Paper Machine Section Draws

Draw (speed difference) between successive paper machine sections, as a percentage of the earlier section's speed, and the cumulative draw from wire to reel.

Method: Smook; Handbook for Pulp & Paper Technologists; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Wire speed	1,200.0	m/min
Press section speed	1,224.0	m/min
Dryer section speed	1,236.0	m/min
Reel speed	1,242.0	m/min

Calculated results

Parameter	Value	Unit
Draw wire → press	2.0000	%
Draw press → dryers	0.98039	%
Draw dryers → reel	0.48544	%
Total draw wire → reel	3.5000	%

Notes for this case

- Open draws need enough tension to keep the sheet straight but not so much that wet paper breaks.

Formula and method

$$d = \frac{v_{i+1}}{v_i} - 1, \quad d_t = \frac{v_r}{v_w} - 1$$

Variables

v_w	Wire speed	m/s
v_p	Press section speed	m/s
v_d	Dryer section speed	m/s
v_r	Reel speed	m/s
d_{wp}	Draw wire → press	-
d_{pd}	Draw press → dryers	-
d_{dr}	Draw dryers → reel	-
d_t	Total draw wire → reel	-

Method and standards

Draw definitions.

Assumptions and limits

- Steady running.
- A negative draw (a section slower than the one before) is flagged.

References

- Smook
- Handbook for Pulp & Paper Technologists
- 3rd ed. (Angus Wilde, 2002)
- ch. 16–17 (sheet transfer and draws between sections)
- Definitions and mass and energy balances

Report details

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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/pulp-paper/paper-machine-draw

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.