Intoxilyzer 9000 and the Disconnect Defense

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Intoxilyzer 9000
SPECIFICITY FOR ETHANOL

- Where the 5000 measured the carbon-hydrogen (C-H) bond vibrations in the 3 micron region of ethanol’s molecular fingerprint; the 9000 is measuring the carbon-oxygen (C-O) vibration in the 8-9 micron region.

GBI Intoxilyzer 9000 Operator Transition Training Manual 2014 Revision, pg. 5; GBI Evaluation of Breath Alcohol Testing Instruments to Replace the Intoxilyzer 5000, pg. 6, 39 and 77 (September 2012).
SPECIFICITY FOR ETHANOL
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- **PROBLEM:** Other organic molecules, which can potentially contaminate breath samples, also absorb IR radiation at 9 microns.
  - Other [alcohol](#), [esters](#), and [ethers](#) that contain both the methyl group and carbon-oxygen bonds in their molecular structures.

See Labianca, Dominick; Breath-alcohol analysis: a commentary on ethanol specificity in the 3 micron and 9 micron regions of the IR spectrum; Journal of Forensic Toxicology v. 24, pg. 92 (2006).
Dimethyl sulfoxide (DMSO)

- Dimethyl sulfoxide (DMSO) exhibits IR absorption in both the 3.4 and 9.4 micron regions.
- DMSO is a common solvent for organic compounds and is also used in the treatment of interstitial cystitis (aka painful bladder syndrome) and scleroderma, with rapid absorption occurring through the skin and mucous membranes. *Id.*
Dimethyl sulfoxide (DMSO)
dimetilsulfóxido

número de onda

transmitancia (%)
Diethyl Ether

- Diethyl Ether, has been found to produce false ethanol readings at 3.4 and 9.5 microns, the latter overlapping absorption at 9.4 microns.
- Widely used as a solvent for waxes, fats, oils, perfumes, alkaloids, and gums. *Id.*
- Exposure to ether vapor is highly problematic because of its high tissue solubility and its low partition ratio in humans.
Diethyl Ether

NIST Chemistry WebBook (http://webbook.nist.gov/chemistry)
DIETHYL ETHER
INFRARED SPECTRUM

Wavenumber (cm⁻¹)

TRANSMITTANCE

NIST Chemistry WebBook (http://webbook.nist.gov/chemistry)
Ethyl Formate, Methyl Butanoate, Propyl Acetate, and Pentyl Acetate are noteworthy because they are synthetic flavoring agents that allow many products, including ice cream, soft drinks, candy and other foods, to taste natural in flavor.
On the breath of individuals in a state of ketosis from untreated diabetes, prolonged fast, or a low-carb diet.

Acetone impairment may resemble alcohol intoxication.

The Intoxilyzer 9000 does not subtract the effect of acetone from the results. Texas recognizes the need to evaluate whether acetone testing will need to be a necessary part of official inspection in the future.

The Effect of Acetone on the Intoxilyzer 9000, PowerPoint presentation by Janeen Kubilus, Forensic Scientist, Breath Alcohol Laboratory, Law Enforcement Support-Crime Laboratory Service (432)386-0353, slide 6.
Lack of Specificity - Georgia

- GBI cited problems with the lack of sensitivity to compounds other than alcohol when evaluating the 9000.
  
  GBI Evaluation of Breath Alcohol Testing Instruments to Replace the Intoxilyzer 5000, pg. 65 (September 2012). Compounds that were analyzed by the 9000 for specificity included: acetone, acetaldehyde, methanol, 2-propanol, toluene, ethyl acetate, 2-butanone, 2-butanol, 1-propanol, acetonitrile, methylene chloride, and 2-methyl propanol. *Id.* at 93.

- 9000 actually scored the lowest of any competitor on the GBI survey to a list supplied by CMI to rate the specificity/selectivity for ethanol.
  
  GBI Evaluation of Breath Alcohol Testing Instruments to Replace the Intoxilyzer 5000, pg. 64 (September 2012).
Breath-alcohol analysis via IR at 3.4 and 9.4 microns is not entirely ethanol specific and any subject’s employment, medical or eating history can and should be ascertained through appropriate evaluation of the subjects and the compounds.

