

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF SEALED SOURCE

NO.: CA0406S227S
(Supercedes IL0103S102S)

DATE: March 6, 2003

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SEALED SOURCE TYPE: Gamma Source

MODEL: Cs7.PO2, Cs7.PO2-A

DISTRIBUTOR: Isotope Products Laboratories, Inc.
24937 Avenue Tibbitts
Valencia, CA 91355

MANUFACTURER BEBIG Isotopentechnik und
Umweltdiagnostik
GMBH
Robert-Rossle-Strasse 10
D-13125 Berlin
Germany

CESIO Ltd. (A BEBIG subsidiary)
RADIOVA 1
10227 Prague
Czech Republic

ISOTOPE: Cs-137

MAXIMUM ACTIVITY: 500 mCi (18.5 GBq)

LEAK TEST FREQUENCY: Six (6) months

PRINCIPAL USE: (D) Gamma gauges

CUSTOM SOURCE: _____ YES X NO

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DESCRIPTION:

The ceramic, with dimensions of 3mm x 3mm, is saturated with the cesium nitrate solution, air dried and subsequently exposed to laser energy and heated to a temperature of 1300°C to create the glazed ceramic. The Cs-137 is thereby bonded to the ceramic and cannot be eluted.

After glazing the ceramic activity is measured and is visually inspected. The ceramic is then placed into the primary capsule, plug inserted, and the TIG welded. Following leak test of the primary capsule, it is placed in the outer capsule and TIG welded. The design feature of double stainless steel encapsulation and glazed ceramic provide the prime materials for source integrity. The outer capsule has a maximum length of 15.9 mm and a maximum width of 6.4 mm.

The source Cs7.PO2-A is a source with adaptor and the adaptor is utilized for the purposes of mounting the source into a device and remains with the source throughout the lifetime of the source.

LABELING:

The following information will be engraved on the surface of the sources:

- BEBIG Logo "BB"
- Radionuclide
- Model "Cs7.PO2"
- Serial number/Year of manufacture "XXXX/XX"
- "Radioactive"

The following information will be engraved on the surface of the adaptors:

- BEBIG Logo "BB"
- Model "Cs7.PO2-A"
- Serial Number/Year of Manufacture "XXX/XX"
- "Radioactive"

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A Isotope Products Laboratories' label with IPL logo and similar information will be attached to the source shipment.

DIAGRAMS:

See Attachments 1, 2 &3.

CONDITIONS OF NORMAL USE:

The Cs7.PO2 gamma industrial source is intended for rigorous industrial operations. The users of the source are manufacturers/operators of thickness, level, or density gauges. The manufacturer indicates a recommended working life of 15 years.

Other applications according to Principal Use Code D are acceptable provided that the environmental conditions do not exceed the stress limitations provided by the ISO 2919 classification of C66646.

Because of double encapsulation, theoretical analysis shows that the release of activity cannot occur up to a temperature of 1500°C. Due to the "non-leachable" nature and stability to high temperature of the ceramic, danger of release below 1500°C is estimated to be zero.

ISO classification categories are the ceilings to which test prototypes have been subjected. In no manner does the classification suggest long term operation under upper limit tolerances. If in doubt about operating conditions, the issuing agency should be contacted.

PROTOTYPE TESTING:

A prototype of the model Cs7.PO2 sealed source was constructed and subjected to the tests provided in ISO 2919 and achieved a classification of C66646.

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EXTERNAL RADIATION LEVELS:

The following figures are calculated from the specific gamma ray constant for Cesium-137 τ_{20} and point source dose function for a 18.5 GBq source (τ_{20} From H. Reich, "Dosimetrie Ionisierender Strahlung," B.G. Teubner, 1990).

<u>Distance</u>	<u>Dose Rate</u>	
5 cm	650 mGy/h	(65000 mrad/h)
30 cm	17.5 mGy/h	(1750 mrad/h)
100 cm	1.5 mGy/h	(150 mrad/h)

QUALITY ASSURANCE AND CONTROL:

Isotope Products Laboratory maintains a quality assurance and control program that has been deemed acceptable for licensing purposes by California Department of Health Services. A copy of the program is on file with the California Department of Health Services.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- This source may be distributed only to persons specifically licensed for manufacturing or distribution of sealed sources or devices by the Department, the Nuclear Regulatory Commission (NRC), an Agreement State, or a Licensing State.
- This source shall be leak tested at 6 month intervals using techniques capable of detecting 0.005 uCi of removable contamination.
- The Models Cs7.PO2 and Cs7.PO2-A shall not be subjected to environmental extremes or other conditions of use in excess of the ANSI classification of 77C66646.

