



New and efficient technologies for pellets production

Amandus Kahl GmbH & Co. KG

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By Florian Schmuchler

New and efficient technologies for pellets production

Process-steps of wood pellet production

Production Cost Efficiency

Group 1 Defibration plant

- 1. Wet milling with pan grinder mill**
- 2. KAHL pan grinder mill**
- 3. Optimized grinding**

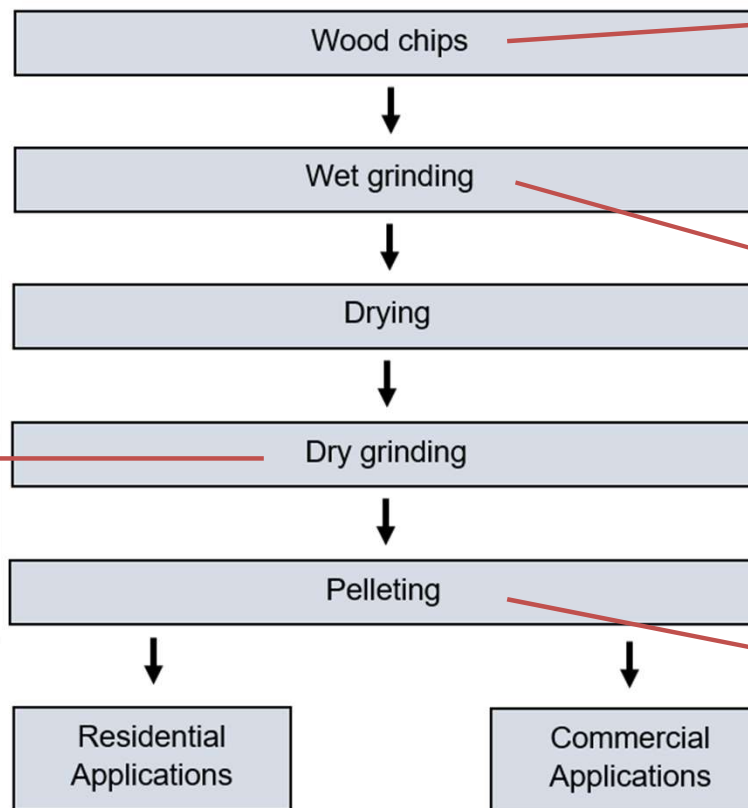
Group 2 Pelleting plant

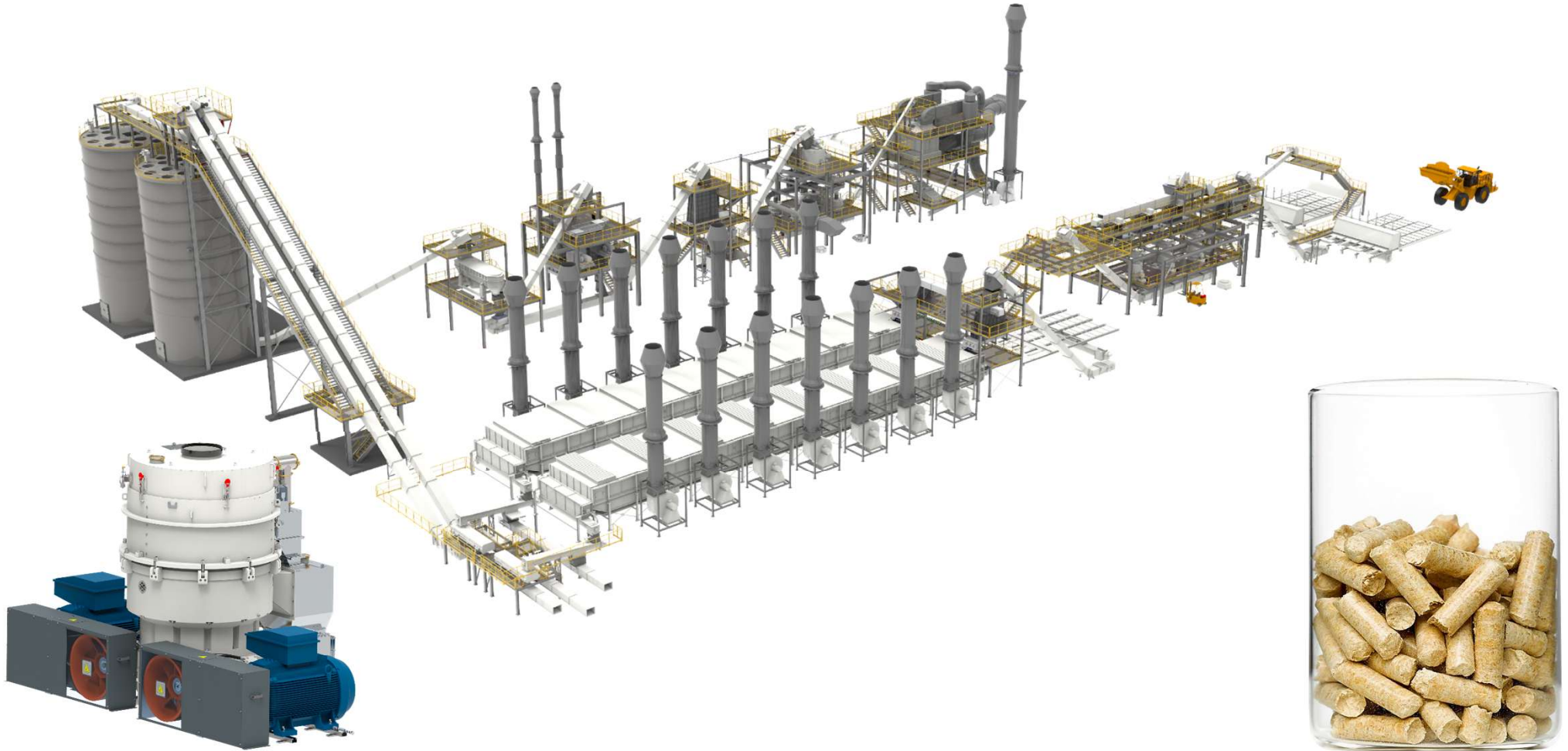
- 1. Flat die pellet mill**
- 2. Distamat hydraulic**
- 3. KAHL Eco Roll – Practical Experience**

