REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO: NR-636-D-101-G DATE: August 28, 2001 PAGE 1 of 7

DEVICE TYPE: Static Charge Neutralizer

MODEL: 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A**, 3078

MANUFACTURER/DISTRIBUTOR: TSI Incorporated
500 Cardigan Road
P. O. Box 64394
St. Paul, MN 55164

SEALED SOURCE MODEL DESIGNATION: **Isotopes Products Labs (formerly** DuPont Merck**):**
NER-8295, -8285, -8275

3M Model: 3B4G

ISOTOPE:	MAXIMUM ACTIVITY:		
Krypton-85	1 mCi	(37 MBq)	(Model**S** 3013, 3078)
	2 mCi	(74 MBq)	(Model**S** 3012, 3077)
	10 mCi	(370 MBq)	(Model 3054)
	15 mCi	**(555 MBq)**	**(Models 3012A, 3077A)**
	30 mCi	**(1110 MBq)**	**(Model 3054A)**

LEAK TEST FREQUENCY: Not required

PRINCIPLE USE: (O) Ion Generators, Static Eliminators

CUSTOM DEVICE: _____ YES X NO

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DEVICE TYPE: Static Charge Neutralizer

DESCRIPTION:

The TSI, Incorporated, Models 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A, and** 3078, are designed to neutralize electrostatic charges on airborne particles or to charge particles as they pass through the device. These models are usually plumbed into an aerosol sampling system.

Models 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A**, and 3078 are similar in design. **Models 3012, 3012A, and 3013 are identical in design differing only in source activity. Models 3054 and 3054A are the same design except for the fact that Model 3054A incorporates two sources mounted on opposite sides of the tube while Models 3054 has only one source. Models 3077, 3077A, and 3078 are identical in design differing only in the source activity.**

The krypton gas is contained in a stainless steel tube. This tube is inserted into source holders, one on each end, and expoxied in place. Models 3054, **3054A**, 3012, **3012A**, and 3013 have additional set screws to hold the tube in place. The source holders are bolted (Models 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A**, and 3078) and expoxied to the inside of the outer cylindrical housing. For Models 3012, **3012A**, and 3013, the outer housing is constructed of aluminum. The outer housing is constructed of stainless steel for Models 3054, **3054A**, 3077, **3077A**, and 3078.

For Model 3012, fasteners (phillips head screws) changed to stainless steel 1/4-20x3/8 one way screws to prevent the customer from removing the screws.

For Model 3054, fasteners (rivets) changed to stainless steel 6-32x1/2 one way screws to prevent the customer from removing the rivets and for ease of assembly.

DEVICE TYPE: Static Charge Neutralizer

DESCRIPTION (cont.):

The Model dimensions are given in Table I below:

TABLE I. Model Dimensions

Model	Length (in/cm)	Diameter (in/cm)
3012, **3012A**	17.8/45.2	3.0/7.6
3013	17.8/45.2	3.0/7.6
3054, **3054A**	20.0/50.8	3.6/9.1
3077, **3077A**	6.1/15.5	1.5/3.8
3078	6.1/15.5	1.5/3.8

Models 3012, and 3077 contain 2 mCi (74 MBq)of krypton-85. Model 3054 contains 10 mCi (370 MBq) of krypton-85. **Models 3012A and 3077A contain 15 mCi (555 MBq)of krypton-85. Model 3054A contains a maximum of 30 mCi (1110 MBq) of krypton-85.** Models 3013, and 3078 contain**ed a nominal** 1 mCi (37 MBq) of krypton-85. Models 3013 and 3078 are obsolete since TSI, Inc. no longer makes them.

LABELING:

The devices are labeled in accordance with Section 20.203, 10 CFR Part 20 and the requirements of Section 32.51, 10 CFR Part 32.

DIAGRAM:

See attachments 1-3.

CONDITIONS OF NORMAL USE:

The devices can be used up to a maximum temperature of 150°F (66°C) and are usually plumbed into an aerosol sampling system.

DEVICE TYPE: Static Charge Neutralizer

PROTOTYPE TESTING:

Prototype testing for Thermo-Systems, Inc. Models 3012, 3054, 3077 electrostatic charge neutralizers have been deemed acceptable by the NRC for licensing purposes on December 30, 1976.

The manufacturer submitted data to show that Models 3012, 3054, and 3077 have been used in the field since October 1, 1986, with no associated health and safety problems.

The sealed sources have achieved an ANSI N542 - 1977 classification of 77C32131.

