

Chemical Tests for Intoxication

Training Course for Breath Test Operator Certification

**Indiana State Department of Toxicology
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**Chemical Tests for Intoxication
Training Course for Breath Test Operator Certification**

Schedule

0800 – 0815 ILEA Welcome / Orientation

0815 – 0830 Dept. of Toxicology / Indiana Administrative Code (IAC) 260

0830 – 0925 Pharmacology and Toxicology of Alcohol / Evidence Submission

0925 – 0935 Break

0935 – 1030 Legal Aspects of Breath Testing for Ethanol / Recent Case Law

1030 – 1145 Instrumentation and Approved Method for Breath Test Analysis

1145 – 1300 LUNCH

1300 – 1700 Laboratory Exercises / Evaluations / Written Examination / Final Laboratory Exercise

Breaks will be provided between blocks of instruction as time permits.

**Chemical Tests for Intoxication
Training Course for Breath Test Operator Certification**

Course Schedule

(See Course Schedule – page 3)

Requirements:

Must be present for entire course

Must obey ILEA Rules

Course Staff:

Inspectors

Tom Pierce
Lou Brown
Dwight Holbrook

Breath Test Program Supervisor

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General Counsel

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Indiana Administrative Code Title 260

Objective:

To provide the training required under 260 IAC 2-2-2 for breath test operator certification.

Duties of the Department:

IC 10-20-2 (enacted 2011)

- Conduct analyses for poisons, drugs, and alcohols upon human tissues and fluids
- Report analytical findings of the department
- Consult with Indiana coroners regarding interpretation of analytical findings
- Furnish expert testimony
- Provide instruction in toxicology to law enforcement officers
- Certify law enforcement officers as required by law for administration of breath chemical tests
- Provide instruction and technical assistance to prosecutors and defense counsel regarding ISDT lab results
- Provide instruction to judges on toxicology and alcohol and drug testing

IAC 260

A complete copy of Title 260 is available at:

http://www.in.gov/legislative/iac/iac_title?iact=260

See Article 2 of Title 260 for current provisions.

IAC Title 260 regulates:

Selection, training, certification, and recertification of breath test operators

Selection, inspection, and certification of breath test instruments and chemicals

Approved methods for administering breath alcohol tests

Reference: IC 9-30-6-5

260 IAC 2-2-1 Selection of breath test operators

Must be employed by a law enforcement agency

“Law enforcement agency” means an agency or department with authority to apprehend criminal offenders

260 IAC 2-2-2 Training of breath test operators

Required training:

- Pharmacology and toxicology of ethanol
- Legal aspects of breath testing for ethanol
- Theory, operation, and care of breath test equipment
- Use of breath test instrument using known ethanol-water or ethanol-gas standards

260 IAC 2-2-3 Recertification of breath test operators

- Must be recertified at least every two years from month of certification or recertification. **Your operator card expires on the last day of the month.**
- Must demonstrate competence by passing an examination approved by ISDT
- A person who fails the recertification exam may be given a second exam if previous certification has not been expired for more than 30 days
 - **During time between first and second exams, person is not certified**
- Director may suspend or revoke certification at any time

260 IAC 2-2-4 Authorization of certified breath test operators

- Administer breath tests
- Make replacements and adjustments to breath test instruments not related to calibration

260 IAC 2-3-1 Selection of breath test equipment

The department shall select breath test equipment for use for evidentiary breath testing to ensure the accurate analysis of breath specimens for the determination of breath ethanol concentrations.

- Equipment selected by the department must analyze breath samples and report a numerical value expressed as grams of ethanol per two hundred ten (210) liters of breath.

260 IAC 2-3-2 Inspection of breath test instruments

- ISDT must inspect each instrument at least every 180 days
- If the location of the instrument is changed, the instrument must be inspected and certified prior to use
 - Moving an instrument past the length of its electrical cord is a location change

- Intox EC/IR II shall not deviate more than 5% or 0.005, whichever is greater, from the certified value of the ethanol-water standard or the value adjusted for ambient barometric pressure of the certified ethanol-gas standard

***Permitted deviation is plus or minus 5% or 0.005, whichever is greater.

Example: If the target value (“dry gas target”) is 0.077, the instrument reading of the ethanol content of the dry gas must fall within the range of 0.072 to 0.082.

Indiana Code

- ISDT publishes certifications of breath test operators and instruments on its website.
- IC 9-30-6-5(b): Failure to publish a certificate does not invalidate any test.
- ISDT maintains records of certifications at its administrative office.

Pharmacology and Toxicology of Alcohol

History of Ethanol Testing

Sir Edward Mellanby (1884 - 1955):

Established relationship between BAC and intoxication. (1919)

Erik M.P. Widmark (1889 - 1945):

Described mathematical terms (rho and beta) for alcohol distribution and elimination. (1932)

Goran Liljestrand (1889 - 1968):

Determined that expired air contained an ethanol concentration ~ 1/2000 that of blood. (1931)

Rolla N. Harger (1890 - 1983):

Developed first practical breath test instrument: Drunkometer (low reliability) (1938)

Robert Forney (1916 - 1997):

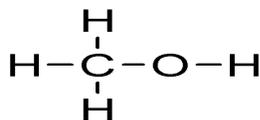
First Director of State Department of Toxicology. (1957)

Robert Borkenstein (1912 - 2002):

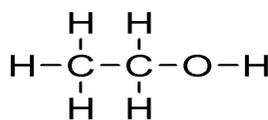
Creator of the Breathalyzer (1954); conducted first study to demonstrate relationship between BAC and the likelihood of being in a motor-vehicle accident: Grand Rapids Study supported changing the legal blood alcohol content for vehicle operation from 0.10 to 0.08. (1964)

Types of Alcohols

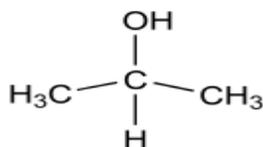
Alcohols are characterized as a chemical class of molecule having a carbon atom bound to an oxygen-hydrogen (-OH) bond.



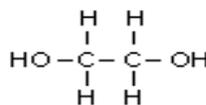
Methanol



Ethanol



Isopropanol



Ethylene Glycol

Methanol

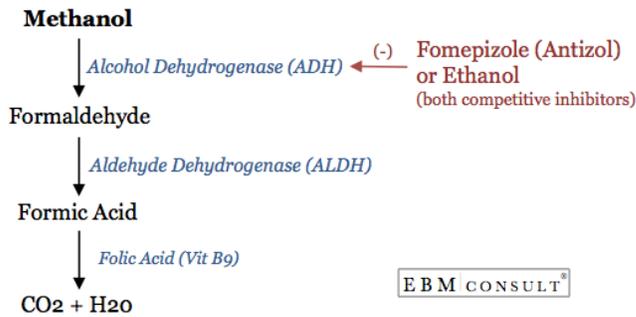
Wood alcohol

All types of alcohol can cause CNS impairment

Methanol intoxication symptoms mirror those of EtOH

Extremely toxic even at low doses (0.02-0.03 g%)

Methanol Metabolism



Isopropanol

Rubbing alcohol

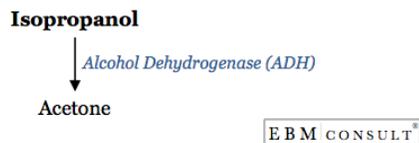
All types of alcohol can cause CNS impairment

Isopropanol intoxication symptoms mirror those of EtOH

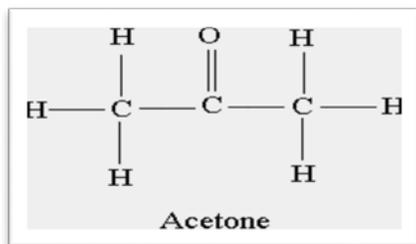
Toxic (>0.04%) – metabolized to acetone

Acetone causes CNS impairment as well

Isopropanol Metabolism



Acetone (ketone)



Sources of Acetone

Metabolite of Isopropanol

Solvent

Compromised liver function

Fatty liver

Cirrhosis

Diabetic Ketoacidosis

Starvation Ketoacidosis

Ethylene Glycol

Component in antifreeze

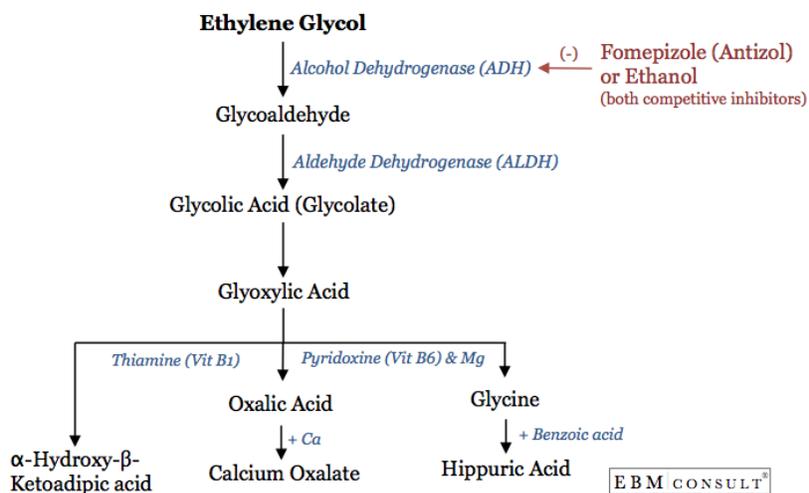
Can also cause CNS impairment

Extremely toxic

Metabolites lead to severe acidosis

Metabolites can also lead to acute renal failure

Ethylene Glycol Metabolism



Ethanol

Proof:

Spirit	Alcohol Content (%)	Proof
Vodka	40-50	80-100
Tequila	45-50	90-100
Whiskey	40-75	80-150
Gin	40-85	80-170
Rum	40-95	80-190

Uses:

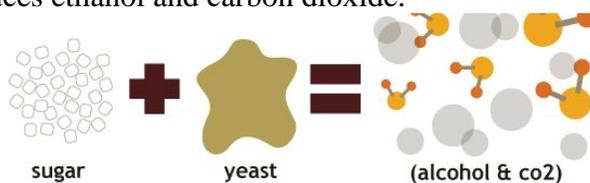
Flavoring: extracts

Disinfectant: hand sanitizer, mouthwash

Fuel: E85

Fermentation

A biological process in which sugars such as glucose, fructose, and sucrose are converted into cellular energy—this conversion produces ethanol and carbon dioxide.



Distillation

A physical process by which ethanol is separated and purified from a mixture.

