

Sorting Plant Operation

Manfred Geistbeck
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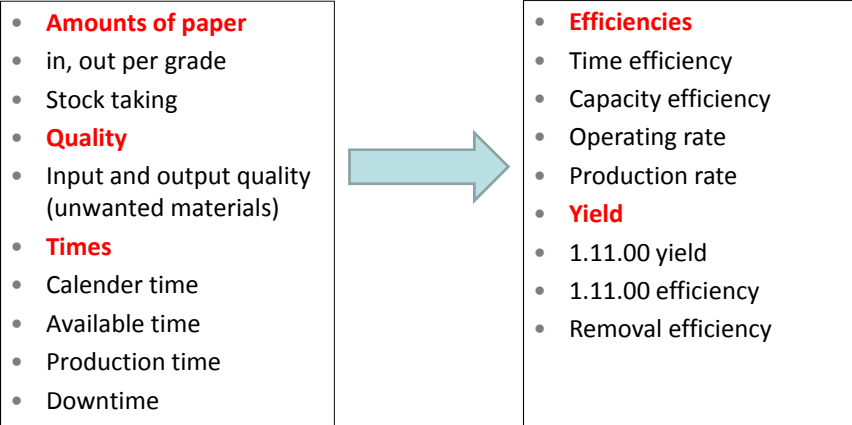


Introduction

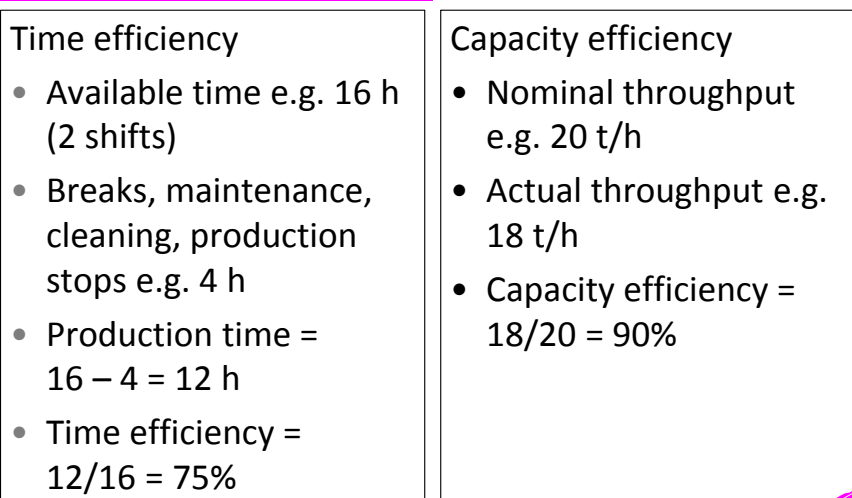
- Control engineering and automation technology is missing in PfR sorting
- Langerbrugge is on a progressive path – hopefully others will follow
- Determination of sorting plant efficiency
- No standards available
- Inspired by rules for paper machine efficiency



List of parameters



Time and capacity efficiency



Operating rate and spec. throughput

Operating rate

- Available time e.g. 16 h (2 shifts)
- Calendar time 24 h
- Available time divided by calendar time = $16/24 = 67\%$

1 month = 22 working days = 352 h avail. time
 $352/720 = 49\%$

Spec. throughput

- Daily production e.g. 288 t
- Available time e.g. 16 h
- Production time e.g. 12 h
- Spec throughput (A) = $288/16 = 18 \text{ t/h}$
- Spec throughput (P) = $288/12 = 24 \text{ t/h}$

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Yield

1.11 yield

- 1.11.00 tonnage = Input – produced bales e.g. $288 - 118 = 170$
- 1.11.00 yield = $170/288 = 59\%$

1.11 efficiency

- Graphic paper content of input e.g. 75%
- Graphic paper in input = $288 \times 75\% = 216 \text{ t}$
- Graphic paper in 1.11.00 = 170 t – 3% impurities = 165 t
- 1.11.00 efficiency = $165/216 = 76\%$

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Removal efficiency and summary

Removal efficiency

- Non-graphic paper content of input e.g. 25% => $288 \times 25\% = 72$ t
- Impurities in 1.11.00 e.g. 3% => $170 \times 3\% = 5$ t
- Removal efficiency = $(72-5)/72 = 93\%$

Summary

- 1.11.00 yield: 59%
- 1.11.00 efficiency: 76%
- Removal: 93%
- Simplified analysis
 - Wanted material (graphic paper)
 - Unwanted material (non-graphic paper and non-paper materials)

Classification of materials

Wanted papers

- newspapers & magazines
- advertisements
- printing & writing papers

Unwanted materials

- packaging board and paper
- strong coloured papers
- non-deinkable papers
- non-paper materials

- envelopes
- shredded papers
- paper snippets



- grey board
- white board
- film coated papers



Summary

- KPI's as a basis for benchmarks und further optimisation
- Useful for project work
- Better understanding of the sorting process
- To be a competent partner for discussions with operators of sorting systems and machine manufactures
- Contribute to an effectively sorting of PfR and make it still worthwhile in the future for both sorting plants and paper mills



END

- Thank you for your attention

