

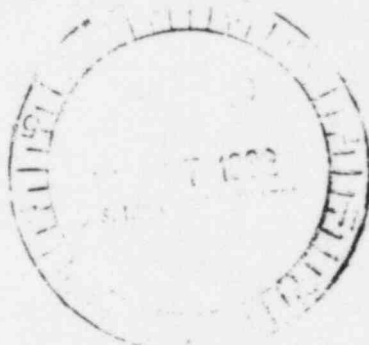
**ohmart**  
CORPORATION

Chk for 910  
19679  
1230(33)  
Amendment  
12/16/82  
Brown

12/16/82  
Dec 8 Amend  
Brown

12/21/82

December 3, 1982  
#576  
rechecked  
from 36 Am DS



Materials Licensing Branch  
Division of Materials & Fuel Cycle Safety  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Reference: CM-244 in Ohmart Model BAL

Gentlemen:

Enclosed is our check for \$910.00 to cover the fee for the safety evaluation of the use of CM-244 in an Ohmart Model BAL source holder (\$570.00), amendment of License No. 34-00639-03G (\$230.00) and amendment of License No. 34-00639-01 (\$110.00).

The Ohmart Model BAL source holder was approved on November 28, 1978 (Amendment 09 to 34-00639-03G) for KR-85, SR-90 and AM-241. We now wish to use CM-244 in the Model BAL.

We will use the CM-244 as a soft gamma emitter but we are aware that there is a small amount of neutron emission. Catalogue sheets from Amersham are enclosed.

Ohmart drawing B-40947 shows the outline dimensions of the Amersham Model CLC.D1 source capsule. This capsule was approved by the NRC on June 7, 1979. It has an ASNI Classification of C-64344 per N542-1977 and is approved for special form up to 1.5 Ci.

Ohmart drawings B-40930-1 and -2 and B-40931-1 and -2 show isodistance radiation surveys for 100 mCi of CM-244 in a Model BAL source holder. Note that the survey shows the field intensity for both the gamma and the neutron radiation. For example,  $\frac{0.34}{0.25}$  means that the gamma radiation is 0.34 mrem/hr and the neutron radiation is 0.25 mrem/hr.

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The gamma radiation was measured with a Victoreen Model 440 with the aluminum cover cap removed. The readings were then divided by 0.95 to correct for the fall-off in response at the CM-244 energy.

The neutron radiation intensity was calculated using the Amersham catalogue value of  $10^3$  n/sec per Ci.

Using the criteria of not exceeding 5 mrem/hr at 30 cm nor 100 mrem/hr at 5 cm a very large activity source could be used. However, cost effectiveness limits the activity to about 1000 mCi. Therefore, we request approval to distribute up to 1000 mCi of CM-244 in the Model BAL to both General and Specific licensees. The leak test interval should not exceed 6 months. Marked copies of our licenses are enclosed.

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INSPECTION AND ENFORCEMENT

### Safety Analysis

#### Typical Environmental Conditions

Temperature: 32<sup>0</sup> to 140<sup>0</sup>F (0<sup>0</sup> to 60<sup>0</sup>C)  
Pressure: Atmospheric  
Impact: Accident conditions only  
Fire: Unlikely  
Explosion: Unlikely

#### Fire

In a fire where the temperature is above the melting point of lead (327<sup>0</sup>C), the lead will melt and reduce the shielding but the source capsule will be retained in the body of the source holder.

For fires where the temperature is above the melting point of aluminum (659<sup>0</sup>C), the body of the source holder will melt, but the source capsule will be retained in the source housing. The source capsule is rated at 800<sup>0</sup>C.

#### Explosion

Ohmart has no history of this type of gage being involved in an explosion.

However, due to the design of the source holder, the source housing, the method of fastening the capsule to the holder and the method of fastening the holder to the housing, the source capsule should be retained in the housing if the gage was involved in an explosion.

#### Quality Control

Sealed source. Examination of vendor source certificate for proper activity and leak test results. Incoming wipe test before placing source in inventory. Wipe test of complete device prior to shipment. Wipe test counting equipment can detect less than 0.005 uCi of activity on the wipe.

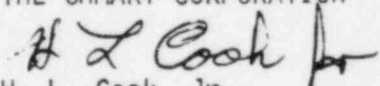
Radiation field intensity. Measure radiation field intensity of completed device prior to shipment to assure that values do not exceed 5 mR/hr at 30 cm from the surface of the device nor 100 mR/hr at 5 cm from the surface.

Meachanical parts and construction. Visual inspection of all parts before and after assembly. Visual inspection of all welds. Operation check of source OFF/ON mechanism. Visual check for proper location and attachment of all labels.

We trust that this information is complete and adequate to obtain licensing approval.

Sincerely,

THE OHMART CORPORATION

  
H. L. Cook, Jr.  
Vice President

Materials Licensing Branch  
December 3, 1982  
Page Three

Enclosures Amersham Catalogue Sheets  
B-40947  
B-40930-1 & -2  
B-40931-1 & -2  
Marked License #34-00639-01  
Marked License #34-00639-03G  
Ohmart Check #19679

# Nuclide reference tables

nuclide and half-life	type of decay	particle energies and transition probabilities		electromagnetic transitions		products	pages
		energy MeV	transition probability	photon energy MeV	photons emitted		
<b>Curium-244</b> (17.8y)	$\alpha$	5.763 5.806 others	23.6% 76.4% low	0.043 0.099 0.152 others (up to ~0.8) Pu L X-rays ~8% (0.012-0.023)	0.02% 0.0013% 0.0014% low	low energy photon sources	46
<b>Europium-152</b> (13.0y)	$\beta^-$  $\beta^+$ e.c.	0.185 0.394 0.705 1.484 others	1.8% 2.4% 13.8% 8.0% 1.6% ~0.02% 72.4%	0.122 0.245 0.344 0.411 0.444 0.779 0.867 0.964 1.086 1.090 1.112 1.213 1.213 1.299 1.408 others	28.3% 7.4% 26.4% 2.2% 3.1% 12.8% 4.1% 14.4% 10.0% 1.7% 13.6% 1.4% 1.4% 1.6% 20.6% <1% each	$\gamma$ -reference sources	94
<b>Gadolinium-153</b> (241.5d)	e.c.	100%		0.070 0.075 0.083 0.089 0.097 0.103 0.173 Eu K X-rays ~110% (0.041-0.048)	2.6% 0.07% 0.23% 0.12% 30% 20% 0.04%	low energy photon sources	46
<b>Gold-195</b> (183d)	e.c.	100%		0.031 0.099 0.130 others Pt K X-rays ~90% (0.065-0.078)	1.1% 10.4% 0.7% low	$^{195}\text{Pt} (^{195}\text{Au})$ Mössbauer sources	74
<b>Hydrogen-3</b> (Tritium) (12.35y)	$\beta^-$	0.0186	100%			$\beta$ -reference sources $\beta$ -sources low energy photon sources targets for n-generators	78 26 37 64
<b>Iodine-125</b> (60.0d)	e.c.	100%		0.035 Te K X-rays 138% (0.027-0.032)	7% 138%	low energy photon sources	48
<b>Iodine-129</b> ( $1.57 \times 10^7$ y)	$\beta^-$	0.150	100%	0.040 Xe K X-rays ~69% (0.030-0.035)	7.5% ~69%	$\gamma$ -reference sources	94
<b>Iron-55</b> (2.7y)	e.c.  KLL others	100%  4.990-5.210 keV low	  ~61% low	Mn K X-rays ~28% (0.0059-0.0065)		Auger electron sources low energy photon (X-ray) sources $\gamma$ -reference sources source target assemblies variable energy X-ray sources primary X-ray sources	26 49 94 90 78 85

## $\gamma$ and primary X-ray sources

### Curium-244, Gadolinium-153

#### Curium-244

Curium-244 incorporated in a ceramic enamel recessed into a stainless steel support with tungsten alloy backing and sealed in a welded monel capsule with brazed beryllium window. Principal emissions: Pu L X-rays.

##### Quality control

Wipe test A  
Bubble test D  
Immersion test L

Photon emission and spectral purity checked using Si(Li) detector.

##### Neutron emission

The  $^{244}\text{Cm}$  sources emit  $\sim 10^5\text{n/sec}$  per Ci due mainly to  $(\alpha, n)$  reactions with the low atomic number elements (e.g. Si, Al, O) in the active material ( $10^4\text{n/sec} = 1\text{mrem/hr}$  at 10cm).

The use of Be windows does not increase this emission significantly.

#### Gadolinium-153

Gadolinium-153 incorporated in a ceramic enamel and sealed in a welded stainless steel capsule. Principal emissions 97.4 and 103.2keV  $\gamma$ -rays, Eu K X-rays and W K X-rays produced in source backing.

Photon emission and spectral purity checked using Si(Li) and Ge(Li) detectors.

