



Certificate

CDN/E243/ (Rev. 6)

Endorsement of Transport Package Design

No. USA/9371/B(U) (Rev. 6)

The transport package design identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and Subsection 10(1) of the *Packaging and Transport of Nuclear Substances Regulations, 2015* and to the IAEA's *Regulations for the Safe Transport of Radioactive Material, 2018 Edition*.

REGISTRATION OF USE OF PACKAGES

All users of this authorization shall register their identity in writing with the Canadian Nuclear Safety Commission prior to the first use of this authorization and shall certify that they possess the instructions necessary for preparation of the package for shipment.

PACKAGE IDENTIFICATION

Designer: **QSA Global Inc.**
Make/Model: **360-2, 360-4, 360-4W, 360-10, 360-10W Source Changers**
Mode of Transport: **Air, Sea, Road, Rail**

IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**USA/9371/B(U)**".

PACKAGE DESCRIPTION

The model 360 series of packages, as shown on QSA Drawing No. R360-User (Rev. F) and as further described in foreign certificate no. USA/9371/B(U) (Rev. 6), consists of five models constructed in accordance with QSA Drawing No. R36000 (Rev. K); 360-2, 360-4, 360-4W, 360-10, and 360-10W. The major components of the package include: the container assembly, the shield assembly, the shield retainer, the source securing assembly, the cover assembly, and the source assemblies. Shielding is provided by either all tungsten or a combination of tungsten and depleted uranium (DU) shields. Models with the "W" designation use all tungsten shielding. Model 360-2 contains 18 kg of DU, Model 360-4 contains 25 kg of DU and Model 360-10 contains 36 kg of DU. An optional adapter tungsten shield can also be added to the top side of the package for additional shielding.



Depending on the source assembly to be transported, the source capsule is attached to either a flexible steel wire or is incorporated into a segment of a source chain. Each source securing mechanism incorporates a locking mechanism to secure the source inside the package and a source dust cap to further protect the end of the source assembly during transport. A lock assembly secures the various lengths of source assemblies in the 360-2, 360-4, and 360-4W models, which have the option of three loading positions: bottom, middle, or top. For the 360-10 and 360-10W models, the chain assemblies, which are shorter in length, are secured to the locking assembly via stainless steel jumper extensions.

The configuration of the model no. 360-2 is as follows:

Shape:	Cylinder	Shielding:	Tungsten/DU
Mass:	50 kg	Outer Casing:	Stainless Steel
Length:	407 mm	Height:	430 mm
Width:	343 mm	Diameter:	n/a

The configuration of the model no. 360-4 is as follows:

Shape:	Cylinder	Shielding:	Tungsten/DU
Mass:	59 kg	Outer Casing:	Stainless Steel
Length:	407 mm	Height:	430 mm
Width:	343 mm	Diameter:	n/a

The configuration of the model no. 360-4W is as follows:

Shape:	Cylinder	Shielding:	Tungsten
Mass:	70.3 kg	Outer Casing:	Stainless Steel
Length:	407 mm	Height:	430 mm
Width:	343 mm	Diameter:	n/a

The configuration of the model 360-10 is as follows:

Shape:	Cylinder	Shielding:	Tungsten/DU
Mass:	77 kg	Outer Casing:	Stainless Steel
Length:	407 mm	Height:	430 mm
Width:	343 mm	Diameter:	n/a

The configuration of the 360-10W is as follows:

Shape:	Cylinder	Shielding:	Tungsten
Mass:	82 kg	Outer Casing:	Stainless Steel
Length:	407 mm	Height:	430 mm
Width:	343 mm	Diameter:	n/a



AUTHORIZED RADIOACTIVE CONTENTS

The model 360 series transport package is authorized to contain Ir-192 and Se-75 sealed sources with a valid special form radioactive material certificate, as further described in foreign certificate no. USA/9371/B(U) (Rev. 6).

MANAGEMENT SYSTEM

The management system for the design, manufacture, testing, documentation, use, maintenance and inspection of the package shall be in accordance with:

- Foreign Certificate No. USA/9371/B(U) (Rev. 6)
- Packaging and Transport of Nuclear Substances Regulations, 2015

SHIPMENT

The preparation for shipment of the package shall be in accordance with:

- Foreign Certificate No. USA/9371/B(U) (Rev. 6)
- Packaging and Transport of Nuclear Substances Regulations, 2015

This certificate is valid only in Canada.

