Fresh Water Allowance and Dock Water Allowance (Load Line)

Fresh water allowance and dock water allowance of a ship from its displacement and tonnes per centimetre, with the draught change when moving between waters.

Method: Fresh and dock water allowances

Input parameters

Unit system: SI

Parameter	Value	Unit
Displacement at the summer load line	15,000	t
Tonnes per centimetre immersion in salt water	22.000	t/cm
Density of the dock water	1,010.0	kg/m³

Calculated results

Parameter	Value	Unit
Fresh water allowance Δ/(4 TPC)	170.45	mm
Dock water allowance	102.27	mm
Sinkage from salt to dock water (approximate)	102.27	mm

Notes for this case

- FWA (mm) = Δ (t)/(4 TPC (t/cm)): the sinkage from salt water (1,025) to fresh water (1,000). In dock water of intermediate density the ship may load until the load line is submerged by the DWA.

Formula and method

$$FWA = \frac{\Delta}{4\,TPC}\ \text{mm}\ (\Delta\ \text{in t}, TPC\ \text{in t/cm}), \quad DWA = FWA\,\frac{1025 - \rho_{dock}}{25}$$

Variables

Δ	Displacement at the summer load line	kg
TPC	Tonnes per centimetre immersion in salt water	kg/m
ρ_{dock}	Density of the dock water	kg/m³
FWA	Fresh water allowance Δ/(4 TPC)	m
DWA	Dock water allowance	m
δT	Sinkage from salt to dock water (approximate)	m

Method and standards

Load line allowances.

Assumptions and limits

- Wall-sided ship near the waterline.

References

Fresh and dock water allowances

Report details

Report reference	FCC-N3C4-CTYE (the same inputs always give the same reference)
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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/mechanical/marine/fresh-water-allowance

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.