##### Quality control

Wipe test A  
Bubble test D  
Immersion test L

type	capsule	activity mCi	photon output in photons/sec per steradian 18.3keV	code
disc	X.130/4	10	$1.00 \times 10^6$	CLC.13044
		30	$3.00 \times 10^6$	CLC.13045
		100	$7.30 \times 10^6$	CLC.13046
disc	X.131/4	10	$1.00 \times 10^6$	CLC.13144
		30	$3.00 \times 10^6$	CLC.13145
		100	$1.00 \times 10^6$	CLC.13146
		200	$2.000 \times 10^6$	CLC.13147

\*activity tolerance -0. +25%

Availability: D\*

type	capsule	activity* mCi	photon output in photons/sec per steradian 97.4-103.2keV	code
disc	X.92/1	100	$1.4 \times 10^8$	GDC.9216
		300	$4.2 \times 10^8$	GDC.9217
		500	$7 \times 10^8$	GDC.9218

\*activity tolerance -0. +25%

Availability: D\*

MATERIALS LICENSE  
SUPPLEMENTARY SHEETLicense number  
34-00639-03G

Docket or Reference number

Amendment No. 15

Ohmart Corporation  
4241 Allendorf Drive  
Cincinnati, Ohio 45209

In accordance with letter dated July 28, 1982, License Number 34-00639-03G is amended as follows:

Conditions 10. and 18. are amended to read:

10. Each device distributed pursuant to the terms and conditions of this license shall be in accordance with the following table:

Device Model Numbers	Source Model Numbers	Isotopes	Maximum Activity per source (Millicuries)
ASR-2	A2102 or A-2104	Cesium 137	4500
ASR-3	A-2102 or A-2104	Cesium 137	4000
ASR-4	A-2102	Cesium 137	2700
BAL	A-33766	Krypton 85	75
	A-4829	Krypton 85	1200
	A-36058	Krypton 85	1500
	A-4830	Strontium 90	200
	A-5799	Americium 241	1000
Beta Art	B-40947	Cyranium 244	1000
Series 6000	A-35950	Krypton 85	75
(with BAL source holder)	A-36058	Krypton 85	200
BG-1G	A-4829 or A-4834	Krypton 85	600
BG-2G	A-5840 or A-4830	Strontium 90	300
BG-2/9G	B-14315	Strontium 90	100
	B-14315	Krypton 85	1200
BG-3G	A-4832, A-4831	Strontium 90	1000
	or A-5800		
BG-4G	B-6815	Krypton 85	1000
BG-9G	A-4829 or A-4834	Krypton 85	1200
BG-11G	B-6815	Krypton 85	2000
BGCD-2/9G	B-14315	Strontium 90	100
	B-14315	Krypton 85	1200
BGCD-9G	A-4829	Krypton 85	1200
BGO-1G	A-4829 or A-4834	Krypton 85	600
BGO-2G	A-5840 or A-4830	Strontium 90	300
BGO-3G	A-4832, A-4831, or	Strontium 90	1000
	A-5800		
BGO-4G	B-6815	Krypton 85	1000
BGO-9G	A-4829 or A-4834	Krypton 85	1200
BGO-11G	B-6815	Krypton 85	2000
BGOC-1G	A-4829 or A-4834	Krypton 85	600
BGOC-2G	A-5840 or A-4830	Strontium 90	300
BGOC-3G	A-4832, A-4831	Strontium 90	1000
	or A-5800		



MATERIALS LICENSE  
SUPPLEMENTARY SHEET

CORRECTED COPY

License number

34-00639-01

Docket or Reference number

Amendment No. 27

## 9. Authorized use

A. through P. For use and/or possession incident to:

- (1) Research, development, testing and demonstration of gauging devices.
- (2) Installation into or removal from gauging devices.
- (3) Installation, relocation, repair, testing and servicing of Omart devices.
- (4) Calibration of radiation survey meters, and measuring instruments.
- (5) Picking up, packaging, and transfer of sealed sources and devices received from customers for transfer to authorized recipients including sealed sources and or devices not manufactured by Omart.
- (6) Distribution in devices specified in Condition 10 of this license or other gauging devices (e.g., custom devices) to persons authorized to receive the licensed material pursuant to terms and conditions of specific licenses issued by the U. S. Nuclear Regulatory Commission or Agreement States.
- (7) Instruction of individuals in the use and servicing of Omart devices.

## CONDITIONS

10. Except for custom-made devices, each device distributed under this license shall be in accordance with the following table:

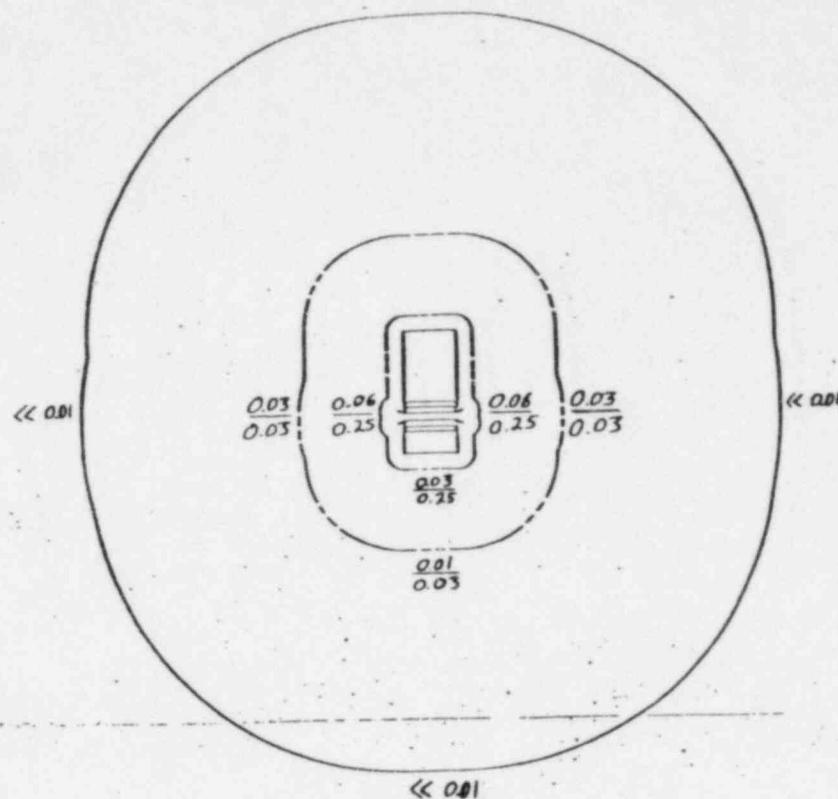
Device Model Numbers	Source Model Numbers	Isotopes	Maximum Activity Per Source (Millicuries)	User Leak Test Interval
AS-2	A-2102	Cesium 137	100	3 yrs
ASR-2	A-2102 or A-2104	Cesium 137	4500	3 yrs
ASR-3	A-2102 or A-2104	Cesium 137	4000	3 yrs
ASR-4	A-2102	Cesium 137	2700	3 yrs
BAL	A-33766	Krypton 85	75	NONE
	A-4829	Krypton 85	1200	NONE
	A-36058	Krypton 85	1500	NONE
	A-4830	Strontium 90	200	6 Mos.
	A-5799	Americium 241	1000	6 Mos.
	A-22439	Iron 55	150	6 Mos.
Beta Art	A-35950	Krypton 85	75	NONE
Series 6000	A-36058	Krypton 85	200	NONE
(with BAL	A-22439	Iron 55	150	6 Mos.
source holder)				
CC	A-5776	Cesium 137	3	3 yrs.

Date \_\_\_\_\_

By \_\_\_\_\_ Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

13242



SIDE VIEW

WINDOWS- 1 mil KAPTON (TOP & BOTTOM)

**TOLERANCES**  
UNLESS OTHERWISE SPECIFIED:  
ANGLE TOLERANCES  $\pm 1/2^\circ$   
CAST OR FLD DIM  $\pm 1/8$   
MACHINED FRACTIONAL  $\pm 1/64$   
MACHINED DECIMAL  $\pm .005$   
BREAK ALL SHARP CORNERS

PL.
MATERIAL.
PROVINCE.
MADE FROM.

