NRC FORM 313 (7-87)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 6-30-90

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS. IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION 2
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item.)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [X] C. RENEWAL OF LICENSE NUMBER 20-21472-01

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Biomedical Technologies, Inc.
378 Page Street
Stoughton, MA 02072

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

378 Page Street, Stoughton, MA 02072

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Ronald Forand

TELEPHONE NUMBER: 617-344-9942

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE. Ronald Forand

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY: 3A
AMOUNT ENCLOSED: $ 120.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

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.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
Maurice Lamarque	Maurice Lamarque	President	12-7-87

8912060430 880915
REG1 LIC30
20-21472-01 PDR

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
Renewal	Jan. 1 I	3B	"OFFICIAL RECORD COPY" 108130	
AMOUNT RECEIVED	CHECK NUMBER			DATE
$120 / $40	1388 / 1474			1/26/88

RECEIVED-REGION 1
JAN 01 880 10:51 AM

Item 5. Licensed Material

	A. Element and Mass number	B. Chemical and/or Physical Form	C. Maximum Amount Possessed at any one time
A.	Calcium - 45	A. Any	A. 10 millicuries
B.	Carbon - 14	B. Any	B. 2000 millicuries
C.	Chromium - 51	C. Any	C. 100 millicuries
D.	Hydrogen - 3	D. Any	D. 5000 millicuries
E.	Iodine - 125	E. Any	E. 75 millicuries
F.	Phosphorus - 32	F. Any	F. 100 millicuries
G.	Sulfur - 35	G. Any	G. 200 millicuries

Item 6. Use of By-product materials

A. Hydrogen - 3 and Carbon - 14

Purified compounds containing H-3 or C-14 will be purchased and repackaged as part of research kits and systems developed by the company. No synthesis with these isotopes are planned at this time. Some purification involving less than 5mCi may be undertaken, but will not be part of an ongoing program. Only R. Forand will be involved in use of materials at the mCi level.

Technicians will use tracer level materials (less 2uCi at a time) for R & D purposes and will package materials containing less 100uCi at any one time.

These products are primarily ionized biochemicals. BTI will only handle very small quantities (<100uCi) of tritiated water.

All compounds are stored in Area C. Please see Floor Plan under Item 9.

B. Iodine - 125

All procedures with sodium iodide-125 are carried out in a properly functioning glove-box (containing an activated carbon filter in-line with hood exhaust, and held under negative air pressure by same hood exhaust fan; (see attached sketch in Item 9.). Compounds labelled are ionized biochemicals, proteins, peptides, nucleotide derivatives, etc. Various state-of-the-art methologies are employed. Most purifications are also done inside the glove box. Where this is not feasible, purifications are done in the adjacent fume hood, after it has been verified that no oxidizing species remain in the reaction mixture - a colorimetric test with unlabelled potassium iodide. Monitoring of the breathing zone and exhausted air is done each day of the experiment or set of experiments. Only R. Forand handles/uses sodium iodide-125 and organically bound materials greater than 100uCi.

Three to eight experiments are currently done in one month. Average daily use is 1-3mCi; occasionally 5mCi may be used in one day.

All sodium iodide-125 is stored in original manufacturers' packaging and inside the box. All organically bound iodine-125 materials are stored in the refrigerator/ freezer of Area C.

Typically, technicians handle materials at 10-20uCi/gram (less than 100uCi total). These operations are confined to Area C. Technicians also use small quantities (less than 5uCi) in Area B (Biochemistry lab).

C. Calcium - 45, Chromium -51, Phosphorus - 32, Sulfur - 35

These materials are primarily for distribution. Tracer quantities may occasionally be used for R & D and quality control.

Item 8. Training for Individuals Working in Restricted Areas

Ronald Forand, Lab Manager
Maurice Lamarque, President
Kathy Ouimet, Technician
(supervised by R. Forand)

MAURICE P. LAMARQUE
3 Regan Road
Walpole, Massachusetts 02081
(617) 492-6200

AREAS OF KNOWLEDGE AND EXPERIENCE	Sales Management Marketing	Personal Selling Trade Shows	Product Management

PERSONAL

Birthdate: 2/6/48 Married
5'10" 160lbs Excellent Health

EDUCATION

Boston State College, Boston, Massachusetts
B.S. Degree Major: Chemistry Minors: Physics, Math

Babson College, Wellesley, Massachusetts
(Graduate School of Business Administration)
M.B.A. Candidate

Special Training Courses: Effective Listening, Xerox Sales Training Courses, Real Estate Brokerage Courses and other Sales Training Courses. Numerous Technical Seminars including Molecular Biology, Biochemistry and Radiobiology.

EXPERIENCE

(1979 to 1980) Sales Manager,
Collaborative Research, Inc., Waltham, Mass.

Responsible for all Sales Management activities including: Sales/Marketing Plan, Customer Service, Telephone Sales, Major Account Coverage, Sales Training and Trade Shows. Also directed all Product Management functions.

(1974-1979) Senior Technical Representative, Research Products Div.
New England Nuclear Corporation, Boston, Mass.

(1972-1974) Technical Representative, Research Products Div.
New England Nuclear Corporation, Boston, Mass.

(1969-1972) Technical Service Assistant, Marketing Department
New England Nuclear Corporation, Boston, Mass.

RADIOISOTOPE BACKGROUND

1) Education

New England Nuclear Corporation - Attended numerous seminars on the safe and effective handling of radioactive material. Programs included opening of different types of packaging, shielding, liquid scintillation counting and radioimmunoassay techniques. Attended and gave seminars to Technical Representatives and other company personnel on the effective use of radioactive compounds in Life Science Research. The topics included: Molecular Biology and Protein Biochemistry. At New England Nuclear I was continually involved with diseminating information on safe handling techniques for radioisotopes as these techniques evolved. For example: plastic shielding as an effective barrier for Phosphorous-32; charcoal trapping Iodine-125 gas released from radio-iodination; effective storage techniques for all radioactively labeled compounds made at NENC.