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- Handling, storage, use, transfer, and disposal: To be determined by the licensing authority. These services should be provided by persons specifically authorized by the Department, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State.
- This registration sheet and the information contained within the references shall not be changed without the written consent of California Department of Health Services.

SAFETY ANALYSIS SUMMARY:

Based on review of Models Cs7.PO2 and Cs7.PO2-A sealed sources, its ISO classification, and the information and the test data cited below, we conclude that the sources are acceptable for licensing purposes.

Furthermore, we conclude that the Models Cs7.PO2 and Cs7.PO2-A sealed sources would be expected to maintain its integrity for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.

REFERENCES:

The following supporting documents for the Cs7.PO2 and Cs7.PO2-A sealed sources are hereby incorporated by reference and are made a part of this registry document.

- Application dated October 19, 1994.
- Letters, with attachments, dated July 6, 1995, July 17, 1995, July 24, 1995, October 20, 1995, November 27, 1995, December 5, 1995, January 29, 1996 and February 12, 1996.
- Telefacsimile dated February 19, 1996.
- Isotope Products Laboratories letter December 16, 2002.

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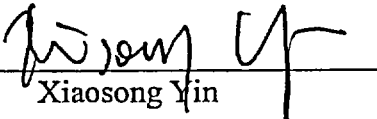
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ISSUING AGENCY:

California Department of Health Services

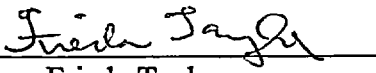
DATE: March 6, 2003

REVIEWED BY:


Xiaosong Yin

DATE: March 6, 2003

CONCURRED BY:

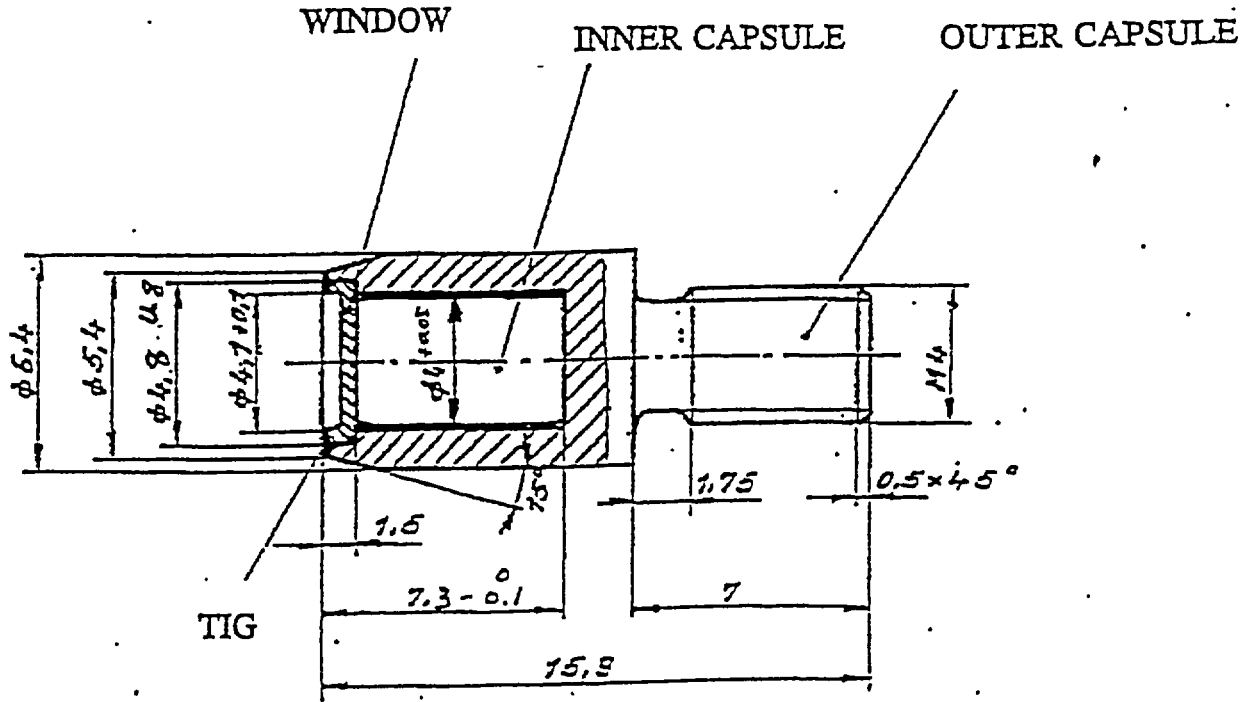

Frieda Taylor

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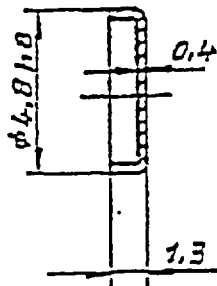
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AMENDMENT: 1



