

KCL Pilot Plant

The leading open access pilot and
laboratory service provider in Europe



What is KCL?

- Founded in 1916
- Pilot, laboratory and calibration services
- Our customers
 - pulp, paper and biomaterial companies
 - chemical and equipment suppliers
 - research and consulting companies
- Situated in Otaniemi campus area in Espoo, Finland
- www.kcl.fi



KCL offers pilot and laboratory services for the biomaterial value chain. We support our customers in developing their products and processes, scale-ups and demonstrations.



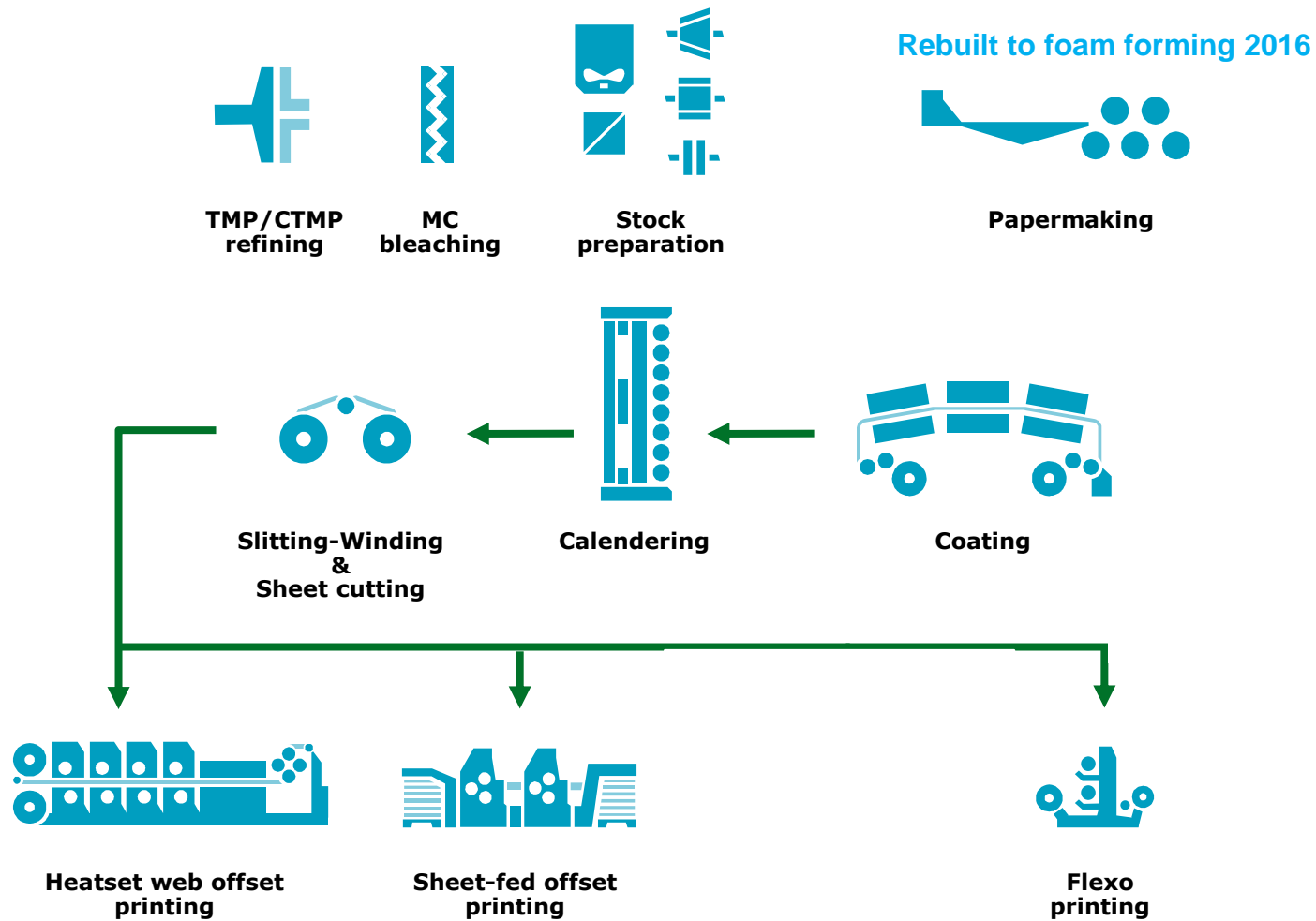
Services for the sustainable future

KCL support the development of **circular economy** with services that are linked to e.g.:

- plastic replacement with **renewable** materials
- **recyclability** of materials
- **compostability** of materials
- hazardous materials replacement with **bio-based** alternatives
- **new products** from **side streams**
- **lighter** packaging materials