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

**P.O. NUMBER**

**COMMENTS**

GRAVIN TRE

DATE  
11-5-92

CECECO

1994

SCALE

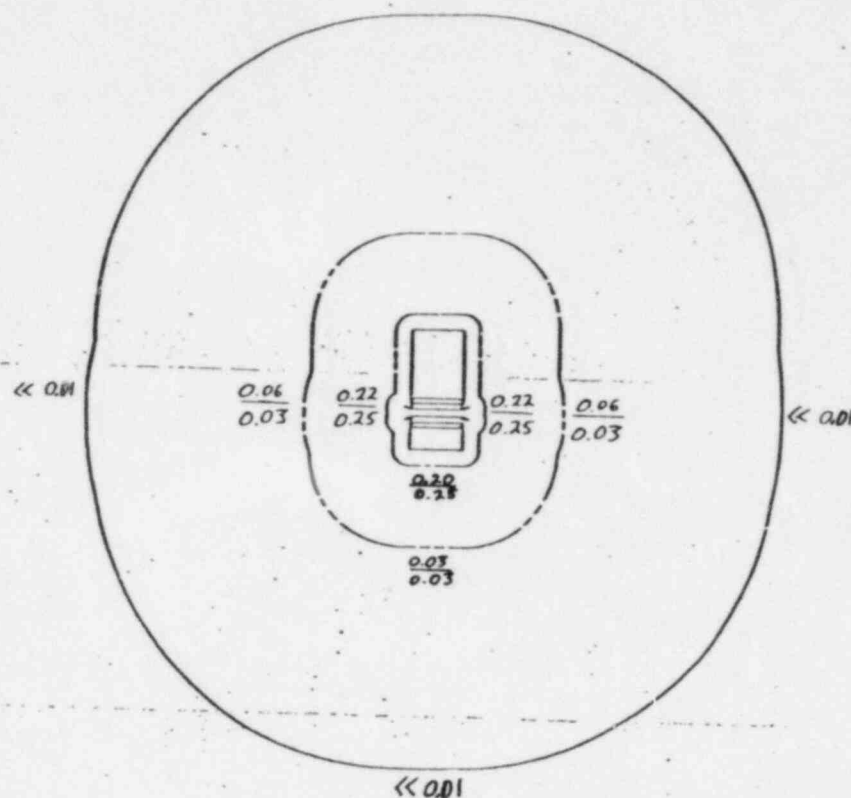
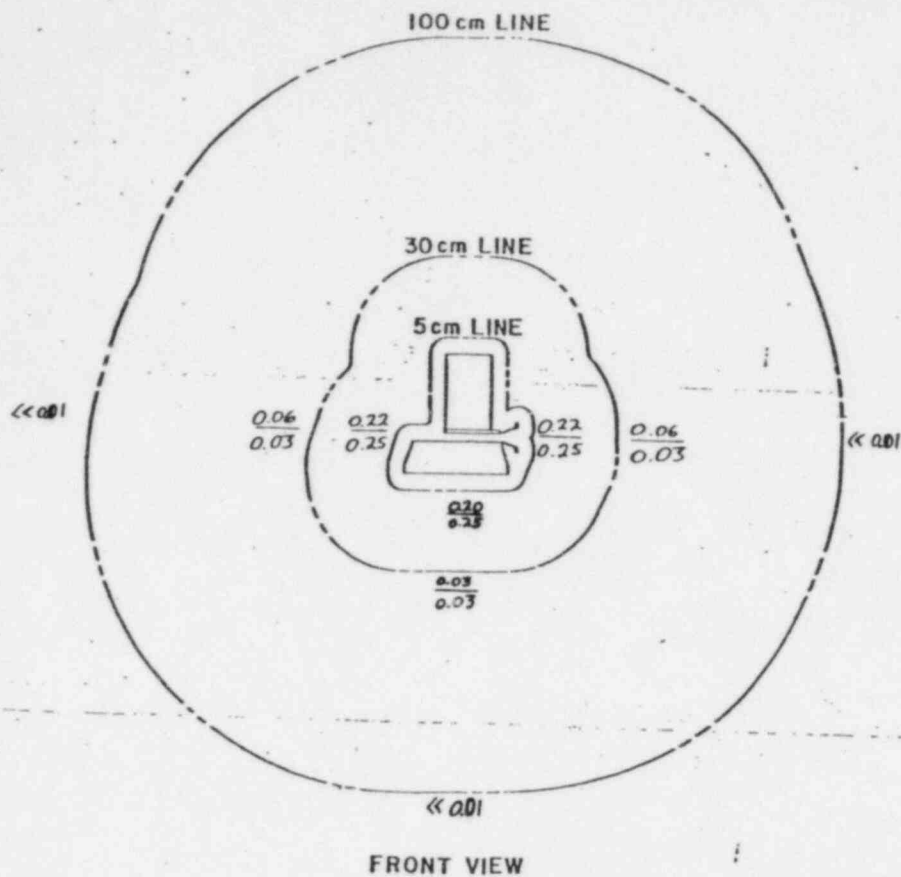
CAV
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B-40930-1





REV	REVISION	BY & DATE	CHECKED & DATE



SURVEY METER: VICTOREEN MODEL 440 (cover off)  
SERIAL NO. 3062

SOURCE: CN

SOURCE: 100mCi OF Cm-244

AIR GAP: 2"

DOSE RATE: GAMMA mrem/hr  
NEUTRON

COLLIMATOR- NONE

WINDOWS- 1 mil KAPTON (TOP & BOTTOM)

UNLESS OTHERWISE SPECIFIED:  
ANGLE TOLERANCES: 1/2°  
CAST OR FLOWN: 1/8"  
MACHINED SURFACES: 1/64"  
MACHINED DIMENSIONS: 0.015"  
BREAK ALL SHARP CORNERS

P.L.      M.A.

MATERIAL

FINISH

MADE FROM

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART S.O.

DRAWN TRF

DATE 11-5-82

CHECKED

COPY 12-1-82

SCALE

CAT.

ES-40931-1





RECEIVED BY LFMI  
Date: 12/16/82  
By: Dec 8 Amends  
12/21/82  
December 3, 1982

Materials Licensing Branch  
Division of Materials & Fuel Cycle Safety  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Reference: CM-244 in Ohmart Model BAL

Gentlemen:

Application: CM-244  
Check No.: 19679  
Amount: \$910  
Type of Fee: Amendment  
Date of Fee: 12/16/82  
Received by: Brown



Enclosed is our check for \$910.00 to cover the fee for the safety evaluation of the use of CM-244 in an Ohmart Model BAL source holder (\$570.00), amendment of License No. 34-00639-03G (\$230.00) and amendment of License No. 34-00639-01 (\$110.00).

The Ohmart Model BAL source holder was approved on November 28, 1978 (Amendment 09 to 34-00639-03G) for KR-85, SR-90 and AM-241. We now wish to use CM-244 in the Model BAL.

We will use the CM-244 as a soft gamma emitter but we are aware that there is a small amount of neutron emission. Catalogue sheets from Amersham are enclosed.

Ohmart drawing B-40947 shows the outline dimensions of the Amersham Model CLC.D1 source capsule. This capsule was approved by the NRC on June 7, 1979. It has an ANSI Classification of C-64344 per N542-1977 and is approved for special form up to 1.5 Ci.

Ohmart drawings B-40930-1 and -2 and B-40931-1 and -2 show isodistance radiation surveys for 100 mCi of CM-244 in a Model BAL source holder. Note that the survey shows the field intensity for both the gamma and the neutron radiation. For example,  $\frac{0.34}{0.25}$  means that the gamma radiation is 0.34 mrem/hr and the neutron radiation is 0.25 mrem/hr.

The gamma radiation was measured with a Victoreen Model 440 with the aluminum cover cap removed. The readings were then divided by 0.95 to correct for the fall-off in response at the CM-244 energy.

The neutron radiation intensity was calculated using the Amersham catalogue value of  $10^5$  n/sec per Ci.

Using the criteria of not exceeding 5 mrem/hr at 30 cm nor 100 mrem/hr at 5 cm a very large activity source could be used. However, cost effectiveness limits the activity to about 1000 mCi. Therefore, we request approval to distribute up to 1000 mCi of CM-244 in the Model BAL to both General and Specific licensees. The leak test interval should not exceed 6 months. Marked copies of our licenses are enclosed.

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INSPECTION AND ENFORCEMENT

13243

### Safety Analysis

#### Typical Environmental Conditions

Temperature: 32° to 140°F (0° to 60°C)  
Pressure: Atmospheric  
Impact: Accident conditions only  
Fire: Unlikely  
Explosion: Unlikely

#### Fire

In a fire where the temperature is above the melting point of lead (327°C), the lead will melt and reduce the shielding but the source capsule will be retained in the body of the source holder.

For fires where the temperature is above the melting point of aluminum (659°C), the body of the source holder will melt, but the source capsule will be retained in the source housing. The source capsule is rated at 800°C.

#### Explosion

Ohmart has no history of this type of gage being involved in an explosion.

However, due to the design of the source holder, the source housing, the method of fastening the capsule to the holder and the method of fastening the holder to the housing, the source capsule should be retained in the housing if the gage was involved in an explosion.

#### Quality Control

Sealed source. Examination of vendor source certificate for proper activity and leak test results. Incoming wipe test before placing source in inventory. Wipe test of complete device prior to shipment. Wipe test counting equipment can detect less than 0.005 uCi of activity on the wipe.

Radiation field intensity. Measure radiation field intensity of completed device prior to shipment to assure that values do not exceed 5 mR/hr at 30 cm from the surface of the device nor 100 mR/hr at 5 cm from the surface.

Mechanical parts and construction. Visual inspection of all parts before and after assembly. Visual inspection of all welds. Operation check of source OFF/ON mechanism. Visual check for proper location and attachment of all labels.

We trust that this information is complete and adequate to obtain licensing approval.

Sincerely,

THE OHMART CORPORATION

*H. L. Cook, Jr.*  
H. L. Cook, Jr.  
Vice President

Materials Licensing Branch  
December 3, 1982  
Page Three

Enclosures    Amersham Catalogue Sheets  
                 B-40947  
                 B-40930-1 & -2  
                 B-40931-1 & -2  
                 Marked License #34-00639-01  
                 Marked License #34-00639-03G  
                 Ohmart Check #19679



