

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF DEVICE

NO: NR-140-D-101-S

DATE: JUL 8 1983

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DEVICE TYPE: X-Ray Fluorescence Cell

MODEL: Drawing No. KGC-4566

MANUFACTURER/DISTRIBUTOR:

AMP, Inc.  
P.O. Box 3608  
Harrisburg, PA 17105

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATION:

New England Nuclear Model NER-476C

ISOTOPE: Americium-241

MAXIMUM ACTIVITY: 10 millicuries

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (V) X-Ray Fluorescence

CUSTOM DEVICE: ☒ YES ☐ NO

CUSTOM USER:

The cells are to be used by AMP, Inc.  
plating facilities located in Pennsylvania,  
Virginia, and North Carolina.

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DEVICE TYPE: X-Ray Fluorescence Cell

DESCRIPTION:

The AMP, Inc. drawing No. KGC-4566 is a portrayal of a uniquely designed x-ray fluorescence cell. The cells are constructed of stainless steel into which a New England Nuclear sealed source Model NER-476C is secured. The cell is used to monitor (on-line) the chemical concentration of plating bath solutions. The solutions are drawn from the plating tanks through a filter media. The filter removes any abrasive residues. This prevents clogging of the cell cavity and protects the mylar window. The solution is then drawn through the cell between a mylar window and the top plate of the cell. The detector is mounted opposite the cell at the annular opening of the source.

LABELING:

A label is affixed to the cell which contains the following: The words "Caution-Radioactive Material," isotope and activity, date of assay, and a trefoil radiation symbol. Additionally, the cell is engraved with the manufacturers unique identification number.

DIAGRAM:

See attachment.

CONDITIONS OF NORMAL USE:

The device will be used in industrial environs and under the supervision of authorized AMP personnel. AMP states that the cell will not be exposed to any severe environs or chemicals that are not compatible with the materials of construction.

PROTOTYPE TESTING:

Since this is a custom device, the manufacturer did not perform actual testing on the cell. However, they stated that the cell will not be exposed to harsh conditions that are incompatible with the materials of construction. Using engineering analysis they determined that due to the method of construction of the cell, physical damage to the source is extremely unlikely. Additionally, the New England Nuclear sealed sources Model NER-476C has been tested and achieved an ANSI N542 classification of 77 C64433.

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EXTERNAL RADIATION LEVELS:

AMP reported calculated dose rates of  $5 \times 10^{-5}$  mrem/hr at the nearest surface of the cell. Additionally, they will perform actual measures around the cell once installed on-line to be sure that dose rates are within acceptable levels.

QUALITY ASSURANCE AND CONTROL:

We have reviewed AMP, Inc. "Corporate Product Assurance Program" and have found it acceptable. A copy of this program is on file with the Material Certification and Procedures Branch.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- o This device shall be distributed to AMP, Inc. facilities located in Pennsylvania, Virginia, and North Carolina.
- o The device shall be leak tested at six month intervals 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 NRC.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and data cited below and that the device will be used by persons trained in radiation protection, we conclude that the x-ray fluorescence cell identified by Drawing No. KGC-4566 is acceptable for licensing purposes.

Furthermore, we conclude that these devices would be expected to maintain their containment integrity of the source for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.

REFERENCES:

The following supporting documents for the x-ray fluorescence cell Drawing No. KGC-4566 are hereby incorporated by reference and are made a part of this registry document:

- o AMP Inc. letter dated January 27, 1983, May 26, 1983, and letter received June 27, 1983, with enclosures thereto.

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DEVICE TYPE: X-Ray Fluorescence Cell

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: JUL 8 1983

Reviewer:

*[Signature]*

Date: JUL 8 1983

Concurrence:

*[Signature]*

JUL 8 1983