EXTERNAL RADIATION LEVELS:

The distributor reports the radiation levels:

Models		**3077, 3077A**	**3012, 3012A**	**3054, 3054A**
Activity of Measured Source (mCi)		**3.65**	**3.1**	**9.6**
Measured Dose Rate (mR/hr)	**0** **6"** **12"** **40"**	**10** **0.3** **0.2** **0.05**	**0.9** **0.22**	**8.5** **0.75** **0.35** **0.08**
Maximum Activity (mCi)		**15**	**15**	**30**
Calculated Dose Rate (mR/hr)	**0** **6"** **12"** **40"**	**41.1** **1.2** **0.82** **0.21**	**4.4** **1.1**	**26.6** **2.3** **1.1** **0.25**

Models 3013 and 3078 would be expected to have lower external radiation levels due to lower activities than Models 3012 and 3077, respectively.

DEVICE TYPE: Static Charge Neutralizer

QUALITY ASSURANCE AND CONTROL:

The QA program was deemed acceptable by the NRC for licensing purposes on December 30, 1976.

The manufacturing process for each model consists of fabricating or purchasing the component parts and sending these parts to the radioactive source manufacturer. The source manufacturer fabricates the source and completes the assembly of the neutralizer.

The source is installed and initially tested for proper labeling, and external radiation levels and leak tested by persons specifically licensed by the NRC or an Agreement State. The assembled product is then returned to TSI where a protective wrapper is applied, as well as, some additional labels.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- The devices shall be distributed to persons that are generally licensed by the NRC or an Agreement State.
- **The device may be installed and used by persons generally licensed by the NRC or an Agreement State. For disposal, the device must be returned to persons specifically licensed by the NRC or an Agreement State.**
- Handling, storage, use, transfer, disposal: To be done in accordance with 10 CFR 31.5 and Section 32.51.
- This registration and the information contained within the references shall not be changed without the written consent of the NRC.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
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DEVICE TYPE: Static Charge Neutralizer

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, we continue to conclude that the TSI, Incorporated's Models 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A**, and 3078 have sufficient information to provide reasonable assurance that:

- The device can be safely operated by persons not having training in radiological protection.

- Under accident conditions (such as fire and explosion) associated with handling, storage and use of the device, it is unlikely that any persons would receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified below.

PART OF BODY	rem (mSv)
Whole body; head and trunk active blood-forming organs; gonads; or lens of eye	15 (150)
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter	200 (2000)
Other organs	50 (500)

- Under ordinary conditions of handling, storage, and use of the device, the byproduct material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in any period of one calendar quarter a dose in excess of 10 percent of the limits specified in the table in Section 20.101(a), 10 CFR 20.

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

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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DEVICE TYPE: Static Charge Neutralizer

REFERENCES:

The following supporting documents for Models 3012, **3012A**, 3013, 3054, **3054A**, 3077, **3077A**, and 3078 are hereby incorporated by reference and are made a part of this registry document:

- TSI's application dated August 5, 1991, letters dated November 22, 1991, October 25, 1991, August 30, 1997, November 10, 1998, **February 27, 2001, May 14, 2001, and May 25, 2001, and August 7, 2001,** with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: August 28, 2001 Reviewer: /RA/
Michele L. Burgess

