



Laboratory Report

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Introduction

This report summarizes the testing of two Echo Flask™ hydrogen water bottles manufactured by Echo Technologies, LLC, Spanish Fork, UT. The flasks were tested for dissolved hydrogen concentration on the 10- and 20-minute cycles. The flasks were received for testing on 6/17/25.

Product Description

Name: Echo Flask™ Brand: Echo Volume: 375 mL
Serial#: 008485005407154500031819 (labeled "no pressure"); 008485005407154500031816

Materials & Methods

Test water: Distilled (generic); temperature: 24.7°C ± 1.5°; ec: 6 us/cm; pH: 6.28

Laboratory elevation: 864 meters (0.91 atm); all measurements adjusted to SATP

Test Equipment: SRI 8610C gas chromatograph (GC), Torrance, CA; Column: Hayesep-D 6M; temp: 60°C; Detector: TCD; Carrier: N₂

Calibration Gas: Gasco, Cal Cas Direct, Inc., Oldsmar, FL; 2500 & 5000 ppm. Method: static headspace analysis

Before testing, the unit's internal batteries were charged overnight and the membrane was wetted using warm distilled water (60°C). On the day of testing, the GC was permitted to warm up for two hours and then calibrated. For each test, the bottle was connected to a power transformer via the USB-C cable, filled with distilled water, and the cap was securely tightened. After completion of the desired cycle test time (10 or 20 min), the manual pressure release was engaged, the cap was removed, and a 2000 µL sample was drawn from the bottle using a gas-tight syringe. The sample was injected into the headspace vial and placed into a centrifuge for three minutes to permit the dissolved H₂ to equilibrate with the headspace. After equilibration, a 1000 µL sample of the headspace was drawn using a gas-tight syringe and injected into the GC for analysis. Three tests were conducted for each cycle time, the results recorded, and the mean and standard deviations calculated. Based on the dissolved H₂ concentration and the water volume, the amount of H₂ that will be consumed when drinking the entire contents was calculated and reported as "Available H₂".

GC Test Results:

Cycle Time (min)	Mean H ₂ Conc (mg/L)	SD	Available H ₂ (mg)
"No Pressure" Flask			
10	5.85	0.20	2.19
20	9.00	0.35	3.37
Control Flask			
10	6.05	0.61	2.27
20	9.14	0.53	3.43



RSSharpe

Approved By: Randy Sharpe, Director of Testing

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