

What is a substituted or adulterated specimen?

In short, a substituted specimen is a urine sample that is not consistent with normal human urine.

An adulterated specimen has had something added to it to try and thwart the test.

Before a laboratory tests a sample for drugs, they do what's known as Validity Testing. They want to make sure the sample is consistent with normal human urine. They do this by looking at color, smell, specific gravity, and creatinine. Color and smell are self-explanatory—we all know what urine looks like and smells like. The other two are a bit more complicated. Specific gravity of a liquid is its density. Water has a specific gravity of 1.0000. Urine has a higher specific gravity. Creatinine is a chemical found in all human urine. The concentrations of creatinine range from about 20 – 300 ng/ml. They also check for substances that are known adulterants that can be added to urine to attempt to thwart the test.

Substituted

The lab conducts very sophisticated tests to determine the specific gravity and creatinine level of each sample. The labs follow strict guidelines set forth by SAMHSA and HHS to determine if a sample has acceptable specific gravity and creatinine levels. These levels are derived from studies with thousands of test subjects. Substituted specimens have creatinine and specific gravity values that are so diminished, they are neither consistent with human urine nor have these levels ever been found physiologically in human urine. The lab tests the sample multiple times on different machines to make sure the readings are accurate.

Adulterated

An adulterated specimen is a urine sample containing a substance that is not found in urine. Here are some examples of adulterants that labs can detect: Nitrites, Hexavalent Chromium, Halogens, Hydrogen Peroxide, Pyridium Chlorochromate, and Glutaraldehyde. They also check the PH of the sample. If the PH is too far out of normal range for human urine, they report it as adulterated. Common things added to urine that can affect the PH is Drano, Bleach, and Ammonia,

Medical Review

Your Medical Review Officer should interview any donor whose sample came back as “substituted” or “adulterated” and offer them to give a medical explanation for the lab's findings. No such medical condition exists.

What is the result and what am I supposed to do?

DOT regulations state that a laboratory confirmed substituted or adulterated sample with no medical explanation should be released to the employer as a “Refusal to test”. In other words, the donor refused to give his or her own urine sample or added something to the sample at the time of the test. This is treated the same as a positive test. The employer must accept the MRO's verified result and take appropriate action by removing the employee from safety sensitive duties.

For non-DOT regulated employees, we will still release it as a refusal to test. It is up to the employer to determine what action to take with these results; however, we would advise you to “trust the science”.