

Overview

Useful For

Detecting the presence of acetone, methanol, isopropanol, or ethanol in urine with subsequent quantitation

This test is **not intended for use** in employment-related testing.

Providing chain of custody for when the results of testing could be used in a court of law. Its purpose is to protect the rights of the individual contributing the specimen by demonstrating that it was always under the control of personnel involved with testing the specimen; this control implies that the opportunity for specimen tampering would be limited.

Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
COCH	Chain of Custody Processing	No	Yes

Testing Algorithm

This test includes analysis of methanol, ethanol, isopropanol, and acetone.

Method Name

Headspace Gas Chromatography Flame Ionization Detector (HSGC-FID)

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

This test is for situations that require the chain-of-custody process. For testing **not** requiring chain of custody, order VLTU / Volatile Screen, Random, Urine.

Additional Testing Requirements

If urine creatinine is required or adulteration of the sample is suspected, order ADLTX / Adulterants Survey, Chain of Custody, Random, Urine in addition to this test.

Specimen Required

**Supplies:** Chain-of-Custody Kit (T282)  
**Container/Tube:** Chain-of-Custody Kit containing the specimen containers, seals, and documentation required.  
**Specimen Volume:** 10 mL  
**Collection Instructions:** Collect a random urine specimen using the container provided, seal, and submit with the associated documentation to satisfy the legal requirements for chain of custody testing.

Forms

- 1. [Chain of Custody Request](#) is included in the Chain-of-Custody Kit (T282).
- 2. If not ordering electronically, complete, print, and send a [Therapeutics Test Request](#) (T831) with the specimen.

Specimen Minimum Volume

1 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	14 days	
	Ambient	24 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Urine provides a medium for easy screening for methanol, ethanol, isopropanol, and acetone. Acetone is generally elevated in metabolic conditions such as diabetic ketoacidosis. Methanol and isopropanol are highly toxic and result from exogenous ingestion.

Ethanol is one of the most widely abused legal substances in the United States. It is the active agent in beer, wine, vodka, whiskey, rum, and other liquors. Ethanol acts on cerebral function as a depressant similar to general anesthetics. This depression causes most of the typical symptoms such as impaired thought, clouded judgment, and changed behavior. As the level of alcohol increases, the degree of impairment progressively increases.

Chain of custody is required whenever the results of testing could be used in a court of law. Chain of custody is a record of the disposition of a specimen to document each individual who collected, handled, and performed the analysis. When a specimen is submitted in this manner, analysis will be performed in such a way that it will withstand regular court scrutiny.

Reference Values

Methanol  
Not detected (Positive results are quantitated.)

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Cutoff concentration: 10 mg/dL

Toxic concentration: > or =10 mg/dL

#### Ethanol

Not detected (Positive results are quantitated.)

Cutoff concentration: 10 mg/dL

#### Isopropanol

Not detected (Positive results are quantitated.)

Cutoff concentration: 10 mg/dL

Toxic concentration: > or =10 mg/dL

#### Acetone

Not detected (Positive results are quantitated.)

Cutoff concentration: 10 mg/dL

Toxic concentration: > or =10 mg/dL

### Interpretation

#### Methanol:

The presence of methanol indicates exposure that may result in intoxication, central nervous system (CNS) depression, and metabolic acidosis. Ingestion of methanol can be fatal if patients do not receive immediate medical treatment.

#### Ethanol:

The presence of ethanol indicates exposure that may result in intoxication, CNS depression, and metabolic acidosis.

#### Isopropanol:

The presence of isopropanol indicates exposure that may result in intoxication and CNS depression. Ingestion of isopropanol can be fatal if patients do not receive immediate medical treatment.

#### Acetone:

The presence of acetone may indicate exposure to acetone; it is also a metabolite of isopropanol and may be detected during ketoacidosis.

### Cautions

Quantitation of acetone, methanol, isopropanol, or ethanol in urine correlates poorly with degree of intoxication.

### Clinical Reference

1. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023;chap 43
2. Mayfield J, Mihic SJ. Ethanol. In: Brunton LL, Knollmann BC, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. 13th ed. McGraw-Hill Education; 2012;chap 27
3. Olson KR, Anderson IB, Benowitz NL, et al. Specific Poisons and Drugs: Diagnosis and Treatment. In: Poisoning and Drug Overdose. 8th ed. McGraw-Hill; 2022;section II

**Performance****Method Description**

Samples are analyzed and quantified by headspace gas chromatography with flame ionization detection. (Baselt RC. Disposition of Toxic Drugs and Chemicals in Man. 10th ed. Biomedical Publications; 2014:2211; Pinto M, Eusebio E, Monteiro C. Development and validation of an analytical method for volatiles with endogenous production in putrefaction and submersion situations. J Anal Toxicol. 2021;45(9):961-968. doi: 10.1093/jat/bkaa154)

**PDF Report**

No

**Day(s) Performed**

Monday through Saturday

**Report Available**

1 to 2 days

**Specimen Retention Time**

2 weeks

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Superior Drive

**Fees & Codes****Fees**

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

**Test Classification**

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

G0480  
80320 (if appropriate for select payers)  
[Clinical Toxicology CPT Code Client Guidance](#)

**LOINC® Information**

# Test Definition: VLTUX

Volatile Screen, Chain of Custody, Random,  
Urine

Test ID	Test Order Name	Order LOINC® Value
VLTUX	Volatile Screen, CoC, U	24350-1

Result ID	Test Result Name	Result LOINC® Value
36247	Volatile Scrn, U	12983-3
36248	Methanol, U	5695-2
36249	Ethanol, U	5645-7
36250	Acetone, U	5570-7
36251	Isopropanol, U	9434-2
36252	Chain of Custody	77202-0