



Exemption guidance

Radioactivity in Museums

**September 2011
Version 1**

**Radioactive Substances Act 1993
The Environmental Permitting (England and Wales)
(Amendment) Regulations 2011**

1 General questions

What regulations apply to permitting radioactive substances in the UK?

The Environmental Permitting (England and Wales) (Amendment) Regulations 2011
Radioactive Substances Act 1993
The Radioactive Substances Exemption (Scotland) Order 2011
The Radioactive Substances Act 1993 Amendment (Scotland) Regulations 2011
The Radioactive Substances Exemption (Northern Ireland) Order 2011
The Radioactive Substances Act 1993 (Amendment) Regulations (Northern Ireland) 2011

What other guidance is available?

The UK Government and Devolved Administrations have issued guidance for environmental regulators and users of radioactive substances as follows:
Guidance on the Exemptions Framework under the Radioactive Substances Act 1993 and Schedule 23 to the Environmental Permitting (England and Wales) Regulations 2011.

This document is one of a series of guidance documents issued by the environmental regulators to assist users in complying with the above regulations. They are available on the Environment Agency and SEPA web sites. The guidance is intended to apply to all parts of the UK. Because the regulations are different though, reference is made here to the tables in the Government Guidance to keep the text simple.

1 General questions

What do “out of scope” and “exempt” mean?

Out of scope of regulation equates to ‘not radioactive’ for the purposes of the legislation. Radioactive substances which are ‘out of scope’ are not subject to any regulatory requirement under EPR or RSA93 relating to radioactive substances or radioactive waste.

Exempt means that no radioactive substances permit is required under EPR or RSA93 to keep or use such radioactive sources, or accumulate and dispose of such radioactive waste, provided that the conditions specified are met.

Items which are out of scope or exempt may be subject to other regulations, including those covering health and safety and transport.

What is meant by the terms “luminised”, “sealed source” and “open source”?

A luminised article is an object which has a luminescent substance in the form of a film or a paint and which is radioactive solely because it contains Pm-147 or H-3, and is not a sealed source.

A sealed source is a radioactive source where the structure is designed to prevent, under normal use, any dispersion of radioactive substances. The strict definition in the regulations excludes electrodeposited or tritium foil sources but this is of little relevance to museums. The regulators may consider clocks, compasses, aircraft instruments, etc to be sealed sources if luminous paint is protected by a sufficiently

robust covering, eg a sheet of glass or acrylic – further advice should be sought if necessary.

An open source is a radioactive source which is not a sealed source and is intended to be or can be dispersed. These are sometimes called unsealed sources. Uncovered luminous paint would fall into this category.

What sources are out of scope of regulation?

NORM in the form of geological specimen held in museums is out of scope of regulation because they are not within the definition of radioactive material as they are neither a NORM industrial activity nor processed for radioactive, fissile or fertile properties. Health and safety considerations may still be relevant.

Luminous clocks, compasses, etc using tritium or radium have been processed for their radioactive properties and so are only out of scope if the concentration of radioactivity is not more than 100 Bq/g of tritium or 0.01 Bq/g of radium. (Table 2.3 of Government Guidance). Most luminous items will be above these values and so within the scope of the regulations.

What sources are exempt in museums?

Many of the radioactive sources commonly used in museums are exempt from permitting for keeping or use. A range of items are exempt; some of those commonly found in museums are described below:

Sources described below in Table 1 (adapted from Table 3.2 of Government Guidance), provided no more than the quantities specified for each row is held in the form of radioactive material and waste.

Table 1

<i>Radioactive material or accumulated radioactive waste type*</i>	<i>Maximum quantity of radionuclides for each item of material or waste</i>	<i>Maximum quantity of radionuclides: - on any premises in items of the material or waste which satisfy the limit in column 2; or -in mobile radioactive apparatus held by a person</i>
Radium luminised sealed sources	4×10^6 Bq	2×10^8 Bq
A luminised article**	8×10^7 Bq Pm-147 or 4×10^9 Bq H-3	4×10^{10} Bq Pm-147 or 2×10^{11} Bq H-3
A substance or article which is or contains magnesium alloy or thoriated tungsten in which the thorium concentration does not exceed 4% by mass	No limit	No limit

* Other items can be exempt – only those commonly found in museums are listed here (eg for smoke detectors and GTLDs, see other guidance where relevant).

** Items luminised with radium are not included in the definition of luminised articles and so are either sealed sources or open sources.

Note that the above limits in column 3 apply to the total activity of items held as radioactive material and radioactive waste. Items in separate rows of the Table can be held at the same time.

