

From:
Trace Analytics, LLC
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To:
Mr. Jim Wyatt
Cave Country Dive Shop
705 Northwest Santa Fe Blvd.
High Springs, FL 32643

TRACE ANALYTICS, LLC



ANALYSIS CERTIFICATE

Report 11-23927, Sampled on
10/5/2011

Next Sample Due Quarterly, Approximately
1/5/2012

CAVE COUNTRY DIVE SHOP

IS IN COMPLIANCE WITH THE AIR/GAS QUALITY PORTION OF THE SPECIFICATION:
OXYGEN COMPAT. AIR-2003(I) & CGA G-7.1-2004 GRADE E(2)

AS ANALYZED AND REPORTED ON THIS CERTIFICATE

FOR THE SAMPLE DESCRIBED UNDER SECTION "SAMPLE & REPORT INFORMATION"



American Assn for Laboratory Accreditation
1991: Certificate No. 322.01 Chemical Field of Testing

Richard A. Smith
Richard A. Smith, C.I.H., Laboratory Director

Analytical Test Methods	Media Sampled	Estimate of Uncertainty
Gases & Vapors CAT-A-01 Gas Chromatography/Mass Spectrometry	Source Bottle: 751351	The average analytical uncertainty (k=2) is 98.8±2.4% (relative) at the specification limit for the ten compounds normally reported. For uncertainty information for a specific compound, contact Trace.
Oil & Particulate CAT-A-03 Analytical Gravimetry	Ambient Bottle: 420071	
Particle Size CAT-A-04 Optical Microscopy	Source Filter: 128036	

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Sample & Report Information

Results of Test: **PASS**

Sampled For	Sampled By	Sampled On	Received On	Analyzed On	Analytes	Source Results	Ambient Results	Specification ¹ Allowable Limits
Cave Country Dive Shop	Jim Wyatt	10/5/2011	10/7/2011	10/7/2011	Oxygen, Volume %	21.0(Z)	20.9	20-22
					Nitrogen, Volume %	78.1	78.2	N/A
					Argon, Volume %	0.9	0.9	N/A
					Nitrogen Plus Argon, Volume %	79.0	N/A	N/A
					Carbon Monoxide (CO), ppmv	<0.3	<0.3	2
					Carbon Dioxide (CO ₂), ppmv	286	495	1000
Make:	Bauer				Water Content (H ₂ O), ppmv/Dewpoint, °F	<3.4 / <-91	N/A	N/A / N/A (W)
Model:	E3 K-15				Atmospheric Dew Point, °F (DT)	N/A	N/A	N/A
Serial No.:	5741				TVHC (including CH ₄), ppmv	1.7	2.0	25
Cylinder(s):	4				Methane (CH ₄) ppmv	1.7	2.0	N/A
Other ID:	84/2955/06/01				TVHC (excluding CH ₄), ppmv	<0.7	<0.7	N/A
					Oil (condensed) & Particulate, mg/m ³	<0.03	N/A	0.1
Customer Comments					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

PASS

(2) Water content is reported although not required by CGA G-7.1 for breathing air not used in conjunction with SCBA.
(1) 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.
(Z) Some Data Sheet information was not provided; we left blank on this report except: [1] If flow rate or sampling time blank, we entered 20 L/min for 10 min; [2] If odor information blank, we entered "None/Slight" or equivalent; [3] If date sampled blank, we entered a date of 5 days before the sample was received; [4] If spec blank, we chose one.

Report Number 11-23927
Customer ID 3943
Date Reported 10/10/2011
Frequency Quarterly
Next Sample Due Approx. **1/5/2012**



Trace Analytics, LLC

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Austin, Texas 78738
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E-mail: ServiceTeam@AirCheckLab.com

SOME INFORMATION BELOW IS PREPRINTED FROM YOUR PREVIOUS AIR TEST.

IF ANY OF THE INFORMATION HAS CHANGED OR IS INCORRECT, PLEASE MARK ONE LINE THROUGH IT AND CAREFULLY PRINT THE CORRECT INFORMATION.

1 Contact Information

Customer ID	3943	Customer Name	Cave Country Dive Shop	Country	USA
Contact	Mr. Jim Wyatt	E-mail	jim@cavediveflorida.com	Phone	(386) 454-1954
Alternate		E-mail		Phone	
				Fax	(386) 454-1954
				Fax	

Note: Fill in this section only if you are taking a sample for a third party.

