

ISO 21909-1:2015-12 (E)

Passive neutron dosimetry systems - Part 1: Performance and test requirements for personal dosimetry

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | v |
| Introduction | | vi |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms, definitions, and symbols | 1 |
| 3.1 | General terms and definitions | 1 |
| 3.2 | Terms relating to quantities | 2 |
| 3.3 | Terms relating to calibration and evaluation | 3 |
| 3.4 | List of symbols | 6 |
| 4 | General test conditions | 8 |
| 4.1 | Test conditions | 8 |
| 4.2 | Reference radiation | 8 |
| 4.3 | Tests requirements | 8 |
| 5 | Tests and performance requirements | 9 |
| 6 | Test methods | 12 |
| 7 | Performance tests: intrinsic characteristics | 12 |
| 7.1 | General | 12 |
| 7.2 | Irradiations | 12 |
| 7.3 | Qualification for eliminating the use of the full neutron and photon package | 17 |
| 7.3.1 | Aim of the test | 17 |
| 7.3.2 | Method of test | 18 |
| 7.3.3 | Interpretation of results | 18 |
| 7.4 | Performances tests | 18 |
| 7.4.1 | General | 18 |
| 7.4.2 | Coefficient of variation/linearity | 18 |
| 7.4.3 | Energy and angle dependence of the response | 19 |
| 7.4.4 | Specific test for thermal neutrons | 20 |
| 8 | Performance tests: stability in the range of realistic conditions of use of the dosimeters. 21 8.1 | |
| | Fading | 21 |
| 8.1.1 | General | 21 |
| 8.1.2 | Method of test | 21 |
| 8.1.3 | Interpretation of results | 22 |
| 8.2 | Ageing | 22 |
| 8.2.1 | General | 22 |
| 8.2.2 | Method of test | 23 |
| 8.2.3 | Interpretation of results | 23 |
| 8.3 | Effect of storage for unexposed dosimeters | 24 |
| 8.3.1 | General | 24 |
| 8.3.2 | Method of test | 24 |
| 8.3.3 | Interpretation of results | 24 |
| 8.4 | Exposure to radiation other than neutrons | 24 |
| 8.4.1 | General | 24 |

| | | |
|--|---|----|
| 8.4.2 | Photon radiation | 24 |
| 8.4.3 | Radon | 26 |
| 8.5 | Stability under various climatic conditions | 26 |
| 8.5.1 | General | 26 |
| 8.5.2 | Effect on the dose response | 26 |
| 8.5.3 | Effect for unexposed dosimeters | 27 |
| 8.6 | Effect of light exposure (insensitivity to light) | 28 |
| 8.6.1 | Effect on the dose response | 28 |
| 8.6.2 | Effect for unexposed dosimeters | 28 |
| 8.7 | Drop test | 28 |
| 8.7.1 | Effect on the dose response | 29 |
| 8.7.2 | Effect for unexposed dosimeters | 29 |
| 8.8 | Distance to the phantom | 29 |
| 8.8.1 | General | 29 |
| 8.8.2 | Method of test | 30 |
| 8.8.3 | Interpretation of results | 30 |
| 8.9 | Sealing | 30 |
| 9 | Identification and accompanying documentation | 30 |
| 9.1 | Individual marking | 30 |
| 9.2 | Collective marking | 30 |
| 9.3 | Accompanying documentation | 31 |
| Annex A (normative) Dosimetry for the irradiation of the extremities | | 32 |
| Annex B (normative) Reference and standard test conditions | | 33 |
| Annex C (informative) Irradiation conditions | | 34 |
| Annex D (normative) Conversion tables | | 35 |
| Annex E (normative) Confidence limits | | 36 |
| Bibliography | | 39 |