WINDOW



All dimensions in mm

Cs-137 SOURCE

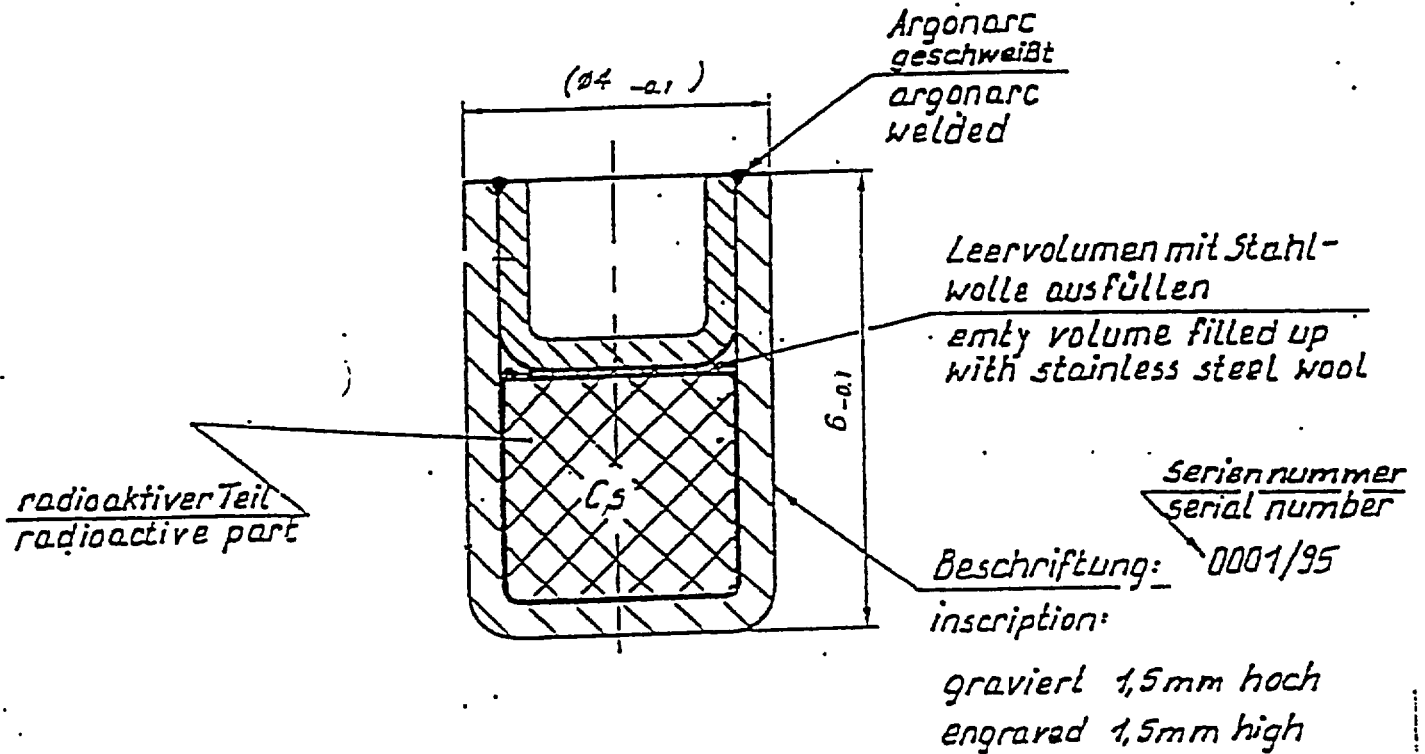
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AMENDMENT: 2

INNER CAPSULE Cs7.KO1
(Not to be authorized for use without Cs7.PO2)



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AMENDMENT: 3

Cs7.PO2-A HOLDER WITH Cs7.PO2 SOURCE

