

A Simple Guide to TDS Testing

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1. What is TDS?

TDS is short for Total Dissolved Solids. We measure TDS in liquids like drinking water, streams, lakes, pools and spas. TDS is not a pollutant. It is a general indicator of water quality and the level of dissolved substances in water.

TDS is measured with a TDS meter. The TDS meter provides a digital readout in PPM, which is parts per million. A TDS reading on 1 ppm is equal to one milligram of dissolved substance in one liter of liquid.

2. TDS Levels in Water

Take a look at this chart illustrating the different TDS levels.

Ideal Drinking water from reverse osmosis, distillation, deionization, microfiltration, etc..	0-50 PPM
Often considered acceptable range for carbon filtration, mountain springs or aquifers.	50-140 PPM
Average tap water.	20-400 PPM
Unpleasant levels from tap water, aquifers or mountain springs.	300-500 PPM
The EPA's maximum contamination level.	500 PPM

3. Why is TDS important?

TDS is not a measure of harmful substances or pollutants. TDS is simply a measure of all substances dissolved in water. Purified water has a TDS of 0-1 ppm. The ocean has a TDS over 10,000 ppm. Neither water sources are harmful.

TDS is a good tool for monitoring the general water quality of a known source of water.

Here is a perfect example! If you tested the TDS of distilled water and found it was 300 ppm, you would know the water was not distilled. Perhaps the water purification system was faulty or something had contaminated the distilled water. TDS testing is like a "watch dog." It will tell you if things are not as they should be.

4. How do you reduce or remove the TDS in your water?

- Carbon Filters (very slight reduction)
- Reverse Osmosis (R.O.) (extremely high reduction and great tasting water)
- Distillation (total reduction - flat taste)
- DI Deionization (usually a final polishing filter following a RO Reverse Osmosis filtration system to eliminate TDS)

5.TDS and tap water

Tap water contains a variety of minerals and salts like calcium, magnesium, chloride and potassium. The more minerals and salts in the water, the higher the TDS. The United States Environmental Protection Agency sets the standards for drinking water in the US. The maximum TDS in drinking water is 500 ppm.

A high TDS usually indicates the water source contains a high level of calcium and magnesium (hard water) and other salts. This water is probably corrosive to plumbing fixtures, pipes and appliances. The water may taste bad too, due to the high mineral content. A professional water treatment company will be able to advise you on specific actions to take to correct the situation.

6.How to test the TDS of tap water

- Turn on the cold water and let it run for about one minute.
- Take a water sample in a clean plastic or glass container.
- Make sure that the container is clean and free of any substance that could affect TDS.
- Place the TDS meter in the sample and wait for the reading to stabilize.
- Rinse the TDS meter with distilled water after each use.

7.How to test bottled water

Bottled water is a generic term with no distinct meaning other than it is water in a container. Spring water, distilled water, filtered water and purified water do, however, have distinct legal definitions.

Testing the TDS of bottled water is similar to testing tap water.

- Pour a sample in a clean container.
- Place the TDS meter in the water and wait for the reading to stabilize.
- Be sure to thoroughly rinse the TDS probe after each use.

Distilled water contains no minerals and will have a very low TDS. In normal practice the TDS of pure water is around 0-2.

Spring water, purified water and filtered water, on the other hand, may contains a lot of minerals and salts which affect the TDS. It is not unusual for bottled water have a TDS of 100 ppm or higher.

8.TDS and hydroponics

Hydroponic growing is more popular than ever. Since the plants are growing in a nutrient solution, TDS is an indicator if the nutrient solution needs to be adjusted. If the TDS creeps out of range, it indicates the nutrients are out of balance. The recommended TDS range is dependent of the type of plant being grown. Monitoring the TDS is essential in order to have a successful hydroponic garden or growing operation.

9. How to test TDS in hydroponics

It is best to test the TDS in an area of the hydroponic system that has moving water.

- Place the TDS meter into the agitated nutrient solution and wait for the reading to stabilize.
- Rinse the probe end of the meter with distilled water after each use.

10. TDS and aquariums

Aquarium hobbyists keep and breed hundreds of kinds of tropical fish in their aquariums. Some aquarists specialize on South American river fish and plants that thrive in soft water containing almost no minerals (Low TDS). Others keep African lake fish that live in high TDS water containing a high level of calcium, sodium and chloride.

Whether you are keeping a simple tank of tropical fish or a specialized aquarium, monitoring the TDS is an important part of aquarium maintenance. TDS measurement will indicate if the minerals, salts and other compounds are building up over time. If the TDS climbs above normal levels, a water change is required. Testing the TDS each week will show if the water quality is stable or declining.

11. Ideal TDS range for aquarium fish and ornamental pond fish

350-400 ppm	African lake cichlids
200-500 ppm	Goldfish, Japanese koi
100-300ppm	Guppies, Swordtails, Mollies, Barbs, Platies
10-100 ppm	Angelfish, Discus, Neon tetras

12. Testing TDS in aquarium water

Testing the TDS in an aquarium is easy with a TDS meter.

- Simply place the meter into the aquarium, preferably near flowing water.
- Hold the TDS meter until the reading stabilizes.
- Thoroughly rinse the meter after each use.
- Aquarium water contains salts, algae and other microbes that must be rinsed from the probe after each use.