# Nuclide reference tables

nuclide and half-life	type of decay	particle energies and transition probabilities		electromagnetic transitions		products	pages
		energy MeV	transition probability	photon energy MeV	photons emitted		
<b>Curium-244</b> (17.8y)	$\alpha$	5.763 5.806 others	23.6% 76.4% low	0.043 0.099 0.152 others (up to ~0.8) Pu L X-rays ~8% (0.012-0.023)	0.02% 0.0013% 0.0014% low	low energy photon sources	46
<b>Europium-152</b> (13.0y)	$\beta^-$  $\beta^+$ e.c.	0.185 0.394 0.705 1.484 others	1.8% 2.4% 13.8% 8.0% 1.6%	0.122 0.245 0.344 0.411 0.444 0.779 0.867 0.964 1.086 1.090 1.112 1.213 1.213 1.299 1.408 others	28.3% 7.4% 26.4% 2.2% 3.1% 12.8% 4.1% 14.4% 10.0% 1.7% 13.6% 1.4% 1.4% 1.6% 20.6% <1% each	$\gamma$ -reference sources	94
<b>Gadolinium-153</b> (241.5d)	e.c.	100%		0.070 0.075 0.083 0.089 0.097 0.103 0.173 Eu K X-rays ~110% (0.041-0.048)	2.6% 0.07% 0.23% 0.12% 30% 20% 0.04%	low energy photon sources	46
<b>Gold-195</b> (183d)	e.c.	100%		0.031 0.099 0.130 others Pt K X-rays ~90% (0.065-0.078)	1.1% 10.4% 0.7% low	$^{195}\text{Pt} (^{195}\text{Au})$ Mössbauer sources	74
<b>Hydrogen-3</b> (Tritium) (12.35y)	$\beta^-$	0.0186	100%			$\beta$ -reference sources $\beta$ -sources low energy photon sources targets for n-generators	78 20 37 64
<b>Iodine-125</b> (60.0d)	e.c.	100%		0.035 Te K X-rays 136% (0.027-0.032)	7%	low energy photon sources	48
<b>Iodine-129</b> (1.57 $\times 10^7$ y)	$\beta^-$	0.150	100%	0.040 Xe K X-rays ~69% (0.030-0.035)	7.5%	$\gamma$ -reference sources	94
<b>Iron-55</b> (2.7y)	e.c. Auger electrons KLL others	100% 4.990-5.210 keV low		Mn K X-rays ~28% (0.0053-0.0065)		Auger electron sources low energy photon (X-ray) sources $\gamma$ -reference sources source target assemblies variable energy X-ray sources primary X-ray sources	26 49 94 90 88 85

## $\gamma$ and primary X-ray sources

## Curium-244, Gadolinium-153

### Curium-244

Curium-244 incorporated in a ceramic enamel recessed into a stainless steel support with tungsten alloy backing and sealed in a welded monel capsule with brazed beryllium window. Principal emissions: Pu L X-rays.

#### Quality control

Wipe test A  
Bubble test D  
Immersion test L

Photon emission and spectral purity checked using Si(Li) detector.

#### Neutron emission

The  $^{244}\text{Cm}$  sources emit  $\sim 10^5$  n/sec per Ci due mainly to ( $\alpha, n$ ) reactions with the low atomic number elements (e.g. Si, Al, O) in the active material ( $10^5$  n/sec = 1 mrem/hr at 10 cm).

The use of Be windows does not increase this emission significantly.

### Gadolinium-153

Gadolinium-153 incorporated in a ceramic enamel and sealed in a welded stainless steel capsule. Principal emissions 97.4 and 103.2 keV  $\gamma$ -rays, Eu K X-rays and W K X-rays produced in source backing.

Photon emission and spectral purity checked using Si(Li) and Ge(Li) detectors.

#### Quality control

Wipe test A  
Bubble test D  
Immersion test L

type	capsule	activity mCi	photon output in photons/sec per steradian 18.3 keV	code
disc	X.130/4	10	$1.00 \times 10^6$	CLC.13044
		30	$3.00 \times 10^6$	CLC.13045
		100	$7.30 \times 10^6$	CLC.13046
disc	X.131/4	10	$1.00 \times 10^6$	CLC.13144
		30	$3.00 \times 10^6$	CLC.13145
		100	$1.00 \times 10^6$	CLC.13146
		200	$2.000 \times 10^6$	CLC.13147

\*activity tolerance -0, -25%

Availability: D\*

type	capsule	activity* mCi	photon output in photons/sec per steradian 97.4-103.2 keV	code
disc	X.92/1	100	$1.4 \times 10^8$	GDC.9216
		300	$4.2 \times 10^8$	GDC.9217
		500	$7 \times 10^8$	GDC.9218

\*activity tolerance -0, -25%

Availability: D\*

MATERIALS LICENSE  
SUPPLEMENTARY SHEET  
CORRECTED COPY

License number  
34-0039-01  
Docket or Reference number  
Amendment No. 27

9. Authorized use

A. through P. For use and/or possession incident to:

- (1) Research, development, testing and demonstration of gauging devices.
- (2) Installation into or removal from gauging devices.
- (3) Installation, relocation, repair, testing and servicing of Omart devices.
- (4) Calibration of radiation survey meters, and measuring instruments.
- (5) Picking up, packaging, and transfer of sealed sources and devices received from customers for transfer to authorized recipients including sealed sources and or devices not manufactured by Omart.
- (6) Distribution in devices specified in Condition 10 of this license or other gauging devices (e.g., custom devices) to persons authorized to receive the licensed material pursuant to terms and conditions of specific licenses issued by the U. S. Nuclear Regulatory Commission or Agreement States.
- (7) Instruction of individuals in the use and servicing of Omart devices.

CONDITIONS

10. Except for custom-made devices, each device distributed under this license shall be in accordance with the following table:

Device Model Numbers	Source Model Numbers	Isotopes	Maximum Activity Per Source (Millicuries)	User Leak Test Interval
AS-2	A-2102	Cesium 137	100	3 yrs
ASR-2	A-2102 or A-2104	Cesium 137	4500	3 yrs
ASR-3	A-2102 or A-2104	Cesium 137	4000	3 yrs
ASR-4	A-2102	Cesium 137	2700	3 yrs
BAL	A-33766	Krypton 85	75	NONE
	A-4929	Krypton 85	1200	NONE
	A-36058	Krypton 85	1500	NONE
	A-4830	Strontium 90	200	6 Mos.
	A-5799	Americium 241	1000	6 Mos.
	A-22439 ← B-40947	Iron 55	150	6 Mos.
Beta Art	A-35950	Krypton 85	75	NONE
Series 6000	A-36058	Krypton 85	200	NONE
(with BAL	A-22439	Iron 55	150	6 Mos.
source holder)				
CC	A-5776	Cesium 137	3	3 yrs.

Date \_\_\_\_\_

By Material Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D. C. 20555

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

34-0061 03G

Docket or Reference number

Amendment No. 15

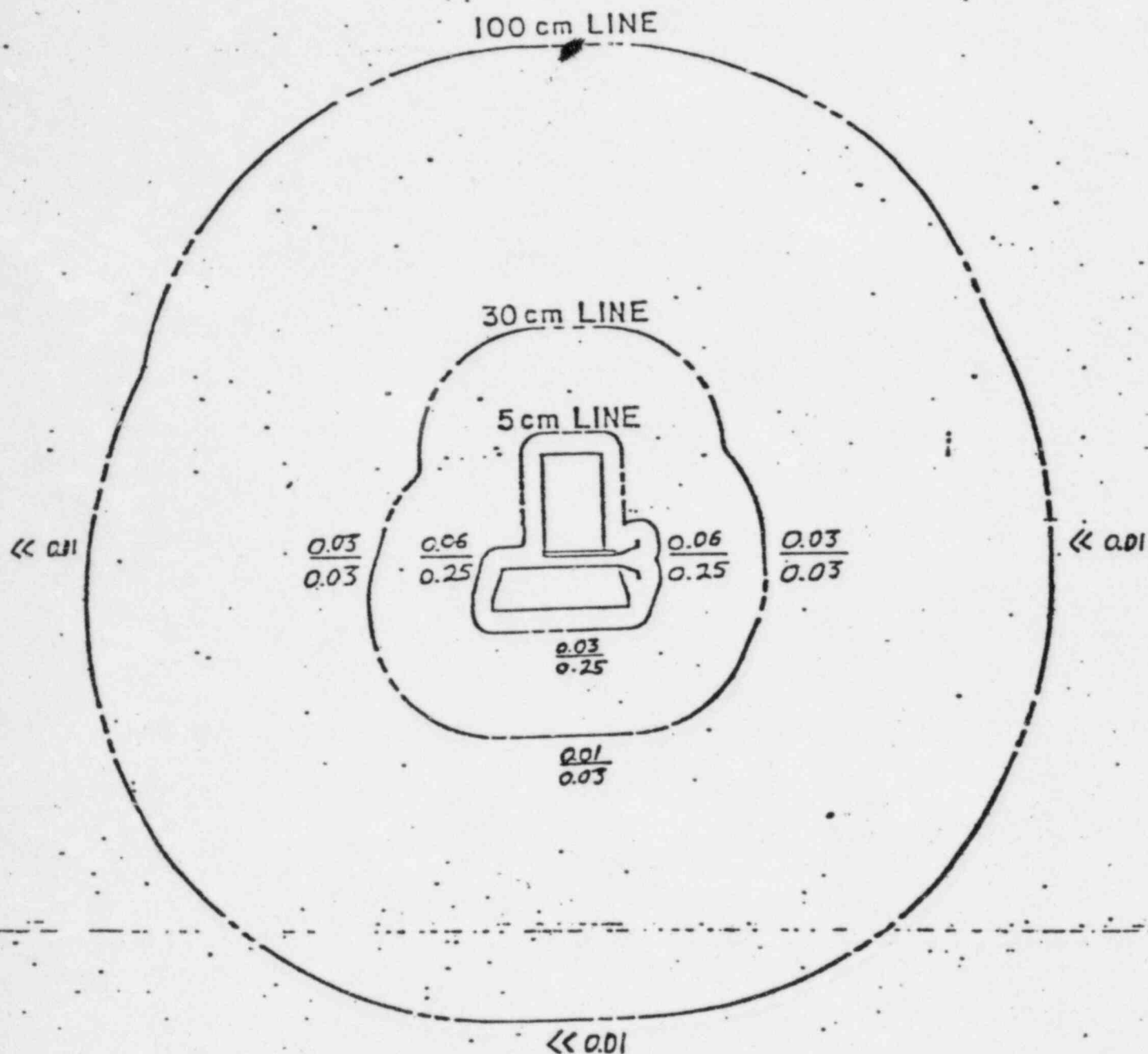
Ormat Corporation  
4241 Allendorf Drive  
Cincinnati, Ohio 45209

