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Energy efficient recycled fiber processing –
latest pulping developments

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PAPERmatters 2018!

The
Presentations

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Apprenticeship as a Papermaker



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Challenge: Producing high quality end products from low quality OCC

- Variety of circumstances push the quality of recycled fiber down
 - Lower quality waste streams
 - Blending of grades
 - Sourcing just-in-time, pressure to be less selective when procuring fiber.
 - Same fibers recycled again and again

Virgin pulp fiber

Recycled pulp fiber

Frayed fibrils

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Conventional drum pulper solution



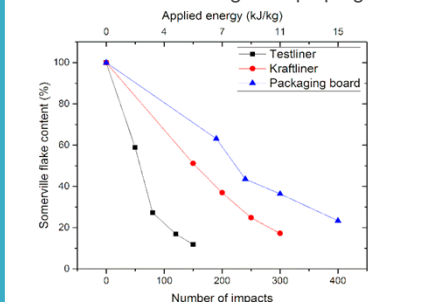
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Research efforts behind the new drum pulper

Graph source: Disintegration of packaging material,
H. Upola, PHD thesis 2017

Effect of material strength on pulping times



Extensive studies of conventional drum pulper and wide range of pilot trials with new innovative technologies were run at Valmet Technology Center in Finland.

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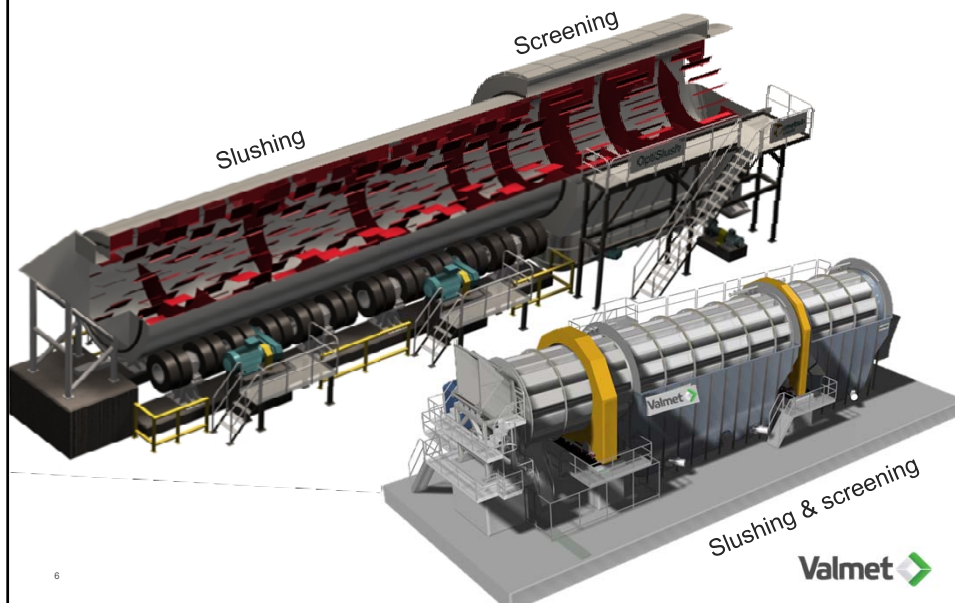
Animation here:



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Conventional drum vs. new OptiSlush Drum



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Rethinking pulping – simplified structure

