



Designation: D5702 – 18 (Reapproved 2022)

Standard Practice for Field Sampling of Coating Films for Analysis for Heavy Metals¹

This standard is issued under the fixed designation D5702; 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.

1. Scope

1.1 This practice covers a method to control the removal of samples of coating films from substrates for subsequent laboratory analysis for heavy metal content on a mass basis. This technique can be used in the field, the fabricating shop, or laboratory.

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.3 *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.* For specific hazard information, see Section 5, Note 1, and Note 3.

1.4 *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

[D4138 Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means](#)

[D6132 Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage](#)

[D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to](#)

[Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals](#)

3. Significance and Use

3.1 Prior to beginning a project that involves the removal, cutting, grinding, or burning of paint, it is necessary to determine if the coating contains hazardous metals, such as lead. If it does, certain requirements for worker and environmental protection may need to be imposed. The presence and quantity of hazardous metals in a paint can be determined through laboratory analysis. Proper sampling protocol is needed to assure the laboratory results represent the actual amount of heavy metal in the coating. The number and location of samples to be removed must also be determined to characterize properly the extent of the presence of hazardous materials, if any, on a structure.

4. Materials and Equipment

4.1 *Sample Collection Container*—A clean plastic bag or rigid container comprised of a material such as polyethylene that will not contaminate the sample.

4.2 *Straight Edge or Ruler.*

4.3 *Knife or Chisel*, cleaned and sharpened, for removing paint samples.

4.4 *Dry Film Thickness Gage*, for measuring total coating thickness.

5. Procedure

5.1 Select a sufficient number of areas for coating removal that properly characterize the coatings on the structure.

5.1.1 Selection may be based on painting history, knowledge of previously applied coatings, prior touch-up and repainting programs, and other such factors.

5.1.2 Select areas that properly characterize the range of thickness found. Dry film thickness can be measured in accordance with Test Methods [D4138](#), [D6132](#), or Practice [D7091](#).

5.1.3 Remove a minimum of three samples.

5.2 At each sample site, clean the surface of dirt, dust, or debris.

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 D01.46 on Industrial Protective Coatings.

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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.

NOTE 1—Hazardous materials can be present in surface debris and chalk which may be removed during cleaning. Thus, consideration should be given to collecting this surface debris and chalk for analysis.

5.3 At each sample site, use a knife and straight edge to scribe the perimeter of a square through the coating film to the substrate. The square should be of sufficient size to give a one gram sample.

NOTE 2—Paint with a density of 1.5 g/cm³ and 250 microns (10 mils) thick will generate one gram of sample in a square that is 5 cm (2 in.) on a side assuming 100 percent of the material is collected. Paint density normally ranges from 1.1 g/cm³ to 2.5 g/cm³. Adjust the sample size based on density, thickness and collection efficiency.

5.4 Remove essentially all of the coating within the square down to the substrate by scraping, by making closely-spaced parallel scribes to disbond ribbons of the coating, or other controlled means that permit collection of all of the film scrapings. Take extreme care to remove the coating to the substrate, but avoid including portions of the substrate itself in the sample. Place all chips and scrapings in the sample bag or container.

NOTE 3—The controlled application of heat to the sample area may assist in paint removal, but health and safety concerns must be carefully addressed before using such methods.

5.5 Seal the sample bag or container, tape shut to avoid accidental or unauthorized opening, and complete the information as designated in Section 6.

6. Report

6.1 *Sample Containers*—Report the following minimum information on each sample container:

6.1.1 Identification number (This is a unique number assigned to each sample.).

6.1.2 Date and time of sampling.

6.1.3 Project name and location.

6.1.4 Identification of the item or location where the sample was taken.

6.1.5 Name and signature of technician removing sample.

6.2 *Chain of Custody Form*—Report the following minimum information:

6.2.1 Project name and location.

6.2.2 Name of technician removing sample.

6.2.3 Unique sample number, date and time of sample removal, and specific location from which sample is removed.

6.2.4 The laboratory analysis specified for each component (for example, lead, chromium, etc., as required in the contract documents, or as agreed upon between purchaser and seller). Caution the laboratory that fragments of the substrate, if included in the sample, should be removed prior to analysis.

6.2.5 Signatures and dates for each transfer of the samples from the technician through the carrier(s) to the laboratory receiving the samples.

7. Keywords

7.1 coating film sampling; coating film identification; hazardous elements; heavy metals; paint film identification; paint film sampling; sampling

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