



Certificate

CDN/2101/B(U) (Rev. 0)

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, 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: **ISO-RAD Canada Inc.**
Make/Model: **ISORAD-TC1**
Mode of Transport: **Air, Sea, Road, Rail**

IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**CDN/2101/B(U)**".

PACKAGE DESCRIPTION

The packaging consists of an Outer Drum Assembly, an Inner Container, and sealed source capsules which meet the requirements of special form radioactive material. The radioactive contents are carried within the Inner Container in special form capsules of various sizes and configurations. The Outer Drum Assembly and Inner Container do not have O-rings, therefore, containment is provided by the special form sources. Cork is located between the Outer Drum Assembly and the Inner Container which provides impact protection and thermal insulation. The shielding is primarily provided by the Inner Container.

The outer drum is 589 mm tall and has a diameter of 403 mm. The lid for the Outer Drum is attached to the body using eight M14 x 2 bolts. There are also two lock studs which can be padlocked for security, and a tamper-evident seal.

The Inner Container consists of five configurations;

- Square Bulk & PIC Inner Container (BPIC) – DWG No. R180831-101 Rev. X2
- Round BPIC, the square Multi Port Inner Container (MPIC) – DWG No. R180831-101-4 Rev. X1
- Square MPIC – DWG No. R180831-102 Rev. X2
- Round MPIC – DWG No. R180831-102-6 Rev. X2
- BPIC 2835A – DWG No. R180831-101-5 Rev. X1

The total mass of each package combination is as follows:

- Square Bulk & PIC Inner Container (BPIC): 136 kg
- Round BPIC, the square Multi Port Inner Container (MPIC): 122 kg
- Square MPIC: 112 kg
- Round MPIC: 103 kg
- BPIC 2835A: 114 kg

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:	Cylinder	Shielding:	Depleted Uranium or Tungsten
Mass:	136 kg	Outer Casing:	Stainless Steel
Length:	n/a	Height:	589 mm
Width:	n/a	Diameter:	403 mm

AUTHORIZED RADIOACTIVE CONTENTS

The radioactive contents for the various configurations of the ISORAD-TC1 Transport Package are listed in Appendix A attached.

MANAGEMENT SYSTEM

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

- ISORAD Document Number QAP-001 Revision 1, "Quality Assurance Program/Management System"
- Packaging and Transport of Nuclear Substances Regulations, 2015



SHIPMENT

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

- ISORAD-TC1 Operating Manual, Revision 1
- Packaging and Transport of Nuclear Substances Regulations, 2015

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.

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



Appendix A

Isotope	Maximum Authorized Radioactive Contents (All sealed sources are required to have a valid special form certificate) TBq / (Ci)	
	BPIC	MPIC
Ac-225	2.50675 (67.75)	-
Ac-227	0.925 (25)	-
Ac-228	0.629 (17)	-
Ba-131	187.812 (5076)	-
Ba-133	4.625 (125)	-
Cd-109	99.900 (2700)	-
Co-57	11.100 (300)	-
Cs-131	995.300 (26900)	-
Cs-134	7.04295 (190.35)	-
Cs-137	143.856 (3888)	-
Cu-67	690.309 (18657)	-
Cm-248	0.185 (5)	-
Eu-152	2.997 (81)	-
In-111	424.575 (11475)	-
Ir-192	374.625 (10125)	55.5 (1500)
Ir-194	2.04795 (55.35)	-
Fe-55	99.9 (2700)	-
Lu-177	370.629 (10017)	-
P-32	5.57442 (150.66)	-
P-33	370.629 (10017)	-
Se-75	370.629 (10017)	55.5 (1500)
Na-22	99.9 (2700)	-
Sr-89	12.1878 (329.4)	-
Sr-90	1.85 (50)	-
Th-227	10.0899 (272.7)	-
Th-228	5.57442 (150.66)	-
W-187	22.3776 (604.8)	-
W-188	0.64232 (17.36)	-
Y-90	1.72827 (46.71)	-
Y-169	370.629 (10017)	55.5 (1500)
Y-175	995.3 (26900)	-
Zn-65	18.5 (500)	-
Other Isotopes	Type A Quantity	-

