# Density and Specific Volume Converter (kg/m³, g/cm³, lb/ft³)

Convert a density between kg/m³, g/cm³, kg/L and lb/ft³, and give the specific volume in m³/kg, L/kg and ft³/lb.

**Method:** NIST SP 811 (2008); Appendix B conversion factors

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Density (choose its unit) | 1,000.0 | kg/m³ |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Density in kg/m³ | 1,000.0 | kg/m³ |
| Density in g/cm³ | 1.0000 | g/cm³ |
| Density in kg/L | 1.0000 | kg/L |
| Density in lb/ft³ | 62.428 | lb/ft³ |
| Specific volume in m³/kg | 0.001000 | m³/kg |
| Specific volume in L/kg | 1.0000 | L/kg |
| Specific volume in ft³/lb | 0.016018 | ft³/lb |

**Notes for this case**

- Specific volume is the inverse of density.

## Formula and method

$$v = \frac{1}{\rho}, \quad 1\ \mathrm{lb/ft^3} = 16.018\,46\ \mathrm{kg/m^3}$$

### Variables

| | | |
|---|---|---|
| $\rho$ | Density (choose its unit) | kg/m³ |
| $v$ | Specific volume in m³/kg | m³/kg |

### Method and standards

Exact pound and foot definitions (NIST SP 811).

### Assumptions and limits

- Units only.

### References

- NIST SP 811 (2008)
- Appendix B conversion factors

## Report details

| | |
|---|---|
| Report reference | FCC-7V1V-ZH8R (the same inputs always give the same reference) |
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| Calculator | Density and Specific Volume Converter (kg/m³, g/cm³, lb/ft³) |
| 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/general/unit-conversions/density-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.