



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/0806/B(U)-96, REVISION 2**

**REVALIDATION OF CANADIAN COMPETENT AUTHORITY  
CERTIFICATE CDN/2091/B(U)-96**

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>.

1. Package Identification - Aspect 12K.
2. Package Description and Authorized Radioactive Contents - as described in Canadian Certificate of Competent Authority CDN/2091/B(U)-96, 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 Engineering and Research, (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, 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/0806/B(U)-96, REVISION 2**

- 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. Marking and Labeling - The package shall bear the marking USA/0806/B(U)-96 in addition to other required markings and labeling.
5. Expiration Date - This certificate expires on November 30, 2019. 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 173.473 of Title 49 of the Code of Federal Regulations, in response to the February 19, 2015 petition by Source Production and Equipment Company, Inc., St. Rose, LA, and in consideration of other information on file in this Office.

Certified By:



William Schoonover  
Associate Administrator for Hazardous  
Materials Safety

April 04, 2018  
(DATE)

Revision 2 - Issued to revalidate Canadian Certificate of Approval  
No. CDN/2091/B(U)-96, Revision 2.



# Certificate

**CDN/2091/B(U)-96 (Rev. 2)**

## 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 IAEA's *Regulations for the Safe Transport of Radioactive Material, 2012 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: **Aspect Technology Ltd.**  
Make/Model: **12K Transport Package (serial numbers 001 AS - 040 AS, XXX AS),  
Maxibulk Inner Container; Minibulk Inner Container; 10 Channel Inner  
Container**  
Mode of Transport: **Air, Sea, Road, Rail**

### IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**CDN/2091/B(U)-96**".

### PACKAGE DESCRIPTION

The ASPECT 12K package, as shown in Aspect Technology Drawing Nos. B170100 (Rev. 7), B170101 (Rev. 5), B170210 (Rev. 5), and B170300 (Rev. 5) consists of cylindrical outer and inner containers. The outer container includes a steel drum of 1.2 mm wall thickness and a Kaolite 1600 liner. The cover of the drum is secured by a clamp ring fastened by a bolt. Additionally, four tabs are welded to the underside of the cover and are engaged by M8 bolts through the side wall of the container. A plastic or wire tamper seal is attached to the clamp ring. Kaolite 1600 liners fill inside the drum, leaving a cavity inside the Kaolite to hold the inner container. The dimensions of the cavity are approximately 181 mm in diameter and 286 mm in height. A stainless steel or galvanized steel support cylinder separates the inner container from the Kaolite liner. A ceramic insulator or aluminum spacers may be used inside the cavity to keep the inner container in place.



The source capsules act as the primary containment for the radioactive contents. The package contains one of three possible inner containers; Maxibulk, Minibulk, or the 10-Channel. Each inner container consists of a stainless steel cylindrical shell and uses depleted uranium (DU) encased in stainless steel as shielding.

The Minibulk inner container is 140 mm in diameter, 180 mm in height with a cavity of 23.6 mm in diameter and 40 mm high, and weighs 37 kg including 31 kg of DU. The cavity inside the DU shield is lined with steel and the internal lid is closed with two M8 screws, while the external lid is closed with four M8 screws.

The Maxibulk inner container is 170 mm in diameter, 250 mm in height with a cavity of 31.6 mm in diameter and 72.5 mm high, and weighs 79 kg including 69 kg of DU. The cavity inside the DU shield is lined with steel and the internal lid is closed with two M8 screws, while the external lid is closed with four M8 screws.

The 10-Channel inner container is used as a source changer and is 180 mm in diameter, 280 mm high, and weighs 60 kg including 52 kg of DU. The DU shielding is made of two separate parts; the DU shield and the DU shield insert. There are ten channels in the DU to hold copper plated stainless steel source tubes. The special form sources, incorporated into source assemblies, are held in the tubes using hold down caps. The caps are covered by a lid held in place by an eyebolt.

An illustration of the package is shown on the attached Aspect Technology 12K Descriptive Assembly drawing.