Alcoholic Beverages

These beverages contain the **same amount** of ethanol:

One beer (12 oz, 4.5%)

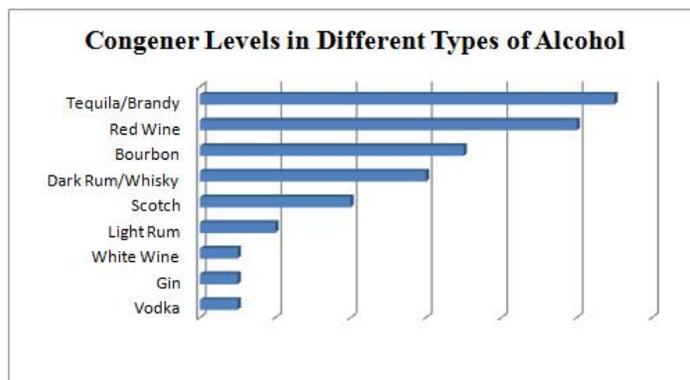
One glass of wine (4.5 oz, 12%)

One mixed drink (containing 1.5 oz, 80 proof)

The total amount of ethanol consumed, not the type of beverage, is important.

Congeners

A minor chemical constituent, especially one that gives distinctive character to a wine or liquor or is responsible for some of its physiological effects; produced during fermentation or added during production (e.g. methanol, fusel oil, tannins, acetaldehyde)



Pharmacology

Definition: Study of mechanisms by which drugs alter biological systems in an attempt to improve health and alleviate disease.

Pharmacokinetics of Ethanol = what the body does to the drug.

Absorption: how it gets in

Distribution: where it goes

Metabolism: what happens to it

Elimination: where/how it leaves

Absorption

Routes of absorption: Mouth - Esophagus - Stomach - Intestine

Mouth:

Ethanol can be absorbed from the mouth, but very slowly; not significant.

A mouth rinsed with a solution containing ethanol will be alcohol-free in about 10-12 minutes (MOUTH ALCOHOL).

Stomach:

Ethanol can be absorbed directly from the stomach.

The stomach normally absorbs about 20% of ingested ethanol.

Stomach has thick lining, not really designed for absorption.

Small size of EtOH permits its passage via diffusion.

Intestine:

The upper intestine normally absorbs about 80% of the ingested ethanol.

The lower intestine and lower bowel readily absorb ethanol. Most ethanol is absorbed, however, from the upper GI tract before it reaches the lower intestine.

ABSORPTION primarily occurs in the **INTESTINES**

Skin:

Ethanol has not been demonstrated in the blood as a result of absorption through the skin. If it is absorbed, the rate is lower than the rate of metabolism.

EtOH absorption defense

Absorption rate through the skin < Elimination rate = NO net BAC accumulation

Factors that affect rate of ethanol absorption:

Presence of food in the stomach - *** **Most Important** ***

- Most foods will delay gastric emptying - ↓ absorption

Exercise - Effects vary; some studies show no effect

- Mild exercise can increase gastric emptying - ↑ absorption

- Strenuous exercise can decrease gastric emptying - ↓ absorption

Excitement or fear - ↓ absorption

Drugs - Effects vary

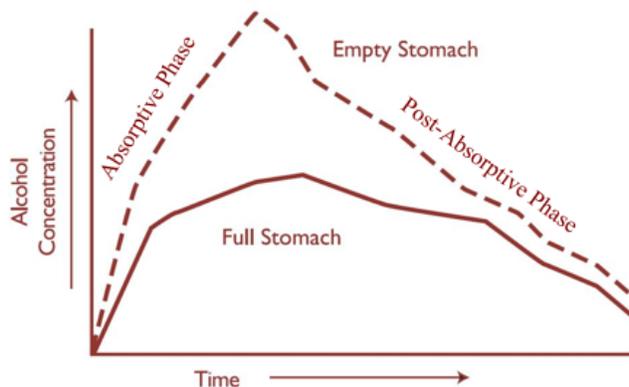
Smoking - ↓ absorption

GI pathologies - Effects vary, depending on the pathology

The rate of ethanol absorption depends on the rate of gastric emptying. Increased gastric emptying will increase absorption of ethanol and result in higher peak blood/breath alcohol concentrations. Decreased gastric emptying will decrease absorption of ethanol and result in lower peak blood/breath alcohol concentrations.

Absorption

Impact of Food on Alcohol Absorption



- Food in the stomach delays absorption.
 - Lower peak BAC.
- Peak occurs when the amount being absorbed equals the amount being eliminated (both occurring simultaneously)

Distribution

Ethanol is soluble in water and is distributed throughout the body based on water content.

Tissues and organs that have the highest concentration of water will have the highest concentration of ethanol.

Widmark's rho or Widmark's r

The available water content of an average male is 68%; of an average female, 55%.

For the same amount of ethanol per body weight, a woman will have a higher concentration of ethanol.

Metabolism



EtOH is metabolized by both the stomach and by the liver; **primarily by the liver.**

Some EtOH is metabolized by these organs before reaching the general circulation.

Approximately 90 - 95 % of absorbed ethanol is metabolized by the body prior to elimination, mostly in the **liver.**

The rest is excreted unchanged in urine, sweat, tears, milk, and breath

Effects of Pathological Conditions on Ethanol Metabolism

Fatty Change (steatosis)

Alcoholic Hepatitis

Cirrhosis of the Liver

Diabetes

Elimination

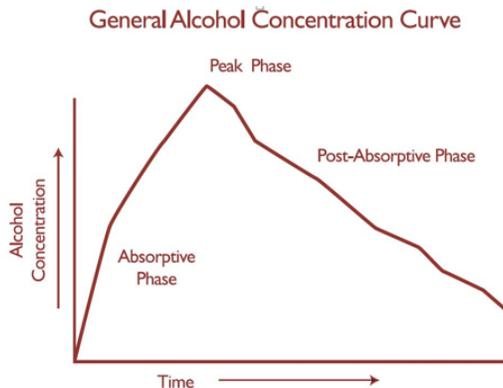
Ethanol disappears from the blood at a constant rate, known as Widmark's β (beta) factor ("burn off rate").

Rate varies between individuals:

Average rate: 0.015-0.019 g% per hour

Range: 0.010-0.025 g% per hour

Alcoholics and binge drinkers: up to 0.035 g% per hour



Toxicology

Definition: Study of the adverse effects of chemicals on living organisms.

Principle: "All substances are poisons; there is none that is not a poison. The right dose differentiates a poison from a remedy." Paracelsus



Toxicity Rating	Dose (mg/kg b.w.)	For Average Adult
1. Practically non-toxic	More than 15,000	More than 1 quart
2. Slightly Toxic	5000-15,000	1 pint-1 quart
3. Moderately Toxic	500-5000	1 ounce-1 pint
4. Very Toxic	50-500	1 teaspoon-1 ounce
5. Extremely Toxic	5-50	7 drops-1 teaspoon
6. Supertoxic	Less than 5	Less than 7 drops

Forensic Toxicology

Study of the effects of chemical substances on criminal behavior or results.

Substances:

Alcohol
Other drugs
Poisons

Testing:

Laboratory
Breath alcohol

Interpretation:

OVWI
Postmortem

Toxicology of Ethanol

Ethanol is a CNS Depressant

CNS = Central Nervous System

Depressant = slows function

Even though impairment has been correlated to blood and breath alcohol concentrations, impairment is caused by ethanol in the **BRAIN**.

Four Primary Types of Impairment

1. Loss of judgment and self-control
2. Impairment of vision and hearing
3. Clumsiness of voluntary muscles
4. Decreased awareness of surroundings

STAGES OF ACUTE ALCOHOLIC INFLUENCE/INTOXICATION

BLOOD-ALCOHOL CONCENTRATION grams/100 mL	STAGE OF ALCOHOLIC INFLUENCE	CLINICAL SIGNS/SYMPTOMS
0.01-0.05	Subclinical	Influence/effects usually not apparent or obvious Behavior nearly normal by ordinary observation Impairment detectable by special tests
0.03-0.12	Euphoria	Mild euphoria, sociability, talkativeness Increased self-confidence; decreased inhibitions Diminished attention, judgment and control Some sensory-motor impairment Slowed information processing Loss of efficiency in critical performance tests
0.09-0.25	Excitement	Emotional instability; loss of critical judgment Impairment of perception, memory and comprehension Decreased sensory response; increased reaction time Reduced visual acuity & peripheral vision; and slow glare recovery Sensory-motor incoordination; impaired balance; slurred speech; vomiting; drowsiness
0.18-0.30	Confusion	Disorientation, mental confusion; vertigo; dysphoria Exaggerated emotional states (fear, rage, grief, etc) Disturbances of vision (diplopia, etc.) and of perception of color, form, motion, dimensions Increased pain threshold Increased muscular incoordination; staggering gait; ataxia Apathy, lethargy
0.25-0.40	Stupor	General inertia; approaching loss of motor functions Markedly decreased response to stimuli Marked muscular incoordination; inability to stand or walk Vomiting; incontinence of urine and feces Impaired consciousness; sleep or stupor
0.35-0.50	Coma	Complete unconsciousness; coma; anesthesia Depressed or abolished reflexes Subnormal temperature Impairment of circulation and respiration Possible death
0.45+	Death	Death from respiratory arrest

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Tolerance

The ability of an organism to adapt.

There are two forms of ethanol tolerance, including:

- (1) Psychological: Increased ability to alter behavior in order to not appear intoxicated.
- (2) Biochemical: Increased rate of degradation of alcohol to inactive metabolites.

With practice, the brain can learn to function better under the influence of ethanol. People vary in their abilities to handle ethanol, not just as a result of inherent differences, but as a result of experience.

