

The difference between Conductivity, TDS and salinity

When measuring water quality, you may be asked for a [conductivity](#) reading, a TDS reading, a Salinity reading, or all three. All three measurements are related and below we will discuss the difference between them.

Conductivity is a measurement of how well an aqueous solution can carry an electrical current. It is commonly used to determine the levels of impurities in the water, typically the more impurities in the water, the higher the conductivity value will be. Absolutely pure water has a conductivity value around $0.055\mu\text{S}/\text{cm}$, tap water typically has a value around $50\text{-}100\mu\text{S}/\text{cm}$ and sea water normally has a value around $53\text{mS}/\text{cm}$. To take a conductivity measurement, two plates are placed into the sample, a potential is applied across the plates, and the current is measured. For most salts, there is a linear relationship between ion concentration and the conductivity value, although in some cases, such as sulphuric acid, it stops being linear when at very high concentrations.

TDS, short for Total Dissolved Solids, is an estimate of the mass of dissolved solids within the solution and is typically expressed as mg/L or parts per million (ppm). It is derived from the conductivity reading using a conversion factor. For accurate TDS readings, the correct TDS factor must be used. For example, a sodium chloride solution has a TDS factor of around 0.49, whereas a sodium bicarbonate solution has a TDS factor of 0.91. If you are unsure of the TDS factor for your water sample, you can send it to a lab for analysis and they can analyse it for you.

Salinity is similar to TDS in that it is an estimate of the level of salt in a water sample and it is derived from the conductivity reading using a conversion factor (usually 0.5). It is typically expressed as parts per thousand (ppt) or g/L. Salinity readings are typically used by industries such as agriculture, hydroponics, and pool and spa monitoring.

If you need any assistance with [conductivity meters](#) or if you are looking for some input on the best meter for your application, feel free to contact one of our friendly Scientists via [email](#) or phone on 1300 737 871.