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 with Maxibulk Inner Container is as follows:

Shape: <b>Cylinder</b>	Shielding: <b>Depleted Uranium</b>
Mass: <b>149 kg</b>	Outer Casing: <b>Steel</b>
Length: <b>n/a</b>	Height: <b>550 mm</b>
Width: <b>n/a</b>	Diameter: <b>390 mm</b>

The configuration of the package with Minibulk Inner Container is as follows:

Shape: <b>Cylinder</b>	Shielding: <b>Depleted Uranium</b>
Mass: <b>107 kg</b>	Outer Casing: <b>Steel</b>
Length: <b>n/a</b>	Height: <b>550 mm</b>
Width: <b>n/a</b>	Diameter: <b>390 mm</b>

The configuration of the package with the 10 Channel Inner Container is as follows:

Shape: <b>Cylinder</b>	Shielding: <b>Depleted Uranium</b>
Mass: <b>130 kg</b>	Outer Casing: <b>Steel</b>
Length: <b>n/a</b>	Height: <b>550 mm</b>
Width: <b>n/a</b>	Diameter: <b>390 mm</b>





## **AUTHORIZED RADIOACTIVE CONTENTS**

Appendix 1 and Appendix 2 list the maximum authorized radioactive contents that may be transported in each package configuration. All radioactive contents must have a valid special form radioactive material certificate.

## **QUALITY ASSURANCE**

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

- Aspect Technology Ltd., Document "Aspect Technology Ltd. Quality Assurance Program"
- Packaging and Transport of Nuclear Substances Regulations, 2015
- IAEA Regulations for the Safe Transport of Radioactive Material, 2012 Edition

## **SHIPMENT**

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

- Aspect Technology Ltd., Document "Aspect 12K operating manual, Rev. 6"
- Packaging and Transport of Nuclear Substances Regulations, 2015
- IAEA Regulations for the Safe Transport of Radioactive Material, 2012 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.

S. Faille

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



## Appendix 1

MaxiBulk and MiniBulk inner containers may contain one of the nuclear substances up to the corresponding maximum activity. The 10-Channel inner container may contain any of the nuclear substances as further specified in Appendix 2.

Isotope	MaxiBulk	MiniBulk	10-Channel
	Max Activity	Max Activity	Max Activity
	TBq	TBq	TBq
Iridium-192	350	112	56
Selenium-75	370	370	56
Ytterbium-169	56	56	56
Cesium-137	250	5.6	-
Cobalt-60	0.022	0.003	-



## Appendix 2

The 10-Channel inner container can only hold the source assemblies listed in this Appendix and can hold up to 10 source assemblies each containing up to 5.6 TBq of Ir-192, Se-75 or Y-169.

<b>Device</b>	<b>Source Holder</b>	<b>Drawing</b>
GammaMat TSI Series	TI-GF7	H811.12-000
GammaMat TSI Series	TSI-GF7.8	H811.25-000
GammaMat SE/Rid- SE4P	SE-GM7	H811.30-000
GammaMat Hybrid	HY-GF7	Aspect 170233
Gilligan Eng. Viking	II-SA	CPPSII02A
Gilligan Eng. Viking V	V-SA	CPPSV02A
Gilligan Eng. Viking VI	VI-SA	CPPSVI02A
Gilligan Eng. Viking X	X-SA	CPPSX02A
Industrial Nuclear IR-100	32, 70400, C-376B, 87703, G-40T, G-40F	B912000
Sentinel 880 Series	A424-9, A424-25W, 91810, T-5, T-5F, C-337B, 7, 70200	D900000
Source Production SPEC-150	G-60, 969	B912000
Source Production SPEC-2T	G-1F, G-1T, G-3F	B912000

