

SCRAM CAM Reference Guide

SCRAM Continuous Alcohol Monitoring[®]—or SCRAM CAM[®]—

is the world's most widely used and trusted 24/7 transdermal alcohol testing system designed for high-risk, hardcore DUI and alcohol offenders. The SCRAM CAM device shows the frequency and pattern of alcohol consumption by automatically taking samples of the wearer's insensible perspiration and performing analysis on a continuous basis, every 30 minutes, 24 hours a day, 7 days a week. Continuous alcohol monitoring is proven to support long-term behavior change and complements treatment for alcohol dependence or addiction.

Transdermal Alcohol Science

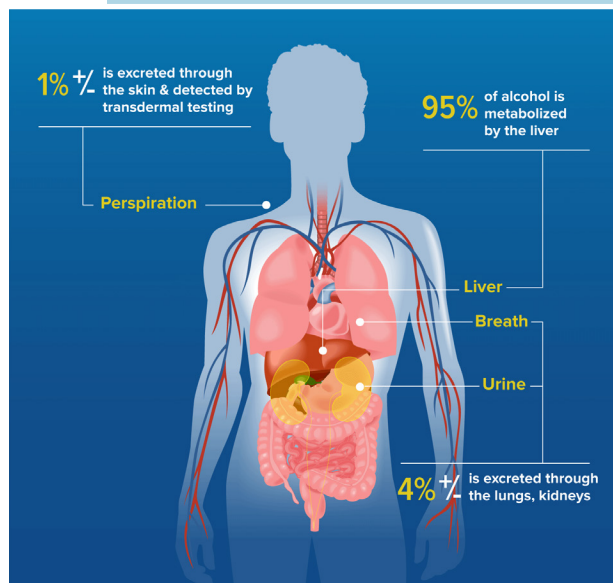
The SCRAM CAM bracelet is based on the science of transdermal alcohol testing. Transdermal—or literally “through the skin”—has been known for decades as a reliable way to transport substances, both through absorption and excretion. In the 1920s researchers first began testing the concept of alcohol emissions through the skin. In 1985, researchers at the Indiana University School of Medicine published two studies on the subject of measuring volatile substances through the skin and measuring alcohol excretion in human perspiration. Today the science is well studied, documented, and peer reviewed.

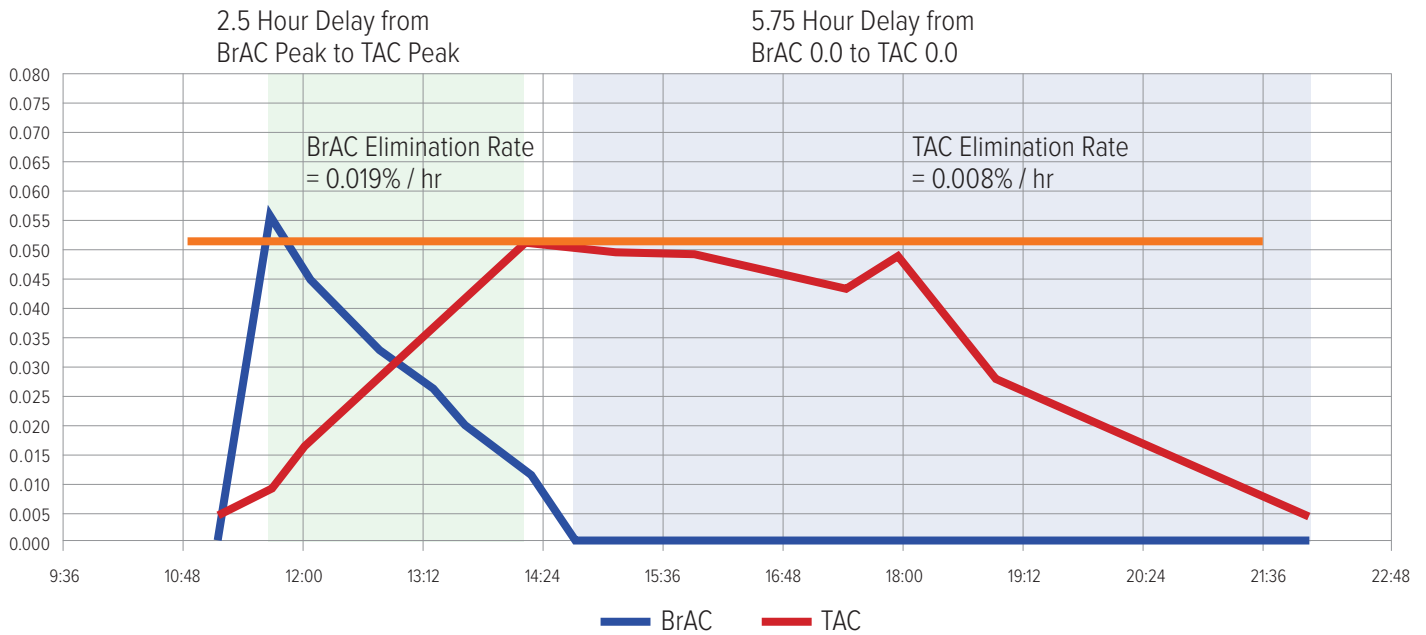
When ingested, alcohol first passes through the gastrointestinal system and then enters the blood stream. As it passes through the liver, alcohol is metabolized. Over time, about 95 percent of the alcohol is processed by the liver. The remaining alcohol is excreted through the kidneys, lungs, and skin and is thus detectable in urine, breath, and sweat. Breath alcohol detection devices detect alcohol concentration in the air expelled by the lungs, whereas transdermal devices such as SCRAM CAM detect alcohol concentration in otherwise undetectable vapors passed through the skin or insensible perspiration.



