



UJP PRAHA

PO-12 PACKAGING

FOR THE TRANSPORT OF RADIOACTIVE MATERIAL

INSTRUCTIONS FOR USE AND MAINTENANCE

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PO-12 PACKAGING – Instructions for use and maintenance

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IDENTIFICATION**Serial No.:****Product:** PO-12 packaging**Intended use:** Type B(U) packaging for the transport of shielding containers with sources for gamma radiography**Manufacturer:** UJP PRAHA a.s., Nad Kamínkou 1345,
156 10 Prague-Zbraslav, Czech Republic**Contact:** Tel.: +420 227 180 300
E-mail: service@ujp.cz
Website: www.ujp.cz**INTENDED USE**

Model PO-12 Type B(U) packaging is intended for the transport and storage of Gammamat TI, TI-F and TI-FF shielding containers with radioactive sources for gamma radiography falling in the ISO category of special form radioactive materials.

The permitted radionuclide contents of the packaging, which are governed by the maximum approved activity for Gammamat TI-FF, are indicated in Table 1.

Table 1

Radionuclide	¹⁹² Ir	¹³⁷ Cs	¹⁶⁹ Yb	¹⁷⁰ Tm
Maximum activity [TBq]	7.5	0.75	3.7	3.7

Radioactive materials not specified above may be transported at activities up to the A₁ level specified in Table 1, Annex 3 to Czech Regulation No. 317/2002, or in Table I, Section IV, Safety Standards No. TS-R-1 (ST1, revision), Regulations for the Safe Transport of Radioactive Material, 2005 Edition, IAEA.

In addition, the dose equivalent rate on the outer packaging surface and at 1 m from the outer packaging surface must not exceed **2 mSv/h** and **0.1 mSv/h**, respectively.

PRODUCT DESCRIPTION

Model PO-12 Type B(U) packaging is intended for accommodating shielding containers – equipment for gamma radiography, which constitute its integral parts. The packaging is manufactured to drawings No. 1192-00 00 000. A schematic of the packaging and a picture of the photograph are appended hereto.

This Type B(U) packaging is a box-formed container with a hinged cover. Both the container and the cover are double-jacketed, the space between the jackets is filled with a wood material. The contact planes of the container and cover are polished and the assembly is made leaktight by using an O-ring between the contact planes.

When closed, the hinged cover is secured against opening with two clamps. The assembly can be handled by using two hinged handles on the sides and lugs on the cover.

The packaging enhances the safety of the shielding container against radioactivity leaks and protects the shielding container from mechanical damage and external heat. It will withstand drop from 9 metres and will resist 800°C external temperature for 30 minutes while maintaining its integrity.

The maximum external packaging size is 200 mm width, 470 mm length (380 mm with the hinges down), and approx. 245 mm height. The size of the sealed space size is 125 x 265 mm and height 180 mm.

The maximum weight of the packaging (with no shielding container inside) is approximately 18 kg.

The shielding container to be transported in the PO-12 packaging will be provided by the customer. It must possess the following properties:

- Size fitting into the internal space of the packaging
- Weight ≤ 20 kg
- Uranium as the shielding material
- Activity of the radioactive material complying with Table 1
- PDE on the shielding container ≤ 2 mSv/h.

Furthermore, the shielding container for gamma radiography must meet the requirements for the transport of radioactive sources for gamma radiography. The radiation source must be closed in the shielded position and secured against release.

The packaging is provided with a radioactivity symbol on the cover, and the body carries a metallic plate which is firmly fixed to it and displays the following basic information:

- The word RADIOACTIVE
- Radioactivity symbol
- Packaging name: PO-12
- Package type: B(U)
- Maximum weight: 38 kg
- Serial number
- Manufacturer

The letters, numbers and symbols are irremovably engraved in the plate metal.

The total weight of the package as sent is ≤ 38 kg.

Any consignment involving radioactivity must display the appropriate transport name and United Nations number preceded by the letters “UN”. This information must be well visible, eligible and durable.

Confinement system

The overall confinement system is a combination of the confinement system of the packaging & the confinement system of the radioactive material in the shielding.

The confinement system of the packaging comprises the following elements:

- Internal space well closed by means of clamps
- O-ring between the flanges of the packaging body and cover
- Double-jacketed design with thermal insulation between the jackets, exhibiting high mechanical and thermal resistance and guaranteeing that the integrity of the assembly will not be disturbed in any situation

The confinement system of the packaging comprises the following elements:

- The special form radioactive source is well fixed in the shielded holder
- The shielded position of the source in the closed container, secured against spontaneous release

When sent as a radioactive consignment, the package must meet the requirements of applicable IAEA regulations.

INSTRUCTIONS FOR USE

The package must be handled by persons who have been assigned to that task and have demonstrably been made familiar with radioactive materials handling rules and regulations.

The dose equivalent on the package surface must be measured prior to any handling of the package.

The procedure for radioactive material insertion into the shielded source holder / removal from it must be performed at a specialized workplace which is equipped with adequate technical means and has a licence for performing such operations.

Replacement of the shielded source in the device for gamma radiography must be performed by a competent person having the appropriate equipment and tools available:

Proceed as follows to assemble the system:

- Take over the system to be transported, i.e. the shielding container for gamma radiography including the shielded source holder accommodating the special form radioactive material, from the specialized workplace. Measure the PDE level to make sure that the permissible limits are not exceeded.
- Put the shielding container into the packaging and confine its free movement inside the packaging by means of rubber inserts.
- Close the packaging with the clamps.
- As a measure against tampering, fit the closing system with a padlock or lead seal.
- Fix the package against free movement inside the vehicle.