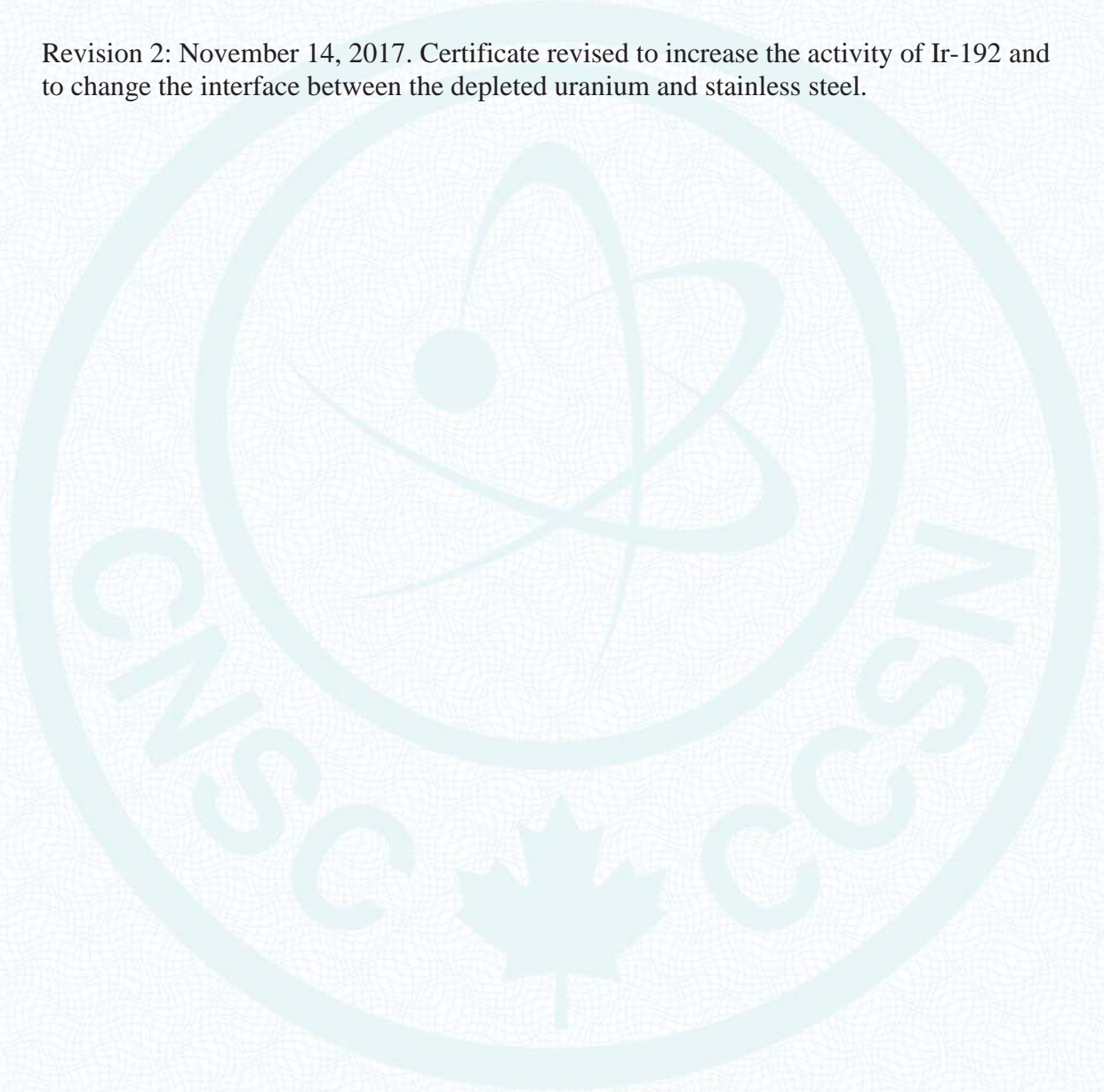


## **NOTES**

Revision 0: November 19, 2014. New certificate.

Revision 1: November 27, 2014. Certificate amended to correct Appendix 2, Column 1, "Source Production Spec-15" and Source Production Spec 2-1" and replace with "Source Production SPEC-150" and "Source Production SPEC-2T".

Revision 2: November 14, 2017. Certificate revised to increase the activity of Ir-192 and to change the interface between the depleted uranium and stainless steel.