Summary

Process-steps of wood pellet production

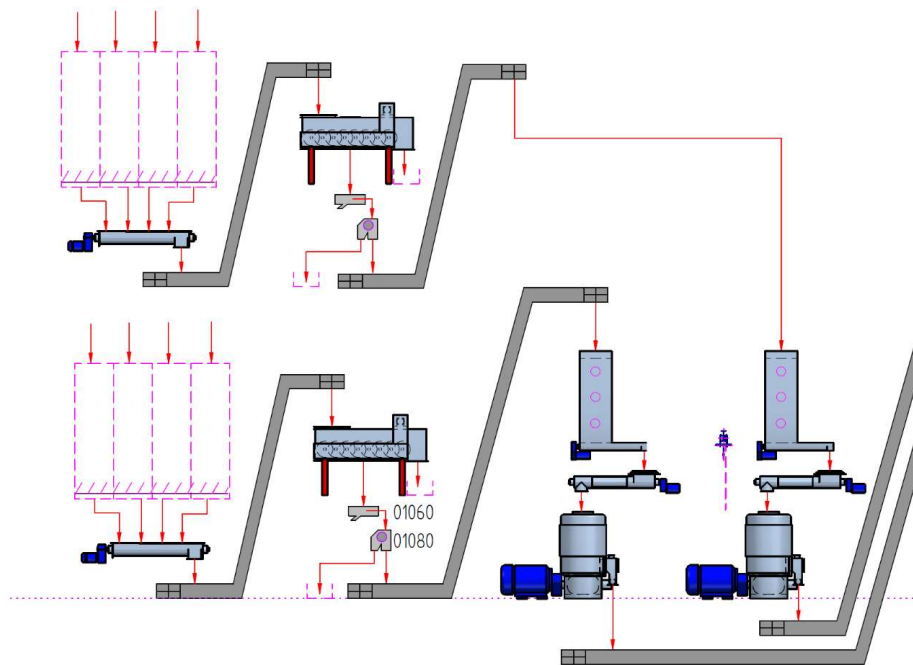
Process-steps of wood pellet production





Production Cost Efficiency

Group 1 – Defibration Plant



- Infeed - hydraulic walking floor
 - Sieving / metal separation
 - Wet defibration
- **KAHL pan grinder mill**