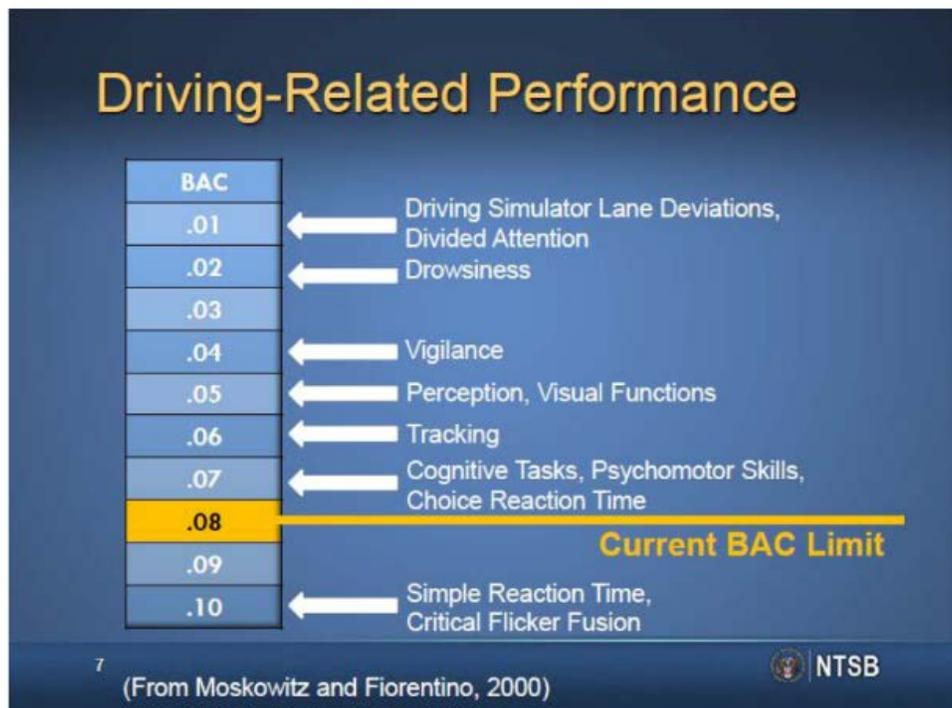
Ethanol Involvement in Auto Crashes

<u>% BAC</u>	<u>Enhancement Factor</u>
0.01-0.04	0.9x
0.05-0.09	1.5x
0.10-0.14	5x
0.15-0.19	14x
0.20-0.24	24x

Grand Rapids Study: Borkenstein, et al. 1964

Latest reanalysis of Borkenstein and other data reveals:

at 0.08 %	Chances are 4x
at 0.15 %	Chances are 25x
at 0.20 %	Chances are >100x



Breath Ethanol Determination

As the blood passes through the lungs, ethanol will leave and become part of the expired breath.

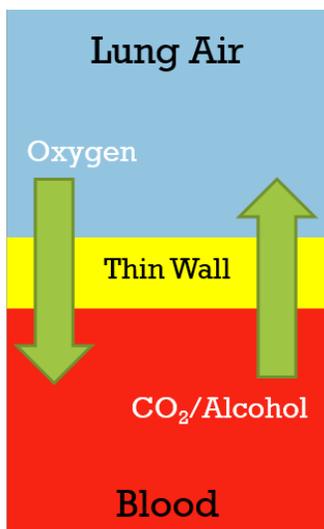
Ethanol's distribution between blood and breath obeys Henry's Law.

Henry's Law -- in a closed container, at a given temperature and pressure, a material in solution will be in equilibrium with the air in the space above.

Body temp = 37° C (98.6° F)

Breath temp = 34° C (93.2° F)

The ratio between the concentration of ethanol in the blood and that in the breath from the deepest part of the lung (alveolar air) is called the partition coefficient. The accepted ratio is 2100:1 in the United States.



This ratio means that 2100 mL (2.1 Liters) of alveolar air will contain the same amount of ethanol as does 1 mL of blood.

The amount of ethanol in deep (alveolar) lung air is directly related to the amount present in the blood.

Most of the population has a breath: blood ratio greater than 2100:1

Breath test instruments in Indiana are calibrated at a ratio of 2100:1

For most of the population, Indiana breath test instruments underestimate the BAC

A breath test should not produce a higher result than a blood test

Ethanol reporting units:

Blood – g/100 mL

Breath – g/210 L

Breath to blood ratio = the EtOH in 2100 mL (2.1 L) of air is equivalent to the ethanol in 1 mL of blood.

2.1 L of air = 1 mL of blood

210 L of air = 100 mL of blood

Common Challenges to Breath Test Results

Subject vomited or burped:

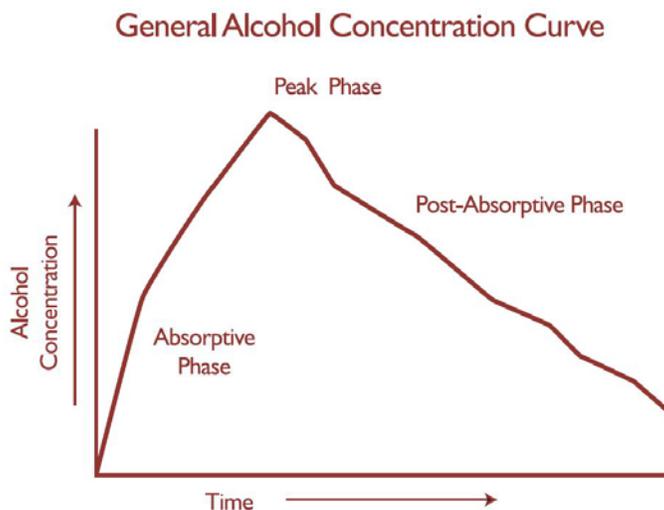
The argument may be that a subject who burped or vomited while a high concentration of alcohol existed in the stomach would exhibit falsely elevated breath ethanol levels. **Observe carefully during the 15-minute waiting period. Record your observations, including “nothing unusual.”**

Unable to give a sufficient sample due to pulmonary disorders:

Argument against refusal given for Insufficient Sample or Time Out. Cases in which this would be true are rare.

Subject was not impaired at the time of the incident:

The argument is that the subject had recently consumed an alcoholic beverage and was still absorbing ethanol at the time of the incident. (Rebuttal of 3-hour presumption. This is usually addressed by a toxicologist.)



Lab Ethanol Measurement

Indiana statutes are based on concentrations in **whole blood** and breath.

ISDT Lab tests whole blood and serum/plasma.

Most hospital labs test serum or plasma, with some exceptions.

Other sample types can be tested, but may have no evidentiary value in Indiana

(blood = impairment vs. urine = use)

Ratio of ethanol in other fluid to that in whole blood:

serum/plasma 1: 1.04- 1.26

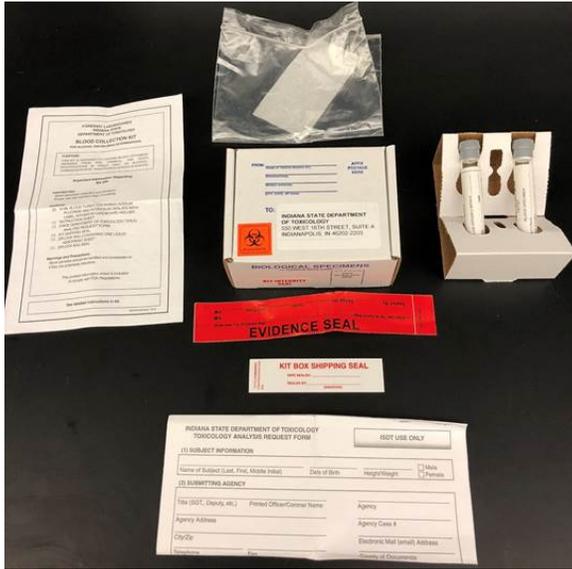
saliva 1: 1.10

urine variable

Blood vs. Serum

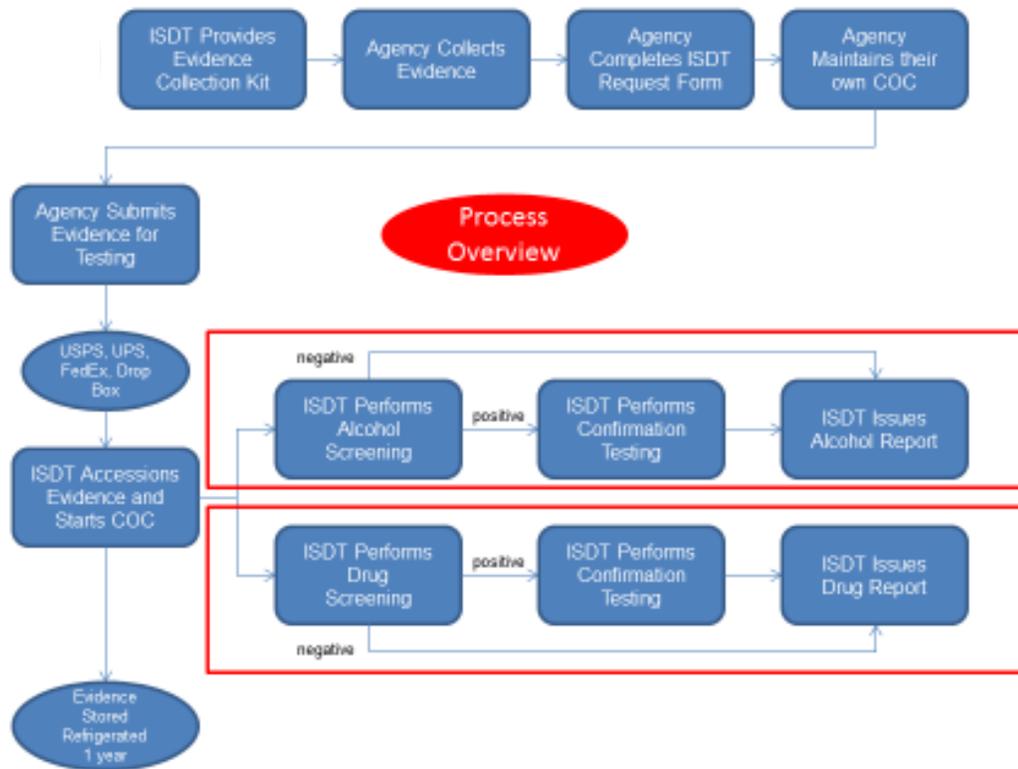
Serum is an amber-colored, protein-rich liquid that separates out when blood coagulates





