



# **Template for Eurachem Guides**

## **A Guide for Guide Editors**

**Issued September 2015**



## **Eurachem Guide**

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**A Guide for Guide Editors**

**First edition**

**September 2015**

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### **Acknowledgements**

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### **Recommended citation**

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*\*Subject to journal requirements*

Template for Eurachem Guides

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## Foreword

Eurachem guides have been developed over a long period of time but the format of different guides has varied. After a proposal from B. Magnusson in 2014, the Eurachem executive committee decided that a non-mandatory template should be developed giving guidance on the format of all parts of the guide.

This Guide is provided in such a way that it serves as an example of the guidance that it provides.

## Abbreviations and symbols

The following abbreviations, acronyms and symbols occur in this Guide.

BIPM	International Bureau of Weights and Measures	ISO	International Organization for Standardization
CITAC	Cooperation on International Traceability in Analytical Chemistry	IUPAC	International Union of Pure and Applied Chemistry
GUM	Guide to the expression of Uncertainty in Measurement	MS	Microsoft
ICP-MS	Inductively Coupled Plasma Mass Spectrometry	pt	Point (as in font size)
IEC	International Electrotechnical Commission	VIM	International Vocabulary of Metrology

## 1 Introduction and scope

Guides published by Eurachem should be easy to read, clear and unambiguous. To achieve these objectives, the document shall:

- be as complete as necessary within the limits specified by its scope,
- be consistent and clear,
- be comprehensible to qualified persons who have not participated in its preparation,
- take into account the principles for the drafting of documents – see Eurachem procedure for the development of Guides [1].

This template applies to new and revised Eurachem Guides.

This template is not mandatory but contains recommendations for the style and structure of Eurachem guides. This version of the template is written in Microsoft Word 2010. The recommendations are based on previous Eurachem Guides and also loosely based on the ISO/IEC Directives, Part 2, *Rules for the structures and drafting of International Standards* [2]. Similar guides are published by companies [3], metrology institutes [4] and national standardisation bodies [5].

## 2 General format of a Eurachem guide

### 2.1 Language

The language in the English version of Eurachem Guides is UK English spelled according to, e.g. the *Concise Oxford Dictionary* [6].

**Table 1 – Examples of preferred spelling**

Preferred	Not recommended
Centre	Center
Characterisation	Characterization
Colour	Color
Programme*	Program*
Analyse	Analyze
*Other than 'computer program'	

### 2.2 Page layout

Other than the Foreword and Introduction, if any, text is laid out in two columns in the published version of Guides. Level 1 headings (for main sections) are on a new page across two columns. In MS Word this requires a section break before and after each Level 1 heading.

### 2.3 Page numbering

For the main text after the Contents page, the page number is placed at the bottom right corner and is prefixed with the word Page, starting with page number 1 on the right-hand page. Before the main text, page numbering starts on the Contents page (including cover page) with Roman numerals in lower case placed at the bottom of the page and centred.

### 2.4 Paragraph numbering

When it is necessary to refer to single paragraphs in the Guide, numbering of paragraphs is recommended.

### 2.5 Authors and their affiliations

The names of authors should be given in alphabetical order of surnames with the format shown on the title page in this Guide. The affiliation after the author's name may be the author's employer or, where appropriate, the name

of the relevant liaison organisation. For authors contributing as individual experts, the hometown is given.

The country code after the author's affiliation should be the two-letter code defined in ISO 3166-1 [7].

Editors, where identified, should be listed separately from other authors.

Authors may also be grouped according to representation (for example in the case of joint working groups).

Examples of editor, author and contributor lists for some common circumstances are shown in Annex A.

### 2.6 Text format

#### 2.6.1 Body text

The body text (style Normal, single line spacing) is given in Times New Roman 11 point (pt) with two columns, with space 0.6 cm between columns. The font is chosen to be the same as the default in the current Word equation editor which is used for mathematical formulas.

Text in paragraphs is left and right justified.

The space after a paragraph is normally 6 pt. A multi-line paragraph should not begin or end with just one line on a page – at least two lines should appear on each page.

If two columns do not fill a page, both columns should end at about the same level on the page. An example is given in Section 1 **Introduction and scope**.

#### 2.6.2 Headings

##### 2.6.2.1 Use of headings

Headings should be used as necessary to separate and identify text under specific topics.