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

NOTES

Foreign Certificate No. USA/9371/B(U) (Rev. 6) attached.

Revision 0: July 16, 2014. New certificate.

Revision 1: July 9, 2015. Certificate revised to incorporate revision 1 of foreign certificate.

Revision 2: January 12, 2016. Certificate revised to correct the reference to Drawing No. R-36000.

Revision 3 : January 18, 2019. Certificate revised to incorporate revision 3 of foreign certificate.

Revision 4 : July 17, 2023. Certificate revised to incorporate revision 4 of foreign certificate.

Revision 5: March 18, 2025. Certificate revised to incorporate new source assembly models (A426-1 and A426-2)

Revision 6: January 26, 2026. Certificate revised to reflect issuance pursuant to the 2018 edition of the IAEA Regulations and to incorporate revision 6 of the foreign certificate.



Certificat d'homologation

CDN/E243/ (Rév. 6)

Acceptation de la conception de colis de transport de l'étranger

n° USA/9371/B(U) (Rév. 6)

La Commission canadienne de sûreté nucléaire a procédé à l'homologation du modèle de colis décrit plus loin en vertu de l'alinéa 21(1)(h) de la *Loi sur la sûreté et la réglementation nucléaires* et de l'article 10(1) du *Règlement sur l'emballage et le transport des substances nucléaires (2015)* du Canada et du *Règlement de l'AIEA, Édition de 2018, Règlement de transport des matières radioactives* de l'Agence internationale de l'énergie atomique.

INSCRIPTION DE L'USAGE DU COLIS

Toute personne qui prévoit utiliser la présente autorisation pour la première fois doit s'inscrire par écrit auprès de la Commission canadienne de sûreté nucléaire et attester qu'elle possède les instructions nécessaires pour préparer le colis pour fins d'expédition.

IDENTIFICATION DU COLIS

Concepteur : **QSA Global Inc.**
Marque/Modèle : **changeurs de source 360-2, 360-4, 360-4W, 360-10, 360-10W**
Modes de transport : **aérien, maritime, routier, ferroviaire**

MARQUE D'IDENTIFICATION

Le colis porte la marque d'identification <<**USA/9371/B(U)**>> de l'autorité compétente.

DESCRIPTION DU COLIS

La série 360 des modèles de colis, tel que illustré dans le dessin n° R360-User (rév. F) de QSA et décrite plus en détail dans le certificat de l'étranger n° USA/9371/B(U) (rév. 6), comporte cinq (5) modèles fabriqués conformément au dessin de QSA n° R36000 (rév. K) : 360-2, 360-4, 360-4W, 360-10, et 360-10W. Les composants principaux des colis comportent le contenant, le blindage, le dispositif de retenue du blindage, le dispositif d'arrimage de l'assemblage de la source, l'assemblage du couvercle et les assemblages de la source. Le blindage est constitué soit entièrement de tungstène ou d'une combinaison de blindages de tungstène et d'uranium appauvri. Les modèles portant la désignation « W » utilisent un blindage composé entièrement de tungstène. Le modèle 360-2 contient 18 kg d'uranium appauvri, le modèle 360-4 en contient 25 kg et le modèle 360-10 en contient 36 kg. Un adaptateur de blindage optionnel en tungstène peut aussi être ajouté sur le dessus du colis pour offrir un meilleur blindage.



Selon l'assemblage de la source à transporter, l'enveloppe de source peut soit être fixée à un câble d'acier flexible ou incorporée à un segment d'une chaîne de source. Chaque dispositif d'arrimage de la source incorpore un mécanisme de verrouillage pour assujettir la source à l'intérieur du colis et un capuchon antipoussière de source pour protéger les extrémités de l'assemblage de la source pendant son transport. Un dispositif de verrouillage assujettit les longueurs variées d'assemblages de source dans les modèles de colis 360-2, 360-4 et 360-4W, lesquels présentent trois options de chargement : au bas, au centre ou au haut du colis. Pour les modèles 360-10 et 360-10W, les assemblages de chaîne, plus courtes en longueur, sont fixés au mécanisme de verrouillage au moyen de cavaliers en acier inoxydable.

