Coal Bunker and Fuel Silo Capacity

Bunker or silo volume for a number of hours of firing from the firing rate, bulk density and usable share, split among the bunkers.

Method: Mass and volume balance

Input parameters

Unit system: SI

Parameter	Value	Unit
Fuel firing rate at MCR	12,000	kg/h
Hours of firing to store Enter your specification's storage time.	12.000	h
Bulk density of the fuel Coal about 0.75–0.9 t/m³; bagasse about 0.1–0.15 t/m³; wood chips about 0.2–0.35 t/m³. Use the value for your fuel.	800.00	kg/m³
Usable share of the geometric volume Allows for the hopper, the angle of repose at the top and dead zones.	85.000	%
Number of bunkers sharing the storage	2.0000	

Calculated results

Parameter	Value	Unit
Total geometric volume	211.76	m³
Geometric volume of each bunker	105.88	m³
Volume of fuel stored	180.00	m³
Mass of fuel stored	144.00	t

Formula and method

$$m = \dot{m}_f t_s \qquad V_f = \frac{m}{\rho_b} \qquad V_t = \frac{V_f}{f} \qquad V_1 = \frac{V_t}{n}$$

Variables

$\dot{m}_f$	fuel firing rate at MCR	kg/s
t_s	hours of firing to store	s
ρ_b	bulk density of the fuel	kg/m³
f	usable share of the geometric volume	–
n	number of bunkers	–
V_t	total geometric volume	m³
V_1	geometric volume of each bunker	m³
V_f	volume of fuel stored	m³
m	mass of fuel stored	kg

Method and standards

Mass and volume balance on the bunkers at the MCR firing rate.

Assumptions and limits

- Bulk density as stored; wet or fine coal and compacted biomass differ from the loose value.
- Storage time and usable share are your inputs; the calculator does not suggest them.

References

- Mass and volume balance

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/boilers-power-plant/fuel-ash-handling/coal-bunker-capacity

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.