Membrane Rejection and Log Removal Value (LRV)

Rejection, percent removal and log removal value of a membrane or other barrier from feed and permeate concentrations of particles, pathogens or solutes.

Input parameters

Unit system: SI

Parameter	Value	Unit
Feed concentration (any consistent unit)	2,000,000	
Permeate concentration (same unit)	1.0000	

Calculated results

Parameter	Value	Unit
Rejection	100.000	%
Log removal value	6.3010	
Passage	5.0000e-07	

Notes for this case

• LRV equals the 'number of nines': 4-log is 99.99 % removal. With a non-detect in the permeate, using the detection limit gives the demonstrable minimum LRV.

Formula and method

$$R = 1 - \frac{C_p}{C_f}, \quad LRV = \log_{10} \frac{C_f}{C_p}$$

Variables

C_f	Feed concentration (any consistent unit)	-
C_p	Permeate concentration (same unit)	-
R	Rejection	-
LRV	Log removal value	-
C_p/C_f	Passage	-

Method and standards

Definitions of rejection and log removal.

Assumptions and limits

- Concentrations measured on the same basis and sample timing.

Report details

Report reference	FCC-7SEM-BSXQ (the same inputs always give the same reference)
Generated	23 November 2026, 17:34 UTC
Calculator	Membrane Rejection and Log Removal Value (LRV)
Method last reviewed	17 November 2026
Software release	FireCAD Calc, release of 22 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/drinking-water/membrane-log-removal-value

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.