

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

NO. LA-612-S-106-S

DATE: February 21, 1995

PAGE 1 OF 7

SEALED SOURCE TYPE:

Industrial Radiography Source Assembly

MODEL:

T Series

MANUFACTURER/DISTRIBUTOR:

Source Production and Equipment Co., Inc.
113 Teal Street
St. Rose, Louisiana 70087-9691

ISOTOPE:

Iridium-192
Cobalt-60

MAXIMUM ACTIVITY:
(INACTIVE)

140 Curies
100 Curies

LEAK TEST FREQUENCY:

Six (6) months

PRINCIPAL USE:

Industrial Radiography

CUSTOM SOURCE:

NO

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PAGE 2 OF 7

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DESCRIPTION:

The "T" series source assemblies (with the exception of the T-6) consist of a source capsule, locking ball and connector, attached to a flexible stainless steel cable. The overall length varies from (approximately) 7.25 to 7.5 inches.

All source capsules are fabricated from Type 316 or 316L stainless steel with an end cap which is hellarc (T.G) welded. With the exception of the T-6, all iridium-192 sources are singly encapsulated. The minimum wall thickness is 0.030 inch. The connector, locking ball and source capsules are crimped to 1/8 inch diameter stainless steel cable (except for T-6, 3/16 inch drive cable), and pigtail dimensional tolerances are maintained to $\pm 1/16$ inch.

The model "T" series source assemblies manufactured by SPEC are all designed for use in Amersham (formerly, Technical Operations, Inc.) exposure devices and (with the exception of the Model T-6 source assembly) employ the Amersham/Ameritest (Technical Operations) "Ball and Socket Spring-Loaded Type" connector. However, it must be noted that many licensees have had their licenses amended to allow the use of other style connectors. Care must be exercised to insure that the connector employed is compatible with the mating piece which is attached to the control cable. The T-6 source assembly is designed for use only in the Amersham/Ameritest (Technical Operations) Model 683 exposure device. The source capsule is crimped directly to the control drive cable, and no connector is used.

LABELING:

The source capsules for use with ANSI Type 1 devices are stamped, "Danger Radioactive", in compliance with 10 CFR 43.20 (c) (4). Additional labeling information is provided on the source identification tag, provided for attachment to the exposure device.

DIAGRAM:

Please see the attached figure.

CONDITIONS OF NORMAL USE:

The SPEC, Model "T" series, source assemblies are designed for use in industrial radiography exposure devices, as shown in the source selection chart.

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PAGE 3 OF 7

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PROTOTYPE TESTING:

The manufacturer states that all prototype source encapsulations meet or exceed the requirements for industrial radiography sources found in ANSI N542-1977 for a classification of 77C43515.

EXTERNAL RADIATION LEVELS:

The various sources have different activity levels; therefore, the external radiation levels differ from source to source. Since the encapsulation provides essentially no shielding, the radiation level for a particular source can be calculated, using the standard emissivity values.

QUALITY ASSURANCE AND CONTROL:

All of SPEC's sources are manufactured under control of the SPEC Quality Assurance Program in compliance with 10CFR Part 71.77. SPEC has been issued a Quality Assurance Program Approval for Radioactive Material Packages, Number 0102, by the NRC.

Each pigtail assembly is subjected to a 150 lb pull-test prior to radioactive material insertion and is subjected to a wipe test after the material is sealed in the capsule. If the results of the wipe test are inconclusive, a hot liquid bubble test or other tests are performed. No source will be shipped if removable contamination exceeds 0.002 microcurie. A decay chart and source tag are supplied with each source, providing information concerning the activity and leak test results.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- A. Series "T" sources shall be distributed (in the U.S.) only to specific licensees of the U.S. NRC or Agreement States.
- B. Series "T" sealed sources shall not be subjected to environmental or other conditions of use which exceed ANSI 77C43515.

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PAGE 4 OF 7

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C. Series "T" sources shall be leak tested at intervals not to exceed (6) months, using techniques approved by the licensing authority and capable of detecting at least 0.005 microcurie of removable contamination.

D. Reviewer's Note: The following "T" series sources are no longer being manufactured and are not in use:

<u>Model No.</u>	<u>Connector</u>	<u>Exposure Devices</u>	<u>Isotope</u>	<u>Source Changer</u>
T-2F	3	Technical Operations Models 412, 435, 489, 490, 498, and 533	Ir	SPEC C-1 GI C-4, C-10
T-3	4	Technical Operations Models 412, 435, 489, 490, 498, and 533	Ir	SPEC C-1 GI C-4, C-10
T-4	5	Technical Operations Models	Co	GI C-8,
T-4F	3	446, 491, and 500		
T-7	2	Technical Operations Models 660 series, 713	Ir	SPEC C-1 GI C-4, C-10

E. Reviewer's Note The following "T" series sources are currently being manufactured and distributed:

"T" SERIES SOURCE-PIGTAIL SELECTION CHART

<u>Model No.</u>	<u>Connector</u>	<u>Exposure Devices</u>	<u>Isotope</u>	<u>Source Changer</u>
T-1	1	Technical Operations Model	Ir	SPEC C-1
T-1F	3	533		INC IIR-50 AM 550
T-2	2	Technical Operations Model	Ir	SPEC C-1
		533		INC IIR-50 AM 650

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PAGE 5 OF 7

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<u>Model No.</u>	<u>Connector</u>	<u>Exposure Devices</u>	<u>Isotope</u>	<u>Source Changer</u>
T-5	1	Technical Operations Model	Ir	SPEC C-1
T-5F	3	660		INC IR-50 AM 650
T-6	None	Technical Operations Model 683*	Ir	SPEC C-1

* This capsule will be crimped onto a 3/16 inch diameter drive cable, the length of which will be determined by the length of the control cables attached to the exposure device. Controls for this exposure device are designed to remain connected to the exposure devices at all times.

