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## H<sub>2</sub> HUBB Official Test Report

### Product:

**Name:** H<sub>2</sub>Life Brown's Gas therapy machine v4.0 (BG4)

**Model:** H<sub>2</sub>Life BG v4.0

**Company:** Hydrogen For Health

**Type:** Oxyhydrogen Inhalation Device (66%: H<sub>2</sub> / 33%: O<sub>2</sub>)

- Electrolytic Cell Type
  - No membrane

**Tester:** Tywon Hubbard (TH)

**Testing start date:** 8/29/22

**Completion date:** 9/2/22

### PERFORMANCE:

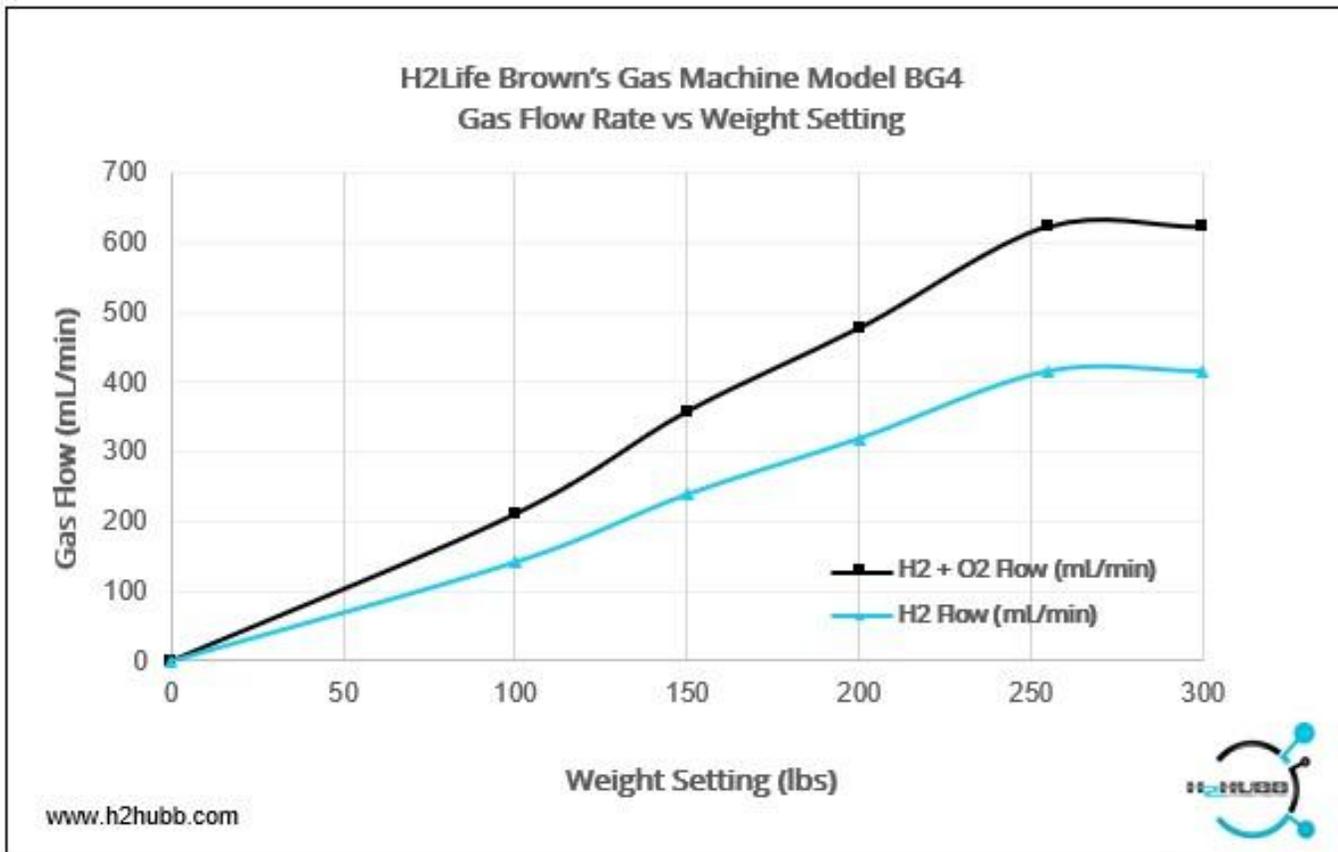
#### H<sub>2</sub> mL/min Confirmation Test:

