

FAQ: HI781 Saltwater Nitrate Low Range Checker® HC



What is nitrate?

Nitrate is a by-product of the Nitrogen cycle. The nitrogen cycle begins when organisms produce ammonia as a toxic waste byproduct. From there, beneficial bacteria in the aquarium use the ammonia and convert it to nitrite, a less harmful byproduct. The nitrite is ultimately converted to nitrate by further oxidation from bacteria.

How does nitrate affect aquariums?

While nitrate is essential for the growth and reproduction of plants, high levels of nitrate can really harm your fish and inverts. Over time, nitrate will adversely impact cell development, resulting in weakened immune systems and reduced growth.

What is a healthy range?

There is no set value at what to keep your nitrate levels at. The ideal range for nitrates depends on the type of coral you keep, your ideology behind husbandry, and other factors. Some fish and inverts can be particularly sensitive to raised levels. Generally, it is best to keep nitrates on the lower side, below 15ppm, for inverts and other sensitive marine species. Fish are able to tolerate higher levels.

Nitrate Guidelines for Saltwater Aquariums			
Parameter	Reef Aquarium	Fish Only	Nature (Coral Reef)*
Nitrate (NO ₃)	Low Values Preferred	< 30 ppm	Variable (Typically < 0.1 ppm)

***NOTE** that values for natural coral reefs are based on typical surface ocean value and can change.

How do you measure nitrate?

Nitrate cannot be detected directly, as it is invisible and odorless. Instead, you will need to use a chemical test kit or colorimeter to measure the level of nitrate in your system.

Why are low range nitrate measurements in seawater difficult to measure colorimetrically?

It can be difficult to achieve the sensitivity needed to accurately measure low concentrations because of the many possible interferents. This is why many test kits have such light colors in the low ends of the range.

What is the benefit to using the HI781?

Most test kits on the market rely on a color change that needs to be judged by eye. These are notoriously inaccurate, especially in the lower ranges because many factors can alter how a color is perceived. The amount and type of light in the environment as well as other colors close by, and even fatigue all can affect how you perceive color. The [Hanna Marine Nitrate Checker HC - HI781](#) is more accurate than standard test kits because the instrument reads the color digitally, producing a precise number.



What method does the HI781 use?

The HI781 uses an adaptation of the zinc reduction method. The reaction between nitrate and the reagents cause a pink/violet tint in the sample in this colorimetric method.

Some nitrate tests on the market use a cadmium reduction method. Cadmium is a heavy metal and is considered hazardous waste. Cadmium can adversely affect environmental and human health and must be disposed of in accordance to state and federal laws. By using the zinc reduction method, users can be less concerned about how they dispose of their waste.

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What are possible sources of interference in this method?

Main sources of interference are nitrite and copper.

What is the function of each of the three reagents in determining seawater nitrate(NO_3^-) values in the HI781? What specifically does each reagent do to help accurately determine nitrate in seawater?

Reagent HI781A-0 is a buffer, intended to raise the pH of the solution to the optimum point for reduction of nitrate to nitrite. HI781B-0 is a mix of powders that includes zinc, which is what actually reduces the nitrate to nitrite. HI781C-0 is what you could call the indicator, and simply reacts with the emerging nitrite to form a bright pink color.



What is the significance in using the filter?

Most zinc-based methods currently on the market leave the zinc in the sample during the reaction. This results in a 'bleaching' effect during color development. This leads to much lower color development and inaccurate results at low levels. Our HI781 filters the zinc out of the sample for better repeatability, accuracy, and sensitivity at low concentrations.

HI781 Instructional Video

In the following video, we will walk you through the entire procedure to test your nitrate levels from 0.00 to 5.00 ppm. For samples containing between 5 - 50 ppm, follow the instructions for the dilution measurement procedure.



[Watch Video](#)

HI781 Instructional Video with Dilution

The following video describes the procedure of measuring dilution volumes using the Hanna HI781 Marine Nitrate Checker for samples containing 5-50 ppm nitrate. Make sure to use RO/DI water and quality artificial aquarium salts to mix the nitrate/nitrite free artificial seawater diluent for this test.



[Watch Video](#)

Where can I find SDS sheets for this product?

SDS Sheets can be found at sds.hannainst.com

Please use the following reagent codes when searching:

- HI781A-0
- HI781B-0
- HI781C-0