EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE 20-05216-01

Licensee: ENGELHARD INDUSTRIES INC.
Site of operation:

This report is generated from a previous
expert system evaluation done for this license number.

INFORMATION ON EXACT AMOUNTS OF MATL WAS NOT NEEDED TO EVALUATE

THIS LICENSE WAS ELIMINATED FROM CONSIDERATION
The reason for elimination was: NO POSSESSION

EXPERT SYSTEM EVALUATION WAS BASED ON THE
INVENTORY RECORD IN JOB 0317, BOX 26

Docket

Licensee: ENGELHARD INDUSTRIES INC.
Address: ATTLEBORO, MA Zip:
State of operation: MA
Site used:No site of operation in record
Disposition information present: CERTIFICATE
Licensee indicated no material ever possessed
There is an NRC inspection report in this license file
There is an NRC verification letter in this license file
This license was listed as expired on 05/31/65
Remarks:
JOB NUMBER: 0317 BOX NUMBER: 26

CONTENTS OF
INVENTORY RECORD IN JOB 0307, BOX 09

Docket

Licensee: ENGELHARD INDUSTRIES INC
Address: ATTLEBORO, MA Zip:
State of operation: MA
Site used: LIC'S ADD & ROUTE NO. 152, PLAINVILLE, MA
Disposition information present: CERTIFICATE
Licensee indicated no material ever possessed
This license was listed as expired on 05/31/65
Remarks:
JOB NUMBER: 0307 BOX NUMBER: 09

Date of last evaluation/revision: 08/11/92 Reviewer:

Form HQ-277
(4-64)

ML:IN:34 5-31-65

UNITED STATES
ATOMIC ENERGY COMMISSION
CERTIFICATE—DISPOSITION OF RADIOISOTOPES

LICENSEE (*Institution, firm, hospital, person, etc.*)	LICENSE NUMBER
Engelhard Industries, Inc. D. E. Makepeace Div.	20-5216-1

ADDRESS
Pine & Dunham Sts. Attleboro, Mass.

DEPARTMENT(S)

INDIVIDUAL RADIOISOTOPE USER(S)

CERTIFICATION

The licensee and any individual executing this certification on behalf of the licensee certify that (check appropriate item(s) below):

☒ No byproduct materials have been procured and/or possessed by licensee.

OR

All byproduct materials procured and/or possessed by licensee under Byproduct Material License No. _____ have been:

☐ (1) transferred to (*state name of institution, firm, hospital, person, etc.*)

_____

which has Byproduct Material License No. _____

☐ (2) disposed of by decay.

☐ (3) disposed of in compliance with the provisions of 10 CFR 20.

Remarks:

U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL & RECORDS SECTION

1965 JUN 25 PM 3 50

RECEIVED

Engelhard Industries, Inc.
D. E. Makepeace Division
Attleboro, Mass.

Henry M. Crowther
(*Signature of certifying official*)

Henry M. Crowther

Date 6-31-65

GPO 16—76591-1

GPO: 1964—O-728-698

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 20-5216-1 (M65)

Amendment No. 4

Engelhard Industries, Inc.
D. F. Makepeace Division
Pine and Dunham Streets
Attleboro, Massachusetts

Attention: Herton M. Weiss

In accordance with application dated April 25, 1963, License No. 20-5216-1 is amended as follows:

To extend the expiration date (Item 4) from May 31, 1963, to May 31, 1965.

To change the symbol below the license number from (M63) to (M65).

To change Condition 16. C. to read: 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 also be sent to the Director, Region I, Division of Compliance, USAEC, 376 Hudson Street, New York 14, New York.

DIV. OF COMPLIANCE
REG. 1, USAEC, N. Y.
RECEIVED
MAY 20 1 52 PM '63

MAY 15 1963

Date

For the U. S. Atomic Energy Commission
Original Signed by
Robert E. Brinkman
Isotopes Branch
by
Division of Licensing and Regulation
Washington 25, D. C.

4

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.)*

Engelhard Industries, Inc.
D. E. Makepeace Division
Pine and Dunham Streets
Attleboro, Massachusetts

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

Route #152
Plainville, Massachusetts

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Department

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

Renewal of License No. 20-5216-1

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.)*

Norton M. Weiss, Health & Safety Manager

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.)*

Norton M. Weiss

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

Co 60

(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.)*

One Sealed Source (Tracerlab, Inc. Model RG-31)

5 millicuries

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.)*

Sealed Source (Tracerlab, Inc. Model RG-31) to be used for calibration of survey instruments.