La configuration du modèle 360-2 est la suivante :

Forme :	Cylindre	Blindage :	Tungstène/UA
Masse :	50 kg	Enveloppe extérieure :	Acier inoxydable
Longueur :	407 mm	Hauteur :	430 mm
Largeur :	343 mm	Diamètre :	n/a

La configuration du modèle 360-4 est la suivante :

Forme :	Cylindre	Blindage :	Tungstène/UA
Masse :	59 kg	Enveloppe extérieure :	Acier inoxydable
Longueur :	407 mm	Hauteur :	430 mm
Largeur :	343 mm	Diamètre :	n/a

La configuration du modèle 360-4W est la suivante :

Forme :	Cylindre	Blindage :	Tungstène
Masse :	70.3 kg	Enveloppe extérieure :	Acier inoxydable
Longueur :	407 mm	Hauteur :	430 mm
Largeur :	343 mm	Diamètre :	n/a

La configuration du modèle 360-10 est la suivante :

Forme :	Cylindre	Blindage :	Tungstène/UA
Masse :	77 kg	Enveloppe extérieure :	Acier inoxydable
Longueur :	407 mm	Hauteur :	430 mm
Largeur :	343 mm	Diamètre :	n/a

La configuration du modèle 360-10W est la suivante :

Forme :	Cylindre	Blindage :	Tungstène
Masse :	82 kg	Enveloppe extérieure :	Acier inoxydable
Longueur :	407 mm	Hauteur :	430 mm
Largeur :	343 mm	Diamètre :	n/a



CONTENU RADIOACTIF AUTORISÉ

Le modèle de colis de transport de la série 360 est autorisé à contenir une source scellée d'Ir-192 ou de Se-75 ayant un certificat de matière radioactive sous forme spéciale valide, tel que décrit plus en détail dans le certificat de l'étranger n° USA/9371/B(U) (rév. 6).

SYSTÈME DE GESTION

Le système de gestion visant la conception, la fabrication, les épreuves, l'établissement des documents, l'utilisation, l'entretien et l'inspection du colis doit être conforme aux :

- Certificat de l'étranger USA/9371/B(U) (rév. 6)
- Règlement sur l'emballage et le transport des substances nucléaires (2015)

EXPÉDITION

La préparation du colis pour fins d'expédition doit être conforme aux :

- Certificat de l'étranger USA/9371/B(U) (rév 6)
- Règlement sur l'emballage et le transport des substances nucléaires (2015)

Le présent certificat n'est valide qu'au Canada.

J. Ramsay
Fonctionnaire désigné en vertu de l'alinéa 37(2)(a)
de la *Loi sur la sûreté et la réglementation nucléaires*

NOTES

Certificat de l'étranger n° USA/9371/B(U) (rév. 6) ci-joint.

Révision 0 : le 16 juillet 2014. Nouveau certificat.

Révision 1 : le 9 juillet 2015. Révision du certificat pour inclure la révision 1 du certificat de l'étranger.

Révision 2 : le 12 janvier 2016. Révision du certificat pour corriger la référence au dessin n° R-36000.

Révision 3 : le xx janvier 2019. Révision du certificat pour inclure la révision 3 du certificat de l'étranger.

Révision 4 : le 17 juillet 2023. Révision du certificat pour inclure la révision 4 du certificat de l'étranger.

Révision 5: le 18 mars 2025. Révision du certificat afin d'ajouter deux nouveaux modèles d'assemblage de source (A426-1 et A426-2)

Révision 6: le 26 janvier, 2026. Certificat révisé afin de le délivrer en vertu de l'édition 2018 du Règlement de l'AIEA et d'incorporer la révision 6 du certificat de l'étranger.



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION FOR A
TYPE B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/9371/B(U) , REVISION 6**

The Competent Authority of the United States certifies that the radioactive material package design described in this certificate satisfies the regulatory requirements for a Type B(U) package as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America² The package design is approved for use within the United States for import and export shipments made in accordance with applicable international and domestic transport regulations.

