



Testing H₂ in Hydrogen Water and Water Ionizers

All you wanted to know about getting consistently good H₂ production.

We have had many questions about the H₂ or Hydrogen water performance using the Vesta H₂. Before discussing the Vesta H₂ performance testing, there are a few important points to make about H₂ (diatomic hydrogen) performance in ANY electric ionizer.

The first point cannot be emphasized enough. Performance levels are significantly impacted by source water - whether you are talking about H₂ or pH and ORP. If you test any ionizer using hard water with elevated levels of TDS and alkaline minerals, it will always give its best level of performance. Conversely, if you test the exact same ionizer on soft water it will always give less performance. When discussing water quality, it is also important to note that water quality changes throughout the year in most locations, which can cause different test results. Any performance comparison is invalid unless the exact same source water is used.

The second important point is that an ionizer's flow rate will affect performance. All things being equal, an ionizer with a slower flow rate will produce more performance. You can also slow the flow on an ionizer and achieve higher performance. Slowing the flow will also typically raise pH, which is an issue we will cover below. Our Vesta H₂ and Athena H₂ offer the convenience of an excellent flow rate and on-board flow control valves and a real-time flow meter display which help you achieve the perfect balance between the flow rate and the hydrogen / pH performance you want.

The third thing to consider is ongoing performance after an ionizer has been in service. This is an often overlooked point. To achieve optimal performance the electrodes must be kept clean. Therefore, how well an ionizer's cleaning system performs its function is critical. You can achieve one set of performance results with a new ionizer. If you have hard water after your ionizer has formed scale on the

electrodes, you will return lower performance results. Another overlooked issue in ongoing performance – especially with H₂ – is the power supplied to the plates. If a high power is needed then there is the issue of the degradation of the platinum plating. Degraded plating will deliver less performance. Many ionizers tout higher power as if that is the panacea to performance when in the long run it isn't. The good news is that our new H₂ ionizers offer solutions to both issues. First, they include our DARC cleaning which has a 9-year track record as the best cleaning system in the industry. We have always approached the power issue with the belief that if you have advanced electrode design and manufacturing, then apply the right amount of power, you'll get efficiency and performance. Our H₂ ionizers run 150 watts of peak power ensuring long plate life.

Lastly, while we understand the basic science of how hydrogen water is produced during electrolysis, it is a new focus in our industry. No one fully understands all the unique nuances of this delicate chemical process. We don't know if certain properties, in addition to hardness and TDS, affect H₂ performance. Apart from TDS and hardness, it is entirely possible that certain water chemistries lend to a better performance, while others to a lower performance.

That is a lot of information. However, we feel these all are important points for properly informed dealers and customers to consider before simply reading – and believing – a company's declaration that "our ionizer does Xppm of H₂". **Bearing all that in mind, below are our internal test results for the Vesta H₂.** Please be sure to note the different source waters and resulting results. All in all, the Vesta H₂ is a stellar performer in hard or soft water. What is better is you can achieve excellent H₂ results on lower alkaline settings and lower pH. Most ionizers will not produce any hydrogen water at lower power settings. All other features and benefits aside, we think the Vesta H₂ is unique in our industry just for that reason.

Source: Encinitas, CA tap water		Tap water pH:	pH 8.0
Source TDS: 628 ppm		Tap hardness:	282 ppm
Setting / Flow	Top pH	ORP	H2
Alkaline 4 /Pwr Step 4 "Normal" Flow Rate	10.6	-881 mv	1.5ppm

Source: Reno NV tap water		Tap water pH:	pH 7.24
Source TDS: 66 ppm		Tap hardness:	46 ppm
Setting / Flow	Top pH	ORP	H2
Alkaline 2 /Pwr Step 2 "Normal" Flow Rate	9.0	-473 mv	.6ppm
Alkaline 4/ Pwr Step 4 "Normal" Flow Rate	10.4	-683 mv	.8ppm

The Athena H₂ will produce approximately 20% less –ORP and H₂ than the Vesta H₂*.
The Melody II will produce approximately 40% - 50% less –ORP and H₂ than the Vesta H₂*.

*Depending on your water source and if using the same water source.

So, as you can see, the Vesta H₂ produces excellent H₂ / diatomic hydrogen/ hydrogen water in a wide range of water quality situations. From the Encinitis and Reno tests you can see it can produce good H₂ at lower, safer and better tasting pH levels. Engineered with DARC cleaning and a super-efficient plate/power combination ensuring our H2 Series water ionizers will keep high performance for longer than other ionizers.