Send requests for evidence kits to:
toxkits@isdt.in.gov

Available for pick-up at ISDT or
shipment to departments



ISDT Testing Policy

All positive screening results will be confirmed

- No need to request confirmation testing

All testing requested will be performed

- Exceptions:
 - Urine ethanol and urine drug analysis
 - Drugs outside ISDT panel

iResults: web-based results retrieval

Indiana State Department of Toxicology
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Compound Name	Drug Classification	Confirmation Drug Class	Alternate Name	Screen cutoff	Screening Technique	Confirmation cutoff	Confirmation Technique
1 Acetone	Volatile	Volatile	Acetone	0.010 g/100 mL	HS-GC	0.010 g/100 mL	*The lower of the two confirmations will be used to report.
2 Ethanol	Volatile	Volatile	Beer, Wine, Spirits				
3 Isopropanol	Volatile	Volatile	Rubbing Alcohol				
4 Methanol	Volatile	Volatile	Wood Alcohol				
Compound Name	Drug Classification	Confirmation Class	Trade/Alternate Name	Screen cutoff	Screening Technique	Confirmation cutoff	Confirmation Technique
1 7-Aminoclonazepam	Benzodiazepine	Benzodiazepine-Z-drug	Clonazepam metabolite	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
2 Alprazolam	Benzodiazepine	Benzodiazepine-Z-drug	Xanax, Zannies, Z-bars	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
3 Clonazepam	Benzodiazepine	Benzodiazepine-Z-drug	Klonopin, Rivotril	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
4 Desalkylflurazepam	Benzodiazepine	Benzodiazepine-Z-drug	Norflurazepam	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
5 Diazepam	Benzodiazepine	Benzodiazepine-Z-drug	Valium, Diastat	10 ng/mL	LC-TOF	50 ng/mL	LC-MS-MS
6 Lorazepam	Benzodiazepine	Benzodiazepine-Z-drug	Ativan	10 ng/mL	LC-TOF	50 ng/mL	LC-MS-MS
7 Midazolam	Benzodiazepine	Benzodiazepine-Z-drug	Versed	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
8 Nordiazepam	Benzodiazepine	Benzodiazepine-Z-drug	Nordaz, Stilny, Madar, Vegesan, Calmday, Diazepam metabolite	10 ng/mL	LC-TOF	50 ng/mL	LC-MS-MS
9 Oxazepam	Benzodiazepine	Benzodiazepine-Z-drug	Serax, Zaxopam, Diazepam metabolite	10 ng/mL	LC-TOF	50 ng/mL	LC-MS-MS
10 Temazepam	Benzodiazepine	Benzodiazepine-Z-drug	Restoril, diazepam metabolite	10 ng/mL	LC-TOF	50 ng/mL	LC-MS-MS
11 Zolpidem	Sedative Hypnotic	Benzodiazepine-Z-drug	Ambien	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
12 α-Hydroxyalprazolam	Benzodiazepine	Benzodiazepine-Z-drug	Alprazolam metabolite	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
13 THC	Cannabinoid	Cannabinoid	Marijuana			1 ng/mL	GC-MS
14 THC-COOH	Cannabinoid	Cannabinoid	Marijuana metabolite	10 ng/mL	LC-TOF	5 ng/mL	GC-MS
15 Amphetamine	Stimulant	Stimulants	Adderal, Methamphetamine metabolite	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
16 Benzoylcegonine	Stimulant	Cocaine and Cocaine Metabolite	Cocaine metabolite	20 ng/mL	LC-TOF	20 ng/mL	GC-MS
17 Cocaine	Stimulant	Cocaine and Cocaine Metabolite	Coke, White, Snow, Speedball	10 ng/mL	LC-TOF	20 ng/mL	GC-MS
18 Ephedrine	Stimulant	Stimulants	Bronkaid, Primatene	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
19 MDA	Stimulant	Stimulants	Tenamfetamine			5 ng/mL	LC-MS-MS
20 MDEA	Stimulant	Stimulants	MDE, Eve	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
21 MDMA	Stimulant	Stimulants	Ecstasy	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
22 Methamphetamine	Stimulant	Stimulants	Desoxy, Meth, Speed, Crystal, Glass, Ice, Crank, Yaba	10 ng/mL	LC-TOF	10 ng/mL	LC-MS-MS
23 Phencyclidine	Dissociative anesthetic	Stimulants	PCP, Angel dust, Sernyl	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
24 Phentermine	Stimulant	Stimulants	Adipex-P, Suprenza	10 ng/mL	LC-TOF	20 ng/mL	LC-MS-MS
25 Phenylpropanolamine	Stimulant	Stimulants	Propalin Proin, PPA, Norephedrine, Norpseudoephedrine, Cathine	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
26 Pseudoephedrine	Stimulant	Stimulants	Sudafed	10 ng/mL	LC-TOF	5 ng/mL	LC-MS-MS
27 Amobarbital	Sedative Hypnotic	Barbiturates	Amylobarbitone, Amytal	200 ng/mL	LC-TOF		
28 Butabarbital	Sedative Hypnotic	Barbiturates	Butisol	200 ng/mL	LC-TOF		
29 Butalbital	Sedative Hypnotic	Barbiturates	Fioricet, Fiorinal	200 ng/mL	LC-TOF		
30 Pentobarbital	Sedative Hypnotic	Barbiturates	Nembutal	200 ng/mL	LC-TOF		
31 Phenobarbital	Sedative Hypnotic/Anticonvulsant	Barbiturates	Luminal, Solfoton	200 ng/mL	LC-TOF		
32 Secobarbital	Sedative Hypnotic/Anticonvulsant	Barbiturates	Seconal	200 ng/mL	LC-TOF		
33 Buprenorphine	Narcotic Analgesic	Buprenorphine	Suboxone, Buprenex	10 ng/mL	LC-TOF		
34 Norbuprenorphine	Narcotic Analgesic	Buprenorphine	Buprenorphine metabolite	10 ng/mL	LC-TOF		
35 Carisoprodol	Muscle Relaxant	Carisoprodol	Soma	500 ng/mL	LC-TOF		
36 Meprobamate	Muscle Relaxant	Carisoprodol	Carisoprodol metabolite	500 ng/mL	LC-TOF		
37 Cyclobenzaprine	Muscle Relaxant	Cyclobenzaprine	Flexeril, Amrix, Fecmid	10 ng/mL	LC-TOF		
38 Dextromethorphan	Stimulant/Antitussive	Dextro/Levo Methorphan	Delsym, Robitussin, Zicam, DXM, DM	10 ng/mL	LC-TOF		
39 Acetylfentanyl	Narcotic Analgesic	Fentanyl	Fentanyl analog	1 ng/mL	LC-TOF		
40 Fentanyl	Narcotic Analgesic	Fentanyl	Duragesic, Abstral, Subsys	1 ng/mL	LC-TOF		
41 Norfentanyl	Narcotic Analgesic	Fentanyl	Fentanyl metabolite	1 ng/mL	LC-TOF		
42 Flunitrazepam	Benzodiazepine	Flunitrazepam	Rohypnol	10 ng/mL	LC-TOF		
43 EDDP	Narcotic Analgesic	Methadone	Methadone metabolite	10 ng/mL	LC-TOF		
44 Methadone	Narcotic Analgesic	Methadone	Dolophine, Methadose	10 ng/mL	LC-TOF		
45 Naloxone	Narcotic Analgesic	Naloxone	Narcan, Evzio, (Zubsolv, Suboxone)	10 ng/mL	LC-TOF		
46 Naltrexone	Narcotic Analgesic	Naltrexone	Vivtrol	10 ng/mL	LC-TOF		
47 6-Monoacetylmorphine	Narcotic Analgesic	Opioids	6-MAM, 6-acetylmorphine, 6-AM, Heroin metabolite				
48 Codeine	Narcotic Analgesic	Opioids	Codeine	10 ng/mL	LC-TOF		
49 Dihydrocodeine	Narcotic Analgesic	Opioids	Drocode, Paracodeine and Parzone	10 ng/mL	LC-TOF		
50 Hydrocodone	Narcotic Analgesic	Opioids	Vicodin, Lortab, Lorecet, Norco, Verdrocet	10 ng/mL	LC-TOF		
51 Hydromorphone	Narcotic Analgesic	Opioids	Dilaudid	10 ng/mL	LC-TOF		
52 Morphine	Narcotic Analgesic	Opioids	Duramorph, DepoDur, Astramorph, Heroin metabolite	10 ng/mL	LC-TOF		
53 Oxycodone	Narcotic Analgesic	Opioids	Oxycotin, Percodan, Percocet	10 ng/mL	LC-TOF		
54 Oxymorphone	Narcotic Analgesic	Opioids	Opana, Numorphan, Numorphone	10 ng/mL	LC-TOF		
55 Propoxyphene	Stimulant	Propoxyphene	Darvon, Darvocet	10 ng/mL	LC-TOF		
56 O-Desmethyltramadol	Narcotic Analgesic	Tramadol	Tramadol metabolite	10 ng/mL	LC-TOF		
57 Tramadol	Narcotic Analgesic	Tramadol	Ultram, ConZip, Ryzolt	10 ng/mL	LC-TOF		
58 Zaleplon	Sedative Hypnotic	Zaleplon	Sonata	10 ng/mL	LC-TOF		
59 Zopiclone	Sedative Hypnotic	Zopiclone	Lunesta	10 ng/mL	LC-TOF		

Outsourced to NMS

Alcohols, Benzodiazepines, Sedative Hypnotics, Anticonvulsants, Narcotic Analgesics, Cannabinoids, and Muscle Relaxants are all Central Nervous System Depressants

NOTE: All positive screening results will be confirmed and quantified, if possible.

GC/MS = Gas Chromatography / Mass Spectrometry LC-TOF = Liquid Chromatography-Time of Flight

HS-GC = Headspace – Gas Chromatography LC/MS/MS = Liquid Chromatography tandem Mass Spectrometry

Cutoff = Lowest concentration of drug that can be reported

Alternate Name = Not meant to be comprehensive / inclusive; only meant to provide an example of alternate drug name

Updated: 10/24/18

SPECIMEN GUIDANCE:

Blood: Gray top preferred, but not required. Some analyses may be performed on other types of tubes.

Urine: No longer analyzed by ISDT

Other: Consult ISDT Toxicologist

Negative alcohol result



INDIANA STATE DEPARTMENT OF TOXICOLOGY
 TOXICOLOGY REPORT - Alcohol Analysis

ISDT CASE:

Item descriptions:
 Evidence Submission 1: Plastic Evidence Bag
 Item # 1-A: Blood Tube
 Item # 1-B: Blood Tube

Indianapolis, IN 46225

Subject Name:
 Agency Case:
 County:

None Detected

Analysis includes the following analytes: Ethanol, Acetone, Isopropanol, and Methanol
 Unless noted otherwise, the limit of detection for all analytes is 0.010 g/100 mL

If this case has been resolved and all requested testing has not been completed, please notify the laboratory immediately.
 Specimens will be destroyed one year after the initial report unless ISDT is notified in writing to retain the specimens for a longer period of time.

