

OPERATIONS DIVISION
RADIOISOTOPE DEPARTMENT

PROC. NO. 31
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DATE 2/12/80

BUILDING 3029
SOURCE DEVELOPMENT LABORATORY
LEAK TESTING PROCEDURE FOR RADIOACTIVE MATERIALS
CONTAINED IN SPECIAL FORM OR DOT 2R CAPSULES

I. Leak Testing

A. General

All radioactive materials contained in Special Form or DOT 2R capsules are leak tested before shipment. The method used is the air bubble, vacuum, and glycol as described in ANSI Standard N14.5 A3.6.

B. Equipment

1. The leak test equipment consists of a glass test chamber with a removable sealable top. A line penetrates the top and is connected to an in-cell vacuum pump. The size and shape of the test chamber may vary with the design of the piece being tested; and must be large enough that the piece can be completely immersed in the test liquid, leaving at least one inch of test liquid above the weld area.
2. Racks, suspension assemblies, or similar positioning devices may be required for some radioactive sources. These will be designed so as not to interfere with observation of the weld area during testing.
3. Unless otherwise specified, the test liquid for liners is distilled water. The final test liquid for radioactive sources is ethylene glycol. The final leak test has a sensitivity greater than 1×10^{-6} at.cm³/sec.

C. Procedure

1. The test chamber is filled with test liquid to a depth sufficient to cover the piece being tested and leave at least one inch, but not more than three inches, of test liquid above the weld area when the piece is in the test position.
2. The top is placed on the test chamber and a vacuum of at least 20 inches Hg is imposed.
3. The piece, and especially the weld area, is observed for 30 seconds while the vacuum is maintained. A leak is indicated by a steady stream of air bubbles coming from a fixed point on the source.
4. After the 30-second observation the vacuum is relieved; then the piece is removed from the test chamber.

APPROVED

SUPERVISOR

PROJECT GROUP LEADER

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- a. Leaking pieces are rejected and defueled.
 - b. Non-leaking pieces are transferred to the furnace testing area.

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