2) Seminars on Methods of Measuring Isotopes

Set up seminars on effective methods for quantitating various emitters: beta, gamma, beta/gamma, and alpha emitters. These programs were given by NEN personnel at Harvard University, Mass General Hospital, Boston University Medical Center, Wesleyan University and the Marine Biology Institute.

3) Harvard University Isotope Handling Course

I have attended various lectures given by Harvard Health Physics personnel on isotopes, their detection, the biological hazards involved with handling radioisotopes and dosimetry, etc.

4) Many of the Chemistry and Physics courses in my undergraduate program included topics on isotope use and measurement.

Experience:

New England Nuclear Corporation:

Carbon-14	1-5uCi
Tritium	5-10uCi
Iodine	1-5uCi
Phosphorous-32	1-10uCi

During various workshops concerning the use of radioactivity for a variety of applications, I handled small quantities of labeled compounds. Training consisted of Theory & Principles of Beta and Gamma Counting and various Radioimmunoassay Techniques.

Item 16: Training and Experience

Name: Ronald R. Forand

Date and Place of Birth: February 25, 1947, Barton, VT

Citizenship: United States

Marital Status: Married, one child

Residence: [redacted]

Education:

1968 Undergraduate Research Participation Program Recipient. Isolation and Purification of Plant Glycosides

1970 B.S. Biochemistry, University of New Hampshire, Durham, NH

1973 M.S. Biochemistry, University of New Hampshire. Thesis: The Active Site Structure of Hemerythrin by Chemical Modification

Acquired the techniques of protein chemistry; procedures for the purification and characterization of proteins and peptides including ion exchange, gel-filtration chromatography, peptide mapping; determination of amino acid composition and primary structure of peptides, methods of secondary and tertiary structure investigation.

Experience:

1980- 1982 Biochemist, Kor Inc., 56 Rogers St. Cambridge, MA

Develop biosynthetic capabilities for the manufacture of stable isotopically labelled biochemicals. Preparation of specifically labelled compounds with enriched deuterium, nitrogen-15, carbon-13.

Participated in the establishment of Kor Biochemicals division of research products. Prepared iodine-125 labelled compounds.

Radiation Safety Officer

Safety Committee member

1979-1980 Staff Chemist, diagnostics development, RIA Products Inc., 411 Waverly Oaks Road, Waltham, MA

Developed the "Combo-Stat-No Boil" assay kit for the vitamins B-12 and folic acid. Patent pending, assigned to RIA Products Inc.

1976-1979 Biochemist, product development, Collaborative Research, Inc., 1365 Main Street, Waltham, MA

Technical aspects of the growth factors product line including epidermal (EGF), fibroblast (FGF), and nerve (NGF) growth factors, the cell culture derived somatomedin MSA; human fibronectin and endothelial cell growth supplement (ECGS); also development of human somatomedins, insulin-like growth factors, colony stimulating factor, human prolactin, bovine growth hormone, cell-specific serum-free growth medium, human plasminogen activator from cell culture.

Prepared iodine-125 labelled protein derivatives.

Designed tissue culture bioassays and radioreceptor assays.

1973-1976 Research Chemist, Instrumentation Laboratory, Inc., Lexington, MA

Assessed competitive protein binding methods for application to clinical diagnostics.

Developed an enzyme-linked immunoassay system for digoxin and testosterone, including chemical conjugation of the drugs to enzymes, purification of the reaction products by immunological and co-factor affinity chromatography.

1969-1973 Amino acid analyzer technician, Department of Biochemistry, University of New Hampshire, Durham, NH

Operation and maintenance of a Beckman 120C Amino Acid Analyzer for department personnel while acquiring bachelor's and Master's degrees.

Radioisotope Background

I. Education

3 credit hours, one semester course

University of New Hampshire, 1971

Characteristics of radiation and its interaction with matter. Methods of measurement of isotopes; Theory of instrumentation used i.e. scintillation counters, GM tubes etc. Biological hazards of radioisotopes. Practical aspects of the set-up and daily operation of a radioisotope laboratory; Waste, Dosimetry, etc. Experimental Design.

II. Experience

Place	Year	Isotopes	Max Used/day
Univ. N.H. Durham	1971-1973	H-3, C-14	5mCi
Instrumentation Lab	1973-1976	C-14	0.5mCi
Collaborative Research	1976-1979	I-125	6mCi
		P-32	0.2mCi
		Zn-65	0.2mCi
		H-3	0.1mCi
KOR Biochemicals	1980-1982	I-125	12mCi
	1981-1982	Radiation Safety Officer	

KATHLEEN M. OUIMET

OBJECTIVE

A position in a laboratory utilizing research, analytic, and quantitative skills.

EDUCATION

STONEHILL COLLEGE — North Easton, MA
Graduated May of 1985 with a Bachelor of Science degree in Biology.
Financed 60% of education through loans and employment.
Member of Biology Society.

EXPERIENCE

Morton Hospital — Taunton, MA

January-May 1985

Volunteer Laboratory Intern
-Assisted technologists in the tests being performed in each department.
-Analyzed test results.
-Assisted with paper work and controls for each test.
-Operated manchines and computers.
-Observed pathologist checking specimen's from the Operating room.

The Assonet Inn Restaurant — Assonet, MA

December 1982-present

Cook in a small family restaurant.
-Train and supervise staff.
-Prepare food.
-Open in the morning and close at night.

St. Annes Hospital — Fall River, MA

August 1980-September 1984

Secretary in the Radiology Department.
-Assisted Radiologist during testing when needed.
-Set up x-ray films for the Radiologist to read.
-Assisted x-ray technologists when needed.
-Processed patients to be tested.
-Answered phones.
-Organized files.

ADDITIONAL EMPLOYMENT

Nurses aide, stock person, cashier, ice cream attendent.

INTERESTS

New developments in technology, skiing, hiking, and reading.