In accordance with letter dated July 28, 1982, License Number 34-00639-03G is amended as follows:

Conditions 10. and 18. are amended to read:

10. Each device distributed pursuant to the terms and conditions of this license shall be in accordance with the following table:

Device Model Numbers	Source Model Numbers	Isotopes	Maximum Activity per source (Millicuries)
ASR-2	A-2102 or A-2104	Cesium 137	4500
ASR-3	A-2102 or A-2104	Cesium 137	4000
ASR-4	A-2102	Cesium 137	2700
BAL	A-33766	Krypton 85	75
	A-4829	Krypton 85	1200
	A-36058	Krypton 85	1500
	A-4830	Strontium 90	200
	A-5799	Americium 241	1000
	B-40947	Cesium 137	1000
	A-35950	Krypton 85	75
	A-36058	Krypton 85	200
Beta Art Series 6000 (with BAL source holder)			
BG-1G	A-4829 or A-4834	Krypton 85	600
BG-2G	A-5840 or A-4830	Strontium 90	300
BG-2/9G	B-14315	Strontium 90	100
	B-14315	Krypton 85	1200
BG-3G	A-4832, A-4831 or A-5800	Strontium 90	1000
BG-4G	B-6815	Krypton 85	1000
BG-9G	A-4829 or A-4834	Krypton 85	1200
BG-11G	B-6815	Krypton 85	2000
BGCD-2/9G	B-14315	Strontium 90	100
	B-14315	Krypton 85	1200
BGCD-9G	A-4829	Krypton 85	1200
BGO-1G	A-4829 or A-4834	Krypton 85	600
BGO-2G	A-5840 or A-4830	Strontium 90	300
BGO-3G	A-4832, A-4831, or A-5800	Strontium 90	1000
BGO-4G	B-6815	Krypton 85	1000
BGO-9G	A-4829 or A-4834	Krypton 85	1200
BGO-11G	B-6815	Krypton 85	2000
BGOC-1G	A-4829 or A-4834	Krypton 85	600
BGOC-2G	A-5840 or A-4830	Strontium 90	300
BGOC-3G	A-4832, A-4831 or A-5800	Strontium 90	1000



FRONT VIEW

SURVEY METER: VICTOREEN MODEL 440 (cover off)  
SERIAL NO. 3062

SOURCE: ON

SOURCE: 100mCi OF Cm-244

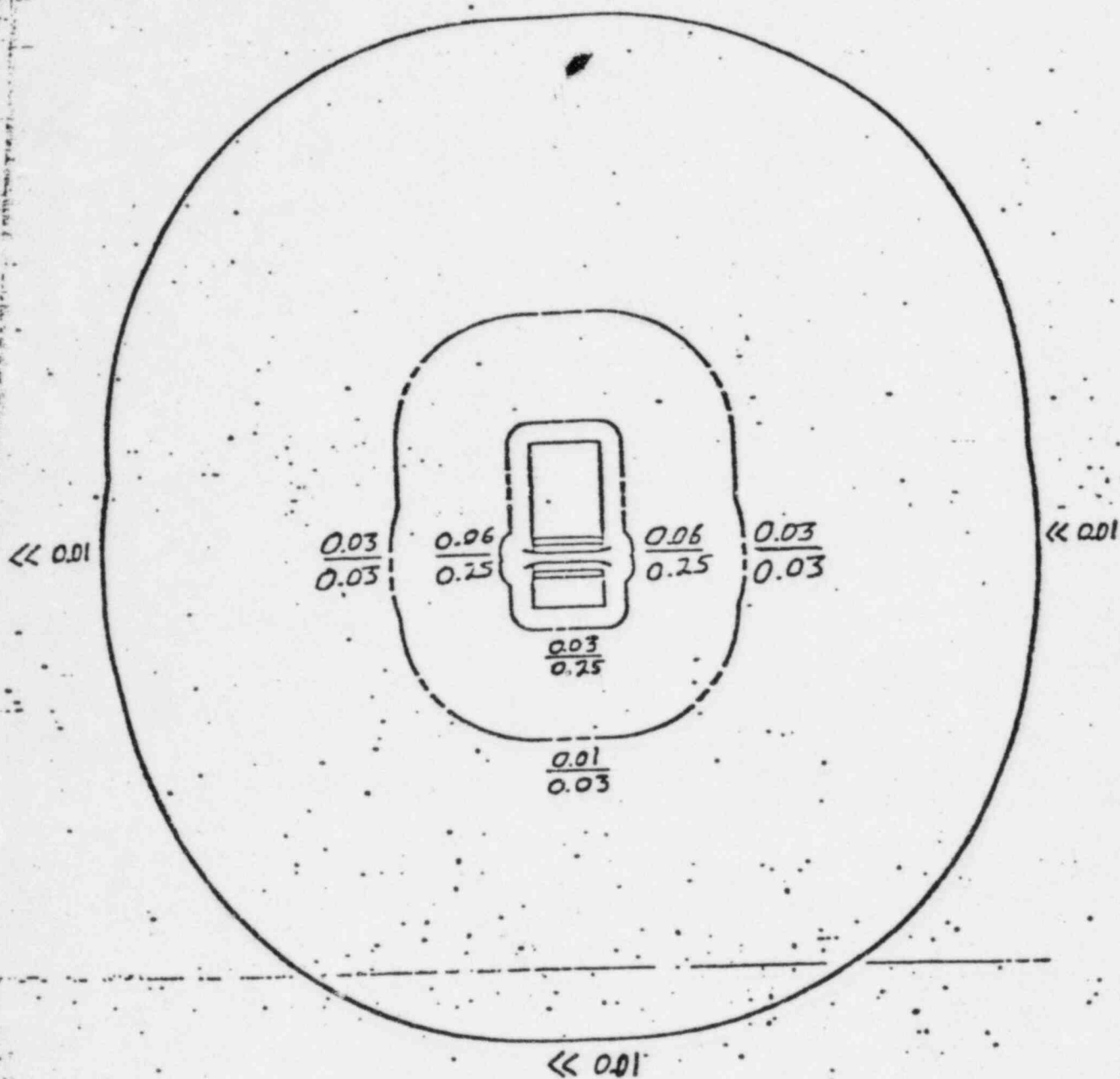
AIR GAP:  $\frac{1}{2}$ "

DOSE RATE: GAMMA mrem/hr  
NEUTRON

COLLIMAT  
WINDOWS

<p>UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: ANGLE TOLERANCE CAST OR WELD MACHINED SURF MACHINED SURF</p>
--





SIDE VIEW

IR- NONE

1 mil KAPTON (TOP & BOTTOM)

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART S.O.

DRAWN TRF

DATE 11-5-82

CHECKED

C 12

SCALE

CAT.

B-40930-1

1 AND PLACING  
OF PARTS

P.L.

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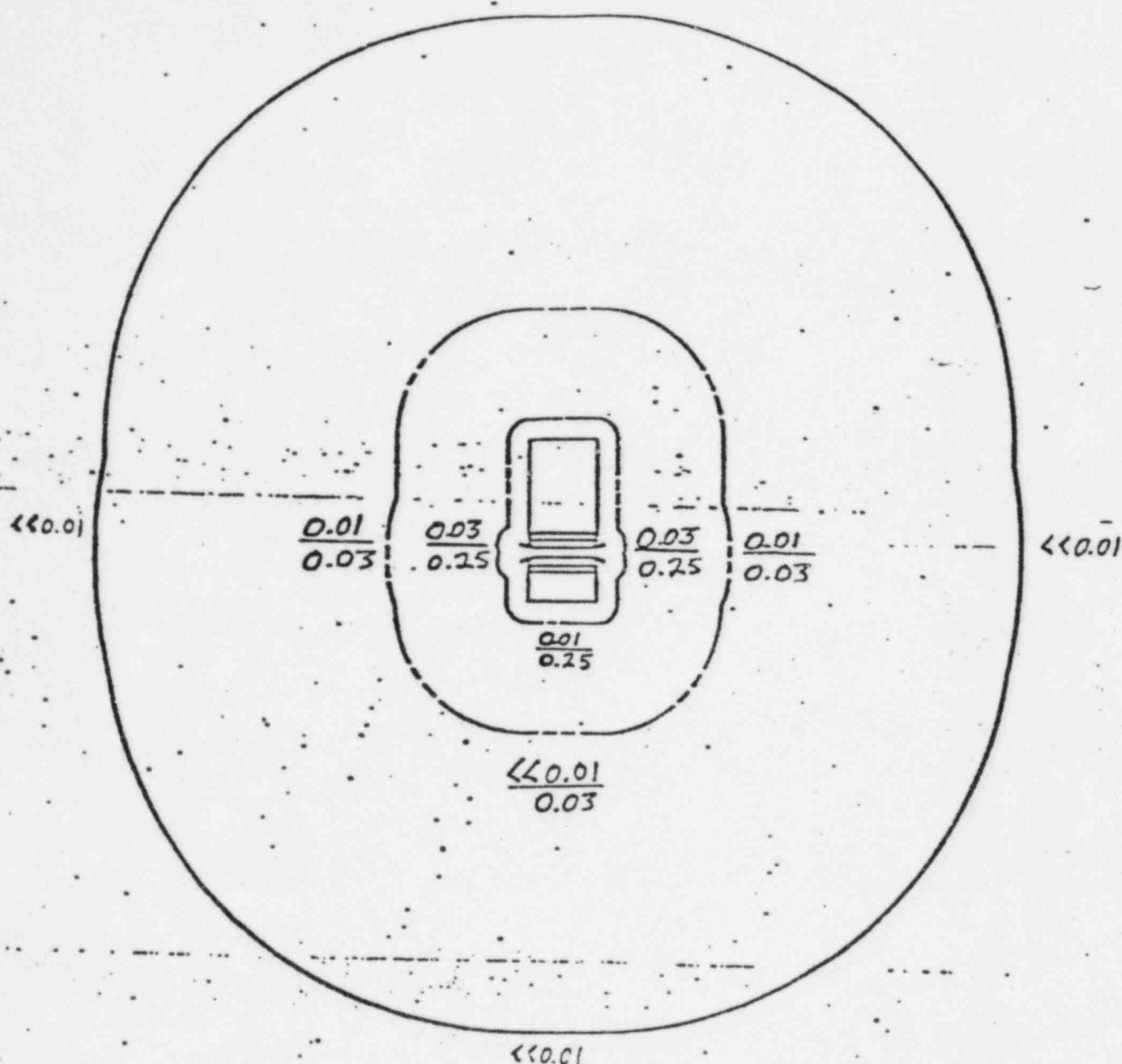
COORNETS

