BOD and COD Load and Organic Loading Rate

Daily BOD and COD loads of a wastewater stream from the flow and concentrations, the volumetric organic loading rate on a reactor, and the COD/BOD ratio.

Method: Metcalf & Eddy; Wastewater Engineering (load = flow × concentration)

Input parameters

Unit system: SI

Parameter	Value	Unit
Wastewater flow	500.00	m³/d
BOD concentration	300.00	mg/L
COD concentration	600.00	mg/L
Reactor (tank) volume	250.00	m³

Calculated results

Parameter	Value	Unit
BOD load Q × BOD	150.00	kg/d
COD load Q × COD	300.00	kg/d
Organic loading rate (BOD) on the volume	0.60000	kg/(m³·d)
Organic loading rate (COD) on the volume	1.2000	kg/(m³·d)
COD to BOD ratio	2.0000	

Formula and method

$$L = Q\,C, \quad OLR = \frac{L}{V}$$

Variables

Q	Wastewater flow	m³/s
BOD	BOD concentration	kg/m³
COD	COD concentration	kg/m³
V	Reactor (tank) volume	m³
L_{BOD}	BOD load Q × BOD	kg/s
L_{COD}	COD load Q × COD	kg/s
OLR_{BOD}	Organic loading rate (BOD) on the volume	kg/(m³·s)
OLR_{COD}	Organic loading rate (COD) on the volume	kg/(m³·s)
COD/BOD	COD to BOD ratio	-

Method and standards

Mass flow equals flow times concentration.

Assumptions and limits

- Average values.

References

• Metcalf & Eddy
• Wastewater Engineering (load = flow × concentration)

Report details

Report reference	FCC-F1QQ-XMDK (the same inputs always give the same reference)
Generated	17 November 2026, 19:34 UTC
Calculator	BOD and COD Load and Organic Loading Rate
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
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/environmental/wastewater/organic-loading-rate

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.