Radioisotope Training

Primarily on-the-job

1. Periodically reviews NRC publications, i.e., CFR Part 20 and Part 19 and Regulatory Guide 8.20 and others

2. Reviews literature, text books, etc. concerning nature of radioactivity, means of measurement, health and safety issues

3. Receives in-house instructions on proper use of instrumentation, and health and safety procedures

4. To attend seminars given by consultants or other individuals.

Item 9. Facilities and Equipment

A. Floor Plan, Explanation of Floor Plan, Glove Box ventilation sketch, and Ventilation Specifications are Attached.

B. Sealed Sources: None

C. Instruments

Type	Manufacturer	Model	Number Available	Radiation Detected	Sensitivity, Range
1. Portable Meter	Ludlum	3	1	beta gamma	0-2MR/hr 20-300,000 cpm
2. Gamma Counter	Packard	5136	1	gamma	0-2,000,000 cpm
3. Liquid Scintillation	Packard	4430	1	beta	0-2,000,000 cpm

Calibration:

Ludlum: Bolton-Galinik, P.O. Box 306, Boston, MA 02139 Annually.

Packard #5136: Commercial Standard (West-Chem, 7079 Mission Gorge Rd., San Diego, CA 92120) Weekly.

Packard #4430: Commercial Standard (Amersham, 2636 S. Clearbrook Dr., Arlington Heights, IL 60005 Semi-annually.

D. Personnel Monitors: Landauer, 2 Science Rd., Glenwood, IL 60425. Film badges, ring badge. Monthly.

iomedical Technologies Inc.

bti 378 Page Street
Stoughton, MA 02072
(617) 344-9942

EXPLANATION OF FLOOR PLAN

Area A. Offices and front entry.

Area B. Biochemistry laboratory.

Area C. Radio Lab.

Primary lab for working with and storage of By-Product Material. This is an area restricted to authorized personnel only.

Contains a five foot fume hood, (#15) exhausted to the roof by a 12 inch PVC stack and a roof-mounted ventilator. The hood achieves in excess of 100ft/min at face with the sash 15 inches from the bench top.

Adjacent to the hood is a plexiglass glove box (#15A) with dimensions of 48 inches wide, 29 inches deep, 32 inches high which is connected to a charcoal filter and vented into the exhaust stack. Negative pressure will be achieved and controlled by a valve installed between the filter and inlet of the stack. All radioiodinations and other procedures involving potentially significant release of material to the atmosphere will be done in the glove box under proper operating conditions.

Air sampling of the stack effluent will be done to insure a release of less than 8×10^{-11} uCi/cc and no detectable release in the breathing zone.

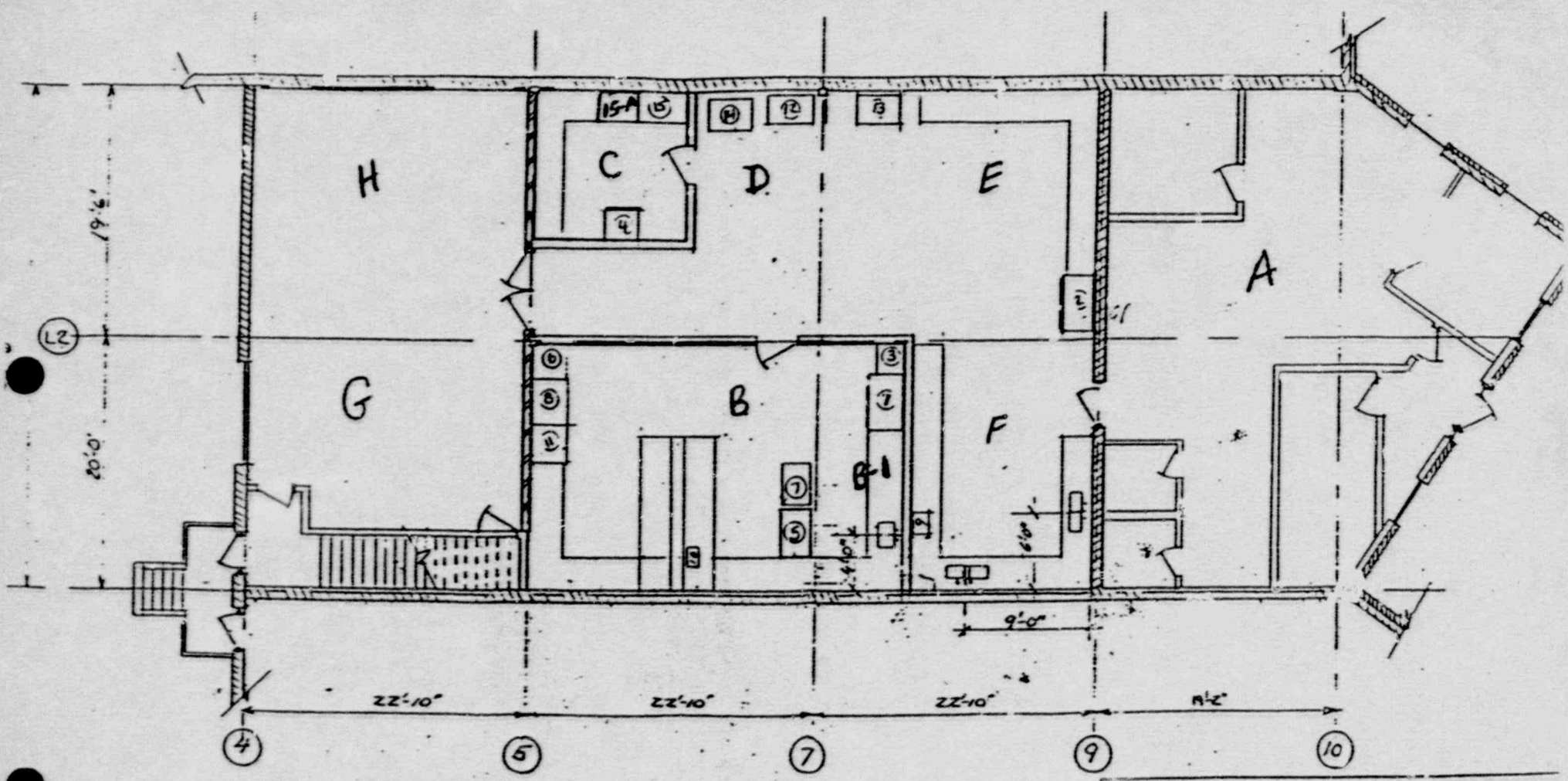
Area D. Trace level area.