1. Wet defibration plant



Group 1 – Defibration Plant



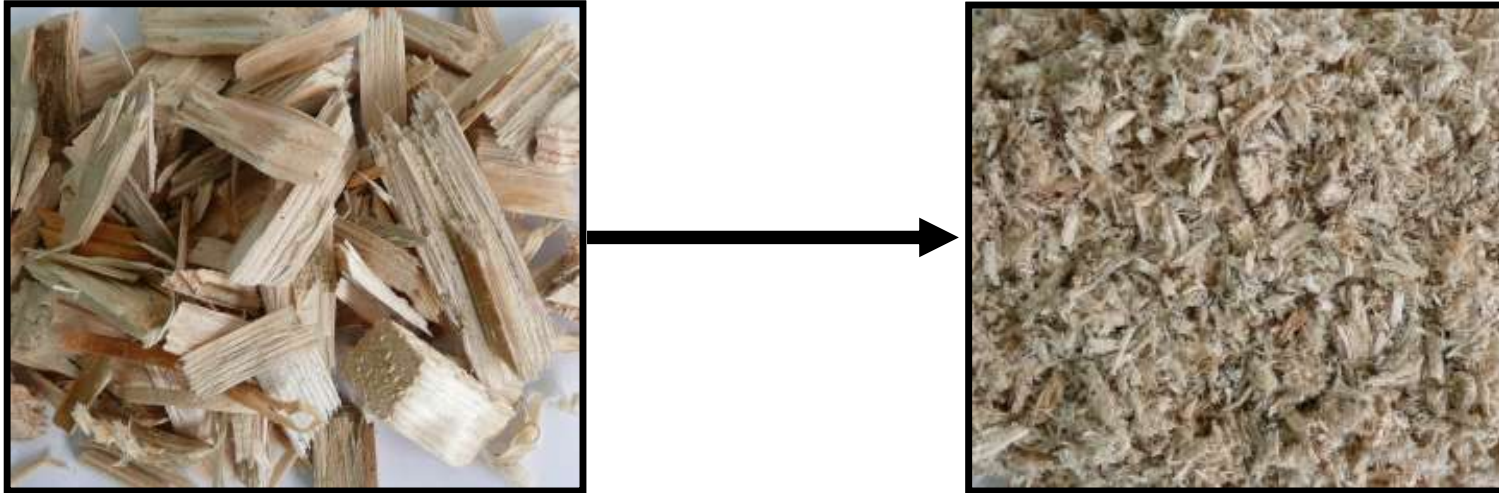
Low energy consumption

No aspiration system needed

No ATEX requirements

Pan grinder mill ruptures cell structure

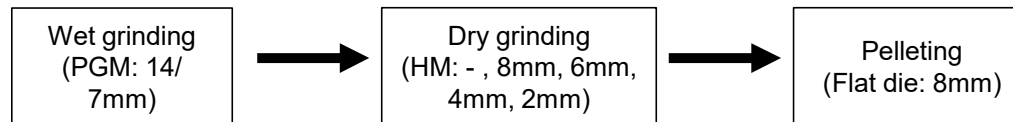
Group 1 – Defibration Plant



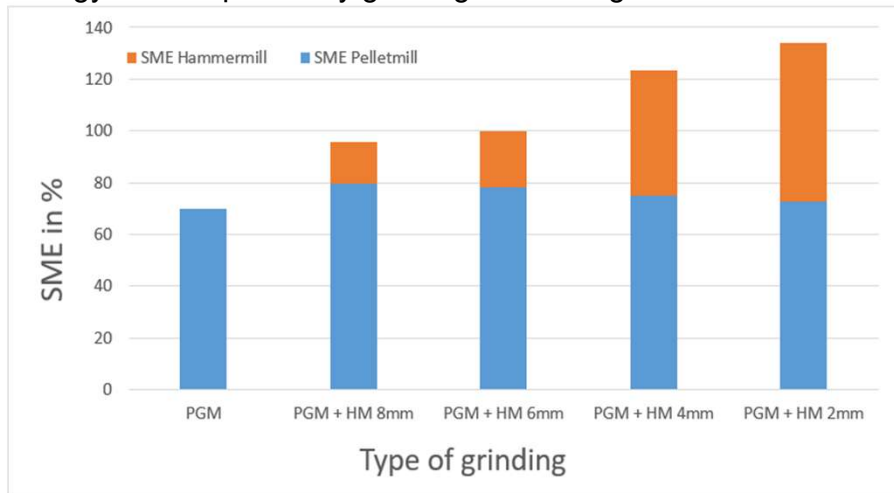
- Up to 30 t/h capacity each pan grinder (wet basis)
- 3 – 5 % saving in drier energy
- No hammer mill for EN Plus A1 and Boiler Pellets with KAHL flat die mill

Group 1 – Optimized Grinding

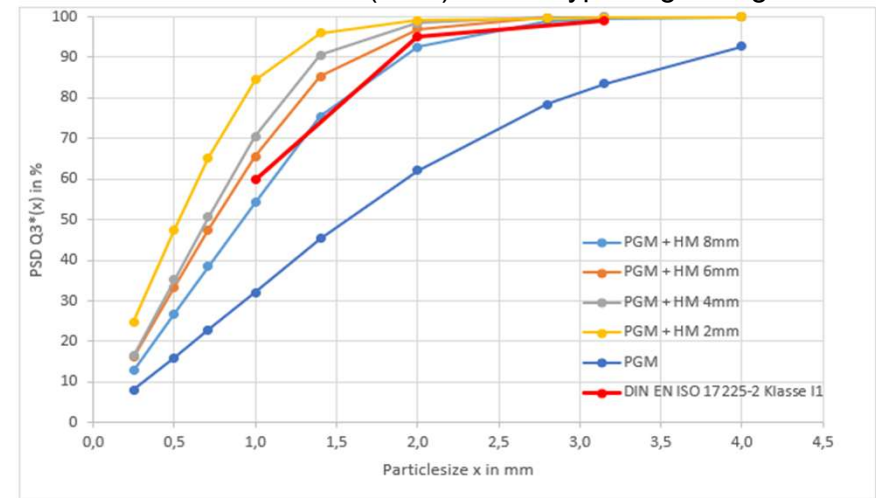
Trials performed at the pilot plant of Amandus Kahl:



Energy consumption: Dry grinding & Pelleting



Particle Size Distribution (PSD) acc. to type of grinding



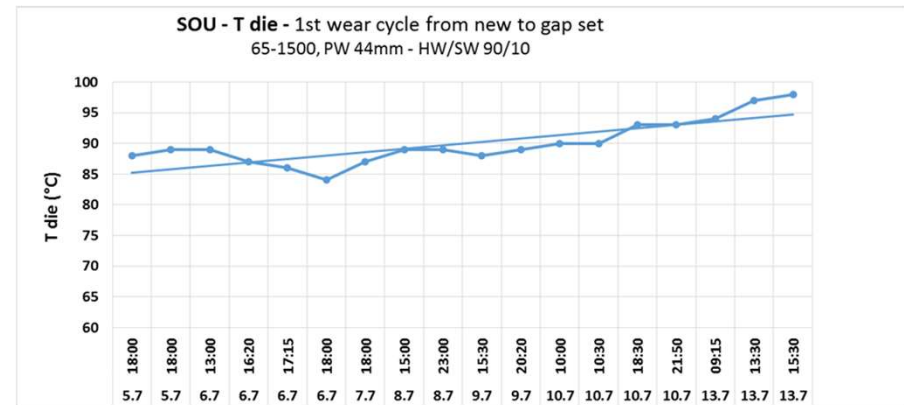
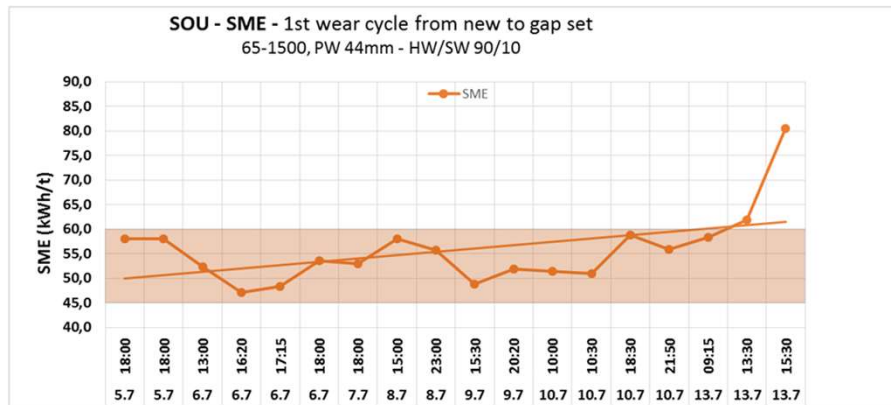
Group 2 – Flat die pelleting mill



Group 2 – Flat die pelleting mill



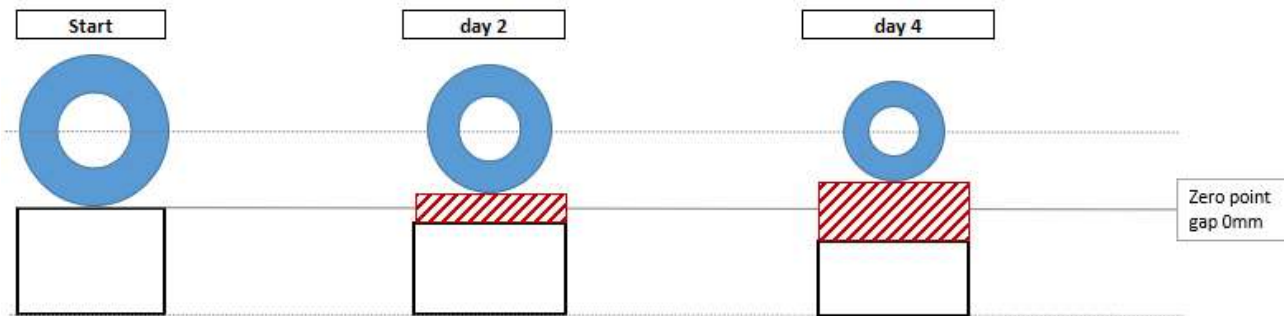
Basic – Why a Distamat?