51087

(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			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

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/cm^2)*	USE *(Monitoring, surveying, measuring)*

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

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

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

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 No

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.

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.

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.

Date April 25, 1963

Engelhard Industries, Inc.
Applicant named in item 1

By: Norton M. Weiss

Health & Safety Manager
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.

FORM AEC-374
(12-57)

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE NO. 20-5216-1 AMENDMENT NO. 3 (253)

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, 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 byproduct 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.

Licensee	
1. Name: Engelhard Industries, Inc. N. E. Chemetron Division	In accordance with application dated April 7, 1961,
2. Address: Pine and Dedham Streets Attleboro, Massachusetts	3. License number 20-5216-1 is amended in its entirety to read as follows:
	4. Expiration date: May 31, 1963
	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 Source (Isotopes, Inc., Model SC-31)	A. 5 millicuries

9. Authorized use

A. Instrument calibration.

CONDITIONS

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

11. Byproduct material may also be used at Route No. 152, Plainville, Massachusetts.

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

13. Byproduct material shall be used by, or under the supervision of, Norton H. Weiss or Albert DeCosta.

14. Except as specifically 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 April 7, 1961.

(See Page 2)

License Number 30-5216-1
(E63)

AMENDMENT NO. 3

Continued from Page 1

CONDITIONS

15. Written administrative instructions, entitled "Health and Safety Manual" and submitted with W. F. Mittendorf's letter dated February 5, 1958, shall be followed and a copy of these instructions shall be supplied to each individual using or having responsibility for use of byproduct material. Any changes in these administrative instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

16. A. Each sealed source containing Cobalt 60 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 microcurie 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 D of Title 10, Code of Federal Regulations, Part 20.

For the U. S. Atomic Energy Commission

JUN 9 1961

Date MAY 24 1961

RECEIVED by Original Signed By
Charles R. Mason
Division of Licensing and Regulation
Washington 25, D. C.

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R027.4

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.)*

Engelhard Industries, Inc.
D. E. Makepeace Division
Pine and Dunham Streets
Attleboro, Massachusetts

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

Route #152
Plainville, Massachusetts

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Department

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

Renewal of License No. 20-5216-1

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.)*

Norton M. Weiss, Health & Safety Manager
Albert DaCosta, Assistant Health & Safety Manager

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.)*

Norton M. Weiss

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

Co 60

(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.)*

One Sealed Source (Tracerlab, Inc. Model RG-31)

5 millicuries

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.)*

Sealed Source (Tracerlab, Inc. Model RG-31) to be used for calibration of survey instruments.

33785

(Continued on reverse side)

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

8. TYPE OF TRAINING — Albert DaCosta	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	Engelhard Industries, Inc. D. E. Makepeace Division	1 mo.	(Yes) No	Yes (No)
b. Radioactivity measurement standardization and monitoring techniques and instruments	"	"	(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
Co 60	5 mc	Engelhard Industries, Inc. D. E. Makepeace Div.	1 month	Instrument calibration

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)
Nuclear-Chicago Model 2612 G-M Survey Meter	3	β, γ	0-20 mr/hr.		Surveying
Tech. Assoc. Model SRJ-6 Juno Survey Meter	1	α, β, γ	0-5000 mr/hr.		Monitoring
(see attached sheet for remainder)					

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

Nuclear-Chicago instruments calibrated with individual sealed Radium sources once a week. (see attached sheet)

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

Bi-weekly beta-gamma and x-ray film badges - Controls for Radiation, Inc. Cambridge, Massachusetts

Bio-assay for enriched and total uranium - " "

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

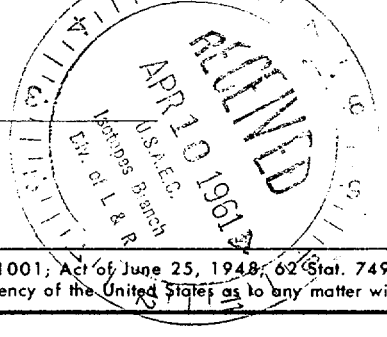
13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes, No

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. Leak testing to be performed under the direction of Tracerlab, Inc. or Controls for Radiation, Inc. Servicing and Maintenance

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. to be done by Tracerlab, Inc.

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.



Date April 7, 1961

By: [signature]

Engelhard Industries, Inc.
Applicant named in Item 1

Plant Manager
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.

