



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/0214/B(U) , REVISION 18**

**REVALIDATION OF CANADIAN COMPETENT AUTHORITY  
CERTIFICATE CDN/2045/B(U)**

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 Agency<sup>1</sup> and the United States of America<sup>2</sup> 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 - MDS Nordion F-168-X Shipping Flask, Serial Nos. 22-X, 23-X, 24-X, 25-X, 26-X, 41-X.
2. Package Description and Authorized Radioactive Contents - as described in Canadian Certificate of Competent Authority CDN/2045/B(U), Revision 21 (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.

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<sup>1</sup> "Regulations for the Safe Transport of Radioactive Material, 2012 Edition, No. SSR-6" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

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

**CERTIFICATE USA/0214/B(U) , REVISION 18**

- 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 regulations<sup>1</sup> 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 - This package is approved as meeting the requirements of the 1973 Edition of the IAEA regulations. Fabrication of new packagings is not authorized. The package design has not been evaluated against the requirements of the 2018 Edition of the IAEA regulations.
5. Marking and Labeling - The package shall bear the marking USA/0214/B(U) in addition to other required markings and labeling.
6. Expiration Date - This certificate expires on April 30, 2025. Previous editions which have not reached their expiration date may continue to be used.

This certificate is issued in accordance with paragraph(s) 820 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the December 27, 2021 petition by Nordion (Canada) Inc., Ottawa, Ontario, and in consideration of other information on file in this Office.

Certified By:



William Schoonover  
Associate Administrator for Hazardous  
Materials Safety

January 24, 2022  
(DATE)



# Certificate

## CDN/2045/B(U) (Rev. 21)

### Transport Package Design

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 1973 Revised Edition (as amended) of the IAEA's *Regulations for the Safe Transport of Radioactive Material*.

#### **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: **Nordion (Canada) Inc.**  
Make/Model: **F-168-X Shipping Flask, Serial Nos. 22-X, 23-X, 25-X, 41-X**  
Mode of Transport: **Air, Sea, Road, Rail**

#### **IDENTIFICATION MARK**

The package shall bear the competent authority identification mark "**CDN/2045/B(U)**".

#### **PACKAGE DESCRIPTION**

The F-168-X package, as shown on drawing nos. F116801-100 (Rev. F) and F116801-101 (Rev. J), consists of a lead-filled (266 mm thick lead shielding) steel-encased right cylinder with external fins, insulated steel flame shields on the top and side and steel-covered insulation on the bottom. The package is permanently mounted on a structural steel base. The containment system is the source assembly.

An illustration of the package is shown on attached Drawing No. F-168-X (IN/SS 1928 F168X) (Rev. 6).

Any modification to the package design must be submitted to the Canadian Nuclear Safety Commission for approval prior to implementation.





The configuration of the package is as follows:

Shape:	<b>Cylinder</b>	Shielding:	<b>Lead</b>
Mass:	<b>5445 kg</b>	Outer Casing:	<b>Steel</b>
Length:	<b>1372 mm</b>	Height:	<b>1659 mm</b>
Width:	<b>1372 mm</b>	Diameter:	<b>1013 mm</b>

## **AUTHORIZED RADIOACTIVE CONTENTS**

This package is authorized to contain not more than 7,400 TBq of cobalt-60 in the form of metal, pellets, metal wafers, metal slugs, stainless steel clad wire, or aluminium clad cobalt slugs. The maximum decay heat is 3,200 watts.

The authorized models of the capsules that may be contained in this package are C132, C133, C146, C151, C177, C185, C188, C189, C190, C198, C199, C200, C238, TC239, C246, C247, C248, C252, C306, C335, XC318, XC325, C348, AC191, AC195, AC345, AC339 or any other welded stainless-steel capsules that meet the requirements of the International Organization of Standardization Standard 2919:2012 under classification number E53424 and that are either transported for the purpose of recycling, long-term storage prior to final disposal or final disposal.

## **MANAGEMENT SYSTEM**

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

- Nordion document No. IN/QA 0224 Z000 (12)\*, "Radioactive Material Transport Package Quality Plan"
- Nordion document No. IN/OP 0019 Z000 (14)\*, "Radioactive Material Transport Packaging Inspection and Maintenance Procedure"
- Packaging and Transport of Nuclear Substances Regulations, 2015
- \* or latest current revision

## **SHIPMENT**

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

- Nordion document No. IN/PP 0517 F168 (17), "Preparation for Shipment of the F-168 and F-168-X Transport Packagings"



- Packaging and Transport of Nuclear Substances Regulations, 2015

For heat fluxes exceeding  $15 \text{ W/m}^2$ , supplementary arrangements must be made with the carrier to ensure adequate heat dissipation.

Air transport is restricted to a maximum of 1,200 TBq of cobalt-60 to meet the 3000  $A_2$  value and the temperature requirement of paragraphs 433 and 619 of the IAEA Regulations, 2018 Edition.

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

A handwritten signature in black ink, consisting of several horizontal strokes followed by a stylized flourish.

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





## **NOTES**

Revision 19: February 22, 2016. Certificate renewed.

