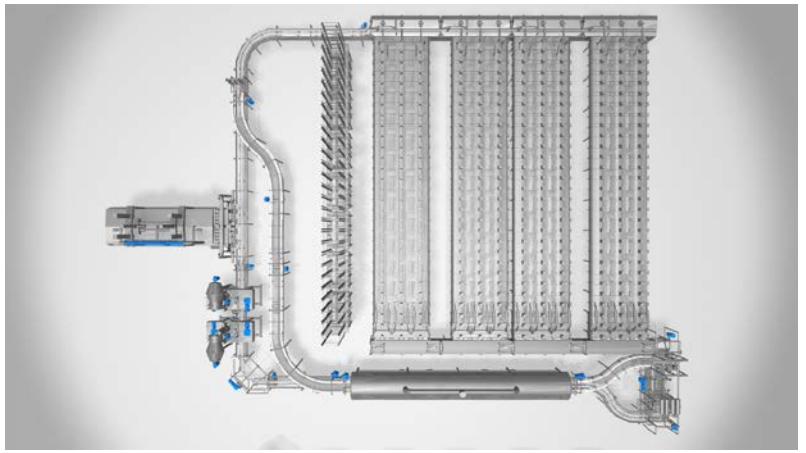
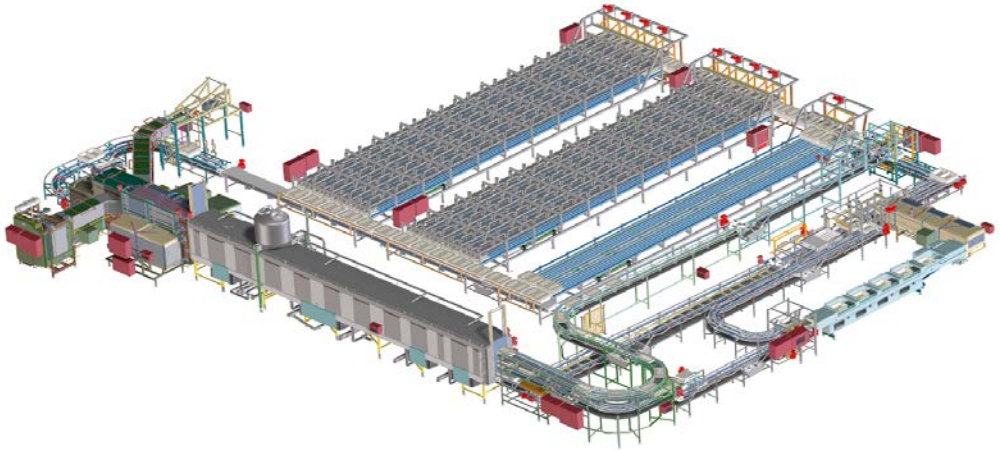
Semi Hard Pressing systems