For radium luminised articles in the form of sealed sources use row 1 of the Table; they are exempt up to 4 MBq individually and total activity on the premises of 200 MBq. Open source radium luminised items are exempt up to a maximum on the premises of 10 kBq (or alternatively a maximum concentration of 10 Bq/g), as specified in Table 3.1 of Government Guidance. Limits for other radionuclides are also obtained from Table 3.1 of Government Guidance.

Who is this guidance for?

This guidance is intended to cover a range of common uses of radioactivity in museums but specific guidance is given elsewhere if museums hold other types of items. Items not usually found in museums may be exempt even if not mentioned here.

This guidance does not apply exclusively to museums; the exemptions described here are available to all organisations.

Does it apply in England, Wales, Scotland and Northern Ireland?

Yes. The requirements are the same across the UK.

Who is responsible for deciding if my sources are out of scope or exempt?

The person or organisation responsible for the sources, eg company or museum. Responsibility for the use of exemptions and compliance with the conditions rests with the person or organisation responsible for the sources. If the environment agencies become aware of failure to hold a permit or to comply with exemption conditions, action will be taken to obtain compliance.

Do I need to tell anyone I believe my sources are out of scope or exempt?

No.

Where can I get more advice?

From an appropriate adviser, eg a suitable Radioactive Waste Adviser or Radiation Protection Adviser. Or from the environment agency which regulates your premises.

2 Keeping radioactive sources in Museums and geological specimen collections

Which sources are exempt?

See guidance in section 1.

How many sources may I keep and still be exempt?

The maximum allowed by the limits on exempt holdings described in section 1.

If another person, such as a visiting test engineer, brings additional small sources onto site and retains control of them, that does not affect the exempt status of sources you hold.

What premises are exempt from the need for a permit?

All types of premises may be exempt providing that the radioactivity in any given source and the total radioactivity in sealed sources and total activity or activity concentrations in open sources held by one person are less than the limits specified above.

The regulations do not apply to homes and no permit is needed for them.

Can I use the sources on more than one premises?

Yes provided that you meet the limits.

What do I need to do if I use more or stop using sources?

If you need more than the limits then, before increasing your holding, you must apply for and receive a permit. You do not need to tell anyone that you have stopped using radioactive sources, but you must dispose of them properly (see below).

I already have a permit for some sources, can I be exempt for others?

There is no interaction between the exemption and a permit for sources that are not covered by the exemption. For example a permit for sealed sources with activity greater than 4 MBq does not affect the ability to make use of the exemption order for sources smaller than this.

It is legal to have small sealed sources listed on a permit but they still count towards the 200 MBq limit for exemption. Above a total of 200 MBq of small sealed sources, they all need permitting. Some current permits include small sources which can be exempt and these continue in operation until varied. In future only in exceptional cases will the regulators issue permits for sources which can be exempt.

A permit for open sources other than luminised items means that all open sources need to be permitted (see Table 3.2 of the Government Guidance).

3 Solid waste sources

How much waste can I create?

You can hold up to the quantity specified in Column 3 of Table 1, in the form of fixed sources, mobile sources and waste, in total. Each row of the table is considered separately from the other rows. For example radium sealed sources of up to 200 MBq in total.

For open sources you can hold radium up to 10 kBq (or alternatively a maximum concentration of 10 Bq/g), in the form of fixed sources, mobile sources and waste, in total. Limits for other radionuclides are also obtained from Table 3.1 of Government Guidance.

Can I store waste?

Yes but solid waste should be disposed of as soon as practicable.

How should I dispose of waste?

Solid waste up to the quantities specified in Table 2 (derived from Table 3.3 of Government Guidance) can be disposed of to a person who disposes of substantial quantities of non-radioactive waste by burial in landfill, incineration or recovery (eg with ordinary refuse) as described in the Government Guidance.

Table 2

<i>Radioactive waste</i>	<i>Maximum concentration of radionuclides</i>	<i>Maximum quantity of waste to be disposed of in the period stated</i>
Solid radioactive waste, with no single item > 4 x 10 ⁴ Bq	4 x 10 ⁵ Bq for the sum of all radionuclides per 0.1m ³	2 x 10 ⁸ Bq/year
Solid radioactive waste containing tritium and C-14 only, with no single item > 4 x 10 ⁵ Bq	4 x 10 ⁶ Bq of tritium and C-14 per 0.1m ³	2 x 10 ⁹ Bq/year
Individual sealed sources	2 x 10 ⁵ Bq for the sum of all radionuclides per 0.1m ³	1 x 10 ⁷ Bq/year
Individual sealed sources which are solely radioactive waste because they contain tritium	2 x 10 ¹⁰ Bq of tritium per 0.1m ³	1 x 10 ¹³ Bq/year
Luminised articles with no single item containing > 8 x 10 ⁷ Bq of Pm-147 or > 4 x 10 ⁹ Bq of tritium	8 x 10 ⁷ Bq per 0.1m ³ of Pm-147 or 4 x 10 ⁹ Bq per 0.1m ³ for tritium	2 x 10 ⁹ Bq/year of Pm-147 or 1 x 10 ¹¹ Bq/year of tritium

Alternatively all types of exempt waste sources may be disposed of as exempt items to a person who holds a permit to receive them. This could be a supplier of such items or a specialist radioactive waste contractor.

