



# Certificate

## for Radiation Device

<b>Certificate Number</b> R-061-0003-0-2040	<b>Date of Issue</b> October 08, 2025	<b>Date of Expiry</b> October 31, 2040
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The radiation device identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and section 12 of the *Nuclear Substances and Radiation Devices Regulations*.

**Manufacturer:** QSA Global, Inc.

**Make and Model:** QSA Global Model 1100

**Prev. Mfr. Name:**

**Device Type:** EXPOSURE DEVICE, CABLE

**Description:** The radiation device consists of a cylindrical stainless-steel shell, 1.7 mm thick, two end plates enclosing a depleted uranium shield, a titanium "S" tube through which a source assembly travels, and an optional polyurethane jacket. The gap between the depleted uranium shield and the shell is filled with polyurethane foam. The source assembly consists of a sealed source swaged onto one end of a flexible cable with a connector on the other end of the cable for attachment to a remote control. The remote control is used to move the source assembly out of the device and into the working position at the end of a guide tube, as well as to retract the source assembly back into the device. The front plate assembly incorporates a tungsten shielded port shutter mechanism that rotates to shield the end of the source tube during connection and disconnection of the guide tube. The optional jacket is affixed over the cylindrical shell by four binding barrels and screws and provides a handle and a stable base for use. For storage and for transport, the source in the "S" tube is secured in the shielded position by means of a locking assembly attached to the rear end-plate assembly. A green colored indicator is visible when the source is locked, and a red colored indicator is visible when the source is unlocked. The radiation device measures approximately 330 mm long x 165 mm wide x 216 mm high and weighs about 20 kg without the optional jacket and 22 kg with the jacket.

Refer to the Summary Evaluation for additional information (CNSC document number 7551571). Reference CNSC application number 64542.

The radiation device may contain any of the following nuclear substances in a quantity not exceeding the corresponding quantity indicated:

Nuclear Substance	Maximum Quantity
Depleted Uranium (used as shielding)	15.4 kg
Iridium 192	5,560 GBq
Selenium 75	5,560 GBq

Designated Officer pursuant to paragraph 37(2)(a) of the *Nuclear Safety and Control Act*



# Summary Evaluation

For certificate number R-061-0003-0-2040

## 1. Identification of Radiation Device

<b>Manufacturer:</b> QSA Global, Inc.
<b>Model(s):</b> Model 1100
<b>Type:</b> Exposure Device, Cable

## 2. Description

The radiation device consists of a cylindrical stainless-steel shell, 1.7 mm thick, two end plates enclosing a depleted uranium shield, a titanium "S" tube through which a source assembly travels, and an optional polyurethane jacket. The gap between the depleted uranium shield and the shell is filled with polyurethane foam. The source assembly consists of a sealed source swaged onto one end of a flexible cable with a connector on the other end of the cable for attachment to a remote control. The remote control is used to move the source assembly out of the device and into the working position at the end of a guide tube, as well as to retract the source assembly back into the device.

The front plate assembly incorporates a tungsten shielded port shutter mechanism that rotates to shield the end of the source tube during connection and disconnection of the guide tube. Once the guide tube is connected to the front plate fitting, the shutter mechanism can be rotated to move the tungsten shielding away from the end of the source tube, creating a path for the source to be projected outside of the exposure device. The shutter mechanism and an outlet port cover block access to the source when the front plate assembly is in the secured position with no guide tube attached.

The optional jacket is affixed over the cylindrical shell by four binding barrels and screws and provides a handle and a stable base for use. For storage and for transport, the source in the "S" tube is secured in the shielded position by means of a locking assembly attached to the rear end-plate assembly. A green colored indicator is visible when the source is locked, and a red colored indicator is visible when the source is unlocked.

The radiation device measures approximately 330 mm long x 165 mm wide x 216 mm high and weighs about 20 kg without the optional jacket and 22 kg with the jacket.

Illustrations of the radiation device are shown in Figures 1 and 2.

## 3. Intended Use

The radiation device is used for non-destructive testing and inspection in industrial radiography applications.

#### 4. Authorized Nuclear Substances

The radiation device is authorized to contain one of the following nuclear substances within the listed source assemblies:

Nuclear substance	Radiation device maximum activity*	Source assembly model no.	Source manufacturer	Special form radioactive material certificate
Ir-192	5.56 TBq	A426-1	QSA Global	USA/0335/S-96
Se-75	5.56 TBq	A426-2	QSA Global	USA/0335/S-96

\* The maximum activity corresponds to the nominal activity plus the manufacturing tolerance.

