TRACE Analytics LLC

PASS

Certificate of Analysis

University of Hawaii at Manoa

is in compliance with the air/gas quality portion of the specification:

Oxygen Compatible Air-2003 (I)

as analyzed and reported on this certificate for the sample described under section "sample & report information"

ACCREDITED
CHEMICAL TESTING LABORATORY
CERTIFICATION
#0322.01

Analytical Test Methods:			Media Sampled:		Estimate of Uncertainty:
Gases & Vapors:	CAT-A-01	Gas Chromatography/Mass Spectrometry	Source Bottle:	786387	The average estimate of uncertainty at standard specification limits for 10 compounds normally reported is ±3.24%, at a 95% confidence interval (k=2). For more detailed uncertainty information, contact Trace Analytics, LLC.
Oil & Particulate:	CAT-A-03	Analytical Gravimetry	Ambient Bottle:	N/A	
Particle Size:	CAT-A-04	Optical Microscopy	Source Filter:	8311	
Pressure Dew Point:	CAT-A-07	Gas Detector Tube	Detector Tube:	Draeger 5-a/P	

Maria Sandoval, Laboratory Director

Results of Test: PASS

From:
Trace Analytics, LLC
15768 Hamilton Pool Road
Austin, Texas 78738

To:
University of Hawaii at Manoa
EHSO- Diving Safety Program
c/o Michael Pamatat
2040 East West Road
Honolulu, HI 96822

Analytes	Source Results (1)	Ambient Results	Specification Allowable Limits
Oxygen, Volume %	20.8	N/A	20-22
Nitrogen, Volume %	78.2	N/A	N/A
Argon, Volume %	1.0	N/A	N/A
Nitrogen Plus Argon, Volume %	79.2	N/A	N/A
Carbon Monoxide (CO), ppmv	<0.5	N/A	2
Carbon Dioxide (CO2), ppmv	171	N/A	1000
Water Content (H2O), ppmv/Dewpoint, °F (DT)	14 / -72	N/A	N/A / N/A (W)
TVHC (including CH4), ppmv	5.2	N/A	25
Methane (CH4) ppmv	<0.7	N/A	N/A
TVHC (excluding CH4), ppmv	5.2	N/A	N/A
Oil (condensed) & Particulate, mg/m3	<0.02	N/A	0.1
Odor (provided by customer)	None/Slight	N/A	None/Slight
Other	N/A	N/A	N/A
Other	N/A	N/A	N/A
Other	N/A	N/A	N/A

(1) Results apply to the sample as received from the customer. Information supplied by the customer can affect the validity of results.
(DT) Water content Pass/Fail was determined by water vapor detector tube analysis.
(I) This specification for oxygen compatible air is taken from ANSI/CGA G-7.1 Grade E as modified by International Association of Nitrox and Technical Divers (IANTD) in their document Blending Standards, 2003.
(W) Dew point is expressed in °F at one atmosphere pressure absolute.

Sample & Report Information

Sampled For	University of Hawaii at Manoa
Sampled By	Mike Pamatat
Sampled On	1/15/2021
Received On	1/27/2021
Analyzed On	2/1/2021
Sampled From	Compressor & Stored Air
Make	Hypress
Model	HP-6000-NA4-E3
Serial No.	1A070302
Cylinder(s)	Bank 1-7
Hours	966.4
Sample Phase	Routine
Customer Comments	
Report Number	21-02868
Customer ID	3267
Date Reported	2/1/2021
Frequency	Quarterly

Routine AirCheck™ Datasheet

TRACE Analytics LLC
15768 Hamilton Pool Road
Austin, Texas 78738
800-AIR-1024 or 512-263-0000 • Fax: 512-263-0002
E-mail: ServiceTeam@AirCheckLab.com

*IF RUSH REQUESTED, CALL WITH TRACKING NUMBER

DS-BA-01

1 Contact Information

IMPORTANT: FILL OUT COMPLETELY, CAREFULLY PRINT, AND RETURN A DATA SHEET WITH EACH SAMPLE SET.