If any subheadings are used within a headed section, all subsections within that section should have separate headings. In particular, the first section in a section containing subheadings should also have a subheading so that it can be uniquely referenced.

### 2.6.2.2 Heading format

Headings are given in font Arial and the font size depends on the heading level:

- Heading level 1: 14 pt bold, centred on page margins, over two columns, starts on top of a new page, preferably on an odd (right hand) page number.
- Heading level 2: 13 pt bold.
- Heading level 3: 12 pt bold.
- Heading level 4: 11 pt bold.

Headings are numbered consecutively according to their levels such as, 1, 1.1, 1.1.1 and 1.1.1.1. A list style is used to define the numbered headings. The main heading for foreword, abbreviations, annexes A, B, C etc. and the bibliography section has the same format as heading level 1 but without numbering.

Annexes should be designated by Roman letters (Annex A, B etc) Subheadings in annexes are formatted similarly to the corresponding heading levels in the body text, but the heading number should be preceded with the Annex letter code (A1, A1.1 etc) .

Headings of level 1 and 2 should normally appear in the table of contents. Further subdivision (levels 3 or more) may be given where this does not make length of the table excessive. The subheadings of annexes do not normally appear in the Table of Contents unless annex subdivisions extend over several pages.

Normally only the first word in a heading should begin with a capital letter. In the full title of a Guide all important words begin with a capital letter as in the title of this Guide: Template for Eurachem Guides – A Guide for Guide Editors.

The page header is in Times New Roman bold 12 pt (upright) and footer is in Times New Roman 9 pt

The headline of the Table of Contents is in Arial 14 pt bold. The section headings in the Table of Contents are as follows: level 1 headings Arial 11 pt bold italics with space before 8pt and space after 4 pt; level 2 in Arial 11 pt; and level 3 in Arial 10 pt.

### 2.6.3 Notes, footnotes and endnotes

A note should be preceded by the word 'NOTE'. If there is more than one note in the same paragraph, they should be numbered using Arabic numerals.

Footnotes should be indicated with superscript symbols (\* ...) placed at the bottom of the page.

Bibliographic references should be indicated consecutively with cross-references to the numbered list in section Bibliography and placed inside square brackets [] on the line.

## 2.7 Terms and definitions

Terms and their definitions should primarily be those published by international bodies, such as ISO and IUPAC. The VIM [8] and the GUM [9] are the prime references for fundamental concepts related to measurement and measurement uncertainty. Other useful references are:

- ISO Guide 30 for reference materials [10];
- ISO/IEC 17000 for conformity assessment [11];
- ISO 9000 for quality management systems [12];
- IUPAC 'colour books' for analytical chemical terminology ([www.iupac.org](http://www.iupac.org)) [13, 14].

The most recently published version of terms and definitions should normally be used. If an older definition is used, the guidance document should explain the difference and the rationale for the choice

### 3 Formulas, numbers, quantities and units

#### 3.1 Mathematical formulas

Formulas that are referred to in the text should be numbered sequentially in parentheses as in Equation (1) below.

$$u(f_{\text{temp}}) = 0.1/\sqrt{3} = 0.06 \text{ }^{\circ}\text{C} \quad (1)$$

Numbering for formulas in Annexes should recommence at 1 and include a letter designating the Annex, e.g. A.2.

A subscript is given in Roman (upright) font unless it is a symbol of a quantity itself; in Equation (2) the subscript ‘c’ (in Roman) denotes ‘combined’, whereas the italic subscript ‘i’ denotes a variable index.

$$u_c^2 = \sum_{i=1}^n u_i^2 \quad (2)$$

#### 3.2 Numbers

Express numbers in the same font and size as surrounding text (usually Times New Roman 11 pt). Examples are given in Table 2.

**Table 2 – Examples of expression of numbers (UK English)**

Preferred	Not acceptable	Remark
16.78	16,78	The decimal marker is the point on the line
43 279	43,279	A short space is used as a thousand separator
0.143 567	0.143567	A short space is used as a separator in long numbers
25 × 60.5	25 · 60.5	When the decimal marker is the point on the line, the multiplication sign should be an ‘×’
NOTE The standard for the decimal marker is a comma on the line in ISO documents.		

The decimal marker should be the form most commonly used for the language of the document. For UK English the decimal marker is a point on the line.