Typical operation behaviour without Distamat:

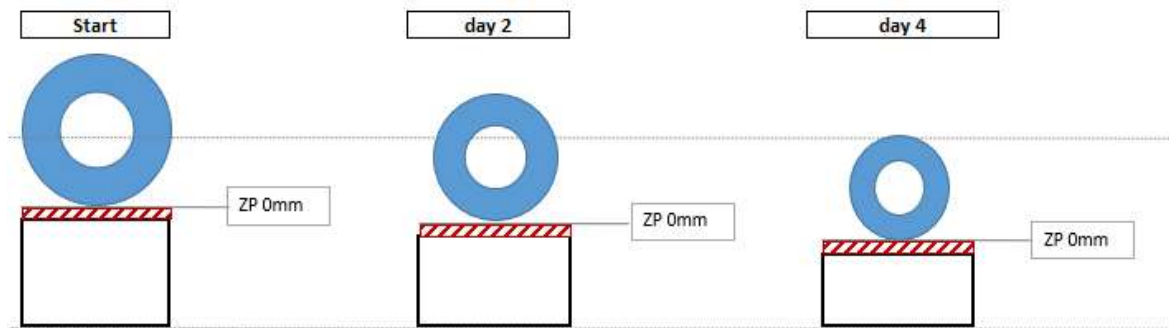
- Continuous change of process parameters until the working window is left
- Without Distamat no possibility of intervention after press start without stopping the press
- Press runs until problems arise

Pelleting without Distamat



- Zero-point gap adjustment with roller head stop
- Gap becomes larger due to wear
- No gap reduction possible during operation
- Gap adjustment only possible by press stop and mechanical lowering with roller head stop

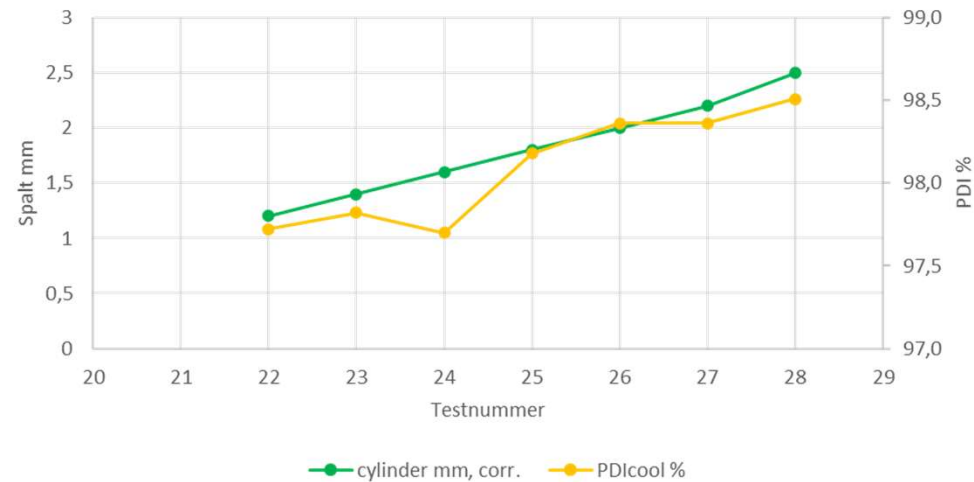
Pelleting with Distamat



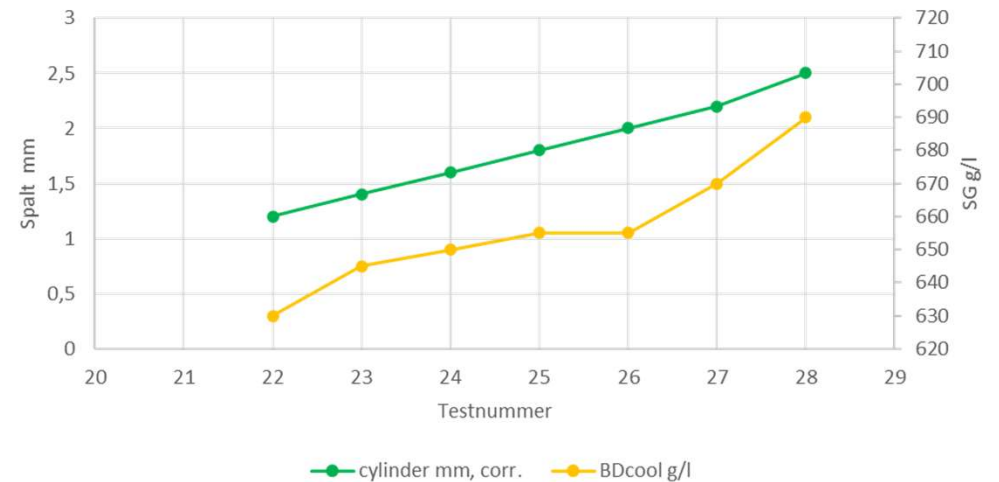
- Zero point adjustment by regular taring (stop and direct start)
 - no need to disassemble the press
- Gap almost independent of wear
- Gap constant
- Gap adjustment infinitely variable during operation