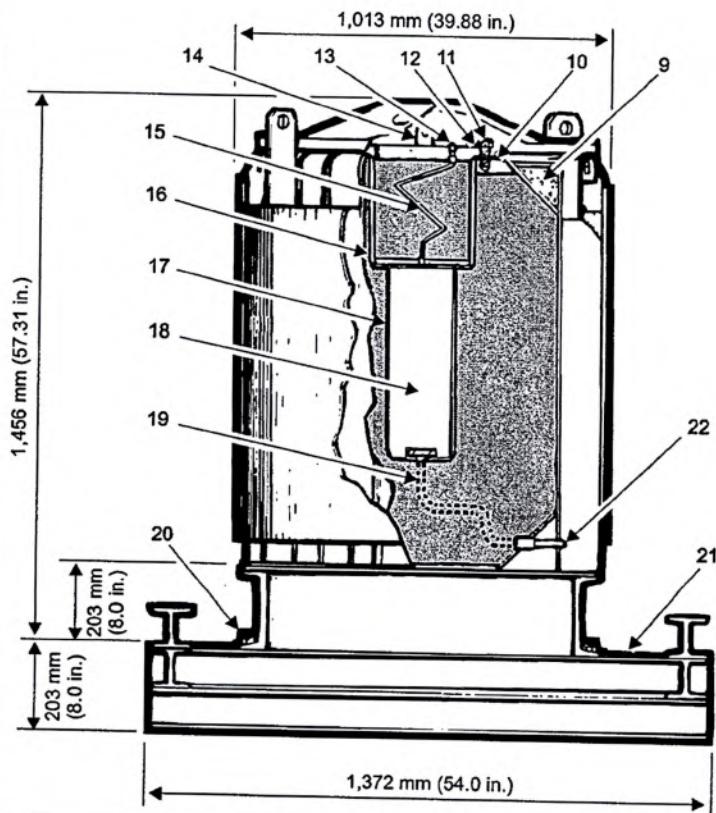
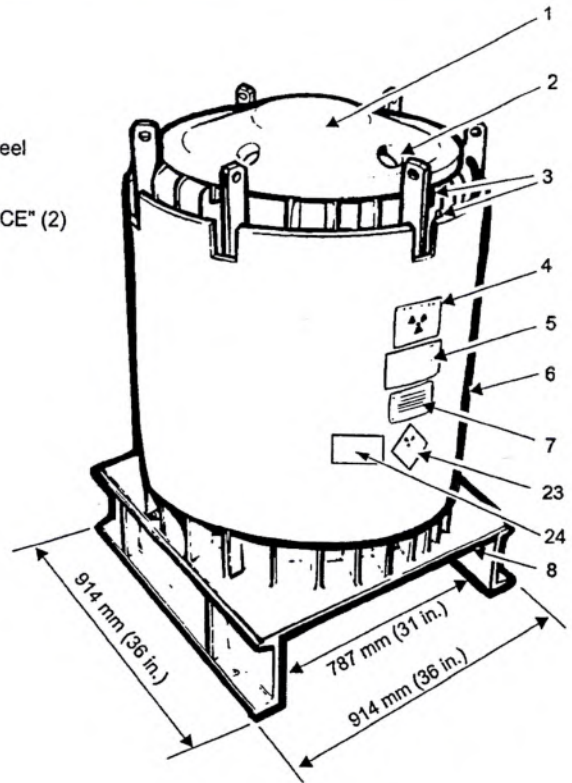
Revision 20: March 25, 2020. Certificate renewed.

Revision 21: December 22, 2021. Certificate amended to change the details associated with sources classified under the ISO 2919 standard.



**Parts List**

1. Upper fireshield
2. Holes for ventilation
3. Retaining brackets (4) for upper fireshield
4. Radiation caution plate (2)
5. Identification plate (2)
6. Fireshield (removable) - laminated construction: 2 x 6.3 mm (0.25 in.) Steel + 25.4 mm (1 in.) Kaowool, O.D. 1,013 mm (39.88 in.)
7. Warning plate "CAUTION - HEAT EMITTER - DO NOT STORE IN INSULATED OR REFRIGERATION CONTAINER OR INSULATED SPACE" (2)
8. Transite - steel encased
9. Vermiculite packing
10. Gasket (Neoprene)
11. 7/8 - 9 x 2 in. long hex bolt (8)
12. Wire seal
13. 3/8 in. NPT pipe plug (2)
14. Plug lift lug
15. Vent tube (sealed off at cavity)
16. Plug
17. Cavity: 479 mm x 162 mm dia. (18.87 in. x 6.37 in. dia.)
18. Radioactive contents and carrier
19. Drain tube (sealed off at cavity)
20. 3/4 -10 x 2 in. hex bolt for Skid (4)
21. Removable shipping skid, 1,372 mm (54 in.) square
22. Standard pipe plug (sealed off)
23. Category label (2): on two opposite sides
24. UN Number Label (2): one next to each of the radioactive category labels



**Notes**

1. CNSC certificate CDN/2045/B(U)
2. Meets IAEA Type B(U) requirements
3. Steel encased lead shielding: 266 mm (10.5 in.)
4. Gross weight: 5,445 kg (12,000 lb.)
5. Plug weight: 177 kg (390 lb.)
6. Projected floor loading: 2,900 kg/m<sup>2</sup> (593 lb/ft<sup>2</sup>)
7. Radionuclides carried: Cobalt-60
8. Labels may be positioned as illustrated, or 45° to that shown

**MDS Nordion**

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 Kanata, Ontario, Canada, K2K 1X8  
 Tel: (613) 592-2790 · Fax: (613) 592-6937

TITLE

**F-168-X Transport Packaging**

REF. IN/SS 1928 F168X  
 F116801-100/F116801-101

REVISED May 03 DCN A1944-D-04A

DATE 1980 August

No.

**F-168-X**

ISSUE

**6**

DRAWN *BW* CHECKED *AD* APPROVED *ML*  
SW KD MK

SHEET 1 OF 1

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**CERTIFICATE NUMBER:** USA/0214/B(U)

**ORIGINAL REGISTRANT(S) :**

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