1. Package Identification - Model No. 360 series (Model Nos. 360-2, 360-4, 360-4W, 360-10, and 360-10W).
2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9371, Revision 4 (attached).
3. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
 - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Engineering and Research, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

¹ "Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6, Revision 1" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/9371/B(U) , REVISION 6

c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

d. Records of Management System activities required by Paragraph 306 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

4. Special Conditions -

a. Aging Management protocols detailed in QSA Global In-Service Bulletin SB-26 dated December 2024 (attached) shall be followed.

5. Marking and Labeling - The package shall bear the marking USA/9371/B(U) in addition to other required markings and labeling.

6. Expiration Date - This certificate expires on August 31, 2028. Previous editions which have not reached their expiration date may continue to be used.

This certificate is issued in accordance with paragraph(s) 810 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the July 30, 2025 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:



William Quade
Acting Associate Administrator for
Hazardous Materials Safety

September 03,
2025

(DATE)

Revision 6 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9371, Revision 4, to the Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6, Rev. 1.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9371	4	71-9371	USA/9371/B(U)-96	1	OF 4

2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, *Code of Federal Regulations*, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.
3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION
- a. ISSUED TO (*Name and Address*)
QSA Global, Inc.
40 North Avenue
Burlington, MA 01803
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
QSA Global, Inc., application dated April 25, 2018.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

- (1) Model No.: 360
- (2) Description

The Model No. 360 series of packages consist of a family of five package configurations used to transport Ir-192, Yb-169, and Se-75 source assemblies that meet the requirements for special form material. These five packages are the Model Nos. 360-2, 360-4, 360-4W, 360-10, and 360-10W. The external dimensions of all models are identical and are approximately: 15 inches [38 centimeters (cm)] long, 12.5 inches (32 cm) wide, and 15.9 inches (40 cm) tall.

The major components of the package include: (i) the container assembly, (ii) the shield assembly, (iii) the shield retainer, (iv) the source securing assembly, (v) the cover assembly, and (vi) the source assemblies. Shielding is provided by either all tungsten or a combination of tungsten and depleted uranium shields. Models with the "W" designation use all tungsten shielding. An optional adapter tungsten shield can also be added to the top side of the Model No. 360 for additional shielding.

Depending on the source assembly to be transported, the source capsule will be attached to either a flexible steel wire or will be incorporated into a segment of a source chain. Each source securing mechanism incorporates a locking mechanism to secure the source inside the package and a source dust cap to further protect the end of the source assembly during transport. A lock assembly will secure the various lengths of the source assemblies in the Model Nos. 360-2, 360-4, and 360-4W. Those models have the option of three loading positions: bottom, middle, or top. For the Model Nos. 360-10 and 360-10W, chain assemblies, which are shorter in length, will be secured to the locking assembly via stainless steel jumper extensions.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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5.(a)(2) Description (continued)

The maximum weight of the package varies depending on the configuration. The maximum package weights are listed in the table below:

Model No.	Package Weight
360-2	110 lbs. (50 kg)
360-4	130 lbs. (59 kg)
360-4W	155 lbs. (70.3 kg)
360-10	170 lbs. (77 kg)
360-10W	180 lbs. (82 kg)

(3) Drawings

The package is constructed in accordance with QSA Global, Inc., Drawing No. R36000, Rev. K, sheets 1-10.

The package user should reference QSA Global, Inc., Drawing No. R360-User, Revision F, sheets 1-2.

(b) Contents

(1) Type and form of material

Iridium-192 (Ir-192), Selenium-75 (Se-75), and Ytterbium-169 (Yb-169), as sealed sources, which meet the requirements of special form radioactive material.

All source wire assemblies consist of the source capsule attached to either a flexible steel wire or incorporated into a segment of a source chain.

(2) Maximum quantity of material per package:

The maximum quantity of Se-75 and Yb-169 is 5,000 curies (Ci) for all variations of the Model No. 360 transportation package. For Ir-192, the values may depend on the location of the source activity in package shielding and are listed in Table 1 below.

Output curies for Ir-192 are determined by measuring the source output at 1 meter and expressing its activity in curies derived from the following: 0.48 R/(hr-Ci) (Ref: American National Standards Institute N432-1980, "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography").

