



**Queensland
Government**

Radiation Safety Act 1999

RADIATION SAFETY STANDARD

NM009:2020

***Standard for sealed radioactive substances incorporated in sealed source apparatus
used to carry out industrial gauging***

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 NM009:2020 *Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out industrial gauging* 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 industrial gauging. 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 industrial gauging.

By ensuring compliance with this radiation safety standard, the standard of sealed source apparatus used for industrial gauging in Queensland will be significantly enhanced.

I, Steven Miles, Deputy Premier and Minister for Health and Minister for Ambulance Services, pursuant to section 16(1) of the *Radiation Safety Act 1999*, make the radiation safety standard NM009:2020 *Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out industrial gauging*, for the purposes of the Act, and repeal the previous standard NM009:2010 *Standard for sealed radioactive substances incorporated in a sealed source apparatus used to carry out industrial gauging*.

STEVEN MILES MP
Deputy Premier and
Minister for Health and
Minister for Ambulance Services

25 May 2020

Contents

Section 1 – General

- 1.1 Scope
- 1.2 Expiry
- 1.3 Documents
- 1.4 Definitions

Section 2 – Standard - Industrial gauges

Appendix

- A Documents

Standard for sealed radioactive substances incorporated in sealed source apparatus used to carry out industrial gauging

Section 1 – General

1.1 Scope

This radiation safety standard sets out the minimum requirements for sealed radioactive substances in sealed source apparatus which is used to carry out industrial gauging.

1.2 Expiry

This radiation safety standard expires on 1 September 2021.

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.

“**industrial gauging**” means where a radioactive substance incorporated in a sealed source apparatus is used for the measurement of thickness, level and density gauging or for control purposes. The sealed source apparatus is generally installed in a fixed position.

“**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 – Industrial gauges

Test	Compliance Test	Criteria for Passing the Test
Radioactive substance details		
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>¹, 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>² issued under the <i>Environmental Protection (Nuclear Codes) Act 1978</i> (Cwlth), or equivalent.</p>
Radiation dose rate		
2	Radiation dose rate	<p>When the sealed source apparatus is locked in the "beam off" position, the radiation dose rates must not exceed:</p> <p>(a) 300μSv in one hour at any accessible point 5 centimetres from the external surface of the sealed source apparatus; and</p> <p>(b) 10μSv in one hour at any accessible point 1 metre from the external surface of the sealed source apparatus.</p>
Warning signs		
3	Labelling of indicators	<p>The "beam on" and "beam off" positions must be clearly and unambiguously indicated.</p> <p>The indicator must be protected against mechanical damage.</p> <p>If a mechanical indicator is used, the "beam on" and "beam off" markings must not be readily obscured by dust, precipitation, corrosion or paint.</p> <p>If an electrical indicator is used, it must include separate lamps or signals to indicate the "beam on" and "beam off" conditions and must be fail safe.</p>

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

² 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
4	Radiation warning sign	<p>The sealed source apparatus must be durably and legibly marked with a metal label incorporating the radiation warning sign (trefoil), the word “caution” and words to the general form of “radiation source”.</p> <p>The symbol and lettering must be engraved or embossed and must be black on a yellow background.</p>
5	Labels	<p>The sealed source apparatus must be durably and legibly marked with a metal label incorporating the following information:</p> <ul style="list-style-type: none"> • name, model and serial number of the sealed source apparatus manufacturer • name and address of the supplier or manufacturer • name of the radioactive substance • activity of the radioactive substance and the date that this activity was measured • maximum radiation dose rate at 1 metre from the surface of the sealed source apparatus (with shutters closed) and the date this measurement was made. <p>The lettering must be black (or dark).</p>
Shutter mechanism		
6	Shutter or source control mechanism	<p>The sealed source apparatus must be provided with a radiation source control mechanism or shutter.</p> <p>This shutter or source control mechanism must be fail safe.</p>
7	Shutter lock	<p>The shutter must be provided with an effective lock so that it can be secured in the “beam off” position.</p> <p>The shutter must not be able to be locked in the “beam on” position.</p>
Handling		
8	Handling features	<p>The sealed source apparatus must:</p> <ul style="list-style-type: none"> (a) be provided with means for manual handling if it has a gross mass between 10 kilograms and 50 kilograms; and (b) have features to enable safe handling by mechanical means if it has a gross mass over 50 kilograms.

Appendix A

Documents

Australian Radiation Protection and Nuclear Safety Agency. Code of Practice and Safety Guide for Safe Use of Fixed Radiation Gauges (2007)