#### 5. Maximum Expected Radiation Dose Rate

Measured typical dose rates from a production unit loaded with a maximum activity of 5.56 TBq are listed in the table below.

	Maximum radiation dose rate with maximum activity of 5.56 TBq of Ir-192	Maximum radiation dose rate with maximum activity of 5.56 TBq of Se-75
Distance from surface (cm)	Closed shutter (source in shielded position) ( $\mu\text{Sv/hr}$ )	Closed shutter (source in shielded position) ( $\mu\text{Sv/hr}$ )
At the surface	1,680	73
100	13	2

Calculated unshielded radiation levels for a maximum activity of 5.56 TBq are listed in the table below.

	Maximum radiation dose rate with maximum activity of 5.56 TBq of Ir-192	Maximum radiation dose rate with maximum activity of 5.56 TBq of Se-75
Distance from surface (cm)	Source unshielded (Sv/hr)	Source unshielded (Sv/hr)
5	288.5	121.7
30	7.96	3.46
100	0.7	0.3

Actual production radiation devices can have a maximum dose rate of 2 mSv/hr on the surface of the radiation device and 20  $\mu\text{Sv/hr}$  at 1 meter from the surface of the radiation device.

#### 6. Conditions of Use and Storage

The radiation device is designed to operate or stored in the temperature range of  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ . Humidity is not expected to affect the device.

#### 7. Leak Tests

Leak tests are to be conducted in accordance with QSA Global procedures and the *Nuclear Substances and Radiation Devices Regulations*.

#### 8. Emergency and Accident Response

Emergency and accident responses are to be taken in accordance with QSA Global procedures and the *Nuclear Substances and Radiation Devices Regulations*.

## 9. Quality Assurance

The design, testing and manufacture of the radiation device are in accordance with the QSA Global quality assurance program, which complies with ISO 9001.

## 10. Inspection, Maintenance and Servicing

The radiation device is to be inspected, maintained and serviced in accordance with QSA Global procedures, and the *Nuclear Substances and Radiation Devices Regulations*.

## 11. Packaging and Transport

The sealed source, when shipped in the radiation device, must be transported in accordance with the *Packaging and Transport of Nuclear Substances Regulations, 2015*. The source is secured in the locked position during transport.

## 12. Authorized Configurations and Accessories

The following accessories are authorized for use with this radiation device:

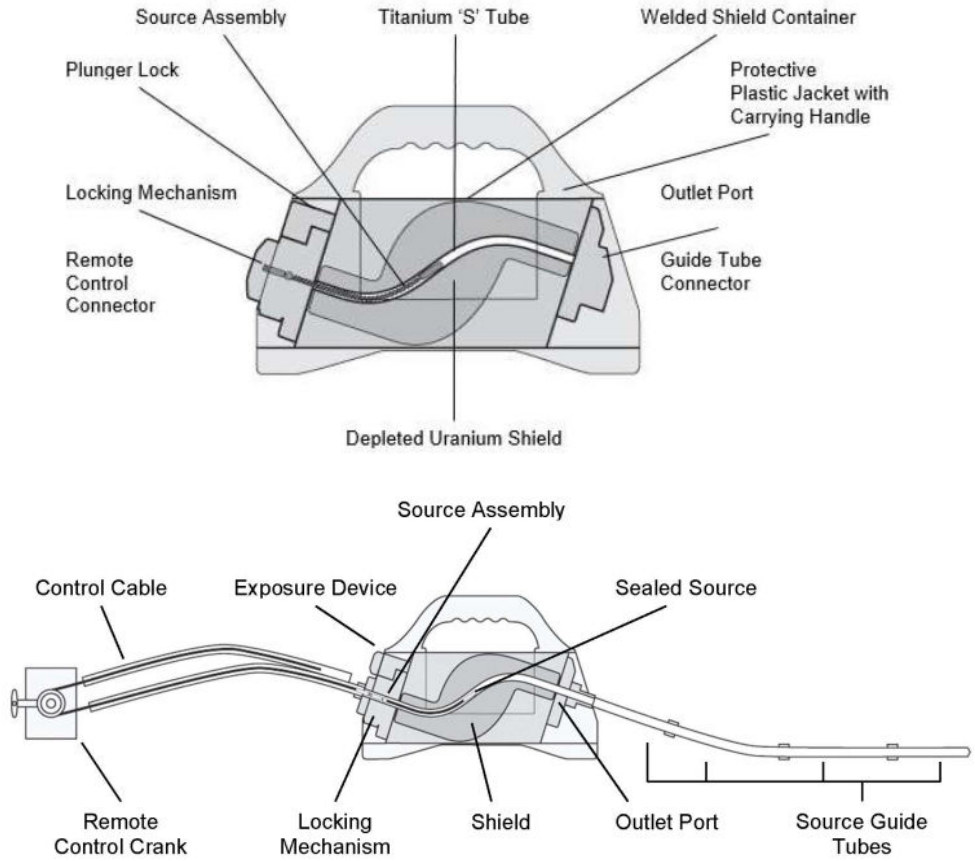
Equipment	Model No	Manufacturer
Control assemblies	664XX, 692XX, 693XX, SAN882XX, SAN882RXX, SAN885XX, SAN885RXX, SAN886XX, SAN886RXX, SAN887XX, SAN887RXX	QSA Global
	3740-04 SAE100R7	Acuren
Guide tubes	48906-X, 48930-X, 48931-X, 95020-X, 95021-X, 48907-X, 48998-X, 48999-X, 95073-X, 95074-X, 95075-X, 95076-X, 48912G-X, 48912GTUB-XX, 48906G-X, 95020G-X Model 489- and Model 950- style guide tubes may be used with Model TUB011-X guide tube shield assembly as an option.	QSA Global
Collimators	717, 827, 828, 846	QSA Global
Cable male connectors	550	QSA Global
Drive connector	661	QSA Global
Threaded end stops	TAN691, 8011003202	QSA Global
Centering device	CANSPEC-045	Acuren
Rigid tube	J-tube CANSPEC-048	Acuren
	J-tube 91500-XX	QSA Global
	69130-XX	QSA Global
Source changers	360-2, 360-4, 360-4W, 360-10, 360-10W, 650L, 855, 3056, 880SC	QSA Global