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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5.(b)(2) Maximum quantity of material per package (continued):

Table 1

Model No.	Activity Shield Location	Maximum Package Capacity	Maximum Number of Sources
360-2	Bottom	300 Ci	2
	Top or Middle	270 Ci	
360-4	Bottom	600 Ci	4
	Top of Middle	540 Ci	
360-4W	Any	260 Ci	4
360-10	Any	1,500 Ci	10
369-10W	Any	170 Ci	10

(3) Maximum weight of contents:

0.3 lbs. (138 grams) for the Model No. 360-2 package.

0.6 lbs. (276 grams) for the Model Nos. 360-4 and 360-4W packages.

1.5 lbs. (690 grams) for the Model Nos. 360-10 and 360-10W packages.

The maximum content weight includes the mass of radioactive material and the source capsule handling wire assembly for a shipment containing the maximum number of source wire assemblies that can be transported in a package (i.e., 2 source assemblies for the Model No. 360-2, 4 source assemblies for the Model Nos. 360-4 and 360-4W packages, and 10 source assemblies for the Model Nos. 360-10 and 360-10W packages).

(4) Maximum decay heat: 21 watts

6. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section No. 7 of the application, as supplemented;

(b) The package must meet the Acceptance Tests and Maintenance Program of Section No. 8.0 of the application; and

(c) In conjunction to the requirements of 6.(a) the package shall be lifted and tied down for transport as presented in QSA Global, Inc. Service Bulletin SB-19 Revision March 2023.

7. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

8. Revision No. 3 of this certificate may be used until August 31, 2023.

9. Expiration date: August 31, 2028.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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REFERENCES

QSA Global, Inc., application dated April 25, 2018 as supplemented on August 29, 2022, March 22, 2023, March 29, 2023, and March 31, 2023.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



White, Bernard signing on behalf
of Diaz-Sanabria, Yaira
on 04/21/23

Yaira K. Diaz Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: See digital signature



QSA GLOBAL

SERVICE BULLETIN

360 Series Extended Inspection & Maintenance for IAEA SSR-6: 2018 Compliance

Purpose

This document provides information applicable to the inspection and maintenance of the Model 360 Series transport packages to comply with IAEA SSR-6 (2018). In addition to ensuring the packages are in accordance with the operating instructions supplied with the transport packages, per 10 CFR 71.87 and 71.89, specifically Sections 7 & 8 of the Model 360 Series Safety Analysis Report, compliance with this bulletin is required for all packages shipped under a USDOT certificate, or other foreign Type B certification, endorsed to IAEA SSR-6 (2018).

Packages Inspection & Maintenance Requirements

The Model 360 Series packages must be maintained regularly by trained and qualified personnel to ensure the packages comply with applicable Type B(U) or Type A approval requirements and the packages maintain their integrity during transport.

The recommended inspection and maintenance requirements are based on the system's design, application, materials, anticipated work cycles, environmental factors of use under the normal and abnormal conditions of transport. A program of systematic maintenance will prolong the working life of the package in addition to ensuring safety during transport and use. Routine inspection of the package is required prior to each shipment. In addition, a complete annual servicing of the 360 Series package designs is necessary to ensure the packages integrity.

Maintenance program administrators must recognize the need for maintenance intervals that are less than the required annual interval, especially in cases where the packages are used in severe environmental conditions. Maintenance program administrators must ensure the systems are completely serviced immediately after observed damage or after exposure to severe conditions. Extreme or severe conditions may include, but is not limited to, conditions where the package was:

- Immersed in water or mud.
- Subjected to high-concentrations of particulate such as fly ash, sand or foundry green-sand.
- Subjected to hot radiography conditions.
- Subjected to salt-water conditions, caustic or acidic materials.
- Subjected to accidental drops or falling objects.
- Whenever subjected to extreme environmental conditions.

The complete, annual inspection and maintenance (also required after removal from long term storage – see Section 4) involves an enhanced inspection and service for package components and major assemblies.

Personnel performing the inspections and maintenance in this bulletin must be adequately trained and approved to perform these duties. Personnel approved and qualified under either a USNRC approved QA program or an ISO 9001 QA program to perform Type B container inspection and maintenance would meet the training requirements in this bulletin.