550 W. 16th Street Indianapolis, IN 46202
 Phone No: 317-921-5000 FAX No: 317-278-2836
 Website: www.in.gov/ISDT

Page 1 of 1

Positive alcohol result



INDIANA STATE DEPARTMENT OF TOXICOLOGY
 TOXICOLOGY REPORT - Alcohol Analysis

ISDT CASE:

Date of Report:

Item descriptions:
 Evidence Submission 1: ISDT KIT
 Item # 1-A: Blood Tube
 Item # 1-B: Blood Tube

Subject Name:
 Agency Case:
 County:

Alcohol Analysis Results

Alcohol	Analyte	Result	Method	Analyst
Blood 1-A	Ethanol	0.140 ± 0.006 g/100 mL	GC/MS	CHERYL ANDERSON

Quantitative ethanol results ≥ 0.010 and < 0.400 g/100 mL are reported as
 Result ± Uncertainty of Measurement at a coverage probability of 99.73% (k=3).

Analysis includes the following analytes: Ethanol, Acetone, Isopropanol, and Methanol.
 Unless noted otherwise, the limit of detection for all analytes is 0.010 g/100 mL.

If this case has been resolved and all requested testing has not been completed, please notify the laboratory immediately.
 Specimens will be destroyed one year after the initial report unless ISDT is notified in writing to retain the specimens for a longer period of time.

550 W. 16th Street Indianapolis, IN 46202
 Phone No: 317-921-5000 FAX No: 317-278-2836
 Website: www.in.gov/ISDT

Positive drug result

Legal Aspects of Breath Testing for Ethanol

Implied Consent

A person who operates a vehicle impliedly consents to submit to a chemical test as a condition of operating a vehicle in Indiana.

Chemical test means an analysis of a person's blood, breath, urine, or other bodily substance for the determination of the presence of alcohol, a controlled substance or its metabolite, or a drug or its metabolite.

Implied Consent Advisement

If the person refuses to submit to a chemical test, you **shall** inform the person that refusal will result in the suspension of the person's driving privileges.

Indiana cases: *State v. Schulze* (Court of Appeals of Indiana, 2014)

Burnell v. State (Supreme Court of Indiana, 2016)

Miranda Warning

Miranda warning must be given when suspect is in custody AND is being interrogated.

Miranda warning is often given after the suspect fails the breath test.

Once subject is in custody, officer should not question subject about vehicle operation, impairment, crash details, etc., until *Miranda* warning is given.

In custody

Gray area – Not clearly delineated

Handcuffing suspect is placing “in custody.”

Putting suspect in police car may constitute “in custody.”

Traffic stop and asking subject to get out of car, in and of itself, is not “in custody.”

Sobriety checkpoints: *State v. Brown* (Supreme Court of Indiana, 2017)

Interrogation

Neither Portable Breath Tests (PBT) nor Field Sobriety Tests (FST) are statements. They alone, therefore, do not constitute an interrogation.

If you administer a PBT or FST's without interrogating the suspect, you are not required to give the *Miranda* warning.

Similarly, breath and blood samples do not require *Miranda* warning. The implied consent advisement is not interrogation, and IC 9-30-6-3(b) specifically provides that a person's refusal to submit to a chemical test is admissible into evidence.

Field Sobriety Tests

Ackerman v. State (Court of Appeals of Indiana, 2002)

PBTs

State v. Whitney (Court of Appeals of Indiana, 2008)

Administering the Breath Test

Observation time (use same timepiece throughout)

Insufficient samples

Hurley v. State (Supreme Court of Indiana, 2017)

Instrument status messages not listed in the Approved Method

Connor v. State (Court of Appeals of Indiana, 2018): **If there is any status message on the breath test instrument report that is not listed in the Approved Method, administer a breath test on a different instrument or get blood.**

Preparation for Testimony

Review case file

Discuss case with other officers who witnessed or assisted

Mentally organize elements of offense and supporting evidence

Revisit the scene if appropriate

Discuss case with assigned prosecutor

During Testimony

Provide specific descriptive details

Avoid vague language

Testimony regarding the breath test

Describe administering the Approved Method

1. Observation time (use same timepiece throughout)
2. Instructions given
3. Subject cooperation or lack of cooperation
4. How results are expressed

Testimony about training

Dates of your certification

Verify dates of certification with your identification card covering the period in question.

Keep current identification card with you and save all old/expired cards.

Topics taught in Training Course for Breath Test Operator Certification

This course has covered the areas required by 260 IAC 2-2-2:

- (1) The pharmacology and toxicology of ethanol
- (2) The legal aspects of breath testing for ethanol
- (3) The theory, operation, and care of breath test equipment
- (4) The use of a breath test instrument using known ethanol-water or ethanol-gas standards

Questions officers lack expertise to answer in testimony

Certification process

How instruments are certified

When instrument was last certified

Any questions regarding instrument certification materials or process

Expert testimony regarding pharmacology/toxicology of ethanol

Effect of ethanol

How much ethanol results in impairment

Mechanics of instrument operation and maintenance

How the instrument operates

How/when maintenance is done

Any other questions relating to repair and/or maintenance of instrument

“I don’t know.”

Do not volunteer more information than necessary to answer questions asked.

Focus on answering questions succinctly

Other Issues/Relevant Statutes

IC 9-30-5 and prima facie evidence of intoxication

1. 0.08 gram of alcohol per 100 milliliters of blood or 210 liters of breath
2. 0.15 gram of alcohol per 100 milliliters of blood or 210 liters of breath

If a chemical test was administered within 3 hours of the time probable cause was developed, the Indiana code establishes a rebuttable presumption that the breath or blood alcohol content test result is the subject’s breath or blood alcohol content at the time of vehicle operation.

The law also establishes a rebuttable presumption that a person who operates a vehicle with at least 0.080 breath or blood alcohol content is intoxicated. Because this presumption is rebuttable, however, evidence in addition to the chemical test result is required to prove the impairment element of the charge of operating a vehicle while intoxicated.

IC 9-30-7 – implied consent for accident involving serious injury or death

“A law enforcement officer shall offer a portable breath test or chemical test to any person who the officer has reason to believe operated a vehicle that was involved in a fatal accident or an accident involving serious bodily injury.”
(IC 9-30-7-3)

Blood search warrants

Metzger v. State, 6 N.E.3d 485 (Indiana Court of Appeals, 2014)

IC 34-47-3-1 Disobedience of process or order

Missouri v. McNeely (U.S. Supreme Court, 2013)

IC 9-30-6-6(a) Subpoenas for hospital blood samples/test results:

If medical personnel take a sample during the course of normal treatment, the sample or test results shall be provided to an officer who requests them as part of a criminal investigation **even if the patient does not consent.**

Indiana law exempts medical personnel from civil and criminal liability for providing law enforcement with a sample or test result under these circumstances.

Instrumentation and Approved Method for Breath Analysis for Alcohol

Intox EC/IR II

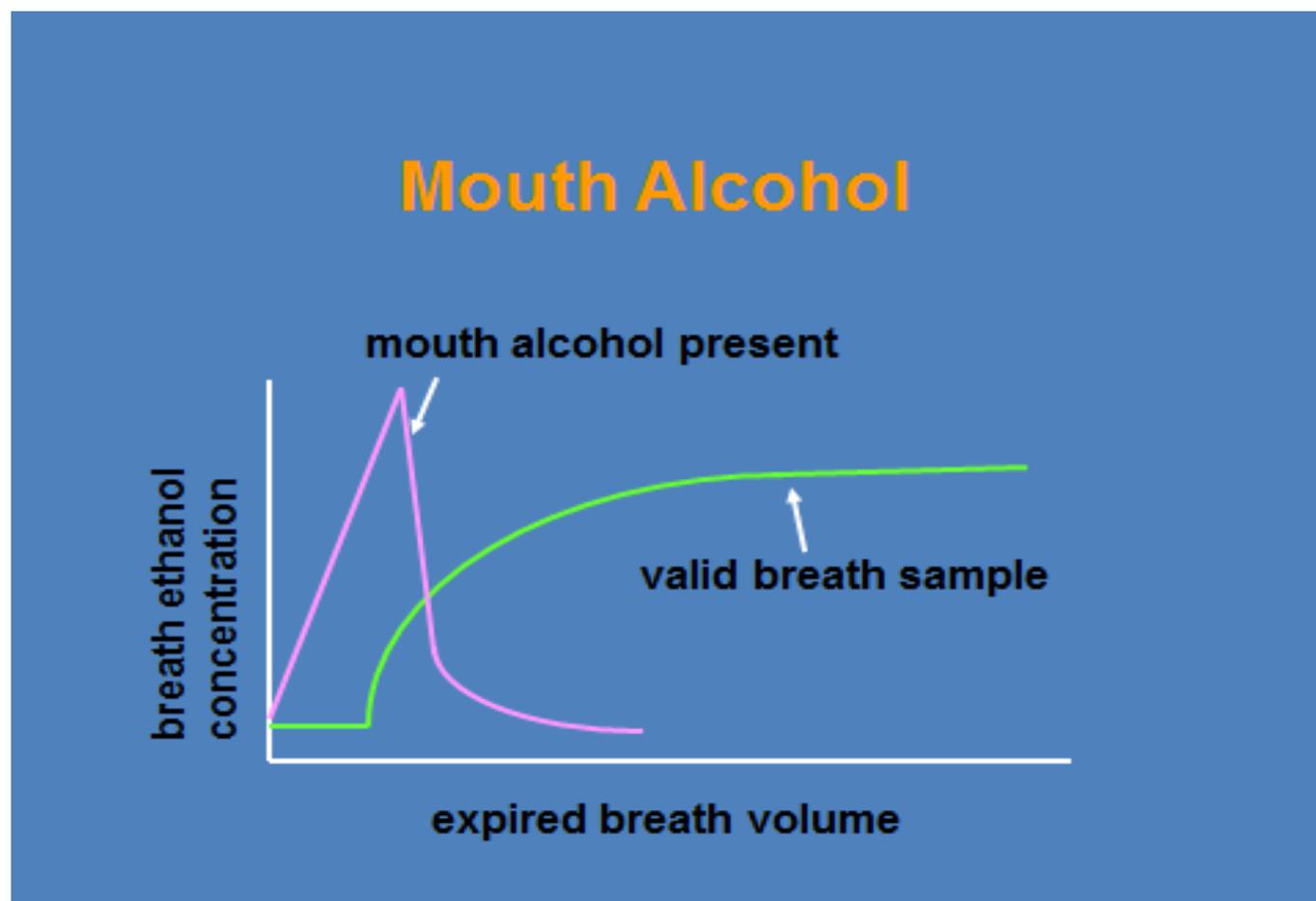
NHTSA-approved as an evidentiary breath alcohol instrument

Theory of Operation

- EC = Electrochemical (fuel cell)
- IR = Infrared
 - Intox EC/IR II uses fuel cell technology to measure amount of ethanol in a sample
 - Intox EC/IR II uses infrared technology to detect mouth alcohol

The infrared system tracks the ethanol concentration in the sample in near real time to detect the presence of mouth alcohol, but does not produce a BAC measurement

- If mouth alcohol is present, the IR system will detect that there is a higher ethanol concentration in the subject's mouth air than in the subject's deep lung air



Intox EC/IR II

When a breath sample containing ethanol is introduced into the fuel cell sample port, an electrochemical reaction occurs.

