17th Day of Slovene Paper Industry
19. – 20.11.2014

Custom-Tailored Dewatering Technology for the Paper Industry

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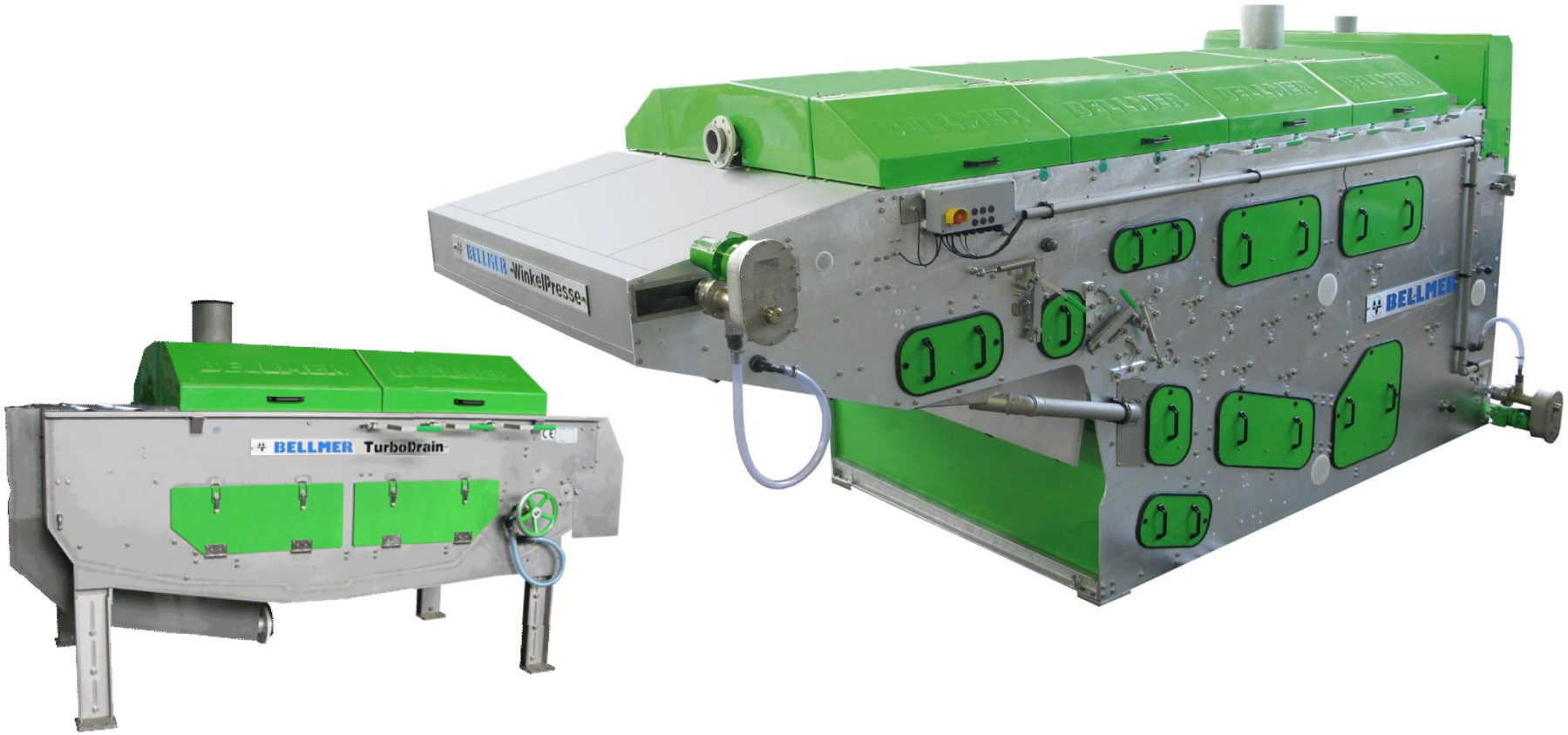
www.Bellmer.de

Gegr. 1842 BELLMER PAPER TECHNOLOGY SEPARATION TECHNOLOGY

Welcome to BELLMER

- Your specialist for sludge treatment -



BELLMER SEPARATION TECHNOLOGY

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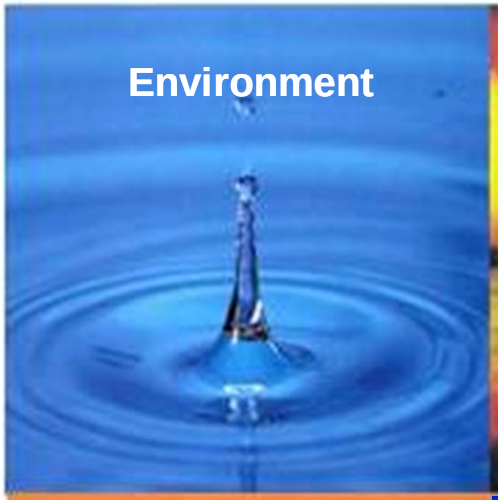
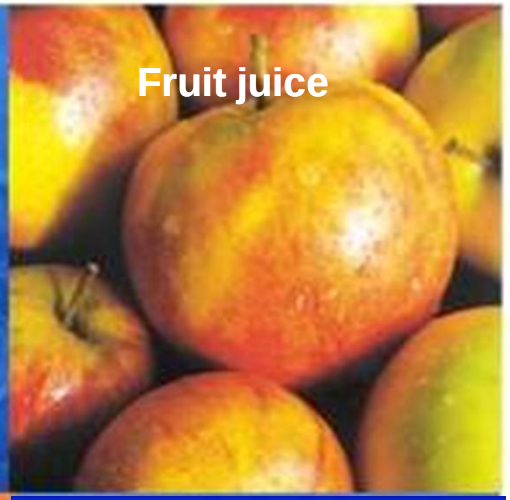
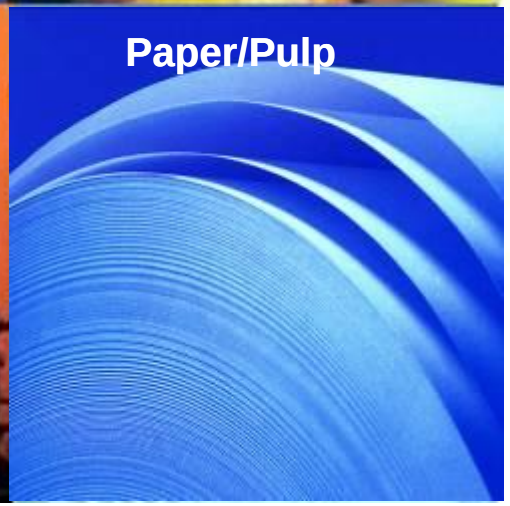
World Market leader with 4.500 references in Separation Technology











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Types of sludge arising in the paper industry - Solutions with TurboDrain and WinklePress

- **Biological sludges**
- **Flotation sludges**
- **DIP-sludges**
- **Sludges arising in the PM, Sedimentation**
- **Fibre rejects**
- **Mixed sludges (e. g. PM & coating)**

Overview
Products for the paper industry

Machines:

TurboDrain™ - **sludge thickening**
- **white and process water filtration**
- **final clarification**

WinklePress™ - **sludge dewatering**
- **high pressure sludge dewatering**

Machine combination:

Cascade S™ TurboDrain™ & WinkelPress™

Applications TurboDrains™

Applications:

- sludge thickening upstream of digesters

- thickening of primary sludge, waste activated sludge, digested sludge

- process water filtration

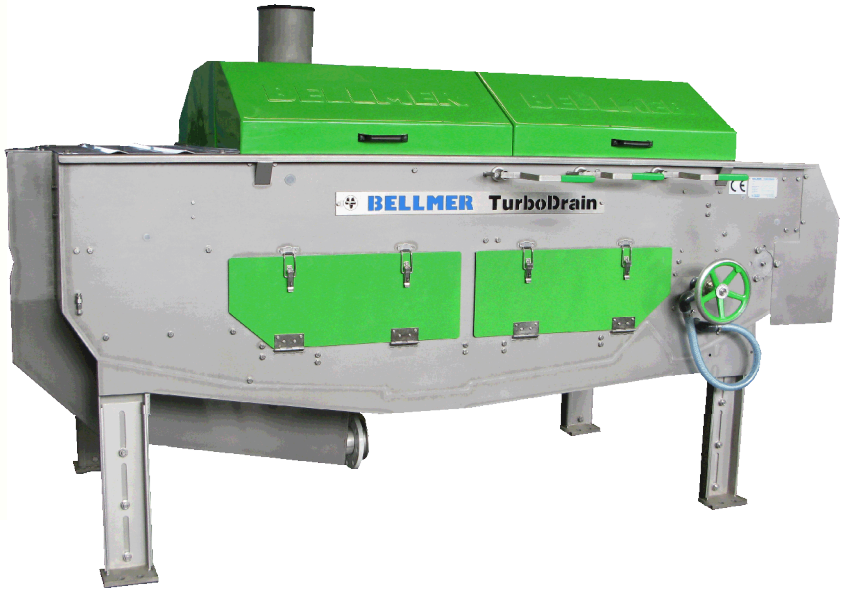
- replacement of final clarifiers

- replacement of DAF`s

- increasing the capacity for final clarification

TurboDrain™ Green

The eco-friendly high-performance thickening unit



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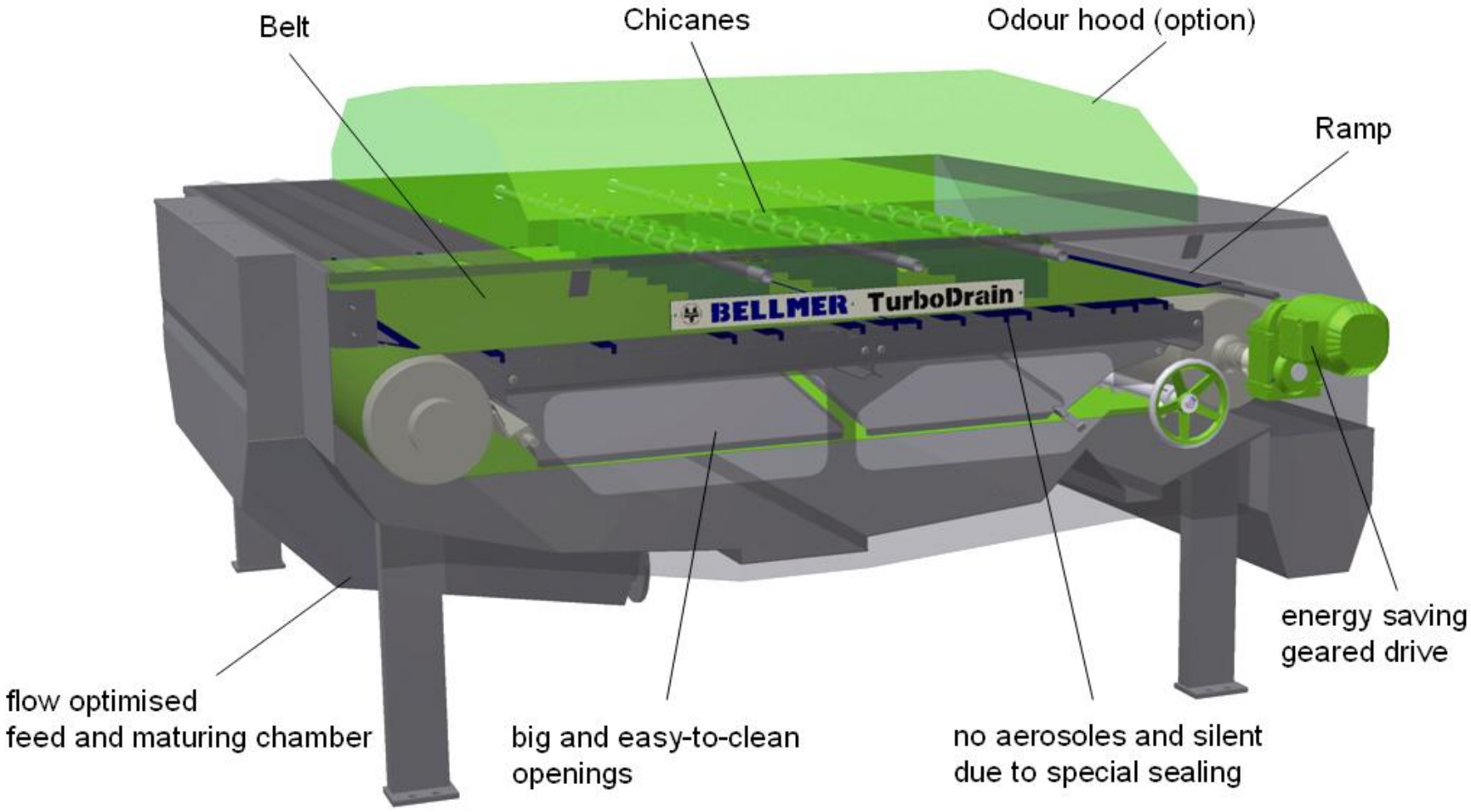
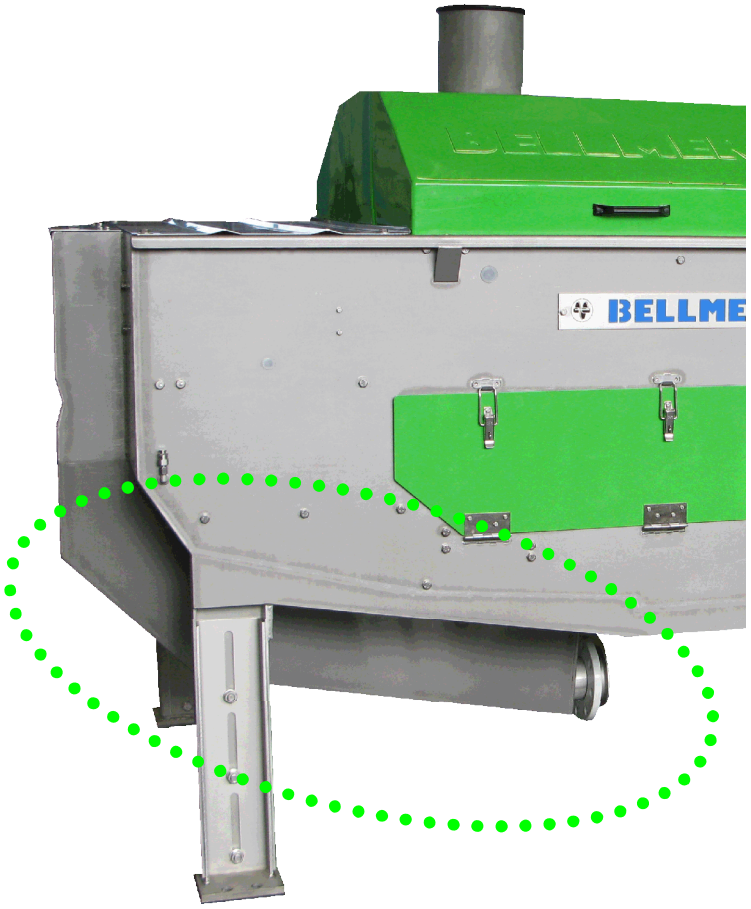
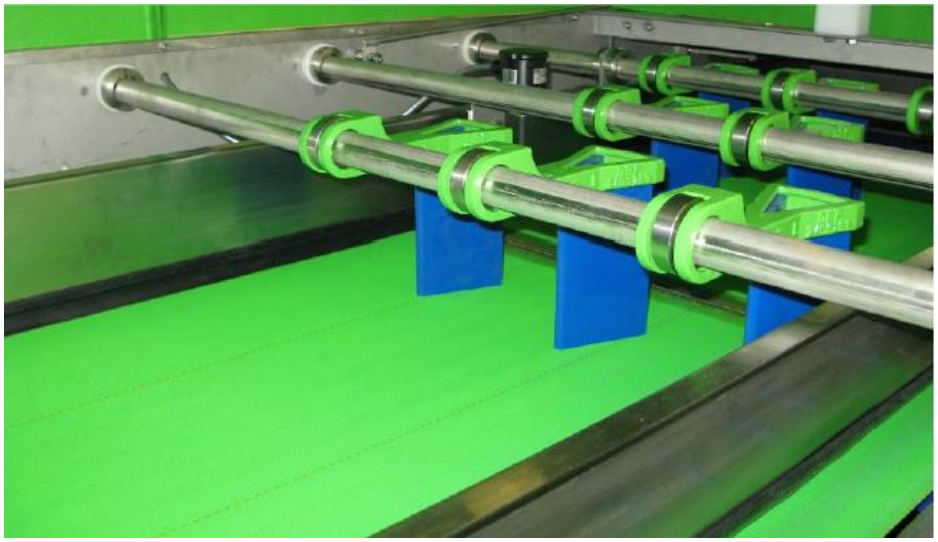
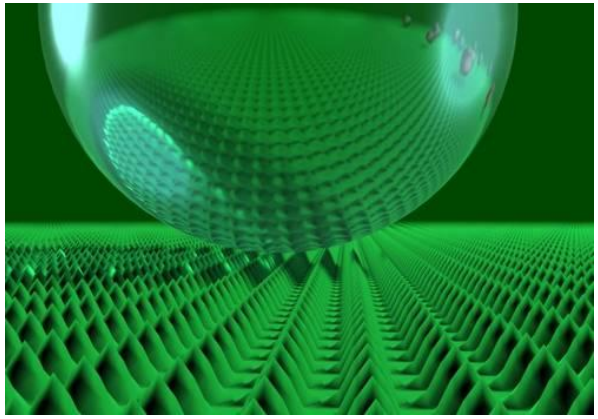
Features of the TurboDrain™ Green



