

PO-14 PACKAGING

OPERATING AND MAINTENANCE INSTRUCTIONS

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Index	Date	Change		Compiled by	Checked by		Approved by
		Name	Signature	Level	ID		Copy no.
Compiled by	04/19	Majer		Order number	219028		
Checked by	04/19	Verner		Archive number	OScode650Av01m02		
Approved by	06/19	Krupička					

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1. IDENTIFICATION

Serial number:

Product: **PO-14**

Designated usage: Packaging for the transport of Type B(U) radioactive consignments

Manufacturer: UJP PRAHA a.s., Nad Kamínkou 1345,
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2. USAGE

The PO-14 type B(U) packaging comprises the transport container and the radioactive material in the shielding container, which is placed inside the transport container. The transport container enables the transport of shielding containers (gamma ray projector) as specified in paragraph 2.1 a) containing the radioactive materials as specified in paragraphs 2.1 b) or 2.1 c). The package may be used to transport special form radioactive materials with valid documentation proving that the radioactive source is tightly sealed. The transport container protects the package against mechanical and heat damage during transport.

2.1. Permissible radioactive content of package

- a) The PO-14 transport container may be used to transport gamma ray projectors, which must comply with the requirements for the shielding of radioactive contents according to the following type approval:
- GammaMat TSI 3/1
 - GammaMat TSI 5/1
 - Exertus DUAL 60
 - Exertus DUAL 120
- b) The PO-14 transport container may be used to transport the special form radioactive materials specified in the table (Table 1) in the devices specified in section 2.1 a):

Table 1

Radionuclide	¹⁹² Ir	¹³⁷ Cs	¹⁶⁹ Yb	¹⁷⁰ Tm	⁷⁵ Se
Max. activity [TBq]	7.5	0.75	3.7	3.7	7.5

- c) The package may also be used to transport solid radioactive materials not specified in the table (Table 1) up to the value of A_2 according to Table 2, Annex No. 3 of SUJB Decree No. 379/2016 Coll. (or according to Table 2, part IV, Safety Standards No. TS-R-1, Regulations for Safe Transport of Radioactive Material 2012 Edition, IAEA) in the devices specified in section 2.1 a).

The condition for use is that the dose rate on the outer surface of the package must not exceed the value of **2 mSv/hour**, and **0.1 mSv/hour** at a distance of 1 m from the outer surface of the package.

3. DESCRIPTION OF PRODUCT

The PO-14 type B(U) packaging comprises the transport container and the radioactive material in the shielding container placed inside the transport container. The transport container enables the transport of shielding containers (gamma ray projector) containing radioactive materials. The transport container is manufactured in accordance with documentation no. 1276 - 00 00 000. The Operating and Maintenance Instructions includes a schematic of the package (section 11) and an illustration of the transport container (section 12).

The type B(U) transport container is designed as a square container with a hinged lid. The container and the lid have two casings; the space between the casings is filled with wood mass. The contact surfaces of the container and the lid are machined and sealed with a single O-ring. In the corners of the contact surfaces there are holes for degassing the lining.

The lid tilts away from the container on two hinges; when it is closed, it is secured by two drawbolt latches with a safety lock to prevent it from being opened. Inside the lid there is a polyurethane polyether foam lining, which prevents any unwanted movement of the content of the transport container. Movement is further restricted by shaped inserts inside the container, which restrict the longitudinal movement of the individual types of packages transported. For handling purposes the container has two folding handles on the sides and four suspension shackles on the front and rear side of the lid to enable the container to be attached and lifted or for manipulating the lid.

The transport container further protects the shielding container against any leakage of radioactive material and also protects it against mechanical damage and the effects of external heat.

The outer dimensions of the transport container are: length 565 mm (475 mm with the handles folded in), width 225 mm and height approx. 278 mm. The inner sealed compartment measures 360 mm × 140 mm and is 230 mm in height.

The maximum weight of the actual transport container (excluding the shielding container) is 25 kg.

The shielding container transported in the PO-14 package must comply with the following technical parameters:

- the maximum dimensions of the shielding container are given by the inner dimensions of the transport container, i.e. 360 mm × 140 mm and 230 mm in height
- maximum weight of container 25 kg
- shielding material - uranium, tungsten, lead, iron
- maximum permissible activity of radioactive material see Table 1
- maximum surface dose rate of shielding container up to 2 mSv/h.