Measurement of the electrical current produced indicates the amount of ethanol consumed by the fuel cell.

The fuel cell is specific to alcohol, but not specific to ethanol.

- Intox EC/IR II detects methanol and isopropanol (alcohols other than ethanol) as interferences.

Acetone is not a fuel for the fuel cell, so the fuel cell does not react to it.

Accuracy Checks

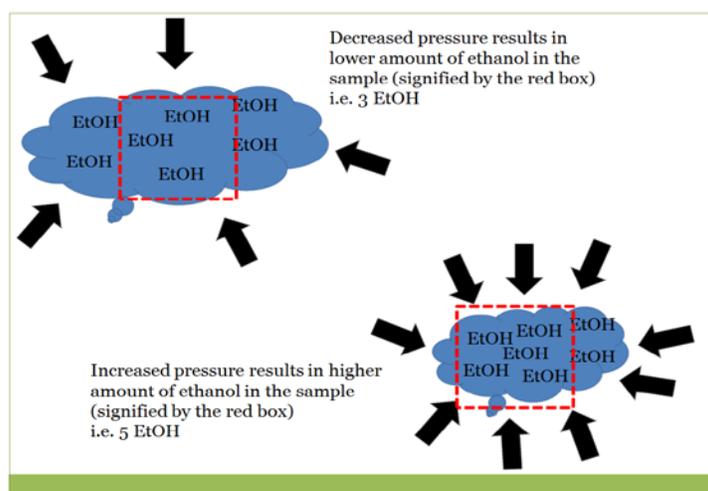
The Intox EC/IR II performs a calibration (accuracy) check before and after each breath test by testing a sample from an internal dry gas tank containing a certified value of ethanol and nitrogen.

Instrument will disable if result of each calibration check is not within 0.005 or 5%, whichever is greater, of the dry gas target*.

*Dry gas target = the certified value of the ethanol and nitrogen standard (dry gas in the instrument's internal tank) adjusted for the ambient barometric pressure

- Ethanol molecules in dry gas are affected by ambient barometric pressure: high pressure keeps the molecules closer together, resulting in a higher ethanol measurement; low pressure allows the molecules to spread, resulting in a lower ethanol measurement

*****The target is listed on the instrument report as “Dry Gas Target.”**



The Intox EC/IR II adjusts for this effect by measuring the ambient barometric pressure to determine a target for itself when it measures the ethanol in its internal dry gas tank.

Care and Service of the Intox EC/IR II

Instrument should be left turned on 24/7.

- Any person can turn instrument on or off***

***But this should only be done if absolutely necessary

Only persons authorized by director of ISDT may make changes that affect instrument calibration.

Instrument should not be operated in environments heavy with alcohol vapor, cigarette smoke, high levels of radio frequencies, or magnetic interference.

- Intox EC/IR II is designed so that none of these environmental conditions will affect test results.
- Prolonged exposure to these conditions may shorten the life of the fuel cell.

Instrument displays a status message indicating the condition when:

- it fails a calibration check
 - it malfunctions
 - the dry gas tank is low
- If this occurs, notify ISDT.

Instrument Service

To request service of an instrument, complete and email the service request form on the State Department of Toxicology website or call ISDT at 317-921-5000.

Provide the following information:

Officer's name (or name of contact person at instrument location)

Instrument location

Instrument serial number

Description of any issues and status messages displayed or printed on instrument reports.

An inspector will be notified as soon as possible and will contact the instrument location.

Approved method for Intox EC/IR II

The **approved method** that **shall be followed** in making an analysis of breath for ethanol using the Intox EC/IR II breath test instrument has twelve steps. (260 IAC 2-4-2)

***These are rules, not guidelines.**

- STEP ONE: Person to be tested must:
 - have had nothing to eat or drink,
 - not have put any foreign substance into mouth or respiratory tract, and
 - not smoke within 15 minutes before time first breath sample is taken or at any time from first breath sample until after final breath sample.
- Fifteen-minute period can begin before subject arrives at testing site.

One of the common challenges to breath test results is that the subject burped or vomited prior to the test, causing an elevated breath ethanol level. Observe the subject during the 15-minute waiting period, and record your observations, including “nothing unusual.” If the subject burps or vomits during the 15-minute period, begin a new 15-minute period, or take the subject for a blood test.

- STEP TWO: Verify that instrument is in ready mode, as indicated by instrument display.
 - Check to see that the printer is online and has paper.
- STEP THREE: Press “Enter” key to start subject test.

**Approved Method
for Intox EC/IR II**

- STEP TWO: Verify that instrument is in ready mode, as indicated by instrument display



Intoximeters
Intox
EC/IR II
Instrument Ready
Press ENTER to Start

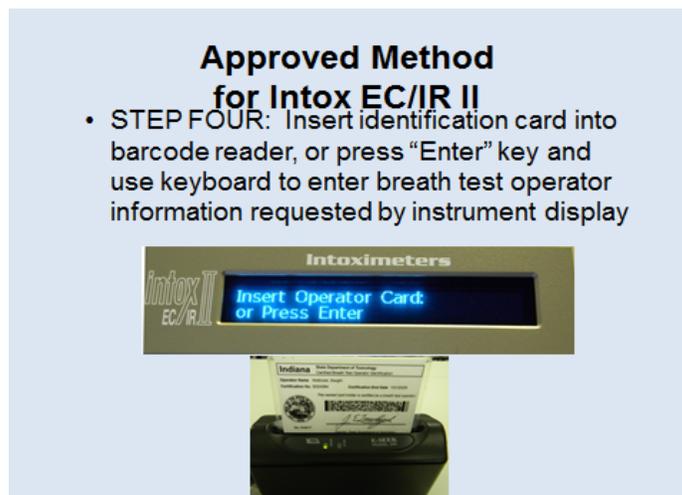
- STEP THREE: Press “Enter” key to start subject test



Intoximeters
Intox
EC/IR II
Press ENTER to Start
Subject Test

- **STEP FOUR:** Insert identification card into barcode reader, or press “Enter” key and use keyboard to enter breath test operator information requested by instrument display.

All of the information scanned from the operator ID card may be edited by using the instrument keyboard. Any text that is highlighted on the instrument display may be edited; e.g., a last name change or a department change.

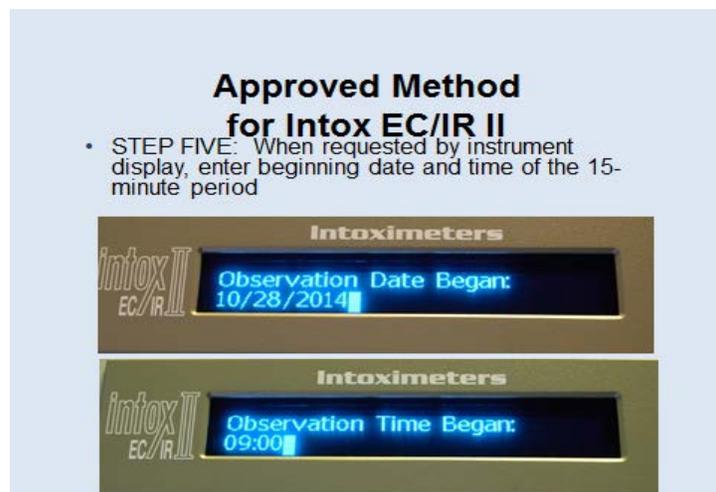


- **STEP FIVE:** When requested by instrument display, enter beginning date and time of the 15-minute period.

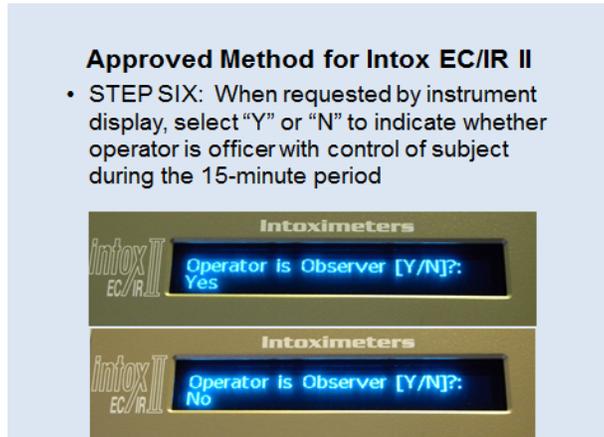
Format for date is MM/DD/YYYY

Format for time is HH:MM (military time)

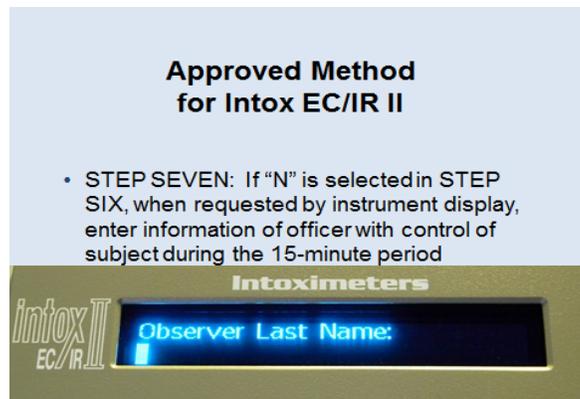
Instrument will calculate 15 minutes from the beginning time entered by the operator. If the beginning time entered was not ≥ 15 minutes ago, instrument will delay start of test sequence until 15 minutes have elapsed from the beginning time entered. Examples: If beginning time entered was 10 minutes ago, instrument will wait for 5 minutes before starting the test sequence. If beginning time entered was 30 minutes ago, instrument will begin the test sequence.



- **STEP SIX:** When requested by instrument display, select “Y” or “N” to indicate whether operator is officer with control of subject during the 15-minute period.