20% less polymer thanks Nanotech belt and flow optimised Headbox







TurboDrain with integrated feed box

BELLMER TurboDrain™

The Ramp → Final DS-content: 5 – 15 % DS

BELLMER TurboDrain™

Clear Filtrate! → suspended solids 10 – 100 mg/l

Case study 1 - paper mill
Improvement of the WWTP – solid recovery

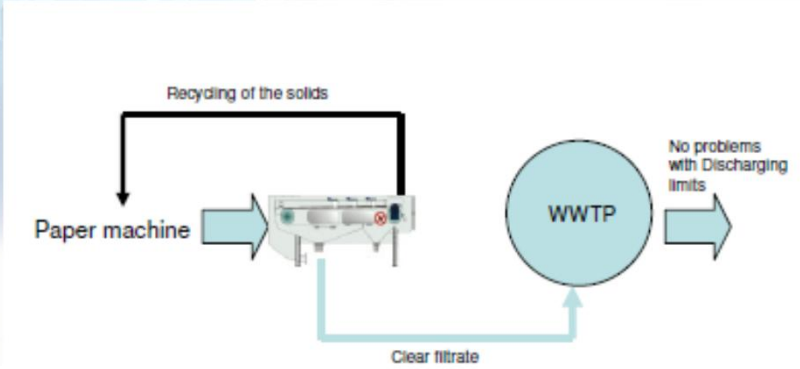
Situation before TDH installation:

- **Overloaded WWTP**
- **Uncontrolled anaerobic fermentation**
- **Problems with effluent standards**
- **High amount of lost solids from paper production**

paper mill
Improvement of the WWTP – solid recovery

Solution:

- **Solid recovery upstream to the WWTP with TDH**
- **Load removal at the WWTP → better working WWTP**



paper mill
Improvement of the WWTP – solid recovery

Benefits:

- **Well operating WWTP**
- **No anaerobic fermentation**
- **No problems with the effluent standards for the WWTP**

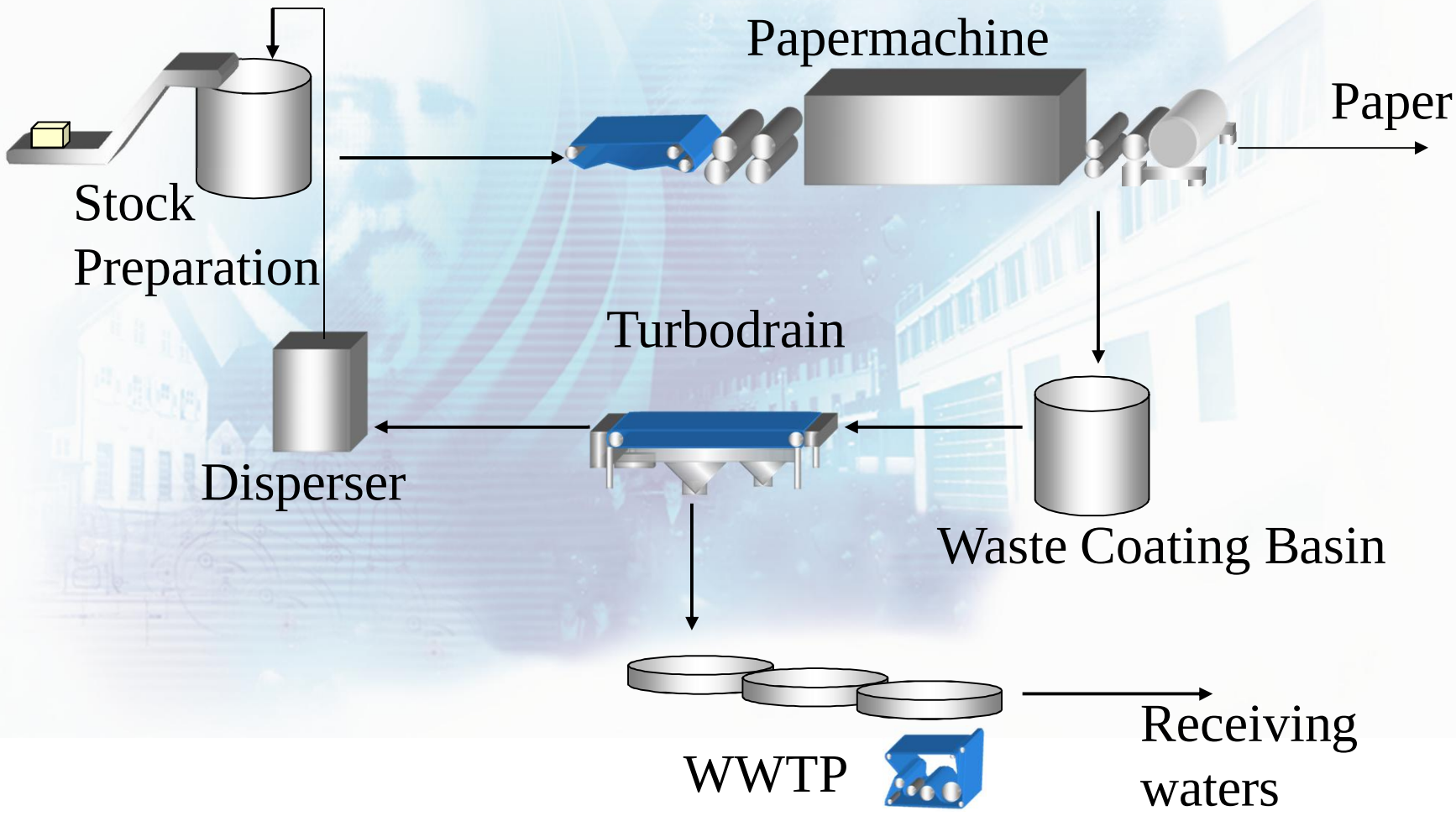
  → no surcharge for violation of limits
- **Solid recycling at the paper machine**

  → Saving of raw material

Case study 2
- Bellmer Turbodrain
Coating Waste Recovery

- **Waste coating will be thickened with the help of Turbodrian**
- **Filtrate quality < 100 mg/l**
- **Solids will be treated by Disperser**
- **Solids can be used as „fresh“ filler**

Coating Waste Recovery Principle



BELLMER TurboDrain™
Sum Up - Coating Waste Recovery

- **Saving of filler**
- **Filtrate quality < 100 mg/l**
  (can be used for conditioning at stock preparation, paper machine, wwtp)
- **WWTP will be released up to 50 %**
- **Saving of chemicals**

Conclusion

- **Different Types of Turbodrain for different kinds of applications**
- **For all liquid/solid separation applications – Recovery Solutions**
- **Best thickening rates**
- **Filtrate quality under 50 mg/l**
- **Cost efficiency thickening (low energy consumption, low polymer consumption, very low abrasion)**
- **Saving of clean water**

Different Types of WinklePresses™

WPN G

- municipal sludge dewatering
  (primary sludge, waste activated sludge, digested sludge)