MATERIAL

FINISH

MADE FROM





SIDE VIEW

OR- NONE

1 mil KAPTON (TOP & BOTTOM)

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART S.O.

DRAWN TRF

DATE 11-5-82

CHECKED

SCALE

CAT.

13-40930-2

NOT AND INCLUDE  
NOT PRINTING  
SPEC-  
SPECIFIED:  
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HOLE  $\pm 1/2$ "  
TIGAL  $\pm 1/64$   
HOLE  $\pm .005$   
TIGAL CORNERS

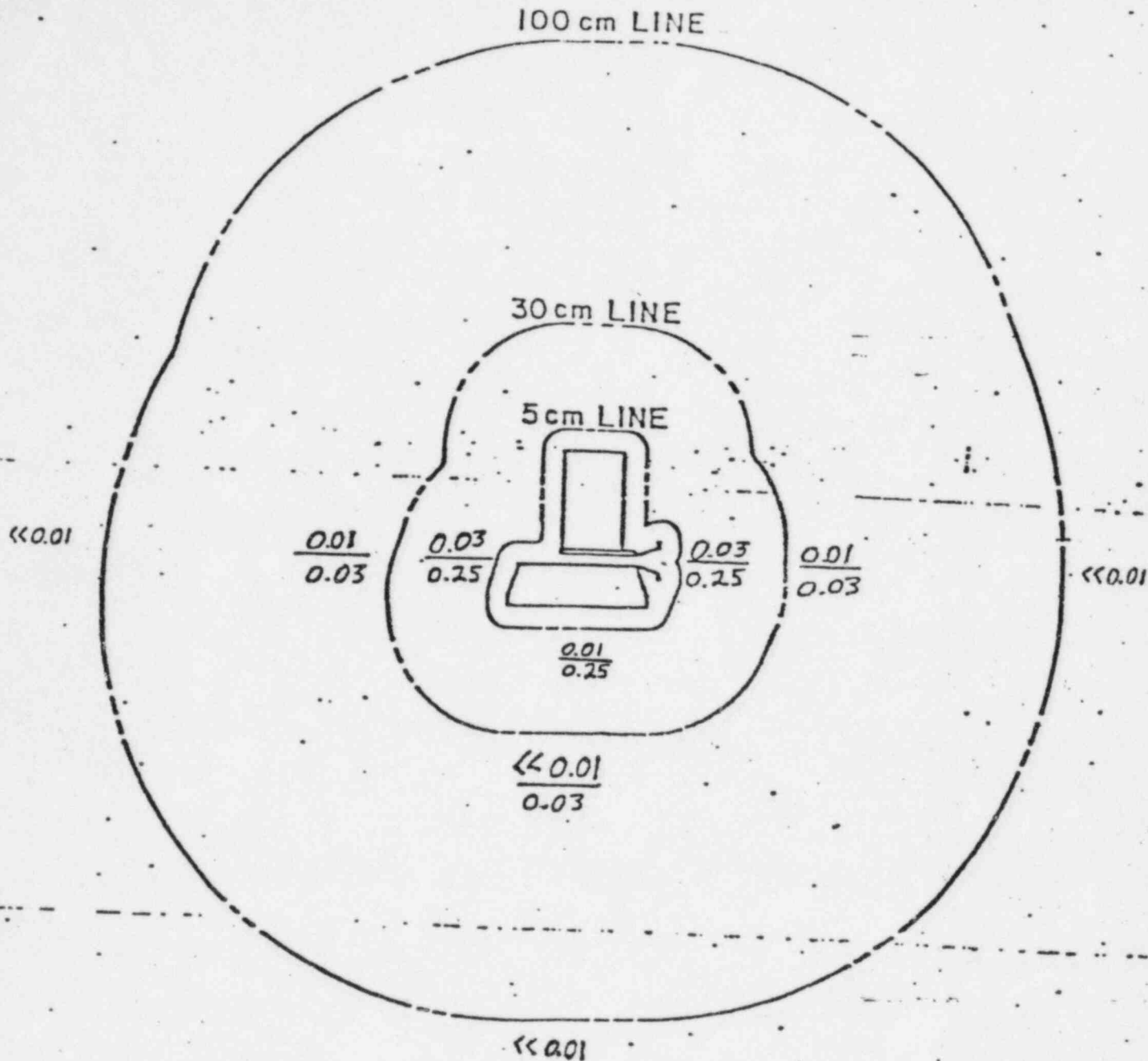
P.L.

N.A.

MATERIAL

FINISH

MAUFACTURER



FRONT VIEW

SURVEY METER: VICTOREEN MODEL 440 (cover off)  
SERIAL NO. 3062

SOURCE: OFF

SOURCE: 100mCi OF Cm-244

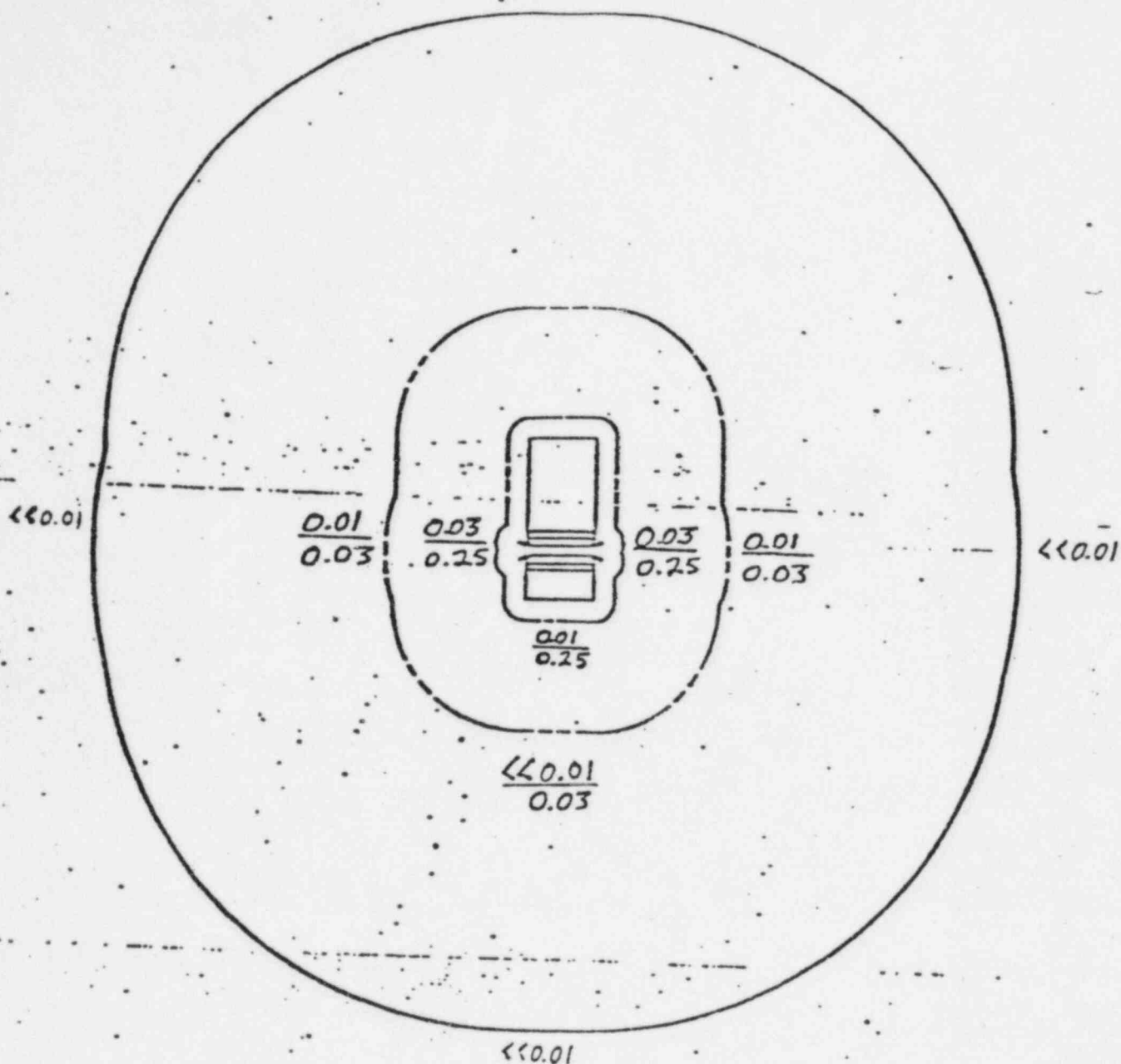
AIR GAP:  $\frac{1}{2}$ "

DOSE RATE: GAMMA mrem/hr  
NEUTRON

COLLIM

WINDOW

DISCONTINUED  
PLATE 1000  
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ANGLE TO  
CAST ON V  
MACHINED  
MACHINED  
BREAK ALL



SIDE VIEW

R- NONE

1 mil KAPTON (TOP & BOTTOM)

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART S.O.