Area E. Packaging and other activities with no opened containers of By-Product Materials.

Area F. Glass washing, storage. No By-Product Materials allowed.

Area G. Shipping/Receiving storage of finished products, including trace level quantities of By-Product Materials in packaged kits. No opened containers of materials are allowed. Received packages will be checked and opened in area D or C.

Area H. General Storage Area.

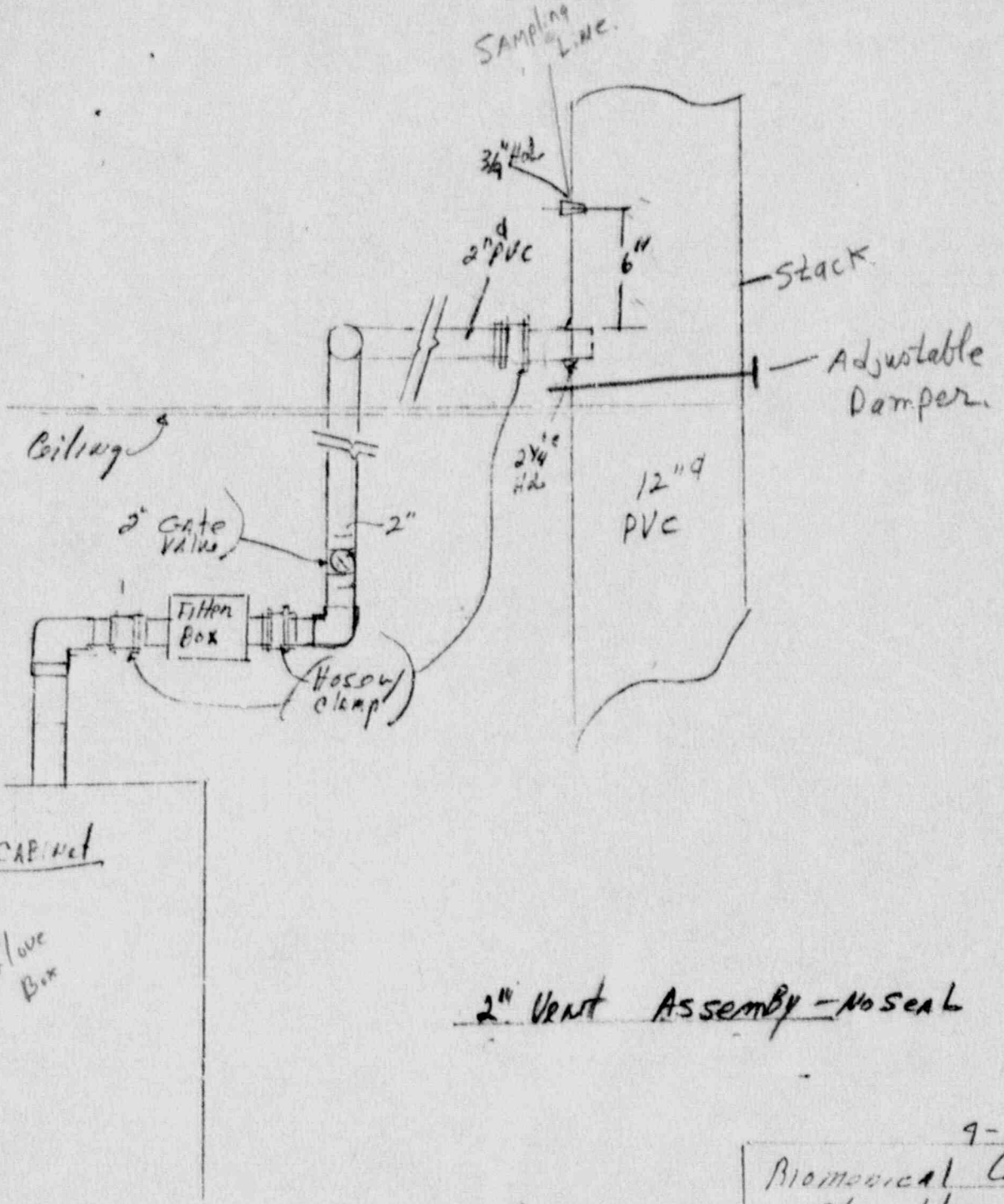


BIOMEDICAL TECHNOLOGIES I

EQUIPMENT LAYOUT — SCALE 1/8"=1'0" — DRAWN BY E — REVISED

378 PAGE ST. STOUGHTON MA

DATE 10/21/85 — APPROVED BY — DRAWING NUM F-1



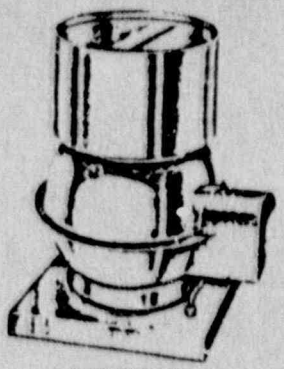
2" Vent Assemby - No seal

9-2-86

Biomedical O.K.
Stoughton Mass
C & S Mechanical Inc.
744 PROVIDENCE HWY.
NORWOOD, MA 02062
PHONE 769-4550

CENTRI-VANE®

TYPE UCV UPBLAST



VERTICAL DISCHARGE

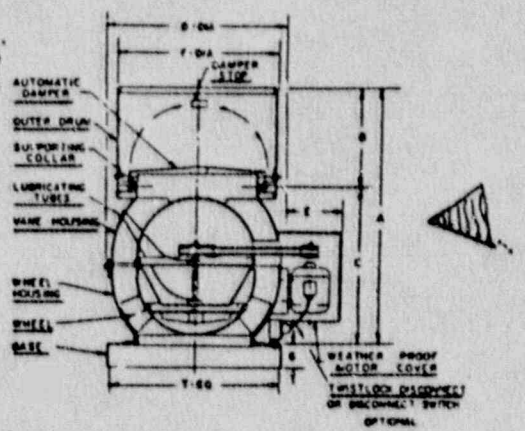
All discharge air is blown up into the atmosphere away from the roof area. Automatic dampers open when fan is energized and close when unit is turned off.

