U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

IAEA CERTIFICATE OF COMPETENT AUTHORITY
SPECIAL FORM RADIOACTIVE MATERIALS
CERTIFICATE NUMBER USA/0166/S-96, REVISION 12

This certifies that the sources described have been demonstrated to meet the regulatory requirements for special form radioactive material as prescribed in the regulations of the International Atomic Energy Agency[1] and United States of America[2] for the transport of radioactive material.

1. Source Identification - Gamma Industries Model Nos. VD, VD(HP), NB, NBG, NB(HP), single encapsulation universal source, double encapsulation universal source, and single encapsulation with side weld. Sources must have been manufactured before August 1, 1993.

2. Source Description - All sources described by this certificate are welded encapsulations constructed of Series 300 stainless steel or ARMCO Type 17-4 PH stainless steel. The sources are described, and have been manufactured in accordance with the referenced and attached Gamma Industries drawings:

Gamma Industries Model Number	Gamma Industries Drawing No.
VD and VD(HP)	602-7001-004
NB, NBG, and NB(HP)	602-7001-005
Universal source, single encapsulation	602-7001-006
Universal source, double encapsulation	602-7001-007
Single encapsulation with side weld	602-7001-008

3. Radioactive Contents -

a. Gamma Industries Model Nos. VD and VD(HP) - No more than 11.1 TBq (300 Ci) of any one of the following radionuclides: Barium-131, Cadmium-109, Calcium-45, Calcium-47, Cesium-137, Chlorine-36, Chromium-51, Iridium-192, Cobalt-60, Iron-59, Manganese-54, Phosphrous-32, Rubidium-86, Selenium-75, Strontium-85, Thallium-204, Thulium-170, Tin-113, Ytterbium-169, or Zinc-65.

b. Gamma Industries Model Nos. NB, NBG, NB(HP) - No more than either 0.93 TBq (25 Ci) of Americium-241, 1.1 GBq (30 mCi) of Radium-226, or 18.5 GBq (500 mCi) of an Americium-241 and Cesium-137 mixture.

c. Gamma Industries universal source, single encapsulation - No more than either 18.5 TBq (500 Ci) of Iridium-192 or 0.74 TBq (20 Ci) of Cobalt-60.

d. Gamma Industries universal source, double encapsulation - No more than either 185 TBq (5000 Ci) of Iridium-192 or 74 TBq (2000 Ci) of Cobalt-60.

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[1] "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

[2] Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

e. Gamma Industries single encapsulation with side weld - No more than either 18.5 TBq (500 Ci) of Iridium-192 or 0.74 TBq (20 Ci) of Cobalt-60.

4. Quality Assurance - Records of Quality Assurance activities required by paragraph 310 of the IAEA regulations[1] shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

5. Expiration Date - This certificate expires on February 28, 2022.

This certificate is issued in accordance with paragraph 804 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations, in response to the January 11, 2017 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified by:

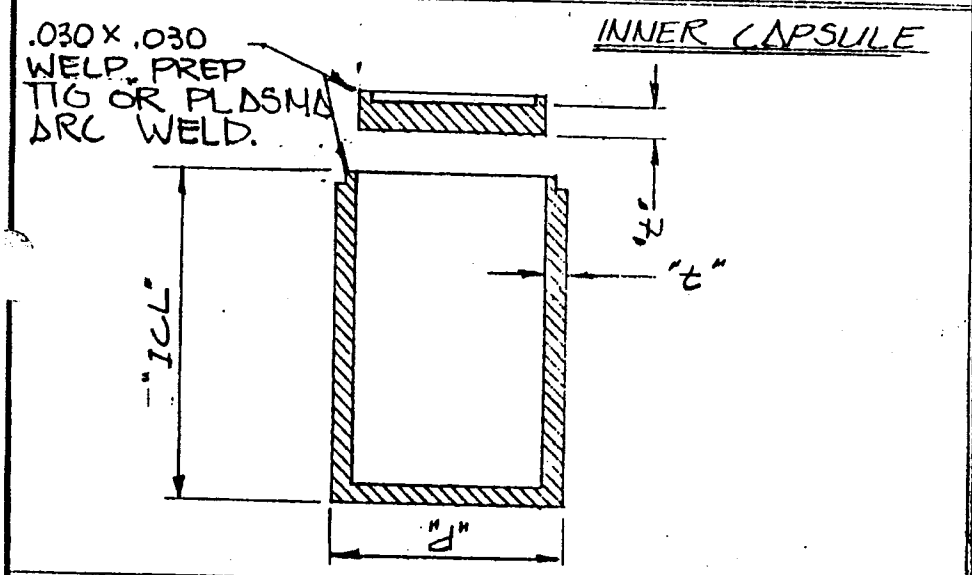
William Schoonover
Associate Administrator for
Hazardous Materials Safety