GPO - 87 407 3

SUPPLEMENTARY SHEET

Item #10 continued

Type of Instruments	Number Available	Radiation Detected	Sensitivity Range	Use
Tech. Assoc. Model CP-3 Cutie Pie Survey Meter	1	α, β, γ	0-5000 mr/ hr.	Monitoring
Eberline Model PAC-3G Alpha Counter	1	α	0-100,000 counts/min.	Monitoring

Item #11 continued

Juno and Cutie Pie calibrated with 5mc Co 60 source once a month.

Eberline Counter calibrated with Normal Uranium source once a week.

FORM AEC-374A
(12-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 20-5216-1 (E61)

AMENDMENT NO. 2

Engelhard Industries, Inc.
D. F. Shakespeare Division
Attleboro, Massachusetts

Attention: Norton Weiss
Raymond Diffley

In accordance with letter dated October 11, 1960, Condition 12 of License No. 20-5216-1 is amended to read as follows:

---

12. Byproduct material shall be used by, or under the direct supervision of, Norton Weiss or Raymond Diffley.

For the U. S. Atomic Energy Commission
Original Signed By
James R. Mason
by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

Date October 19, 1960

ENGELHARD INDUSTRIES, INC.

D. E. MAKEPEACE DIVISION
PINE & DUNHAM STREETS
ATTLEBORO, MASS.
ATTLEBORO 1-0090

October 11, 1960

U. S. Atomic Energy Commission
Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

ATTENTION: Robert E. Brinkman
Senior Licensing Reviewer

Gentlemen:

RE: DLR:IB:CMK(20-5216-1)

In reply to your letter of October 5, we are pleased to submit the qualifications of Mr. Raymond Diffley in order that he may become an authorized user of byproduct material as specified in our license number 20-5216-1.

Mr. Diffley has been employed as Assistant Health-Physicist by the D. E. Makepeace Division of Engelhard Industries, Inc. since April, 1960. His educational background consists of a B. S. degree in Physics received in June, 1958 from Providence College. Subsequent to that date and prior to employment at D. E. Makepeace Division, he taught physics, electronics, and mathematics at the high school level.

His duties as Health-Physicist consist of helping to administer the Health and Safety program in a plant devoted to nuclear fuel element fabrication. In this respect the fields of criticality control, radiation protection, monitoring, liquid and solid radioactive waste disposal, and calculations basic to the use and measurement of radioactivity are encountered daily. At the present time all of his training has been received on the job, but it is anticipated that this will be supplemented by formal training at a later date.

We feel that Mr. Di fley is well qualified to assume the use of the Cobalt 60 sealed source when required, and request is made that he be specified as an authorized user of this material.

Very truly yours,

Norton M. Weiss

Norton M. Weiss
Health and Safety Manager

NMW:vka

29838

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number 20-5216-1

(061)

AMENDMENT NO. 1

Engelhard Industries, Inc.
E. I. Nuclear Division
Attleboro, Massachusetts

Attention: Norton Weiss

In accordance with application dated September 16, 1960 signed by C. A. Coulon, License No. 20-5216-1 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
A. Cobalt-60	B. Sealed source (Tracerlab, Inc., Model MS-31)	B. 3 millicuries

9. Authorized use

A. To be used for calibration of instruments.

CONDITIONS

Condition 16 is added:

16. Sealed sources shall be tested for leakage and/or contamination in accordance with the following:

A. Leak test shall be performed by Tracerlab, Inc., or by other persons specifically licensed by the Commission to perform such tests.

B. Each sealed source containing Cobalt 60 shall be tested for leakage and/or contamination as follows:

(1) An appropriate test for leakage and/or contamination shall be performed on the sealed source surface, or on the accessible surfaces of the device in which such a sealed source is permanently or semipermanently mounted. The test shall be performed upon receipt of a source from another person, unless the licensee receives certification from the person making the transfer that the sealed source had been tested within thirty (30) days prior to transfer and found free of any removable radioactive material.

(Continued)

FORM AEC-374A
(1-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

Continued from first page

License Number 20-5216-1
(261)

Amendment No. 1

CONDITIONS

(2) Following completion of the test prescribed in B(1), each sealed source shall be tested for leakage and/or contamination at intervals not to exceed six (6) months.

C. The test performed pursuant to B shall be sufficiently sensitive to detect 0.05 microcurie of removable beta and/or gamma emitting radioactive material. Records of leak test results shall be maintained by the licensee.

