Resistivity and Conductivity Converter (Ω·m, µS/cm, mS/cm)

Convert electrical resistivity between Ω·m, Ω·mm²/m and µΩ·cm, and conductivity between S/m, mS/cm and µS/cm, with the reciprocal of each.

Method: Unit definitions per NIST SP 811 and the SI Brochure (exact where defined)

Input parameters

Unit system: SI

Parameter	Value	Unit
Resistivity (choose its unit)	0.017200	Ω·mm²/m
Conductivity (choose its unit)	100.00	µS/cm

Calculated results

Parameter	Value	Unit
Ω·m	1.7200e-08	Ω·m
Ω·mm²/m	0.017200	Ω·mm²/m
µΩ·cm	1.7200	µΩ·cm
Conductivity from the resistivity	5.8140e+07	S/m
S/m	0.010000	S/m
mS/cm	0.10000	mS/cm
µS/cm	100.00	µS/cm
Resistivity from the conductivity	100.00	Ω·m

Notes for this case

• Resistivity and conductivity are reciprocals: κ = 1/ρ. Conductor resistivity is usually in Ω·mm²/m (copper 0.0172, aluminium 0.0283 at 20 °C), which equals µΩ·m. Water conductivity is in µS/cm: pure water is about 0.055 µS/cm, drinking water 50–800 µS/cm, sea water about 50 mS/cm. 1 µS/cm = 10^{-4} S/m; the matching resistivity of high-purity water is quoted in MΩ·cm (18.2 MΩ·cm ↔ 0.055 µS/cm).

Formula and method

$$\kappa = \frac{1}{\rho}, \quad 1\ \mu\mathrm{S/cm} = 10^{-4}\ \mathrm{S/m}$$

Variables

ρ	Resistivity (choose its unit)	Ω·m
κ	Conductivity (choose its unit)	S/m
$1/\rho$	Conductivity from the resistivity	S/m
$1/\kappa$	Resistivity from the conductivity	Ω·m

Method and standards

Resistivity units.

Assumptions and limits

- Exact factors.

References

Unit definitions per NIST SP 811 and the SI Brochure (exact where defined)

Report details

Report reference	FCC-FTYJ-ANPF (the same inputs always give the same reference)
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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/general/unit-conversions/resistivity-conductivity-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.