So for example, 50 sealed sources per year of 200kBq each can be disposed of in normal refuse at a concentration of 200 kBq per 0.1m³.

Should I handle the waste small sources the same as my other waste?

Waste in the form of small sources is not itself subject to other waste legislation. But if it they are disposed of mixed in other waste as VLLW, then all of the waste is treated as subject to conventional waste legislation.

I receive waste sources from other people, are there special requirements on me?

Organisations can send you their exempt waste sources but you will need a permit to receive and deal with them unless you are a person who disposes of substantial quantities of non-radioactive waste by burial in landfill, incineration or recovery (eg with ordinary refuse) as described in the Government Guidance.

4 Conditions on exemption

Are there any conditions that I need to comply with?

You will need to comply with all the conditions of the exemption, which include the need to:

- Prevent accidental removal, loss or theft of sources,
- Keep adequate records,
- Label sources as radioactive where practicable,
- Remove radioactive labels before source disposal with ordinary refuse, where practicable,
- Not modify or mutilate the sources,
- Allow the environmental regulator access to records / premises,
- Dispose of the sources as soon as practicable and within 26 weeks of them becoming waste.

More information is given in the Government Guidance.

What do I do if I have an incident or lose an exempt source?

You must notify the regulator as soon as practicable if:

- the amount of exempt radioactive substances lost or stolen (or suspected to have been lost or stolen) in the incident exceeds 10 times the value in column 2 of Table 3.1 in the government guidance; or
- the total amount of such substances lost or stolen (or suspected to have been lost or stolen) in the incident and in all other such incidents in the preceding 12 months exceeds that value.

The notification must include the details of any other losses or thefts (or suspected losses or thefts) in the preceding 12 months

I use exempt sources at different premises, are there any special things I need to do?

You should retain control over the sources, unless agreed otherwise with the occupier of the premises. You may use the occupier's storage facilities at the premises but it must be clear who is responsible for the sources at all times.

Exemption example – use and disposal of uranium and thorium on a single premises, etc

Circumstances	Permitted/Exempt	Explanation
Keeping or Use:		
Rocks forming collection of geological specimens	Out of scope	Not radioactive material
45 radium compasses, sealed sources, 4 MBq each	Exempt	Individual sources within limit (4 MBq). Total activities within limit (200 MBq)(including accumulation as below). Table 3.2 GG refers
3 radium compasses, open sources, 1 MBq each	Permitted	Total activity above 10 kBq. Table 3.1 GG refers
3 Tritium luminised watches, unknown activity	Permitted	Need to characterise
1 GTLD luminous watch, 1GBq	Exempt	Less than 20 GBq. Table 3.2 GG refers
Aircraft engine containing thorium alloy (4%)	Exempt	Unlimited quantity. Table 3.2 GG refers
Waste accumulated:		
Rocks forming collection of geological specimens	Out of scope	Not radioactive waste
5 radium compasses, sealed sources, 4 MBq each	Exempt	Individual sources within limit (4 MBq). Total activities within limit (200 MBq)(including keeping as above). Table 3.2 GG refers
1 radium compass, open source, 1 MBq each	Permitted	Total activity above 10 kBq. Table 3.1 GG refers
1 Tritium luminised watch, unknown activity	Permitted	Need to characterise
1 GTLD luminous watch, 1GBq	Exempt	Less than 20 GBq. Table 3.2 GG refers
Aircraft engine containing thorium alloy (4%)	Exempt	Unlimited quantity. Table 3.2 GG refers
Disposals (per year):		
Rocks forming collection of geological specimens	Out of scope	Not radioactive waste
5 radium compasses, sealed sources, 4 MBq each	Exempt	Disposal to a permitted person (above 200 kBq) Table 3.3 GG refers
1 radium compass, open source, 1 MBq each	Permitted	Single item above 40 kBq. Table 3.3 GG refers
1 Tritium luminised watch, unknown activity	Permitted	Need to characterise
1 GTLD luminous watch in waste bin, 1GBq	Exempt	Less than 20 GBq in 0.1 cubic metres. Table 3.3 GG refers
Aircraft engine containing thorium alloy (4%)	Exempt	Unlimited quantity. Table 3.3 GG refers