Closed pressing systems

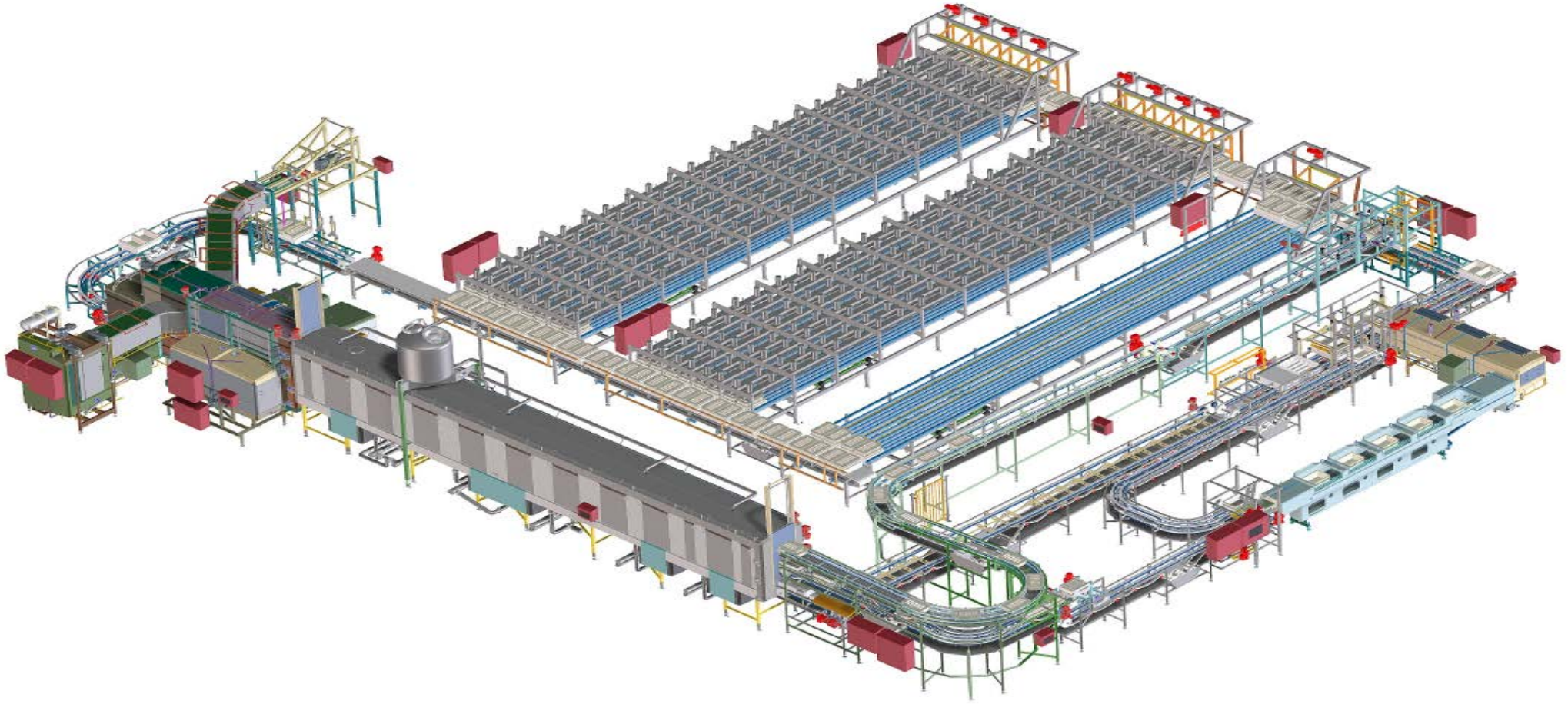


Whey Tray systems



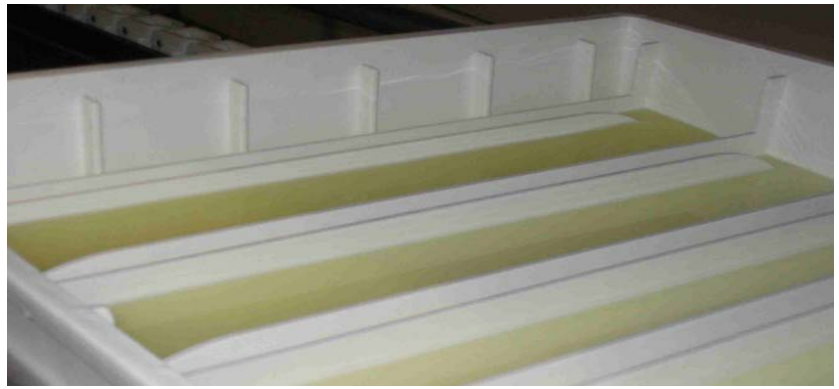
Whey Container - Tray System

Concept for dry presses – dry floor



Whey container system

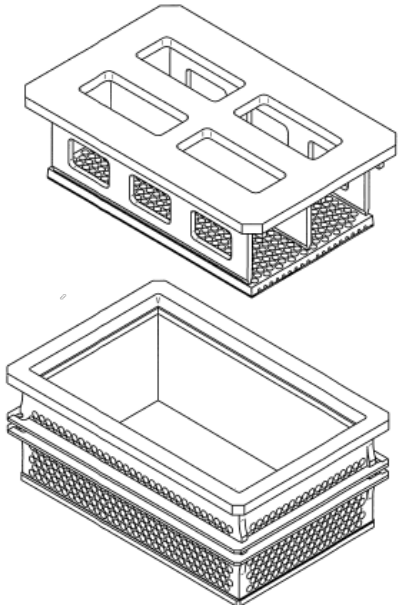
- Increased recovery of high quality whey
- No cleaning of the presses, conveyors nor handling equipment
  - Less operational costs - less water and cleaning agents, less energy
  - Lower impact on cheese room climate
  - Less energy consumption
  - Pressing per batch configuration

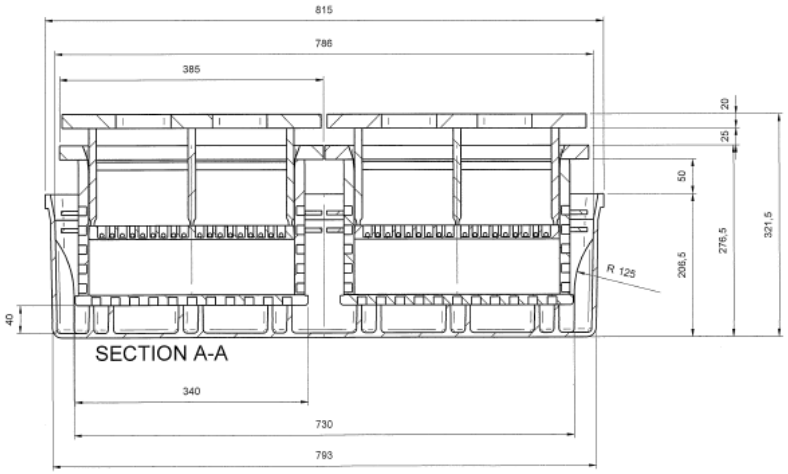


Cheese line – most efficiency pressing system

Mould handling system (conveyors):

- adapted to many different recipes
- open and accessible finall pressing system
- special mould and trays design



