



**Eckert & Ziegler**

**Isotope Products**

24937 Avenue Tibbitts  
Valencia, California 91355

Tel 661-309-1010

Fax 661-257-8303

# CERTIFICATE OF CALIBRATION GAMMA STANDARD SOURCE

<b>Radionuclide:</b> Cs-137	<b>Customer:</b> IDAHO NATIONAL LABS
<b>Half-life:</b> 30.17 ± 0.16 years	<b>P.O. No.:</b> 00084042
<b>Catalog No.:</b> CS730000100U	<b>Reference Date:</b> 15-Mar-09 12:00 PST
<b>Source No.:</b> F9-369	<b>Contained Radioactivity:</b> 93.51 μCi 3460 kBq

**Physical Description:**

A. Capsule type:	A3000
B. Nature of active deposit:	Evaporated metallic salt in ceramic matrix
C. Active diameter/volume:	0.125" (3.18 mm)
D. Backing:	Stainless Steel
E. Cover:	Stainless Steel

**Radioimpurities:**

None detected

**Method of Calibration:**

This source was assayed using a pressurized well type ionization chamber.

**Uncertainty of Measurement:**

A. Type A (random) uncertainty:	± 0.3 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- This source has a working life of 15 years.

Quality Control

11/2/09

Date

IPL Ref. No.: 1363-34

ISO 9001 CERTIFIED

Medical Imaging Laboratory

24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504



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# CERTIFICATE OF CALIBRATION GAMMA STANDARD SOURCE

Radionuclide:	Cs-137	Customer:	IDAHO NATIONAL LABS
Half-life:	30.17 ± 0.16 years	P.O. No.:	00084042
Catalog No.:	CS730000100U	Reference Date:	15-Mar-09 12:00 PST
Source No.:	F9-370	Contained Radioactivity:	94.93 μCi 3512 kBq

**Physical Description:**

A. Capsule type:	A3000
B. Nature of active deposit:	Evaporated metallic salt in ceramic matrix
C. Active diameter/volume:	0.125" (3.18 mm)
D. Backing:	Stainless Steel
E. Cover:	Stainless Steel

**Radioimpurities:**

None detected

**Method of Calibration:**

This source was assayed using a pressurized well type ionization chamber.

**Uncertainty of Measurement:**

A. Type A (random) uncertainty:	± 0.2 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- This source has a working life of 15 years.

Quality Control

Date

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## CERTIFICATE OF CALIBRATION GAMMA STANDARD SOURCE

<b>Radionuclide:</b>	Cs-137	<b>Customer:</b>	IDAHO NATIONAL LABS
<b>Half-life:</b>	30.17 ± 0.16 years	<b>P.O. No.:</b>	00084042
<b>Catalog No.:</b>	CS730000100U	<b>Reference Date:</b>	15-Mar-09 12:00 PST
<b>Source No.:</b>	F9-371	<b>Contained Radioactivity:</b>	97.76 µCi 3617 kBq

**Physical Description:**

A. Capsule type:	A3000
B. Nature of active deposit:	Evaporated metallic salt in ceramic matrix
C. Active diameter/volume:	0.125" (3.18 mm)
D. Backing:	Stainless Steel
E. Cover:	Stainless Steel

**Radioimpurities:**

None detected

**Method of Calibration:**

This source was assayed using a pressurized well type ionization chamber.

**Uncertainty of Measurement:**

A. Type A (random) uncertainty:	± 0.2 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- This source has a working life of 15 years.

  
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 Quality Control

11 Mar 09  
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 Date

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# CERTIFICATE OF CALIBRATION GAMMA STANDARD SOURCE

<b>Radionuclide:</b> Cs-137	<b>Customer:</b> IDAHO NATIONAL LABS
<b>Half-life:</b> 30.17 ± 0.16 years	<b>P.O. No.:</b> 00084042
<b>Catalog No.:</b> CS730000100U	<b>Reference Date:</b> 15-Mar-09 12:00 PST
<b>Source No.:</b> F9-372	<b>Contained Radioactivity:</b> 99.61 μCi 3686 kBq

**Physical Description:**

A. Capsule type:	A3000
B. Nature of active deposit:	Evaporated metallic salt in ceramic matrix
C. Active diameter/volume:	0.125" (3.18 mm)
D. Backing:	Stainless Steel
E. Cover:	Stainless Steel

**Radioimpurities:**

None detected

**Method of Calibration:**

This source was assayed using a pressurized well type ionization chamber.

**Uncertainty of Measurement:**

A. Type A (random) uncertainty:	± 0.1 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain Implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- This source has a working life of 15 years.

  
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<b>Radionuclide:</b> Cs-137	<b>Customer:</b> IDAHO NATIONAL LABS
<b>Half-life:</b> 30.17 ± 0.16 years	<b>P.O. No.:</b> 00084042
<b>Catalog No.:</b> CS730000100U	<b>Reference Date:</b> 15-Mar-09 12:00 PST
<b>Source No.:</b> F9-373	<b>Contained Radioactivity:</b> 99.86 μCi 3695 kBq

**Physical Description:**

- |                              |  |
|------------------------------|--|
| A. Capsule type:             | A3000                                      |
| B. Nature of active deposit: | Evaporated metallic salt in ceramic matrix |
| C. Active diameter/volume:   | 0.125" (3.18 mm)                           |
| D. Backing:                  | Stainless Steel                            |
| E. Cover:                    | Stainless Steel                            |

**Radioimpurities:**

None detected

**Method of Calibration:**

This source was assayed using a pressurized well type ionization chamber.

**Uncertainty of Measurement:**

- |   |         |
|---|---------|
| A. Type A (random) uncertainty:                   | ± 0.2 % |
| B. Type B (systematic) uncertainty:               | ± 3.0 % |
| C. Uncertainty in aliquot weighing:               | ± 0.0 % |
| D. Total uncertainty at the 99% confidence level: | ± 3.0 % |

**Notes:**

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- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
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