Overland Park KS
Tywon@H2HUBB.com
www.H2HUBB.com

Date: 1/31/2025

H2HUBB Official Test Report

Evaluation Introduction

Our report summarizes our analysis of the Hydrogen Water Bottle (Model: X5) offered by the company Yunshen Smart Tech (shenzhen) Co Ltd. H_2HUBB classifies this device as a high-pressure (psi) H_2 water portable system. The device features a PEM/SPE membrane to ensure H_2 gas production regardless of source water conductivity (TDS). Its session time-frame or cycle time-frames are 5 minutes and 10 minutes. We evaluated the system's dissolved hydrogen performance at 5 and 10 minutes. The unit contains a 3.7 V +1800 mAh battery, as stated by the battery specs. Our investigation was to analyze whether the product would meet our H_2 product performance standards, which must be achieved to be approved and recommended by H_2HUBB. To learn more about our H_2 performance standards for hydrogen water bottles, visit **H_2HUBB.**

H2 Products

- Company: Yunshen Smart Tech (shenzhen) Co Ltd
- Product Name: X5 Hydrogen Water Bottle
- Type: High-Concentration H_2 Water Device
  - PEM/SPE
  - Portable hydrogen water generator
  - High-PSI bottle
- Model: X5
- URL Link: **Yunshen Smart Tech (shenzhen) Co Ltd**

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: 0.230 L or 230 mL
- Cycle Time Frame:
  - 5-minutes
  - 10-minutes
- Contamination Tests:
  - Chlorine generation (Cl2)
  - Ozone Generation (O3)
- Test Location: 277 meters (909 ft elevation)
- Test Methodology:
  - Titration: H_2Blue® Test Reagent
- All Dissolved H_2 Concentration Tests Converted to SATP (water temp and pressure)
- Claimed Dissolved H_2 mg/L: 4.0-6.0 mg/L (post 5~10 minutes)

Test Results

To measure the dissolved hydrogen gas concentration of the bottle, we filled it with distilled water up to the base of the threads. The lid was then securely fastened, and the bottle was activated using either the 5-minute or 10-minute hydrogen generation setting. All measurements were conducted using the H_2Blue testing method. Multiple tests were performed to ensure accuracy, and the results were averaged to determine the bottle's performance. While our primary emphasis is on the average dissolved hydrogen concentration, peak concentration values are also included to provide a comprehensive analysis of the bottle's capabilities.

H_2 Concentration at SATP:

- 5-mins avg mg/L (ppm): ≅ 2.20 mg/L (ppm); SD: 0.10
- 10-mins avg mg/L (ppm): ≅ 5.34 mg/L (ppm); SD: 1.19

Peak H_2 Concentration at SATP:

- 5-mins peak mg/L (ppm): ≅ 2.30 mg/L (ppm)
- 10-mins peak mg/L (ppm): ≅ 6.71 mg/L (ppm)

Avg H_2 mg Produced in Designated Vol:

- 5-mins: ≅ 0.50 mg (≡ 6.07 mL Dissolved)
- 10-mins: ≅ 1.23 mg (≡ 14.93 mL Dissolved)

- **Claimed H_2 mg/L (ppm) confirmed:** Yes

H_2HUBB Hydrogen Concentration Assessment

- According to our testing, the X5 Hydrogen Water Bottle exhibits a dissolved molecular hydrogen concentration of 2.20 - 5.34 mg/L (ppm) throughout its cycle durations of 5 and 10 minutes. Based on current scientific literature in human studies, the dissolved hydrogen concentration on the 5-10 minute settings is deemed sufficient to induce therapeutic effects. The bottle surpasses our H_2HUBB standards for both **H_2 Concentration and Daily Dose of H_2**, and we recommend users utilize the 10-minute cycle time for consuming hydrogen water from the device.

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:**
  - 1800 mAh (1.80 amps)
- **Total watts:**
  - 6.66Wh (watts)

- **Electrolysis volts:**
  - 2.91 volts
- **Electrolysis amps:**
  - 0.55 amps
- **Total watts:**
  - 1.60 watts

H_2 Production vs. Dissolved Hydrogen:

- **Theoretical Max H_2 production:**
  - 4.19 mL/min or 0.34 mg/min
- **Theoretical Max Dissolved H_2 Level**
  - 5-mins: ≅ 7.50 mg/L (ppm)
  - 10-mins: ≅ 15.0 mg/L (ppm)
- **Measured Dissolved H_2 reading:**
  - 5-mins: ≅ 2.20 mg/L (ppm)
  - 10-mins: ≅ 5.34 mg/L (ppm)
- **Percentage of Max H_2 Dissolved (as measured):**
  - 5-mins: ≅ 29.36% dissolved
  - 10-mins: ≅ 35.56% dissolved
- **Percentage of Max H_2 Undissolved (loss):**
  - 5-mins: ≅ 70.64% undissolved
  - 10-mins: ≅ 64.44% undissolved

Product Assessment

Functionality:

- Power on/off button
  - Located on the H_2 generator.
  - Press the power button to initiate electrolysis for hydrogen gas production and initiate a 5-minute session, then shuts off.
  - Press the power button twice to initiate a 10-minute session time then shuts off.
- Magnetic USB charging port
  - Located on the backside of the device.
- Anode reservoir off-gas port
  - Pin-hole located on the bottom of the bottle.

