

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF SOURCE

NO: NR-136-S-232-S

DATE:

JUN 26 1985

PAGE:

1 of 4

SOURCE TYPE: Gamma Gauge Source Series

MODEL: CDC.711M SERIES

MANUFACTURER/DISTRIBUTOR:

Amersham Corporation  
2636 S. Clearbrook Drive  
Arlington Heights, IL 60005-4692

ISOTOPE:

Cesium-137

MAXIMUM ACTIVITY:

10 curies

LEAK TEST FREQUENCY:

6 months

PRINCIPAL USE:

(D) Gamma Gauges

CUSTOM SOURCE:

\_\_\_\_ YES

\_\_\_\_ X \_\_\_\_ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF SOURCE

NO: NR-136-S-232-S

DATE:

JUN 26 1985

PAGE: 2 of 4

SOURCE TYPE: Gamma Gauge Source

DESCRIPTION:

The active material as cesium carbonate in solution is mixed with a powdered glass frit containing the oxides of silicon, sodium and calcium to give the required specific activity. From this mix the correct amount for each source is dispensed and heated until molten at about 1200°C. On cooling, it forms a solid glass sphere. The bead is washed to remove loose contamination and then encapsulated in a stainless steel capsule which is sealed by TIG welding. The overall size of the inner capsule varies proportionally to the source activity. This capsule is sealed into a secondary capsule, or outer capsule designated the X-38. The size of the inner capsule dictates the dimensions of the outer capsule lid. This gives rise to the use of a capsule mnemonics X-38/1 - 38/4.

The CDC.711M originally had a capsule designation of XN161. according to the manufacturer this early design is virtually obsolete.

LABELING:

The sources are engraved with the isotope, the manufacturer's logo and a unique serial number.

DIAGRAM:

See Attachment 1.

CONDITIONS OF NORMAL USE:

The Model CDC.711M series source design is intended for uses such a gamma gauging in industrial or research applications.

PROTOTYPE TESTING:

The manufacturer reports that the Model CDC.711M series source designs has been tested in accordance with ISO/DIN 2919 standards (international equivalent of ANSI N542-1977) and have achieved the classification of C64444 or C66646 for capsule X N161. In addition, this source design has been certified by the British authority to meet special form requirements.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF SOURCE

NO: NR-136-S-232-S

DATE:

JUN 26 1985

PAGE: 3 of 4

SOURCE TYPE: Gamma Gauge Source

EXTERNAL RADIATION LEVELS:

The manufacturer reports dose rates from the source to be 330 mrem/hr/ci at 1 meter.

QUALITY ASSURANCE AND CONTROL:

During manufacture capsule components and materials are checked both visually and dimensionally to ensure that they comply with the detailed engineering drawings. The welded seals are tested by bubble test method for leakage. The sources are checked and wiped, immersion tests and visual inspections are performed prior to distribution.

Gamma emissions are checked against standards using an ion chamber to ensure that they are consistent with equivalent activities in the range of 0 to  $\pm 25\%$  of the nominal equivalent activity. The manufacturer reports that a certificate for test assays and gamma emission check assays accompany each source in the form of a test report.

LIMITATIONS AND OTHER CONSIDERATIONS OF USE:

- o The Model CDC.711M series shall be distributed only to specific licensees of the Nuclear Regulatory Commission or an Agreement State.
- o The source design shall not be subjected to environmental or other conditions of use which exceed those ANSI classifications referenced under the prototype testing section of this document.
- o The sources shall be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcurie of removable contamination.
- o Handling, storage, use, transfer and disposal: To be determined by the licensing authority.
- o This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the Nuclear Regulatory Commission.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF SOURCE

NO: NR-136-S-232-S

DATE:

JUN 26 1985

PAGE: 4 of 4

SOURCE TYPE: Gamma Gauge Source

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data listed below and that this amendment introduces new capsule designs (x38/1 and x38/3) for the Model CDC.711M, we continue to conclude that the Model CDC.711M series source and capsule designs are acceptable for licensing purposes. Furthermore, we continue to conclude that the sources and capsules would be expected to maintain their containment integrity for the normal conditions of use and accidental conditions of use and accidental conditions which might occur during the uses specified in this certificate.

REFERENCES:

The following supporting documents for the Model CDC.711M series source designs are hereby incorporated by reference and are made a part of this registry document.

- o Amersham Corporation letters dated March 24, 1981, August 17, 1981, and October 15, 1984 and March 13, 1985, with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

JUN 26 1985

DATE

REVIEWER:

JUN 26 1985

DATE

CONCURRENCE:

*[Handwritten signature]*

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF SOURCE

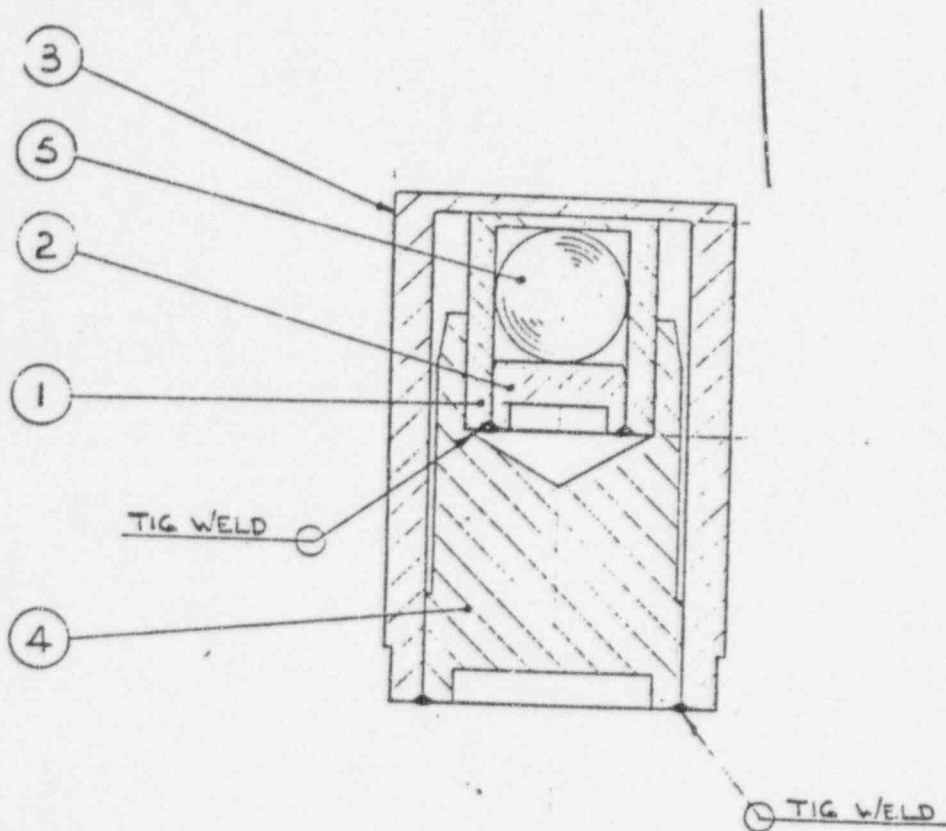
NO: NR-136-S-232-S

DATE:

JUN 26 1985

ATTACHMENT 1

SOURCE TYPE: Gamma Gauge Source



Item No.	Description
1	CELL BODY
2	CELL LID
3	SHEATH BODY
4	SHEATH LID
5	ACTIVE MATERIAL