

SCHEDULE 15

TEST PROCEDURES

PART II—

TESTS FOR SPECIAL FORM RADIOACTIVE MATERIAL

General

1. The tests which shall be performed on specimens that comprise or simulate special form radioactive material are: the impact test, the percussion test, the bending test, and the heat test.
2. A different specimen may be used for each of the tests.
3. After each test specified in paragraphs 4–8 below, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in paragraph 9 below for indispensible solid material and paragraph 10 below for encapsulated material.

Test methods

4. **Impact test:** The specimen shall drop onto the target from a height of 9 metres. The target shall be a flat, horizontal surface of such a character that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

Percussion test:

5. The specimen shall be placed on a sheet of lead which is supported by a smooth solid surface and struck by the flat face of a steel billet so as to produce an impact equivalent to that resulting from a free drop of 1.4 kg through 1 metre. The flat face of the billet shall be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm. The lead, of hardness number 3.5 to 4.5 on the Vickers scale and not more than 25 mm thick, shall cover an area greater than that covered by the specimen. A fresh surface of lead shall be used for each impact. The billet shall strike the specimen so as to cause maximum damage.

Bending test:

6. The test shall apply only to long, slender sources with both a minimum length of 10 cm and a length to minimum width ratio of not less than 10. The specimen shall be rigidly clamped in a horizontal position so that one half of its length protrudes from the face of the clamp. The orientation of the specimen shall be such that the specimen will suffer maximum damage when its free end is struck by the flat face of a steel billet. The billet shall strike the specimen so as to produce an impact equivalent to that resulting from a free vertical drop of 1.4 kg through 1 metre. The flat face of the billet shall be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm.

Heat test:

7. The specimen shall be heated in air to a temperature of 800°C and held at that temperature for a period of 10 minutes and shall then be allowed to cool.
8. Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be excepted from:

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- (a) The tests prescribed in paragraphs 4 and 6 provided they are alternatively subjected to the Class 4 impact test prescribed in the ISO classification document; and
- (b) The test prescribed in paragraph 7 provided they are alternatively subjected to the Class 6 temperature test specified in the ISO classification document.

Leaching and volumetric leakage assessment methods

9. For specimens which comprise or simulate indispersable solid material, a leaching assessment shall be performed as follows:

- (a) The specimen shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7-day test period, the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6–8 and a maximum conductivity of 1 mS/m at 20°C.
- (b) The water with specimen shall then be heated to a temperature of (50±5)°C and maintained at this temperature for 4 hours.
- (c) The activity of the water shall then be determined.
- (d) The specimen shall then be stored for at least 7 days in still air of relative humidity not less than 90% at 30°C.
- (e) The specimen shall then be immersed in water of the same specification as in (a) above and the water with the specimen heated to (50±5)°C and maintained at this temperature for 4 hours.
- (f) The activity of the water shall then be determined.

10. For specimens which comprise or simulate radioactive material enclosed in a sealed capsule, either a leaching assessment or a volumetric leakage assessment shall be performed as follows:

- (a) the leaching assessment shall consist of the following steps:
 - (i) The specimen shall be immersed in water at ambient temperature. The water shall have an initial pH of 6–8 with a maximum conductivity of 1 mS/m at 20°C.
 - (ii) The water and specimen shall be heated to a temperature of (50±5)°C and maintained at this temperature for 4 hours.
 - (iii) The activity of the water shall then be determined.
 - (iv) The specimen shall then be stored for at least 7 days in still air at a temperature not less than 30°C.
 - (v) The process in (i), (ii) and (iii) shall be repeated.
- (b) The alternative volumetric leakage assessment shall comprise any of the tests prescribed in the ISO leak test document which are acceptable to the Secretary of State.