1. General Requirements

- a. The Model 360 Series transport packages must be loaded and closed in accordance with procedures that, at a minimum, include the requirements in Sections 7 & 8 of the SAR and this bulletin. Shipment of Type B quantities of radioactive material are authorized for sources specified in Section 2. Maintenance and inspection of these packages is in accordance with the additional requirements specified in Section 3 and 4.

QSA GLOBAL

SERVICE BULLETIN

360 Series Extended Inspection & Maintenance for IAEA SSR-6: 2018 Compliance

NOTE: Package conformance after storage and prior to use for Type B shipments is ensured by proper inspection and maintenance. The materials used in the Model 360 Series packages are not vulnerable to degradation due to irradiation over time, and there will typically be no chemical/galvanic material interactions between package materials during storage so long as the packages are not exposed to hazardous chemicals and is stored under controlled environmental conditions¹.

For packages removed from storage and prior to shipment, the package components are inspected for any degradation due to non-use/storage. Any degradation identified will prevent the package's use for shipment until correction by replacement, service and/or repair. (Reference: IAEA SSR-6 §503(e) & 613A).

- b. Results of package annual inspections and maintenance covered in this bulletin must be recorded and include, at a minimum,
- The date of inspection and maintenance.
 - Name and signature of the qualified individual performing the required inspections.
 - Problems found and maintenance or repairs performed.
 - Packages model number (e.g., 360-4, 360-10, etc.) and the serial number.
 - Associated equipment that was inspected and maintained.
 - Part numbers and associated lot numbers or serial numbers, when applicable, of replacement parts installed.

If any defective/damaged components are identified on the package or source(s) contained in the package, they must be removed from transport use and identified with a status indicator (tag, label, or tape) to prevent inadvertent shipment or use. Defective or damaged components must be repaired or replaced before continued use of the Model 360 Series package in transport.

NOTE: Repair of any 360 Series package must be performed by, or under the direction and approval of, QSA Global, Inc. only.

Contact QSA Global, Inc. if additional guidance or assistance is needed to determine actions to deal with defective/damaged 360 Series transport packages.

2. Authorized Packages Contents

The Model 360 Series transport packages are designed for use with a special form source capsules as approved under a U.S. Department of Transportation special form certification². The approved isotopes and maximum packages activity limits are shown in Table A. Details of encapsulation as well as chemical and physical form of the radioactive material will comply with specifications approved under U.S. Department of Transportation or other Competent Authority special form certifications.

¹ Storage of the Model 360 Series packages should be in a temperature and humidity controlled area away from chemicals or other hazardous substances to prevent degradation of the packages integrity while in storage.

² Special Form is defined in 10 CFR 71, 49 CFR 173, IAEA TS-R-1 and SSR-6.

360 Series Extended Inspection & Maintenance for IAEA SSR-6: 2018 Compliance

Table A: Ir-192 Permitted in the Model 360 Series³

Model	Activity Shield Location	Maximum Capacity ⁴	Maximum Sources	Maximum DU Weight	Maximum Packages Weight
360-2	Bottom	300 Ci	2	40 lbs (18 kg)	110 lbs (50 kg)
	Top or Middle	270 Ci			
360-4	Bottom	600 Ci	4	55 lbs (25 kg)	130 lbs (59 kg)
	Top or Middle	540 Ci			
360-4W	Any	260 Ci	4	NA	155 lbs (70 kg)
360-10	Any	1,500 Ci	10	80 lbs (36 kg)	170 lbs (77 kg)
360-10W	Any	170 Ci	10	NA	180 lbs (82 kg)

NOTE: The maximum quantity of Se-75 and Yb-169 is 5,000 Ci for all variations of the Model 360 transportation package in any shield location.

3. Packaging Maintenance and Inspection Prior to Shipment

- a. If the package has been in storage for 1 year or longer, inspection to the requirements in Section 4 must be completed in addition to the maintenance and inspection listed in this section.
- b. Ensure all markings are legible including the package serial number and that the labels are securely attached to the package. Labels should be easily legible at a distance of roughly 3 ft (1 m) and contain all necessary information.
- c. Inspect the package components for signs of damage or significant degradation. Ensure all welds are intact, the components are free of heavy rust and cracks/damage to the lid and container body. If there is any evidence of damage which could adversely impact the packages integrity for Type B transport, contact QSA Global, Inc. prior to shipping.
- d. Assure all bolts, washers, nuts and fasteners (hardware) required for assembly of the packages, and as specified on the drawings referenced on the Type B transport certificate, are fit for use. Do not disassemble any of the other packages subassemblies to perform this inspection (e.g., do not remove hardware from the cover or lock assemblies from the package. Examine the visible external surfaces for any signs of damage including fatigue cracking.