Now the package is ready for transport. Proceed in the reverse order to remove the gammagraphic equipment from the packaging.

TECHNICAL DATA

<i>Packaging</i>	Type B(U) for special form radioactive materials
Steel shielding material thickness:	3.7 mm
External size (width x length x height):	200 mm × 380 mm x 245 mm
Internal size (width x length x height):	125 mm × 265 mm x 180 mm
Weight:	≤18 kg
<i>Shielding container</i>	Gammamat TI, TI-F, TI-FF
Shielding material:	Uranium, tungsten, steel
Size:	Up to 125 mm × 265 mm x 180 mm
Weight:	≤20 kg
Total weight of the assembled package:	≤38 kg

MATERIALS

Shielding material:	Steel
Packaging material:	Class 17 stainless steel
Thermal insulation:	Hardwood sawdust/water glass mixture
Placard:	Brass ČSN 423213

MAINTENANCE

Please keep in mind the fact that the product is subject to normal wear during use. Comply with the following provisions to ensure safety and good and failure-free performance of your product:

- Keep the packaging constantly in good condition

- Inspect periodically the contact faces between the packaging body and cover as well as to the O-ring.
- Inspect periodically the hinges and clamps and as well as the screws.
- Send the packaging to the manufacturer for inspection and/or repair after any damage, failure, incident or accident, including fire to which the packaging has been exposed

The manufacturer shall take no responsibility whatsoever for any damage caused by a defective product whose structure/design has been subjected to any unauthorized intervention!

OPERATING CONDITIONS

In view of the design and materials used, no limitations are imposed on the normal transporting or working environment.

The package will retain its performance parameters within the temperature range from -40°C to +85°C.

Exposure to temperatures in excess of 100°C can bring about damage to the sealing elements.

When containing radioactivity, the assembly becomes Type B(U) package, and applicable transport regulations must be complied with.

No special provisions are needed to remove heat from the package with radioactivity inside. Thermal power of the ^{192}Ir , ^{137}Cs , ^{169}Yb a ^{170}Tm activities transported is very very low and meets the requirements for non-exclusive transport. However, keep the package, away from long-time solar radiation.

SAFETY, QUALITY

The PO-12 packaging has been subjected to all mandatory tests prescribed for a Type B(U) packaging. The tests were performed by SÚRAO¹ Packaging Testing Laboratory in Litoměřice, which assessed the results and issued a test report.

The radiation shielding capacity of the packaging before and after the testing referred to above has been assessed by UJO PRAHA a.s. and a measurement report has been issued.

The quality of manufacture and verification of compliance of the properties and parameters of each individual unit with the approved type are assured as stipulated by Czech State Office for Nuclear Safety Regulation No. 317/2002.

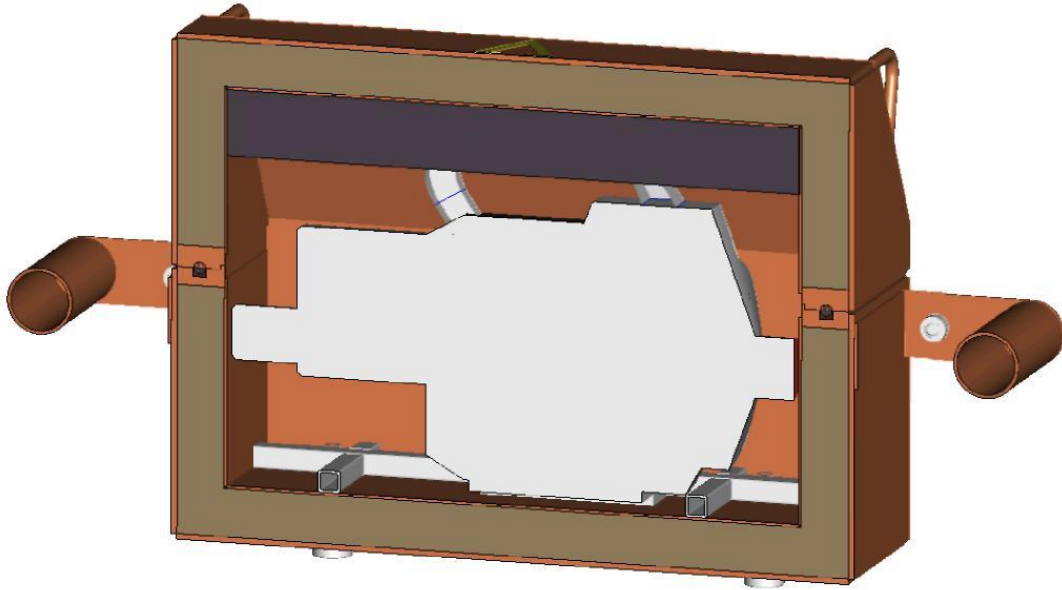
PACKAGING, SHIPMENT, STORAGE

No special provisions during transport or storage are required for the empty packaging. When containing radioactivity, the packaging becomes Type B(U) package and applicable transport regulations must be complied with. No special provisions during storage or transport are needed to remove heat from the package.

¹ Radioactive Waste Repository Authority (RAWRA)

Section through the PO-12 packaging

Weight ≤ 38 kg



Picture of the PO-12 packaging