Significance of the roller gap

KBB110mm Spalt / PDI nach Kühler

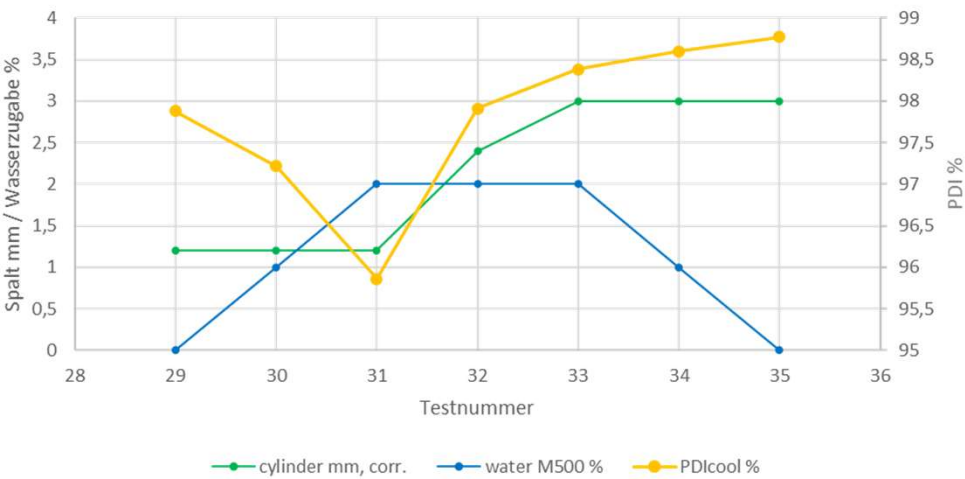


KBB110mm Spalt / SG nach Kühler

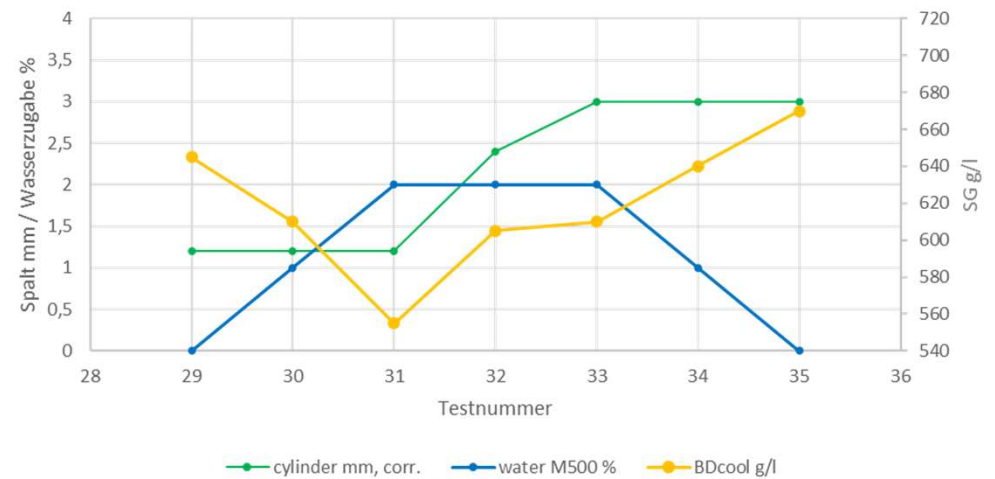


Compensation of moisture variation

KBB110mm Spalt / Wasserzugabe / PDI



KBB110mm Spalt / Wasserzugabe / SG



Impact of Distamat hydraulic

- No gapset of the wedge – increased up time / availability
- Reduction of tooling costs – more operation hours until tooling refurb is necessary
- Option to change setpoint during operation – react to changing upstream conditions
- Run the pellet mill the whole uptime with maximum throughput and constantly high pellet quality
- Less time effort to care about the pellet mill – lower staff cost, less for the operator need for bigger plants with a significant number of pellet mills
- Lower SME because of the optimal operation mode

KAHL Eco Roll – Practical Experience

- Up to **25 % capacity increase** and **12 t/h** output in production
- Low specific energy consumption, approx. **40 – 45 kWh/t**
- **Highest** pellet quality, bulk density and durability

Group 2 – Flat die pelleting mill

Roller Head – with ECO-ROLL Tool-Set



Due to the ECO-ROLL, the **Advantages of a larger hole area** are combined with the **Advantages of the narrow rollers**