Shorter & lighter

New innovative design of pulp lifters

Smart design – process in two stages

Strong and rigid structure

Totally new approach for pulping – OptiSlush

Bales in

Shredding, wetting and pre-slushing

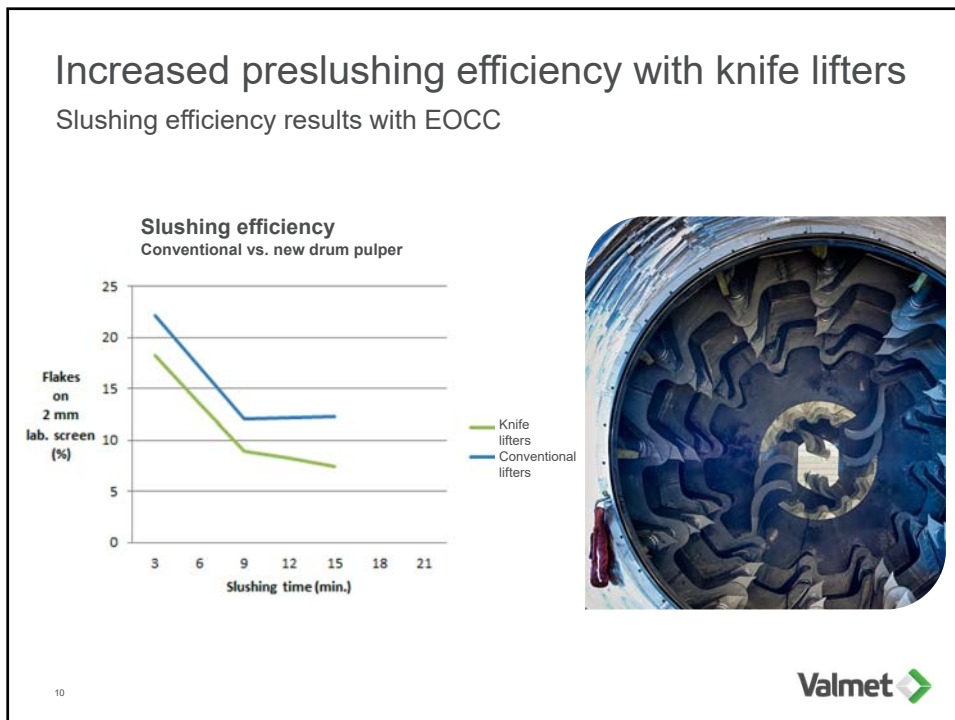
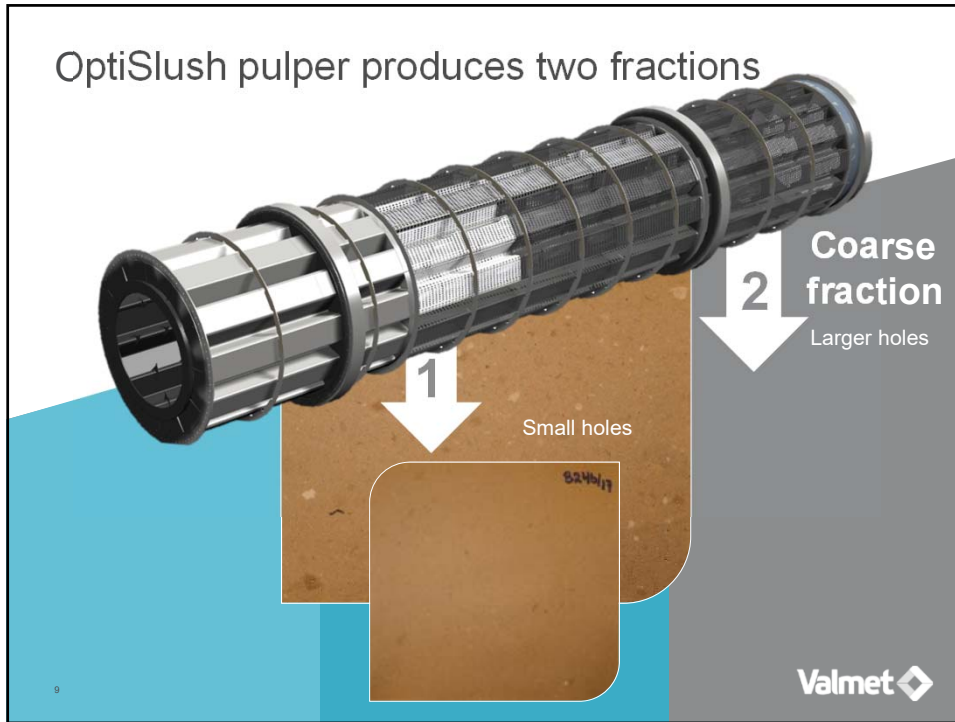
1st slushing and screening

2nd slushing and screening

Fine accept

Coarse accept

Reject out



High accept quality even with low-quality furnish

OptiSlush Drum pulper

Raw material flexibility

- Pulping of dirty, poor quality raw materials with plenty of rejects and plastics



Gentle processing

- Removal of easy-to-slush fine fraction as soon as possible
- Gentle pulping, no contaminant crushing



