

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. University of Dayton Metals and Ceramics Division		3. License number 34-07958-05
2. 300 College Park Dayton, OH 45469		4. Expiration date July 31, 1990
		5. Docket or Reference No. 030-18666
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material with Atomic Nos. 3 to 83, inclusive	A. Any	A. 23 millicuries of each byproduct material with Atomic Nos. 3 to 83 inclusive, with a total of 250 millicuries except as listed specifically below:
B. Hydrogen-3	B. Any	B. 50 millicuries
C. Carbon-14	C. Any	C. 50 millicuries
D. Calcium-45	D. Any	D. 5 millicuries
E. Iron-55	E. Any	E. 5 millicuries
F. Strontium-90	F. Any	F. 1 millicurie
G. Bismuth-207	G. Any	G. 1 millicurie
H. Americium-241	H. Any	H. 2 millicuries
I. Promethium-147	I. Sealed source (Radio Chemical Centre Model No. PHX.31)	I. 10 curies
J. Hydrogen-3	J. Foil source (Varian Aerograph Electron Capture Detector Cell Model No. 02-1681-01)	J. 1 curie

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6. Byproduct, source,
and/or special nuclear
material

7. Chemical and/or
physical form

8. Maximum amount that
licensee may possess
at any one time
under this license

K. Nickel-63

K. Foil source
(Varian Associates Electron
Capture Detector Cell Model
No. 2020)

K. 8 millicuries

9. Authorized Use

A. through I. To be used for research and development as defined in 10 CFR 30.4(q)
including animal studies and instruction to students.

J. and K. To be used in gas chromatographs for sample analysis.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at
300 College Park Avenue, Dayton, Ohio.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal
Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and
Part 20, "Standards for Protection Against Radiation."

12. A. Licensed material shall be used by, or under the supervision of, individuals
designated by the Radiation Safety Committee, Richard S. Harmer, Ph.D., Chairman.

B. Individuals designated to use licensed material shall meet the training and
experience criteria specified in 10 CFR Part 33, Section 33.15(b)(1) and (2).

C. The Radiation Protection Officer for the activities authorized by this license
is Richard S. Harmer, Ph.D.

13. A. (1) Each sealed source acquired from another person and containing licensed
material, other than Hydrogen 3, with a half-life greater than thirty days
and in any form other than gas shall be tested for contamination and/or
leakage prior to use. In the absence of a certificate from a transferor
indicating that a test has been made within six months prior to the
transfer, a sealed source received from another person shall not be put into
use until tested.

(2) Notwithstanding the periodic leak test required by this condition, any
licensed sealed source is exempt from such leak tests when the source
contains 100 microcuries or less of beta and/or gamma emitting material or
10 microcuries or less of alpha emitting material.

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- (3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
- B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.
- C. Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.
- D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the U. S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, describing the equipment involved, the test results, and the corrective action taken.
14. Sealed sources containing licensed material shall not be opened.
15. Detector cells containing licensed material shall not be opened or the foil sources removed from the detector cell by the licensee.
16. A. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
- B. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.

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17. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
18. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
19. Experimental animals administered licensed materials or their products shall not be used for human consumption.
20. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days for decay-in-storage before disposal in ordinary trash provided:
 - A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of ten (10) half-lives.
 - B. Prior to disposal as normal waste, radioactive waste shall be monitored to determine that its radioactivity cannot be distinguished from background with typical low-level laboratory survey instruments. All radiation labels will be removed or obliterated.
21. Sulfur-32 shall not be disposed of in accordance with 10 CFR Part 20, Section 20.306.
22. The Radiation Safety Officer shall have the authority to immediately halt any activity he judges to be a threat to health, safety, property, the environment or a violation of the conditions of this license or the regulations.
23. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 3, 1985. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

Date June 28, 1985

Original Signed
By William J. Adam, Ph.D.
Materials Licensing Section, Region III

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