NOTE 1: Connector 1 denotes the Technical Operations (spring loaded) connector.
Connector 2 denotes the Gamma Industries long (new style) saf-t-key connector.
Connector 3 denotes the SPEC Fail-Safe connector.
Connector 4 denotes the Gamma Industries short (old style) saf-t-key connector.

Note 2: Compatibility of "T" series sources for use with ANSI Type 1 exposure devices and the SPEC C-1 are determined by testing. Compatibility of sources with other source changers is based upon authorizations issued to licensees by the NRC and agreement states.

Abbreviations used:	SPEC	Source Production and Equipment Company
	GI	Gamma Industries
	INC	Industrial Nuclear Corporation
	AM	Amersham (Amertest)

SAFETY ANALYSIS:

All of these sealed sources have been in use for many years. Their operational history justifies the conclusion that they are safe for their intended uses. Also, SPEC's claims that these sources meet the ANSI N542-1977 requirements for a classification of 77C43515. The "T" series sources should, therefore, be safe to license for use as industrial radiography sources.

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DATE: February 21, 1995

PAGE 6 OF 7

SEALED SOURCE TYPE:

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REFERENCES:

Source Production and Equipment Company letter dated May 15, 1988.

Source Production and Equipment Company letter dated November 13, 1991.

Source Production and Equipment Company letter dated December 18, 1991.

Source Production and Equipment Company letter dated January 3, 1992.

Source Production and Equipment Company letter dated January 6, 1992.

Source Production and Equipment Company letter dated January 17, 1992.

Source Production and Equipment Company letter dated March 24, 1992.

Source Production and Equipment Company letter dated March 2, 1993.

Source Production and Equipment Company letter dated March 13, 1994.

Source Production and Equipment Company letter dated December 23, 1994.

Source Production and Equipment Company **PROPOSED** REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF SEALED SOURCES dated January 19, 1993. (This document was generated by SPEC and is not a valid registry sheet.)

Source Production and Equipment Company **PROPOSED** REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF SEALED SOURCES dated March 2, 1993. (This document was generated by SPEC and is not a valid registry sheet.)

Fax of February 20, 1995 from Kenneth N. Carrington, Source Production and Equipment Company to Clifford Russell, LRPD

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NO. LA-612-S-106-S

DATE: February 21, 1995

PAGE 7 OF 7

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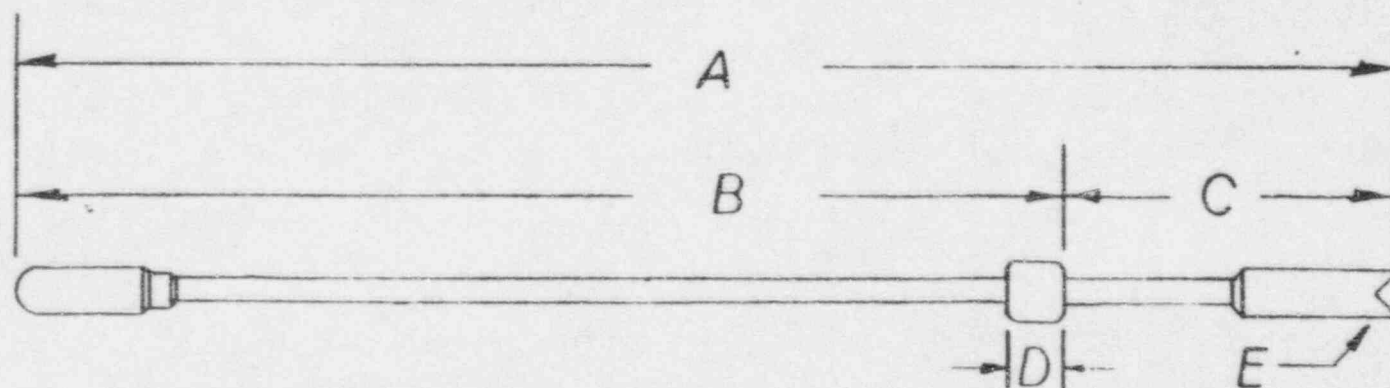
ISSUING AGENCY:

State of Louisiana, Department of Environmental Quality, Office of Air Quality and Radiation Protection, Radiation Protection Division.

Date: 2/21/95 Reviewed By: Clifford Russell
Clifford Russell

Date: 2/21/95 Concurrence: James W. Sanford
James W. Sanford, Ph. D.

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SPEC "T" Series typical assembly