The Centri-Vane Up-Blast roof ventilator is designed for use on high pressure duct systems wh exhausting is required through the roof. It eliminates unsightly goosenecks and provides a vertical d charge ejecting the exhausted air into the atmosphe e. The UCV is compact in design and versa in usage and performance. It extends the range of the Centri-Vane Blower into many areas in bo new construction and in modification of existing buildings.

FEATURES

Lightweight, All Aluminum Construction The UCV is all aluminum throughout. It requires no surfa maintenance and reduces installation costs. Completely Weatherproof The UCV belt drive is comple ly weatherproof with remo.able motor cover for inspection. Lubrication The UCV is equipped wi extended lubricating tubes for external lubrication of the fan bearings. Non-Overloading Centrifu Wheel The specially designed impeller with its aluminum true airfoil blades has a non-overloadi horsepower characteristic. Easily Installed The UCV mounts over a standard roof curb. A COOK VC or VCA prefabricated curb can also be used. Disconnect A weatherproof disconnect switch or tw disconnect is optional. No Backdraft Dampers Required Built-in aluminum butterfly dampe prevent backdraft when unit is not in operation.

Spark Proof
Acid resistant coating
#1100 00/100



DIMENSION DATA FOR UCV - CVR

Unit Size	A	A1	B	B1	C	D	E	F1	T	E*	G	Shaft Dia.	Wheel Dia.	Gauge of Aluminum
12	25-1/8	20-3/4	8	3-5/8	13-1/8	19-1/4	16	16-1/4	20	15	2	1	15-9/16	.090 Head .080 Base
14	28-1/8	25-11/16	10	4-1/8	18-1/8	22	18	23-1/8	24	15	2	1	18-1/4	
16	31-9/16	25-11/16	10	4-1/8	21-9/16	24-7/8	21	23-1/8	24	15	2	1	20-15/16	.100 Head .080 Base
18	35-1/2	31-1/2	12	5-1/8	23-1/2	27-3/4	23	30-1/8	28	16	2	1	23-9/16	
20	38-3/8	31-1/2	12	5-1/8	26-3/8	30-1/2	25	30-1/8	28	16	2	1	26-1/4	
24	45-1/4	38-3/8	14	7-1/8	31-1/4	36-3/4	29	37-5/8	32	20	3	1-1/4	31-9/16	
28	52	43-3/4	16	7-3/4	36	42-1/4	33	44-1/8	36	20	3	1-1/4	36-7/8	
32	58-7/8	50-1/8	18	9-1/4	40-7/8	48	37	54-1/8	42	20	3	1-7/16	42-3/16	.125 Head .080 Base
36	64-1/2	55-3/8	20	11-1/8	44-1/4	53-5/8	41	64-1/8	48	20	3	1-7/16	47-1/2	

*Will vary with motor size. Drives through 5 H.P. are all variable pitch.

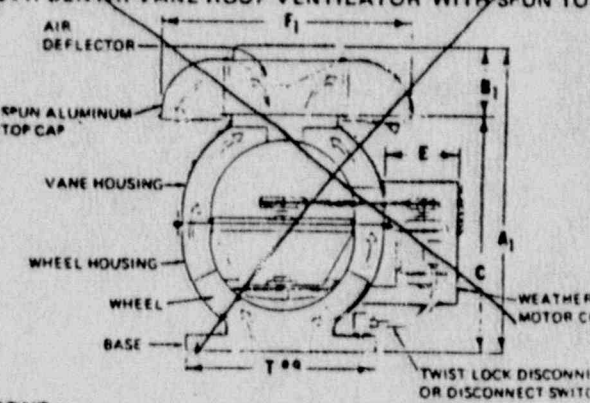
1150 cfm 0.V=1500fpm 1/2"S.P. 1/3HP-120V-60Hz

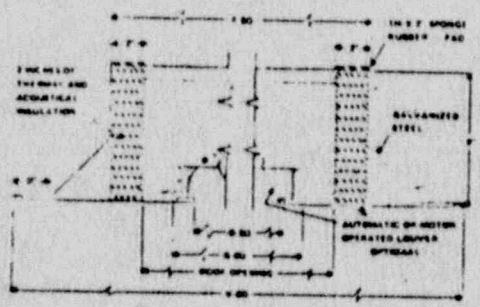
GUIDE FOR SELECTING THE UCV UPBLAST ROOF VENTILATOR

UNIT SIZE	12	14	16	18	20	24	28	32	36
MINIMUM OUTLET VELOCITY	1000	1100	1200	1400	1600	2000	2000	2200	2200
MINIMUM CFM	769	1166	1662	2457	3469	6218	8476	12192	15562
MAXIMUM CFM	2922	4432	5817	7371	9106	13058	18647	24385	29690
SELECTION TABLE SEE PAGE	6	7	8	9	10	11	12	13	14

WHEN ORDERING SPECIFY "TYPE UCV", SIZE, BHP, FAN RPM, CFM AND VELOCITY

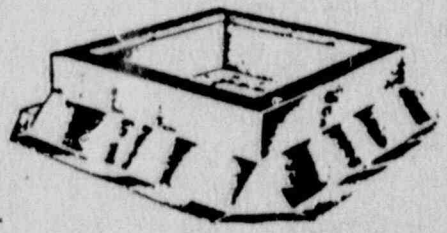
CVR CENTRI-VANE ROOF VENTILATOR WITH SPUN TOP





