H_2HUBB TEST REPORT

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Evaluation Introduction

Our report summarizes H_2HUBB's analysis of the 17 oz Hydrogen Water Bottle offered by Piurify. H_2HUBB classifies this device as a premium high-pressure (PSI) portable hydrogen water system. The unit features a PEM/SPE membrane, which helps ensure hydrogen gas production regardless of the source water's conductivity (TDS). The device offers 10-minute and 20-minute cycle options. At Piurify's request, we evaluated the system's dissolved hydrogen performance at 10, 20, and 40 minutes. According to the stated battery specifications, the unit contains a 3.7 V, +2200 mAh battery. The purpose of our evaluation was to determine whether this product meets H_2HUBB's hydrogen product performance standards required for approval and public recommendation.

To learn more about our H_2 performance standards for hydrogen water bottles, visit **H_2HUBB.**

H_2 Products

- Company: Piurify
- Product Name: Piurify 17 oz Bottle
- Type: High-Concentration H_2 Water Device
  - PEM/SPE
  - Portable Hydrogen Water Generator
  - High-PSI bottle
- URL Link: **https://www.piurify.com/**

Method and Procedure

- Distilled water: 6.0 pH (verifies that unit can function with low water conductivity)
- ΔpH (delta pH): Did not increase
- Water Temperature: 65~70°F/ 18~21°C
- Bottle Vol Size: 0.5 L or 500 mL (16.91 oz)
- Cycle Time Frame:
  - 10-minutes
  - 20-minutes
  - 40-minutes
- Contamination Tests:
  - Chlorine generation (Cl2)
  - Ozone Generation (O3)
- Test Location: 277 meters (909 ft elevation)
- Test Methodology:
  - Electrochemical detection using Unisense H_2 Microsensor.
- All Dissolved H_2 Concentration Tests Converted to SATP (water temp and pressure)
- Claimed Dissolved H_2 mg/L: > 6.0 mg/L as stated on packaging

Test Results

To measure dissolved hydrogen gas concentration, the Piurify 17 oz Hydrogen Water Bottle was filled with 500 mL (16.91 oz) of distilled water to the base of the lid threads. The lid was then securely fastened, and the system was activated for the designated testing intervals using either the 10-minute cycle, the 20-minute cycle, or two consecutive 20-minute cycles for a total of 40 minutes of hydrogen generation. All measurements were conducted using the Unisense H_2 Microsensor paired with the UniAmp amplifier and calibrated to our laboratory conditions. Each test was repeated multiple times to ensure accuracy and reproducibility, and the resulting values were averaged to determine the bottle's overall performance. While the primary emphasis is placed on the mean dissolved hydrogen concentration, peak concentration values are also reported to provide a more complete evaluation of the bottle's hydrogen-generation capability.

H_2 Concentration at SATP:

- 10-mins avg mg/L (ppm): ≅ 4.70 mg/L (ppm)
- 20-mins avg mg/L (ppm): ≅ 7.20 mg/L (ppm)
- 40-mins avg mg/L (ppm): ≅ 9.20 mg/L (ppm)

Peak H_2 Concentration at SATP:

- 10-mins peak mg/L (ppm): ≅ 5.02 mg/L (ppm)
- 20-mins peak mg/L (ppm): ≅ 7.61 mg/L (ppm)
- 40-mins peak mg/L (ppm): ≅ 9.50 mg/L (ppm)

Avg H_2 mg Produced in Designated Vol:

- 10-mins: ≅ 2.35 mg (≡ 28.53 mL Dissolved)
- 20-mins: ≅ 3.60 mg (≡ 43.70 mL Dissolved)
- 40-mins: ≅ 4.60 mg (≡ 55.84 mL Dissolved)

- **Claimed H_2 mg/L (ppm) confirmed: Yes, the bottle exceeds the company's stated dissolved hydrogen performance claims.**

