H_2HUBB TEST REPORT

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Evaluation Introduction

Our report summarizes H_2HUBB's analysis of the 12 oz Flask 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, +5000 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 Flask 12 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: 75.2~77°F/ 24~25°C
- Bottle Vol Size: 0.354 L or 354 mL (12.0 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: > 8.0 mg/L as stated on packaging

Test Results

To measure dissolved hydrogen gas concentration, the Piurify 12 oz Flask Hydrogen Water Bottle was filled with 354 mL (12 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): ≅ 5.10 mg/L (ppm)
- 20-mins avg mg/L (ppm): ≅ 8.30 mg/L (ppm)
- 40-mins avg mg/L (ppm): ≅ 9.42 mg/L (ppm)

Peak H_2 Concentration at SATP:

- 10-mins peak mg/L (ppm): ≅ 5.43 mg/L (ppm)
- 20-mins peak mg/L (ppm): ≅ 8.73 mg/L (ppm)
- 40-mins peak mg/L (ppm): ≅ 9.60 mg/L (ppm)

Avg H_2 mg Produced in Designated Vol:

- 10-mins: ≅ 1.81 mg (≡ 21.20 mL Dissolved)
- 20-mins: ≅ 2.94 mg (≡ 35.69 mL Dissolved)
- 40-mins: ≅ 3.34 mg (≡ 40.54 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 12 oz Flask Hydrogen Water Bottle consistently achieved dissolved molecular hydrogen concentrations ranging from 5.10 to 8.30 mg/L (ppm) during both the 10- and 20-minute generation cycles, with a peak concentration of 8.73 mg/L (ppm) measured using the Unisense H_2 Microsensor. The 40-minute cycle reached an impressive average of 9.42 mg/L, with peak values up to 9.60 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:**
  - 5000 mAh (5.0 amps)
- **Total watts:**
  - 18.50 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 Flask 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 5.10 to 8.30 mg/L (ppm) in 354 mL (12 oz) of water, resulting in a total hydrogen milligram content of 1.81 to 2.94 mg, equivalent to 21.20 to 35.69 mL of H_2 gas at SATP. The device also achieved an impressive peak hydrogen concentration range of 5.43 to 8.73 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 Flask produced the highest dissolved hydrogen concentration of any hydrogen water bottle H_2HUBB has tested to date. A single full 12 oz (354 mL) bottle produced on the 10- or 20-minute cycle provides approximately 2 to 4 times H_2HUBB's minimum daily effective dose standard of 0.8 mg of molecular hydrogen. This 0.8 mg threshold already exceeds the lower end of hydrogen doses commonly reported in peer-reviewed hydrogen research. Consuming one to three full bottles per day can provide a total daily hydrogen intake comparable to higher-dose ranges used in clinical hydrogen research 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 12 oz Flask 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 2-8 mg of H_2 per day**. We are pleased with the device's dissolved hydrogen concentration.

It should be noted that the Piurify Flask is a high-pressure hydrogen water system, operating above most hydrogen water bottles on the market. Because of this, its safety profile is especially important. Dissolving hydrogen gas in water above 8.0 mg/L requires pressures greater than 70 PSI. This means the bottle's design, operation, and pressure-release valve must be properly engineered to help ensure user safety. During H_2HUBB testing, which pushes bottles beyond normal consumer use conditions, we were satisfied with the Flask's engineering and overall safety profile. The bottle includes a reinforced electrolytic H_2 cell built for high-PSI operation, thicker plastic walls, and an automatic pressure-release valve in the lid. Despite reaching approximately 70–80 PSI during testing, the lid remained easy to open after each test. Overall, the safety profile of this high-pressure system appears to be properly engineered to support safe consumer use.

Overall, the Piurify Flask Hydrogen Water Bottle is a well-designed, high-performing system constructed from safe materials and capable of consistently producing exceptionally high, therapeutically relevant concentrations of dissolved hydrogen gas within its 12 oz capacity. The Flask also offers a more rugged look and feel compared to many hydrogen water bottles on the market. Its design provides a different aesthetic option for consumers, especially men or users who prefer a stronger, more durable, flask-style appearance rather than the more polished or wellness-oriented look common in this category. 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 undesirable byproducts such as chlorine or ozone from entering the drinking water. Based on our evaluation, the Piurify Flask 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 12 oz Flask 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 12 oz Flask 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 12 oz Flask bottle's ability to generate and sustain exceptionally high dissolved hydrogen concentrations during the 10-, 20-, and 40-minute cycles within its 354 mL volume.