Long numbers are structured in groups of 3 digits as seen in Table 2 (as counted away from the decimal marker) using a short non-breaking space also called an ‘en space’. (CTRL+SHIFT+SPACE in MS Word). A 4-digit number is preferably written without a separator, e.g. ‘4004’

Where used, the thousand separator should be a short non-breaking space.

#### 3.2.1 Reporting results

Although Eurachem Guides do not usually report measurement results, they often include illustrative examples. These should demonstrate good practice in reporting.

Mean values, measures of precision and uncertainties, should be reported with a sensible number of digits. Standard deviations are generally not reported to more than two significant figures unless more digits are needed to avoid rounding errors in intermediate calculations. Mean values and relative standard deviations should be rounded to be consistent (same number of decimal places) with the standard deviation.

Final measurement results ( $y$ ) and expanded uncertainties ( $U$ ) should be reported in the same units and in the format  $y \pm U$ . The unit could be stated once,  $(523 \pm 17) \mu\text{g}$  or twice  $523 \mu\text{g} \pm 17 \mu\text{g}$ . Different units should be avoided, e.g. the format ‘ $523 \mu\text{g} \pm 3 \%$ ’ is discouraged.

According to GUM the expanded uncertainty should not be given with more than two significant digits.

The coverage factor  $k$  (usually 2) should always be stated.

The result should be rounded and presented with the same number of decimal places as the expanded uncertainty.

### 3.3 Quantities and units

ISO 80000-1:2009 [15] gives general information and definitions concerning quantities, systems of quantities, units, quantity and unit symbols, and coherent unit systems, especially the International System of Quantities, ISQ, and the International System of Units, SI. Examples of expression of units are given in Table 3.

**Table 3 – Examples on expression of units (UK English)**

Preferred	Not acceptable	Remark
mg L <sup>-1</sup>	mg/L	Multiplication sign: A space is recommended between units
50 g; 25 °C; 5 %	50g; 25°C; 5%	Non-breaking space between value and unit (CTRL+SHIFT+SPACE in MS Word)
L	l	For unit litre
5 m	five m	
s	Sec	
min	Mins	
h	Hrs	

The full name of a unit may be given in descriptive text when small numbers are given in words; for example, ‘five metres’ may be used instead of ‘5 m’.

Quantity symbols for lengths, concentrations etc. should be written in Times New Roman italics (*m*, *c*, *U*, *u*, *k* ...) with units in regular (Roman) type (kg, mol, mL,...).

Examples:

$$m = 10 \text{ kg}$$

where *m* is a mass,

$$c = 12.3 \text{ mol L}^{-1}$$

where *c* is a concentration.

Write symbols for chemical elements and chemical formulas in Times New Roman regular type, including any indices, e.g. <sup>208</sup>Pb, BaSO<sub>4</sub>.

#### 3.3.1 Quantities describing composition of mixtures

In Eurachem guides, when the text describes general features of laboratory work, quantities are often used in a generic sense (unqualified) or even omitted. Examples are:

- ‘The customer wished to know the content of copper in the water sample’;
- ‘The laboratory has developed a new method for determination of serum albumin concentration’;
- ‘The amount of protein requested for the analysis proved insufficient’.

However, in situations where focus is on metrological aspects, e.g. in specifying the measurand during uncertainty evaluation, or depicting links in a specific metrological traceability chain, or when drawing up a protocol for an interlaboratory comparison, any quantity of interest must be specified in detail.

When describing composition of mixtures use the name and appropriate symbol (Table 4). Concentrations are quantities describing the ratio of one of the quantities of a single substance (mass, volume, chemical amount or number of entities) to the total volume of the mixture.

Abbreviations such as ppm, ppb and ppt can have different meanings and should not be used.\* Preferably use instead, e.g. mg kg<sup>-1</sup>, mol L<sup>-1</sup> etc.

Abbreviations such as ‘*m/m*’, ‘*w/w*’ and ‘*V/V*’ should not be used to identify the measured quantity because they can have different meanings. Write instead ‘mass fraction’, ‘volume fraction’ etc. and use the recommended symbols from Table 4.

The per cent (%) and per mille (‰) symbols are not sufficient to describe a composition in a metrological context. Write instead, e.g. ‘...the mass fraction (%) is 2.5’.