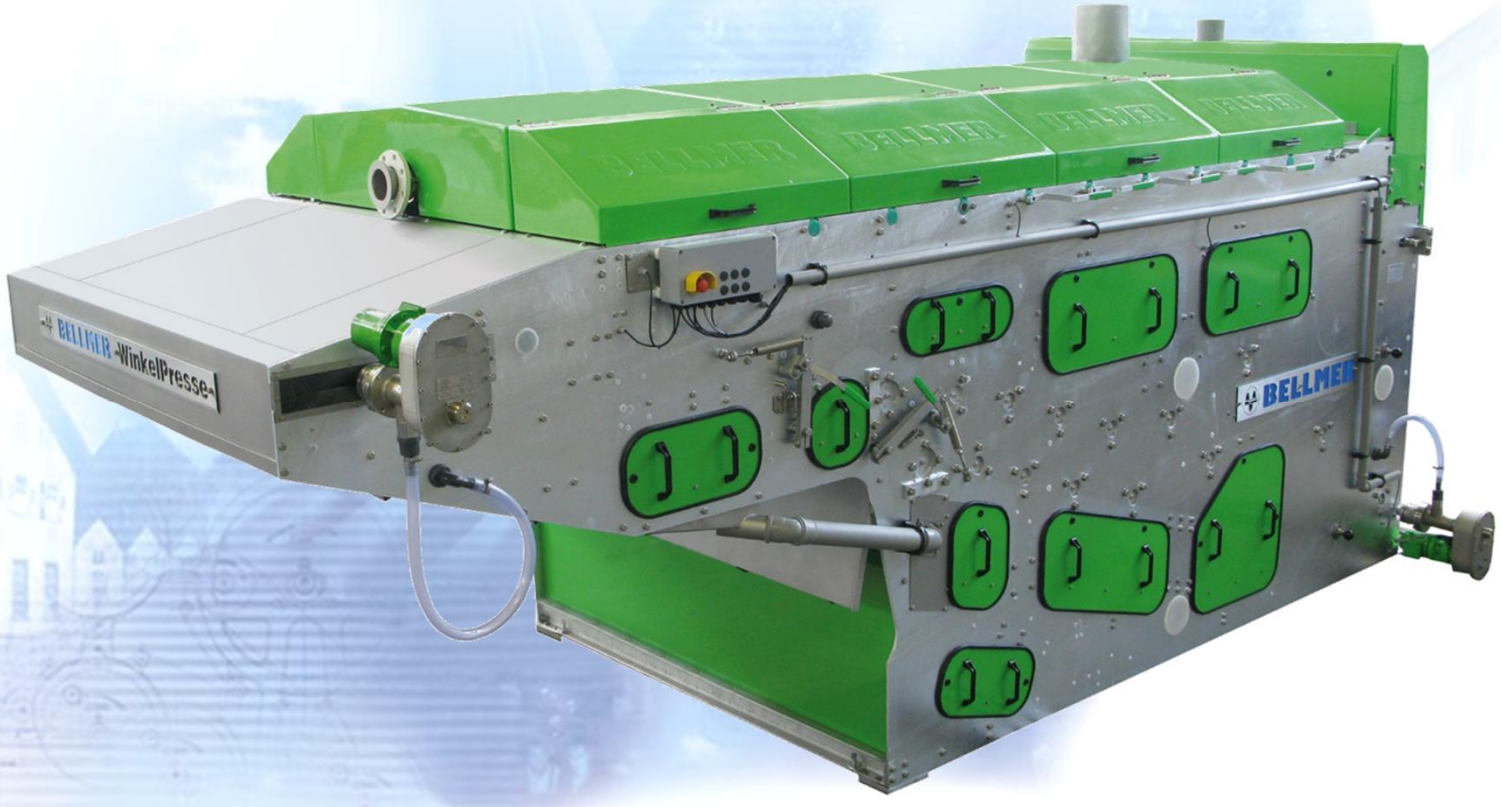
WP Green K / I

- for higher dry solids and capacity (up to 35 % DS)

WPH

- for highest dewatering results up to 70 % (special application)

BELLMER WinklePress™ Green



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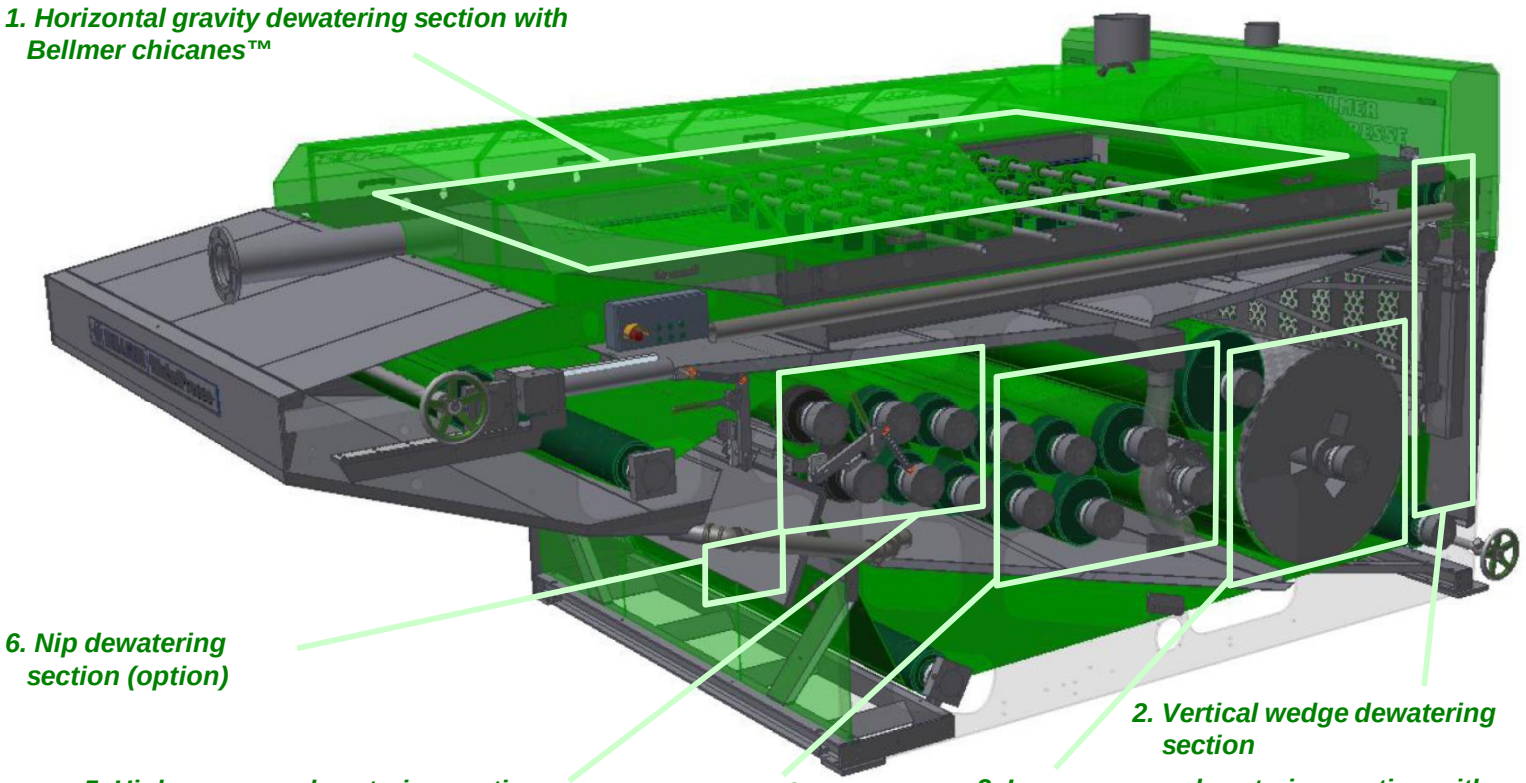
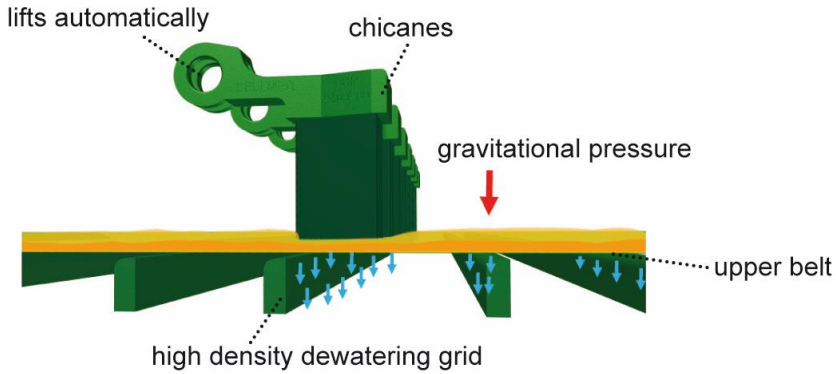
BELLMER WinklePress™ Green

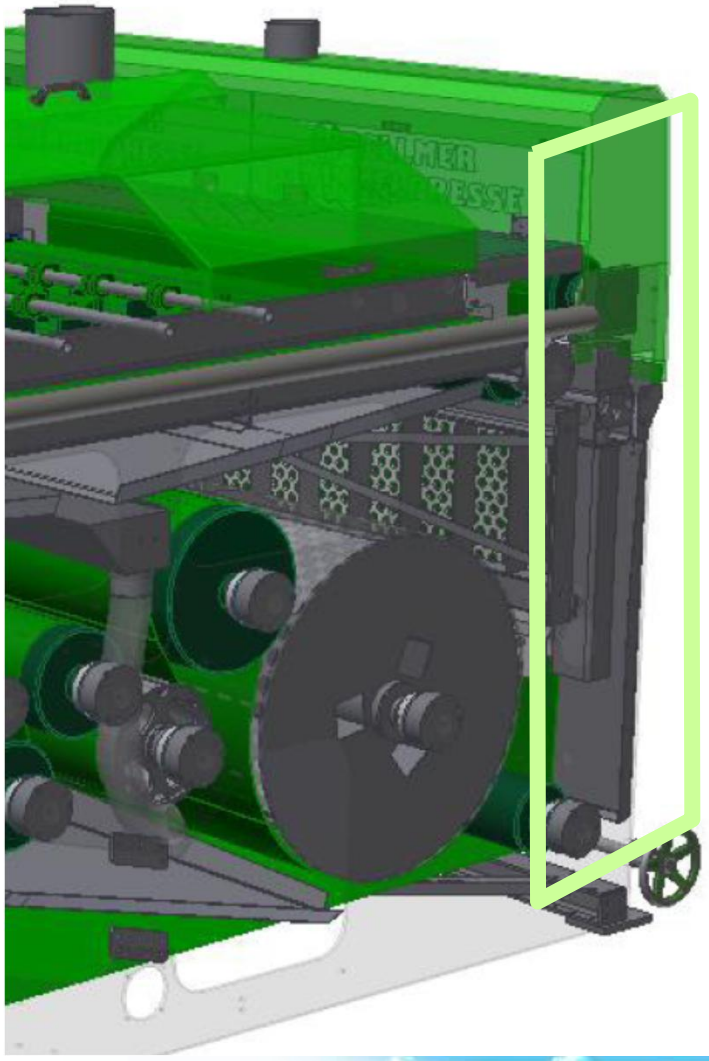
Highest dry solids contents and lowest flocculant costs due to unique process technology