DRAYN TRF

DATE 11-5-82

CHECKED

EA 124

SCALE

CAT.

B-40930-2

1 AND INCLUDE  
FRACTIONS

P.L.

M.A.

CS-  
SPECIFIED:

MATERIAL

US 1/2"  
L 1.2

FINISH

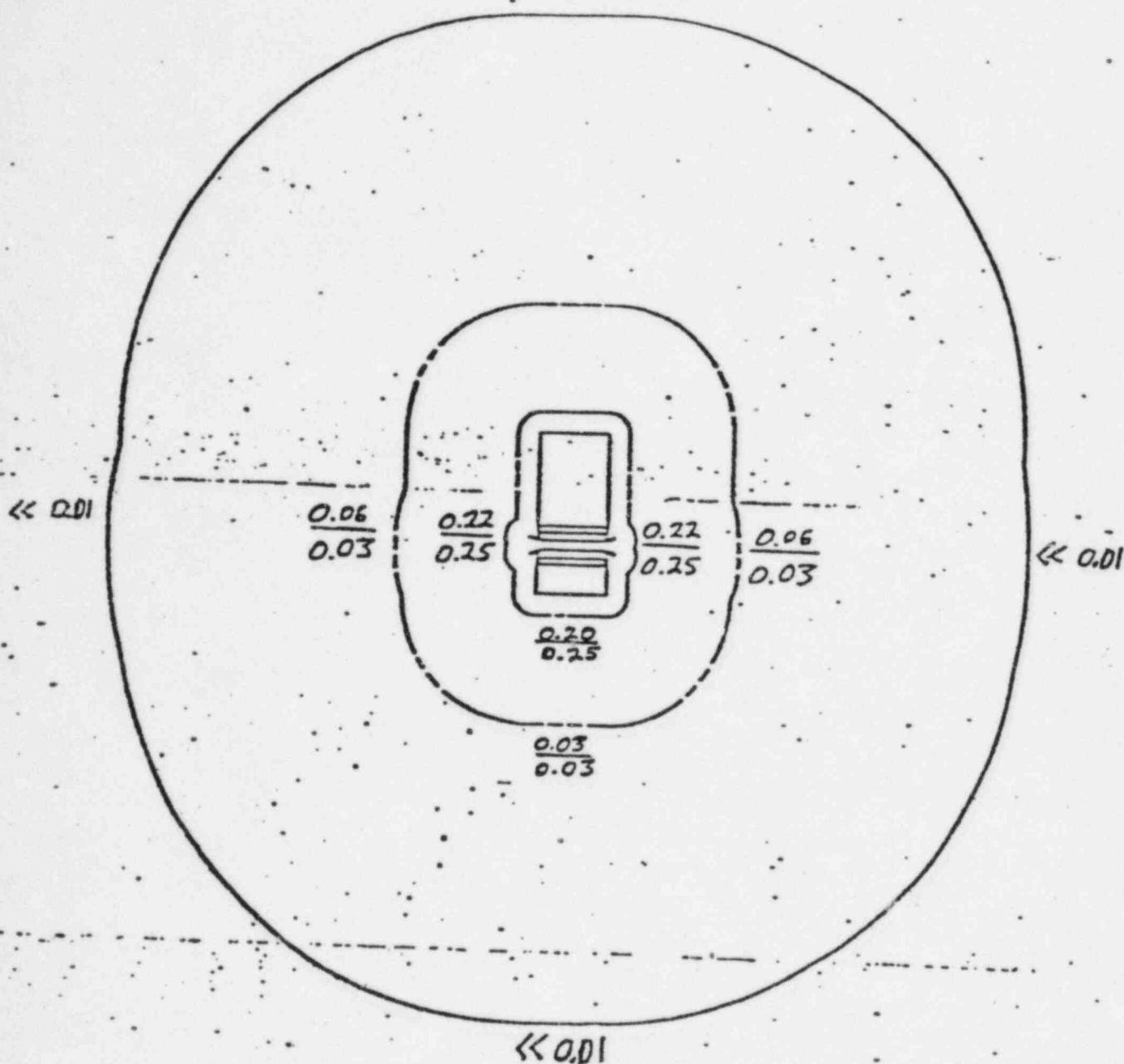
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MAUFACTURE

CORRECTIONS

13247

DATE		CHECKED	



SIDE VIEW

NE

CAPTON (TOP & BOTTOM)

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART S.O.

