Crusher–Screen Circuit Circulating Load from Screen Efficiency

Circulating load of a closed crushing circuit from the screen efficiency and the undersize in the screen feed, with the oversize returned and the screen feed rate.

Method: Wills and Finch; Wills' Mineral Processing Technology; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Screen efficiency (undersize recovered to the undersize product)	85.000	%
Undersize (finer than the aperture) in the screen feed	50.000	%
Fresh feed (= circuit product)	300.00	t/h

Calculated results

Parameter	Value	Unit
Circulating load (oversize / product)	135.29	%
Oversize returned to the crusher	405.88	t/h
Screen feed rate	705.88	t/h

Notes for this case

- Assumes no oversize passes through the screen (u = 1) and steady state. In a circuit with the crusher first, f is the undersize in the crusher product; with the screen first it is the undersize in the combined screen feed.

Formula and method

$$C = \frac{O}{U} = \frac{1}{E_U f} - 1, \quad E_U = \frac{U}{F f}$$

Variables

E_U	Screen efficiency (undersize recovered to the undersize product)	-
f	Undersize (finer than the aperture) in the screen feed	-
U	Fresh feed (= circuit product)	kg/s
C	Circulating load (oversize / product)	-
O	Oversize returned to the crusher	kg/s
F	Screen feed rate	kg/s

Method and standards

Mass balance on the screen undersize.

Assumptions and limits

- No oversize in the undersize product.

References

- Wills and Finch
- Wills' Mineral Processing Technology
- 8th ed. (Butterworth-Heinemann, 2016)
- ch. 8
- eqs. 8.1-8.10

Report details

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Release checks	3 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/civil/mining-minerals/crusher-screen-circulating-load

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.