Package - the transport container is marked with the radioactivity symbol on the lid and has a metal non-removable plate on the side with the following basic information:

- a RADIOACTIVE warning sign
- the radioactivity symbol
- the package name: PO-14
- the package type: B(U)
- max. weight of package in kg
- serial number

- manufacturer's name
- international identification code: CZ/096/B(U)-96

The lettering, digits and symbol are indelibly engraved into the plate material.

Each radioactive package must also be clearly, legibly and permanently labelled on the outer surface of the package with the correct transport name and United Nations number, prefixed by the letters "UN".

The overall retention system of the packaging container is always a combination of the retention system of the transport container and the retention systems of the contents transported in the shielding container.

Transport container retention systems:

- inner space of the transport container tightly sealed by hinges and drawbolt latches with a safety lock.
- the flange joint of the container and lid of the transport container is sealed with an O-ring
- the double-casing design of the transport container with thermal insulation has high mechanical and heat resistant and guarantees that the integrity of the package will not be disrupted.

Shielding container retention systems:

- the source is tightly sealed in the shielding container (gamma ray projector)

When transported as a radioactive consignment the package must comply with the requirements of the applicable IAEA rules.

4. OPERATION

The PO-14 packaging container may only be operated by designated personnel who are demonstrably familiar with the handling of radioactive materials.

Before handling the package it is always necessary to check the dose rate on the surface.

Package assembly process:

- an authorised person will take delivery of the object to be transported from the specialised workplace – gamma ray projector, which contains a special form radioactive source. This handover process also includes surface dose rate inspection measurements.
- the gamma ray projector is inserted into the inner compartment of the transport container; its movement is restricted by a polyurethane polyether foam lining and shaped inserts in the container
- the functionality of the rubber O-ring is checked
- the lid of the transport container is closed and sealed with two drawbolt latches with a safety lock
- the container is secured against unauthorised access by locking it with a padlock or a lead seal
- the carrier must secure the package in the vehicle to prevent any movement.

When set up as described above, the package complies with the transport conditions. The procedure for removing the gamma ray projector from the package container will be the above process in reverse.

5. TECHNICAL DATA

Package:	type B(U) for special form radioactive materials
Transport container:	
Thickness of shielding – steel:	3.7 mm
Outer dimensions – length × width × height:	565 × 225 × 278 mm
Inner dimensions – length × width × height:	360 × 140 × 230 mm
Maximum weight of empty transport container:	25 kg
Gamma flaw detection device	
Shielding material:	uranium, tungsten, lead, steel
Max. dimensions of shielding containers:	360 × 140 × 230 mm
Maximum weight of empty shielding container:	25 kg

The total max. weight of the package, including contents, is 50 kg.

6. MATERIALS USED – TRANSPORT CONTAINER

Package container:	stainless steel
Thermal insulation:	mix of hardwood sawdust with soluble glass
Plate:	brass
Connecting material:	stainless steel

7. MAINTENANCE

The manufacturer explicitly draws the user's attention to the fact that operation of the package can lead to normal wear and tear. In order to keep the package fully functional, the user must assure the following:

- the transport container must always be undamaged
- check the condition of the contact surface of the flange and seals on the transport container
- check the condition of the hinges and drawbolt latches, including all screw joints
- if the package is involved in any accident or emergency, including fire, or if the container is damaged, always take it to the manufacturer to be checked and repaired.

The manufacturer recommends that the transport container be sent to the manufacturer to be checked after every five years of us.

The gamma flaw detection device pursuant to section 2.1 placed inside the transport container containing a special form radioactive material must have a valid long-term stability test certificate (LST). That LST must be performed at least once a year (no LST is required when the empty shielding container is transported without a sealed radioactive source) and confirmation of the LST must be stated visibly on the casing of the gamma flaw detection device.

The long-term stability test (LST) may only be performed by an entity licensed to conduct LST. The licence holder must prepare and follow the methodology and procedures as recommended by the manufacturer and the requirements of the national authorities.

NATIONAL NOTE: LST MAY ONLY BE PERFORMED BY THE HOLDER OF AN SÚJB LICENCE ISSUED FOR THE EVALUATION OF SPECIAL SOURCES OF RADIATION - GAMMA FLAW DETECTION DEVICES CONTAINING A SEALED RADIOACTIVE SOURCE.

