



U.S. Department  
of Transportation

Pipeline and  
Hazardous Materials  
Safety Administration

COMPETENT AUTHORITY CERTIFICATION  
FOR A TYPE B(U)  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/0589/B(U)-85, REVISION 5

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

REVALIDATION OF CANADIAN COMPETENT AUTHORITY  
CERTIFICATE CDN/1041/B(U)-85

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - MDS Nordion F-327/F-448 Transport Package.
2. Package Description and Authorized Radioactive Contents - as described in Canada Certificate of Competent Authority CDN/1041/B(U)-85, Revision 2 (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 Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
  - 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.

---

<sup>1</sup> "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

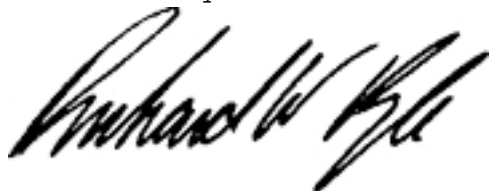
<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

**CERTIFICATE USA/0589/B(U)-85, REVISION 5**

- d. Records of Quality Assurance activities required by Paragraph 310 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 Condition - Before delivery of an F-256 leakproof insert to a carrier for transport, the shipper must provide the consignee special instructions for safely opening the package. The instructions must give special consideration to any byproducts generated by the radiolysis of water.
5. Marking and Labeling - The package shall bear the marking USA/0589/B(U)-85 in addition to other required markings and labeling.
6. Expiration Date - This certificate expires on October 31, 2012.

This certificate is issued in accordance with paragraph 817 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the August 12, 2008 petition by MDS Nordion, Ottawa, Ontario, and in consideration of other information on file in this Office.

Certified By:



Robert A. Richard  
Deputy Associate Administrator for Hazardous Materials Safety

**Sep 04 2008**  
(DATE)

Revision 5 - Issued to revalidate Canadian Certificate of Competent Authority No. CDN/1041/B(U)-85, Revision 2, with the stated special condition.



Canadian Certificate No. <b>CDN/1041/B(U)-85 (Rev. 2)</b>	Issue Date <b>Jul-25-2008</b>	Expiry Date <b>Oct-31-2012</b>	CNSC File <b>30-A2-153-0</b>
--	----------------------------------	-----------------------------------	---------------------------------

## Certificate for 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 Section 7 of the *Packaging and Transport of Nuclear Substances Regulations*, and to the 1985 Edition (As Amended 1990) of the IAEA *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: **MDS Nordion**  
Make/Model: **F-327/F-448 Transport Package**  
Mode of Transport: **Air, Sea, Road, Rail**

### IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**CDN/1041/B(U) - 85**".

### PACKAGE DESCRIPTION

The packaging, as shown on MDS Nordion Drawing No. F632701-001 (Rev. B) and as further described in MDS Nordion Document No. IS/DS 1605 F448(5), consists of a lead-shielded, stainless steel-encased F-448 shielding vessel, centered and supported within a F-327 overpack comprising a removable head type steel drum and wooden filler inserts for thermal and impact protection. The shielding vessel may contain either the F-174, F-286, F-382 or F-389 auxiliary shielding inserts and, when required for containment, the F-256 stainless steel leakproof insert. The containment system consists of the special form sealed sources or the F-256 leakproof insert. The maximum mass of the F-448 shielding vessel with its contents is 79 kg.

An illustration of the package is shown on attached MDS Nordion Drawing No. F-327/F-448 (Issue 5).

Canadian Certificate No. <b>CDN/1041/B(U)-85 (Rev. 2)</b>	Issue Date <b>Jul-25-2008</b>	Expiry Date <b>Oct-31-2012</b>	CNSC File <b>30-A2-153-0</b>
--	----------------------------------	-----------------------------------	---------------------------------

The configuration of the package is as follows:

Shape: <b>Cylinder</b>	Shielding: <b>Lead</b>
Mass: <b>125 kg</b>	Outer Casing: <b>Steel</b>
Length: <b>n/a</b>	Height: <b>521 mm</b>
Width: <b>n/a</b>	Diameter: <b>489 mm</b>

### AUTHORIZED RADIOACTIVE CONTENTS

The authorized radioactive contents shall not exceed the maximum allowable activities for each of the radionuclides and package configurations specified in the attached tables:

Table 1: Contents in solid or liquid form contained in a F-256 leakproof insert, or

Table 2: Contents in welded stainless steel special form sources.