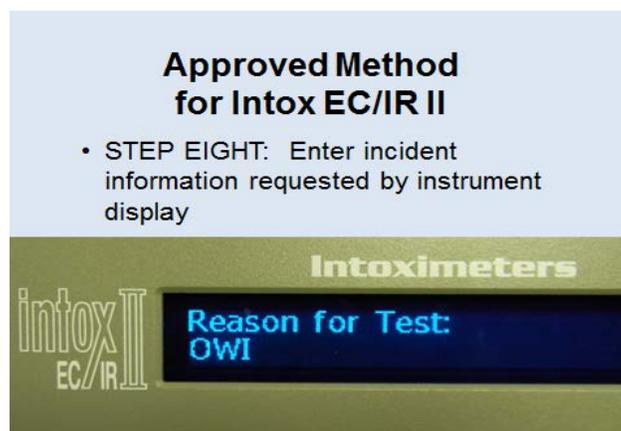


- **STEP SEVEN:** If “N” is selected in STEP SIX, when requested by instrument display, enter information of officer with control of subject during the 15-minute period.



- **STEP EIGHT:** Enter incident information requested by instrument display.

Use spacebar to move between “Reason for Test:” options.



- STEP NINE: Enter subject information requested by instrument display by:
 - inserting subject's driver/operator license or identification card into barcode reader or
 - pressing "Enter" key and using keyboard to enter available subject information requested by instrument display.

Scanned DL info cannot be edited by keyboard.



- STEP TEN: When "Please blow" appears on instrument display, place new mouthpiece in breath tube. Instruct subject to deliver a breath sample. Remove mouthpiece when prompted by instrument display and discard.

Do not allow the test subject to handle the breath tube.

Instruct the subject: "Take a deep breath, make a tight seal around the tip of the mouthpiece, and then blow long, strong, and continuously until I tell you to stop."

If minimum flow is not reached within 3 minutes from time that "Please blow"/"Press 'R' for refusal" is displayed, instrument will display "Refusal? [Y/N]." The 3-minute timer resets after each "Insufficient Sample." If this occurs 3 times, test sequence ends.

Removal of Mouthpiece: The approved method requires the removal of the mouthpiece from the breath tube in order to ensure that there will not be a mouthpiece on the breath tube during the instrument's Purge/Blank cycle, which could result in a failed Blank Check. In order to ensure compliance with this requirement, you may remove the mouthpiece after each delivery or each attempted delivery of each breath sample without waiting for the prompt by the instrument display.

- STEP ELEVEN: When “Please blow” appears again on instrument display, place new mouthpiece in breath tube. Instruct subject to deliver a breath sample. Remove mouthpiece when prompted by instrument display and discard.

After delivery of the first sample there is a 2-minute delay before the next “Purging Remove Mouthpiece” prompt.

Approved Method for Intox EC/IR II

- STEP ELEVEN: When “Please blow” appears again on instrument display, place new mouthpiece in breath tube. Instruct subject to deliver a breath sample. Remove mouthpiece when prompted by instrument display and discard.

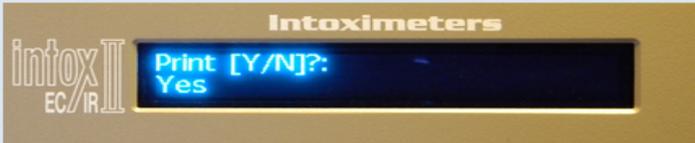


The screenshot shows the Intoximeter display with the text "Please blow until the tone stops" in blue. The device is labeled "Intoximeters" and "intox II EC/IR II".

- STEP TWELVE: Print instrument report and remove from printer; check report for numerical value of subject’s breath ethanol concentration and correct date and time and **sign report** where indicated.

Approved Method for Intox EC/IR II

- STEP TWELVE: Print instrument report and remove from printer; check report for numerical value of subject’s breath ethanol concentration and correct date and time and **sign report** where indicated.



The screenshot shows the Intoximeter display with the text "Print [Y/N]?: Yes" in blue. The device is labeled "Intoximeters" and "intox II EC/IR II".

Two-test sequence with 0.020 agreement

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077

Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.120	11:03	1 st subject sample test
BLK	0.000	11:06	blank check
SUBJ	0.118	11:06	2 nd subject sample test
BLK	0.000	11:07	blank check
CHK	0.076	11:08	calibration check
BLK	0.000	11:09	blank check

Test Status Sample Complete

RESULT: 0.118 g/210L ← subject's breath ethanol content
11:06 EDT, (the lower of the two results)
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS
GRAMS OF ALCOHOL PER 210 LITERS OF BREATH

Operator Signature

“System Check” is a set of internal diagnostics that looks at the baselines of all the instrument sensors. Although only the first system check appears on the instrument report, the instrument performs a system check before each function in the test sequence (i.e., before every blank check, every accuracy check, every subject test).

You may use this instrument report.

Approved method for Intox EC/IR II
260 IAC 2-4-2(b)(1):

- If “Please blow” appears on instrument display after completion of STEPS ONE through ELEVEN, perform an additional breath test, beginning with STEP ELEVEN

The instrument prompts for an additional test when the BAC results of the two previous tests in the sequence are not within 0.020 of each other.

- If “No 0.020 Agreement”*** is printed on report after this additional test:
 - perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE;
 - obtain an alternate chemical test for ethanol, or
 - perform a breath test on another instrument

*** **Example:** If the first test result is 0.130 and the second result is 0.100, the instrument will prompt for a third sample.

Three-test sequence with 0.020 agreement

[text omitted]
 Dry Gas Target: 0.077
 Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed

Test	g/210L	Time	
BLK	0.000	11:00	
CHK	0.076	11:01	← blank check
BLK	0.000	11:02	
SUBJ	0.130	11:03	← 1 st subject sample test
BLK	0.000	11:06	
SUBJ	0.100	11:06	← 2 nd subject sample test
BLK	0.000	11:07	
SUBJ	0.102	11:08	← 3 rd subject sample test
BLK	0.000	11:09	
CHK	0.076	11:10	
BLK	0.000	11:11	

Test Status Sample Complete

RESULT: 0.100 g/210L ← subject's BAC
 [text omitted] (lower of the two results within 0.020 of each other is reported)

The lower of the two results within 0.020 of each other is reported as the subject's BAC.

You may use this instrument report.

Three-test sequence with no 0.020 agreement

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.130	11:03	1 st subject sample test
BLK	0.000	11:06	blank check
SUBJ	0.105	11:06	2 nd subject sample test
BLK	0.000	11:07	blank check
SUBJ	0.083	11:08	3 rd subject sample test
BLK	0.000	11:09	blank check
CHK	0.076	11:10	calibration check
BLK	0.000	11:11	blank check

Test Status No 0.020 Agreement

RESULT: *.*** g/210L ← no BAC reported
11:08 EDT,
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS GRAMS OF ALCOHOL
PER 210 LITERS OF BREATH

Operator Signature

You may not use this instrument report to determine subject BAC.

**Approved method for Intox EC/IR II
260 IAC 2-4-2(b)(2):**

- If “Interfering Substance” is printed on report, perform an additional breath test beginning with STEP ONE and proceeding through STEP TWELVE.

Another 15-minute waiting period is required before beginning an additional breath test.

- If “Interfering Substance” is printed on report after this additional test sequence:
 - obtain an alternate chemical test for ethanol;
 - perform a breath test on another instrument, or
 - if a numerical value for subject’s BAC is printed on a report, check for correct date and time and **sign where indicated.**

Test sequence with Interfering Substance on first subject sample

[text omitted]
Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← **internal diagnostics**

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	*.***	11:03	1st subject sample test
BLK	0.000	11:04	blank check
CHK	0.076	11:05	calibration check
BLK	0.000	11:06	blank check

Test Status *.*** Interfering Substance

RESULT: *.*** ~~g/210L~~ **no BAC reported**
[text omitted]

If you get an “Interfering Substance” on the first test of a sequence, the sequence will end, and the result will be “Interfering Substance.”

You may not use this instrument report.

Test sequence with Interfering Substance on second subject sample

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed **internal diagnostics**

Test g/210L Time

BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.120	11:03	1st subject sample test
BLK	0.000	11:06	blank check
SUBJ	*.***	11:06	2nd subject sample test
BLK	0.000	11:07	blank check
CHK	0.076	11:08	calibration check
BLK	0.000	11:09	blank check

Test Status *.*** Interfering Substance

RESULT: 0.120 g/210L ← **subject's BAC**
11:03 EDT,
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS GRAMS OF ALCOHOL
PER 210 LITERS OF BREATH

Operator Signature

You may not use this instrument report unless you complete a second breath test as specified in the Approved Method, beginning with a 15-minute waiting period.

**Approved method for Intox EC/IR II
260 IAC 2-4-2(b)(3):**

- If “RFI Detected” is printed on report, locate and remove source of interference, and perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE.

Another 15-minute waiting period is not required.

- If “RFI Detected” is printed on report after this additional test sequence:
 - obtain an alternate chemical test for ethanol;
 - perform a breath test on another instrument, or
 - if a numerical value for subject’s BAC is printed on a report, check for correct date and time and **sign where indicated.**

*****Intox EC/IR II case construction provides “Faraday Cage” immunity.**

Test sequence with RFI Detected on first subject sample

[text omitted]
Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← **internal diagnostics**

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	*.***	11:03	1st subject sample test
BLK	0.000	11:04	blank check
CHK	0.076	11:05	calibration check
BLK	0.000	11:06	blank check

Test Status *.*** RFI Detected

RESULT: *.*** g/210L ← **no BAC reported**
[text omitted]

If you get an “RFI Detected” on the first test of a sequence, the sequence will end, and the result will be “RFI Detected.”

You may not use this instrument report.

Test sequence with RFI Detected on second subject sample

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test g/210L Time

BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.120	11:03	1 st subject sample test
BLK	0.000	11:06	blank check
SUBJ	*.***	11:06	2 nd subject sample test
BLK	0.000	11:07	blank check
CHK	0.076	11:08	calibration check
BLK	0.000	11:09	blank check

Test Status *.*** RFI Detected

RESULT: 0.120 g/210L ← subject's BAC
11:03 EDT,
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS GRAMS OF ALCOHOL
PER 210 LITERS OF BREATH

Operator Signature

You may not use this instrument report unless you complete a second breath test as specified in the Approved Method. Another 15-minute waiting period is not required.

Approved method for Intox EC/IR II
260 IAC 2-4-2(b)(4):

- If “Mouth Alcohol” is printed on report, perform an additional breath test, beginning with STEP ONE and proceeding through STEP TWELVE.

