# REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE

DATE: JUN 7 1983 PAGE 1 OF 4 NO: NR-345-D-103-S

DEVICE TYPE: Cigarette Density Gauge

MODEL: 60-01-DR (see also Model NSRB-14DS)

MANUFACTURER/DISTRIBUTOR:

.

Hauni-Richmond, Inc. 5100 Charles City Road Richmond, VA 23231

MANUFACTURER/DISTRIBUTOR:

Hauni-Werke Koerber and Co. kG. Kampchaussee 14-22 2050 Hamburg 80

SEALED SOURCE MODEL DESIGNATION: Amersham Buchler GmbH & Co. kg Model 1411

ISOTOPE: Strontium-90

MAXIMUM ACTIVITY: 25 millicuries (3 sources total)

LEAK TEST FREQUENCY: 6 months

PRINCIPAL USE: (E) Beta Gauging

CUSTOM DEVICE: YES X NO

8403020251 840209 PDR FOIA HAMMITT84-74 PDR

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DEVICE TYPE: Cigarette Density Gauge

#### DESCRIPTION:

The source housing/detector assembly is mounted to a machine that manufactures cigarettes. The housing is connected to an electronic package which controls the density of the tobacco in each cigarette rod. The source housing has dimensions of 24 cm x 12 cm x 9 cm and is constructed mainly of lead bronze with various other mechanical parts and the source holder made of steel or stainless steel. The source housing has an inlet tube or guide tube through which the cigarette rod passes. This tube is constructed of titanium and has an 0.1 millimeter window at the mid point. Therefore, the cigarette rod does not directly contact the source and if the source was to leak, it would not contaminate the cigarette rod. The housing contains three sources totaling 25 millicuries. One of the sources are used as a reference source for the automatic correction of measured values. The shutter mechanism opens only when the cigarette rod is running through the inlet tube at a speed of 1200 cigarettes per minute and is held closed at all other times by a spring. The shutter mechanism also has an "on and off" indicator lights. This source housing is identical to the Model NSRB-14DS with the exception of a different source model number and activity and the increase in structural integrity of the housing by using lead bronze instead of aluminum as in the NSRB-14DS. The source housing has a safety lock which prevents any unauthorized removal of the housing from the production equipment and the radioactive source from the source housing.

# LABELING:

The device is labeled with the manufacturer's logo, trefoil symbol, series and model no., isotope and activity, source serial no., and the words, "Caution-Radioactive Material."

#### DIAGRAM:

See attachment.

# CONDITIONS OF NORMAL USE:

The source housing is used in equipment that is located in climatically controlled facilities. The device's operational temperature range is 18°C to 50°C. The manufacturer also reports that at maximum velocity of the production equipment, 7200 cigarettes per minute, the source housing is subjected to vibration of 120 cycles per second.

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DEVICE TYPE: Cigarette Density Gauge

### PROTOTYPE TESTING:

The design testing of the 60-01 DR\_cigarette rod gauge was performed on March 1, 1982, by the Federal Physical Technical Institute, Braunschweig, St Germany. The source housing was also determined to be flame retardent up 0.925°C. The testing agency concluded that the prototype device adequatery provides protection against potential radiation hazards. Additionally, the Model NSRD-14DS, which is similar to the Model 60-01 DR, has been distributed since March 1980 without any reports of loss of containment integrity of the source. Furthermore, the sealed source was tested and received an ISO/DIN Classification of C44343.

## EXTERNAL RADIATION LEVELS:

The Federal Physical Technical Institute, Braunschweig, West Germany, tested and reported the dose rates. The dose rates were submitted in microsieverts per hour. Assuming 10 microsieverts per hour equals 1 millirem per hour, reported are the dose rates expressed in millirem per hour:

Location	<u>10 cm</u>	<u>30 cm</u>
Front surface	0.3	0.1
Back side (nearest source)	1.3	0.3
Low side	0.7	0.2
Side of inlet tube	0.6	0.2
side of outlet tube	1.6	0.1

## QUALITY ASSURANCE AND CONTROL:

Hauni-Richmond, Inc., has been distributing the Model NSRB-14DS source housing manufactured by the West German parent company since 1980. They had at that time demonstrated to the NRC an acceptable quality assurance control program. We continue to find this program acceptable.

## LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The device shall be distributed only to persons specifically licensed by the NRC or an Agreement State.
- The device shall be leak tested at six month intervals using techniques capable of detecting 0.005 microcurie of removable contamination and following the procedures in Hauni-Richmonds users manual or equivalent procedures.

# REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE

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DEVICE TYPE: Cigarette Density Gauge

### LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- 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.
- o The device shall be installed and initially tested for proper operations of the source exposure mechanism, safety warning components, labels, external radiation levels (source exposed, source shielded) and leak tested by Hauni-Richmond, Inc. or other persons specifically licensed by the NRC or an Agreement State.

# SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below. and that a similar device has been distributed since 1980 without any reports of containment integrity, we conclude that the Model 60-01 DR density gauge design is acceptable for licensing purposes. Furthermore, we conclude that this device would be expected to maintain 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 Model 60-01 DR density gauge are hereby incorporated by reference and are made a part of this registry document:

o Hauni-Richmond application dated March 3, 1983, with enclosures thereto.

#### **ISSUING AGENCY:**

U.S. Nuclear Regulatory Commission

Reviewer:

Joya W. ihrong

Date: JUN

JUN 7 1983

JUN 1 1983 Date:

Concurrence:

Reference Source