D. If the test performed pursuant to B(1) or B(2) reveals removable radioactive material, the licensee shall take immediate action to prevent spread of contamination and, within thirty (30) days after completion of the test shall notify the Isotopes Branch, Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C.

E. Repair of sources shall be performed by the manufacturers of the sources or by persons specifically licensed by the Commission to perform such repairs.

For the U. S. Atomic Energy Commission
Original Signed By
James R. Mason
by Chief, Isotopes Branch
Division of Licensing and Regulation
Washington 25, D. C.

Date OCT 5 1960

4

"This copy for Division of Inspection"

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R027.4

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.)*

ENGELHARD INDUSTRIES, INC.
D. E. Makepeace Division
Pine and Dunham Street
Attleboro, Massachusetts

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

Taunton Street
Route 152
Pawtucket, Massachusetts

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Department

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

Amendment to License 20-5216-1 (E61)

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.)*

Norton M. Weiss
Raymond Diffley

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.)*

Norton M. Weiss

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

Cobalt 60

(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.)*

Wire sealed in stainless steel tube
Tracerlab reference source R-31-5 5 millicuries

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.)*

Calibration of instruments
Tracerlab R-31-5 complete including lead storage container

29208

(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			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

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)*

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

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

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

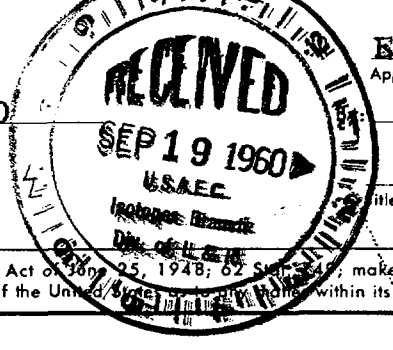
13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes No

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.

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.

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.



ENGELHARD INDUSTRIES, INC.
Applicant named in item 1

Date September 16, 1960

C. A. Canhan
Signature of certifying official

Plant Manager
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.

GPO - 87 407 3

FORM AEC-374 (12-57)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, 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 byproduct 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.

Licensee

1. **Name** Engelhard Industries, Inc. D. F. Mikepeace Division
2. **Address** Attleboro, Massachusetts

3. License number 29-5216-1 (261)
4. Expiration date May 31, 1961
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. Carbon 14	A. Contained in iron	A. 20 millicuries

9. Authorized use

A. For the manufacture of iron strips.

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 direct supervision of, Morton Weiss.

13. Byproduct material shall not be used in products distributed to the public.

14. 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 April 29, 1959.

15. Written administrative instructions, entitled "Health and Safety Manual" and submitted with W. F. Mittendorf's letter dated February 5, 1958, shall be followed and a copy of these instructions shall be supplied to each individual using or having responsibility for use of byproduct material. Any changes in these administrative instructions shall have the prior approval of the Isotopes Branch, Division of Licensing and Regulation.

RYDO

For the U. S. Atomic Energy Commission

JUN 1 195

Original Signed By
James R. Mason

Date May 14, 1959

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

RECEIVED

"This Copy for Division of Inspection"

20-5216-1

Form AEC-313 (5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved. Budget Bureau No. 38-R027.3.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. 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.)*

ENGELHARD INDUSTRIES, INC.
D. E. Makepeace Division
Attleboro, Mass.

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

SAME

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Materials

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

SNM 185 for 250kg U-235, contained as metal

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.)*

Material to be fabricated for Isotope Specialties, Inc.

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.)*

Norton Weiss - Criticality and Health - Safety Officer

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

Carbon 14

(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.)*

2 1/2 pound ingots of iron each containing 10 millicuries of Carbon - 14 will be received, forged and cold rolled to sheet approximately .005" thick. The sheet will be slit into strips 1/64 - 1/32" width and returned to the Isotope Specialties, Inc.

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.)*

The material will be converted for Isotope Specialties, Inc. by Makepeace Div. of Engelhard.

Use not known.

18523

(Continued on reverse side)

Form AEC--313 (5-58) Page Two

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			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

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)
Makepeace Plant has Special Nuclear Materials License to 250 kg. It is AEC approved for Criticality, Health Safety, Accountability, and Security.					

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

see 10

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

see 10

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

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 No See Engelhard List and Brochure

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. Covered under Health Safety Approval

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. Cross Roads, Marine Disposal

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.

Date April 29, 1959

ENGELHARD INDUSTRIES, INC.
Applicant named in item 1

By: John H. Durant
John H. Durant
Business Representative
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 : 1959 O—491408