Customer ID	3267	Customer Name	University of Hawaii at Manoa	Country	USA
Primary	Mr. Mike Pamatat	E-mail	uhdiveop@hawaii.edu	Phone	(808) 956-7179
Alternate	Mr. Dave Pence	E-mail	uhdiveop@hawaii.edu	Phone	(808) 956-6420

◯ Please fill in the circle to the left if you'd like the AirCheck√ Report sent to the person below (fill in information).

Additional _____ E-mail _____

2 Rush Analysis Request

RUSH REQUESTED, $125 extra, Initial Here ____

By initialing, I am authorizing Same Day* Analysis & Reporting for an addt'l $125 per sample. **CALL CUST. SERVICE @ EXT 3 TO SCHEDULE ~ Samples must arrive by 10:30 a.m.** Contact Us for Holiday Scheduling

3 Purchase Order Information (if applicable)

If a purchase order number is required by your company, please attach it to this data sheet and write the PO Number in the space provided here.

PO Number _____

4 System Information

⊘ Wrong ⊗ Wrong ◒ Wrong ● Correc

System ID: 106384

Sampled For: University of Hawaii at Manoa

Testing Schedule:
◯ 45 Days ◯ Monthly ◯ Startup
◯ 90 Days ◯ Other ◯ Verification
◯ 120 Days ◉ Quarterly ◯ Weekly
◯ Annual ◯ Random Sample
◯ Bimonthly ◯ Semi-Annual

Air Spec: Oxygen Compatible Air-2003 (I)

Make: Hypress

Model: HP-6000-NA4-E3

Serial No: 1A070302

Cylinder: Bank 1-7

Other ID: _____

Pressure:
◯ High Pressure (1,000-6,000 psi)
◯ Low Pressure (less than 1,000 psi)

Air used for:
◯ SCBA ◯ Airline Respirator
◉ SCUBA ◯ Other

Purification:
◉ Molecular Sieve/Desiccant ◯ No Purification
◯ Refrigerated Dryer ◯ Unknown
◯ No Dryer

Sampled From:
◯ Compressor ◯ Source ◯ Other
◯ Stored Air ◯ Outlet ◯ Not Provided
◯ Comp. & Storage ◯ Breather Box

Sample Phase: ◯ Before Filter Change ◯ After Filter Change ◯ Routine

Comp. Hours: _____

Lowest Temp: _____ ◯ °F ◯ °C

(Lowest temp, low pressure breathing air may be exposed to during the year)

5 Customer Comments (use back if needed)

6 Sampled By and Sample Date

I attest that all information provided on this datasheet is truthful and accurate to the best of my knowledge. Submittal of this air sample authorizes Trace Analytics, LLC to provide services

SIGNATURE _____ PRINT Name (Person taking the test sample) _____

Date Sample Taken _____ MONTH DAY YEAR

7 Sample Information

Is this sample a Retest taken within 30 days of a failed test? ◯ Yes ◯ No

A Source Bottle, Filter, and Data Sheet MUST BE RETURNED for a complete analysis.

Filter Number (red or green label) 6 or 7 digits: _____

Flowrate (liters per minute): _____

Sample Time (minimum of 10 min.): _____

Detector Tube (OMIT data if sampling media does not include Detector Tube)

Tube Reading (0 - 200): _____ DT Minutes Sampled: _____

Source Bottle Number (blue label) 6 or 7 digits: _____

Ambient Bottle Number (white label) 6 or 7 digits: _____

Odor is REQUIRED. MARK ONLY ONE. ◯ None ◯ Slight ◉ Noticeable ◯ Prominent ◯ Disagreeable

It's determined by sniffing the air from the side port of the Bottle Holder.

PLEASE NOTE - NO EXCEPTIONS

Sample Shelf Life: Once a sample is taken, it must be received by our laboratory within 60 days.

Component Media Shelf Life: Sampling media must be used or returned for free replacement within 2 years of shipment date. See expiration date on return box.