H_2HUBB Hydrogen Concentration Assessment

- According to our testing, the Piurify 17 oz Hydrogen Water Bottle consistently achieved dissolved molecular hydrogen concentrations ranging from 4.70 to 7.20 mg/L (ppm) during both the 10- and 20-minute generation cycles, with a peak concentration of 7.61 mg/L (ppm) measured using the Unisense H_2 Microsensor. The 40-minute cycle reached an impressive average of 9.20 mg/L, with peak values up to 9.50 mg/L across our testing. Based on the current human clinical literature, these concentrations are more than sufficient to provide therapeutic benefit. The device exceeds H_2HUBB's performance standards for both **H_2 Concentration and Daily Dose of H_2.** For practical everyday use, we recommend the 20-minute cycle as the optimal setting for preparing hydrogen-rich water with this bottle.

Contamination Test:

- Chlorine (Cl2): No detectable levels
- Ozone (O3): No detectable levels

Internal Performance

Manufacturer's Rated Electrical Values: (as stated on the power supply)

- **Type of device/electrolytic cell**
  - Pure H_2: PEM/SPE membrane
- **Applied volts:**
  - 3.7 volts
- **Total Amps:**
  - 2200 mAh (2.20 amps)
- **Total watts:**
  - 8.14 Wh (watts)

Product Assessment

Functionality:

- Power on/off button
  - Located on the H_2 generator.
  - Press the power button twice to initiate electrolysis for hydrogen gas production and initiate a 10-minute session, then shuts off.
  - Press the power button once more after activation to initiate a 20-minute session time then shuts off.
- USB-C charging port
  - Located on the backside of the device.
- Anode reservoir off-gas port
  - Pin-hole located on the bottom of the bottle.

Overall Opinion

The Piurify 17 oz Hydrogen Water Bottle is a premium high-pressure (High-PSI) hydrogen water generator. In H_2HUBB's evaluation, the 10- and 20-minute operation cycles produced average dissolved hydrogen concentrations ranging from 4.70 to 7.20 mg/L (ppm) in 500 mL (16.91 oz) of water, resulting in a total hydrogen milligram content of 2.35 to 3.60 mg, equivalent to 28.53 to 43.70 mL of H_2 gas at SATP. The device also achieved an impressive peak hydrogen concentration range of 5.02 to 7.61 mg/L, demonstrating its ability to exceed the 6.0 mg/L threshold even while operating with a larger water volume than most portable hydrogen water bottles. It is important to note that H_2HUBB references the maximum peak concentration observed during testing for documentation purposes only and not as a value that should be expected consistently by all consumers. For this reason, our reports place greater emphasis on the average dissolved hydrogen concentration derived from multiple replicate tests, as this provides a more reliable indicator of overall performance consistency. Dissolved hydrogen levels were measured using the Unisense H_2 Microsensor with UniAmp amplifier, a laboratory-grade electrochemical instrument capable of real-time detection with precision comparable to gas chromatography while minimizing the variability commonly seen with colorimetric (oxidimetry) methods.

Based on these results, the Piurify 17 oz bottle is capable of delivering one of the highest therapeutically relevant doses of molecular hydrogen from a hydrogen water bottle that we have tested to date. This is due not only to its high hydrogen concentration, but also to the volume of water the bottle holds. The milligram dose of molecular hydrogen delivered through water depends on both the hydrogen concentration, meaning how much hydrogen gas is dissolved, and the volume of water consumed. **This is why the unit mg/L is so important for hydrogen companies to use and why health-conscious hydrogen consumers should understand it.** To simplify this process for consumers, H_2HUBB provides an **H_2 dose calculator** on its website, allowing users to easily estimate the milligram dose of molecular hydrogen delivered by their water and better determine total daily H_2 intake. To determine the milligram dose of hydrogen from hydrogen water, one simply multiplies the hydrogen concentration by the water volume in liters:

H_2 concentration × volume = H_2 milligram dose

For example, with the Piurify 17 oz bottle, a 10-minute cycle producing 4.70 mg/L in 0.5 L of water provides:

4.70 mg/L × 0.5 L = 2.35 mg of H_2 ingested

This is something the majority of hydrogen water bottles currently cannot achieve. By drinking just one to two bottles per day using the 10- or 20-minute cycles, the user can ingest approximately 2.35 to 7.20 mg of molecular hydrogen per day while consuming only 0.5 to 1.0 liter of water (16.91 to 33.8 oz). That is an impressive level of hydrogen gas delivery and aligns exceptionally well with the current medical literature, where higher doses of molecular hydrogen administered through water are trending to outperform lower doses, with human studies using approximately 1 to 15 mg per day **[1][2][3].**

Thus, a single full 17 oz (500 mL) bottle produced on the 10- or 20-minute cycle provides approximately 3 to 5 times H_2HUBB's minimum daily effective dose standard of 0.8 mg of molecular hydrogen, a threshold that already exceeds the lower end of doses commonly reported in peer-reviewed hydrogen research. Consuming one to two bottles per day can further increase total daily hydrogen intake and may support a broader range of potential therapeutic effects based on the current body of evidence.

Dissolved hydrogen concentration (mg/L (ppm)) is a critical performance metric, as research suggests that 1-3 mg of H_2 or more per day appears to be therapeutic for humans. Furthermore, the **IHSA** standard for this type of product is a minimum of 0.5 mg/serving or 0.5 mg/L. H_2HUBB's performance standard for hydrogen water devices is slightly higher than IHSA, as we require the device to provide a concentration of 0.8 mg/L (ppm) and 0.8 mg/day consistently. The Piurify 17 oz Hydrogen Water Bottle offered by Piurify surpassed H_2HUBB standards for both **H_2 Concentration and Daily Dose of H_2**. Based on current research data, we believe the device's mg/L (ppm) performance provides more than adequate levels of hydrogen gas to induce therapeutic effects in humans. **According to our test results, the product will be able to easily provide 2-7 mg of H_2 per day**. We are pleased with the device's dissolved hydrogen concentration.

It should be noted that most hydrogen water bottles generally hold between 7 and 12 oz of water, and it is relatively rare to find bottles in the 16 to 20 oz range, let alone ones that can maintain strong hydrogen performance characteristics at that larger volume. In this respect, the Piurify 17 oz Hydrogen Water Bottle represents a significant advancement in the hydrogen water bottle category.

One of the more common complaints from hydrogen water bottle consumers, especially newcomers, is that the bottles are too small. There are several reasons why most bottles in this category have smaller capacities: it is easier to achieve higher hydrogen gas concentrations in a smaller volume of water within a short period of time, and smaller volumes are also easier for the user to drink quickly, which is important because dissolved hydrogen gas dissipates rapidly. H_2HUBB has stated many times throughout its educational materials that hydrogen water bottles in this industry are generally engineered to provide an adequate therapeutic dose of hydrogen per cycle or serving, not to function as all-day hydration devices. However, many consumers understandably assume these products are intended to serve both purposes. Since the term “hydrogen water bottle” emphasizes “water”, it is natural for consumers to associate the product with hydration as well.

As a result, many users become frustrated by the need to drink multiple bottles per day to meet their hydration goals, and for most hydrogen water bottles, that concern is valid. For this reason, there has been ongoing consumer demand for larger-capacity hydrogen water bottles that can better support both hydration and meaningful molecular hydrogen intake. The Piurify 17 oz Hydrogen Water Bottle is a major step in that direction, combining high dissolved hydrogen concentrations with a substantially larger water volume. If a user drinks four full bottles per day, that would equal approximately 2 liters of water and, based on the 20-minute cycle, more than 14 mg of molecular hydrogen per day. That level of intake is comparable to the upper range of doses used in human trials while administering approximately 0.5 to 2 liters of hydrogen water per day **[4][5]**.

This means the Piurify 17 oz bottle can realistically begin to occupy the role of both a hydration tool and a high-dose hydrogen delivery device, something that has been largely missing from the category for years. In fact, H_2HUBB was not particularly favorable toward hydrogen water bottles five years ago because their smaller volumes often resulted in lower overall hydrogen doses. However, the category has progressed, and the Piurify 17 oz bottle helps pave the way for larger-volume hydrogen water bottles that can better meet the long-standing demand for both hydration and therapeutically relevant hydrogen dosing.