- **METHODOLOGY:**
- Distilled water (used for testing): 5.55 pH
- Electrolysis Electrolyte: Sodium Hydroxide: NaOH  
5 g/1.3L (0.10 M/100 mmol or 0.38% solution)
- Water Temperature: 75~77F/ 23.8~25.0 C
- Electrolysis Reservoir Size: 1.3 Liters (1300 mL)
- Humidifier Reservoir Size: 0.6 Liter (600 mL)
- H<sub>2</sub> output: 100% Capacity: 396 mL/min or 32.64 mg/min (@ SATP)
- Test Location: 277 meters (909 ft elevation)
- H<sub>2</sub> Flow Test: mL/min, normal timing for a breathing session
  - Test methodology: Gas Displacement
  - All measurements converted to SATP
- Claimed Mfgr's H<sub>2</sub> mL/min (mg/min) confirmed: Yes
  - ≅ 415 mL/min or 34.21 mg/min (@ SATP)

#### H<sub>2</sub> Flow Test at SATP:

#### Graphing Data

Weight (lbs)	Hydroxy Flow (mL/min)	H2 Flow (mL/min)
0	0	0
100	210.93	141.39
150	358.01	238.43
200	477.99	318.34
255	623.13	415.01
300	623.13	415.01



#### INTERNAL BREAKDOWN AND PERFORMANCE:

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

- **Type of device/electrolytic cell**
  - Oxyhydrogen (H<sub>2</sub>/O<sub>2</sub>): No membrane
  - Series cell configuration
- **Applied volts:**
  - 24 volts
- **Total Amps:**
  - 6.5 amps
- **Total watts:**
  - 156 watts

#### PRODUCT ASSESSMENT:

Functionality:

- **Power Button/Digital-Touch Display Interface**
- **Power button**
  - Turns the system on.
- **Digital Touch Display**
  - **Start/Pause button**
  - Initiates electrolysis for hydrogen gas inhalation.
  - Initiates timing circuit (session time).
  - **Minutes +/-**
  - Sign (+): adds 30 mins to session time.
  - Sign (-): removes 10 mins from the session time.
  - **Weight**
  - Input body weight.
  - Dictates oxyhydrogen output flow rate.
  - The heavier the body weight the more oxyhydrogen is produced.
  - **Cell Temp**
  - Displays electrolytic cell temp.

- **Maintenance Timer**
- Displays a 200-hour countdown timer to alert the owner to maintain the device.
- **Reset button**
- Resets the 200-hour timer of the system after full maintenance.
- **Dim**
- Turns off the display panel and indication lights while the system is running.
- **Indicator lights**
  - Blue light: oxyhydrogen gas is being produced.
  - Red light: System in standby
- **Cell Reservoir**
  - Requires distilled water only (1.3 L reservoir)
  - Sodium hydroxide (NaOH) electrolyte is required for electrolysis.
  - Electrolyte has a molar concentration of 0.10M or a 0.38%.
    - 5g NaOH/1.3L of distilled water
  - Requires distilled water only (0.6 L reservoir)
- **Humidifier**
  - Acts as filtration to ensure H<sub>2</sub> gas purity by removing any residual sodium hydroxide vapor from the oxyhydrogen gas.
  - The humidifier may condition the gas to prevent nasal passage from becoming dry.

## **PRODUCT SAFETY:**

### **Safety Components:**

- The system has 7 key mechanisms for improving the safety of the device.
  - Maintenance notification
    - Notifies use to maintain the system every 200 hrs to ensure the safety of the user and the device.
  - High temp cell sensor
    - Prevents the cell from overheating.
  - Lower electrolyte concentration
    - Only requires a 0.38% solution of NaOH to operate properly.
  - Low-water protection
    - Prevents cell from excessive heat
    - Notifies user to add more water to the cell reservoir.
  - Humidifier Reservoir
    - Prevents sodium hydroxide vapor from being administered with the production gas.
  - Back-flow protection
    - Acts as a back-flow preventer
  - Internal Fan
    - Prevents excessive heat in the system
    - Prevents hydrogen gas build-up in case of leaks.

