

12-140-3

Form AEC-313
(9-55)

ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 33-20273.

DUPLICATED
INSTRUCTIONS: Complete Items 1 through 19 if this is a new application. If a renewal is requested, complete only Items 1 through 11 provided that with respect to the other items there has been no change in the information previously submitted. Mail two copies to: U. S. Atomic Energy Commission, P. O. Box 115, Oak Ridge, Tennessee, Attention: Isotopes Extension, Division of Civilian Application. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. General requirements for issuance of an AEC Byproduct Material License are contained in Title 10, Code of Federal Regulations, Part 30.

1. (a) NAME AND SHIPPING ADDRESS OF APPLICANT <i>(Institution, firm, hospital, person, etc.)</i> Sinclair Research Laboratories, Inc. 400 East Sibley Boulevard Harvey, Illinois	(b) ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED <i>(If different from shipping address)</i> Same as shipping address
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Engine Laboratories	
3. INDIVIDUAL USER <i>(Name and title of individual(s) who will use or directly supervise use of byproduct material)</i> R. L. Pontious, Engine Laboratory Section Leader	
4. RADIOLOGICAL SAFETY OFFICER <i>(Name of person qualified in radiological safety, if other than individual user)</i> Dr. Adolph I. Snow	
5. PREVIOUS LICENSE OR AUTHORIZATION NUMBER <i>(If this is an application for renewal of a license for byproduct material obtained under a prior license or authorization for radioisotope procurement)</i> 38866	

BYPRODUCT MATERIAL OR IRRADIATION SERVICE DESIRED

6. BYPRODUCT MATERIAL <i>(Element and mass number)</i> Tantalum - 182 Cobalt - 60	7. CHEMICAL AND/OR PHYSICAL FORM <i>(Or catalog number)</i> Cutting tool tip components	8. MAXIMUM AMOUNT OF RADIOACTIVITY IN MILLICURIES THAT YOU WILL POSSESS AT ANY ONE TIME 200
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9. IF IRRADIATION SERVICE IS DESIRED, STATE PERTINENT DETAILS SUCH AS: CHEMICAL COMPOSITION AND WEIGHT IN GRAMS OF TARGET MATERIAL, RADIOACTIVITY, IRRADIATION TIME IN DAYS, AND NEUTRON FLUX
Cutting tool tip composition - cobalt 8.75%, tantalum 5.8%, tungsten 65.00%, titanium 11.00%, columbium 1.8%, carbon 7.6%. Total weight per bit 3.7-grms.
Irradiation time 28 hours at 5×10^{12} n/cm²/sec.

STATEMENT OF USE

10. (a) DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If material is for "human use" complete Supplement A in lieu of this item. If material is to be used in or manufactured as a "sealed source" complete Supplement B in addition to this item.)*

To measure wear of cutting tool tips as a function of cutting oil composition and cutting conditions.

(b) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL

Tips handled by 5 ft. long specially designed tools. Stored in specially designed lead shielded storage container permitting remote removal and insertion of tools. Used tips and chips disposed at Argonne National Laboratory or other authorized disposal agency. Oil stored until activity low enough for safe disposal.

CERTIFICATE

11. 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 do solemnly swear (or affirm) that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

State of Illinois
County of Cook
Subscribed and sworn to before me this 17th
day of December, 1956
Eleanor R. Lindberg
Notary Public, Commission Expires June 19, 1959

Sinclair Research Laboratories, Inc.
Applicant named in Item 1
By *[Signature]*
E. J. Martin, Vice President and
General Manager
Title of Certifying Official
Date December 17, 1956

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.

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121

ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS: Complete Items 12 through 19 if this is a new application. This information may be omitted from subsequent applications provided there is no change in the information previously submitted, and reference is made in Item 5 to the application on which this information appears.

TRAINING AND EXPERIENCE WITH RADIOACTIVITY OF INDIVIDUAL USER NAMED IN ITEM 3

12. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
1. Principles and practices of radiological health safety.	Sinclair Research Laboratories, Inc.	1 Year	Yes No	Yes No
2. Radioactivity measurement standardization and monitoring techniques and instruments	" "	1 Year	Yes No	Yes No
3. Mathematics and calculations basic to the use and measurement of radioactivity.	" "	1 Year	Yes No	Yes No
4. Biological effects of radiation. . .	" "	1 Year	Yes No	Yes No
5. Actual use of radioisotopes in the types and quantities for which application is being made, or equivalent experience	" "	1 Year	Yes No	Yes No

13. ISOTOPE HANDLING EXPERIENCE

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cobalt - 60	Around 3 mc.	Sinclair Research Lab.	1 Year	Cutting tool
Tantalum -182	" 200 mc.	" " "	1 Year	Wear tests
Iron - 59	" 45 mc.	" " "	1 Year	Piston ring wear tests

14. If Radiological Safety Officer named in Item 4 is different from individual user named in Item 3, use supplementary sheet to provide equivalent information on "Training and Experience With Radioactivity of Radiological Safety Officer." Supplementary sheet is attached (Circle answer).
 Yes No

PHYSICAL FACILITIES, EQUIPMENT, AND RADIATION INSTRUMENTATION

15. RADIATION DETECTION INSTRUMENTS (Use separate sheet if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)
See previous application					

16. FILM BADGES, DOSIMETERS, AND OTHER PERSONNEL MONITORING DEVICES INCLUDING BIO-ASSAY PROCEDURES

See previous application

17. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE (For film badges specify method of calibration and processing, or name supplier)

See previous application

18. (a) DESCRIBE BRIEFLY REMOTE HANDLING EQUIPMENT, STORAGE CONTAINERS, SHIELDING, AND LABORATORY FACILITIES (Working areas, fume hoods, etc.)

See previous application

(b) SKETCHES OF SUCH FACILITIES ARE ATTACHED (Circle answer)

Yes No

19. DESCRIBE BRIEFLY RADIATION SURVEYING PROCEDURES AND METHODS OF DISPOSING OF RADIOACTIVE WASTES

See previous application

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12-140-3
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14. Radiological Safety Officer

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
1.	Ames Laboratory of the AEC Sinclair Research Laboratories, Inc. University of Chicago	11 Years	Yes	No
2.	Ames Laboratory of the AEC Sinclair Research Labs., Inc. University of Chicago	11 Years	Yes	Yes
3.	Ames Laboratory of the AEC University of Chicago Sinclair Research Labs., Inc.	13 Years	Yes	Yes
4.	Sinclair Research Labs., Inc.	3 Years	Yes	No
5.	Ames Laboratory of the AEC (Sinclair Research Labs., Inc. and University of Chicago - includes experience with X-ray and neutron diffraction equipment)	7 Years	Yes	No

Isotope Handling Experience

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Uranium and Thorium and decay products	Many pounds	Ames Laboratory of AEC	7 Years	Metallurgical, X-ray diffraction, preparation of compounds
Cobalt 60	Around 1 millicurie	Sinclair Research Labs., Inc.	6 Mos.	Preparation of demonstration samples
Tantalum 182	Around 200 millicuries of gamma activity	Sinclair Research Labs., Inc.	1 Year	Cutting tools for wear tests
Iron 59	Around 30 millicuries of gamma activity	Sinclair Research Labs., Inc.	1 Year	Piston ring wear tests
X-ray diffraction equipment Neutron diffraction equipment		Ames Laboratory of AEC University of Chicago	7 Years	Diffraction Studies