Dense-Medium Partition Coefficient and Ecart Probable

Partition coefficient of a density fraction to sinks from float and sink analyses and the floats yield, and the Ecart probable (Ep) of a dense-medium separator.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Feed reporting to floats	82.600	%
Fraction in the floats analysis	10.500	%
Fraction in the sinks analysis	10.820	%
Density with 25 % to sinks	1.3700	g/cm³
Separating density (50 % to sinks)	1.5200	g/cm³
Density with 75 % to sinks	1.6100	g/cm³

Calculated results

Parameter	Value	Unit
Fraction in floats, % of feed	8.6730	%
Fraction in sinks, % of feed	1.8827	%
Reconstituted feed in this fraction	10.556	%
Partition coefficient to sinks	17.836	%
Ecart probable	0.12000	g/cm³

Notes for this case

• Repeat for each density fraction (plotted at its mid density) to build the partition curve, then read ρ25, ρ50 and ρ75 from it. A lower Ep means a sharper separation; Ep does not describe the tails of the curve.

Formula and method

$$P = \frac{a_s(1 - Y_f)}{a_f Y_f + a_s(1 - Y_f)}, \quad E_p = \frac{\rho_{75} - \rho_{25}}{2}$$

Variables

Y_f	Feed reporting to floats	-
a_f	Fraction in the floats analysis	-
a_s	Fraction in the sinks analysis	-
ρ_{25}	Density with 25 % to sinks	kg/m³
ρ_{50}	Separating density (50 % to sinks)	kg/m³
ρ_{75}	Density with 75 % to sinks	kg/m³
$a_f Y_f$	Fraction in floats, % of feed	-
$a_s(1 - Y_f)$	Fraction in sinks, % of feed	-
$\sum$	Reconstituted feed in this fraction	-
P	Partition coefficient to sinks	-
E_p	Ecart probable	kg/m³

Method and standards

Partition coefficient and probable error.

Assumptions and limits

- Representative product samples.

References

- Wills and Finch
- Wills' Mineral Processing Technology
- 8th ed. (Butterworth-Heinemann, 2016)
- ch. 11
- eq. 11.3 (Tromp, 1937) and Table 11.4

Report details

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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/dms-partition-coefficient-ep

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.