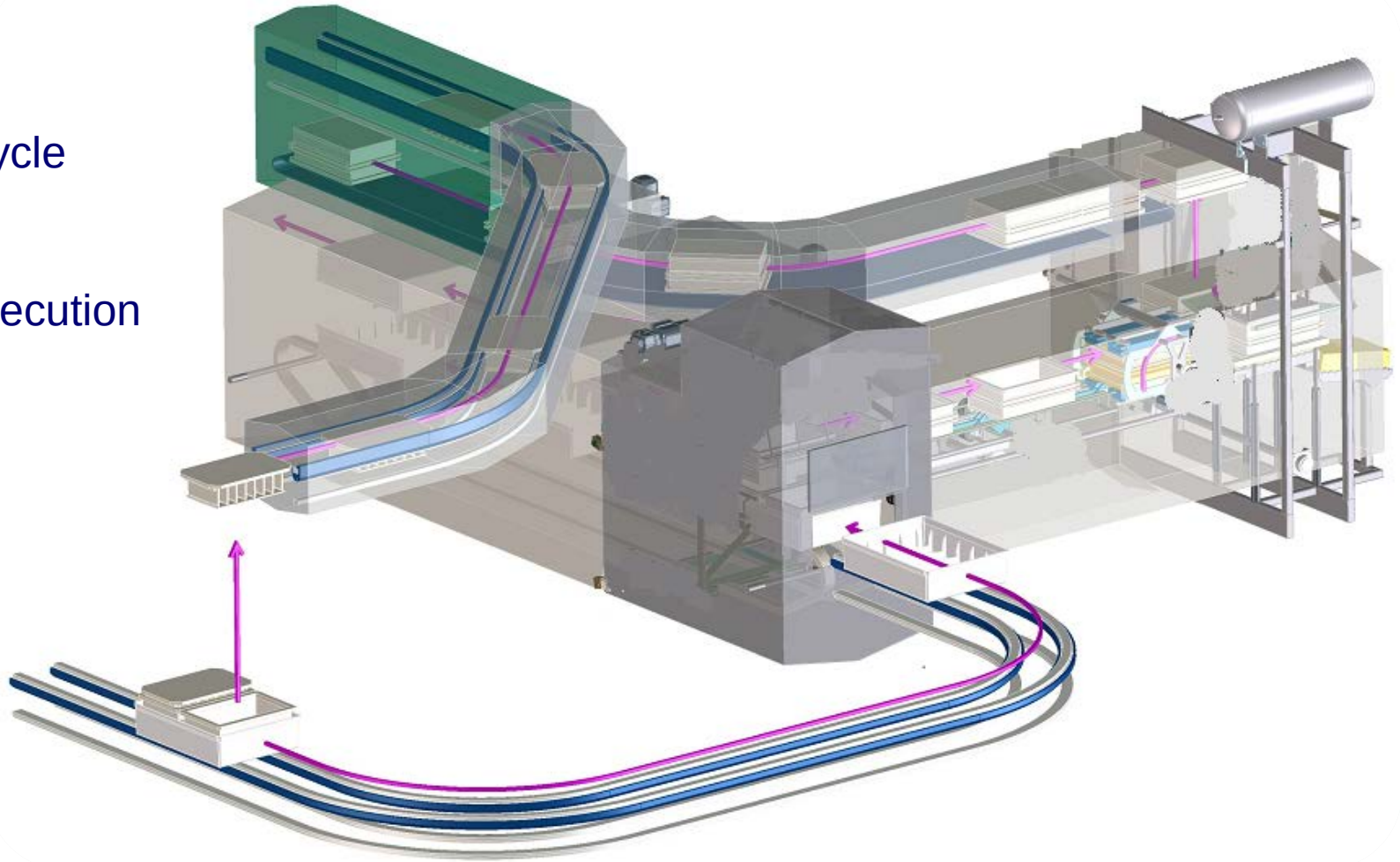


Cheese line - difficult stages

Demoulding system:

- enclosed CIP-able system
- whey recovery after every cycle
- Tray cleaned every cycle
- Collecting station double execution

  CIP every 3 – 4 hours



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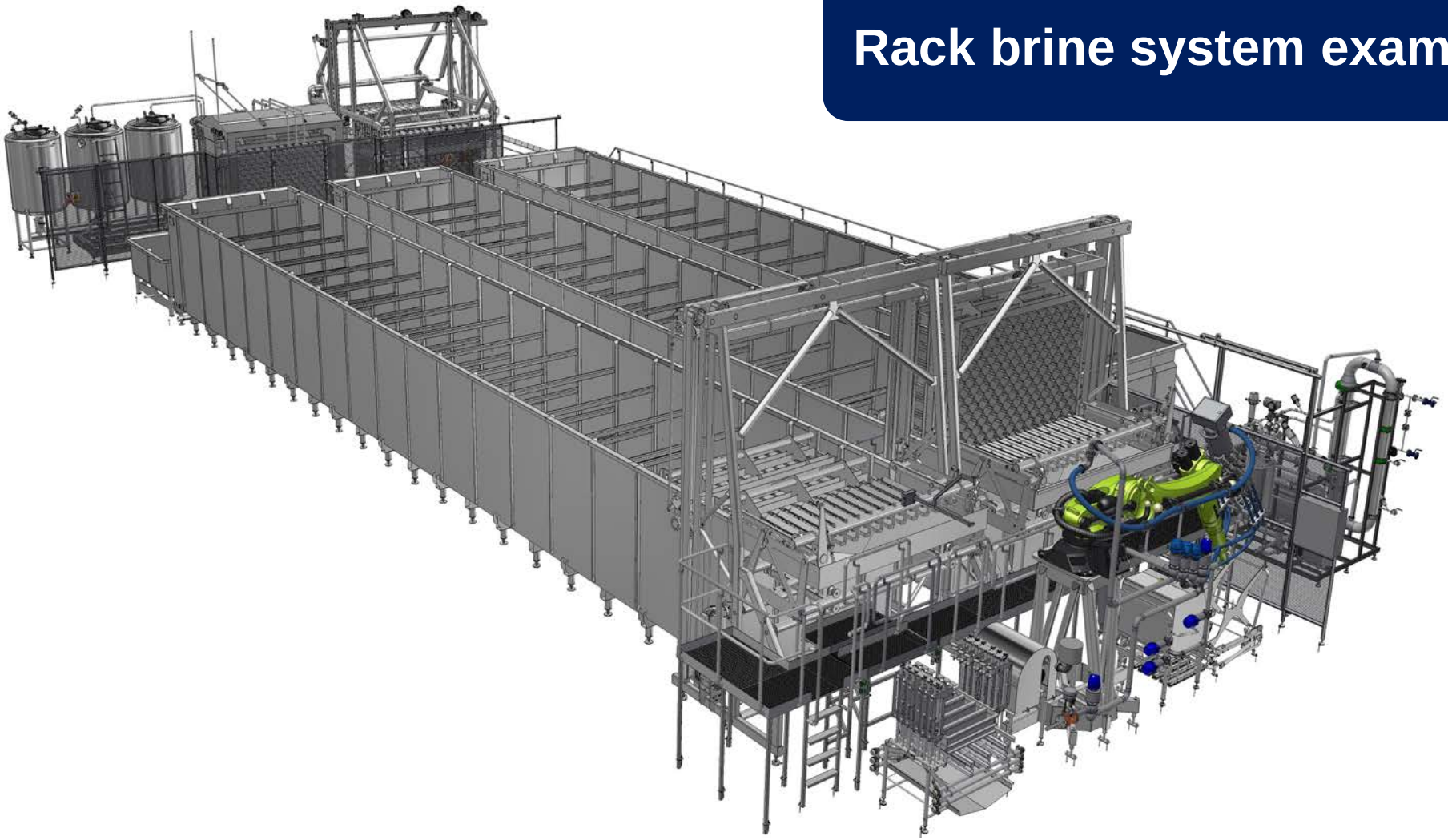
De-moulded cheeses to go into brine system

