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# Free and Hanseatic City of Hamburg

## Department of Justice and Consumer Protection

Department of Justice and Consumer Protection - Office for  
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**Office for Occupational Health and Safety**  
Radiation safety

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Occupational safety number: 040 – 4 28

10.12.2021

### Implementation of the Radiation Protection Act (StrlSchG)

Approval in accordance with § 12 (1) No. 3 StrlSchG on handling open radioactive materials  
Your application of 08.03.2021

### Approval HH-RA 46/21

#### **A** Scope of approval

A.1 The Department of Justice and Consumer Protection, Office for Occupational

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on the grounds of § 12 (1) No. 3 StrlSchG from 27.06.2017 (Federal Law Gazette I p. 1966) in its current version, in conjunction with the Radiation Protection Ordinance (StrlSchV) from 29.11.2018 (Federal Law Gazette I p. 2034) and in conjunction with the nuclear waste shipment ordinance from 29.11.2018 (Federal Law Gazette I p. 2034) the approval to use and store the following open radioactive materials.

A.1.1 Open radioactive materials:

Ser. no.	Radionuclide	Maximum total activity
A.1.1.1	H-3	15.0 GBq
A.1.1.2	C-14	1.0 GBq
A.1.1.3	P-32	1.5 MBq
A.1.1.4	P-33	1.0 GBq

#### **Advice on data processing:**

We attach great importance to data protection. Your personal data is processed in consideration of the applicable data protection regulations, in particular the General Data Protection Regulation (GDPR). Further advice on how your personal data is processed and your rights can be found on our website at <https://www.hamburg.de/bjv/datenschutzhinweise/>. We will be happy to send you this information in a printed form on request.

Ser. no.	Radionuclide	Maximum total activity
A.1.1.5	S-35	1.0 GBq
A.1.1.6	Ca-45	1.0 GBq
A.1.1.7	Mn-54	15.0 MBq
A.1.1.8	Fe-55	150.0 MBq

A.1.2 Open radioactive materials that are integrated in gas chromatographs or mass spectrometers / electron capture detectors (ECD):

Ser. no.	Numbe	Radionuclide	Maximum individual activity	Maximum total activity
A.1.2.1	10	Ni-63	560 MBq each integrated in gas chromatographs	5.60 GBq
A.1.2.2	2	Ni-63	560 MBq each integrated in gas chromatographs / ECD	1.12 GBq

A.2 Place of use:

A.2.1 Research vessel (RV) Meteor isotope laboratory in the isotope container on the upper deck.

A.2.2 Mass spectrometer/ECDs carried by scientific working groups may be set up in laboratories outside the isotope container. The laboratory shall be designated in the trip application.

Purpose of use:

A.3 Biological and chemical analyses of water, suspended particles, sediments and plankton samples.

The application documents constitute an integral part of this approval.

A.4 The approval is limited until **11.12.2026** and is non-transferable. The application for

A.5 continued handling should be made four weeks before expiry of the time limit.

**B. Radiation protection commissioner**

B.1 The radiation protection commissioner within the meaning of § 69 StrlSchG is the approval holder represented by the Chancellor of the University of Hamburg.

B.2 The radiation safety authorized representative is Mr. Jochen Rath up to 31.12.2021 and Mr. Florian Steinke as of 01.01.2022.

B.3 The radiation safety officers within the meaning of § 70 StrlSchG are appointed for each research expedition by the radiation safety authorized representative. The radiation safety officers are members of the respective scientific working groups.

**C. The approval is subject to the following conditions:**

C.1 General

C.1.1 The currently valid version of the approval notice with the corresponding Annexes and the radiation safety instructions have to be submitted to the head of operations, the captain and the respective delegated radiation safety officer against signature with each research trip. Any amendment must be reported in accordance with § 70 Para. 4 StrlSchV.

C.1.2 Radiation safety instructions in accordance with §45 StrlSchV for the handling of radioactive materials must be issued and submitted to the supervisory body named in section D.2 within three months. Amendments to the radiation safety instructions must be immediately notified to the supervisory body named in section D.2.

C.1.3 Two radiation safety officers are to be appointed for the duration of each research expedition. Any amendment must be reported in accordance with § 70 Para. 4 StrlSchV.