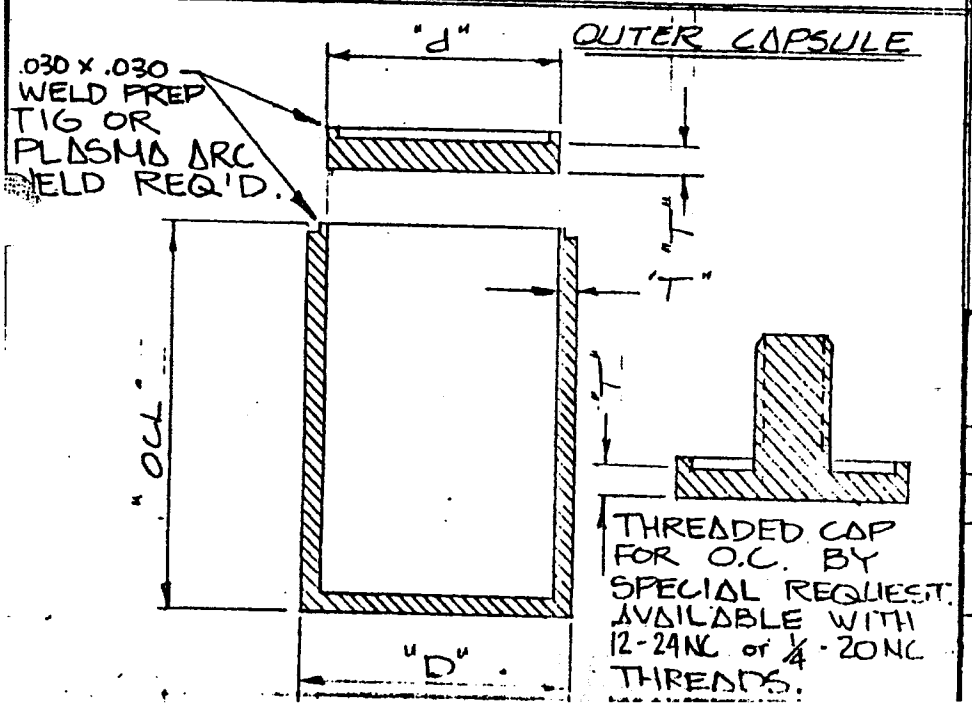
FEB - 1 2017
(DATE)

Revision 12 - Issued to extend the expiration date.

THE OUTER CAPSULE IS TO BE INSCRIBED AS FOLLOWS:

GI _____ (MODEL NO)
_____ (ISOTOPE)
_____ (CURIES)
_____ (SERIAL NO)





	"t" IC Wall Th.	"T" OC Wall Th.	"d" OD-IC	"D" OD-OC	OCL	ICL	Other
MODEL VD							
	.010 Min	.010 Min	0.125" Mn	.145" Mn.	.250" Mn	.230" Mn	See Note #1
			2.000" Mx	2.060" Mx.	6.000"Mx	5.90" Mx	
MODEL VD (HP)							
	*1	*2	0.125" Mn		.250" Mn	.230" Mn	
			2.000" Mx	2.43" Mx	6.000"Mx	5.800"Mx	

*1 "t" = 0.050 d" + .007
*2 "T" = 0.1075 "D"

NOTES:
Note #1:
Model VD sources may employ .002" caps for beta sources. Am-241 sources shall use .010" minimum wall. Ir-192, Cs 137 sources shall employ 0.030" minimum wall.

GAMMA INDUSTRIES; BR, LA.