13. TDS and pools & spas

The ideal TDS level in pools and spas is an area of debate. Most experts agree that the maximum TDS of a freshwater pool or spa should be no higher than 1,500 ppm. As pool chemicals are added the TDS can climb closer to 3,000 ppm. Saltwater pools that use a salt generator normally have a TDS level of 3,500 ppm up to 5,000 ppm.

TDS measurement is helpful for detecting a trend of increasing TDS, which indicates a build-up of minerals or pollutants in the water.

14. Testing TDS in pool and spa water

Testing the TDS in swimming pools and spas is easy.

- Simply place the meter into the water, preferably near flowing water.
- Hold the meter until the TDS reading stabilizes.
- Thoroughly rinse the meter after each use.
- The water contains disinfectants and body oils that must be rinsed from the probe after each use.

15. How to properly use and care for your TDS meter

Your hand-held TDS meter uses the same technology as expensive laboratory TDS meters. Even though it is protected in a rugged plastic case your TDS meter still needs to be cared for just like the expensive laboratory models. Follow these simple tips and your TDS meter will last for many years and always provide accurate results.

- Do not drop or completely submerge the unit in water or drop beyond the maximum immersion line.
- Do not store the unit in high temperature or direct sunlight.
- Treat your TDS meter gently. The probe can be damaged if it comes into contact with hard objects.
- Never dip the meter into substances that can coat and damage the probe. Paint, glue and other sticky substances can damage the probe.
- Never dip the TDS meter into boiling liquids. It will damage the probe.
- When you are finished using your TDS meter, rinse the probe with water, preferably distilled water. The idea is to flush away any contaminants on the probe. Never scrub the probe with a brush or towel.

16. FAQ (Frequently Asked Questions)

1) Before using, Is there anything I should pay special attention to?

- This meter is not waterproof, so during testing, please keep water under max immersion line. (marked in the tester picture in paper instruction.)
- During continuous test, please remember click button "CLEAR" before each test, it's to clear the data from last test and ready for next test.

2) Why the meter show red or green backlit?

As usually purified water TDS shall lower than 40 ppm, It show green backlit when $TDS \leq 40$ ppm, it's to tell you the TDS meet purified water standard.

It show red backlit when $TDS > 40$ ppm, that's to tell you should be careful why TDS is higher, is it contain healthy or harmful minerals?

3) Does the meter need calibration?

The old edition does need calibration, but it make things difficult, hard to use. This meter is upgraded and pre-calibrated by high accuracy equipment in factory, no need calibrate again by customer. we do this to prevent as many calibration related mistakes as possible, and it's easier to use.

If insist for calibration, here's the steps if interest to try:

- 1.Prepare some 342ppm(NaCl) calibration solution.
- 2.After turn on the TDS meter, press button "MODE" for 3 seconds, the whole LCD will flicker.
- 3.Put the probe in calibration solution.
For example, if it show result 340ppm(that smaller than 342ppm), keep the probe in solution, then click button "Hold", the ppm will rise 1ppm when you click every time, you can stop till it reach 342ppm that same as solution ppm.
if it show result 345ppm(that bigger than 342ppm), keep the probe in solution, then click button "Clear", the ppm will fall down 1ppm when you click every time, can stop till it reach 342 ppm.
- 4.Take out probe from solution, Press "MODE" for 5 seconds again, the meter will come back to normal situation, then the calibration finished.

Some important tips:

*Please make sure 342ppm(NaCl) calibration solution is truly 342ppm. There's many reason may cause the solution not accurate, such as incorrect reserve, evaporation, sediment, etc.

*Keep the calibration condition clean.

4) Why the TDS is still high after filtering?

Situation 1: If your filter is RO(Reverse Osmosis)/DI(Deionization) system, usually there's two possible reasons:

- 1).Maybe your RO/DI system filter can't work properly.
- 2).Your TDS meter maybe damaged.

Situation 2: If your filter is water softener, activated carbon filter, and some filter that just aimed to filter part of harmful impurities in water. (For example, filter chlorine, copper, lead, cadmium, chloramines, etc). Then TDS won't be lowered significantly.

Because usually this kind of filter is based on a process of ion exchange, it exchange harmful ions with healthy ions.

For example, water softener exchange calcium and magnesium ions with sodium ions. it does lower water hardness, but because of the exchange process, the TDS(total dissolved solids) is still similar as before.

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5) Why do i experience tiny different TDS readings in the same water ?

TDS meters actually measure EC(electrical conductivity),the more minerals in water, the higher the conductivity. The meter converts the EC reading into TDS as parts per million (ppm).

Here are some reasons cause tiny different conductivity in the same water, thus reads tiny different TDS.:

- *The nature of charged positive ions are always moving, that cause conductivity variances.
- *Air bubbles. Even a tiny air bubble adhered to probes could affect the conductivity.
- *Electrical charges off fingers, static electricity off clothes, etc.
- *Different volumes of the same water may have different levels of conductivity. Displacement may affect the conductivity as well.
- *The depth and position of the probe in the water sample may also affect the conductivity.

6) My TDS meter seems defective, what shall I do?

All products has been checked carefully again before delivery, But it's still may be damaged during violent transportation.

If unluckily you received a defective one, we're extremely sorry for the inconvenience, but there is nothing to worry, we are here for you and we will definitely help you in this.

Please don't hesitate to contact honeforestservice@gmail.com. We'll resolve your problem immediately. Thanks.

Your voice is very important for us!

Not happy, or questions?



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