Date: August 28, 2001 Concurrence: /RA/
John P. Jankovich

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
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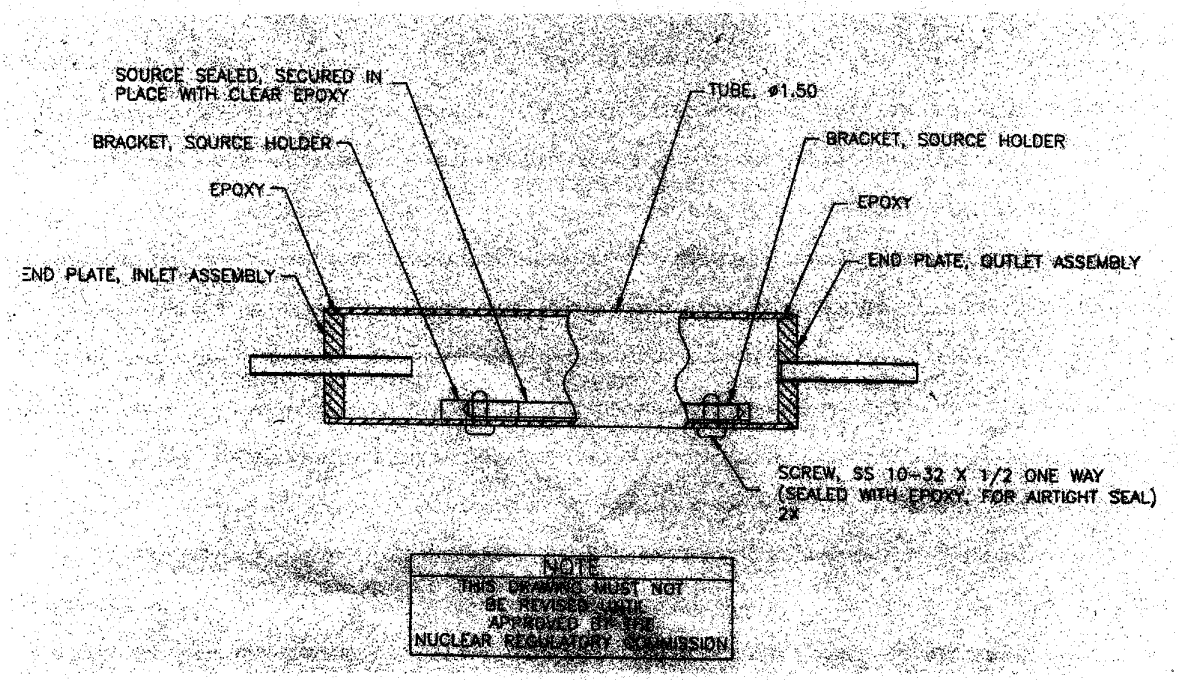
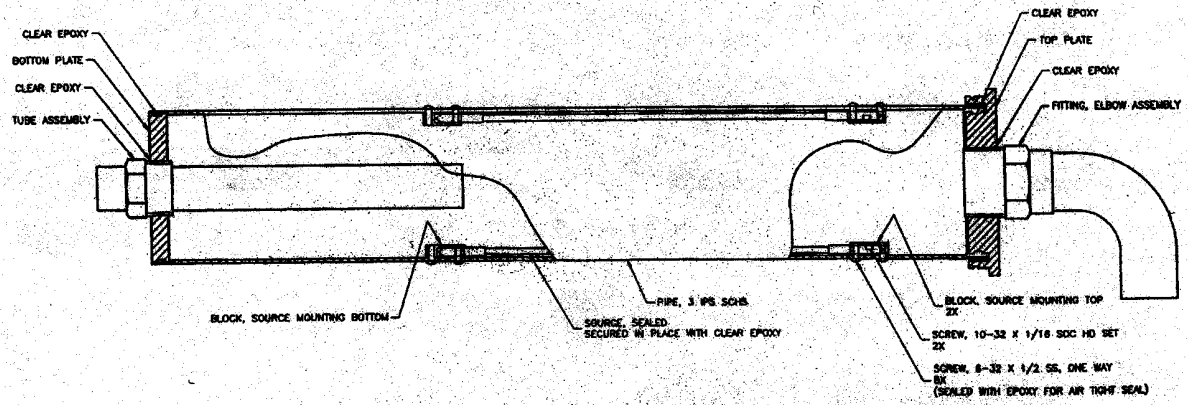
NO: NR-636-D-101-G DATE: ATTACHMENT 1



Models: 3077, 3077A, 3078

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(AMENDED IN ITS ENTIRETY)

NO: NR-636-D-101-G DATE: ATTACHMENT 2



NOTE
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Models: 3054 (Single Source), 3054A (Dual Source)

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
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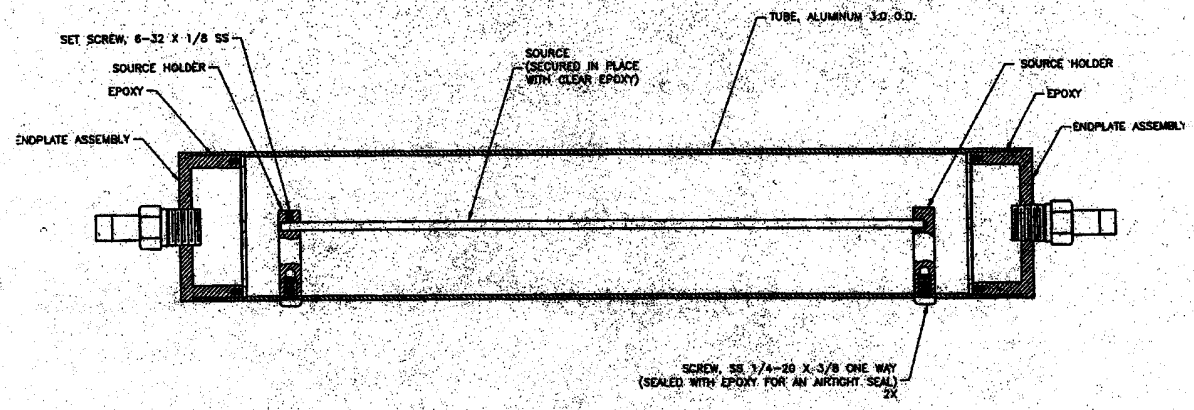
NO: NR-636-D-101-G DATE: ATTACHMENT 3



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Models: 3012, 3012A, 3013

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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NO: NR-636-D-101-G DATE: ATTACHMENT 5

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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