Rack brine system example



(Semi) Hard High Flexibility line solution

N E W T E C H N O L O G Y

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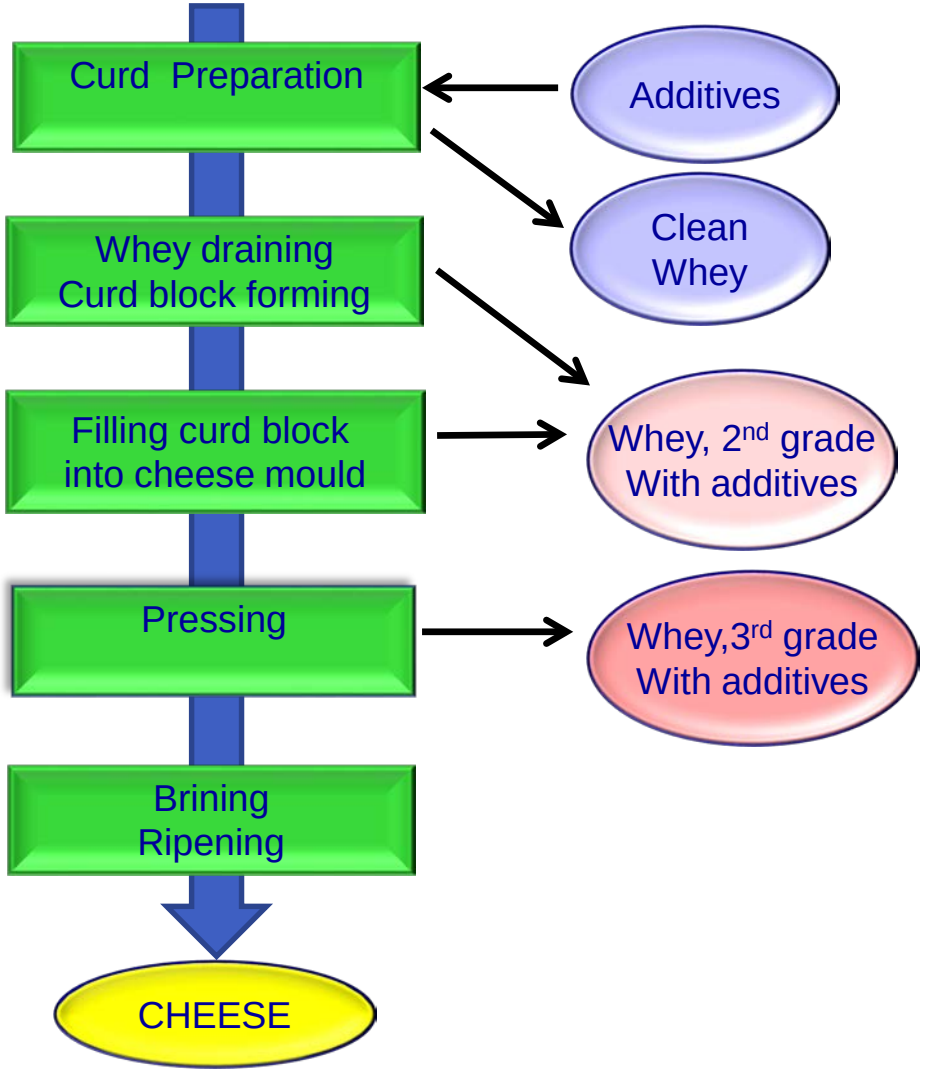
Ultimate flexibility in cheese