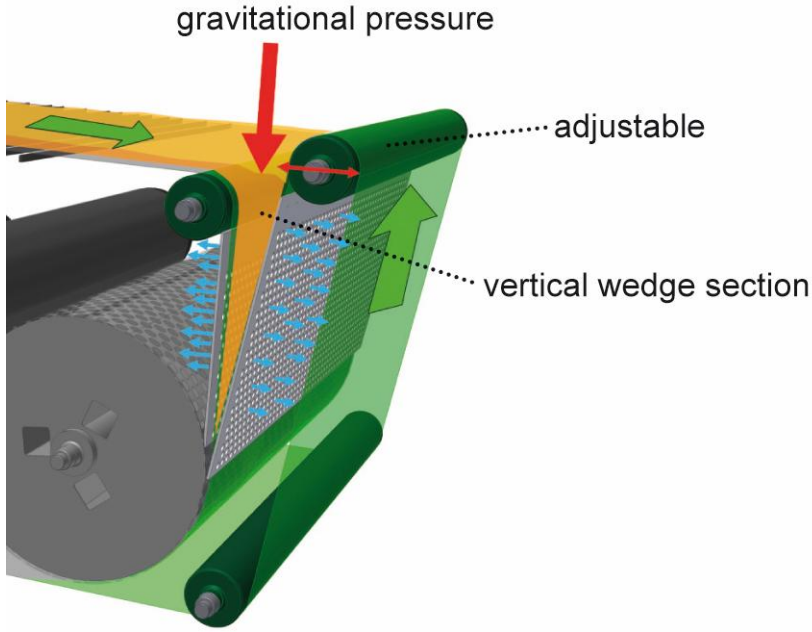


1. Optimum horizontal gravity dewatering with the patented BELLMER chicanes



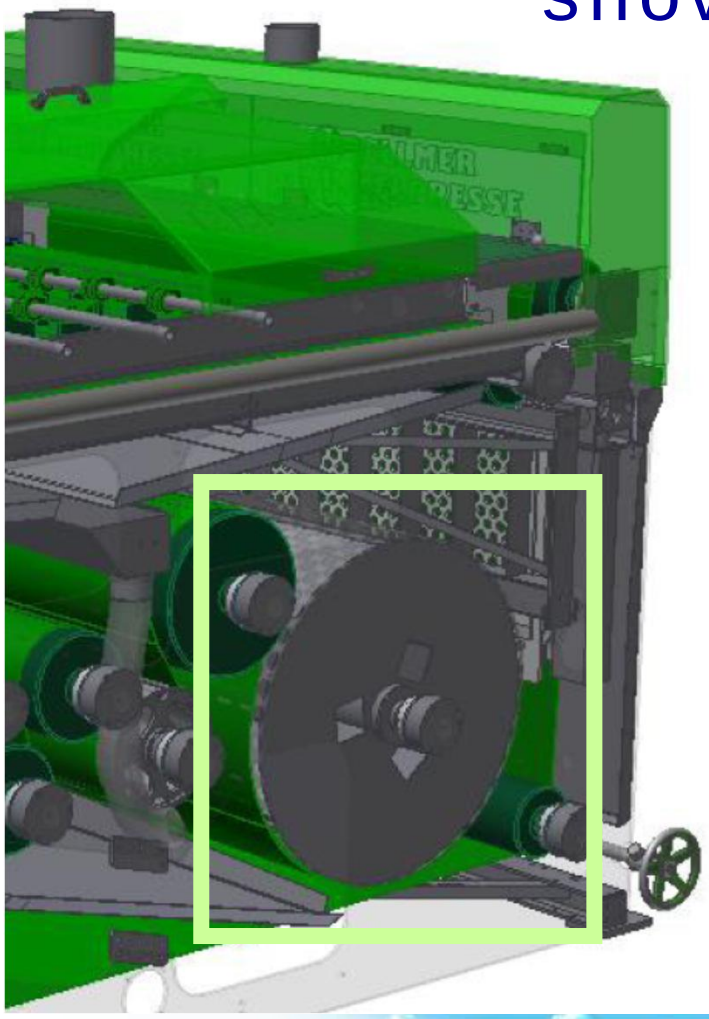
2. Only the WinklePress™ is including a vertical wedge section

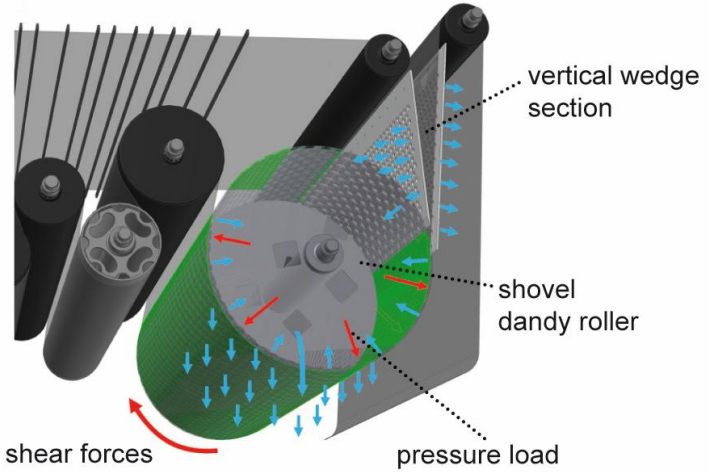




- static dewatering to both sides
  is preparing the pressing of the sludge
- patented vertical sealings
  type „airless“

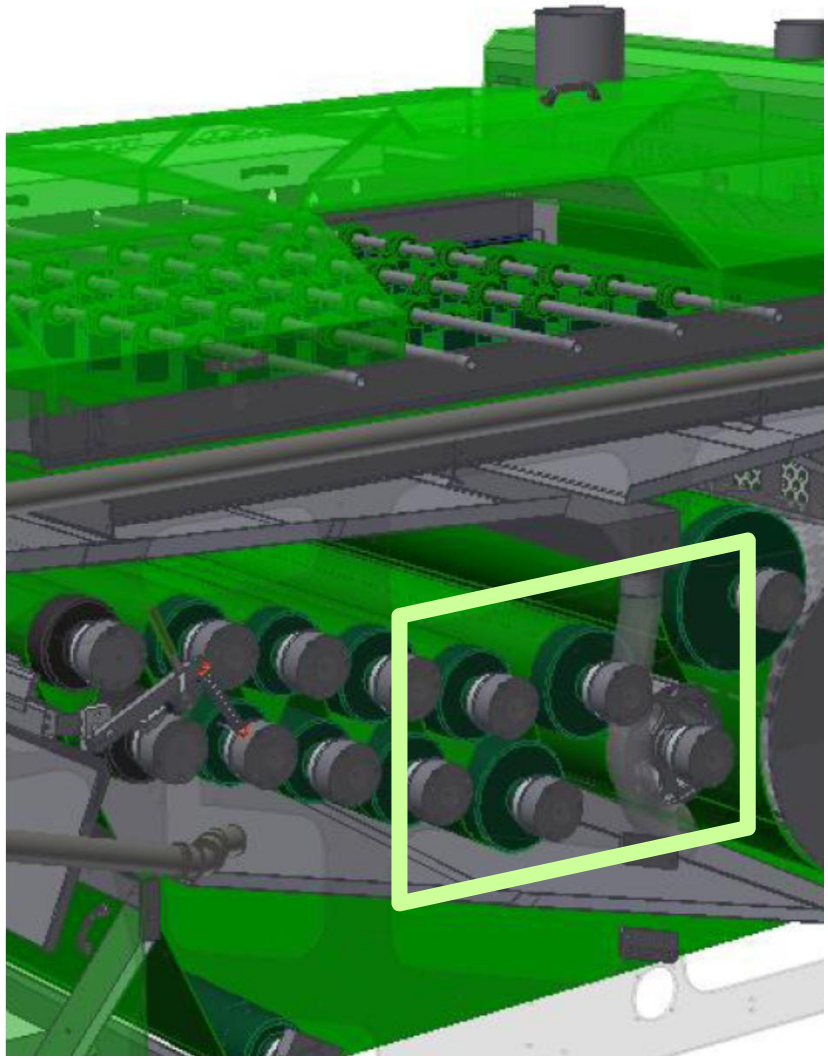
3. Low pressure dewatering section with shovel dandy roller