High yield

- Low fiber loss
- Low energy consumption



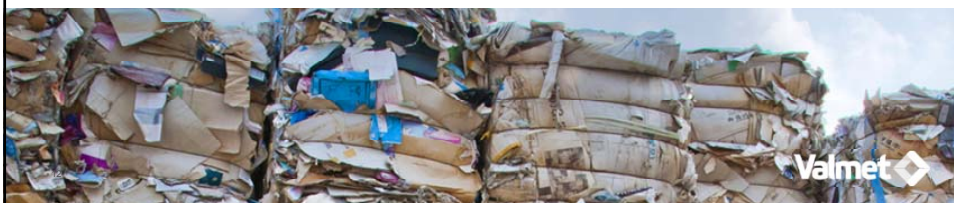
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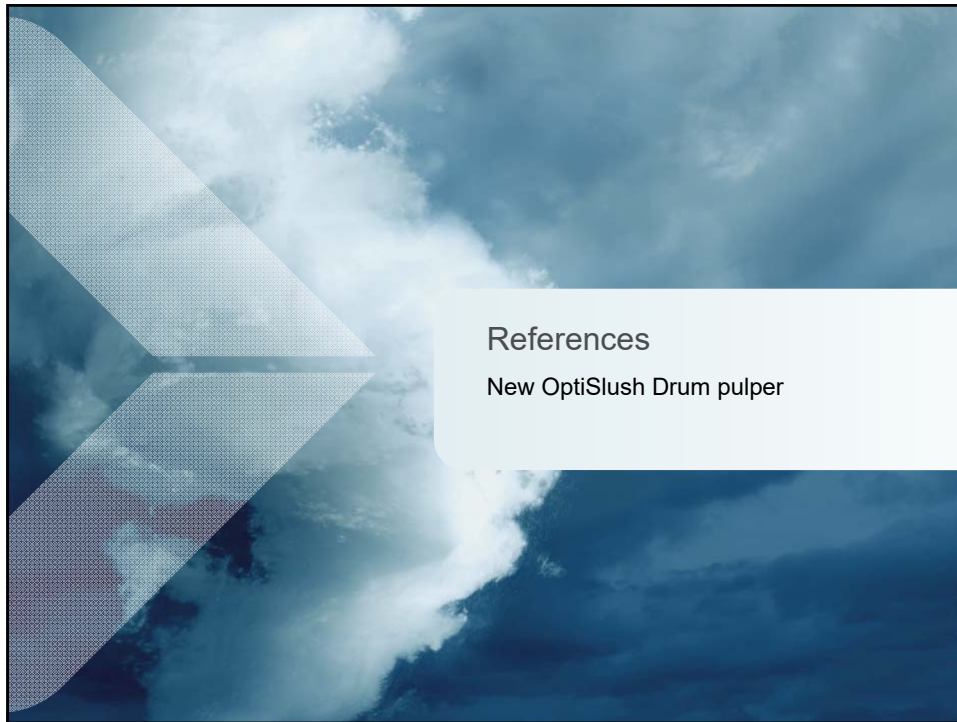
OptiSlush Drum &

energy

- Designed for low energy consumption
 - Drum vs. vat pulper, - 20-30 % in specific pulping energy
 - Practical & smart fiber treatment - material is removed from the pulper as soon as it is screenable, no need for coarse screening of fine fraction
 - Shorter & lighter design, - 30 % in weight – less energy needed for rotating the drum
 - Less energy consuming parts - screening & slushing integrated, no separate bale shredding



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New OptiSlush Drum

Drum pulper case in EMEA

- Customer needs
 - Utilization of dirty raw materials
 - Low operation costs
- Solution: new OptiSlush Drum pulper
 - Compact, length 25,5 m
 - Diameter 4,3 m
 - Installed power 1 250 kW
- Production
 - Feed 850 bone dry tons / day
 - Raw material local OCC

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Fiber Technology Center

Location: Inkeroinen, Finland

- Valmet provides the facilities to test fiber processes as close to production scale as possible
 - Measurements and in-depth analysis
 - Wide expertise and experience of pilot trials
- Pilot trials provide complete pilot processes for
 - Mechanical pulping processes
 - Stock preparation and recycled fiber processes
 - Pulp drying processes

New features – testing possibilities in pilot facility


Integrated bale shredding section	Combined slushing and screening	Novel perforated lifter design	Production different fractions (fine & coarse)
			
Shredder knives testing with part bales	Maximum accepted fiber capacity can be tested in batch	Perforated lifters available in the pilot drum	Quality validation of the accept fractions, batch running, with different hole sizes

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Summary:

OptiSlush Drum - New innovative drum pulper solution

- Integrated slushing and screening → two fractions
- Operation with low energy consumption
- Compact solution – **30%** in space
- Low maintenance costs



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Thank you for your attention!

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