

ALCOHOL TESTING METHODS

Breath Alcohol Testing

Breath alcohol levels have been shown to correlate with Blood Alcohol Concentrations (BACs). During respiration, gas is exchanged from the lungs to the blood (primarily Oxygen (O₂)) during inhalation, and vice versa (primarily Carbon Dioxide (CO₂)) during exhalation. During this exchange, alcohol in the blood vaporizes and is carried out of the lungs in the exhaled breath.

There are several types of breath alcohol testers available today, all of which fall within three categories:

- Evidential Breath Testing Devices (provide forensic quality results)
- Portable, electronic Hand-Held Devices (provide non-forensic results)
- Disposable Devices (provide non-forensic results).

Evidential breath testing devices are generally expensive (costs range from \$2000-\$5000 per unit), require regular maintenance, repair and calibration, and must be operated by certified personnel. Attachments such as sterile mouth pieces must be used each time a test is performed. These units are large table top units designed to be used in one location. Movement can cause a change in calibration.

The portable, electronic hand-held devices provide non-forensic results and are used for screening for alcohol. Portables often require calibration, are less accurate than evidential devices, and require a recovery period between tests that limits the number of tests that can be performed per hour. Hand-held models have been reported to break easily and require regular repair.

The disposable devices are practical, cost effective methods to screen for the presence of alcohol on a test subject's breath. Since they are single-use testers, there is no risk of cross contamination among test subjects. The cost per test for these preliminary screening devices are generally considerably less than the cost of testing using electronic units. They do not require calibration and have a straightforward test procedure that is simple enough for even the average consumer to use.

* Although breath alcohol levels have been shown to represent Blood Alcohol Concentrations (BACs), the connection depends on many factors.

Blood Alcohol Testing

Blood Alcohol Concentration (BAC) is considered to be the standard for measuring the degree to which an individual is impaired by alcohol. For years, studies have shown that there is a direct correlation between the blood alcohol concentration and the degree to which reactions and judgments are impaired. The methodology used for blood alcohol testing is Gas Chromatography and is the most accurate forensic quality test in the industry today. However, drawing blood is an invasive and expensive procedure that most companies prefer to avoid.

Urine Alcohol Testing

Although urine alcohol testing will indicate the presence of alcohol in a person's system, it will not indicate an individual's current condition. Once consumed, alcohol enters the blood through the stomach within about 15 minutes, causing immediate impairment. It is then metabolized by the body and, after 1½ to 2 hours, will begin to show up in the urine. Therefore, urine alcohol does not give a true picture of the person's current condition. The results indicate the person's condition several hours before. Additionally, urine alcohol concentration does not directly correspond to blood alcohol concentration.

Urine alcohol concentration will vary depending on the person's metabolism and the amount of fluid in his system. For instance, a person who is slightly dehydrated will tend to have a higher alcohol concentration in his urine than someone who has a normal level of fluid in his system. At least one study has indicated that a false positive for urine alcohol can occur. High levels of sugar and acetone in the body can cause fermentation in the urine, creating a false positive for urine alcohol.

Saliva Alcohol Testing

Saliva testers are treated with an enzyme alcohol oxidase, which responds to alcohol in proportion to the concentration of alcohol in a mixed saliva sample placed on it. The user estimates the BAC by comparing the color change on the test strip patch to standard colors calibrated to correspond to different BAC's. Although a correlation between blood alcohol concentration and saliva alcohol concentration is believed to exist, the technology and chemical reaction which is employed in all of these testers has not been proven to be accurate or reliable.

Although some saliva testers seem to indicate the presence of alcohol fairly well, the enzyme alcohol oxidase used in these testers is easily affected by hot and cold temperatures. Hot temperatures will tend to indicate falsely high readings, while cold temperatures will tend to indicate falsely low readings. Exposure to temperatures above 80 degrees Fahrenheit or to ambient air will destroy the enzyme alcohol oxidase rendering the tester useless. Most saliva testers give no indication if contamination has occurred, they just won't work. Saliva testers generally have a shelf life of one year or less. Additionally, most saliva testers have test results from independent laboratories.