SCALE: NONE	APPROVED BY: M. Rickell	DRAWN BY: HAL
DATE: 6-20-79		REVISED

SOURCE MODELS : VD & VD (HP)

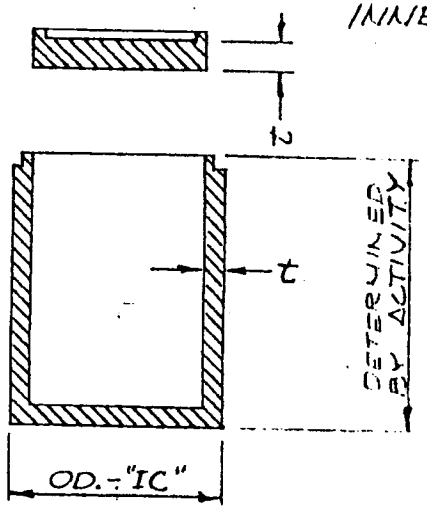
MULTIPURPOSE CAPSULE : 241Am (750 mCi); ANY I.S. (300 Ci)

DRAWING NUMBER 602-7001-004

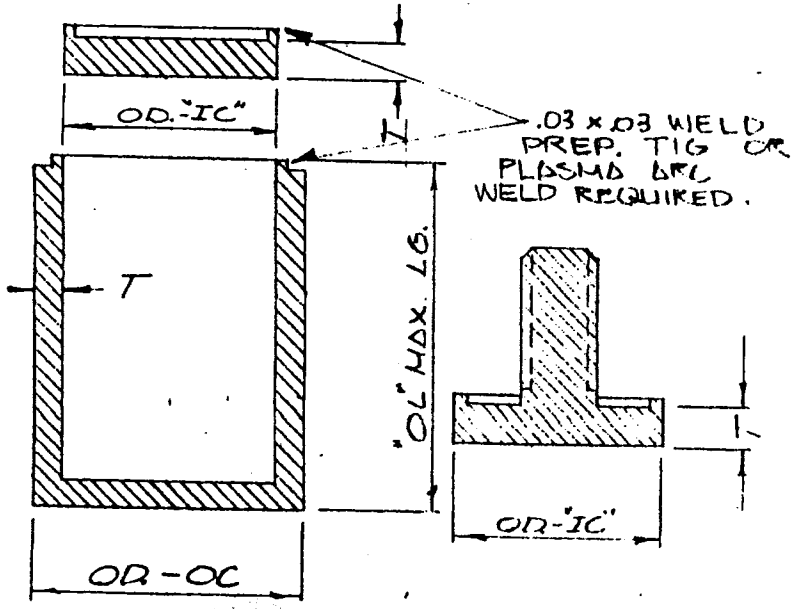
THE OUTER CAPSULE SHALL BE INSCRIBED AS FOLLOWS:

G.I. _____ (MODEL NO.)
_____ (ISOTOPE)
_____ (CURIES)
_____ (SERIAL NO.)

INNER CAPSULE



OUTER CAPSULE



MODEL NB

Activity	OD.-"OC"	"OL" Max. Lg.	Outer Capsule Wall "T" Min.	Inner Capsule Wall "t" Min.
0-3 Ci	.200-.500	.500	.040	.040
3-6 Ci	.500-1.00	1.50	.060	.040
6-10 Ci	1.00-1.50	2.50	.070	.040
10-25 Ci	1.50-2.00	3.0"	.080	.040
MODEL NBG				
500 mCiAm 100 mCiCs	.200-1.00	1.50	.040	.040
MODEL NB (HP)				
1 Ci	up to .500	3 x OD	.050	.040
2 Ci	.501-.625	3 x OD	.070	.050
4 Ci	.626-.750	3 x OD	.095	.060
8 Ci	.751-.875	3 x OD	.110	.070
12 Ci	.875-1.00	3 x OD	.120	.080
20 Ci	1.000-1.50	4 inch	.120	.080
25 Ci	1.25-2.00	4 inch	.120	.080

NOTES:

Note #1: Inner & outer capsules fabricated from 304 or 316 stainless steel.

Note #2: Model NB (HP) is for high pressure 25,000 psi and high temperature +595 degrees C applications.

Note #3: Cap thickness will be at minimum the wall thickness.

Note #4: Inner & outer capsules shall be Helium pressure bubble tested.

Note #5: Outer cap may be extended & taped or threaded 12-24 NC or 1/4-20NC.

