Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

0542

Accredited to ISO/IEC 17025:2017

Cavendish Nuclear Ltd

Issue No: 030 **Issue date:** 19 August 2021

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Calibration performed at the above address only

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
PORTABLE AND SEMI-INSTALLED DOSE RATE MONITORS AND PERSONAL DOSIMETERS			
Air kerma rate	^{60}Co 2.76 μGyh^{-1} to 726.03 mGyh^{-1}	3.0 %	Calibration and testing of air kerma/air kerma rate monitors using air kerma rates traceable to national standards through a secondary standard dosemeter
	^{137}Cs 299.6 nGyh^{-1} to 79.92 mGyh^{-1}	3.2 %	
	^{241}Am 7.49 μGyh^{-1} to 1.29 mGyh^{-1}	3.8 %	
	^{226}Ra 7.3 μGyh^{-1} to 7.8 mGyh^{-1} 40 nGyh^{-1} to 7.3 μGyh^{-1}	7.4 % 17 %	
Ambient Dose Equivalent Rates H*(10)	^{60}Co 3.2μSvh^{-1} to 842.2 mSvh^{-1}	3.0 %	Calibration and testing of dose/dose rate monitors using air kerma rates traceable to national standards through a secondary standard dosemeter and using appropriate coefficients given in ISO standards for H*(10)
	^{137}Cs 362.52 nSvh^{-1} to 96.71 mSvh^{-1}	3.2 %	
	^{241}Am 13.02 μSvh^{-1} to 2.25 mSvh^{-1}	3.8 %	

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
Personal dose equivalent rate ($H_p(10)$):	^{60}Co 3.17 μSvh^{-1} to 834.94 mSvh^{-1}	5.9 %	Calibration and testing of dose/dose rate monitors using air kerma rates traceable to national standards through a secondary standard dosemeter and using appropriate coefficients given in ISO standards for Hp(10)
	^{137}Cs 362.52 nSvh^{-1} to 96.71 mSvh^{-1}	4.3 %	
	^{241}Am 14.15 μSvh^{-1} to 2.44 mSvh^{-1}	6.1 %	
Portable tritium in air monitors			
Concentration of Tritium in Air	0.01 MBqm^{-3} to 200 MBqm^{-3}	6.0 %	A known concentration of tritium gas and a bespoke rig are used. Actual uncertainty quoted will be relative to instrument chamber volume
Alpha, beta and photon large area sources			
Surface emission rate (alpha and beta)	10 emissions s^{-1} to 13000 emissions s^{-1} Alpha emitting nuclides ^{241}Am Beta emitting nuclides ^{14}C ^{90}Sr	2.7 %	Measurement of surface emission rates from planar sources using a transfer standard counter calibrated with extended DkD sources of the same nuclide, or a nuclide with similar energy emissions
Surface emission rate (photon)	10 emissions s^{-1} to 13000 emissions s^{-1} ^{55}Fe only	9.4 %	
END			

Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand.
Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where q is the quantity value.

The notation Q[a, b] stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$