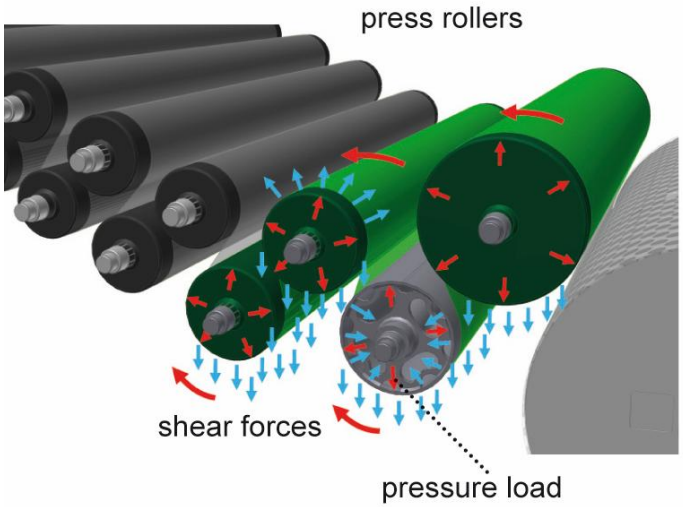




- gentle pressure build-up
- inside shovels prevent a re-wetting of the sludge
- no soiling due to large dimensionated holes
- optimized pressure distribution onto the sludge

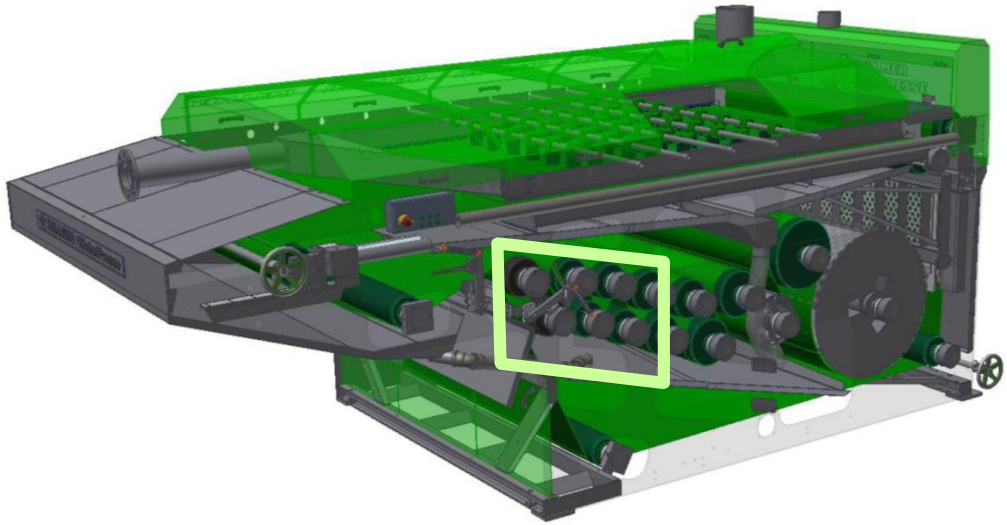
4. Press section

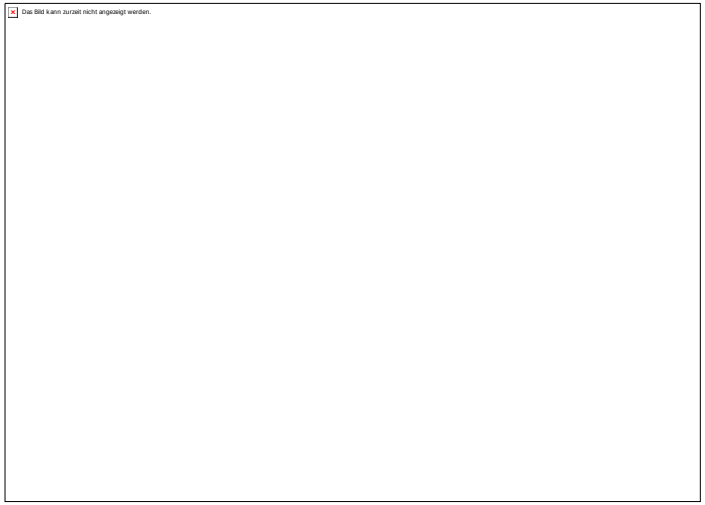


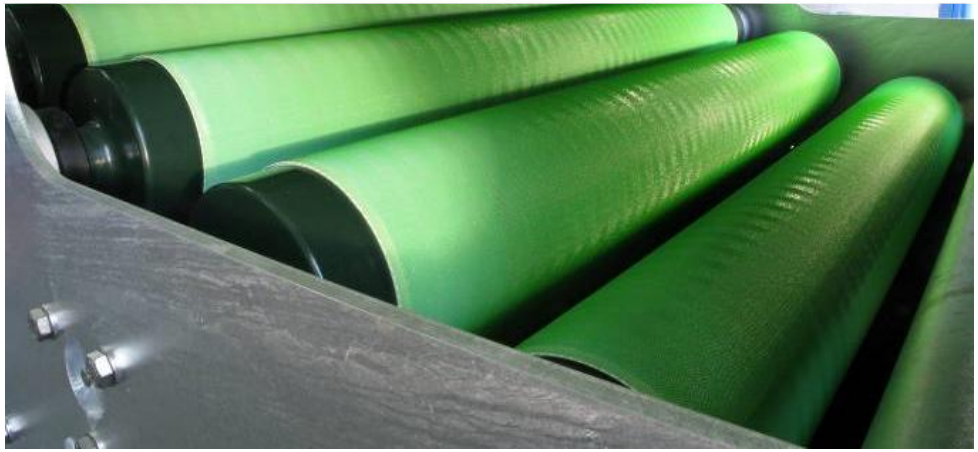


- higher pressure because of decreasing diameters of the rollers
- shear force and kneading action improve filtrate flow out of the cake
- due to thicker sludge cake there is a longer pressing time

5. High pressure-dewatering section for highest dry solids contents and lower disposal costs



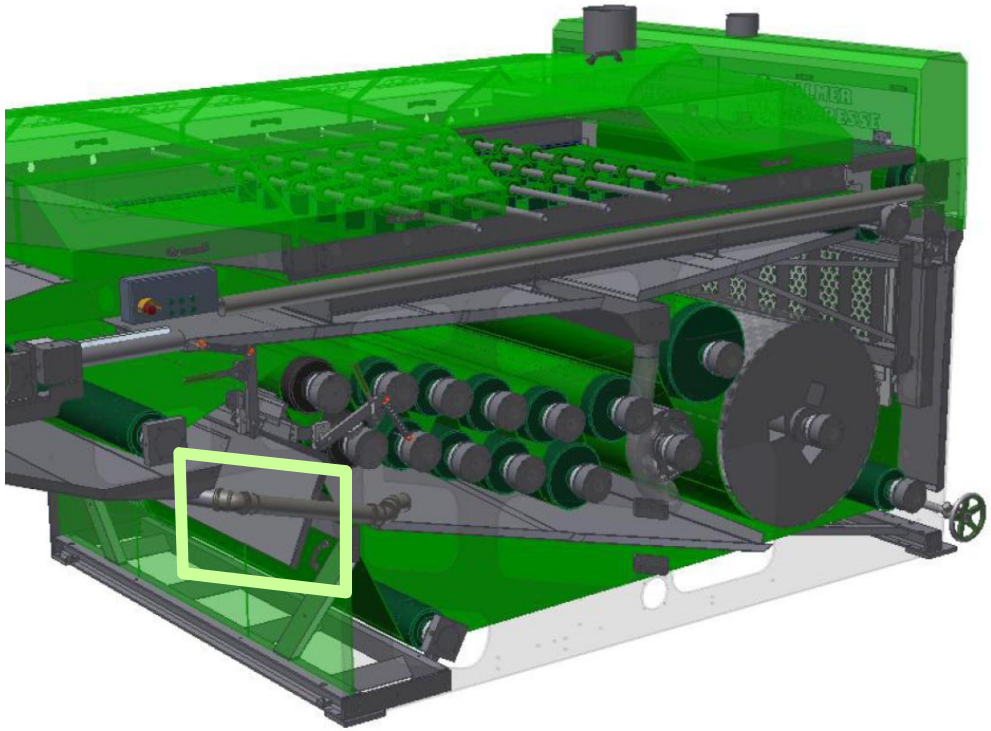


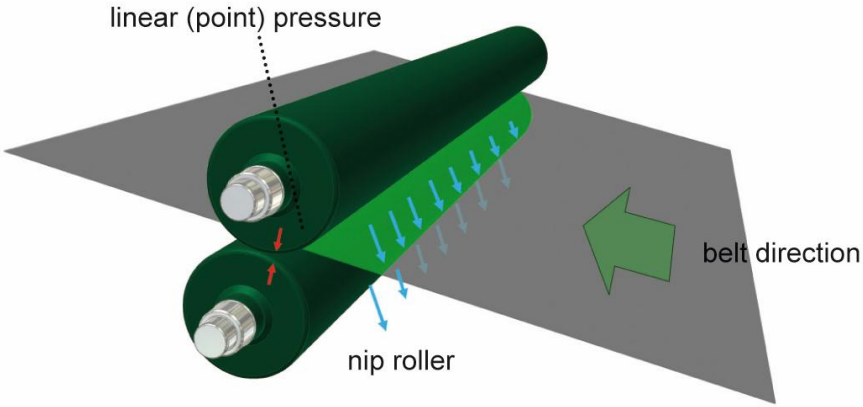


- by the extension of the pressing time due to additional press rollers the filtrate rests will be pressed out of the sludge cake

6. Press nip (option)

highest dry solid contents for fibrous sludges





- with regard to fibrous sludges, as applicable for instance in the pulp and paper industry a linear pressure is generated by the use of a press nip.