UCV - CVR CURB DIMENSIONS

Unit Size	Curb Cat No	VCA Galv. VCA Alum. F.SO	V.SO	Approx. Ship'g Wt.	Gauge of Mat'l
12	VCG 12 VCA 12	18 1/2	26 1/2	32 27	20 GA GALV 16 GA ALUM
14 16	VCG 22 VCA 22	22 1/2	33 1/2	36 31	
18 20	VCG 26 VCA 26	26 1/2	33 1/2	42 34	
24	VCG 30 VCA 30	30 1/2	41 1/2	50 39	
28	VCG 34 VCA 34	34 1/2	45 1/2	58 44	
32	VCG 40 VCA 40	40 1/2	51 1/2	64 50	
36	VCG 46 VCA 46	46 1/2	51 1/2	72 56	



E. Security

There are two entries to the premises, both of which have 2 doors which are locked during off hours. During working hours, office personnel are at the front (Area A) where all business with visitors is conducted. A steel door isolates this area from the laboratory. Unescorted visitors are never allowed into the laboratory.

At the rear (Areas G & H) is the shipping/receiving area. Transport and carrier individuals are not allowed into the lab, which is also isolated by steel doors. All radioactive materials are stored in laboratory C, restricted only to authorized employees. Some low level solid wastes are also stored in the upstairs loft, always locked, which is inaccessible to unauthorized persons.

Item 10. Radiation Protection Program

a. Survey Program: The survey frequency and permissable contamination levels are attached. Radionuclide workers are responsible for daily surveys to regularly establish the contamination levels in the laboratories, and a weekly survey, including wipe testing, is performed under the direction of the RSO. Radionuclide workers are also instructed to survey hands and clothing each time they leave the laboratory. A set of "General Radiation Protection Requirements and Precautions", which is posted in each laboratory, is attached.

b. Records Management: The Radiation Safety Officer with assistance as necessary from his consultant, has been charged with the full responsibility for safe use of radioactive materials within the company. He will maintain all records required by law, including survey records, personnel monitoring records, purchase inventory records and waste disposal records. All radioactive material purchases will require his approval, and he will be responsible for receipt and checking of all materials. He will also be responsible for packaging waste for disposal and for maintenance of all disposal records.

Instructions to other radionuclide workers will include initial lectures for new workers and annual refreshers for all personnel. Items to be covered in such presentations will be the contents of 10CFR19 and 20, license conditions, general handling requirements and precautions, and radiation exposure perspective. The posted general instructions and emergency instructions will also be covered and their continual posting will serve as a constant reminder. All workers who handle radionuclides or frequent areas in which radionuclides are handled will be included in this instructional program. Instruction will be given by the RSO and/or his consultant.

Personnel Monitoring

Film badges are supplied to each person who works in an area of gamma or hard beta-emitting radionuclides, and ring badges are issued to individuals who will be involved in prolonged procedures involving millicurie quantities of such materials. These will be changed monthly with provisions for immediate telephone notification by the processor to the RSO if whole body readings in excess of 400 mrem and finger readings in excess of 1 rem are observed. The RSO and consultant will investigate all such incidents. Bioassays will be performed on persons conducting procedures involving millicurie quantities of I-125 labeled compounds. Continuous records will be kept of all such bioassays. Thyroid counts will be performed by direct measurement over the thyroid using a portable scintillation counter in direct contact with the neck. Thyroid burdens in excess of 1 nanocurie can be detected in this way. The frequency of such measurements will be monthly on all persons frequenting the laboratory in which such quantities of iodine are handled, with specific measurements made on the worker directly involved within 48 hours of each such handling. Similarly, urinalysis will be performed on persons handling quantities of tritium in excess of 10mCi per handling. The urinalysis will be performed within 48 hours of each such handling except for persons who routinely handle such quantities to warrant routine monitoring urinalysis.

Biomedical Technologies Inc.

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378 Page Street
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PROCEDURES FOR OPENING PACKAGES CONTAINING RADIOACTIVE MATERIAL

1. Each package containing radioactive material shall be opened in a radioisotope laboratory. Packages containing powdered, crystalline, or volatile radioactive material shall be opened in an approved hood.

2. Wearing protective gloves, open the outer package. Remove the packing slip and inspect it to verify that the shipment is in agreement with the nuclide(s) and quantities ordered. If special instructions for opening the isotope container are enclosed, follow the instructions.

3. Measure the dose rate emitted from the inner container wit appropriate survey meter. Check inner wrapping materi[illegible] f[illegible] contamination.

4. Remove inner container, and as necessary, place [illegible]ind shielding to minimize body exposure.

5. Open the inner container. Inspect and monitor cont[illegible]g f r possible leakage from primary container (i.e. loss of liquid, discoloration of absorbing material, detection of contamination, etc.)

6. Notify the Radiation Protection Officer if:

   a) Contamination of leakage is detected.
   b) Dose rates in excess of expected values are measured.
   c) There is discrepancy between the material received and that which was ordered.
   d) There are questions about special instructions for opening the isotope container.

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SURVEY FREQUENCIES

1. All areas in which millicurie quantities of unsealed activities are handled shall be surveyed daily with a survey meter and decontaminated if necessary. This survey is performed by laboratory personnel and a log is kept which identifies the person making the survey and the contamination levels observed.

2. Laboratory areas where only small quantities of radioactive material (less than 1 millicurie) are used shall be surveyed at least weekly.

3. The weekly surveys are conducted under the supervision of the RSO and shall consist of:

   a. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.

   b. A series of smear tests to measure contamination levels. The method for performing smear tests should be sufficiently sensitive to detect the limits below to one significant digit.