### QUALITY ASSURANCE

Quality assurance for the design, manufacture, testing, documentation, use, maintenance and inspection of the package shall be in accordance with:

- MDS Nordion Document No. IS/DS 1605 F448 (5), "Design, Manufacturing and Operating Specification for the F-327/F-448 Transport Package"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations

### SHIPMENT

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

- MDS Nordion Document No. IS/DS 1605 F448 (5), "Design, Manufacturing and Operating Specification for the F-327/F-448 Transport Package"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations



Canadian Certificate No. <b>CDN/1041/B(U)-85 (Rev. 2)</b>	Issue Date <b>Jul-25-2008</b>	Expiry Date <b>Oct-31-2012</b>	CNSC File <b>30-A2-153-0</b>
--	----------------------------------	-----------------------------------	---------------------------------

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

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

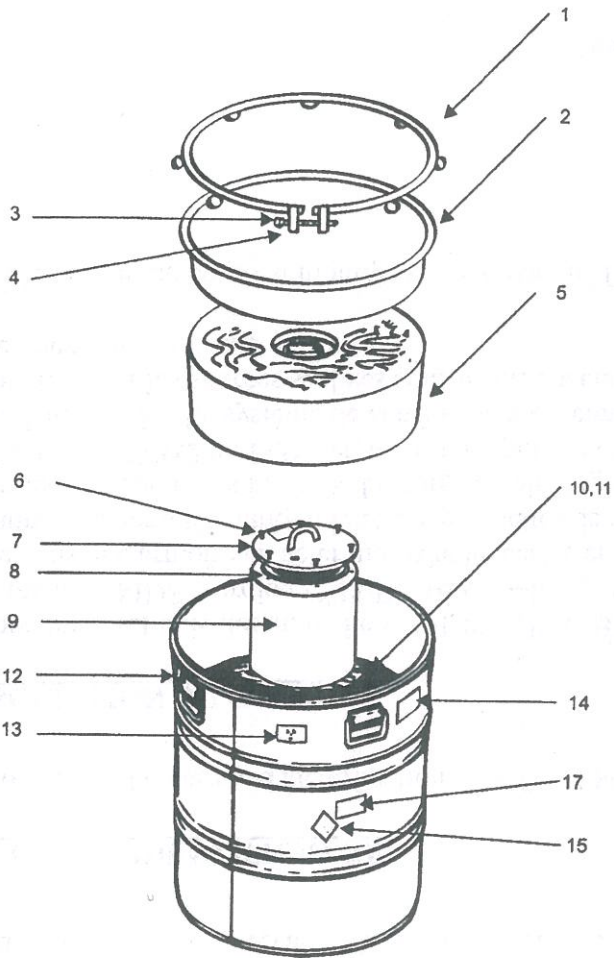


**Table 1 : Authorized Contents for Radionuclides In F-256 Leakproof Insert**

Radionuclide	Package Configuration		Physical and Chemical form
	F-448/F-256	F-448/F-256/F-389	
I-125	7,400 GBq	7,400 GBq	Solid or Aqueous NaOH solution
I-131	5,180 GBq	10,000 GBq	Solid or Aqueous NaOH solution, or Aqueous NaOH solution with 0.02 M Na <sub>2</sub> SO <sub>4</sub>
Mo-99/Tc-99m	555 GBq	1,110 GBq	Solid, or Aqueous NaOH solution or Aqueous NaOH solution with 0.02 M NH <sub>4</sub> NO <sub>3</sub>

**Table 2 : Authorized Contents for Radionuclides in Special Form Sealed Sources**

Radionuclide	Package Configuration			
	F-448	F-448/F-174	F-448/F-286	F-448/F-382
Co-60	4.0 GBq	15.0 GBq	4.0 GBq	15.0 GBq
Ir-192	2,405 GBq	9,250 GBq	4,800 GBq	33,300 GBq
Sb-124	7.4 GBq	11.1 GBq	7.4 GBq	44.4 GBq