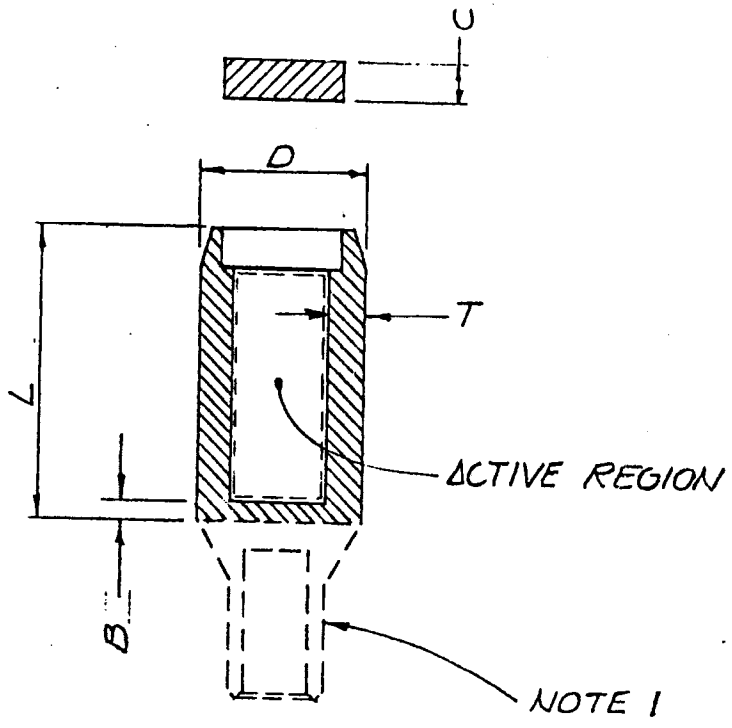
GAMMA INDUSTRIES; BR, LA.

SCALE: NONE	APPROVED BY: M. Ricaud	DRAWN BY HAL
DATE: 6-21-79		REVISED

SOURCE CAPSULE MODELS: NB, NBG, NB(HP)

NEUTRON & NEUTRON/GAMMA SOURCES FOR WELL LOGGING MOISTURE DENSITY, ECT... Am-Be (75 Ci), Ra-Be (300 mCi), Am-Be-Cs (500 mCi)

DRAWING NUMBER 602-7001-005



"B"	"D"	"C"	"T"	"L"	L/D
.100 Min	.187 Min	.130 Min	.030 Min	1.00 Max	5.4 Max

Note 1: Attachments to this capsule may be made by swedging or threading the outlined appendage. Such attachments shall not impair or reduce the structural soundness of the encapsulation. Examples of applications are; Radiography source assemblies, Survey instrument calibrators, et. al.

GAMMA INDUSTRIES ; BR , LA.

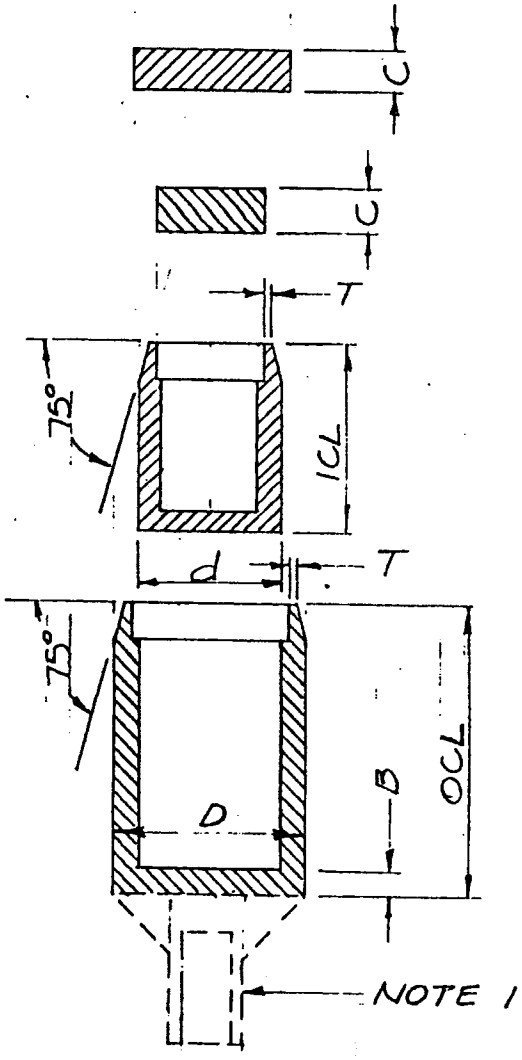
SCALE: NONE	APPROVED BY: M. Rudd	DRAWN BY HAL
DATE: 6-22-79		REVISED