KCL Pilot Plant - from wood to printed product



KCL Demo platform for biomaterials

Thune screw press



Celleco Hedemora disc filter



Rauma Repola filter press



Eimco drum filter



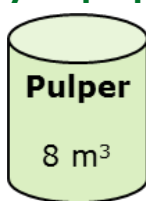
Stock reception

Low consistency, max 5-6%
Membrane pulp, 3" connection

Batch digester



Tampella hydropulper



5.
28,8 m³

9.
22,4 m³

6.
32,4 m³

2.
12,5 m³

1.
12,5 m³

4.
12,5 m³

3.
12,5 m³

8.
100 m³

7.
87,9 m³

Tampella pressure Screens



LC-refiners

Metso Optifiner RF-1



HC-refiner

Sunds RGP 44

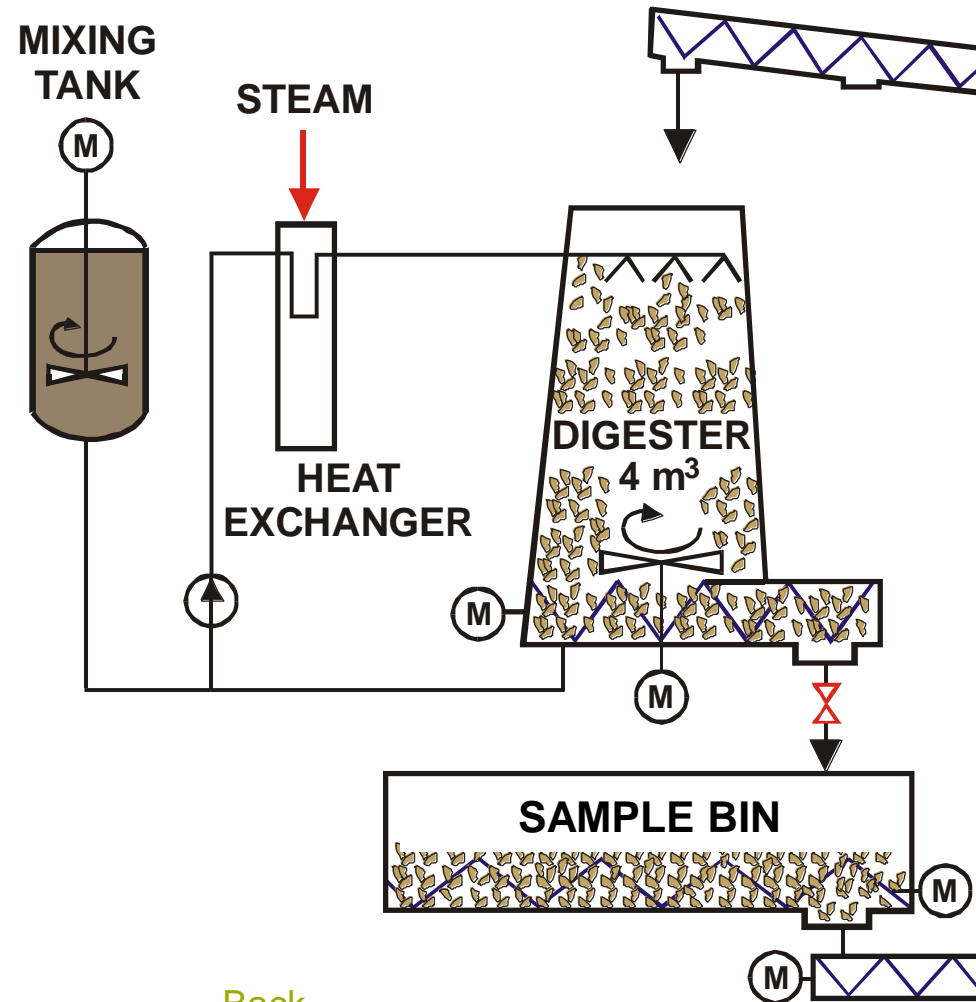


Filtration service

Ultra / Nanofiltration capabilities in pilot-scale

Chemical treatment digester

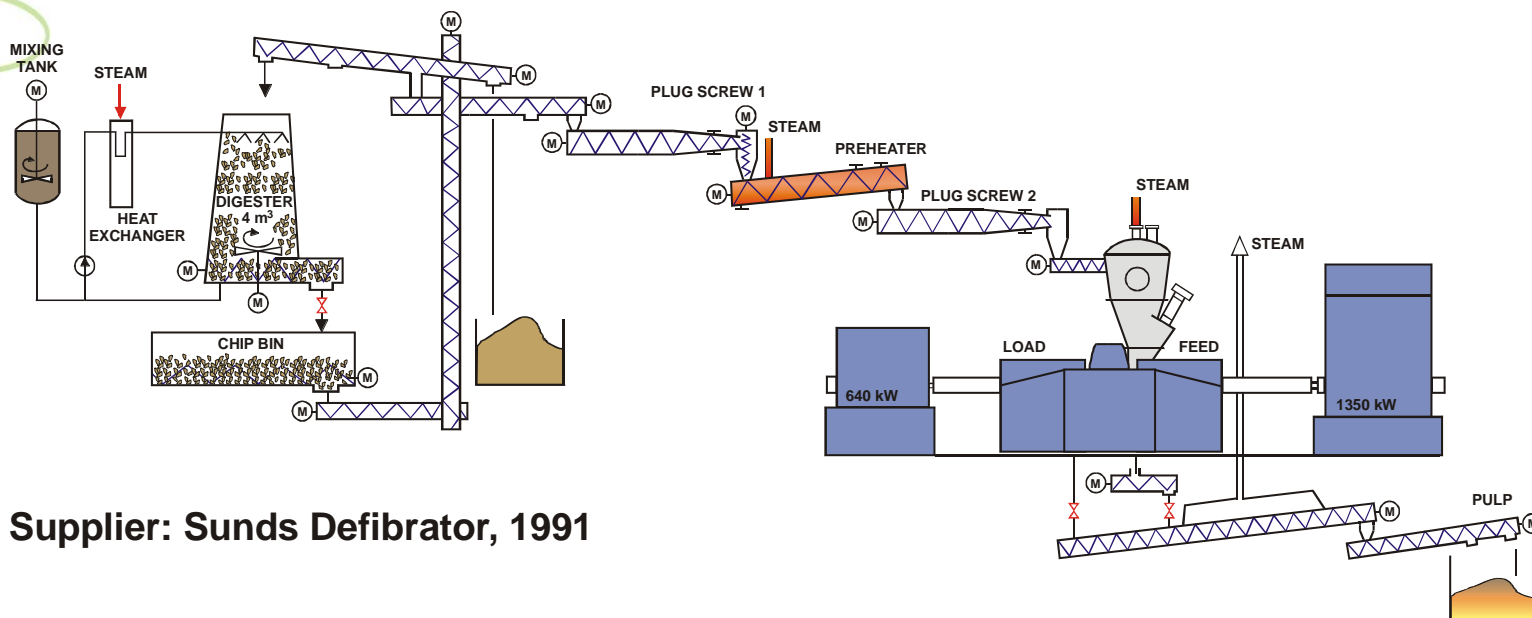
- Batch digester 4 m³
- Liquid and steam phase digesting
- Max temperature 180 °C
- Max pressure 8 bar
- Purified water



PILOT PLANT

REFINER STATION

RGP 44



Supplier: Sunds Defibrator, 1991

RESEARCH AREAS:

TMP, RMP and CTMP refining
Reject refining
Refining of deinked pulp and semi-chemical pulp
Raw material evaluation
Process research
Refiner plate development

TECHNICAL INFORMATION:

- ◆ Single disc, double disc or conical disc
- ◆ Rotating speed 1000 - 2400 rpm
- ◆ Preheater and refiner pressurized separately
- ◆ Design, pressure 1000 kPa (10bar)
- ◆ Max. production rate 1000 kg/h
- ◆ One-stage refining: 400 kg of chips
- ◆ Two-stage refining: 500 - 600 kg of chips
- ◆ 3 - 4 one-stage trials / day and 3 two-stage trials / 2 days
- ◆ Drives: feeding 1350 kW and loading 640 kW (ABB)

CHEMICAL TREATMENT:

Batch digester 4 m³
Liquid or steam phase digesting
Max. temperature 180 °C
Peroxide bleaching in preheater or in refiner plate gap.

MODIFICATIONS OF EQUIPMENT:

Change of plate: 1 day
Changing to conical disc refining: 1 week

CONTROL SYSTEM:

Damatic XD

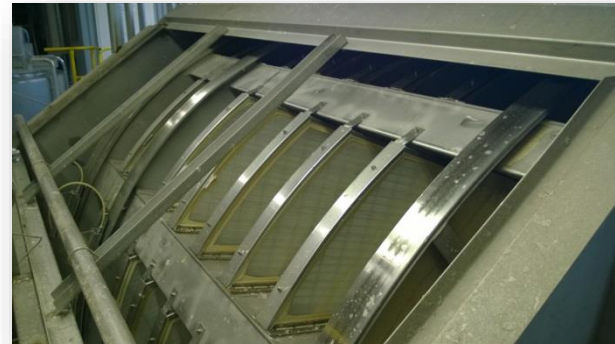
TDC DISC CLEARANCE MEASUREMENT:

- plate gap measurement
- plate temperature measurement

Thickeners

Celleco Hedemora disc filter

- Capacity 500 kg/h
- Feed consistency 0.1–1%
- Dewatered consistency 2,0–3.5%



Rauma Repola filter press

- Capacity 1000 kg/h
- Feed consistency 2–5%
- Dewatered consistency 20–55%



Thickeners

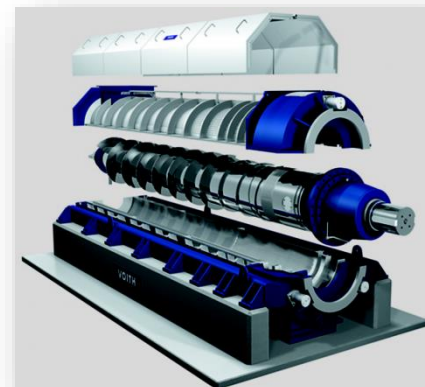
Eimco Belt drum filter

- Capacity 200 kg/h
- Feed consistency 0.1 – 1.5 %
- Dewatered consistency 15-25 %



Thune screw press

- Capacity 800 kg/h
- Motor 18.5 kW, 1500 rpm, 50 Hz
- Operating speed 5 – 15 rpm
- Inlet pressure 0 – 30 kPa
- Feed consistency 1-5 %
- Dewatered consistency 25-50 %



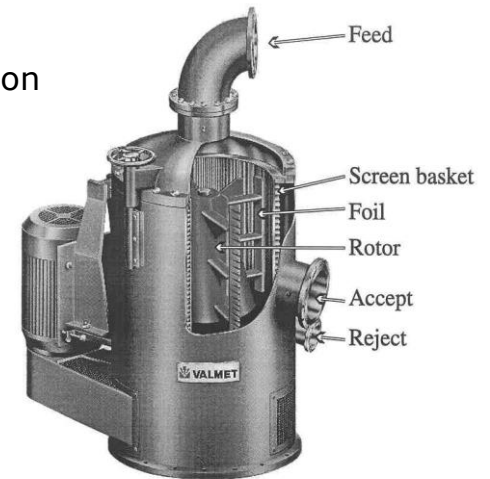
Pressure screens

Main features

- Three (3) Tampella TAP50 pressure screens
- Desired screening conditions can be easily targeted with test runs
- Several different type of baskets are available
- Shives and impurities removal, coarse or fine material fractionation

Technical information:

- C-rotors (conical body) and conventional rotors
- Rotating speed 300 – 750 rpm
- Production rate 5 - 50 tons/day
- Screens are linked in cascade
- Screened accepts/rejects can be thickened up and further processed

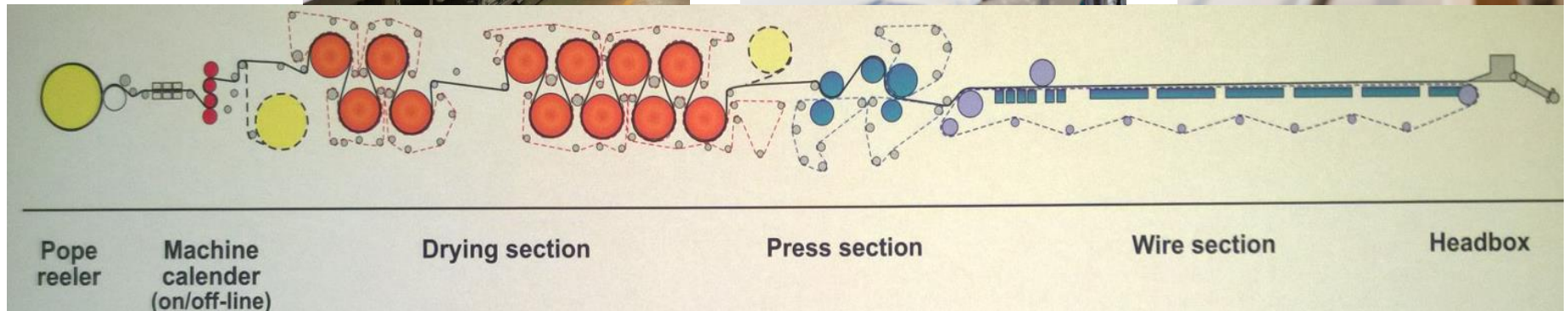


Metso Optifiner RF-01 technical specifications

- ☉ conical refiner
- ☉ feed consistency 3-5 %
- ☉ max. load 400 kW
- ☉ idle power 38 kW (at 1000rpm)
- ☉ rotation speed 500-1800rpm
- ☉ through-put 200-2400 l/min
- ☉ amount of pulp required: min. 200 kg (abs dry)/SEC-curve



KCL pilot foam forming machine





Foam Forming PaperMachine Specifications

Trim (mm)	700
Foam Density (g/l)	300-500
Grammage (g/m ²)	20-150
Machine speed (m/min)	20-100
Press section	On/off
Drying	Cylinder and belt
Calendering	<ul style="list-style-type: none">- Hard nip- 1-3 nips- On-line/off-line
Demo production for further converting	



Contacts

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