Reliability:

- New: Yes
  - Initial test results and evaluation are currently on the report. (see Overall Opinion)

Cost:

- X5 Hydrogen Water Bottle: $299.00 USD
- H_2 Hubb discount: $30.00 USD
- H_2 Hubb recommendation cost: $270.00 USD

Overall Opinion

The X5 Hydrogen Water Bottle is a well-engineered and constructed portable hydrogen water generator. Our evaluation determined that, during a 10-minute operation cycle, the device produced approximately 5.34 mg/L (ppm) of dissolved H_2 in 230 mL of water, resulting in a total dissolved hydrogen content of 1.23 mg H_2 (equivalent to 14.93 mL of H_2 gas at SATP). This molecular hydrogen dose significantly surpasses the performance of substandard hydrogen water bottles, which typically produce only 0.1–0.3 mg per cycle, and falls well within the expected range for high-quality portable hydrogen water generators. Furthermore, the milligram dosage of H_2 per cycle surpasses H_2HUBB's daily hydrogen ingestion standard of 0.8 mg, meaning that a single bottle session at 10 minutes delivers a therapeutically relevant dose. Based on these findings, the X5 Hydrogen Water Bottle ranks among the highest-performing hydrogen water generators we have tested and currently recommend.

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 X5 Hydrogen Water Bottle offered by Yunshen Smart Tech(shenzhen) Co Ltd 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 adequate levels of hydrogen gas to induce therapeutic effects in humans. **According to our test results, the product ranks as a Level 4 hydrogen water device**. You can view the meaning of this rankings **here**. We are pleased with the device's dissolved hydrogen concentration.

During the evaluation of the X5 Hydrogen Water Bottle, we observed a progressive improvement in hydrogen concentration results, likely due to the break-in period of the PEM (Proton Exchange Membrane) technology. Our final test results, taking into account the highest readings, resulted in an average dissolved hydrogen concentration of 5.34 mg/L (ppm), with a peak concentration of 6.71 mg/L (ppm). The bottle consistently demonstrated the ability to achieve hydrogen concentrations ranging from 4.50 to 5.50 mg/L (ppm) during a 10-minute cycle, with peak levels exceeding 6.0 mg/L (ppm). The standard deviation of 1.19 mg/L represents a moderate degree of variability, which can be attributed to the gradual optimization of PEM performance over multiple test cycles. This trend aligns with known PEM behavior, where initial usage conditions may result in lower hydrogen production, improving over time as the membrane reaches its optimal efficiency. By incorporating both average and peak concentration values, this assessment provides a comprehensive representation of the bottle's hydrogen-generating capabilities. The results confirm that the X5 Hydrogen Water Bottle delivers a high concentration of dissolved hydrogen, placing it among the top-performing portable hydrogen water generators tested by H_2HUBB.

Since the X5 Hydrogen Water Bottle achieved a peak H_2 concentration of 6.71 mg/L (ppm) during its 10-minute cycle, it is classified as a Level 4 H_2 water device on our H_2HUBB ranking system. For clarity, our performance classification is based on the highest dissolved hydrogen concentration recorded during our testing period. This approach highlights the maximum capacity of the device, indicating the highest possible H_2 dose a person could receive from the product. However, this does not mean that every individual will consistently receive this exact dose, as real-world performance can vary due to user conditions, product performance, and environmental factors. To provide a more realistic expectation for consumers, we also report the average H_2 concentration achieved across multiple tests. This average value reflects what users are more likely to experience during regular use. In summary, while our performance levels are determined by peak H_2 concentrations, the H_2HUBB test average represents a more typical user experience. Therefore, while the X5 Hydrogen Water Bottle is capable of producing hydrogen concentrations exceeding 6 mg/L(ppm), users should not expect to reach this peak value consistently in every use. Peak concentrations occur under optimal conditions, which is why H_2HUBB aims to provide consumers with a well-rounded understanding of product performance, helping them make informed purchasing decisions.

Overall, the hydrogen water bottle is aesthetically appealing, engineered with high-quality materials, and effectively dissolves a therapeutic concentration of hydrogen gas into its 230 mL capacity. The validity of the manufacturer's claims regarding the bottle's hydrogen gas performance is not in question and the device's performance aligns closely with the product's marketing materials. We have no safety concerns with the system, as it appears to have implemented sufficient safety measures and effectively prevents the production of chlorine and ozone in the drinking water. We are generally pleased with the performance of the device. The X5 Hydrogen Water device performed above our minimum performance standards and, in the opinion of H_2HUBB, the system appears to be safe and suitable for in-home H_2 Water Therapy.

We desire to move forward with recommending the product to the public.

Approved By: Tywon Hubbard

Tywon Hubbard

CEO, H_2HUBB LLC

H2HUBB APPROVED

PRODUCT PASSED STANDARDS