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H₂ HUBB Official Test Report

Product:

Name: Spirit H₂ Essence V2

Company: Spirit H₂

Type: High-Concentration H₂ Water Device

- PEM/SPE
- Portable hydrogen water generator
- High-PSI bottle

Model: SH500

Tester: Tywon Hubbard (TH)

Testing start date: 2/7/24

Completion date: 2/27/24

PERFORMANCE:

H₂ mg/L Concentration Test:

- **METHODOLOGY:**
- Distilled water (6.0 pH, verifies that unit can function with low water conductivity)
- Water Temperature: 65~70F/ 18~21C
- Bottle Vol Size: 0.230 L or 230 mL
- Session Time Frame: 5-10 minutes
 - We only seek to confirm the 10-minute cycle
- Test Location: 277 meters (909 ft elevation)
- Test Methodology: Titration: H₂Blue Test Reagent
- All Dissolved H₂ Concentration Tests Converted to SATP (water temp and pressure)
- Claimed Dissolved H₂ mg/L: 1.0-3.0 mg/L (post 5~10 minutes)

H₂ mg/L (ppm) Concentration Test at SATP:

- **10-mins avg mg/L (ppm):** ≈ 5.0 mg/L (ppm)
- **Avg H₂ mg Produced in Designated Vol:**
 - **10-mins:** ≈ 1.15 mg
- **Total H₂ milligrams able to be ingested in 1 liter:**
 - **10-mins:** ≈ 5.0 mg
- **Claimed Mfgr's H₂ mg/L confirmed:** Yes

H₂ Analytics Hydrogen Concentration Laboratory Assessment

- H₂HUBB solely aimed to conduct a confirmation assessment of the product's hydrogen concentration, aligning with our policy outlined in the Recommendation Guidelines and Terms. This decision is based on the fact that Spirit H₂, the company, has already established the most accurate hydrogen concentration (mg/L) test results through H₂ Analytics, a US-based hydrogen laboratory. According to the H₂ Analytics Test report, the Essence V2 hydrogen water bottle achieved 2.73 mg/L (ppm) with its 5-minute cycle and 6.23 mg/L (ppm) with its 10-minute cycle. These results are outstanding for dissolved H₂ test results, among the highest we have observed in the market. We consistently aim to align our measurements within a 5-20% range of Gas Chromatography measurements conducted by H₂ Analytics, recognizing the inevitable presence of human error in our testing processes. The Essence V2 achieved an H₂ concentration of 5.0 mg/L, based on our testing. These results fall within our 5-20% confirmation range. The bottle, bottle exceeds our H₂HUBB standards for both mg/L and mg/day.

Contamination Test:

- Chlorine (Cl₂): No detectable levels
 - Ozone (O₃): No detectable levels
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INTERNAL BREAKDOWN AND PERFORMANCE:

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

- **Type of device/electrolytic cell**
 - Pure H₂: PEM/SPE membrane
 - **Applied volts:**
 - 3.7 volts
 - **Total Amps:**
 - 2200 mAh (2.2 amps)
 - **Total watts:**
 - 8.14 Wh (watts)
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PRODUCT ASSESSMENT:

Functionality:

- **Power on/off button**
 - Press the power button to initiate electrolysis for hydrogen gas production.
 - Press once to initiate a 5-minute session time then shuts off.
 - Press twice to initiate a 10-minute session time then shuts off.
- **Micro-USB Type C 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:

- **Spirit H₂ (Spirit H₂ Essence V2™):** \$239.00 USD
 - **H₂Hubb discount:** 10%
 - **H₂Hubb recommendation cost:** \$215.10 USD
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Overall Opinion:

The Spirit H₂ Essence V2 portable hydrogen water generator is a high-end, well-engineered portable hydrogen water unit. H₂HUBB classifies this device as a high mg/L H₂ water portable system. The device features a PEM/SPE membrane to ensure H₂ 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 10 minutes. The unit contains a 3.7 V +2200 mAh battery, as stated by the battery specs.

The unit generated 5.0 mg/L (ppm) of dissolved H₂ in 230 mL of water during the 10-min session time-frame. This converts to 1.15 mg of H₂ dissolved into the designated volume size. The total milligrams of H₂ gas dissolved by the bottle at 10 mins is exceptional for a portable H₂ water generator. Portable Hydrogen water generators are notorious for having low H₂ mg levels in their designated volumes. The 1.15 mg produced by the bottle per 10-minute session would deliver 5.0 mg of H₂ if one-liter water was ingested from the bottle (4.34 bottles). The hydrogen laboratory, H₂ Analytics, conducted testing on the bottle, revealing a dissolved hydrogen concentration of 6.23 mg/L (ppm), equivalent to 1.40 mg of H₂ dissolved within the specified volume. The test results from H₂ Analytics are notably more impressive than those from H₂HUBB, placing the hydrogen content in this bottle among the highest we have observed to date.

Dissolved hydrogen concentration (mg/L(ppm)) is a critical performance metric as research is suggesting that 1~3 mg of H₂/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. H₂HUBB's performance standard for hydrogen water devices is slightly higher than IHSA as we require the device to be able to provide a concentration of 0.8 mg/L (ppm) and 0.8 mg/day consistently. The Spirit H₂ Essence V2 device was able to surpass H₂HUBB mg/L and mg/day standard. We are pleased with the device's mg/L (ppm) measurement. As of now based on our analysis and the H₂ Analytics test report shared with us, the bottle can provide individuals with 1.15-1.40 mg of H₂ per bottle at its highest H₂ concentration.

One concern with high mg/L H₂ water portable systems is safety. These systems should have adequate pressure relief systems implemented into the device to manage the higher partial pressure (psi) generated by the system. The Spirit H₂ Essence V2 features a dual passive and manual pressure release cap. We thoroughly tested the cap's ability to release pressure. The cap is simple and efficient at acting as a dual passive and manual pressure release valve while maintaining adequate pressure (psi) for achieving high mg/L H₂ levels. The system passed our standards for safety and high psi. Overall the performance of the device met or surpassed our standards. We would like to move forward with recommending the unit to the general public via featuring it on our recommendation page

H₂ Hubb LLC disclaimer: All tests conducted and test results produced by H₂ Hubb LLC have been done according to industry-accepted practices and standards. Nevertheless, these results may not necessarily reflect test results performed by manufacturers, suppliers or third-party labs. Our test results are independent of all other parties, and testing by other parties may produce different results. We understand that many variables are involved in testing, some of which are extremely difficult to control. These reports are not meant or intended for any other purpose but to uphold H₂ Hubb LLC business practices and to validate the reasons for our recommendations.

Approved by: Tywon Hubbard

A handwritten signature in black ink, appearing to read 'THUBB', with a stylized flourish at the end.

Tywon Hubbard,
CEO, H₂ HUBB LLC.

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