



Designation: D7831 – 20

Standard Practice for Sampling of Tanks by Field Personnel¹

This standard is issued under the fixed designation D7831; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This practice covers information for field personnel to follow in order to collect samples from tanks.

1.2 The purpose of this practice is to help field personnel in planning and obtaining samples from vertical and horizontal tanks, open-topped rectangular/square tanks, railroad and truck tankers, vacuum trucks, and tanks with multiple compartments using equipment and techniques that will assist in meeting the sampling objectives.

1.3 The practice is applicable to hazardous materials, products, raw materials, by-product, or waste.

1.4 Sampling from circulating pump discharge valves and tank transfer lines is not addressed in this practice.

1.5 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[D4687 Guide for General Planning of Waste Sampling](#)

¹ This practice is under the jurisdiction of ASTM Committee [D34](#) on Waste Management and is the direct responsibility of Subcommittee [D34.01.02](#) on Sampling Techniques.

Current edition approved Dec. 1, 2020. Published January 2021. Originally approved in 2013. Last previous edition approved in 2013 as D7831 – 13. DOI: 10.1520/D7831-20.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D4840 Guide for Sample Chain-of-Custody Procedures](#)
[D5088 Practice for Decontamination of Field Equipment Used at Waste Sites](#)
[D5283 Practice for Generation of Environmental Data Related to Waste Management Activities: Quality Assurance and Quality Control Planning and Implementation](#)
[D5495 Practice for Sampling With a Composite Liquid Waste Sampler \(COLIWASA\)](#)
[D5681 Terminology for Waste and Waste Management](#)
[D5792 Practice for Generation of Environmental Data Related to Waste Management Activities: Development of Data Quality Objectives](#)
[D6232 Guide for Selection of Sampling Equipment for Waste and Contaminated Media Data Collection Activities](#)
[D6759 Practice for Sampling Liquids Using Grab and Discrete Depth Samplers](#)
[D7353 Practice for Sampling of Liquids in Waste Management Activities Using a Peristaltic Pump](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this practice, refer to Terminology [D5681](#).

3.1.2 *tank, n*—stationary device designed to contain an accumulated material that is constructed of non-earthen materials that provide structural support.

3.1.2.1 *Discussion*—It may be appropriate to consider various containers (portable devices), such as roll offs, tanker trucks, and rail tank cars, as tanks for sampling purposes, even if they meet a regulatory definition of a container.

4. Summary of Practice

4.1 This practice addresses sampling planning, including pre-sampling and site inspections.

4.2 This practice lists some of the factors that should be considered when collecting tank content samples.

4.3 Sampling procedures for the equipment needed to sample vertical and horizontal tanks, open-topped rectangular/square tanks, railroad and truck tankers, vacuum trucks, and tanks with multiple compartments are presented.

4.4 Sampling procedures to sample single and stratified materials and wastes are addressed.

4.5 It is not intended to cover all equipment that might be purchased or custom made, nor does this practice address every sampling situation that is encountered in the field.

5. Significance and Use

5.1 This practice is intended to assist field personnel in obtaining samples from tanks for laboratory analysis. The cost associated with sampling and analysis, along with other reasons, make it essential that samples be taken correctly before submitting them for chemical analysis, physical testing, or both. Incorrect sampling can invalidate resulting data.

5.2 This practice provides guidance in choosing the sampling technique and equipment suitable for specific situations. It is recommended that this guide be used as a supplement to a written field sampling plan.

5.3 The procedures for sampling tanks using a COLIWASA, liquid profiler sampler, bacon bomb sampler, and peristaltic pump and tubing are delineated.

6. Objective of Sampling

6.1 The purpose of sampling is to collect a representative sample of all or part of the contents of the tank to determine the physical and chemical characteristics of those contents. This information may then be used to:

- 6.1.1 Select suitable methods of treatment and disposal of the contents,
- 6.1.2 Provide evidence for use in a court of law,
- 6.1.3 Confirm that the tank contains what is written on the inventory sheets,
- 6.1.4 Confirm that the tank car or truck contains what is written on the manifest or other type of documentation.

6.2 In most cases, there is a written plan that describes the work to be done (Guide D4687). In other cases, there is no written plan and the instructions are only verbal.

6.3 If the objectives of sampling are unclear or unknown to the field personnel, they should question their supervisor or project manager about the objectives. Well-informed field personnel are then alert to unforeseen circumstances or events that might invalidate the samples.

7. Pre-Sampling Inspection

7.1 Information about the contents of the tanks may be available from:

- 7.1.1 Previous analysis of tank contents,
- 7.1.2 Records or knowledge of the plant process or other sources of the material in the tank,
- 7.1.3 Shipping manifest documents.

7.2 Personnel doing the pre-sampling and sampling must be aware of any special procedures that are to be followed at the given site. Work plans shall include a worker health and safety section because there are potential hazards associated with opening tanks as well as with potentially hazardous contents. Examples of special procedures are donning appropriate protective clothing, personal protective equipment, use of safety equipment of various kinds, evacuation procedures, fire and explosion procedures, vehicle cleaning procedures such as

water washing before leaving the site or storage area, and many others that would be site or storage specific.

7.3 Visually inspect the tank. The type of tank and construction material, along with any markings on the tank, may indicate information about the contents.

7.3.1 Special precautions should be taken when the tank is in poor condition, such as a material leaking from the tank sides, pumps, and flanges. If the tank ladders are rusted or corroded, this might indicate that the tank manway or other covers may be difficult to open and the ladders unsafe to use.

7.3.2 Labels and records about a tank may not be accurate. This is especially true for tanks containing multiple waste materials or tanks that contain stratified materials.

7.4 Examples of different tanks and tank-like containers include:

7.4.1 Vertical tanks, often used for storage of petroleum and petroleum waste product and various other chemicals.

7.4.2 Horizontal tanks, common as railroad and truck tanker cars, vacuum trucks, and for storage of waste materials and products at facilities. Many of these tanks have multiple compartments and each compartment may need to be sampled separately.

7.4.3 Open-topped rectangular and square tanks, common at electroplating facilities and batch processing plants. These can also include concrete sumps with vertical walls.

7.5 The sampling tools, sampling equipment, and sample container shall be selected based on information gathered in the initial characterization of the tank, its contents, and possible sampling points.

7.6 Potential sampling points should be evaluated for safety and accessibility.

7.6.1 Tools needed to remove the manway or other covers should be non-sparking and intrinsically safe.

7.7 The following information shall be gathered and recorded in the field logbook as applicable:

7.7.1 Tank type (that is, horizontal, vertical) dimensions, volume, and conditions (that is, corroded, rusted, leaking contents, and so forth). A sketch of the tank showing dimensions and depths of contents should be recorded.

7.7.2 Physical characteristics (that is, color, viscosity, particle size, and so forth) and quantity and depth of containerized material.

7.7.3 All writing, stencils, labels, or other identifying markings on the tank (that is, flammability and/or reactivity labels, product name and hazards, and so forth).

7.7.4 Appropriate screening instrument and method readings of the tank head space gases or contents, or both (for example, organic vapor analyzer and photo ionization detectors, combustible gas indicators (CGIs)), pH paper, or meter readings.

8. Selection of Suitable Sampling Procedure

8.1 The physical state(s) of the material(s) being sampled is an important criterion when sampling.

8.2 A tank containing one liquid, such as water or a mixture of liquids, such as a stable emulsion like  Documents