

HEALTH PHYSICS inc.

2986 Industrial Blvd. • Box 197 • Bethel Park, Pa. 15102 • Phone 412 • 563-2242

2/10/71

INSTRUCTIONS FOR USE OF MARK V  
LEAK TEST KIT ON SEALED SOURCES

These procedures are to be followed by the individual authorized to employ the Mark V Leak Test Kit for leak testing sealed sources of radioisotopes. Should any question arise concerning proper use of the Kit, he should contact Applied Health Physics, Inc.

1. Pre-Test Procedures

In preparing the Mark V Leak Test Kit, follow these simple procedures:

- a. Remove the plastic cap with its cotton swab insert from the plastic test tube. Add a few drops of water to dissolve the powdered wetting agent in the tube. Slightly dampen the swab's cotton tip with the wetting agent solution, and discard any unused solution that may remain in the tube.

Return the prepared swab to the test tube.

- b. Complete the information required on the self-sticking, circular leak test label which is included in the Kit, and securely attach to the midsection of the test tube.
- c. Obtain a remote handling device, such as an AHP Protecta-Holder, which will be used in manipulating the swab stick during the actual testing procedure.
- d. Carry out final preparation for all radiation protection measures that must be employed.

2. General Testing Procedures

The following general testing procedures should be used on sealed sources:

- a. Grasp the cap or the bare end of its swab stick with the AHP Protecta-Holder or other suitable remote handling device.
- b. Carefully, but firmly, wipe the dampened tip of the cotton swab over surface areas of the sealed source. With certain sealed sources that are located or permanently used in special equipment, it is only necessary to wipe surfaces of the mounting or storage device on which radioisotope contamination might be expected to accumulate.
- c. Immediately following the wiping procedure, dispense with the remote handling device and securely replace the cap and its swab insert in the labeled plastic test tube. Avoid touching the cotton tip to the body or other objects.

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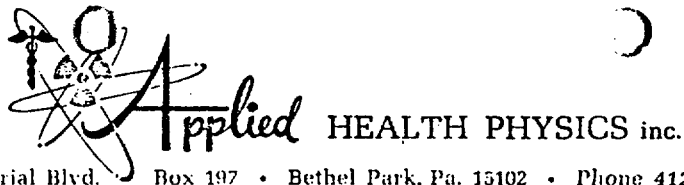
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3. Post-Test Procedures

Pursuant to completion of the leak test, these steps must be taken:

- a. Complete the Mark V Leak Test Data Form in a legible fashion. This form must be signed by the individual who performed the sealed source leak test.
- b. Enclose the Data Form and the sealed plastic test tube in the mailing box, and seal the box. Fill in the proper return address on the Applied Health Physics, Inc.'s shipping label and securely attach to the box.
- c. Monitor all external surfaces of the mailing box with a calibrated survey meter, such as a Geiger-Muller meter with an end-window probe detector. Post Office Department regulations require that radiation levels at any surface of the box must be less than 10 milliroentgens for 24 hours; i.e., an average of approximately 0.4 milliroentgens per hour.

If results of the survey meet these requirements, proceed with mailing the Mark V Leak Test Kit to Applied Health Physics, Inc. Should the survey indicate that any surface of the box has a dose-rate greater than 0.4 milliroentgens per hour, immediately notify Applied Health Physics, Inc. by telephone.



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RADIATION PROTECTION MEASURES DURING USE  
OF MARK V LEAK TEST KIT

Precautionary measures must be observed by any individual authorized to leak test sealed sources with the Mark V Leak Test Kit for radioisotope users licensed by the U. S. Atomic Energy Commission or an Agreement-State. They may be summarized as follows:

1. Certain sealed sources of radioisotopes are NOT TO BE REMOVED from shielding devices within which they are permanently mounted or stored. Radiographic exposure devices, density gauges, teletherapy units, and other such devices shall be leak tested by conducting the test on accessible surfaces of the device upon which contamination might be expected to accumulate.

NOTE: When testing such devices, the sealed source must be in the "OFF" position. This must be confirmed by conducting a radiation survey of the device prior to performing the leak test.

2. The individual conducting the test should wear a lapel film badge, a ring badge, and pocket dosimeters or pocket chambers as may be required by the ~~NRC~~ or Agreement-State license conditions. With this same consideration, personnel monitoring devices should also be worn by other individuals permitted to remain in the area where leak testing is being performed.
3. The leak tester must monitor the test area and any adjacent areas with calibrated survey meters, and any required signs must be posted in accordance with Title 10-CFR-20.203 or other applicable regulations.
4. Only remote handling techniques shall be used during the manipulation of "free" sealed sources. Sources must not be allowed to come into contact with the hands or other portions of the body. Full advantage should be taken of the inverse square law and minimizing exposure time.
5. It is recommended that the leak tester wear protective clothing during the testing of certain sealed sources. Flexible protective gloves, such as AHP:446, offer significant shielding from beta radiation and also prevent the possible contamination of hands. When leak testing higher activity sealed sources of strontium-90 or other energetic beta-emitters, thick lens safety glasses can afford significant protection to the eyes.

NOTE: Ordinary x-ray aprons and similar garments made of leaded rubber, plastic, or glass offer insignificant protection from high energy gamma-emitters such as cobalt-60 and radium-226.

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6. When necessary, accessory shielding devices should be used in the leak testing area. Should the tester not have an AHP Periscopic Shield at his disposal, he may employ a barrier composed of appropriate thicknesses of lead, steel, or concrete when dealing with various gamma-emitters. A portable shield of one-half inch thick lucite or other transparent plastic not only absorbs most beta radiations encountered, but facilitates viewing during the leak testing process.
7. Since the surface of some sealed sources, especially those containing beta-emitters, may be made of a thin foil, special care must be taken to avoid puncturing, eroding, or otherwise damaging this surface during leak testing.
8. It is recommended that "dry runs" are conducted prior to the actual testing. If dummy sources are used during such a practice session, the test operator should dispense with them before beginning the "wet run." Confusing the real sealed sources with the simulated ones can be conducive to over-exposure incidents.
9. Although most licensees are required to leak test sources at intervals not exceeding six (6) months, sealed sources should be leak tested following any incidents wherein they may be damaged. Should a source be subjected to chemical or physical stresses beyond those for which it was designed, an immediate leak test is recommended.
10. Adherence must be given to the provisions of the <sup>NRC's</sup> ~~AEC's~~ Title 10-CFR-20.101, "Exposure of individuals to radiation in restricted areas," and other applicable sections of ~~AEC~~ <sup>NRC</sup> and Agreement-State regulations during all leak testing procedures.