LIMITS FOR REMOVABLE SURFACE CONTAMINATION

Type of Surface	Type of Radioactive Material (dpm/100cm^2)	
	I-125	H-3, C-14, Cr-51, P-32
1. Unrestricted areas	50	100
2. Restricted areas	100	100
3. Personal clothing worn outside restricted areas	50	100
4. Protective clothing worn only in restricted areas	50	100

j. All radioisotope containers which will be left unattended shall be labeled with the radiation symbol, radionuclide, form, assay and date. Storage will be designated storage areas in established radioisotope laboratories, which have been properly identified and labeled by the RSO.

k. Liquid radioactive waste shall be flushed into the sanitary sewerage system via sinks designated for this purpose by the RSO in concentrations that do not exceed those specified in 10CFR20. 106. Solid radioactive waste shall be disposed of in closed, clearly identified radioactive waste container located in each lab. Enter information on waste disposed on appropriate record card on container or over sink for each disposal.

l. Objects and equipment that may have been contaminated with radioactive materials shall be surveyed for exterior surface contamination prior to their removal from the laboratory. If surface contamination is detected, the contaminated objects shall not be removed from the laboratory without the authorization of the Radiation Safety Officer.

m. The Radiation Safety Officer shall be notified immediately if any of the following circumstances is know or suspected to have occurred:

1. Exposure to external radiation in excess of the maximum permissible exposure values stated above.

2. Exposure to inhalation, ingestion or injection of radioactive material.

3. Accidental release of radioactive material into laboratory atmosphere, drains or ventilation systems or onto exposed surfaces.

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GENERAL RADIATION PROTECTION REQUIREMENTS AND PRECAUTIONS

Following are the general requirements and precautions applicable to work with radioactive material:

a. There shall be no smoking, drinking, eating, use of cosmetics, or storage of food in any area where unsealed and unpackaged sources of radioactive materials are used.

b. There shall be no mouth-pipetting of radioactive solutions. Contact the RSO for information on the availability of remote pipetting equipment.

c. Prior to the performance of a procedure involving radioactive material, radiation levels must be measured. Handling tongs, or a suitable remote handling device must be used for handling a source or container which emits a dose rate, at contact, in excess of 100 mR/hr.

d. When performing procedures that might produce airborne contamination (i.e., evaporations, transfers of unsealed powdered or volatile radioactive material), approved exhaust ventilation shall be used.

e. When hand or clothing contamination is possible, protective gloves and a lab coat shall be worn during operations involving handling of loose radioactive material. Contact the RSO for information on the availability of such items.

f. After handling unsealed radioactive material, hands shall be washed before leaving the laboratory, and exposed hair, skin and clothing shall be surveyed for contamination. The Radiation Safety Officer shall be notified immediately if, after decontamination, residual contamination of skin, hair or personal clothing is detected.

g. The prescribed survey frequency and permissible contamination limits for various laboratory areas is attached. All radiation workers are responsible for assuring that the required surveys are performed as necessary. Contact the RSO if your responsibilities in this regard are not clear.

h. Personnel monitoring devices issued by the RSO are to be worn whenever millicurie quantities of radioiodine is in use. These badges are changed at monthly intervals.

i. When transporting radioactive materials between rooms, seal inner container and package in unbreakable outer container.

EMERGENCY PROCEDURES FOR INCIDENTS INVOLVING RADIOACTIVE MATERIAL

MINOR SPILLS:

1. NOTIFY persons in the area that a spill has occurred.

2. PREVENT THE SPREAD by covering the spill with absorbent paper.

3. CLEAN UP RADIOACTIVE MATERIAL: Using disposable gloves and remote handling tongs. Carefully fold the absorbent paper. Insert into a plastic bag, seal and dispose of in the radioactive waste container. Include all other contaminated materials such as disposable gloves.

4. SURVEY THE ENTIRE AREA INVLOVED: With a G.M. Survey Meter. Check the area around the spill, your hands and clothing for contamination. Window on G.M. Survey Meter must be thin enough to measure radiation emitted by the radionuclide spilled.

5. REPORT incident to the Radiation Safety Officer.

MAJOR SPILLS:

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.

2. PREVENT THE SPREAD by covering the spill with absorbent pads. Do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread. Assemble all potential involved personnel in an adjacent room.

3. SHIELD THE SOURCE if practical. This spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.

4. CLOSE AND LOCK THE ROOM to prevent inadvertent entry by authorized personnel.

5. NOTIFY the Radiation Safety Officer immediately.

6. PERSONNEL DECONTAMINATION: Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush thoroughly and then wash with mild soap and lukewarm water. Contact dose rate on skin should be reduced as far below 1 mrem/hr as possible.

RADIATION SAFETY OFFICER: RONALD FORAND

OFFICE PHONE: 344-9942

HOME PHONE:

RADIATION SAFETY CONSULTANT: BOLTON & GALANEK, INC.

OFFICE PHONE: 253-2180

HOME PHONE

Item 11. Waste Management

A. Trace Level Wastes.

1. Isotopes of half-lives ≤ 60 days

a. Solids

These will be held for decay-in-storage for a minimum of 10 half-lives, and disposed as regular trash. A Ludlum portable meter (model 3, sensitivity approximately 2000dpm) and a Packard Model 5136 gamma spectrometer (sensitivity approximately 100 dpm) will be used to verify background activity has been attained. Records are maintained.

b. Liquids

The company disposes of low level liquid wastes by release to the sanitary sewerage system in accordance with 10CFR 20.303. Currently, it includes water soluble liquids of I-125 and H-3 compounds.

The company is in an industrial condominium complex with a single discharge into the main line. Average daily water use of the complex is 2000 cubic feet. From the Table 1, Column 2 of Appendix B of Part 20, our maximum is 2000uCi Iodine-125/day. Our release rate currently is less than 20uCi/day.

2. All Other Isotopes

Where feasible wastes will be released to sanitary sewerage in amounts not to exceed 1% of quantities in 10CFR 20.303.

Currently we release less 10uCi/day of hydrogen-3 compounds. We are using liquid scintillation media (containing less than .05uCi H-3 per gram) deemed safe for sewerage systems by state authorities. Those materials which are not suitable for the above method will be transferred to a contractor according to 10CFR 20.311.