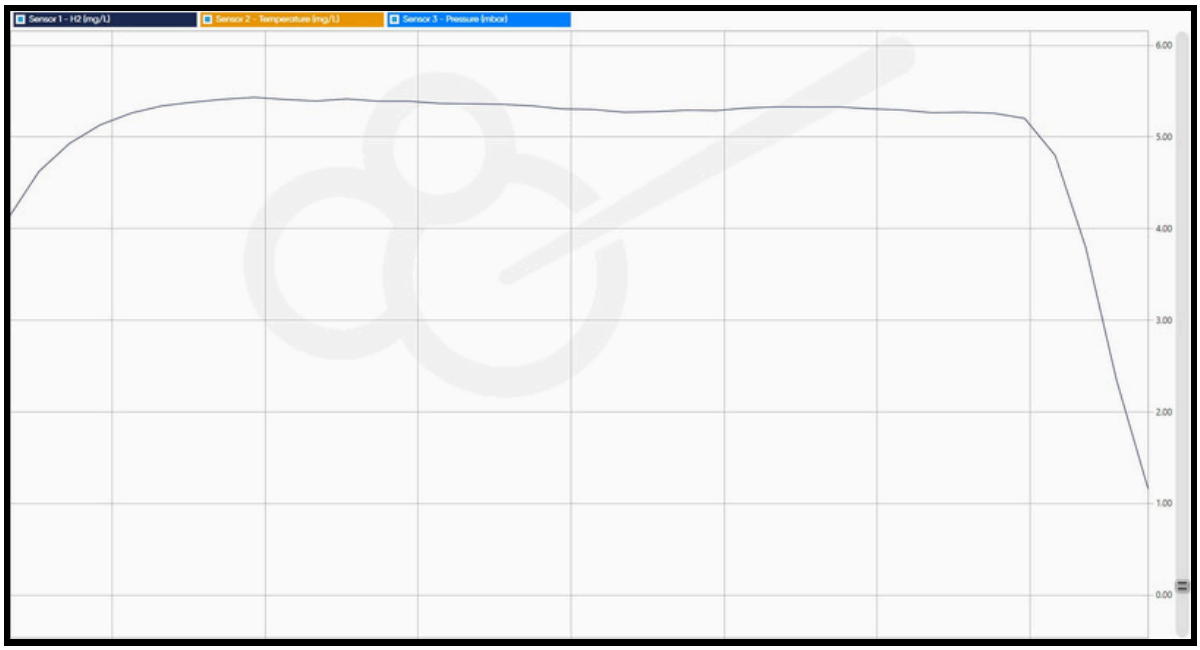
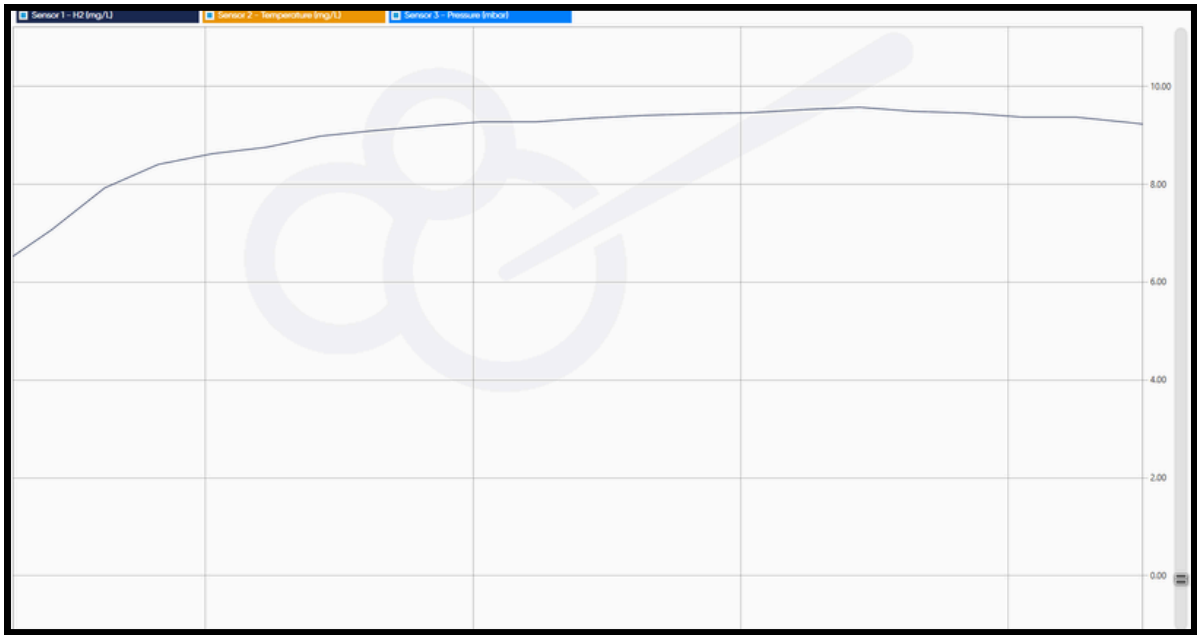


Figure 2. 20-Minute Dissolved H_2 Time-Trace – Piurify 12 oz Flask Hydrogen Water Bottle (Unisense H_2 Microsensor)

Figure 3. 40-Minute Dissolved H_2 Time-Trace – Piurify 12 oz Flask Hydrogen Water Bottle (Unisense H_2 Microsensor)



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Approved By: Tywon Hubbard

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