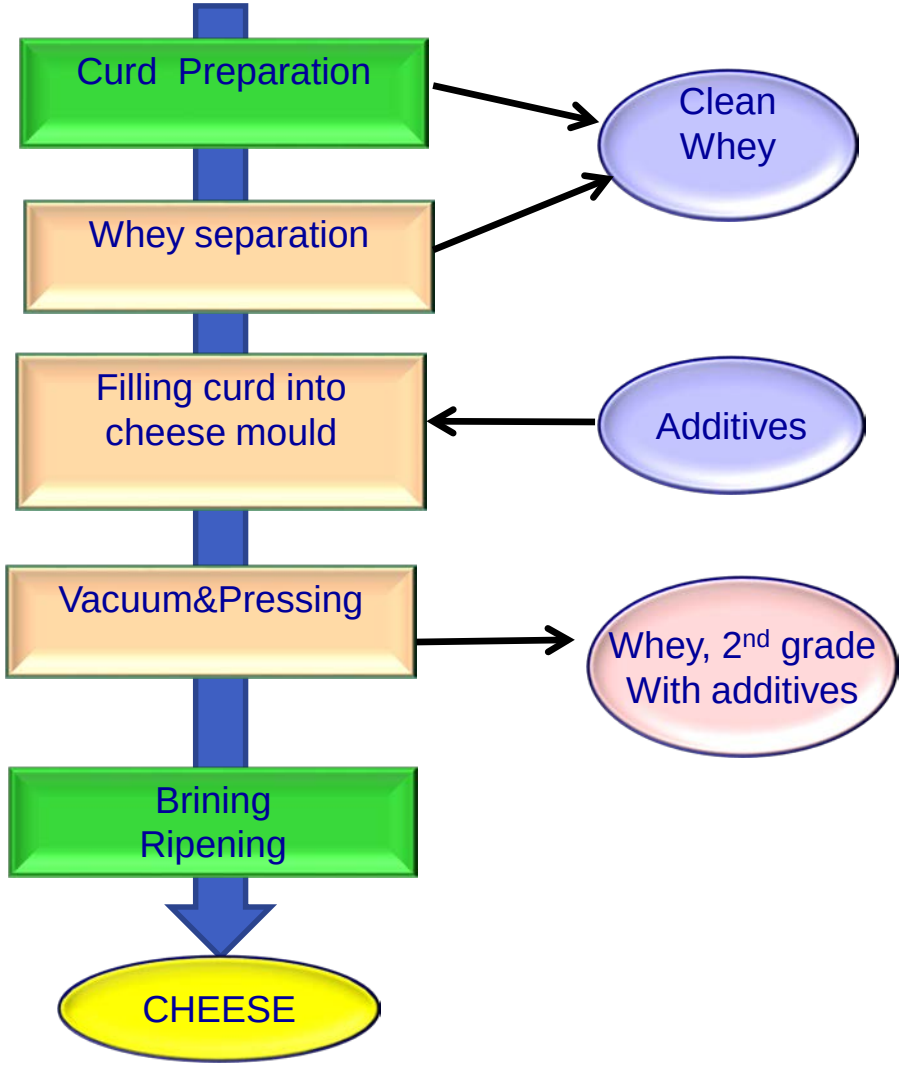
New technology addresses market needs

- Create unique cheese types
- Premium whey quality (early sourcing)
- High quality cheese
- Produce every batch an other cheese type without product and time losses
- Follow consumer demands with short time to market
- Limited investment for new formats
- Maximize value of whey, attractive business case

How it is done

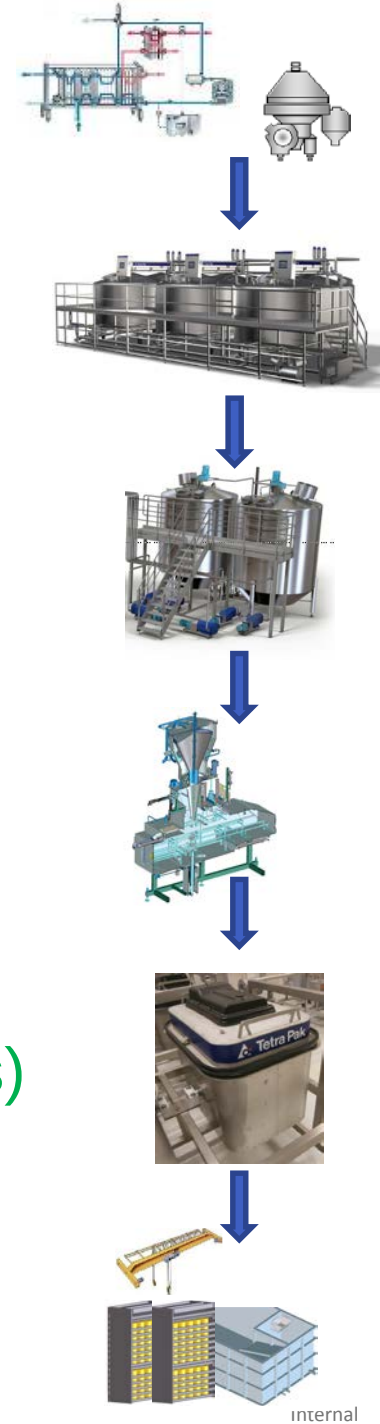
Conventional vs. Revolutionary





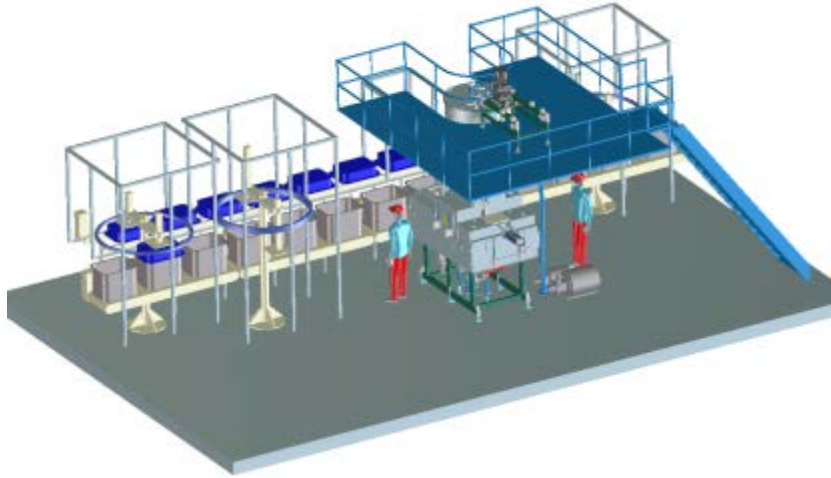
How it is done; total line concept

- Flexible cheese milk pre-treatment
- Based on normal curd making technology
- Discontinuous mode, batch-by-batch
- Whey separation before mould filling
- Ingredient addition in drained curd
- Mould filling and positioning in container
- Vacuumize container
- Pressing with atmospheric air
- Reliable and hygienic de-moulding (mould consisting of 3 parts)
- Rack brining



