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

NO: TX333S132S DATE: February 10, 1987 

SEALED SOURCE TYPE: Medical Radiography Source

MODEL: GI-1

MANUFACTURER/DISTRIBUTOR: Gulf Nuclear, Inc.
202 Medical Center Blvd.
Webster, Texas 77598

MANUFACTURER/DISTRIBUTOR: Gamma Industries
2255 Ted Dunham Avenue
Baton Rouge, Louisiana 70802

ISOTOPE: Iodine-125 MAXIMUM ACTIVITY: 1.5 Curies

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: Medical Radiography

CUSTOM SOURCE: _____ YES __x__ NO

CUSTOM USER:

A14

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DESCRIPTION:

The GI-1 contains a charcoal or silver bead with I-125 absorbed on it. The bead is encapsulated in a stainless steel capsule with a beryllium window on one end. This inner capsule is epoxied into a protective outer sheath. The final dimensions of the source are 0.250 inches in diameter and **0.500 to 1.000 inches in length.**

The iodine-125 contains 0.05 percent I-126 as an impurity when shipped by the manufacturer. It also contains 0.0001 percent Cs-137/Cs-134. This is not expected to become a problem during the sealed source's expected useful life of six months.

LABELING:

Each source is engraved with the serial number, the isotope and activity, and the date of assay. Also engraved on the source is the radiation trefoil.

CONDITIONS OF NORMAL USE:

This source is designed primarily for medical diagnostic research and medical diagnostic use. The source is installed into medical equipment to be used under laboratory conditions. Because the half life of Gd-153 is only about 60 days, the expected useful life of the source is 6 months.

PROTOTYPE TESTING:

This source was tested and found to meet ANSI classification 77C32312 using all encapsulations. The ability of the epoxy to withstand radiation embrittlement during the lifetime of the source was tested using an Ir-192 pellet with an activity of 8 curies. An 8 curie Ir-192 source was calculated to yield the same radiation dose to the epoxy in one day as 1.5 curies of I-125 in 6 months. The prototype source containing the Ir-192 lasted 25 days before it failed a leak test. It was concluded from this testing that the Model GI-1 capsule would last well beyond the useful life of the source.

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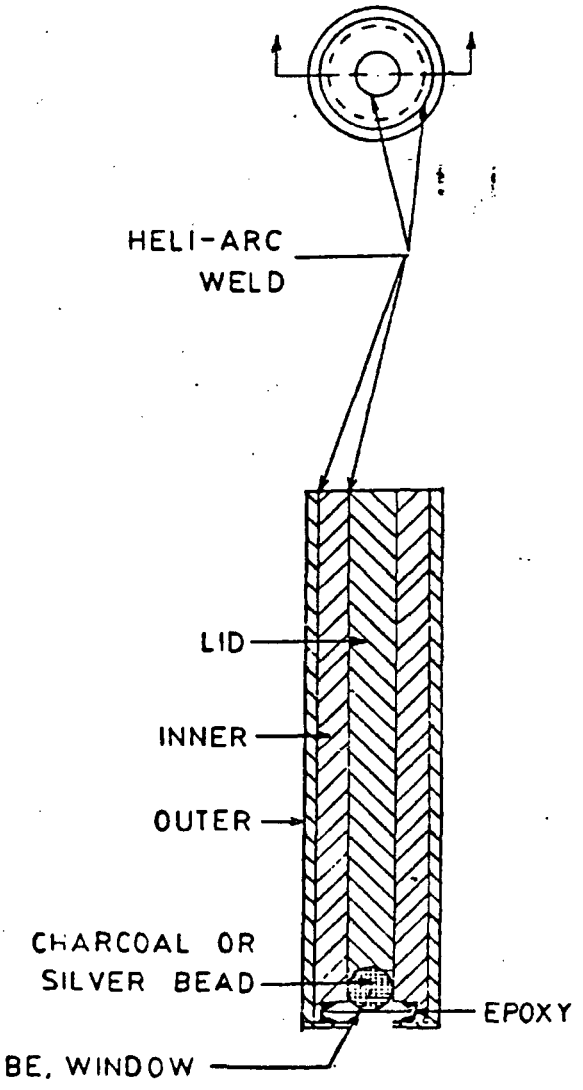
DIAGRAM:



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EXTERNAL RADIATION LEVELS:

Exposure rates of 1.5 Ci. of I-125 at a distance of 30 cm are 1.25 R/hr, for the pellet end and 0.0125 R/hr for the side of the capsule. At 5 cm exposure rates are 22.5 R/hr for the pellet end and 0.125 R/hr for the side. These values were extrapolated from measurements made using a 60 millicurie source.

QUALITY ASSURANCE AND CONTROL:

Each capsule is tested using the vacuum-ethylene glycol leak test method and is tested to meet prototype specifications.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

1. This sealed source shall be distributed to authorized users for the purpose of medical research and/or use. This includes Group VI licensees pursuant to 10CFR35.
2. This sealed source shall be leak tested at six month intervals.
3. Specifics of handling, storage, use, transfer and disposal should be determined by the licensing authority.

SAFETY ANALYSIS SUMMARY:

Based upon the information submitted and the fact that this source will be used by persons trained in the medical professions, this sealed source can be used within acceptable limits.

REFERENCES:

This summary was prepared with the aid of Gulf Nuclear, Inc. letters dated March 11, 1986, August 28, 1986, September 26, 1986 and November 24, 1986 and all associated drawings, documents and procedures.

DATE: 2-13-87 REVIEWED BY: Boyd R Hunter

DATE: 2/18/87 REVIEWED BY: Joseph G. Klinger

ISSUING AGENCY: Texas Department of Health