

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF A DEVICE
(Amended in its Entirety)

NO.: LA-0612-S-106-S

DATE: **October 21, 2010**

PAGE 1 OF 7

SOURCE TYPE: Industrial Radiography Source Assembly

MODEL: "T" Series

MANUFACTURER/DISTRIBUTOR:

Source Production & Equipment Co., Inc.
113 Teal Street
St. Rose, Louisiana 70087
(504) 464-9471

ISOTOPE:

MAXIMUM ACTIVITY PER SOURCE:

¹⁹² Iridium
⁷⁵ Selenium
¹⁶⁹ Ytterbium

140 Curies (5185 GBq)
240 Curies (8888 GBq)
240 Curies (8888 GBq)

LEAK TEST FREQUENCY:

Six (6) months

PRINCIPAL USE:

Industrial Radiography

CUSTOM DEVICE:

Yes No

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NO.: LA-0612-S-106-S

DATE: October 21, 2010

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 heliarc (TIG) welded. All iridium-192 sources are doubly 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 Source Production and Equipment Company, Inc. (SPEC) are all designed for use in Sentinel/AEA Technology/Q.S.A., Inc. exposure devices and with the exception of the Model T-6 source assembly employ the Sentinel/AEA Technology/Q.S.A, Inc. "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 Sentinel/AEA Technology /Q.S.A., Inc., 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 34.20 (c) (4). Additional labeling information is provided on the source identification tag, provided for attachment to the exposure device.

DIAGRAM:

Please see attached figures.

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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NO.: LA-0612-S-106-S

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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 N43.6-2007 for a classification of **07C43515**. **All sealed source capsules crimped to a cable have been tested in accordance with that classification.** In addition, tensile tests have been performed on the "T" series source assemblies **crimped to cables** in accordance with ANSI N432-1980. Further, SPEC provided a source comparison to demonstrate that during normal use, the AEA 880 exposure device/T-5 and T-5F combination's ability to operate safely and maintain its integrity is equivalent to or more robust than the AEA 880/A424-9 combination, or that the differences are such that integrity and safety would not be affected. SPEC provided a second comparison to demonstrate that during normal use, the AEA 880/T-5 and T-5F combination's ability to operate safely and maintain its integrity is equivalent to or more robust than the AEA 660/T-5 and T-5F combination, or that the differences are such that integrity and safety would not be affected.

EXTERNAL RADIATION LEVELS:

The various sources have different isotopes and 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 71.75. 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 (inner capsule) and is subjected to a wipe test after the material is sealed in the outer 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 is 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.

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NO.: LA-0612-S-106-S

DATE: **October 21, 2010**

PAGE 4 OF 7

SOURCE TYPE: Industrial Radiography Source Assembly

- B. Series "T" sealed sources shall not be subjected to environmental or other conditions of use which exceed ANSI 07C43515.
- 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. Only AEA Technology/QSA, Inc. guide tubes that have an end stop, and are designed for use with the AEA 880 Delta and Elite exposure devices shall be used when the T-5 and T-5F source assemblies are used with the referenced exposure devices.
- E. Reviewer's Note: The following "T" series sources are currently being manufactured and distributed:

<u>Model #</u>	<u>Connector</u>	<u>Exposure Devices</u>	<u>Isotope</u>	<u>Source Changer</u>
T-1 T-1F	1 3	Technical Operations Model 533	Ir/Yb/Se	SPEC C-1
T-5 T-5F	1 3	Sentinel/AEA Technology/QSA, Inc., 660 Series, 880 Series	Ir/Yb/Se	SPEC C-1
T-6	None	Technical Operations Model 693*	Ir/Yb/Se	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 Sentinel/AEA Technology/Q.S.A., Inc. (spring loaded) connector. Connector 3 denotes SPEC Fail-Safe 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.

Note 3: Source Models T-1, T1-F, T-2 and T-6 are source models for use with exposure devices which do not meet the requirements of 10 CFR Part 34 and are not authorized for use in the U.S.

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PAGE 5 OF 7

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Additionally, connector #2 does not meet the requirements of 10 CFR Part 34 and is not authorized for use in the U.S.

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. Additionally, SPEC reports that these sources meet the ANSI N43.6-2007 requirements for a classification of 07C43515. The "T" series sources should, therefore, be safe to license for use as industrial radiography sources.

REFERENCES:

The following supporting documents with their enclosures are hereby incorporated by reference and made a part of this registry document:

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

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

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

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

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

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

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

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

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

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

Source Production and Equipment Company, Inc. 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.)

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NO.: LA-0612-S-106-S

DATE: **October 21, 2010**

PAGE 6 OF 7

SOURCE TYPE: Industrial Radiography Source Assembly

Source Production and Equipment Company, Inc. 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, Inc. to Clifford Russell, LRPD. Source Production and Equipment Company, Inc. letter dated November 10, 1999. Source Production and Equipment Company letter dated May 31, 2001 with enclosures thereto.

Source Production and Equipment Company, Inc. letter dated May 31, 2001 with enclosures thereto.

Source Production and Equipment Company, Inc. letter dated July 23, 2001 with enclosures thereto.

Source Production and Equipment Company, Inc. fax transmittal dated September 4, 2001.

Source Production and Equipment Company, Inc. fax transmittal dated April 9, 2002.

The Louisiana Department of Environmental Quality (LDEQ) letter dated May 8, 2002.

Source Production and Equipment Company, Inc. letter dated July 8, 2002, with enclosures thereto.

Source Production and Equipment Company, Inc. letter dated July 12, 2002, with enclosures thereto. Pages 1, 3, and 4 of the Safety Analysis Report for the Model 880 exposure device transport package.

SSDR No. MA-1059-D-334-S for the AEA Technology/QSA, Inc, 880 Delta and Elite radiography exposure devices.

SSDR No. NR-628-D-124-S for the AEA Technology/QSA, Inc., 660 Series radiography exposure devices.

SSDR No. NR-6283-104-S for the AEA Technology/QSA, Inc, A424-9 radiographic source assembly.

LDEQ letter dated July 18, 2002.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF A DEVICE
(Amended in its Entirety)

NO.: LA-0612-S-106-S

DATE: **October 21, 2010**

PAGE 7 OF 7

SOURCE TYPE: Industrial Radiography Source Assembly

Source Production and Equipment Company, Inc. letter dated July 31, 2002.

Copy of a letter from SPEC to LDEQ regarding four (4) disconnect incidents at Owensby and Kritikos (letter dated September 2, 1999).

Source Production and Equipment Company, Inc letter dated September 3, 2002.

Letter from Kelley Richardt (SPEC) dated August 23, 2010, requested to amend the SSD No.: LA-612-S-106-S.

Letter from Kelley Richardt (SPEC) dated September 10, 2010, provided some additional information to amend the SS&D.

Email from Kelley Richardt (SPEC) dated September 13, 2010, provided some additional information to amend the SS&D.

Emails for Kelley Richardt (SPEC) dated October 4 & 18, 2010 provided some additional information to amend the SS&D.

ISSUING AGENCY:

State of Louisiana, Department of Environmental Quality, Office of Environmental Services,
Permits Division, Registrations and Certifications Section

Date: 10/21/10

Reviewed By: Jabari Robinson
Jabari Robinson, M.S.

Date: 11/16/2010

Concurrence: James M. Pate
James M. Pate, M.S.

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