SCRAM CAM Facts

- The SCRAM Continuous Alcohol Monitoring (CAM) bracelet has been in use since 2003 and is currently used in six countries, all fifty US states, and over 2,000 U.S. courts.
- SCRAM CAM is used to monitor approximately 22,000 unique individuals per day.
- The SCRAM CAM bracelet has been used to monitor over 760,000 unique individuals for a total of over 80,000,000 monitored days.





One percent of consumed alcohol is lost through the skin as a gas. Transdermal alcohol sensing methods detect the gas phase of alcohol in the air just above the skin. The alcohol detected is measured as Transdermal Alcohol Concentration (TAC) that parallels the more familiar Blood Alcohol Concentration (BAC) curves, but its curve is shifted later in time by 30 minutes to several hours. TAC curves will rise and achieve their peak slower than BAC curves, meaning TAC curves will achieve their peaks after BAC curves achieve their peaks. TAC will remain elevated after BAC has returned to zero. These differences between TAC and BAC curves are caused by the fact that it takes time for alcohol to diffuse from the bloodstream all the way through the skin, so TAC concentrations always lag behind real-time BAC concentrations.

SCRAM CAM Bracelet Technology

The SCRAM CAM bracelet faceplate has holes that lead to a collection chamber, which collects insensible perspiration coming from the wearer's skin. Every thirty minutes the CAM bracelet takes a "TAC reading" by running a pump and pulling the contents of the collection chamber across an alcohol sensor.

The alcohol sensor is an electrochemical fuel cell, similar to the electrochemical fuel cells used in most evidential and preliminary alcohol breath testing devices. Only alcohol molecules chemically react with a substance on the electrochemical fuel cell, which produces an electrical signal. If alcohol is present in the volume of insensible perspiration, the electrochemical fuel cell's electrical signal output will increase in proportion to the amount of alcohol. If no alcohol is present, there will be no measurable increase in the electrical signal.

Data Interpretation

All TAC alerts are analyzed, and data is interpreted according to a strict set of “confirmation criteria”, rules that have proven to be effective at minimizing false positives. The SCRAM CAM bracelet contains patented technology that tests for alcohol in the environment. Therefore, if there is alcohol in the environment contributing to the overall detection, the detection will not be confirmed as consumption. The Environmental Contaminant Test is one of the many safeguards in the SCRAM CAM system’s confirmation process that assists in distinguishing between environmental contaminants and consumed alcohol that has metabolized in the body.



Court Acceptance

SCRAM CAM results have been accepted in thousands of probation violation and revocation hearings, as well as hundreds of evidentiary hearings across the U.S. and Australia. Sanctions can be verified and enforced based on the data received from the SCRAM CAM device, ensuring single-source admissibility and eliminating the need for a “secondary screen” or additional confirmation of a drinking event. SCRAM CAM has been upheld as valid and reliable by Daubert, Frye, and FRE 702 standards of admissibility in every state where it has been challenged, including state appellate and supreme court-level hearings.



Calibration Process

Each SCRAM CAM bracelet is calibrated to measure the alcohol content of a known TAC alcohol standard before it is put into use. This ensures it measures the correct TAC value within an acceptable tolerance range for a given amount of transdermal alcohol. The calibration process duplicates the way law enforcement and evidential breath testing devices are calibrated.



Sources of Error and Safeguards

No technology is 100% perfect, and potential sources of error that can affect SCRAM CAM results are tampering, mechanical errors, human errors, and environmental alcohol contaminants.

The SCRAM CAM bracelet is equipped with industry-leading, anti-tamper technology that incorporates multiple sensors and accurately detects any tamper attempts. These sensors monitor changes in temperature and any attempt to cut, obstruct, remove, or otherwise defeat the technology. The bracelet’s intelligent self-diagnostic capabilities constantly monitor and report its functionality. Any attempts to tamper with the bracelet or its functionality will be detected by the SCRAM CAM system.



Pump and electrochemical fuel cell degradation will always cause the TAC measurement to read lower than it should, which benefits the wearer. The bracelet routinely performs self-diagnostic tests and sends the results to the monitoring network. If pump or electrochemical fuel cell self-diagnostic measurements meet certain conditions, the bracelet will be removed from use and replaced. Every bracelet is returned to the factory for reconditioning and recalibration after 365 days of use, even if the self-diagnostic measurements indicate the bracelet is functioning properly.

As safeguards, confirmed alerts are reviewed and checked by more senior data analysts and any alert can be reviewed again upon request of the supervising authority.

Peer Review, Scientific Acceptance, and Product Testing, and Error Rates

The SCRAM CAM bracelet has been the subject of, or used, in dozens of independent, peer-reviewed studies. It continues to be used in an ongoing stream of research and SCRAM is generally accepted by the scientific community to be a reliable method of determining if a person has consumed alcohol.

A common discussion point in much of this outside research is that SCRAM confirmation criteria is conservative and much more likely to result in false negatives than false positives. Some researchers have recommended that our confirmation criteria be more aggressive for purposes of clinical intervention, but they agree that this may not be appropriate in a criminal justice setting where the consequences are high.