For TRACE Use Only

Receiving I.D. _____ Receiver's Initials _____

Sampling Notes for Water Vapor Detector Tube

1: Break BOTH tips of detector tube before inserting. Arrow on tube points away from Fitting. 50 LPM for 10 minutes.
2: The DT is filled with a chemical reagent that reacts to the presence of water by changing color from yellow to a grayish/reddish brown. (ignore gray color)

A minimum of 500 liters of air is required for sampling. If you are unable to achieve 50 LPM, adjust sampling time using the following formula:

$$\frac{500 \text{ LITERS}}{\text{FLOWRATE,}} = \text{SAMPLE TIME, MIN}$$

Detector Tube Results are based on a 10 minute sample at 50 LPM.

Sampling for longer or shorter time periods will provide different results than shown on chart. Identify the farthest reddish-brown color change in the tube (ignore gray coloration). Locate where the DT reading and Flowrate (LPM) intersect to determine approximate result in F*. If results do not meet your air specification limits, take corrective actions, and repeat sample. If both samples are returned at the same time, the 2nd sample will be at no charge. For troubleshooting tips, go to: https://rb.gy/gixijy

Flowrate Reading (LPM)	Det. Tube Reading, mg/m³ 2.5	5	10	20	30	40	50	60	70	80	90	100	125	175	200
60	–93	–84	–75	–66	–60	–56	–52	–49	–47	–45	–43	–42	–38	–33	–31
55	–92	–83	–74	–65	–58	–54	–51	–48	–45	–44	–42	–40	–36	–31	–29
50	–90	–81	–72	–62	–56	–52	–49	–46	–44	–42	–40	–38	–34	–29	–27
45	–88	–79	–70	–60	–54	–50	–47	–44	–41	–39	–38	–36	–32	–26	–24
40	–86	–77	–68	–58	–52	–47	–44	–41	–39	–36	–35	–33	–29	–23	–21

PASS	FAIL

Above area marked "Pass" is for high pressure air used for SCBA, with a -65°F limit per CGA Grade L/NFPA
Visit the AirCheck Academy for complete range of flow rates and further details.

If detector tube reading is higher than required, see the following checklist or visit the Aircheck Academy: Breathing Air. www.AirCheckLab.

Purification / Depressurized filters	High ambient air temperatures (above 70°F) affect the operating life of the cartridge. Chemicals used in purification filters begin to degrade as soon as they are installed. Is it time to change the filters?
Manual/auto drain or priority valve	If not working properly can be source for excess water and reduce filter life.
Remote fill or hose reel	Long lengths (>10 ft) of hose are notorious for accumulating and retaining water. A short 1-2 minute purge WILL NOT be sufficient. It is best to take the sample from a short fill hose (5-10 ft) or directly from containment fill station. - View our resource
Recent hydrostat	Bottles must be properly dried after hydrostat and should be immediately pressurized with dry air.
Valves left open	Ambient air can easily have 10,000 - 50,000 ppm of water. Purge sufficiently to remove water accumulated from ambient air.
Sample taken from storage	Take sample from compressor to identify if compressor is producing dry air. If yes, storage banks may contain excess water. Drain and refill with dry air. This may require 2-3 fills to drive off water from inside cylinders. You can request extra detector tubes.
Detector tube cracked	Only the tips of the tube should be broken. If a crack runs down the main body of the tube, results will not be dependable.
Tube fitting wet	If multiple samples are taken consecutively, excess water may pool inside the fitting. Dry fitting between uses.
Other	Keep in mind that 1 milliliter (which is about 20 drops from an eyedropper) in a 1.7 cubic ft cylinder at 4500 psig would be 90 ppm of water vapor. It doesn't take much to fail.

KIT UPGRADES AVAILABLE
We have redesigned our detector tube assembly and tip breaker for ease of use. Available for K901c, K901s, and K901n AirCheck Kits. Please contact our customer service team to order your upgrade today: (512) 263-0000 ext. 3.

Included in Kit Upgrade (U902):
- Brass adapter with wire mesh
- Detector tube holder
- Tip Breaker