



Eckert & Ziegler

24937 Avenue Tibbitts
Valencia, California 91355

Isotope Products

Tel 661-309-1010
Fax 661-257-8303

CERTIFICATE OF CALIBRATION GAMMA STANDARD SOURCE

Radionuclide: Eu-152
Half-life: 4933 ± 11 days
Catalog No.: GF-152-D
Source No.: 1513-63-3

Customer: CABRERA SERVICES, INC.
P.O. No.: 11-0222
Reference Date: 1-Jun-11 12:00 PST
Contained Radioactivity: 0.9704 µCi 35.90 kBq

Physical Description:

- A. Capsule type: D (25.4 mm OD x 6.35 mm THK)
- B. Nature of active deposit: Evaporated metallic salt
- C. Active diameter/volume: 5 mm
- D. Backing: Epoxy
- E. Cover: Acrylic

Radioimpurities:

Gd-153 = 0.209%; Eu-154 = 1.13% on 1-Jun-11

Method of Calibration:

This source was assayed using gamma ray spectrometry.

Peak energy used for integration: 344.3 keV
Branching ratio used: 0.266 gammas per decay

Uncertainty of Measurement:

- A. Type A (random) uncertainty: ± 0.6 %
- B. Type B (systematic) uncertainty: ± 3.0 %
- C. Uncertainty in aliquot weighing: ± 0.0 %
- D. Total uncertainty at the 99% confidence level: ± 3.1 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP 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 5 years.

Daniel James Van Drielan
Quality Control

6-May-11
Date

EZIP Ref. No.: 1513-63

ISO 9001 CERTIFIED

Medical Imaging Laboratory
24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory
1800 North Keystone Street Burbank, California 91504