Another 15-minute waiting period is required.

- If “Mouth Alcohol” is printed on report after this additional test sequence:
 - obtain an alternate chemical test for ethanol;
 - perform a breath test on another instrument, or
 - if a numerical value for subject’s BAC is printed on a report, check for correct date and time and **sign where indicated.**

Test sequence with Mouth Alcohol on first subject sample

[text omitted]
Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← **internal diagnostics**

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	*.***	11:03	1st subject sample test
BLK	0.000	11:04	blank check
CHK	0.076	11:05	calibration check
BLK	0.000	11:06	blank check

Test Status *.*** Mouth Alcohol

RESULT: *.*** g/210L ← **no BAC reported**
[text omitted]

If you get a “Mouth Alcohol” on the first test of a sequence, the sequence will end, and the result will be “Mouth Alcohol.” You may not use this instrument report.

Test sequence with Mouth Alcohol on second subject sample

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.120	11:03	1 st subject sample test
BLK	0.000	11:06	blank check
SUBJ	*.***	11:06	2 nd subject sample test
BLK	0.000	11:07	blank check
CHK	0.076	11:08	calibration check
BLK	0.000	11:09	blank check

Test Status *.*** Mouth Alcohol

RESULT: 0.120 g/210L ← subject's BAC
11:03 EDT,
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS GRAMS OF ALCOHOL
PER 210 LITERS OF BREATH

Operator Signature

You may not use this instrument report unless you complete a second breath test as specified in the Approved Method, beginning with a 15-minute waiting period.

**Approved method for Intox EC/IR II
260 IAC 2-4-2(5)**

- If “Insufficient Sample” or “Time Out” is printed on report, perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE.

Another 15-minute waiting period is not required.

- If “Insufficient Sample” or “Time Out” is printed on report after this additional test sequence:
 - obtain an alternate chemical test for ethanol;
 - perform a breath test on another instrument, or
 - if a numerical value for subject’s BAC is printed on a report, check for correct date and time and **sign where indicated.**
- If “Insufficient Sample” or “Time Out” is caused by subject’s lack of cooperation, operator should record that test was refused.
- If a numerical value for subject’s BAC is printed on a report, check for correct date and time and **sign where indicated.**

Test sequence with Insufficient Sample on first subject sample

[text omitted]
Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	*.***	11:03	1 st subject sample test
BLK	0.000	11:04	blank check
CHK	0.076	11:05	calibration check
BLK	0.000	11:06	blank check

Test Status *.*** Insufficient Sample

RESULT: *.*** g/210L ← no BAC reported
[text omitted]

If you get an “Insufficient Sample” or “Time Out” on the first test of a sequence, the sequence will end, and the result will be “Insufficient Sample” or “Time Out.” You may not use this instrument report.

Test sequence with Insufficient Sample on second subject sample

Intox EC/IR-II: Subject Test

ISDT 550 W. 16th Street Indianapolis, IN 46202

Serial Number: 011082 Test Number: 47
Test Date: 08/07/2013 Test Time: 10:50 EDT

Operator Name: Bunion, Paul R
Operator Certification Number: G99999
Agency Name: Skyville
Observation Began: 08/07/2013 at 10:40
Observer Name: Bunion, Paul R
Driver License Number: 123456789
Subject Name: Sober, Stone
Subject D.O.B.: 05/31/1961

Dry Gas Target: 0.077
Lot Number: AG317601 Tank Number: 4 Exp Date: 06/05/2015

System Check: Passed ← internal diagnostics

Test	g/210L	Time	
BLK	0.000	11:00	blank check
CHK	0.076	11:01	calibration check
BLK	0.000	11:02	blank check
SUBJ	0.120	11:03	1 st subject sample test
BLK	0.000	11:06	blank check
SUBJ	*.***	11:06	2 nd subject sample test
BLK	0.000	11:07	blank check
CHK	0.076	11:08	calibration check
BLK	0.000	11:09	blank check

Test Status *.*** Insufficient Sample

RESULT: 0.120 g/210L ← subject's BAC
11:04 EDT,
08/07/2013

ALCOHOL READINGS ARE EXPRESSED AS GRAMS OF ALCOHOL
PER 210 LITERS OF BREATH

Operator Signature

You may not use this instrument report unless you complete a second breath test as specified in the Approved Method. Another 15-minute waiting period is not required.

Alternate Test

This is a blood test. The sample must be taken by a medical person, but a hospital is not needed.

The drawing of the subject's blood should be witnessed by an officer.

Print Last Test

Press "P" (for "Print")

Type in Password "OPER"

Press "Enter" key

Press "Space" bar to print

Will print only the last test in the instrument memory.

Laboratory Exercises

You will be required to submit the following instrument reports at the completion of these exercises:

Exercise 1: Personal breath test with duplicate copy

Exercise 2: Subject breath test

Exercise 3: Subject (instructor) breath test

Exercise 1: Complete a personal breath test by delivering two acceptable breath samples during a subject test sequence. Print and sign the instrument report. **Print a duplicate of this instrument report by use of the password protected “Print Last Test” command.**

Exercise 2: Complete a subject test sequence acting as the breath test operator and instructing another student in the delivery of two acceptable breath samples during a subject test sequence.** Print and sign the instrument report.

After completion of the above exercises, turn in your instrument reports to an ISDT instructor, and report to the classroom to take the written examination.

After your completed written examination is graded by an ISDT instructor, report to the laboratory to complete the final laboratory exercise below:

Exercise 3: Complete a subject test sequence acting as the breath test operator and instructing an ISDT instructor in the delivery of two acceptable breath samples during the subject test sequence.** Print, sign, and turn in the instrument report.

**** Emphasis should be placed on coaching the test subject on delivery of the samples in order to minimize the occurrence of “Insufficient sample” test results.**

260 IAC 2-4-2 Approved method for Intox EC/IR II breath analysis

The approved method that shall be followed in making an analysis of breath for ethanol using the Intox EC/IR II breath test instrument is as follows:

STEP ONE: The person to be tested must:

- (A) have had nothing to eat or drink;
- (B) not have put any foreign substance into his or her mouth or respiratory tract; and
- (C) not smoke;

within fifteen (15) minutes before the time the first breath sample is taken or at any time from the taking of the first breath sample until after the taking of the final breath sample.

STEP TWO: Verify that the instrument is in ready mode, as indicated by the instrument display.

STEP THREE: Press "Enter" key to start subject test.

STEP FOUR: Insert identification card into the barcode reader, or press the "Enter" key and use the keyboard to enter the breath test operator information requested by the instrument display.

STEP FIVE: When requested by the instrument display, enter the beginning date and time of the fifteen (15) minute period described in STEP ONE.

STEP SIX: When requested by the instrument display, select "Y" or "N" to indicate whether the breath test operator is the officer with control of the subject during the fifteen (15) minute period described in STEP ONE.

STEP SEVEN: If "N" is selected in STEP SIX, when requested by the instrument display, enter the information of the officer with control of the subject during the fifteen (15) minute period described in STEP ONE.

STEP EIGHT: Enter incident information requested by the instrument display.

STEP NINE: Enter subject information by:

- (A) inserting the subject's driver/operator license or identification card into the barcode reader; or
- (B) pressing the "Enter" key and using the keyboard to enter the available subject information requested by the instrument display.

STEP TEN: When "Please blow" appears on the instrument display, place a new mouthpiece in the breath tube. Instruct the subject to deliver a breath sample. Remove mouthpiece when prompted by the instrument display and discard.

STEP ELEVEN: When "Please blow" appears again on the instrument display, place a new mouthpiece in the breath tube. Instruct the subject to deliver a breath sample. Remove mouthpiece when prompted by the instrument display and discard.

STEP TWELVE: Print the instrument report and remove it from the printer; check the instrument report for the numerical value of the subject's breath ethanol concentration and the correct date and time and sign the instrument report where indicated.

OVER

If any of the following messages appear on the instrument display or report, proceed as follows:

(1) If **"Please blow"** appears on the instrument display after completion of STEPS ONE through ELEVEN, perform an additional breath test, beginning with STEP ELEVEN. If "No 0.020 Agreement" is printed on the instrument report after this additional breath test:

- (A) perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE;
- (B) obtain an alternate chemical test for ethanol; or
- (C) perform a breath test on another breath test instrument.

(2) If **"Interfering Substance"** is printed on the instrument report, perform an additional breath test, beginning with STEP ONE and proceeding through STEP TWELVE. If "Interfering Substance" is printed on the instrument report after this additional breath test:

- (A) obtain an alternate chemical test for ethanol;
- (B) perform a breath test on another breath test instrument; or
- (C) if a numerical value for the subject's breath ethanol concentration is printed on any instrument report, check the instrument report for the correct date and time and sign the instrument report where indicated.

(3) If **"RFI Detected"** is printed on the instrument report, locate and remove the source of the interference and perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE. If "RFI Detected" is printed on the instrument report after this additional breath test:

- (A) obtain an alternate chemical test for ethanol;
- (B) perform a breath test on another breath test instrument; or
- (C) if a numerical value for the subject's breath ethanol concentration is printed on any instrument report, check the instrument report for the correct date and time and sign the instrument report where indicated.

(4) If **"Mouth Alcohol"** is printed on the instrument report, perform an additional breath test, beginning with STEP ONE and proceeding through STEP TWELVE. If "Mouth Alcohol" is printed on the instrument report after this additional breath test:

- (A) obtain an alternate chemical test for ethanol;
- (B) perform a breath test on another breath test instrument; or
- (C) if a numerical value for the subject's breath ethanol concentration is printed on any instrument report, check the instrument report for the correct date and time and sign the instrument report where indicated.

(5) If **"Insufficient Sample"** or **"Time Out"** is printed on the instrument report, perform an additional breath test, beginning with STEP TWO and proceeding through STEP TWELVE. If "Insufficient Sample" or "Time Out" is printed on the instrument report after this additional breath test:

- (A) obtain an alternate chemical test for ethanol;
- (B) perform a breath test on another breath test instrument; or
- (C) if a numerical value for the subject's breath ethanol concentration is printed on any instrument report, check the instrument report for the correct date and time and sign the instrument report where indicated.

If an "Insufficient Sample" or "Time Out" message is caused by the lack of cooperation of the subject, the breath test operator should record that the test was refused and, if a numerical value for the subject's breath ethanol concentration is printed on any instrument report, check the instrument report for the correct date and time and sign the instrument report where indicated.