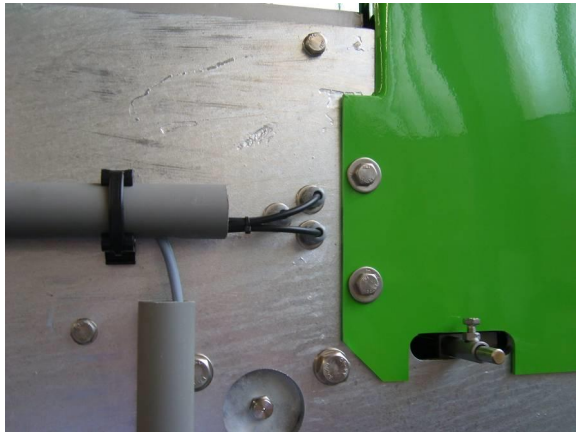
BELLMER WinklePress™ Green
Reduced energy consumption + CO_2 saving

Energy-saving motor according to IE 3 results in approx. 6% lower energy consumption.

Example 4 kW drive
for an operating time 8 h/d, 5 d/w 50 w/a:

Energy saving about 660 kWh p.a.

BELLMER WinklePress™ Green
Innovative until down to the detail



Generously designed, tight inspection openings with handles for optimum accessibility in case of maintenance- and cleaning works as well as tight screw fittings and cable ducts.

Typical applications - WP

TAZV Oderaue Eisenhüttenstadt, Germany – WWTP for pro *papier*

- Thickening of biological sludge

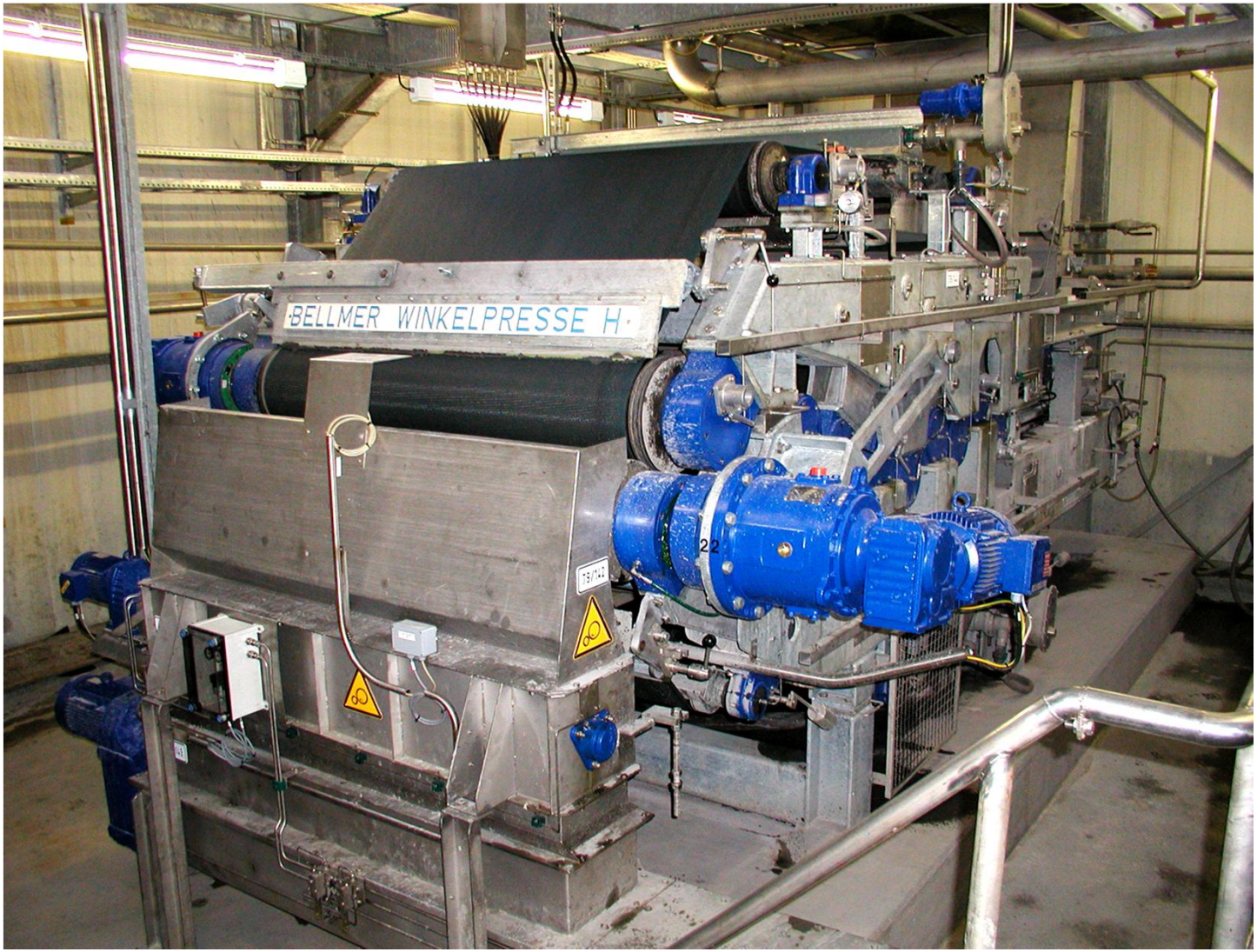
- Dewatering of mixed sludge (bio/fibre/carbonate mixture)

Europac Rouen, France - Turn-Key Project

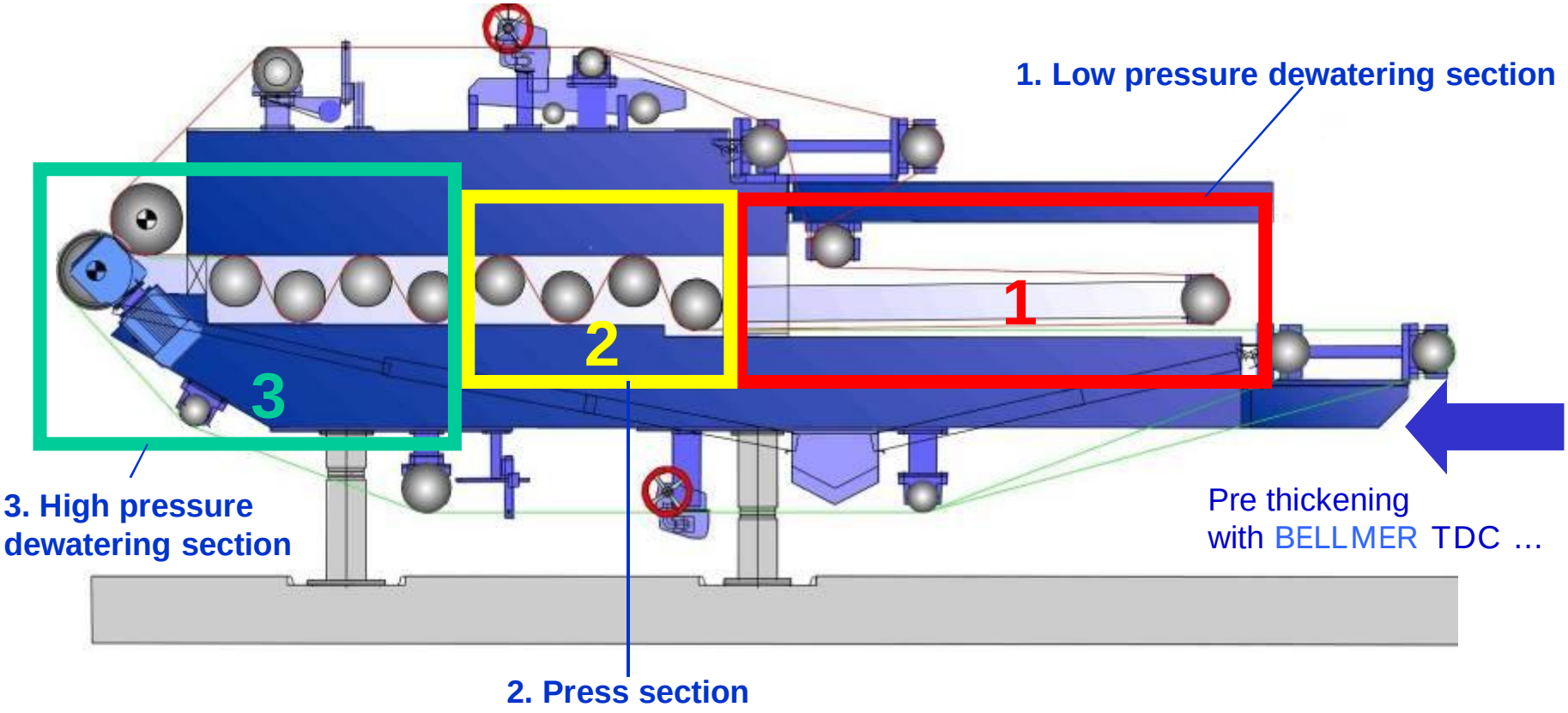
EUROPAC
Papeles y Cartones de Europa

- Complete refurbishment of the WWTP incl. financing via BELLMER

The BELLMER WinklePress™ WPH



The BELLMER WinklePress™ WPH



Case Study 2 – Tissue Mill

Before WPH-Installation:

