



Standard Test Method for Screening of Waste for Radioactivity¹

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1. Scope

1.1 This test method covers the screening for α , β , and γ radiation above ambient background levels or user-defined criteria, or both, in liquid, sludge, or solid waste materials.

1.2 This test method is intended to be a gross screening method for determining the presence or absence of radioactive materials in liquid, sludge, or solid waste materials. It is not intended to replace more sophisticated quantitative analytical techniques, but to provide a method for rapidly screening samples for radioactivity above ambient background levels or user-defined criteria, or both, for facilities prohibited from handling radioactive waste.

1.3 This test method may not be suitable for applications such as site assessments and remediation activities.

1.4 The values stated in SI units are to be regarded as the 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:*

C 859 Terminology Relating to Nuclear Materials²

3. Terminology

3.1 For terminology related to radioactive materials, see Terminology C 859.

4. Summary of Test Method

4.1 A sample is held within 6 mm of the detector window of a radiation survey meter, and the visible or audible reaction of the meter, or both, is noted. The user defines an application/project specific “negative” and “positive” result criteria. A “negative” test result indicates radiation levels are below the user-established criteria; a “positive” test result indicates the radiation levels are above the user-established criteria.

5. Significance and Use

5.1 Most facilities disposing or utilizing waste materials are prohibited from handling wastes that contain radioactive materials. This test method provides the user a rapid method for screening waste material samples in the field or laboratory for the presence or absence of radioactivity at user-established criteria. It is important to these facilities to be able to verify generator-supplied information that radioactive or mixed wastes have not been included in shipments of waste materials.

6. Interferences

6.1 Needle deflections or audible clicks of the survey meter, or both, occur due to naturally occurring omni-directional background radiation. This level of ambient background radiation should be periodically assessed. See Section 10.

6.2 Possible sources of interference include pacemakers, X-ray generating equipment, radium-based luminescent dials, polonium-based static eliminators, and smoke detectors containing a radioactive isotope sensing mechanism. Such interferences can usually be traced to their source using the portable instrument specified in this test method.

6.3 A large amount of potassium in the waste sample may produce a positive result due to the natural presence of the radioactive isotope, Potassium-40.

6.4 The sensitivity of this test method to beta and gamma radiation may be dependent on sample volume. A small sample volume with readings near background levels may give a false negative result.

6.5 Some radioactive isotopes, such as ^3H and ^{14}C , may not emit radiation of sufficient energy to be detected. If suspected to be present in the waste, another procedure should be used that is appropriate to their determination.

6.6 Liquid samples, as well as moisture in solid samples, are good attenuators of radiation and will hinder detection of many radionuclides unless they emit high-energy gamma radiation. The possible inability to detect alpha particles and low-level beta emissions that may be attenuated, in many cases, should not be a serious shortcoming in this test method because these emissions are often accompanied by higher energy gamma emissions.

6.6.1 Moisture-laden Americium-241 bearing waste would be a case where there is a high probability of non-detection due to attenuation.

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.05 on Screening Methods.

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² *Annual Book of ASTM Standards*, Vol 12.01.