Check box if you'd like report sent to the person below.

Contact		E-mail		Phone		Fax	
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2 Rush Analysis Request

IMPORTANT: PLEASE CALL 1-800-247-1024 (ext. 2) or 1-512-263-0000 (ext. 2) TO SCHEDULE

RUSH By marking this box, I understand that I am authorizing Same Day Analysis & Reporting for an additional \$100 per sample. Initial here:

3 Purchase Order Information (if applicable)

PO Number: PO Valid Thru:

4 System Information

System ID:	106785	Sampled For:	Cave Country Dive Shop	Testing Schedule	Quarterly
Air Spec	Oxygen Compat. Air-2003(I) & CGA G-7.1-2004 Grade E(2) for different, cross out and write in				
Make	Bauer	Model	E3 K-15	Serial No	5741
Cylinder	4	Other ID	84/2955/06/01		

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

Air used for SCBA SCUBA Airline Respirator Other

Purification Molecular Sieve/Desiccant Refrigerated Dryer No Dryer No Purification Unknown

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

Comp. Hours Lowest Temperature °F °C (Lowest temperature low pressure breathing air may be exposed to during the year)

NFPA 1989 Only Before Filter Change After Filter Change Routine

Next Due Approx: 1/5/2012

5 Customer Comments (use back if needed)

6 Sampled By and Sample Date

Submittal of this air sample authorizes Trace Analytics, LLC to provide services. If a purchase order number is required by your company, please attach it to this data sheet or write it in the spaces provided in section "3". I attest that all information provided on this datasheet is truthful and accurate to the best of my knowledge.

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

MONTH DAY YEAR

7 Sample Information

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

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

Filter Number <i>red or green label</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Source Bottle Number <i>blue label</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ambient Bottle Number <i>white label</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Flowrate
liters per minute

Sample Time
minimum of 10 min.

PLEASE NOTE:

Sample Shelf Life

Once a sample is taken, it must be received by our laboratory within 60 days. **NO EXCEPTIONS.**

Shelf Life

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

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

Tube Reading (0 - 200) Total Minutes Sampled



Odor is REQUIRED. It's determined by sniffing the air from the side port of the Bottle Holder. **MARK ONLY ONE.**

For Most Common Specs	For NFPA 1989 Specs	US Coast Guard & US Military Specs	For Chart Specs Only
<input type="radio"/> None/Slight <input type="radio"/> Pronounced	Pronounced <input type="radio"/> Yes <input type="radio"/> No	Objectionable <input type="radio"/> Yes <input type="radio"/> No	Discernible <input type="radio"/> Yes <input type="radio"/> No

For TRACE Use Only

DT Reading: Red / Gray 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 yellow filler material that reacts to the presence of water by changing color from yellow to a grayish/reddish brown. At any time during the 10 minute test if color change reaches 200 mark, remove tube and note elapsed time on data sheet.

Reading the Detector Tube for High Pressure Air Used for SCBA

The purpose of providing a detector tube for onsite testing is to allow you the opportunity to correct a problem without having to wait for the complete report. To determine if your sample passes; identify the farthest color change on the tube between 0 and 200; locate that number on chart below; identify the flowrate you took your sample on the left hand side of chart between 40 and 60; where the two readings intersect is the approximate result in °F. For example: If tube showed color change to 50, and flowrate was 50 LPM, the result would be -49°F. The number between 0 and 200 should be written on the data sheet not the dew point from the chart below.



Flowrate Reading	Det. Tube Reading, mg/m ³	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
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 D/NFPA 1989. See AirCheck Notebook Instructions for complete range of flowrates and further details.

If your detector tube reading indicates that you have a problem (anything outside of the PASS area in chart above); go through the following checklist; take corrective action; then retake your sample to see if the problem has been corrected. The 2nd test is free. Submit both samples for analysis to Trace's laboratory.

Troubleshooting Checklist

Purification filters/ 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 (>25 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 sample from a short fill hose (5-10 ft) or directly from containment fill station. - View our resource videos at www.AirCheckLab.com
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 (\$10 ea) to do several checks for water without doing a complete air sample.
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.