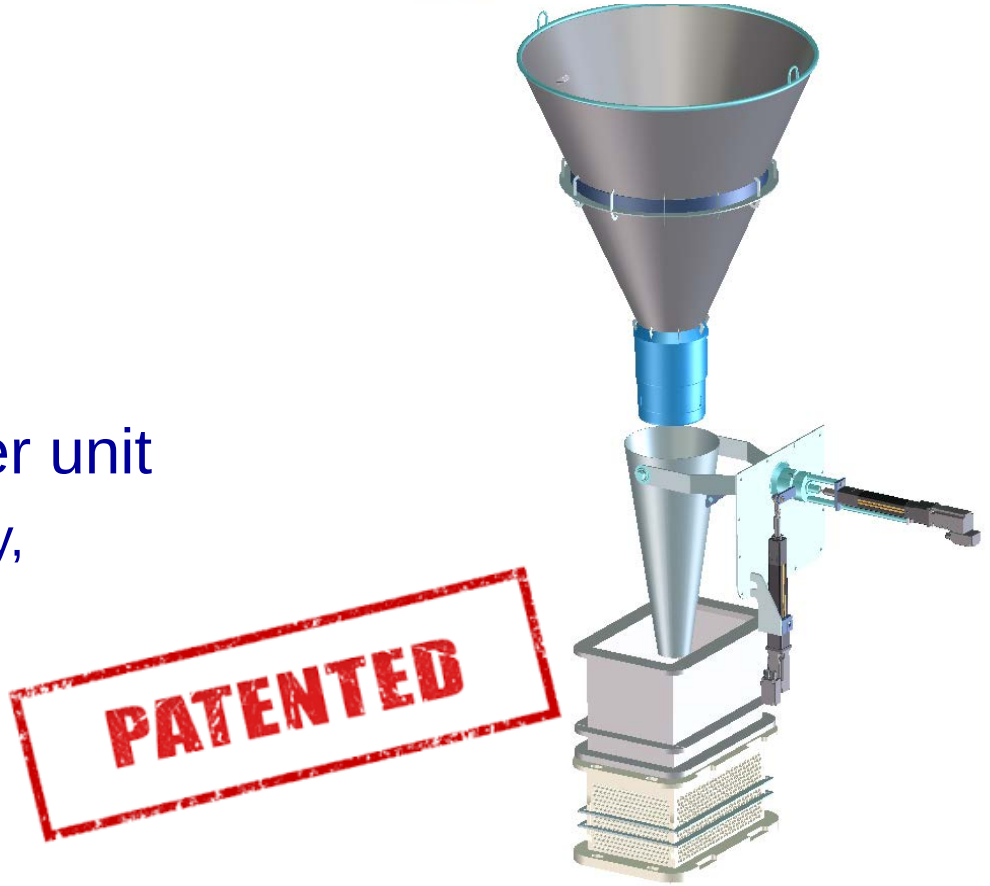
How it is done

Whey Separation and Filling the mould with curd



- Whey separation with rotating conical screen
- Screen consists of two segments
- Easy to flush and clean
- No internal curd buffer

- For single or multi moulds
- Capacity up to 3 moulds per minute per unit
  - Depending line setup, format complexity, ingredient distribution pattern



How it is done

Ingredient placement on drained curd

- Controlled distribution of ingredients
  - Even distribution
  - Uneven distribution patterns possible (layers, spots, other)
- No drag of ingredients between batches
- Small volume of whey contaminated with ingredients residues
- High retention ingredients to cheese
- Placement of wide range of ingredient types possible
- Dry herbs for more intense taste sensation

