



Certificate

CDN/2109/B(U) (Rev. 1)

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-TC3**
Mode of Transport: **Air, Sea, Road, Rail**

IDENTIFICATION MARK

The package shall bear the competent authority identification mark "**CDN/2109/B(U)**".

PACKAGE DESCRIPTION

The package, as shown on ISO-RAD drawing No. R210422-100-110 (Rev. 1) and in the attached Figure 1, consists of an outer drum and an inner container. The outer drum consists of the body, lid, and cork assembly. The outer drum body is an austenitic stainless steel cylinder. It has a permanently closed bottom and an open top. A circular attachment ring is welded to the interior of the outer drum that allows for securing the outer lid with bolts. The lid assembly is secured to the body with eight stainless steel M14 x 2 hex bolts and two locking studs for additional security to accommodate optional padlocks or other locking/security devices.

The cork assembly is used inside the outer drum. There are two configurations of the cork assembly, large and small, to accommodate the two different Inner Container Assembly (ICA) configurations, ICA-large and ICA-small. The cork assembly secures and centers the particular inner container being transported by either cork cutout; or an aluminum ring and sleeve assembly.



The ICA-large is constructed of three major components, the Tungsten Outer Container-large (TOC-large), the Tungsten Inner Container (TIC), and the optional Insert Assembly (IA). The ICA-small design is very similar to the ICA-large and is constructed of three major components, the Tungsten Outer Container-small (TOC-small), the Tungsten Inner Container (TIC), and the optional Insert Assembly (IA).

The TOC-large and TOC-small consist of the body and the lid. They are made of inner and outer austenitic stainless steel shells with tungsten shield in between. The lid and the body are attached using screws and sealed with two silicone or Viton O-rings. There is a port in the lid between the O-rings for leak testing and a central threaded hole for an eyebolt.

Since the TOC-large and TOC-small have identical internal dimensions, the same TIC and IA are used in both configurations. The TIC consists of a body, a lid, and a plug, all made of stainless steel with internal tungsten shield. The lid is closed with eight M6 × 1 screws and sealed by two O-rings. The TIC lid has a leak test port and a central M6 x 1 threaded hole for an eyebolt. The IA consists of a body and a cap that are threaded together and can be of aluminum, tungsten, or stainless steel. The IA can be either full-size or half-size, where two half-size IAs are stacked vertically in the TIC.

The containment system for the package consists of the TOC-large or the TOC-small or TIC or sealed sources with a valid special form radioactive material certificate.

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:	Tungsten
Mass:	184 kg	Outer Casing:	Stainless Steel
Length:	n/a	Height:	591 mm
Width:	n/a	Diameter:	404 mm

AUTHORIZED RADIOACTIVE CONTENTS

See 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:

- ISO-RAD Document No. QAP-002 (Rev. 0)*, "Quality Management System Manual"
- 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:

- ISORAD-TC3 Operating Manual (Rev. 0)
- 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.

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



Appendix A

The package is authorized to contain any one of the solid radioactive contents shown in the following table:

Table 1: Isotopes permitted in the configuration ISORAD-TC3 TOC-Large or TOC-Small

Isotope	Maximum activity for TOC-Large (TBq)	Maximum activity for TOC-Small (TBq)
Iridium-192*	184.5	46.5
Lutetium-177* Normal form in quartz ampoules only	185	185
Lutetium-177* Normal form in 16 Ampoules and with 16 Aluminum Irradiation Targets	44.4	30.55
AC-225	29.6	29.6
Cu-64	18.5	9.25
Ga-68	7.03	2.59
Ge-68	925	925
Gd-153	444	370
Ra-226	0.111	0.0185
Sr-89	13	12.95
Sr-90	55.5	3.7
Tb-161	370	370
Y-90	55.5	3.7

* including impurities



Canadian Nuclear
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NOTES

Revision 0: October 27, 2023. New certificate.

Revision 1: December 18, 2025. Certificate amended to incorporate additional content.

Figure 1: Isometric, side, and top view of the ISORAD TC3 transport package