See Labianca, Dominick; Breath-alcohol analysis: a commentary on ethanol specificity in the 3 micron and 9 micron regions of the IR spectrum; Journal of Forensic Toxicology v. 24, pg. 94 (2006).
The 9000 produces a graphical representation of the breath flow, breath volume, blow duration and breath alcohol concentration for every subject test.
Was the breath flow continual or spiked?
Did the breath sample achieve sufficient slope to be considered a valid test?
Was the slope indicative of mouth alcohol?
Was the exhalation time sufficient to create a level slope?
Likewise, the histogram would reveal what the breath alcohol concentration was at any given point during the exhalation.
**Intoxilyzer 9000 Residential Breath Alcohol Test (BAT) Test Report**

**Subject Name:** BAILEY, CLAUDIA B  
**DOB:** 01/01/2001  
**Sex:** Female  
**Driver License:** 00049151  
**State:** CO  
**Zip Code:** 80112

**Location:** AURORA  
**Serial Number:** 90-0000417  
**Test Number:** 0417130059  
**Case Number:** 13-20030  
**Date & Time of Offense:** 05/30/2013 01:26

**Intoxilyzer Operator:** CRILSON, JASON P  
**Last Certification Date:** 05/19/2013  
**Agency:** AURORA POLICE DEPARTMENT  
**Arresting Officer:** CRILSON, JASON P  
**Agency:** AURORA POLICE DEPARTMENT  
**Crash:** No  
**Injury:** No

**20-minute deprivation period**

<table>
<thead>
<tr>
<th>Event</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>02:12</td>
<td>02:12</td>
</tr>
</tbody>
</table>

**(a)** The 20-minute deprivation period has been conducted at the certified BAT facility by a certified BAT Instructor or operator that is in an active status.

**(b)** The subject has removed any foreign material from the mouth cavity that is not permanent in nature, prior to starting the 20-minute deprivation period.

**(c)** The subject has been deprived access to foreign material that may be introduced into the mouth cavity during the 20-minute deprivation period.

**EBAT Test Sequence**

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Blank</td>
<td>02:32:57</td>
</tr>
<tr>
<td>Sim Temp</td>
<td>02:33:24</td>
</tr>
<tr>
<td>Wet Cal Chk</td>
<td>02:34:36</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:34:36</td>
</tr>
<tr>
<td>Subject Sample</td>
<td>02:35:30</td>
</tr>
<tr>
<td>Breath Volume</td>
<td>1.67 Ls</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:35:30</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Passed</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:36:10</td>
</tr>
<tr>
<td>Wait</td>
<td>02:38:13</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:38:50</td>
</tr>
<tr>
<td>Subject Sample</td>
<td>02:39:12</td>
</tr>
<tr>
<td>Breath Volume</td>
<td>1.6 Ls</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:40:03</td>
</tr>
<tr>
<td>Sim Temp</td>
<td>02:40:30</td>
</tr>
<tr>
<td>Wet Cal Chk</td>
<td>02:40:30</td>
</tr>
<tr>
<td>Air Blank</td>
<td>02:41:10</td>
</tr>
</tbody>
</table>

**Final Result:** 0.097 g/210L

**COMMENTS:**

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I am currently certified as an EBAT operator and attest that this Evidential Breath Alcohol Test (EBAT) has been performed in compliance (SCPR 1055-2) following the procedures set forth by the CDPHE.

I authenticate the information provided on this report is produced by the certified EBAT instrument used to perform this test.

[Signature]

05/30/2013

Certified EBAT Operator or Engineer Signature: [Signature]  
Date: 05/30/2013
Georgia Model Intoxilyzer 9700

Instrument Info
Inst Serial #: 90-00502  Software Version: 5406.05.00  Agency: DUNVILLE
Target Value: 0.000  Lot #: 2191300602  POLICE

Subject Info
Subject Name: DUNVILLE, THOMAS  C  DOB: 12/20/1967  DL: 364236488

TestID#: D522140107  Date: 10/12/2014

Additional Comments
Measured BAC (g/210L) 0.165 (+/- 0.008)
Condition: Reason for Test: DUI

Operator Info
Operator Name: WIN, CHARLES  Permit #: 9122832
Arresting Officer: BALDWIN, ROBERT  Expiration Date: 09/25/2017
Arresting Agency: DUNVILLE PD  Violation Date: 10/12/2014  Violation Time: 00:09
Case #: 3014106

Result Details

<table>
<thead>
<tr>
<th>Test</th>
<th>g/210L</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>00:07:22</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Passed</td>
<td>00:07:57</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>00:10:36</td>
</tr>
<tr>
<td>Subject Sample</td>
<td>0.175</td>
<td>00:59:06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breath Volume</th>
<th>1.45 Liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Blank</td>
<td>0.000 00:59:59</td>
</tr>
<tr>
<td>Dry Cal Chk</td>
<td>0.085 01:00:20</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000 01:01:00</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Passed 01:02:38</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000 01:03:15</td>
</tr>
<tr>
<td>Subject Sample</td>
<td>0.167 01:03:38</td>
</tr>
<tr>
<td>Breath Volume</td>
<td>1.61 Liters</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000 01:04:31</td>
</tr>
</tbody>
</table>

Date of Last Calibration Adjustment: 08/22/2013
Date of Last Inspection: 07/25/2014
CMI Calibration Laboratory is a ISO 17025 accredited calibration laboratory for breath alcohol measuring instruments.
Printed On: 10/21/2014 09:03
**TEXAS FORENSIC BREATH ALCOHOL ANALYTICAL REPORT**