- C.1.4 The radiation safety authorized representative informs the competent supervisory body 4 weeks before the start of the trip / submits:
1. Trip number, trip period, trip area and name of the expedition leader.
  2. Appointment of the two radiation safety officers.
  3. Certificate of competence of the radiation safety officers.
  4. Nature and activity of the radioactive material carried on board by the scientific working group.
- C.1.5 A record must be kept of “otherwise employed persons” who enter and leave such areas, including their instruction about the necessary knowledge of the possible radiation risk and the protective measures to be employed (§ 13 (1) No. 4 StrlSchG). The records must be kept for inspection by the authorities and presented to these on request.
- C.2 Handover of radioactive materials
- C.2.1 All radioactive materials brought on board by a scientific working group (e.g. unused labelled chemicals, ECD detectors, radioactive waste) must be removed from the isotope container, or possibly the laboratories (regarding the mass spectrometers / ECD) and taken off board by the working group at the end of the voyage. Radioactive materials that are no longer suitable for use or no longer needed within the territory of the Federal Republic of Germany must be surrendered. At the end of the research expedition and return of the radioactive materials taken on board, the disposal methods can be employed via the institutes of origin in accordance with federal state legislation.
- C.2.2 If radioactive materials are no longer suitable for use or no longer needed, the following disposal methods can be employed:
1. Handover to the federal state collecting facility (§ 7 Nuclear Waste Shipment Ordinance - AtEV)
  2. Handover to a disposal company, if an agreement has been reached with the competent authority for the recipient of the radioactive materials (§ 6 (1) AtEV)
  3. Handover to the manufacturer or a delivery company.
- C.2.3 Radioactive materials may only be handed over to the firm of Eckert & Ziegler Nuclitec GmbH (EZH) without consulting the authorities named in the letterhead for which a general agreement regulation has been issued by the State of Lower Saxony in accordance with § 6 (1) AtEV.
- C.2.4 If an individual agreement regulation is needed to handover waste materials, a corresponding application in accordance with § 6 (1) AtEV must be made for each individual batch via the authorities named in the letterhead to the Lower Saxony Ministry of the Environment, Energy and Climate Protection
- C.2.5 The radiation safety officer shall certify the contamination-free status of the isotope container at the end of the research expedition and confirm the return of the radioactive materials taken on board and if necessary the disposal of all radioactive waste. (Handover certificate) This confirmation must be sent unprompted to the competent supervisory body by way of the radiation safety authorized representative.
- C.3 Structural radiation safety
- C.3.1 Floors, walls, ceilings, work benches and furniture (cupboards, chairs) must have a smooth surface that is impervious to liquids and has no joints so that they can be easily decontaminated. Work benches must be designed as troughs or the work carried out in troughs.
- C.3.2 All floor drains must be sealed. All sinks that are not connected to a reception facility must be marked so that they can only be used for inactive work.
- C.3.3 The rooms must have communication equipment.
- C.3.4 Structural radiation protection must be provided for the isotope containers in such a way that the limit value of 1 mSv/a for individual members of the population is observed at the outer limits of the radiation protection areas. Suitable structural shields may have to be installed in the rooms to comply with the limit values.

- C.3.5 The exhaust air volume flow rate must be at least  $25\text{m}^3 / \text{m}^2$  of useful laboratory space for the period during which open radioactive materials are handled. Moreover, it has to be ensured that there can be no reversal of the direction of flow. Operation with recirculated air is not allowed.  
The exhaust air must be able to escape freely and other ventilation or exhaust air systems may not be contaminated.  
The functionality of the exhaust air system must be monitored by means of optical displays and the negative pressure by means of suitable displays. If any retrofitting or upgrading of the exhaust air system is necessary, this must be completed by 30.06.2022.  
The ventilation system equipment must be checked and serviced annually by an expert, e.g. specialised company or specialised department. The results of all measurements must be documented in a logbook and records must be kept of the maintenance. These must be presented to the authorities on request.
- C.3.6 The filters in the exhaust hoods must be changed on a regular basis. The filters must be checked for contamination before disposal.
- C.3.7 Rooms, systems, devices, protective containers, storage containers (e.g. fridges and safes) and covers containing radioactive materials must be marked in accordance with § 91 StrlSchV.
- C.3.8 The radionuclide laboratory must be secured against unauthorised access.
- C.3.9 The pertinent guidelines and DIN standards apply when handling radioactive materials.
- C.3.10 The radionuclide laboratory must be designed in accordance with DIN 25425.
- C.3.11 The storage facilities for the radioactive materials must be designed in accordance with the requirements of DIN 25422.
- C.4 Handling
- C.4.1 Radioactive materials may only be handled on board in isotope containers, with the exception of mass spectrometers/ECD (Section A.2.2).
- C.4.2 Records must be kept on the purchase and surrender of radioactive materials that provides information on the current activity inventory at all times.
- C.4.3 Radioactive materials, residual substances and waste must be stored in isotope containers. Radioactive materials must not be stored together with flammable or other hazardous materials.
- C.4.4 Radioactive materials must be kept under lock and key when not in use.
- C.4.5 The radioactive materials (fresh activities and wastes) must be protected against exposure to fire, unauthorised use, unauthorised influences, theft and any other kinds of loss.
- C.4.6 H-3 and C-14 preparations with a max. activity of 5 kBq each may be stored on board permanently for calibration of the on-board scintillation counter ("H-3 and C-14 standards").
- C.4.7 The technical measurement calibration of the scintillation counter with H-3 and C-14 standards must only be carried out in the presence of a scientific radiation safety officer. The mechanical function of the scintillation counter must only be tested by crew members in the absence of the radiation safety officer using non-radioactive samples ("standard background").
- C.4.8 Work with volatile open radioactive materials may only be carried out under an exhaust hood. Specially marked protective clothing must be worn in the radionuclide laboratory. This must be taken off and stored separate from personal clothing when leaving the laboratory.
- C.4.9
- C.4.10 Suitable measuring equipment (surface detectors) must be provided to identify any contamination in accordance with § 57 StrlSchV. The devices must be kept ready for use at all times and checked regularly for their proper working order and correct display.

