614

Form AEC-313
8-64
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R027

INSTRUCTIONS. – Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commisson with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1 (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code)

W. R. Grace & Co.
Washington Research Center
Clarksville, Maryland 21029

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code)

2 DEPARTMENT TO USE BYPRODUCT MATERIAL

Research Division

3 PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.)

Renewal 19-04003-01(B68)

4 INDIVIDUAL USER(S) (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

Joseph D. Moyer
Arthur D. Ketley
Charles R. Morgan
Arvind S. Patil

5 RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

Joseph D. Moyer

6 (a) BYPRODUCT MATERIAL (Elements and mass number of each)

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources, and maximum activity per source.)

	Form	Maximum Quantity
A. Hydrogen 3	A. Any	A. 20 curies
B. Carbon 14	B. Any	B. 40 millicuries
C. Sulfur 35	C. Any	C. 5 millicuries
D. Chlorine 36	D. Any	D. 1 millicurie
E. Potassium 42	E. Any	E. 10 millicuries
F. Iron 59	F. Any	F. 10 millicuries
G. Antimony 124	G. Any	G. 10 millicuries
H. Bromine 82	H. Any	H. 1 millicurie
I. Chromium 51	I. Any	I. 2 millicuries
J. Calcium 45	J. Any	J. 1 millicurie
K. Iodine 131	K. Any	K. 5 millicuries
L. Mercury 203	L. Any	L. 1 millicurie

(See page 3)

7 DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for human use, supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

A through S, U, W through EE. —Laboratory studies to investigate chemical reactions and study composition of materials.
T. Instrument calibration
V. Gas chromatography detection
A through EE. Not to be used in humans or in products distributed to the public.

03258
T20

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8 TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	See page 3		Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9 EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See page 3		

10 RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
See page 4					

11 METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE

See page 4

12 FILM BADGES, DOSIMETERS, AND BIO ASSAY PROCEDURES USED (For film badges, specify method of calibrating and processing, or name of supplier.)

Film badges - Tracerlab, Inc.
Bioassay - New England Nuclear Corp.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13 FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached (Circle answer) Yes

14 RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See page 5

15 WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

See page 5

CERTIFICATE (This item must be completed by applicant)

16 THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

W. R. Grace & Co.
Applicant named in item 1

Date Feb. 6, 1968

By: Joseph D. Moyer

Radiation Protection Officer
Title of certifying official

WARNING.—18 U. S. C., Section 1001, Act of June 25, 1948, 62 Stat. 749, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

* U.S. GOVERNMENT PRINTING OFFICE : 1964 O—745-381

SUPPLEMENTARY SHEET (Continued from page 1)

6. Byproduct Material	Form	Maximum Amount
M. Phosphorous 32	M. Any	M. 10 millicuries
N. Silver 110m	N. Any	N. 1 millicurie
O. Zinc 65	O. Any	O. 1 millicurie
P. Silver 111	P. Any	P. 2 millicuries
Q. Promethium 147	Q. Any	Q. 10 millicuries
R. Cerium 141	R. Any	R. 5 millicuries
S. Lanthanum 140	S. Any	S. 5 millicuries
T. Cobalt 60	T. Sealed source (Tracerlab R-31)	T. 5 millicuries
U. Nickel 63	U. Any	U. 5 millicuries
V. Nickel 63	V. Sealed source (U.S.Radium Model Lab 784) contained in Micro-Tek Instruments Model 739330 detector cells	V. 10 millicuries
W. Cesium 134	W. Any	W. 1 millicurie
X. Strontium 85	X. Any	X. 1 millicurie
Y. Strontium 89	Y. Any	Y. 1 millicurie
Z. Zirconium 95 Niobium 95	Z. Any	Z. 1 millicurie
AA. Barium 133	AA. Any	AA. 1 millicurie
BB. Europium 152-154	BB. Any	BB. 1 millicurie
CC. Yttrium 91	CC. Any	CC. 1 millicurie
DD. Niobium 94	DD. Any	DD. 1 millicurie
EE. Iodine 125	EE. Any	EE. 1 millicurie

(Continued from page 2)

8 and 9. Training and Experience of Individual Users

Information required by Items 8 and 9 for each individual user listed in Item 4 is contained in the following applications for licensing and amendments:

Individual	Application Dated
J. D. Moyer	May 20, 1960
A. D. Ketley	April 27, 1961
C. R. Morgan	May 13, 1966
A. S. Patil	July 7, 1967

SUPPLEMENTARY SHEET (Continued from page 2)

W. R. Grace & Co.
Renewal 19-04003-01(B68)
Feb. 5, 1968

10. Radiation Detection Instruments

Type	Number Available	Radiation Detected	Sensitivity Range	Window Thickness	Use
a. Victoreen Thyac III Survey Meters, Model 490	2	α,β,γ	0-200 mr/hr	1.4 mg/cm^2	Surveying
b. Victoreen "Cutie Pie" Survey Meter, Model 740B	1	α,β,γ	0-2500 mr/hr	1.7 mg/cm^2	Surveying
c. Nuclear Measurements Corp. Model PC-3A Proportional Ctr.	1	α,β,γ	---	--	Measuring
d. Nuclear Measurements Corp. Model WSC2 Well Scintillation Counter	1	γ	>20 Kev	--	Measuring
e. Nuclear Chicago Mark I, Liquid Scintillation Counter, Model 6860	1	α,β,γ	50 dpm	--	Measuring
f. Atomic Accessories Tritium Monitor Model TSM-91B	1	β(H^3)	100-100,000 μc/M^3	--	Monitoring

11. Calibration

a. Survey Meters (10a, b)
(10 a,b) Semiannually with Tracerlab Model R31 cobalt-60 source.
(10a) Semiannually with Nuclear Chicago Model R20 carbon-14 source.

b. Nuclear Instruments Corp. PC-3A Proportional Counter (10c)
Semiannually with Nuclear Chicago Model R20 carbon-14 source.
Semiannually with Tracerlab Model R7 cobalt-60 source.

c. Nuclear Instruments Corp. WSC2 Well Scintillation Counter (10d)
Semiannually with Nuclear Chicago Model RS60 cobalt-60 gamma solution standard (10 x 10^5 dpm/ml).

d. Nuclear Chicago Mark I Liquid Scintillation Counter (10e)
Semiannually with Nuclear Chicago Model RA051 carbon-14 scintillation standard and Nuclear Chicago Model RA052 tritium standard.

SUPPLEMENTARY SHEET (Continued from page 2)

13. Facilities and Equipment

Modern, well-equipped chemical laboratories; fume hoods with >50 ft/min. face velocity in each laboratory; radioisotope hood in radiochemical laboratory with face velocity approximately 100 ft/min.

Lead-lined safe for storage of gamma-emitting isotopes.

Vacuum systems for handling volatile materials.

14. Radiation Protection Program

Personnel monitoring by film badges (Tracerlab,Inc.) as required; evaluated weekly by Tracerlab.

Procedures involving byproduct material routinely monitored with appropriate survey equipment and counts of filter paper swipes.

Bioassay where appropriate by New England Nuclear Corp.

In general, all measures are taken with regard to personnel exposure, caution signs and labels, source monitoring, waste disposal, and record keeping and reporting to comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation".

15. Waste Disposal Service

Nuclear Fuels Service, West Valley, N. Y.