ECO Rolls with Pellet Mill 45-1000



Standard Rollers

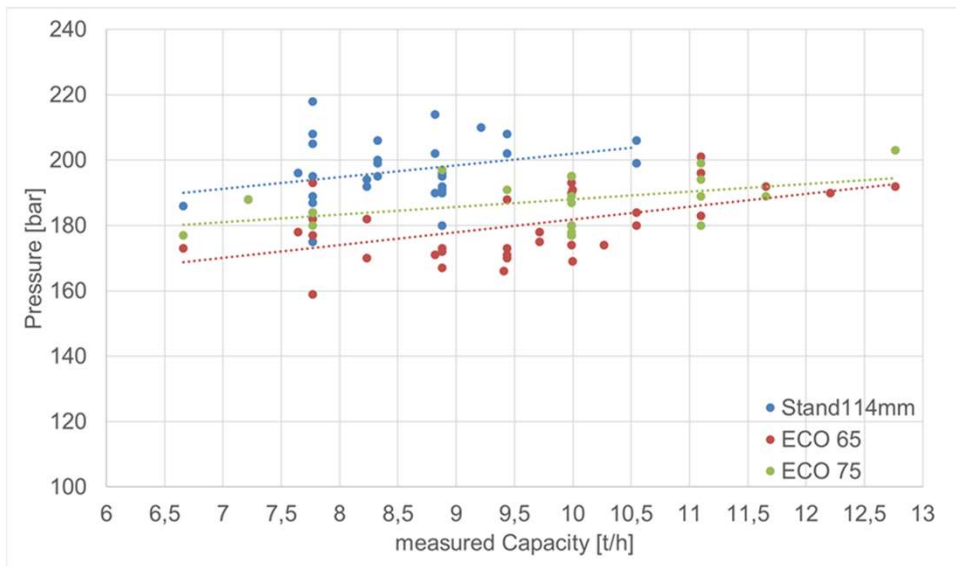
- 2,5 t/h
- strongly fluctuating pressure



