

Radiation Cartridge, ^{226}Ra , 4 kBq 1006797

Instruction sheet

09/15 SP/ALF



- 1 Radiation outlet window
- 2 Radiation cartridge
- 3 Metal base
- 4 Radiation-proof holder

1. Safety instructions

In Germany, working with radioactive substances is controlled by the Radiation Protection Regulations (Strahlenschutzverordnung, StrSchV). In other countries the regulations that apply locally must be observed.

According to the new version of the Radiological Protection Ordinance (StrlSchV) issued by the Federal German Government, the radiation cartridge 1006797 is a level-exempted item, which no longer requires design certification.

Note: Radioactive sources which, according to § 4 Section 1 under Part 2 of StrlSchV₁₉₈₉, did not require licensing, and design was still approved at 1st August 2001, can continue to be used without the necessity for licensing.

However, their use without licensing and without reporting is only allowed if they conform to the sum rule (i.e. the sum of the activities of the individual nuclides as percentages of their exemption levels must not exceed 100%).

The activity of the radiation cartridge ^{226}Ra (1006797) is approximately 4 kBq although it can be up to 40% higher or up to 10% lower. The exemption level of the nuclide ^{226}Ra is 10 kBq. It is possible to exceed the limit with just two ^{226}Ra

cartridges. Three ^{226}Ra cartridges will always exceed the authorised limit.

If several radioactive sources are used, the total activity of which exceeds the 100% allowed by the sum rule, the experiment must be reported first. Students may only take part in the experiments in the presence of the radiation protection officer and under that person's supervision.

Important!

Unauthorised use or interference with the radiation cartridge must be prevented.

For safe storage of the radiation source, it can be put into the radiation-proof holder or into the cloud chamber (1000921).

Despite the low level of activity of the radiation source, safety measures must be strictly applied.

- Ensure that the radiation cartridge cannot be accessed by unauthorised persons, and always store it carefully under lock and key.
- Before using the radiation cartridge, check that it is not damaged.
- Only take the cartridge out of its radiation-proof holder for the duration of the experiment.
- Only handle the cartridge by the outer end of the metal base.

- Never put the radiation cartridge into a body orifice or into the pocket of a garment.
- When carrying out experiments, only place on the laboratory bench those items that are needed for the particular experiment.

2. Description

The radiation cartridge is an exempted radiation source, and serves as a radioactive source for experiments with the spintharoscope (1000918) and the cloud chamber (1000921). It emits α , β and γ radiation.

The radium is provided in the form of radium sulphate and wrapped inside a roll of gold foil. It is located in a deep recess at the upper, flattened, end of the cartridge shaft. The shaft is screwed into an internally threaded metal base, which serves as a holder and seal. The shaft can be rotated about its axis in the metal base using a screwdriver, but cannot be taken out. A radiation-proof holder made of brass with a nickel-plated surface is provided for storing the cartridge.

Details of the radioactive material, its activity, and the source type are engraved on the base.

3. Technical data

Radioactive material:	0.1 μg ^{226}Ra
Radiation:	α , β , γ
Activity:	4 kBq approx.
Tolerance:	-10% / +40%
Radiation-proof holder:	brass with a nickel-plated surface
Weight:	400 g approx.

4. Accessories

Cloud chamber	1000921
Spintharoscope	1000918
Geiger-Müller counter tube	1001035
Digital counter (230 V, 50/60 Hz)	1001033
or	
Digital counter (115 V, 50/60 Hz)	1001032