### **COST:**

- **H<sub>2</sub>Life Brown's Gas therapy machine v4.0 (BG4):** \$1,980.00 USD
- **H<sub>2</sub> Hubb discount:** \$100 USD off
- **H<sub>2</sub> Hubb recommendation cost:** \$1880.00 USD

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### **Overall Opinion:**

Hydrogen For Health H<sub>2</sub>Life Brown's Gas therapy machine v4.0 (BG4) is a well-engineered oxyhydrogen (H<sub>2</sub>/O<sub>2</sub>) inhalation device based on our testing. The unit is rated by the manufacturer to supply 600 mL/min of oxyhydrogen gas on the highest setting. That means the device theoretically should be able to supply 400 mL/min of H<sub>2</sub> as 66.67% of the oxyhydrogen gas is hydrogen gas. In addition the device should be able to supply 200 mL/min of O<sub>2</sub> as 33.33% of oxyhydrogen is oxygen gas. We were able to confirm the manufacturer's claims as the maximum applied voltage and the corresponding amperage are sufficient to achieve the claimed maximum performance capacity of the device, which is 600 mL/min of H<sub>2</sub>/O<sub>2</sub>. The device comes with a hydrogen water diffusion stone attachment, however, we decided not to include our H<sub>2</sub> mg/L concentration test results in the performance section of this report. We seek to confirm a conversion factor for the H<sub>2</sub> water reagent we use before publicizing our oxyhydrogen hydrogen-infused water test result. Based on our evaluation of the diffusion ability to dissolve H<sub>2</sub> in water, the device was able to saturate 1 liter of water with hydrogen gas up to its partial pressure being supplied, 66.67% H<sub>2</sub>. This means that, given adequate time for bubbling the water (e.g. 1L/20 mins), the H<sub>2</sub> concentration reached 1.0 mg/L at SATP based on our testing. It is our intent to recommend the device primarily for its inhalation function rather than for H<sub>2</sub> water.

Hydrogen gas output flow rate is a critical performance parameter for inhalation devices. H<sub>2</sub>HUBB's minimum standard for hydrogen generators or inhalation units (pure H<sub>2</sub>, mixed with air, etc.) is 120 mL/min of H<sub>2</sub> (120 mL/min  $\cong$  2% H<sub>2</sub> at resting breathing rates (4-6 L/min)). This is based on preliminary observations and/or studies demonstrating that a minimum of 1~1.3% (vol/vol) of H<sub>2</sub> may offer therapeutic potential. For these reasons, 120 mL/min of H<sub>2</sub> is our minimum standard for flagship hydrogen generators and the BG4 easily surpasses this standard.

The BG4 appears to utilize an electrolytic cell in a series configuration. We measured the total H<sub>2</sub> gas output from the device at  $\cong$  415.01 mL/min (34.21 mg/min) at SATP. That means we measured a total oxyhydrogen gas production value of 623.13 mL/min at SATP. These figures correlate well with the manufacturer's claims for the device. Based on our gas output measurements, we are pleased with the performance characteristics of the device.

Dissolved hydrogen concentration (mg/L(ppm)) is a critical performance metric as research is suggesting that 1~3 mg of H<sub>2</sub>/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<sub>2</sub>HUBB'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 device was able to surpass H<sub>2</sub>HUBB mg/L and mg/day standard. Therefore, we will mention to clients the device's ability to produce H<sub>2</sub> water in our H<sub>2</sub>HUBB Product Videos.

The validity of the manufacturer's claims are not in question and the device's performance agrees with the product's marketing materials. Overall we are generally pleased with the performance of the device. The BG4 device performed above our minimum performance standards and, in the opinion of H<sub>2</sub>HUBB, the system appears to be safe and suitable for in-home H<sub>2</sub> inhalation and H<sub>2</sub> water therapy. We desire to move forward with recommending the product to the public.

*H<sub>2</sub> Hubb LLC disclaimer: All tests conducted and test results produced by H<sub>2</sub> 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 H<sub>2</sub> Hubb LLC business practices and to validate the reasons for our recommendations.*

**Approved by: Tywon Hubbard**



Tywon Hubbard,  
CEO, H<sub>2</sub> HUBB LLC.

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