**Report Number:** 0938000119  
**Analytical Instrument:** Intoxilyzer 9000  
**Serial Number:** 90-0000938  
**Date:** 07/31/2014  
**Location:** LAB  
**Technical Supervisor Area:** 099

**Subject Name:** SHELTON, DANIEL A II  
**Date of Birth:** 09/23/1968

<table>
<thead>
<tr>
<th>Sequence of Analysis</th>
<th>Result</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational System Check</td>
<td>OK</td>
<td>12:15:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>12:15:04 PDT</td>
</tr>
<tr>
<td>Calibration Verification</td>
<td>0.077</td>
<td>12:15:04 PDT</td>
</tr>
<tr>
<td>Solution Temp.</td>
<td>34.00°C</td>
<td>12:15:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>13:00:04 PDT</td>
</tr>
<tr>
<td>SUBJECT RESULT 1</td>
<td>0.000</td>
<td>13:01:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>13:03:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>13:04:04 PDT</td>
</tr>
<tr>
<td>SUBJECT RESULT 2</td>
<td>0.000</td>
<td>13:04:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.075</td>
<td>13:04:04 PDT</td>
</tr>
<tr>
<td>Calibration Verification</td>
<td>0.000</td>
<td>13:05:04 PDT</td>
</tr>
<tr>
<td>Solution Temp.</td>
<td>34.02°C</td>
<td>13:05:04 PDT</td>
</tr>
<tr>
<td>Air Blank</td>
<td>0.000</td>
<td>13:05:04 PDT</td>
</tr>
<tr>
<td>Operational System Check</td>
<td>OK</td>
<td>13:05:04 PDT</td>
</tr>
</tbody>
</table>

**Test Complete:** 07/31/2014

**Operator Signature:**

**Fifteen minute waiting period completed - YES**

**Operator Name:** [Redacted]

**Certificate Number:** [Redacted]
OTHER OMISSIONS

- the observation period start time;
- observation period ended;
- last instrument calibration date;
- whether the observation period was conducted by a certified Breath Test Operator (BTO);
- last BTO certification date;
- the BTO had the subject remove any foreign material from the mouth cavity;
- the subject was deprived access to foreign material during the observation period;
- the subject did not belch, regurgitate, or intake any foreign material into the mouth during the observation period; and
- the uncertainty measurement for the result.
FOUR FILTERS/ NO ZERO

- **5000**: tungsten filament light source that provided continuous IR and visible radiation to a 5 filter chopper/filter wheel which rotated in front of the detector.
  - had a blank or a zero filter in the wheel

- **9000**: grey body infrared light that pulses the energy through the sample chamber to a stationary detector that contains four filters, each for a specific wavelength of IR radiation.
  - does not have a detector for a true zero.

Instead, 9000 assumes or is programmed to read zero if the filters do not detect other samples besides alcohol.

Additionally, 9000 “masks” all results less than 0.007 and instead reports it as 0.000. GBI Intoxilyzer 9000 Operator Transition Training Manual 2014 Revision, pg. 5-6.
20 minute v. 15 minute Observation Period

○ “An Operator shall remain in the continuous presence of the subject at least 15 minutes immediately before the test and should exercise reasonable care to ensure that the subject does not place any substances in the mouth.”

See An Overview of the Training and Implementation of the Intoxilyzer 9000, pg. 3 and 6; emailed from Larry Smith, Regional Manager North Texas BAL to Kristina Aguirre on July 14, 2014.

○ “clearly the ‘best practice’ is for the Waiting Period to be conducted entirely at the testing site.”
CMI Warranty – 1 year

- original purchaser
- does not include abuse, misuse, cables, switches, or use of the product for other than its intended purpose.
- does not apply if the product is in any way tampered with or modified without express written permission from CMI, Inc.
- extension of the warranty for one year for $125.
COBRA V5 software to the 9000 without a protective order and non-disclosure agreement.
  › Viewing of the source code must be done at CMI and may not be sent outside for independent analysis.

Won’t sell to private citizens.

No ToxTrap

2 breath tests must be within 0.02 of each other.

Dry Gas Simulator, but Texas chose wet bath compatible option.
  › As with any preparation of a simulator solution, human error is always a factor.
NEW 9000 PROBLEMS

- Optical Bench and radio frequency detection circuit?
- New Software Bugs
- Sample Chamber: 6 in (5000) v. 10 in. (9000)
- Valve of Least Resistance
The DISCONNECT Defense

- High Breath Test (0.15 and higher)
  +
- Good Video Performance
  =
- Indisputable Conflict
  › Alleged breath test science
  › Common sense theme of believing what you see.
  › e.g. a DISCONNECT
THE RIGHT CASE

- **Reasonable Suspicion**
  - Speeding, Lights, Signals
  - Weaving – texting, radio, BJ
  - Accidents/ Not Deliberates

- **Probable Cause**
  - Medical records
  - Height and Weight Chart
  - Heels or boots

- **Video**
“The case is won or lost in voir dire.”

