



Designation: D5744 – 18

Standard Test Method for Laboratory Weathering of Solid Materials Using a Humidity Cell¹

This standard is issued under the fixed designation D5744; 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 kinetic test method covers a laboratory weathering procedure that (1) enhances reaction-product transport in the aqueous leach of a solid material sample of specified mass, and (2) measures rates of weathering-product mass release. Soluble weathering products are mobilized by a fixed-volume aqueous leach that is performed and collected weekly. Leachate samples are analyzed for pH, alkalinity/acidity, specific conductance, sulfate, and other selected analytes.

1.1.1 This test method is intended for use to meet kinetic testing regulatory requirements for mining waste rock and ores sized to pass a 6.3-mm (0.25-in.) Tyler screen.

1.1.2 Interlaboratory testing of this method has been confined to mine waste rock. Application of this test method to metallurgical processing waste (for example, mill tailings) is outside the scope of the test method.

1.2 This test method is a modification of a laboratory weathering procedure developed originally for mining wastes (1-3).² However, it may have useful application wherever gaseous oxidation coupled with aqueous leaching are important mechanisms for contaminant mobility.

1.3 This test method calls for the weekly leaching of a well-characterized solid material sample (weighing at least 1000 g) with water of specified purity, and the collection and chemical characterization of the resulting leachate. Test duration is determined by the user's objectives of the test. See Guide D8187.³

1.4 As described, this test method may not be suitable for some materials containing plastics, polymers, or refined metals. These materials may be resistant to traditional particle size reduction methods.

1.5 Additionally, this test method has not been tested for applicability to organic substances and volatile matter.

1.6 This test method is not intended to provide leachates that are identical to the actual leachate produced from a solid material in the field or to produce leachates to be used as the sole basis of engineering design.

1.7 This test method is not intended to simulate site-specific leaching conditions. It has not been demonstrated to simulate actual disposal site leaching conditions. Furthermore, the test is not designed to produce effluents that are in chemical equilibrium with the solid phase sample.

1.8 This test method is intended to describe the procedure for performing the laboratory weathering of solid materials. It does not describe all types of sampling and analytical requirements that may be associated with its application.

1.9 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.9.1 *Exception*—The values given in parentheses are for information only.

1.10 *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.*

1.11 *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*:⁴
[D75/D75M Practice for Sampling Aggregates](#)
[D276 Test Methods for Identification of Fibers in Textiles](#)

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.04 on Waste Leaching Techniques.

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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

³ Additional published guidance sources are listed under 11.4 (Test Duration), subparagraphs 11.4.4.1 and 11.4.4.2.

⁴ 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.