DRAWN TRF

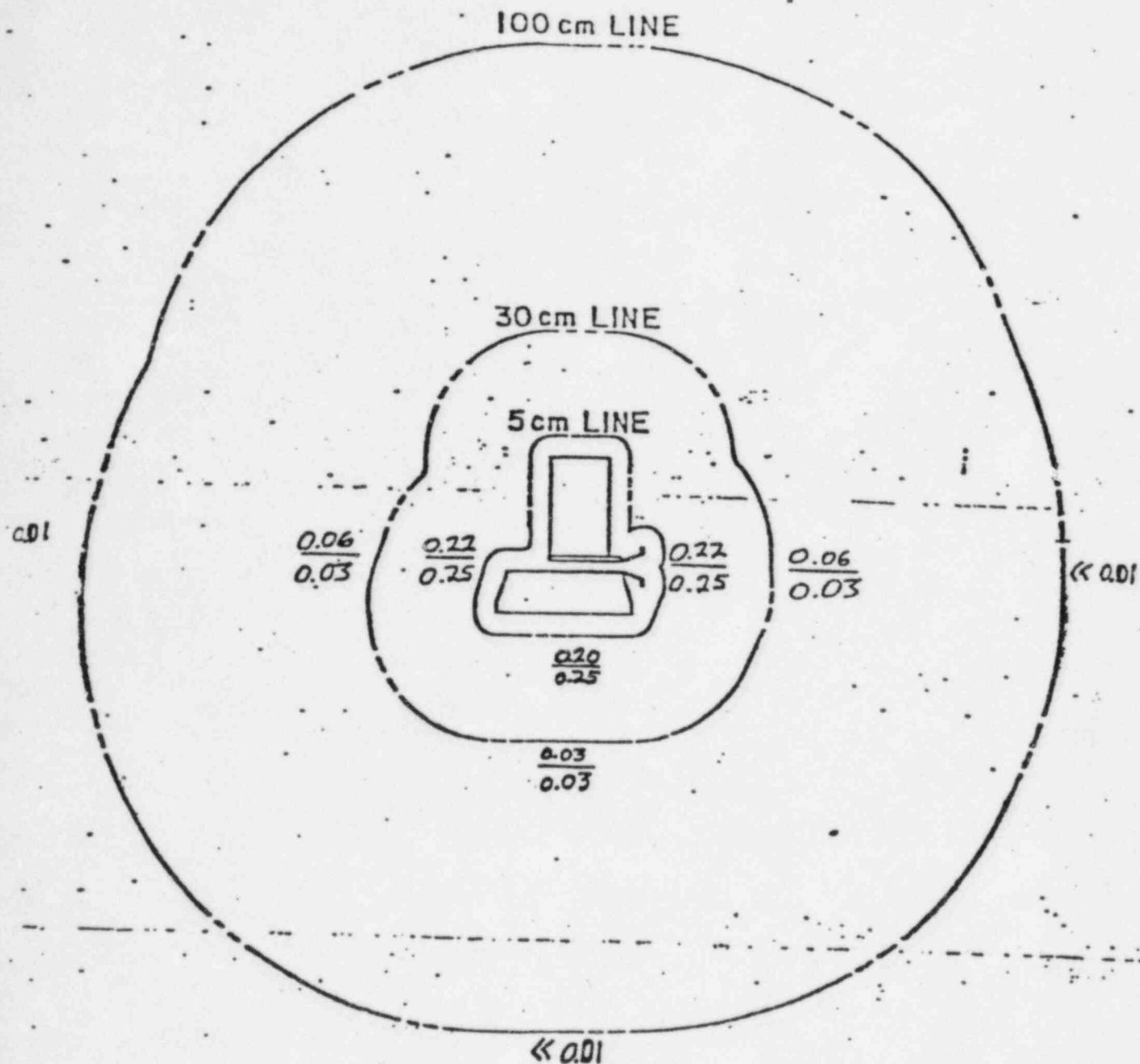
DATE 11-5-82

CHECKED

DATE 12-1-82

SCALE

ES-40931-1



FRONT VIEW

SURVEY METER: VICTOREEN MODEL 440 (cover off)  
SERIAL NO. 3062

COLLIMATOR-

SOURCE: ON

SOURCE: 100mCi OF Cm-244

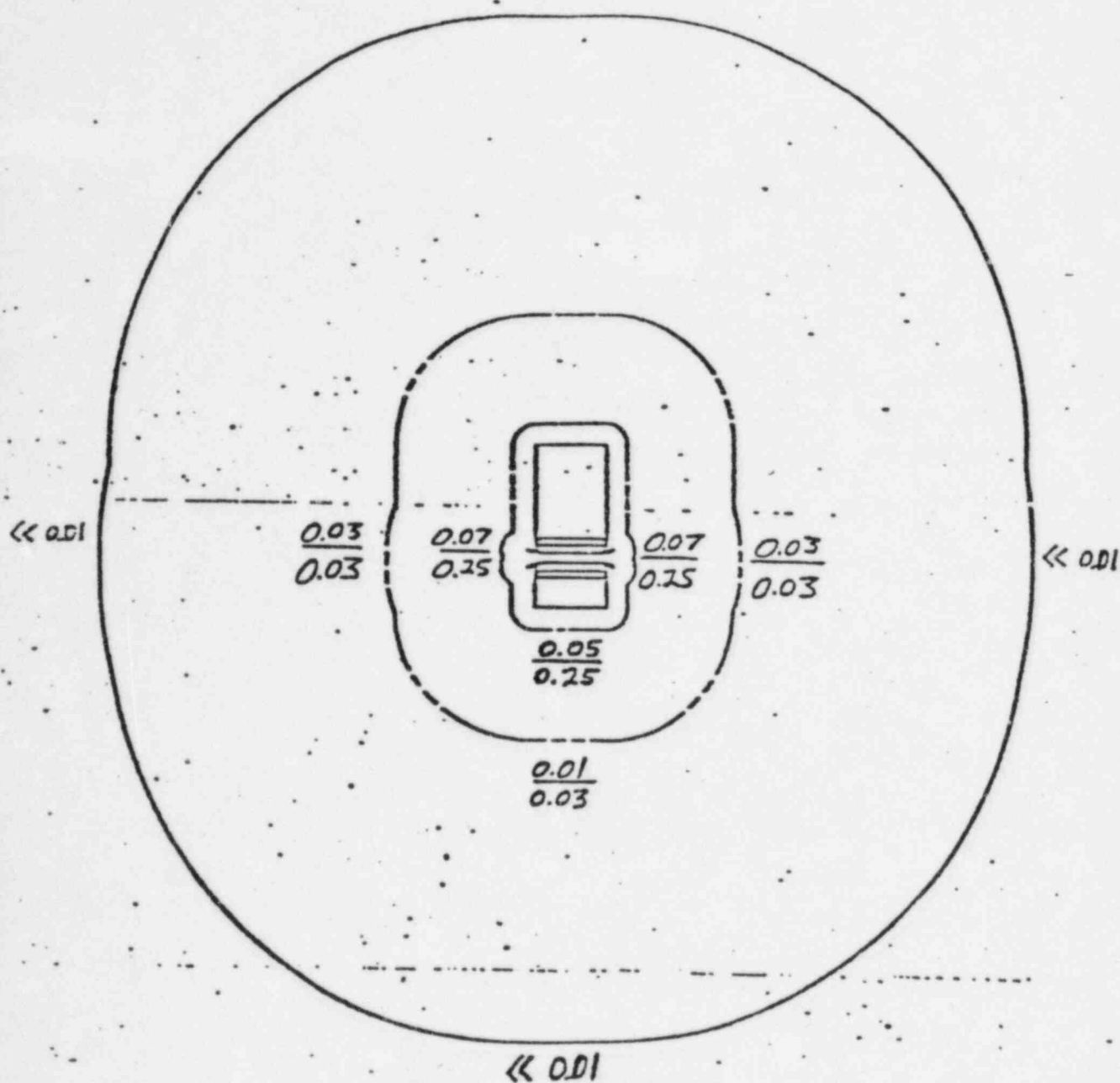
WINDOWS- 1 r

AIR GAP: 2 "

DOSE RATE: GAMMA mrem/hr  
NEUTRON

DRILLING: DRILL AS  
PLATING BUT NOT PAI

TOLEANCES:  
UNLESS OTHERWISE SP  
ANGLE TOLERANCES 2  
CAST OR WELD DIM. 2  
MACHINED FRACTIONS  
MACHINED DECIMAL 2  
BREAK ALL SHARP COR



SIDE VIEW

VE

CAPTION (TOP & BOTTOM)

THE OHMART CORPORATION  
CINCINNATI OHIO

ISO-DISTANCE MEASUREMENTS  
Model BAL Sourceholder

CUSTOMER

P.O. NUMBER

OHMART D.O.

DRAWN

TRF

DATE

CHECKED

DATE

12-1-82

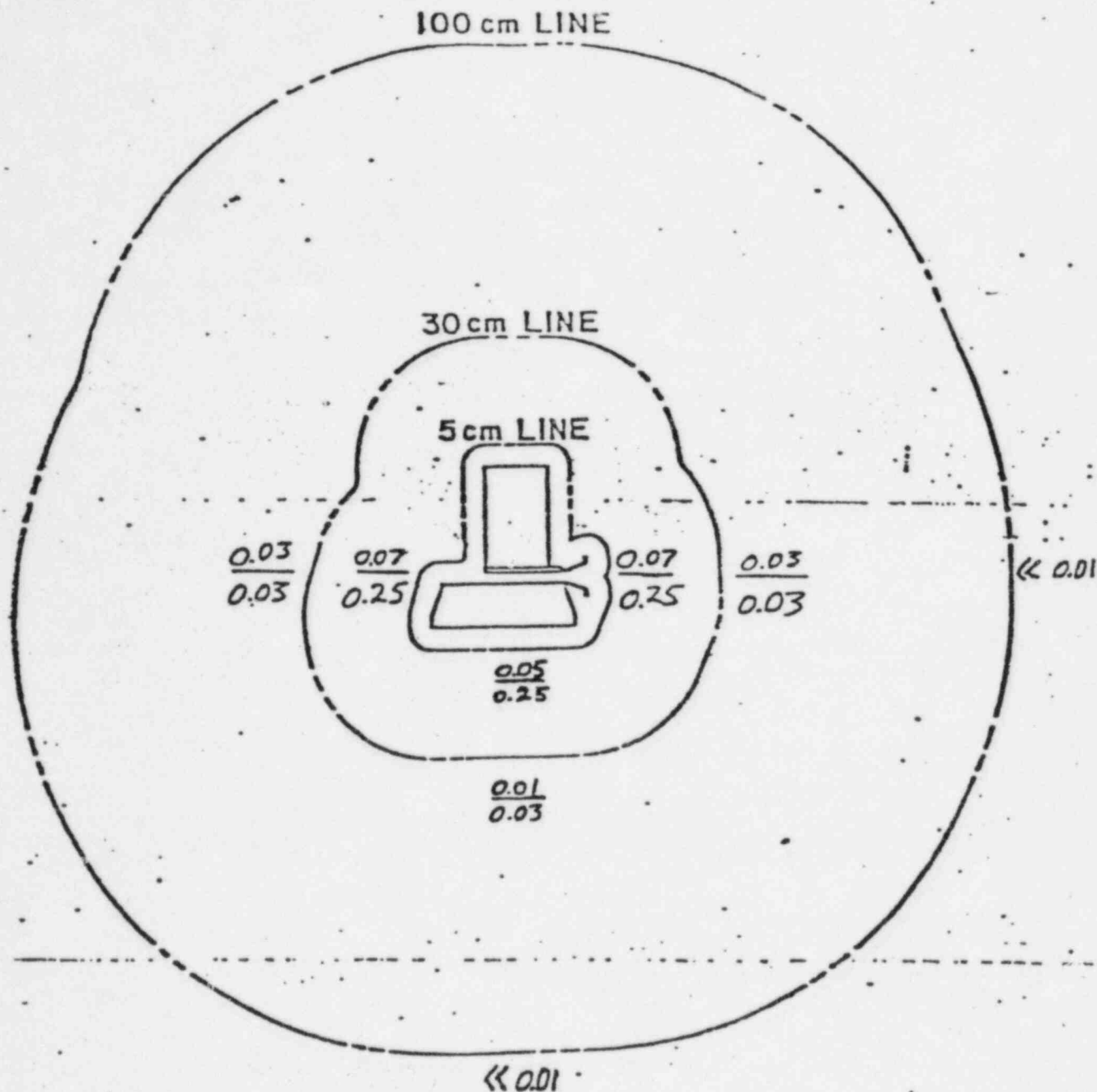
SCALE

1"

B-40931-2



LV297



FRONT VIEW

SURVEY METER: VICTOREEN MODEL 440 (cover off)  
SERIAL NO. 3062

COLLIMATOR-

SOURCE: OFF

WINDOWS - 1

SOURCE: 100mCi OF Cm-244

AIR GAP: 2"

DOSE RATE: GAMMA mrem/hr  
NEUTRON

UNLESS OTHERWISE SPECIFIED  
TOLERANCES ARE IN INCHES  
PLATING NOT TO EXCEED  
TOLERANCE  
UNLESS OTHERWISE SPECIFIED  
ANGLE TOLERANCES  
CAST OR WELD SURFACES  
MACHINED SURFACES  
MACHINED DECIMAL  
BREAK ALL SHARP CORNERS