Overall, the Piurify 17 oz Hydrogen Water Bottle is a well-designed system constructed from safe materials and capable of consistently producing exceptionally high, therapeutically relevant concentrations of dissolved hydrogen gas within its 500 mL capacity. The manufacturer’s safety claims were supported by our findings, and the device’s performance meets and, in several respects, exceeds H_2HUBB’s objective internal standards. No safety concerns were identified during testing, and the system effectively incorporates safeguards to help prevent the formation of undesirable byproducts such as chlorine or ozone in the drinking water. Based on our evaluation, the Piurify 17 oz Hydrogen Water Bottle represents a safe, high-performing, and reliable option for in-home hydrogen water therapy, offering consumers both practical usability and clinically meaningful hydrogen dosing.

Figure 1. 10-Minute Dissolved H_2 Time-Trace – Piurify 17 oz Hydrogen Water Bottle (Unisense H_2 Microsensor)

These plots display the real-time amperometric output from the Unisense H_2 Microsensor paired with the UniAmp amplifier during the 10-, 20-, and 40-minute hydrogen generation time traces of the Piurify 17 oz Hydrogen Water Bottle. The sensor signal, measured in picoamperes and converted to mg/L hydrogen, captures the dynamic dissolved H_2 concentration in the water in real time with a temporal resolution as fine as 0.02 seconds per data point. Data were recorded over the course of each testing period, typically during the first several minutes following bottle opening.

The traces illustrate both the dissolved hydrogen concentrations achieved by the bottle and the natural signal fluctuations that occur during the post-generation phase, as dissolved hydrogen begins to equilibrate and gradually outgas from the solution. Due to the very high hydrogen concentration and resulting microbubble formation, occasional signal spikes can be observed, which is a known artifact in highly supersaturated hydrogen solutions. To minimize this effect, H_2HUBB employed a controlled re-entry technique by removing and reimmersing the microsensor to dislodge surface bubbles, then averaging the top 15 stable readings to determine the final dissolved hydrogen value.

These high-resolution time-series data further demonstrate the Piurify 17 oz bottle's ability to generate and sustain exceptionally high dissolved hydrogen concentrations during the 10-, 20-, and 40-minute cycles within its 500 mL volume.