Aspect Technology 12K Descriptive Assembly drawing

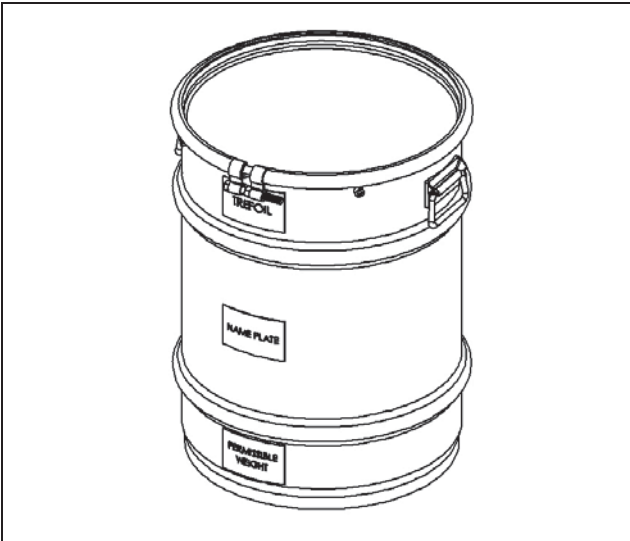


Figure 1.1 ASPECT 12K Package as presented for transport

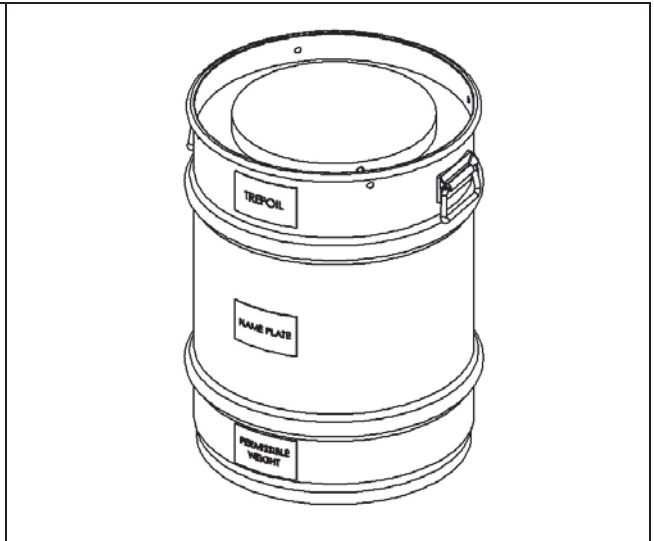


Figure 1.2 ASPECT 12K with cover removed

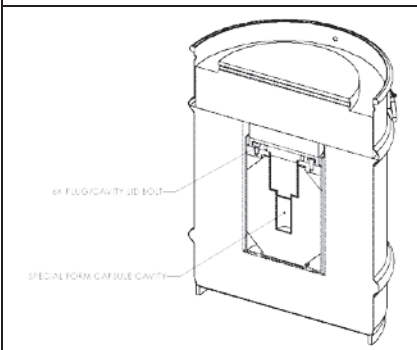


Figure 1.3 ASPECT 12K with inner maxiBulk container

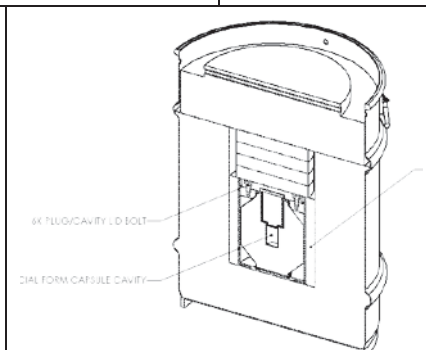


Figure 1.4 ASPECT 12K with inner miniBulk container

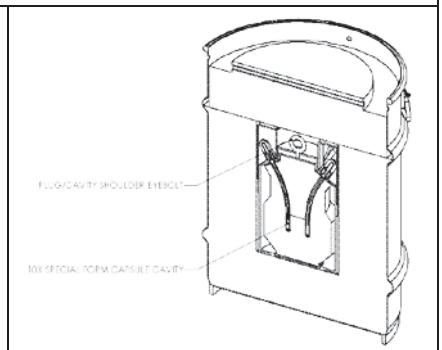


Figure 1.5 ASPECT 12K with inner 10-Channel container



U.S. Department of  
Transportation

**Pipeline and  
Hazardous Materials  
Safety Administration**

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

**CERTIFICATE NUMBER:** USA/0806/B(U)-96

**ORIGINAL REGISTRANT(S) :**

Source Production and Equipment Company, Inc.  
113 Teal St.  
St. Rose, LA, 70087  
USA

Isoflex Radioactive  
108 Teal Street

St Rose, LA, 70087  
USA