- where X represents the length of guide tube in feet
- where XX varies based on the specific configuration of the Sentinel style control assembly model. For example, control assemblies could include SAN88625, SAN88635, SAN88650, etc.

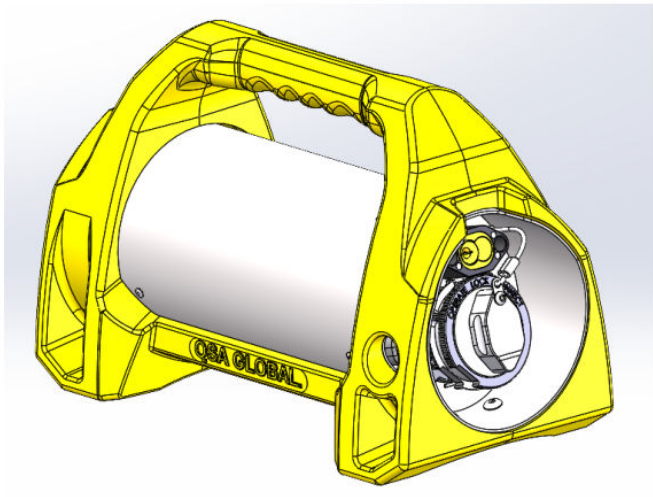
## 13. Reference Documents

No.	Description	Date yyyy-mm-dd	CNSC Reference No.
1	Application	2024-11-20	7411598
2	Supplemental Information	2025-03-04	7475253
		2025-03-06	7476089
		2025-04-16	7504184
		2025-07-28	7555897

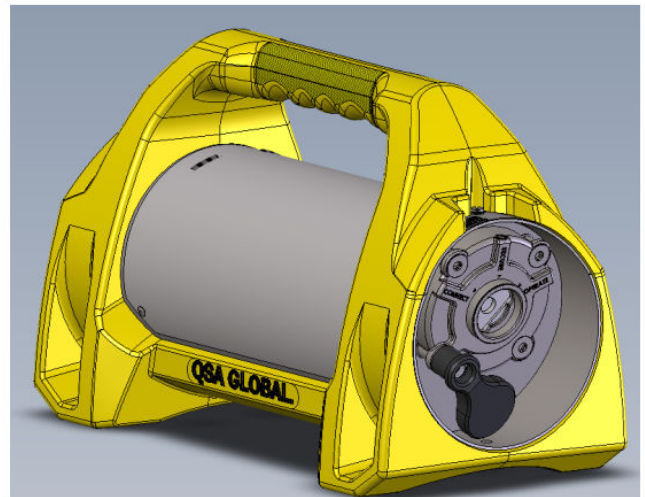
**Figure 1: Model 1100 Main Components and Basic Configuration with Accessories**



**Figure 2: Model 1100 Isometric Views**



**Model 1100 – Rear Plate View**



**Model 1100 – Front Plate View, Port Open**