Note: The hardware must be replaced if no longer fit for use (e.g., threads stripped, unable to fully thread, signs of cracking, galling, etc.). If replacement hardware is required, contact QSA Global, Inc. to obtain parts. This is necessary to ensure replacement hardware meets all applicable specifications listed on the drawings referenced on the Type B transport certificate.

³ Sources allowed for transport in the 360 Series as Type B quantities limited to special form as defined in 10 CFR 71, 49 CFR 173, IAEA TS-R-1 and SSR-6.

⁴ Maximum Capacity Activity for Ir-192 is defined as output Curies determined by measuring the source output at 1 meter and expressing its activity in curies derived from the following: 0.48 R/(hr-Ci) (Ref: ANSI N432-1980).

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- e. Ensure the locking assemblies allow free movement of the lock slide when performing an operational test and that all parts of the lock assembly function as intended. Ensure the plunger lock engages and is functional. Ensure the shipping caps/dust caps install and secure onto the lock assemblies.
- f. Ensure the threaded holes used to secure the lid to the container body do not have damaged threads and engage the cover bolts. Threaded holes must not allow pass through without threading.
- g. Ensure the two grip brackets used for lifting are securely attached to the package base and are undamaged.
- h. Ensure the packages can be assembled, including attachment of a seal wire as identified on drawing R360-USER Revision F.
- i. If the 360 Series fails any of the inspections in steps 3.a-h, remove the package from use until it can be brought into compliance with the Type B certificate.

4. Packaging Annual Maintenance and Inspection

Model 360 Series package must receive inspection and maintenance at least once a year. Annual maintenance and inspection must be performed by individuals specifically trained, qualified and authorized for this work.

NOTE: QSA Global, Inc. can perform annual inspection for customer owned 360 Series upon receiving a request for service.

To perform the annual maintenance/inspection, parts of the package must be disassembled and the major packages sub-assemblies thoroughly cleaned and inspected to ensure the integrity of components that are critical to safety. These procedures can only be performed on an empty package, which requires transfer of the radioactive source assembly(ies) into an approved storage container.

A leak test of a sealed source must be performed every 6 months or prior to its first use after removal from storage. Acceptable results of a radio-assay must indicate removable contamination is less than <185 Bq (0.005 μ Ci). If the source requires a leak test, perform the test and obtain the results prior to transferring the source from the package into a source changer.

- a. If the package has not received an annual inspection per this section within the last year or the package has been in storage for 1 year or longer, inspection to the requirements in this section must be completed.
- b. Complete the inspections in Section 3.b through 3.i.
- c. Remove each lock assembly, disassemble and clean main parts. Replace all springs. Inspect all parts, including screws and fasteners (hardware) required for assembly of the lock for damage/wear. Examine the screws and hardware visible external surfaces for any signs of damage including fatigue cracking.

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Note: The hardware must be replaced if it is no longer fit for use (e.g., threads stripped, unable to fully thread, signs of cracking, galling, etc.). If replacement hardware or other lock assembly parts are required, contact QSA Global, Inc. to obtain parts. This is necessary to ensure replacement components meet all applicable specifications listed on the drawings referenced on the Type B transport certificate.

Reassembly the lock assemblies and attach them to the 360 Series container base. Screws used to attach the lock assemblies to the 360 Series package may use optional threadlocker (Loctite® 242). After attachment, ensure the locking assemblies allow free movement of the lock slide when performing an operational test and that the plunger lock engages and the rest of the lock assembly is functional. For each lock assembly, install stainless steel lockwire between the two top lock assembly screws.

- d. If the package meets the requirements of 4 b. through c., complete an annual inspection sticker and apply one to the 360 Series top plate.
- e. Maintain records of this inspection and maintenance (see 1.b in this bulletin).