

Sealed Source – Leak Testing

1.0 Statement

In accordance with CNSC regulations, leak tests shall be performed on all Sealed Nuclear Sources requiring Leak Tests at the University as outlined in this procedure.

2.0 Definitions

Approved Agency

Agencies approved by CNSC to perform leak tests. CNSC approval is specific to the isotopes specified in the approval and in accordance with *Regulatory Expectations for Leak Testing of Sealed Sources included in RD/GD-371 appendix AA*. The University is a CNSC approved agency. A current list of the approved isotopes is available from the Radiation Safety Officer.

Sealed Source Nuclear substances and radiation devices (Sealed Sources)

Sealed sources are nuclear substances and radiation devices that are encapsulated or encased in such a way that they are extremely unlikely to be absorbed into the body and therefore present only an external radiation hazard. An example would be small calibration sources and Mossbauer spectroscopy sources.

Sealed Sources Requiring Leak Tests

Except for gaseous sources or sources of tritium, **all sealed sources over 50 MBq and all devices containing sealed sources over 50 MBq must be leak tested.**

Devices Containing Sealed Sources

Devices containing integrated sealed sources that are not normally removable. Examples are moisture density gauges, electron capture chromatographs, and X-ray fluorescence equipment.

3.0 Responsibilities

3.1 The Permit Holder is responsible to ensure:

- 3.1.1 Only CNSC Approved Agencies may be used to measure the leak tests required by CNSC regulations.
- 3.1.2 If an agency other than the University is used to measure leak tests, the Permit Holder shall keep copies of each sampling certificate **and** leak test certificate, and is responsible to ensure that a copy of each is forwarded to the Radiation Safety Officer.
- 3.1.3 Copies of every leak test sampling certificate and the leak test certificate shall be kept in the Radiation Safety Records binder for at least the last eight years.
- 3.1.4 A written step-by-step procedure for wipe sampling each type of sealed source and each type of containment is also required. One copy of this procedure shall be kept in the Radiation Safety Records binder, and a second copy shall be forwarded to the Radiation Safety Officer. Such a procedure may be provided in the operator's manual or may be available from the manufacturer. Contact the Radiation Safety Officer for assistance.

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3.1.5 Leak tests are performed at the frequency required by the conditions of the Internal Nuclear Substance Permit.

3.2 Frequency of leak testing

3.2.1 **A leak test is required prior to transferring any source over 50 MBq to another Licensee.**

3.2.2 **Sealed Sources:** Except for gaseous sources or sources of tritium, leak tests shall be performed for all sealed sources of more than 50 MBq. The frequency of leak testing shall be:

- a) Immediately after any incident that may result in source damage.
- b) Every 24 months, for sealed sources that are recorded on the Permit “approved usage” declared as STORAGE ONLY.
- c) Every six months for all other sources.

3.2.3 **Devices Containing Sealed Sources:** Except for gaseous sources or sources of tritium, leak tests shall be performed for all devices containing sealed sources of more than 50 MBq. The frequency of leak testing shall be:

- a) Immediately after any incident that may result in source damage.
- b) Every 24 months, for devices containing sealed sources that are recorded on the Permit “approved usage” declared as STORAGE ONLY.
- c) Every twelve months for all other devices containing sealed sources.

4.0 University Leak Test Procedure

4.1 Contact Radiation Safety Officer to enroll in the University Leak Test Program.

4.2 Once you are enlisted, you will be placed on the leak test sampling schedule.

4.3 Follow the direction therein and refer to your written step-by-step procedure for wipe sampling.

4.4 Keep a photocopy of the filled in leak test kit (**sampling certificate**) in the Radiation Records binder for the room in which the sealed source is stored. Record the leak test on your Sealed Source Inventory records.

4.5 When you receive the Leak Test Certificate (**measuring certificate**) file it in the Radiation Safety Records binder for the room in which the sealed source is stored.

4.5.1 If a source or device fails the leak test, the Radiation Safety Officer will notify the Permit Holder regarding appropriate action(s).

4.6 In the event of any incident that may have caused damage to the sealed nuclear source, IMMEDIATELY CONTACT the Radiation Safety Officer to request an

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emergency leak test kit. The possibly damaged source/device shall be immediately taken out of service.

5.0 Record Keeping

5.1 Copies of the leak test sampling certificate, the written procedure specific for each sealed source and the leak test measuring certificate shall be kept in the Radiation Safety Records binder for this location for at least the last eight years.