

Radiation Safety Act 1999

**RADIATION SAFETY STANDARD**

NM011:2010

*Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out moisture/density measurements*

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## Preface

Under section 17 of the *Radiation Safety Act 1999*, a possession licensee who, under a licence, possesses a sealed source apparatus to carry out a radiation practice, must ensure that the apparatus is not used for this purpose, unless the sealed source apparatus complies with the relevant standard.

This radiation safety standard NM011:2010 *Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out moisture/density measurements* is made under section 16 of the *Radiation Safety Act 1999*.

This standard sets the minimum safety criteria for sealed source apparatus used to carry out moisture/density measurements. Compliance with this standard will assist in ensuring that public and occupational exposure to radiation is minimised.

Queensland Health has prepared this standard based on information derived from reputable sources such as the National Health and Medical Research Council.

The standard will be reviewed periodically to re-evaluate its currency and its appropriateness as the standard for sealed source apparatus used for moisture/density measurements.

By ensuring compliance with this radiation safety standard, the standard of sealed source apparatus used for moisture/density measurements in Queensland will be significantly enhanced.

I, Paul Lucas, Deputy Premier and Minister for Health, pursuant to section 16(1) of the *Radiation Safety Act 1999*, make the radiation safety standard NM011:2010 *Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out moisture/density measurements*, for the purposes of the Act.

**SIGNED**

**PAUL LUCAS MP**  
**Deputy Premier**  
**Minister for Health**

19 / 08 / 2010

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# Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out moisture/density measurements

## Section 1 – General

### 1.1 Scope

This radiation safety standard sets out the minimum requirements for radioactive substances incorporated in sealed source apparatus which are used to carry out moisture/density measurements.

### 1.2 Expiry

This radiation safety standard expires on 1 September 2020.

### 1.3 Documents

Documents which may provide some useful information are listed in Appendix A.

### 1.4 Definitions

In this standard –

“**ISO**” means the International Organization for Standardization.

“**moisture/density measurements**” means in-situ measurements of soils, sands, asphalts and other similar substances using portable devices.

“**radiation dose rate**” means the amount of energy from radiation absorbed by the person or thing exposed to the radiation during a particular time.

## Section 2 – Standard – Moisture/density gauges

Test	Compliance Test	Criteria for Passing the Test
<b>Radioactive substance details</b>		
1	Radioactive substance certification	<p>The sealing of the radioactive substance must:</p> <p>(a) satisfy the requirements of ISO2919-1980(E) <i>Sealed Radioactive Sources – Classification</i><sup>1</sup>, or equivalent; and</p> <p>(b) satisfy the ‘special form’ design and test requirements specified in the <i>Code of Practice for the Safe Transport of Radioactive Substances 1990</i><sup>2</sup> issued under the <i>Environmental Protection (Nuclear Codes) Act 1978</i> (Cwlth), or equivalent.</p>
2	Radiation source fixed in sealed source apparatus	<p>The radioactive substances must be permanently mounted in the sealed source apparatus and be capable of extension and retraction for normal use.</p> <p>The radioactive substance must not be capable of being physically separated from the sealed source apparatus under operational and transport conditions.</p>
3	Radioactive substance assembly	The radioactive substance assembly must be capable of being positively located in the correct operating positions.
<b>Radiation dose rate</b>		
4	Radiation dose rate	<p>When the radioactive substances are locked in the “beam off” position, the radiation dose rates must not exceed:</p> <p>(a) 500<math>\mu</math>Sv in one hour at any point 5 centimetres from the external surface of the sealed source apparatus; and</p> <p>(b) 10<math>\mu</math>Sv in one hour at any point 1 metre from the external surface of the sealed source apparatus.</p>

<sup>1</sup> The standard is available from Standards Australia, 232 St Pauls Terrace, Fortitude Valley, Brisbane.

<sup>2</sup> The document is available from Australian Government Publishing Service, City Plaza, corner Adelaide and George Streets, Brisbane.

Test	Compliance Test	Criteria for Passing the Test
<b>Warning signs</b>		
5	Radiation warning signs	<p>The external surface of the sealed source apparatus must be durably and legibly marked with a fire resistant label, or labels, incorporating:</p> <ul style="list-style-type: none"> <li>• the radiation warning sign (trefoil)</li> <li>• the word "caution"</li> <li>• words to the general form of "radioactive material".</li> </ul> <p>The trefoil and markings must be black on a yellow background.</p>
6	Labels	<p>The external surface of the sealed source apparatus must be durably and legibly marked with a fire resistant label, or labels, incorporating the following information:</p> <ul style="list-style-type: none"> <li>• name and address of the supplier or manufacturer</li> <li>• identification number of the container</li> <li>• the radioactive substance type, its activity and the date of measurement of that activity</li> <li>• maximum radiation dose rate at 1 metre from the surface of the sealed source apparatus (with shutters closed) and the date the measurement was made</li> <li>• name, address and telephone number of the owner.</li> </ul>
<b>Shutter mechanism</b>		
7	Shutter lock	<p>The radioactive substances must be able to be locked in the "beam off" position. This locking device must be an integral part of the sealed source apparatus.</p>

## Appendix A

### Documents

Australian Radiation Protection and Nuclear Safety Agency. Code of Practice and Safety Guide for Portable Density/Moisture Gauges Containing Radioactive Sources (2004)