- C.4.11 Persons and objects (items of clothing, tools, waste containers) that have may have been contaminated by radioactive materials may only leave the radiation protection areas after a contamination check has been carried out. This measurement has to be performed on skin and clothing for persons. The limit values of § 57 (2) StrISchV must be observed.
- C.4.12 Contamination checks must be carried out every working day of the workplaces when handling open radioactive materials. The results of these measurements must be documented. Checks must be carried out immediately if contamination is suspected. If the values of §57 StrISchV are exceeded, appropriate decontamination measures must be initiated. The authorities must be informed without delay. If decontamination is not possible, suitable actions have to be taken to prevent a spread and possible intake of the contamination.
- C.4.13 In case of research expeditions lasting longer than 4 months, routine contamination checks must be carried out at regular intervals, though at least every three months, of existing fixtures such as door handles, cupboards, floors, transport routes and telephones according to a fixed measurement plan. The results of these measurements must be documented.
- C.4.14 Repairs or destructive work on the ECD may only be carried out by the manufacturing company.
- C.4.15 When not in use, every ECD must be stored such that it is safe from fire and theft and taking into account the radiation safety requirements.
- C.4.16 Gas chromatographs / mass spectrometers with ECD must be operated according to the conditions stipulated by the manufacturer / supplier (e.g. maximum permissible operating temperature).
- C.4.17 If any damage is discovered to one of the radiation sources or its cladding (e.g. after overheating due to a failure of the thermal safety switch), the supervisory authority and the manufacturer/supplier must be informed.
- C.4.18 The exhaust gases produced during the operation of the ECD should be drawn off via a hose or an extractor fan directly into the open air or to the room air that is drawn off directly to the open air. The exhaust air must be able to escape freely and other ventilation or exhaust air systems may not be contaminated.

## **D** Notes

- D.1 Any change to the person who performs the tasks in within the meaning of § 69 (2) StrISchG must be reported to the supervisory authority named in D.2 without delay.  
A change to the approval holder requires an approval.
- D.2 The competent supervisory body is the  
Department of Justice and Consumer  
Protection, Office for Occupational Health  
and Safety, V3-As 211 Billstraße 80  
20539 Hamburg.
- D.3 Reference is made to the possibility of issuing subsequent conditions and of withdrawing or revoking them (§179 (1) No. 1 StrISchG).
- D.4 This approval does not replace either the notifications, approvals, authorizations and permissions required pursuant to other public-law regulations, nor an approval pursuant to § 31 StrISchV.

## **E** Provision for sufficient financial cover:

Proof of sufficient financial cover for the fulfilment of statutory compensation obligations is not required in accordance with § 10 StrISchV.

**F**     **Reasoning**

This approval is based on your application of 08.03.2021. The necessary explanations and documents have been enclosed with the application and this is based on the prior approval HH-RA 40/16, so that the documents we required were already in our possession. The legal basis for this approval is § 12 (1) No. 3 of StrlSchG. The examination of the application documents showed that the approval requirements set forth in § 13 StrlSchG have been fulfilled. The conditions listed in the approval notice have been imposed in accordance with § 179 (1) No. 1 StrlSchG to achieve the purposes named in § 1 StrlSchG. The conditions are based of legal regulations, guidelines and requirements according to the state of the art in science and technology. The approval you applied for was therefore granted subject to the aforementioned conditions

**G**     **Fees**

This approval is subject to a fee. The notification of fees shall be sent separately.

**H**     **Your rights**

An objection to this decision may be filed in writing or in writing at the office named on the letterhead within one month of notification.

Heiko Bittner

(L.S.)

No signature is needed for the legal validity of this administrative act. The display of the name satisfies the legal requirements in accordance with § 37 (3) (1) of the Hamburg Administrative Procedures Act.