Conductivity Temperature Compensation to 25 °C

Conductivity at the 25 °C reference from a reading at another temperature with a linear temperature coefficient, and the TDS by a user factor.

Method: Linear temperature compensation $\kappa_{25} = \kappa_T / (1 + \alpha (T - 25\ °C))$ (ISO 7888 practice)

Input parameters

Unit system: SI

Parameter	Value	Unit
Measured conductivity In µS/cm: the TDS factor is per µS/cm. (Another unit gives κ_{25} in that unit, but then the TDS is wrong.)	2,500.0	
Sample temperature	45.000	°C
Temperature coefficient (per K) About 0.02 per K (2 %/°C) for most salt solutions; use your sample's value.	0.020000	
TDS factor (mg/L per µS/cm)	0.65000	

Calculated results

Parameter	Value	Unit
Conductivity at 25 °C	1,785.7	
Ratio of measured to reference	1.4000	
Estimated TDS (mg/L)	1,160.7	

Formula and method

$$\kappa_{25} = \frac{\kappa_T}{1 + \alpha(T - 25\ °C)}, \quad TDS = f\,\kappa_{25}$$

Variables

κ_T	Measured conductivity	-
T	Sample temperature	K
α	Temperature coefficient (per K)	-
f	TDS factor (mg/L per µS/cm)	-
κ_{25}	Conductivity at 25 °C	-
κ_T / κ_{25}	Ratio of measured to reference	-
TDS	Estimated TDS (mg/L)	-

Method and standards

Linear compensation.

Assumptions and limits

- Linear coefficient over the range. High-purity water (below about 20 µS/cm) and samples more than 25 K from 25 °C are flagged: their temperature dependence is non-linear.
- Conductivity in µS/cm, the basis of the TDS factor.

References

- Linear temperature compensation $\kappa_{25} = \kappa_T / (1 + \alpha (T - 25\ °C))$ (ISO 7888 practice)

Report details

Report reference	FCC-CQ8B-AQX2 (the same inputs always give the same reference)
Generated	17 November 2026, 19:35 UTC
Calculator	Conductivity Temperature Compensation to 25 °C
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/instrumentation/analysers/conductivity-temperature-compensation

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.