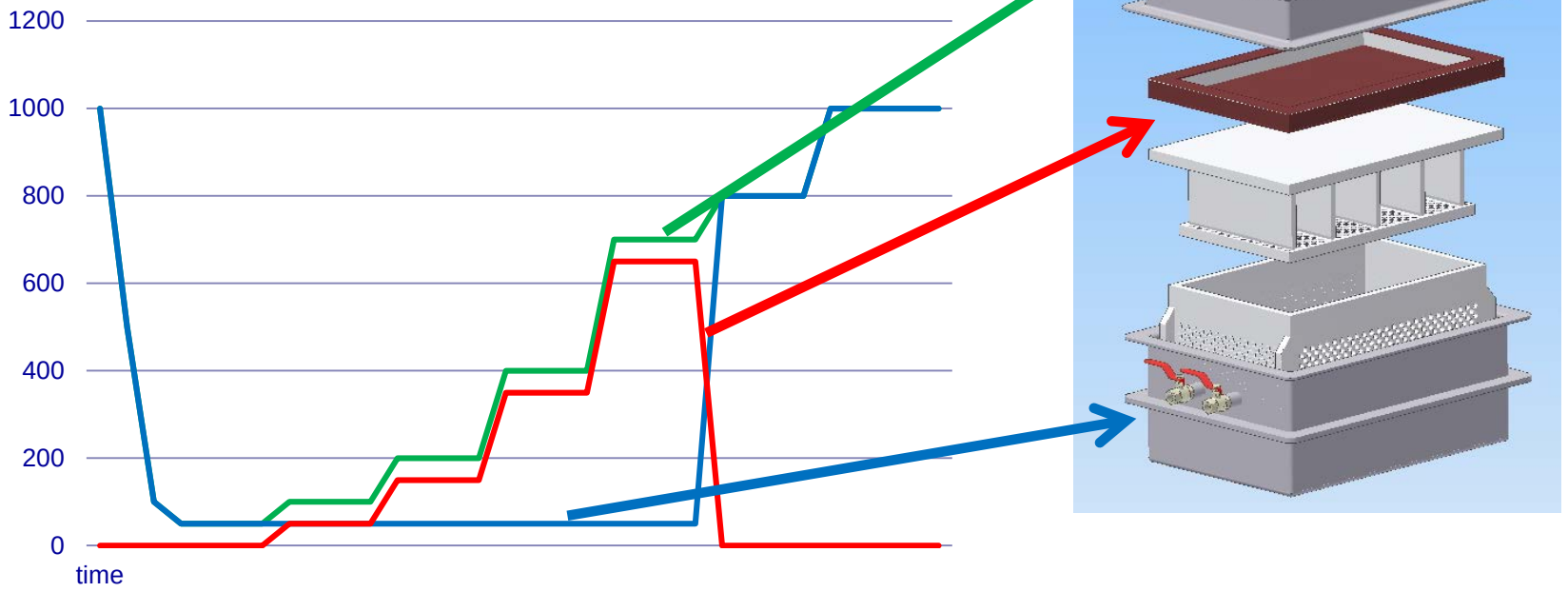
PATENTED

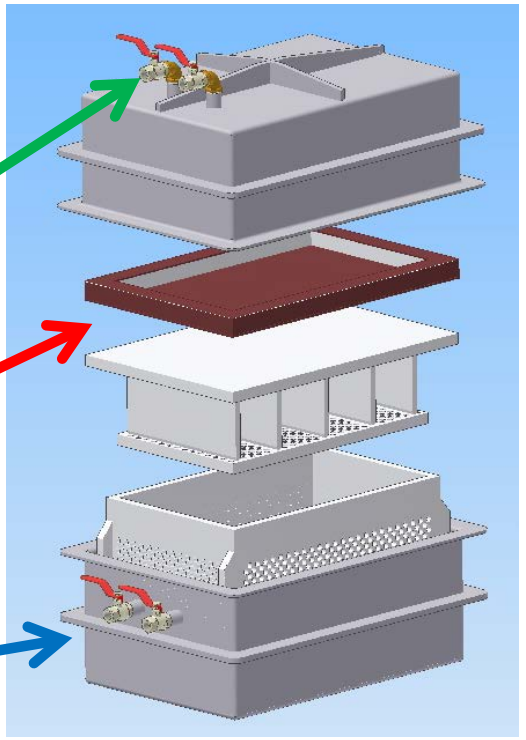
How it’s done

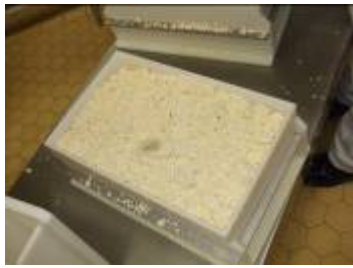
Vacuum based on cheese forming and pressing

