FORM AEC-27A
(12-61)

# U. S. ATOMIC ENERGY COMMISSION
## BYPRODUCT MATERIAL LICENSE



No. 34-6358-1 Amendment No. (#42)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 3 Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduc material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

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| Licensee | In accordance with letter dated September 18, 1961 - amd 4 |
|---|---|
| 1. Name: Harshaw Chemical Company | 3. License number 34-6358-1 is amended in its entirety to read as follows: |
| 2. Address: 1945 East 97th Street, Cleveland 6, Ohio | 4. Expiration date: June 30, 1962 |
| | 5. Reference No. |

| 6. Byproduct material (element and mass number) | 7. Chemical and/or physical form | 8. Maximum amount of radioactivity which licensee may posses at any one time |
|---|---|---|
| A. Cobalt-60 | A. Sealed sources (Prepared by Tracerlab, Inc.) | A. 20 microcuries |
| (See page 2) | | |

9. Authorized use

A. - G. To be used for testing and study of scintillation materials.
H. - K. Instrument calibration.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards For Protection Against Radiation".

12. Byproduct material shall be used by, or under the supervision of, C. T. Schmidt, R. F. Carlson or W. W. Managan.

13. Byproduct material as sealed sources shall not be opened by the licensee.

14. Except as provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7 and 8 of this license in accordance with statements, representations, and procedures contained in his application dated June 14, 1960 and in letters dated July 12 and September 18, 1961 from W. W. Managan.

(See page 2)

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Continued from page 1

License Number 34-6558-1 (P62)

Amendment No. 2

| 6. Byproduct material (element and mass number) | 7. Chemical and/or physical form | 8. Maximum amount of radioactivity which licensee may possess at any one time |
|---|---|---|
| B. Cesium-137 | B. Sealed sources (Prepared by Tracerlab, Inc.) | B. 20 microcuries |
| C. Tin-113 | C. Sealed sources (Prepared by Tracerlab, Inc.) | C. 30 microcuries |
| D. Cerium-144 | D. Sealed sources (Prepared by Tracerlab, Inc.) | D. 30 microcuries |
| E. Mercury-203 | E. Sealed sources (Prepared by Tracerlab, Inc.) | E. 50 microcuries |
| F. Selenium-75 | F. Sealed sources (Prepared by Tracerlab, Inc.) | F. 20 microcuries |
| G. Iron-55 | G. Sealed sources (Prepared by Tracerlab, Inc.) | G. 20 microcuries |
| H. Americium-241 | H. ORNL plated sources | H. 24 microcuries (4 sources of 1 microcurie each; 2 sources of 10 microcuries each) |
| I. Curium-244 | I. ORNL plated sources | I. 20 microcuries (2 sources of 10 microcuries each) |
| J. Californium-252 | J. ORNL plated source | J. 1 source of 10 microcuries |
| K. Polonium-210 | K. Mound Laboratory plated sources | K. 1 millicurie total |

CONDITIONS

15. Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations", you are further licensed to receive, possess and use the special nuclear material resulting from the decay of Curium 244 and Californium 252. This license shall be deemed to contain the conditions specified in Section 70.32(a) of said regulations.

(See page 3)

...ued from page 2

License Number 34-6538-1 (Rev)

Amendment No. 2

CONDITIONS

16. A. Each sealed source containing Cobalt 60, Cesium 137, Tin 113, Cerium 144, Mercury 203, Selenium 75 or Iron 55 shall be tested for leakage and/or contamination at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, the sealed source shall not be put into use until tested.

B. The test shall be capable of detecting the presence of 0.005 microcuries of contamination on the test sample. The test sample shall be taken from the sealed source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.005 microcuries 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 5 days of the test with the Director, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C., describing the equipment involved, the test results and the corrective action taken. A copy of such report shall be sent to the manager of the nearest AEC operations office listed in Appendix B of title 10, Code of Federal Regulations, Part 20.

D. Tests for leakage and/or contamination shall be performed by the licensee, as described in application dated June 14, 1960, or by other persons specifically authorized by the Commission to perform such tests.

For the U. S. Atomic Energy Commission

Date October 13, 1961

Original Signed By
by James R. Mason
Chief, Isotopes Branch

Division of Licensing and Regulation
Washington 25, D. C.

OCT 16 1961

U.S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet



License Number 34-6558-1
(762)

Amendment No. 3

Marshow Chemical Company
1945 East 97th Street
Cleveland, Ohio

Attention: C. T. Schmidt
R. W. Carlson
W. W. Managan

In accordance with application dated November 7, 1961, License No. 34-6558-1 is amended to add the following:

| 6. Byproduct material (element and mass number) | 7. Chemical and/or physical form | 8. Maximum amount of radioactivity which licensee may possess at any one time |
|---|---|---|
| L. Cesium-137 | L. Sealed source (Trecerlab, Inc.) | L. 1 source not to exceed 5 millicuries |

9. Authorized Use

L. Testing and study of electron multiplier phototubes and scintillation crystals.

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For the U. S. Atomic Energy Commission

Date November 15, 1961

by Chief, Isotopes Branch

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Division of Licensing and Regulation
Washington 25, D. C.

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FORM AEC-374A (12-47)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE
Supplementary Sheet



License Number 34-6558-1 (962)

Amendment Number 4

Harshaw Chemical Company
1945 East 97th Street
Cleveland, Ohio

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Attention: C. F. Schmidt
R. W. Carleen
W. W. Managan

In accordance with telegram dated February 8, 1962, License No. 34-6558-1 is hereby amended to change Items 6.K, 7.K and 8.K to read as follows:

| 6. Byproduct material (element and mass number) | 7. Chemical and/or physical form | 8. Maximum amount of radioactivity which licensee may possess at any one time |
|---|---|---|
| K. Polonium 210 | K. Monsanto Research Corp. plated source | K. 1 millicurie - total |

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For the U. S. Atomic Energy Commission

Date February 12, 1962

by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

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EXHIBIT A

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