



Standard Practice for Sampling Liquid Paints and Related Pigmented Coatings¹

This standard is issued under the fixed designation D3925; 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 reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice describes methods of taking representative samples of fluid paint or pigmented coating products from containers of any type.

1.2 Two ISO standards, ISO 1513 and ISO 15528, cover the details and equipment for sampling of liquid paints and associated materials in much greater detail than this standard. The reader is referred to those standards for more information.

1.3 The sampling of dry powder paints, clear coatings, mixed solvents, and nonpigmented materials of any type is not covered in this procedure.

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

1.5 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1475 Test Method For Density of Liquid Coatings, Inks, and Related Products

2.2 *ISO Documents:*

ISO 1513 Paints and varnishes—Examination and preparation of samples for testing³

ISO 15528 Paints, varnishes and raw materials for paints and varnishes—Sampling³

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

Current edition approved June 1, 2015. Published June 2015. Originally approved in 1980. Last previous edition approved in 2010 as D3925 – 02 (2010). DOI: 10.1520/D3925-02R15.

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.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *batch, n*—the quantity of liquid paint or coating produced in the final mixing operation after all production processes are complete. For example, when a number of pigment dispersions are reduced with additional vehicle together in a large tank, the resulting final mixture is one batch.

4. Significance and Use

4.1 Samples are taken from batches, lots, and shipments of paint in order to determine their uniformity and compliance with specification requirements. It is very important that these samples be of convenient and economical size and that they be representative of the batch of paint at the time it was filled into shipping or storage containers.

4.2 The time and effort necessary to ensure that the sample is representative of the original material will be repaid in reduction of laboratory work and elimination of possible rejections of acceptable material.

5. Sampling Considerations

5.1 The use of common sense and good judgment is important even in the apparently simple task of taking samples.

5.2 Use care to ensure that all containers, agitating equipment, and sampling apparatus are *clean* and that they can in no way contaminate the sample being taken. Slight contamination of the paint sample may lead to false test results.

5.3 The sample container should be dry and not cooler than the temperature of the area in which the sample is to be taken.

5.4 Because pigmented coatings are dispersions and not solutions, finely divided pigment particles dispersed in the coating vehicle may settle upon standing. Consequently, thorough and careful agitation before sampling is necessary to restore the paint to its original, uniform condition. The method of agitating or stirring is therefore of prime importance.

5.5 As soon as samples of paint are taken from the shipping or storage container, place them in clean, nonreactive, dry, air-tight containers to prevent evaporation. Do not store samples in plastic bottles because volatile solvents may diffuse through the walls. Loss of volatile solvents may introduce errors in such tests as viscosity, weight per gallon, and

nonvolatile content as well as other properties. If cap liners are used, they should also be nonreactive with the material. If the sample is self reactive or highly volatile, appropriate sample container precautions should be taken to prevent over-pressurization of the container.

5.6 When representative samples have been obtained and packaged in clean, closed containers, deliver them promptly to the testing laboratory. During the period between sampling and delivery to the testing laboratory it is important that samples be kept at temperatures from 40 to 100°F (5 to 40°C) because extremes of temperature may change properties of some paint products.

6. Procedure

6.1 Because of differences in physical properties, somewhat different procedures are required for agitating and sampling those paints containing water as the volatile component in comparison to those containing organic solvents. For coatings with no volatile ingredients, use the method applicable to materials containing organic solvents.

6.2 *Pigmented Coatings Containing Organic Solvents*—Materials in this group are of many different types but all contain organic solvents, not water, as their volatile portion and they are fluids, not dry powders.

6.2.1 *Small Containers:*

6.2.1.1 When the batch to be sampled is filled in small containers and batch numbers are marked on the container, put all containers from the same batch together. From *each batch* select at random 1 % of, but not more than five containers, using the next larger whole number if a fraction results. For example, if there are 275 containers in a batch, select three for test.

6.2.1.2 After selection of the filled, unopened containers, thoroughly agitate or stir the contents by the best means available. Acceptable methods of mixing are mechanical shaking or stirring or hand stirring with a paddle, followed by “boxing,” that is pouring back and forth between the original and a clean empty container. Mechanical shakers are desirable for most materials since there is thorough agitation in a closed container. To prevent evaporation, agitate in a closed container lacquers and other coatings containing a highly volatile solvent.

6.2.1.3 Before mechanical shaking, open the container and check to be sure that the pigment has not caked on the bottom of the container. If this condition exists, stir manually to break up the hard settling and then put the containers on the mechanical shaker. Agitate paints having a weight per gallon of 11 lb (1.3 g/mL) or less on the shaker for 10 min and those with a weight per gallon of more than 11 lb for 20 min.

6.2.1.4 Once the contents have been thoroughly agitated, pour half of the material into an empty container and take a 1 qt (1 L) (or smaller if taken from a container of 1 qt or less) sample from each half. Determine the weight per gallon on

each sample in accordance with Test Method **D1475**. The two determinations should not differ more than 0.5 %. If the results differ by more than this the paint is not thoroughly mixed. Return the material to the original container, stir again, and repeat the test.

6.2.2 *Containers Larger than 5 Gal:*

6.2.2.1 *30 and 55-Gal Drums*—From each batch select at random 5 % of but not more than three containers. Drums may be stirred satisfactorily by several means. With open-head types, mechanical or manual stirring may be used. Some drums contain their own agitators; drum shakers or rollers may also be used. After thorough agitation, take samples from the top and bottom of the drum and compare weights per gallon as described in **6.2.1.4**.

6.2.2.2 *250 to 500-Gal Containers (Tote Tanks)*—Select at random 25 % of all containers for test. Take samples from top and bottom of the container and compare weight per gallon determinations as described in **6.2.1.4**.

6.2.2.3 *Tank Wagons and Tank Cars*—Sample each compartment of the wagon or car. Pigmented paints and coatings packaged in large containers are generally formulated to be essentially nonsettling. Therefore, take samples from the top, middle, and bottom of the container and make weight-per-gallon determinations before any vigorous stirring is done. If the resulting tests fall within the limits described earlier, no further agitation is necessary. Samples may be obtained with a Bacon-bomb sampler or a “thief” apparatus.

6.3 *Pigmented Coatings Containing Water:*

6.3.1 Handle pigmented coatings containing water (latex paints, etc.) in a slightly different manner from solvent-thinned coatings. Water-thinned paints, if stirred too vigorously, have a tendency to incorporate air bubbles, which sometimes result in changing the physical properties of the paint.


6.3.2 With the above consideration, take the samples in accordance with the same general procedure outlined in **6.2** for paints containing organic solvents. If it has been necessary to shake, stir, or agitate a water-thinned paint vigorously, deaerate the samples before the weight-per-gallon tests are run.

6.4 *Sampling from Tanks at the Factory*—Mix the material in the tank thoroughly before completely filling two 1-qt (1-L) containers. If the containers are to be filled from a valve on the bottom or side of the tank, mix the material, draw off at least 5 gal (20 L) through the valve and return to the tank before taking the sample.

6.5 *Sampling During Filling of Containers at the Factory*—After the material is thoroughly mixed in the tank and filling of containers has commenced, take a 1-qt (1-L) sample when about 25 gal (100 L) have been filled and another when about 25 gal remain to be filled.

7. Keywords

7.1 sampling

 **D3925 – 02 (2015)**

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