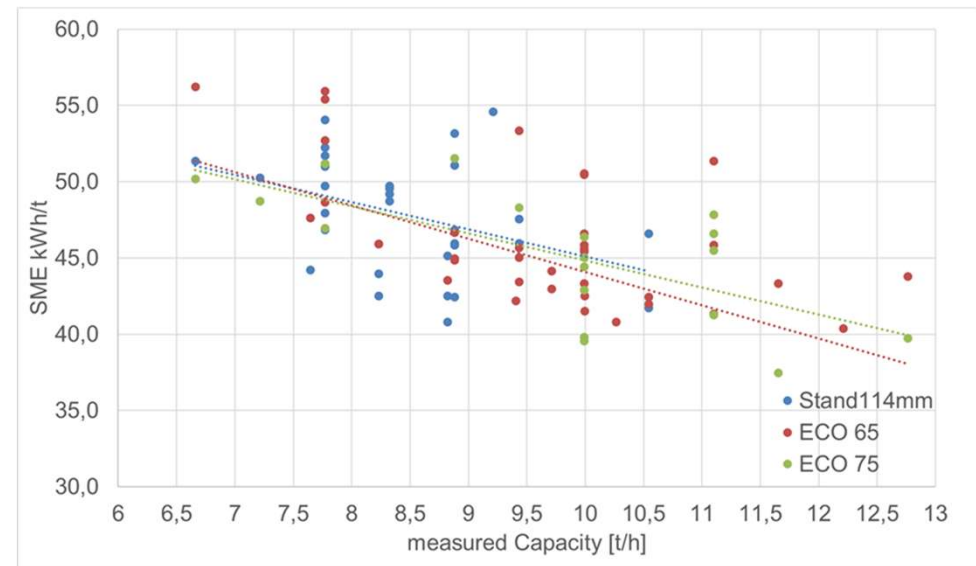
ECO Rolls

- 3,3 t/h
- Significantly more stable operating behavior
- fewer load changes

ECO-ROLLS on Pellet Mill 65-1500

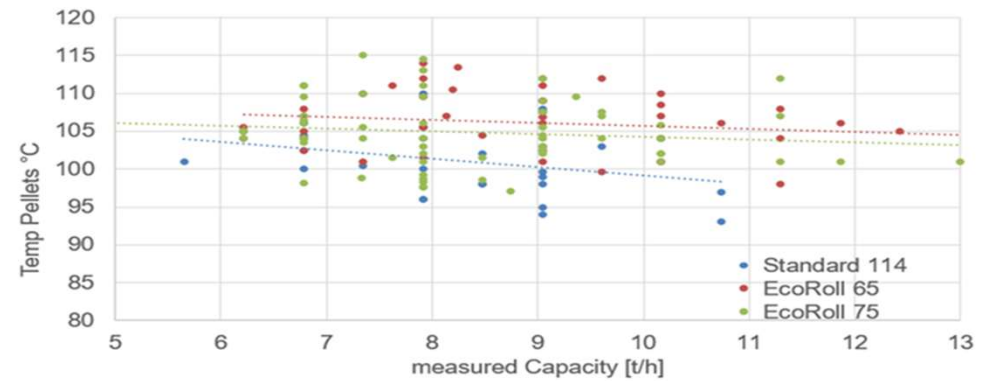
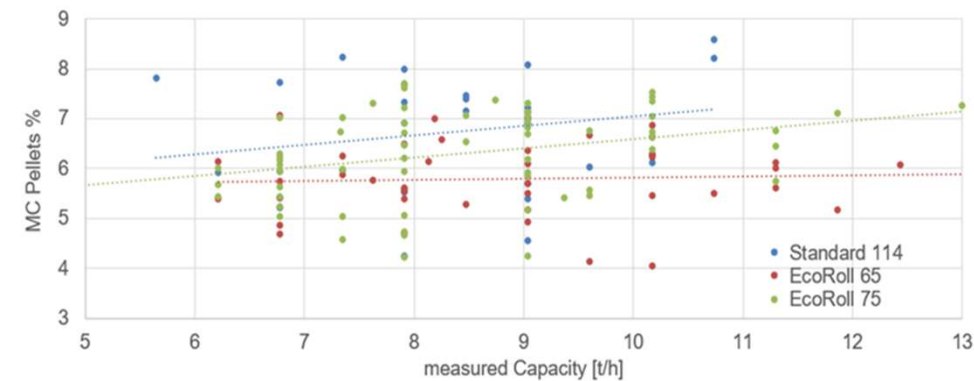
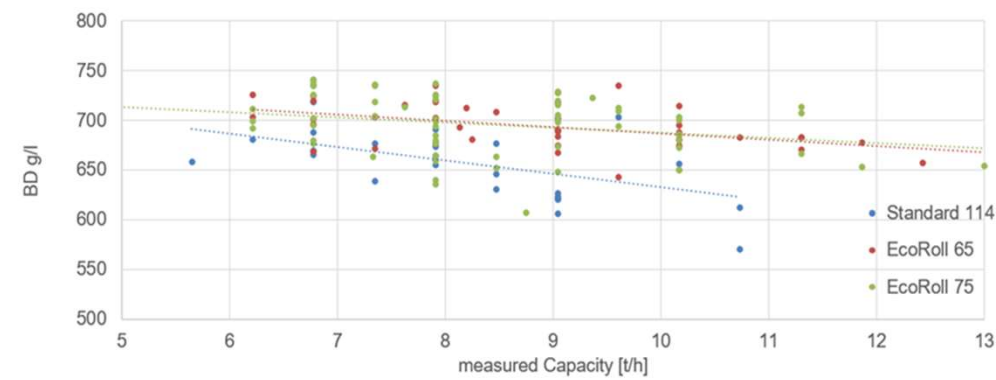
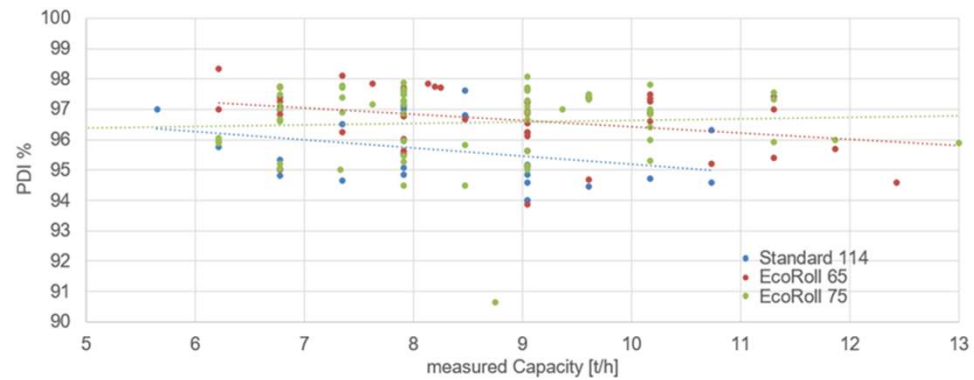


Up to 13 t/h



SME reduction with higher capacity

ECO-ROLLS impact on Pellet quality



Summary of Process data

ECO vs Standard

Process	more stable
Capacity	+ 25%
SME	- 20%
Pressure/motor load	more balanced
Operation Parameters	less pressure and load fluctuations
Material / Moisture variation	much less sensitive
Pellet quality	better
Water addition	1-2% less
PDI	up to 1% higher
BD	30-50 g/l higher
Pellet moisture content	1-1,5% less
Particle size in pellet	no difference

Summary

- Up to **25 % capacity increase** and **12 t/h** output in production ✓
- Low specific energy consumption, approx. **40 – 45 kWh/t** ✓
- **Highest** pellet quality, bulk density and durability ✓
- Lower water addition necessary
- Stable pellet mill operation
- More even wear → longer life time of the tools

**Thank you very much
for
your attention**

**Florian Schmuchler
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