Pressure Screen Mass Balance and Reject Rate

Accept and reject flows, mass and volumetric reject rates and fibre losses of a pressure screen from feed, accept and reject consistencies and the reject flow split.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Feed stock flow	300.00	t/h
Feed consistency	3.0000	%
Accept consistency	2.8000	%
Reject consistency	4.5000	%

Calculated results

Parameter	Value	Unit
Reject stock flow	35.294	t/h
Accept stock flow	264.71	t/h
Volumetric (flow) reject rate	11.765	%
Mass (fibre) reject rate	17.647	%
Thickening factor C_R/C_F	1.5000	

Formula and method

$$\dot{m}_R = \dot{m}_F \frac{C_F - C_A}{C_R - C_A}, \quad R_V = \frac{\dot{m}_R}{\dot{m}_F}, \quad R_M = \frac{\dot{m}_R C_R}{\dot{m}_F C_F}$$

Variables

$\dot{m}_F$	Feed stock flow	kg/s
C_F	Feed consistency	-
C_A	Accept consistency	-
C_R	Reject consistency	-
$\dot{m}_R$	Reject stock flow	kg/s
$\dot{m}_A$	Accept stock flow	kg/s
R_V	Volumetric (flow) reject rate	-
R_M	Mass (fibre) reject rate	-
T_F	Thickening factor C_R/C_F	-

Method and standards

Total and fibre balances.

Assumptions and limits

- Steady state; stock density constant.

References

- Smook
- Handbook for Pulp & Paper Technologists
- 3rd ed. (Angus Wilde, 2002)
- ch. 9.4 (screening: reject rate on mass and volume basis)

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/screen-reject-rate

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.