B. Moderate Level (mCi) Wastes

1. Solids

Millicurie quantities (approximately 10mCi) of Iodine-125 are stored as solids (primarily absorbed to resins and/or activated charcoal) in a 55 gal. steel drum. The drum is kept in the isotope lab (Area C); the

cover held by the metal ring clamp. Technicians and others are not allowed access to this drum.

2. Liquids

Liquids are held for several half-lives (in the freezer of Area C) to allow for decomposition of material to I^-. The inorganic iodide is absorbed to resins, which is treated as solids. Remaining liquids are assayed and released to sanitary sewerage if quantities do not exceed the above limits.

Additional Information Regarding this License

I. Regarding the ALARA Concept

Company philosophy maintains that achieving exposures as low as reasonable is not only good health policy but also good business policy. Recurrent needs for remedial actions place significant burdens on management time and ultimately decreases productivity. Employees receiving significant exposures because of sloppy methodology will be transferred to duties not involving radioisotopes. Inadvertant exposures will be remedied expeditiously by removing offending source.

Environment air samples will be taken from time to time to guard against burdens due to increased storage materials. All remedial actions will be taken to affect a "final" solution.

We have no water effluents (other than sewer). We have a hood equipped with a charcoal trap rated at >95% efficient for Iodine. See enclosure. The hood effluent will be monitored by a sampling device (filter disc with air pump pulling 10L/min) mounted in the duck, post charcoal trap.

Should levels exceed 1% of limits in 10 CFR, Part 20, actions will be taken to 1) locate the offending material and eliminate its contribution by physical/chemical containment such as absorption, sealing in a leak-proof container, etc.

II. Our policy regarding I-125 will encompass the following:

Newly hired employees who will be working with I-125 will receive a thyroid scan at the beginning of employment and

3 months later in order to establish baseline activity and verify that the employee adhere to appropriate laboratory practices. Anyone working with o.1mCi or more of inorganic radioiodine will receive a thyroid scan within 48 hours of finishing the work. Also all laboratory employees will receive a monthly check. These measurements will be made with a portable meter having a sensitivity of 1nCi. Any readings in excess of 5nCi will be verified by Mr. Bolton.

Any individual with thyroid burden of 10nCi will be removed from the laboratory until source/cause of contamination is located and eliminated.

III. Tritium Assays

Bioassays for tritium are not required at this time per guidelines in "Applications of Bioassay for Tritium". It is anticipated that we will be working with less than 10mCi of tritium labelled compounds at one time. This value is 10% of amount in Table 1 of the above guidelines. We will not handle significant quantities ($\leq$1mCi) of HTO.

Should increased quantities of tritium be used, bioassays will be performed on at least a quarterly basis.

Currently, BTI has less than 5mCi of tritium compounds.

IV. Use of Phosphorus-32 Compounds

Whenever millicurie quantities of a P-32 compound are in use, general policies will be the following:

1) Work to be done in trays, in a hood, if possible, to further contain spills.

2) Use of a portable Plexiglass (3/4") shield between source and worker.

3) Appropriate laboratory clothing including non-permeable gloves.

4) Goggles or face shield to be worn.

5) Use of remote handling apparatus and tools for concentrated sources.

6) After use and general clean-up, do survey of area and person for "hot-spots

7) Use finger badge for extensive handling procedures.

V. Procedures for Receipt/Shipment of Licensed Material

All packages containing licensed materials will be handled in accordance to 10 CFR Part 20. Briefly, all packages received or departing the premises will be held in a single area of the shipping department designated for isotope shipments/receipts. Records of shipments/receipts will be maintained in a bound notebook. Entries will be made of smear tests of all packages of non-exempt licensed materials, nuclide and quantity of activity, destination of shipment or shipper of materials received, results of external dosage if appropriate and date.

Licensed materials will not be shipped to a customer or individual unless a current license of the user is in our file and we have determined that materials to be shipped are in accordance with his license. In some circumstances, shipments (small quantities) will be made if an authorized person of the receiver promises to forward a copy of their license promptly.

Biomedical Technologies, Inc.
ATTN: Mr. Ronald Forand
Radiation Safety Officer
378 Page Street
Stoughton, MA 02072

JAN 12 1988

Gentlemen:

This refers to your application dated December 7, 1987, for renewal of Materials License 20-21472-01.

We received your check for $120. Your application, however, is subject to a renewal fee of $460 as specified in §170.31 (3B) of 10 CFR 170, copy enclosed. Payment of the additional $340 should be made to the U.S. Nuclear Regulatory Commission and mailed to my attention at our Washington, D.C. address.

Your application will be processed by the Region I Licensing staff located at 631 Park Avenue, King of Prussia, Pennsylvania 19405. The additional fee, however, is required prior to issuance of the renewal. When submitting the fee, please refer to CONTROL NUMBER 108130.

Sincerely,

Signed by:
Glenda Jackson

Glenda Jackson
License Fee Management Branch
Division of Accounting and Finance
Office of Administration and
Resources Management

Enclosure:
10 CFR 170

cc: Region I

DISTRIBUTION:
Pending Fee File
ARM/DAF R/F
LFMB R/F (2)
DW/RI/BTI

OFFICE:	ARM/LFMB	ARM/LFMB
SURNAME:	SKimberley:rej	GJackson
DATE:	1/11/88	1/12/88

BETWEEN

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LMS

PROGRAM CODE: 03214
STATUS CODE: 2
FEE CATEGORY: 3B
EXP. DATE: 19880131
FEE COMMENTS:

LICENSE FEE TRANSMITTAL

A. REGION 1

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: BIOMEDICAL TECHNOLOGIES, INC.
RECEIVED DATE: 871210
DOCKET NO: 3020824
CONTROL NO.: 108130
LICENSE NO.: 20-21472-01
ACTION TYPE: RENEWAL

2. FEE ATTACHED
AMOUNT: $120
CHECK NO.: 1388

3. COMMENTS

SIGNED
DATE 12/29/87

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /s/)

1. FEE CATEGORY AND AMOUNT: 3B (8460)

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT
RENEWAL /
LICENSE

3. OTHER

SIGNED
DATE 1/11/88