- **End Dry Content: 47 %**
- **Amount of discharged sludge: 83.000 t/year**

45 % TG

Bellmer Winklepress WPV 2 Bj. 1982

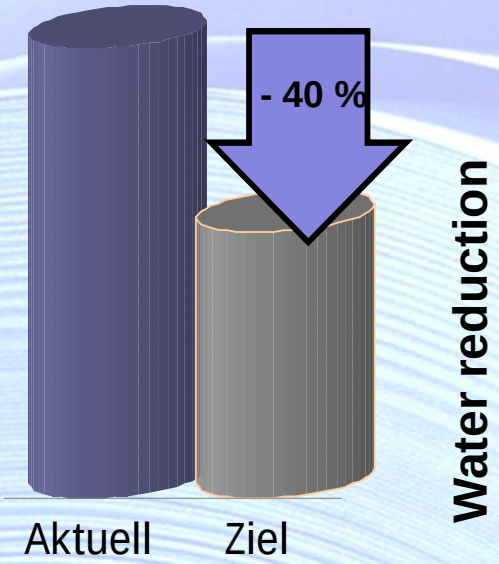
50 % TG

Beltpress Bj. 1986

Reference Tissue Mill
Target for Project Suldge Dewatering

Increase of the Dry Content

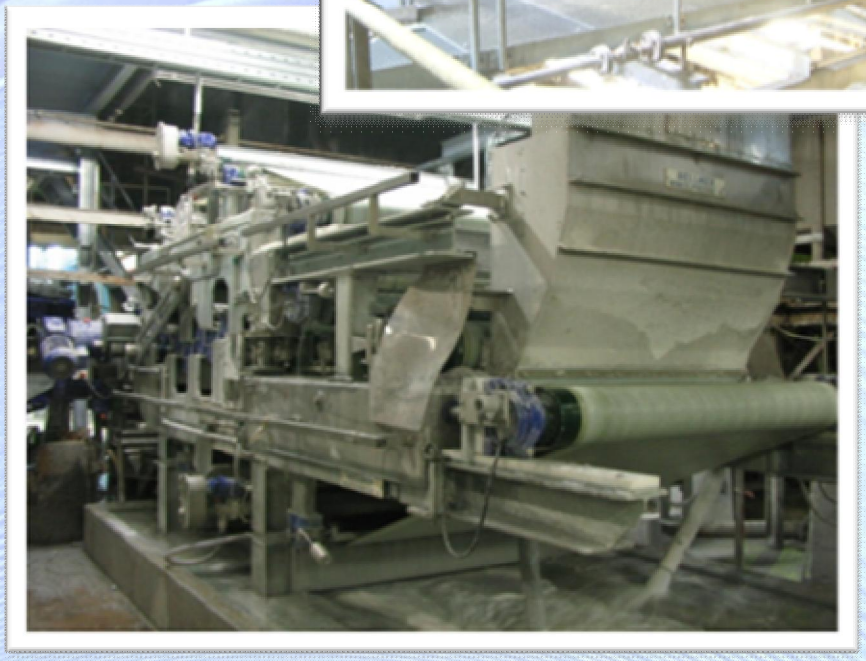
of 47 % DS to 60 % DS



Cost reduction for disposal

Eco-friendly production

Reference Tissue Mill
Reached parameters by Start-up



WPH 1:	**Troughput**	**2,6 t DS / h**
	Ash-Content	**64,40 %**
	Polymer consumption	**0,88 kg / t DS**
	End dry content	**60,0 %**
WPH 2:	**Throughput**	**2,6 t TS / h**
	Ash-Content	**64,14 %**
	Polymer comsumption	**0,78 kg / t TS**
	End dry content	**60,3 %**

Reference Tissue Mill
Savings

The Winklepress runs automatically and controlled from the control room!

Increase of dry content from 47 % up to 60 % !

Solids **-19.000 t/a**

Costs **-580.000 €/a**

Clean Water **-19.000 m³/a**

Water for 400 people/a

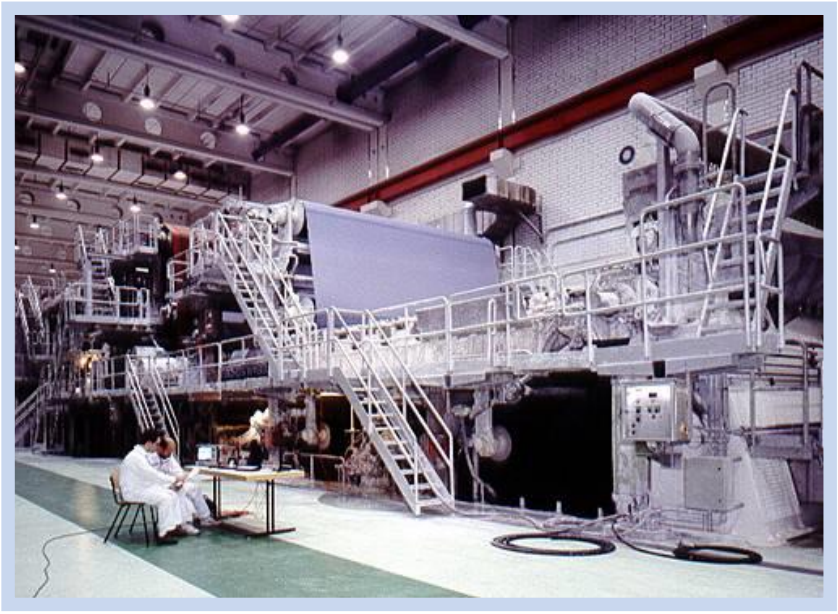
CO2 **-125t/a**

(for 200km)

Conclusion

- **Two different Winklepresses for two different applications**
- **The WPN Press is the Benchmark for Biosludge dewatering**
- **The high pressure Winklepress WPH reach the highest possible dry contents for deinking and tissue sludge**
- **Cost efficiency dewatering (low energy consumption, low polymer consumption, very low abrasion)**
- **Saving of clean water and CO_2**
- **Reduction of disposal costs and increase of the heating value**

Applications



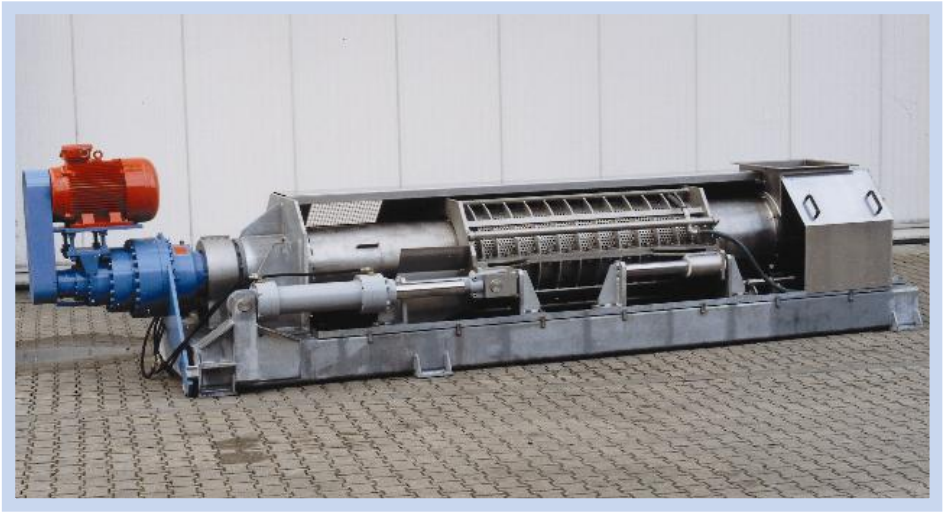
Paper industry

Rejects dewatering

Sludge dewatering

Fibre dewatering

Sheet formation




The End