BS 5650 : 1978
ISO 3999-1977
UDC 620.179.152.3 : 621.039.84

Specification for

Apparatus for gamma radiography

Spécification des appareils de radiographie

Spezifikation für Einrichtungen für Gammaradiographie

British Standards Institution

Gr 6

Contents

National foreword

This British Standard has been prepared under the direction of the Nuclear Engineering Standards Committee. It is identical with ISO 3999 'Apparatus for gamma radiography — Specification', and supersedes BS 4097, which is now withdrawn. The United Kingdom has taken part in the preparation of ISO 3999 by ISO Technical Committee TC 85, Nuclear energy, and the British Standards Institution was responsible for the Working Group that developed the draft standard.

The reader of the standard should bear in mind the duties placed upon designers, manufacturers and suppliers in the United Kingdom by Section 6 of the Health and Safety at Work, etc. Act 1974.

The actual use of apparatus is outside the scope of the standard and users in the United Kingdom should therefore refer to current national regulations for the use of ionizing radiation.

Terminology and conventions. The text of the international standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is therefore drawn to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words 'International Standard' appear, referring to this standard, they should be interpreted as 'British Standard'.

Additional information. With reference to the marking requirement in **7.1**(d), all containers should be marked in the following manner with both the number of this British Standard and the number of the ISO standard:

'BS 5650 [ISO 3999]'

NOTE. The exposure rate of 1 R/h specified in **5.8** is equivalent in SI units to 258 μC/(kg h); see also table 1.

Cross-references. The following international standards are referred to in the text and for each there is a corresponding British Standard; these are as listed below:

International standard	Corresponding British Standard
ISO 3-1973	BS 2045 : 1965 Preferred numbers (Technically equivalent)
ISO 361-1975	BS 3510 : 1968 A basic symbol to denote the actual or potential presence of ionizing radiation (Technically equivalent)
ISO 2919*	BS 5288 : 1976 Sealed radioactive sources (Technically equivalent)

NOTE. The reference to ISO 2855, for which there is no corresponding British Standard, constitutes informative matter only, and since no mandatory requirements are involved, the validity of this British Standard is not affected.

*With reference to footnote 3, clause **2**, ISO 2919 will be published shortly.

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0 INTRODUCTION

Resulting from advances made in the nuclear energy field and the consequent increasing availability of radionuclides, the use and importance of gamma radiography for industrial purposes is now well established.

This International Standard applies to apparatus designed to permit the use of gamma radiation emitted by a sealed radioactive source for the purpose of industrial radiography[1].

The purpose of this International Standard is to specify the performance requirements which such apparatus should meet in order that persons will be safeguarded when the apparatus is in normal use in conformity with the regulations in force regarding radiation protection.

It is emphasized, however, that so far as transport of apparatus is concerned, compliance with this International Standard is no substitute for satisfying the requirements of the relevant transport regulations.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the constructional requirements of portable, mobile and fixed apparatus for gamma radiography of the following categories designed to allow the controlled use of radiation for industrial purposes :

a) **Category I** : An exposure container from which the sealed source is not removed for exposure. The beam of radiation is exposed by opening a shutter or rotating the sealed source within the container or by other means. (See figure 1.)

b) **Category II** : An exposure container from which the sealed source is projected out of the container through a projection sheath to the exposure head for exposure, either mechanically, electrically, pneumatically or by other means by an operator at a distance from the exposure head. (See figure 2.)[1]

The operational usage of exposure containers is not covered by this International Standard.

NOTE – If it is proposed to use these exposure containers as transport packages, they should comply with current International Atomic Energy Agency Regulations for the safe transport of radioactive materials[2] and/or the relevant national transport regulations.

2 REFERENCES

ISO 3, *Preferred numbers – Series of preferred numbers.*

ISO 361, *Basic ionizing radiation symbol.*

ISO 2855, *Radioactive materials – Packagings – Tests for contents leakage and radiation leakage.*

ISO 2919, *Sealed radioactive sources – Classification.*[3]

3 DEFINITIONS

The terms used in this International Standard have the following meanings and some are illustrated in figures 1 and 2 which, however, do not purport to illustrate typical or preferred designs :

3.1 apparatus for gamma radiography : An apparatus including an exposure container and accessories designed to enable radiation emitted by a sealed source to be used for industrial radiography.

3.2 exposure container : A shield in the form of a container designed to allow the controlled use of gamma radiation and employing one or more gamma radiography sealed sources.

3.3 gamma radiography sealed source : A sealed source in a form suitable for use in radiography, which comprises the radioactive material, usually in the form of a pellet or pellets, sealed in one or more capsules.

1) Apparatus operated by removing the sealed source from the exposure container on a handling device is not covered by this International Standard because its use is prohibited in the national regulations of some countries.

2) IAEA Safety Series No. 6, *Regulations for the safe transport of radioactive materials;* and companion document Safety Series No. 37, *Advisory material for the application of the IAEA transport regulations,* current edition.

3) At present at the stage of draft.