Fuel Oil Day Tank and Service Tank Volume

Day-tank volume for a firing rate and hours of storage at the oil density, with ullage, for support-fuel or start-up oil in a solid-fuel boiler house.

Method: V = ṁ t/ρ/(1 − u)

Input parameters

Unit system: SI

Parameter	Value	Unit
Oil firing rate	600.00	kg/h
Hours of storage	24.000	h
Oil density at storage temperature	950.00	kg/m³
Ullage	10.000	%

Calculated results

Parameter	Value	Unit
Oil to hold	15.158	m³
Tank volume with ullage	16.842	m³

Notes for this case

- Local rules limit day-tank volume inside the boiler house: check fire regulations.

Formula and method

$$V_o = \frac{\dot{m}_o t}{\rho_o}, \quad V_t = \frac{V_o}{1-u}$$

Variables

$\dot{m}_o$	Oil firing rate	kg/s
t	Hours of storage	s
ρ_o	Oil density at storage temperature	kg/m³
u	Ullage	-
V_o	Oil to hold	m³
V_t	Tank volume with ullage	m³

Method and standards

Definitions.

Assumptions and limits

- Steady firing at the burner consumption. The unpumpable heel below the suction and any recirculation return are not added; increase the volume for them.

References

- V = ṁ t/ρ/(1 − u)

Report details

Report reference	FCC-BFQF-M6NC (the same inputs always give the same reference)
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Calculator	Fuel Oil Day Tank and Service Tank Volume
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Software release	FireCAD Calc, release of 17 November 2026
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/boilers-power-plant/fuel-ash-handling/fuel-oil-day-tank

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.