Recognize Your Best Jurors
- Connecting with? Laughing with you? Eye contact?

Scientists (engineers, mechanics, machinists, NASA, IT guys)
- GOOD: they’ve never used a machine that worked perfect every time
- BAD: they know the difference between a machine and an instrument
- EFFECT: keep the engineer, IT guy and NASA off your jury. Strike for cause??

HYPOTHETICAL
- Taxalyzer 5000EN, Thermometer, Doppler 5000
- Serious Consequences: jail, brain surgery, natural disaster
- Relate if to the Intoxilyzer:
  - 20% acceptable range of error; self checking for accuracy; newer model; current model not produced anymore; citizen cannot purchase; source code; not available for independent testing; destroys evidence; operator just pushes buttons; “scientist” rarely checks in person; any inconsistencies in data; no warranty; SPECIFICITY
- How does that make you feel?
Reasonable Suspicion and Probable Cause
Start Weaving the Disconnect Thread
Driving Issues
Know the NHTSA Manual Better than Joe
Mental and Physical Faculties
- Innocent reasons for odor, eyes, speech; compromised every SFST; coherent
- Must lose mental before physical (BTO Manual pg. 44)
- Neutralize M&P Faculties; Make it rely on the BT score

Did not urinate or ask to use the restroom!
- 0.235 equals 12 beers (144 oz) in the system.
BREATH TEST OPERATOR

- **Limited Exposure With Defendant**
  - notes? (Hearsay 803(8)(b))
  - No opinion of loss of mental or physical faculties

- **Knowledge of the Machine**
  - Henry’s Law; Infrared Spectroscopy; simulator solution; checking and maintaining machine
  - Simply pushes buttons
  - Machine tells him if working properly (self checking)

- **Temperature of the Machine (34°C ± 0.2)**
  - Temp that night? Required to be? Standard deviation?
  - Mistake can compromise the results (ask TS)
  - Write in large letters on a board

- **15 Minute Observation Period**
  - Video to see if burped or belched
  - What does your TS consider “in the presence”
    - Line of sight; single or multiple officers; within hearing range
    - Establish a conflict with the timing and TS will admit this could compromise the test. (BTO Manual pg. 49; Tex. Admin. Code 19.3(a) and (c)(1)).
  - Article 38.23 of Texas Code of Criminal Procedure

- **Did Not Use the Restroom!**
“Expert,” But Speak in Lay Terms
- working knowledge of breath testing science, the Intoxilyzer, and possession of multiple authoritative studies in the field of breath testing
- Dr. Kurt M. Dubowski, Dr. A.W. Jones, and Professor Dr. E.M.P. Widmark

Articles/ Learned Treatises 803(18)

Tables
- Dubowski’s table of the Stages of Acute Alcoholic Influence/Intoxication
- Stages of Alcoholic Influence – Dubowski
- Elated Disorders: Alcohol, Nicotine and Caffeine
- Specific Effects of Alcohol Related to BAC
**Get Your Chops In and Get Out**

- 20%, self checking; recalled in states; newer model (8000); current model not produced anymore; citizen cannot purchase; source code; not available for independent testing; Toxitrap; check in person once a month; no warranty; any inconsistencies in data

**Retrograde Extrapolation**
- Only if you can explain it to a 5th grader and are in absorptive stage.

**Tolerance**
- The only explanation for the State.
- Binder of articles
- Don’t know anything about Defendant or family
- Metabolic, cellular, behavioral, initial, acute, acquired, cross,
- Agree that a person has to practice these tests while intoxicated…

**Video**
- Did you even watch the video?
- Your determination is purely on the number and not if it matches the table?
DEFENSE EXPERT

- If the Client Can Afford It, Hire It
  - See Bubba’s List
  - Research the expert’s credentials and previous testimony
  - Make your expert familiar with your authoritative research
  - Let the expert meet with Defendant and his family
    - Counsel Defendant and family before this meeting
NAILS IN THE COFFIN

- Systematically weaved reasonable doubt through every aspect of intoxication
- Indisputable Conflict = Reasonable Doubt
  - Innocent Man, Insufficient Evidence, Indisputable Conflict
- Use Demonstrations
  - Green, Green, Red
  - Hypothetical Machine
  - Pictures with ridiculous stats
- DISCONNECT: good video, no loss of mental or physical faculties, never urinated, all about the ridiculously high number, either the machine defies science or there is a problem
- Constitutional Duty to Find Defendant NOT GUILTY