Manufacturer warns the user that any tampering with the structure of the package will exempt the manufacturer from liability for any damage caused by a defective product.

8. OPERATING CONDITIONS

Owing to the design and materials used there are no restrictions on the normal working and transport environment.

The package retains its functional properties within the temperature range of approx. -40°C to +85°C.

If the package is exposed to temperatures exceeding 100°C, the seals may be damaged.

Once the radioactive material is placed in the package, the package becomes a type B(U) consignment and the applicable laws must be respected.

When the package is full, no special measures are required needed as regards the dissipation of heat. The activities of the radionuclides transported pursuant to section 2.1 b) have a negligible heat output, which complies with the conditions of non-exclusive transport. The package should not be exposed to direct sunlight for any length of time.

9. SAFETY, QUALITY

The package testing centre Litoměřice - SÚRAO Praha subjected the PO-14 transport container to all of the prescribed type B(U) tests, performed an assessment and issued a test report.

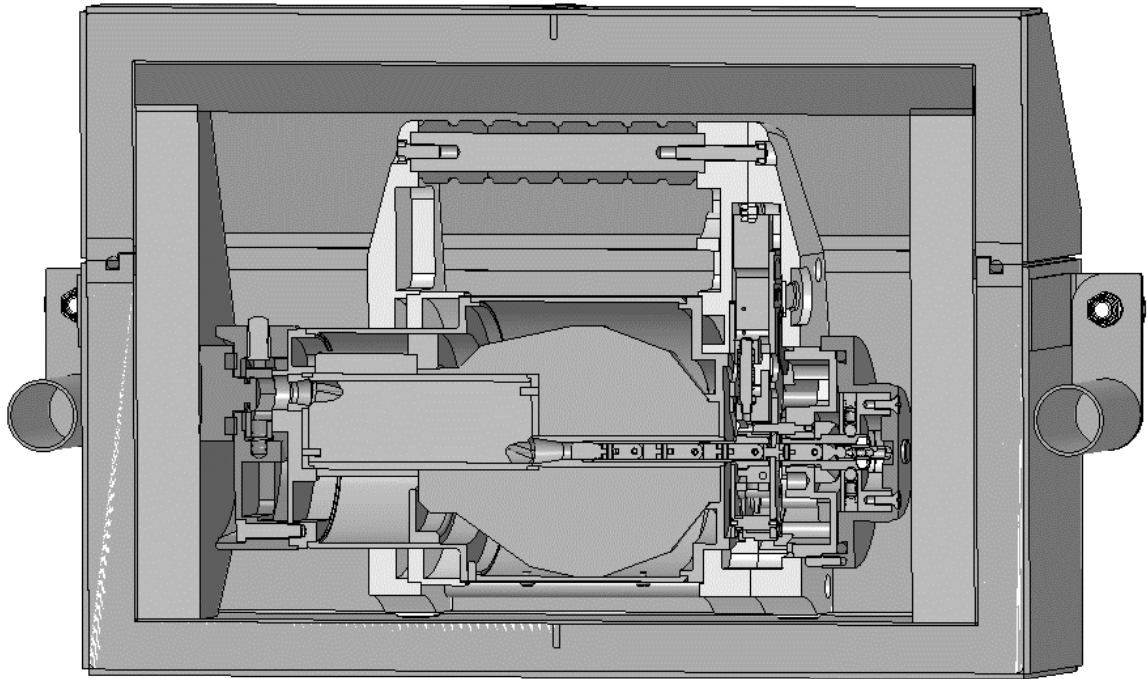
The quality of the manufacturer's production of this type and verification of the compliance of the properties and parameters of individual pieces are assured in accordance with Decree No. 379/2016 Coll. of the State Office for Nuclear Safety of the Czech Republic.

10. TRANSPORT, STORAGE

When empty, no special precautions are required for the transport and storage of the package. Once the shielding container with the radioactive material is added the package becomes a type B(U) consignment and the applicable transport regulations must be respected. No special precautions are required to assure heat dissipation when the package is being transported or in storage.

11. Cross-section of PO-14 package

max. weight 50 kg



12. Illustration of PO-14 transport container