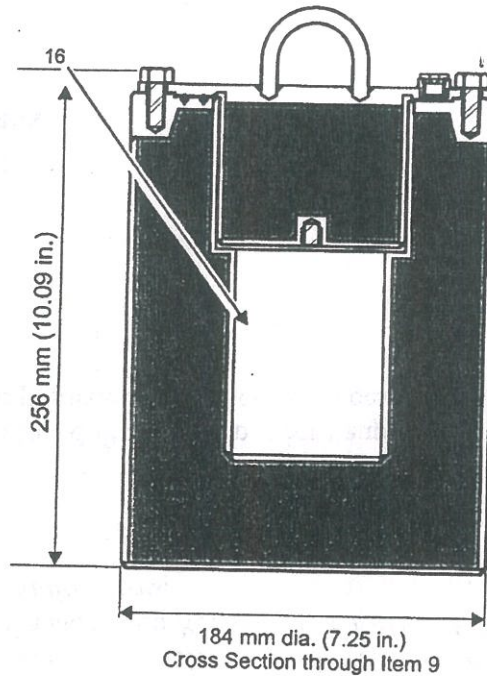
**Parts List**

1. Closure ring
2. Drum lid
3. Locking bolt 5/8-11 UNC x 4in. long
4. Security seal
5. Wood filler (upper) 106 mm (4.19 in.) thick
6. Plug bolts - hex head 3/8 - 16 UNC x 3/4 in. lg (6)
7. Lead-filled plug
8. Neoprene O-rings #244 (1) and # 250 (1)
9. Lead filled shielding vessel
10. Wood filler (middle) 265 mm (10.44 in.) thick
11. Wood filler (bottom) 83 mm (3.25 in.) thick
12. Steel drum 489 mm x 521 mm (19.25 in. dia. x 20.5 in.) high
13. Radiation caution plate
14. CNSC certification plate
15. Radioactive Category Label (2): on opposite sides of container
16. Container cavity 75.4 mm x 106.3 mm ( 2.97 in. dia. x 4.187 in.) high  
Cavity Inserts:  
a) The F-382 tungsten insert (6 holes) is used with Special Form sources  
b) If the sources are not Special Form, the F-256 leakproof insert is used.  
c) The F-389 tungsten insert and 2-oz. glass bottle with absorbent material are used with the F-256 leakproof insert.  
d) F-174 lead/stainless steel 25 mm (1 in.) lead shielding is used with Special Form sources  
e) F-286 lead/stainless steel (6 holes) is used with Special Form sources
17. UN Number Labels (2): one next to each radioactive category label

**Notes**

1. Meets IAEA Type B(U) requirements (CDN/1041/B(U)-85).
2. Weight 119 kg (263 lb.)
3. Lead Shielding 48 mm (1.88 in.)
4. Projected floor loading area: 0.188 m<sup>2</sup> (2.0 ft.<sup>2</sup>)
5. Floor Loading 580 kg/m<sup>2</sup> (120 lb./ft.<sup>2</sup>)
6. Accommodates shielding inserts listed in the table below.
7. Prepare for shipment in accordance with IS/PP 0016 F000.

Shielding Inserts		
Insert	Material	Weight
F-174	Lead/Stainless Steel	3.9 kg (9 lb.)
F-256	Stainless Steel	1.0 kg (2 lb.)
F-286	Lead/Stainless Steel	3.4 kg (8 lb.)
F-382	Tungsten	7.0 kg (15 lb.)
F-389	Tungsten	1.3 kg (3 lb.)



**MDS Nordion**

447 March Road, P.O. Box 13500  
 Kanata, Ontario, Canada, K2K 1X8  
 Tel: (613) 592-2790 · Fax: (613) 592-6937

TITLE

**F-327/F-448 Transport Packaging**

REF. IS/SS 1470 F448  
 F144802001

REVISED June 03 DCN A1944-D-10B

DATE Jan 99

No.

**F-327/F-448**

ISSUE

**5**

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

SHEET 1 OF 1

THIS DRAWING IS THE PROPERTY OF MDS NORDION INC. AND IS SUBMITTED FOR CONSIDERATION ON THE UNDERSTANDING THAT THERE SHALL BE NO EXPLOITATION OF ANY INFORMATION CONTAINED HEREIN EXCEPT WITH THE SPECIFIC WRITTEN AGREEMENT OF MDS NORDION INC.



U.S. Department  
of Transportation

**Pipeline and  
Hazardous Materials  
Safety Administration**

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

**CERTIFICATE NUMBER:** USA/0589/B(U)-85, Revision 5

**ORIGINAL REGISTRANT(S):**

Mr. Marc-Andre Charette  
Manager, Regulatory Affairs  
MDS Nordion  
447 March Road  
Ottawa, K2K 1X8  
CANADA

Luc Desgagne  
Senior Licensing Coordinator  
MDS Nordion  
447 March Road  
Ottawa, Ontario K2K 1X8  
CANADA

Mr. Marc-Andre Charette  
Manager, Regulatory Affairs  
MDS Nordion  
447 March Road  
Ottawa, K2K 1XB  
CANADA