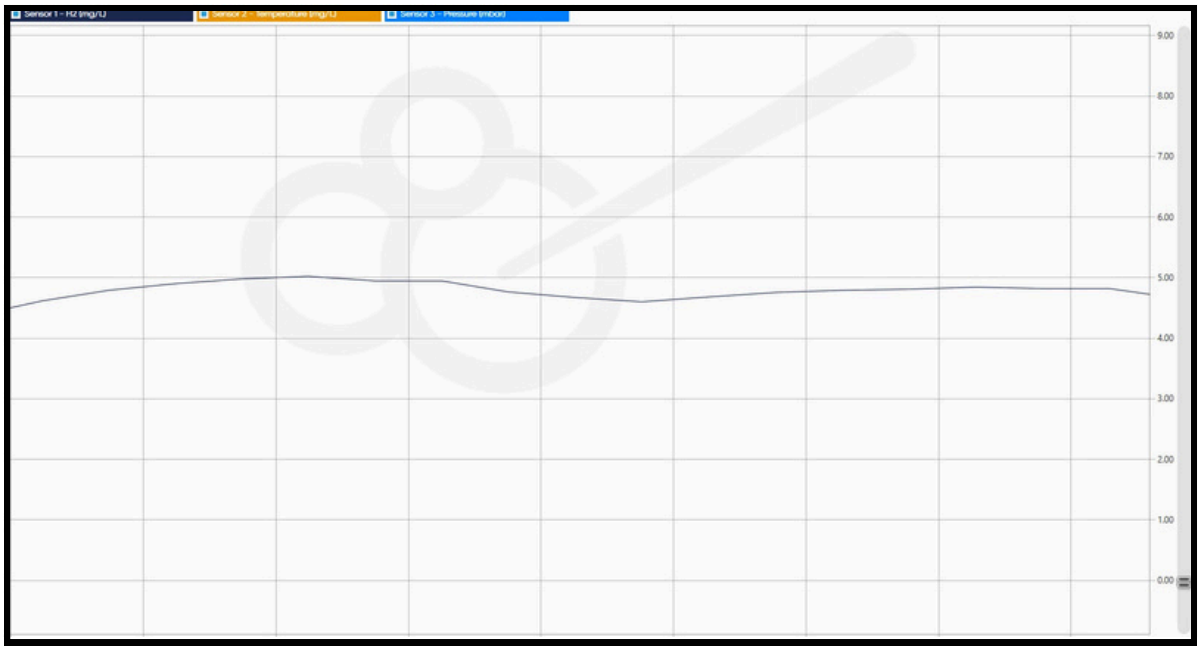
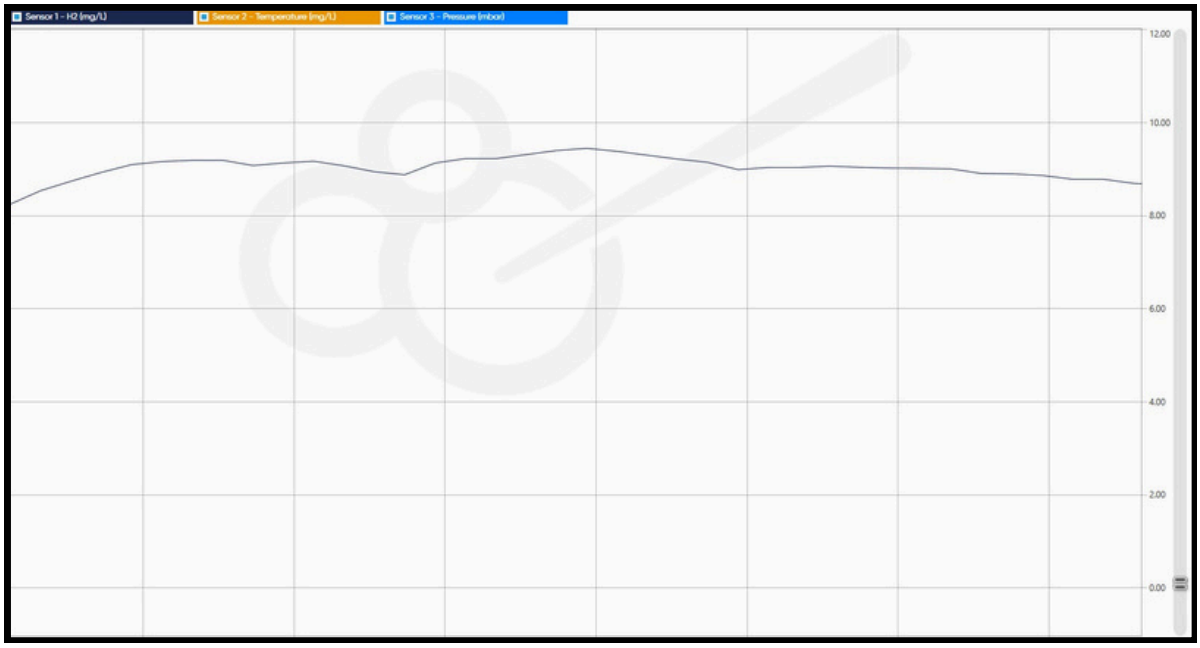


Figure 2. 20-Minute Dissolved H_2 Time-Trace – Piurify 17 oz Hydrogen Water Bottle (Unisense H_2 Microsensor)

Figure 3. 40-Minute Dissolved H_2 Time-Trace – Piurify 17 oz Hydrogen Water Bottle (Unisense H_2 Microsensor)



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Approved By: Tywon Hubbard

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