SINGLE ENCAPSULATION UNIVERSAL SOURCE

^{192}Ir (500Ci) , ^{60}Co (20Ci)

DRAWING NUMBER 602-9001-006

"OCL"	"ICL"	"D"	"d"	"C"	"T"	"B"	OCL/D	ICL/d
1.5" Max	.990" Max	.160" Min	.100" Min	.130" Min	.030" Min	.100" Min	9.4 Max	9.9 Max



Note 1: Attachments to this capsule may be made by swedging or threading the outlined appendage. Such attachments shall not impair or reduce the structural soundness of the encapsulation. Examples of applications are; Radiography source assemblies, Survey instrument calibrators, et. al.

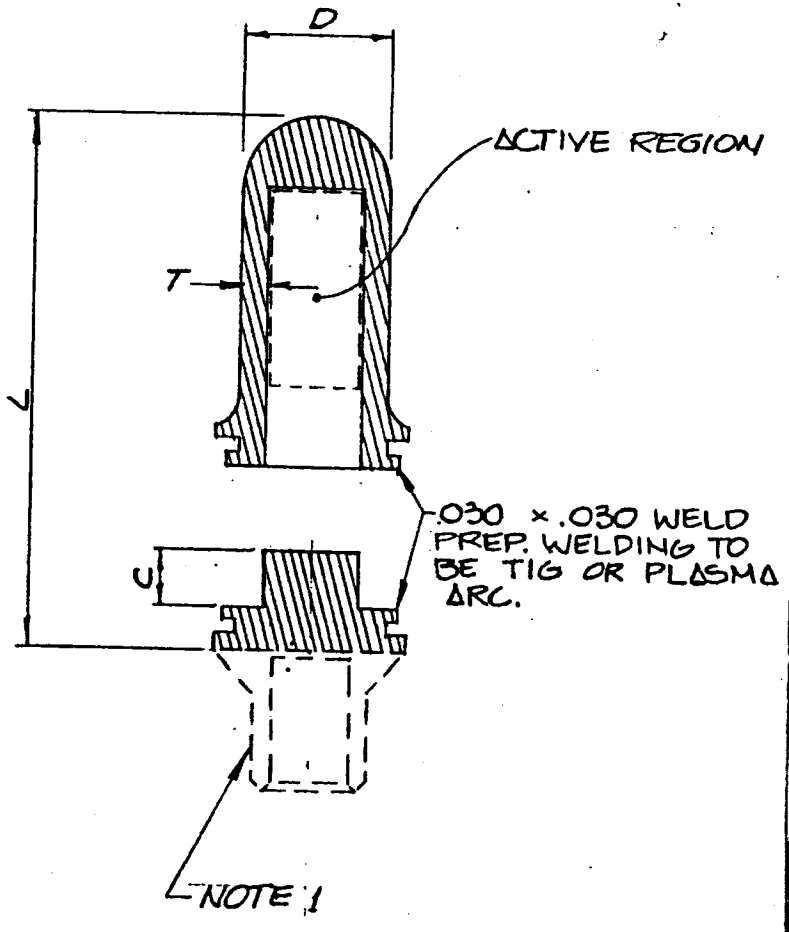
GAMMA INDUSTRIES; BR, LA.

SCALE: NONE	APPROVED BY:	DRAWN BY HAL
DATE: 6-23-70	M. Riddle	REVISED

DOUBLE ENCAPSULATED UNIVERSAL SOURCE

^{192}Ir (5000 Ci), ^{60}Co (2000 Ci)

DRAWING NUMBER 602-7001-007



"L"	"D"	"C"	"T"
1.000 Max	.187 Min	.100 Min	.030 Min

Note 1: Attachments to this capsule may be made by swedging or threading the outlined appendage. Such attachments shall not impair or reduce the structural soundness of the encapsulation. Examples of applications are; Radiography source assemblies, Survey instrument calibrators, et. al.

GAMMA INDUSTRIES; BR, LA.

SCALE: NONE	APPROVED BY:	DRAWN BY HAL
DATE: 7-9-79		REVISED

SINGLE ENCAPSULATION, SIDE WELD

^{192}Ir (500 Ci), ^{60}Co (20 Ci)

DRAWING NUMBER 602-7001-008

U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

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Washington, D.C. 20590**

CERTIFICATE NUMBER: USA/0166/S-96, Revision 12

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