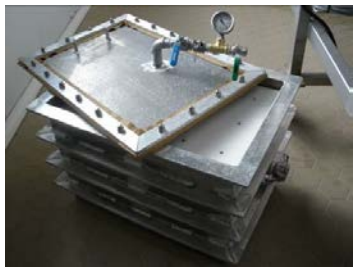
PATENTED

- Moisture removal by evaporation at vacuum
- Pressing by atmospheric pressure







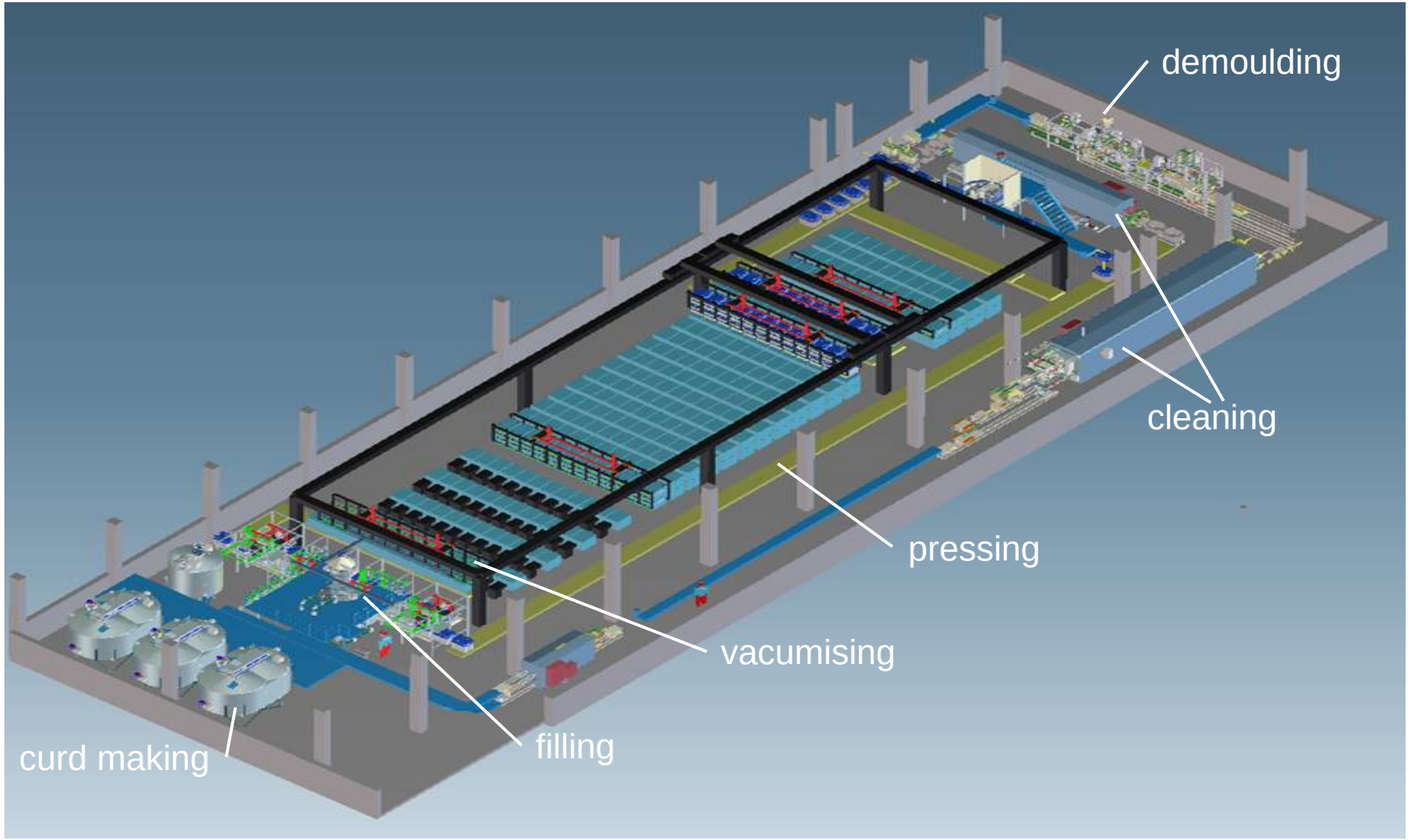


How it is done

Pressing “behind the moon” with atmospheric air

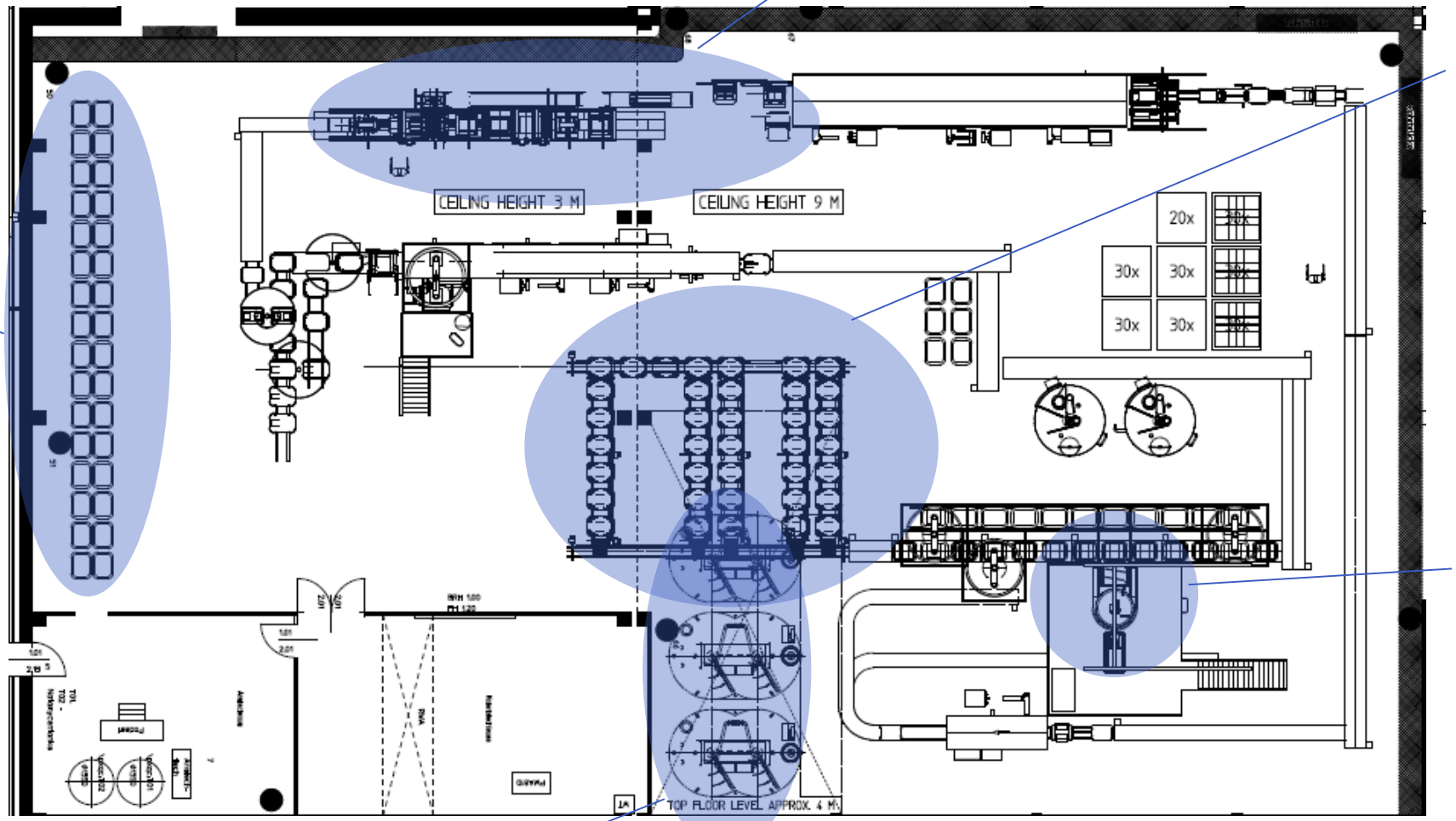
- Autonomous cheese pressing using vacuum container
  - Vacuum is applied to the container
  - Atmospheric force is applying pressure
- Wireless, tubeless, autonomous
  - The container could go anywhere you like
- Flexible
  - Recipe per cheese
- Reduced building demands
  - Footprint and high care areas

Flexline; a principle layout example



Typical Layout of Flexline with Basic Functionality

Example



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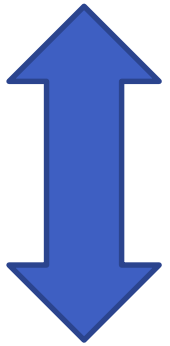

HIGH FLEXIBILITY CHEESE LINE