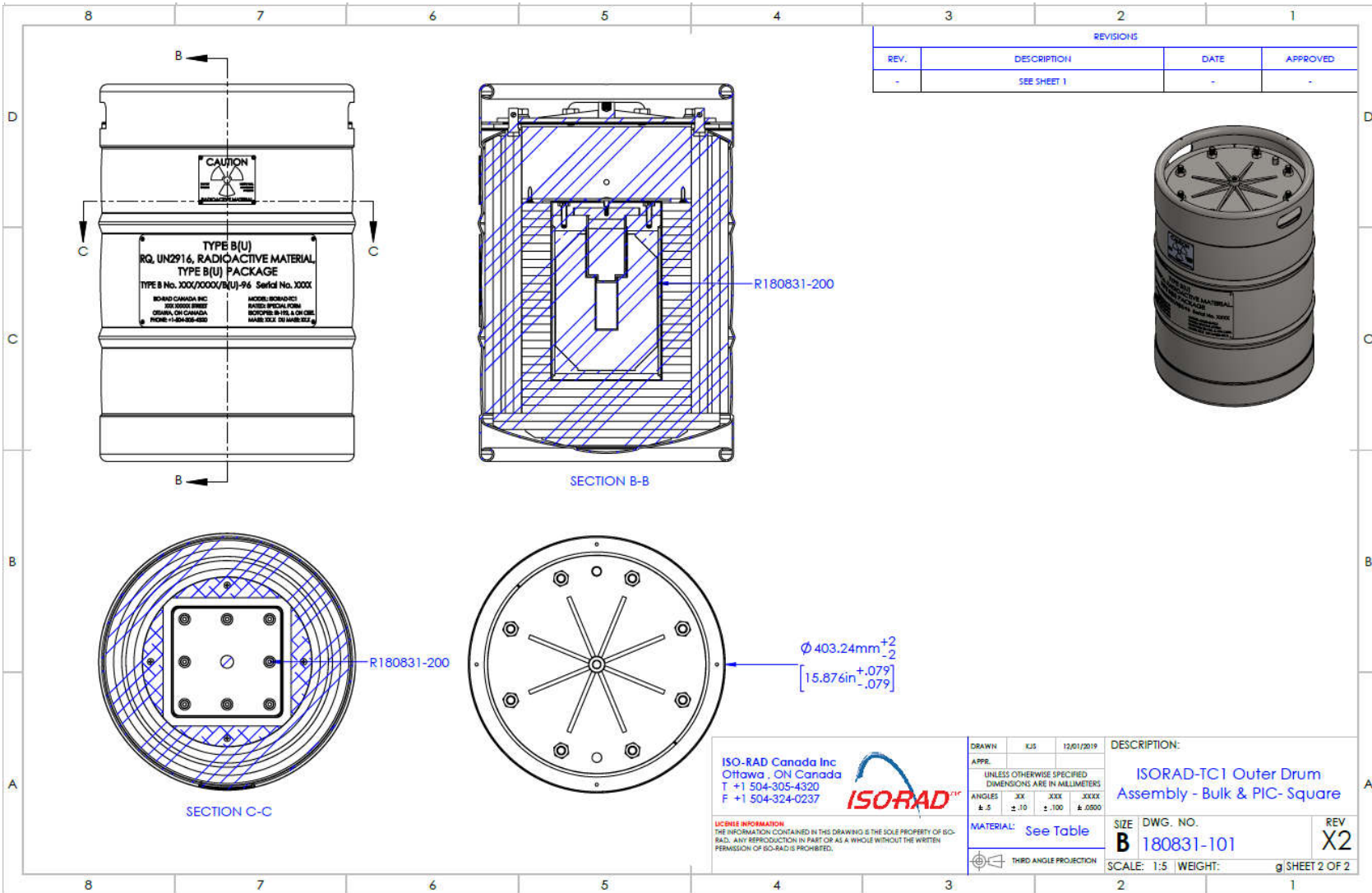




NOTES

Revision 0: June 30, 2021. New certificate.





REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
-	SEE SHEET 1	-	-

ISO-RAD Canada Inc
 Ottawa, ON Canada
 T +1 504-305-4320
 F +1 504-324-0237



DRAWN	KJS	12/01/2019
APPR.		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS		
ANGLES	XX ±.5	XXX ±.10
	XXXX ±.000	

DESCRIPTION:
**ISORAD-TC1 Outer Drum
 Assembly - Bulk & PIC- Square**

LICENSE INFORMATION
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ISO-RAD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ISO-RAD IS PROHIBITED.

MATERIAL: See Table
 THIRD ANGLE PROJECTION

SIZE DWG. NO. REV
B 180831-101 X2
 SCALE: 1:5 | WEIGHT: g SHEET 2 OF 2