The generic term ‘concentration’ or ‘content’ may be used on its own in Eurachem Guides, i.e. unqualified, when a general term is required. To represent the family of terms which includes mass fraction, mass concentration, amount of substance concentration etc.

\* The abbreviation ppt is used for both ‘parts per thousand’ and ‘parts per trillion’

**Table 4 – Names, symbols, definitions and units for quantities describing compositions of mixtures**

Name	Symbol	Definition	SI unit	Common unit
Mass concentration	$\rho_i$	$\rho_i = \frac{m_i}{V}$	kg m <sup>-3</sup>	g L <sup>-1</sup>
Amount of substance concentration	$c_i$	$c_i = \frac{n_i}{V}$	mol m <sup>3</sup>	mol L <sup>-1</sup> mol dm <sup>-3</sup>
Number concentration	$C_i$	$C_i = \frac{N_i}{V}$	m <sup>-3</sup>	cm <sup>-3</sup>
Mass fraction	$w_i$	$w_i = \frac{m_i}{m}$	1	%
Volume fraction	$\varphi_i$	$\varphi_i = \frac{V_i}{V_0}$	1	%
Amount of substance fraction	$x_i$	$x_i = \frac{n_i}{n}$	1	%
NOTE 1 Subscripts <i>i</i> refer to components <i>i</i> of the mixture. Example: mass fraction of substance B – $w_B$ or $w(B)$ .				
NOTE 2 The recommendations in this Table follow the general principles given in <i>Quantities and units – Part 1: General (ISO 80000-1:2009)</i> . [15]				

When giving instructions on how to prepare samples or make dilutions, do not write ‘dilute 10:100’ or ‘dilute 10/100’. Write instead ‘dilute 10 ml to 100 ml’ or mix 10 ml of A with 90 mL of B’.

Do not mix symbols and names of units or quantities (see Table 5).

**Table 5 – Examples of mixing symbols and names of units**

Preferred	Not recommended
The concentration of Pb is 5 ng L <sup>-1</sup>	5 ng Pb L <sup>-1</sup>
km h <sup>-1</sup> kilometres per hour	km per hour

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## 4 Tables and figures

### 4.1 General

Tables and figures should be used when they are the most efficient means of presenting information in an easily comprehensible form. It must be possible for the reader to understand the information in a table or figure without consulting other parts of the Guide. The same information should not be presented in both a table and a figure.

Tables and figures are numbered consecutively as they are addressed in the text. Tables and figures should be accompanied by a title that provides sufficient information about the respective content.

### 4.2 Tables

Tables shall be designated ‘Table’ and numbered with Arabic numerals, beginning with 1. In annexes tables should be numbered separately, e.g. Annex A – Table A1, Table A2 etc.

The table designation and its title should be centred and in bold 11pt Times. The title is not followed by a full stop. If the table is broad covering two columns it should be placed at the top or bottom of the page. Any notes or footnotes should be located within the frame of the table.

A table within a table and subdivision of a table is not recommended.

An example of an outline of a Table is shown in the following example:

**Table 6 – Combined standard uncertainty for the determination of crude fibre in animal feeding stuffs**

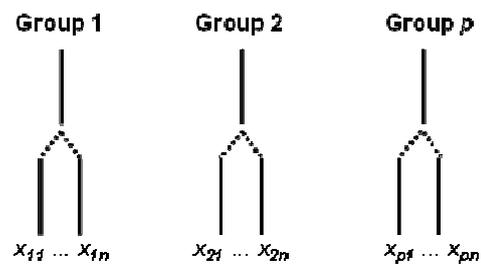
<b>Fibre content* (%)</b>	<b>Standard uncertainty (%)</b>
2.5	0.31*
5	0.4
10	0.6
NOTE The fibre content and the corresponding standard uncertainty are expressed as mass fractions.	
*The fibre content is given in the unit mass fraction.	

### 4.3 Figures

Figures shall be designated ‘Figure’ and numbered with Arabic numerals, beginning with 1. The figure designation and its title should be centred, in bold, below the Figure. The title is not followed by a full stop. Examples are given as Figure 1 and Figure 2. The legend should be in bold, Times New Roman 10 pt, and left and right justified.

Figures in annexes should be numbered from 1 according to their Annex designation, e.g. for Annex A – ‘Figure A1’, ‘Figure A2’ etc.

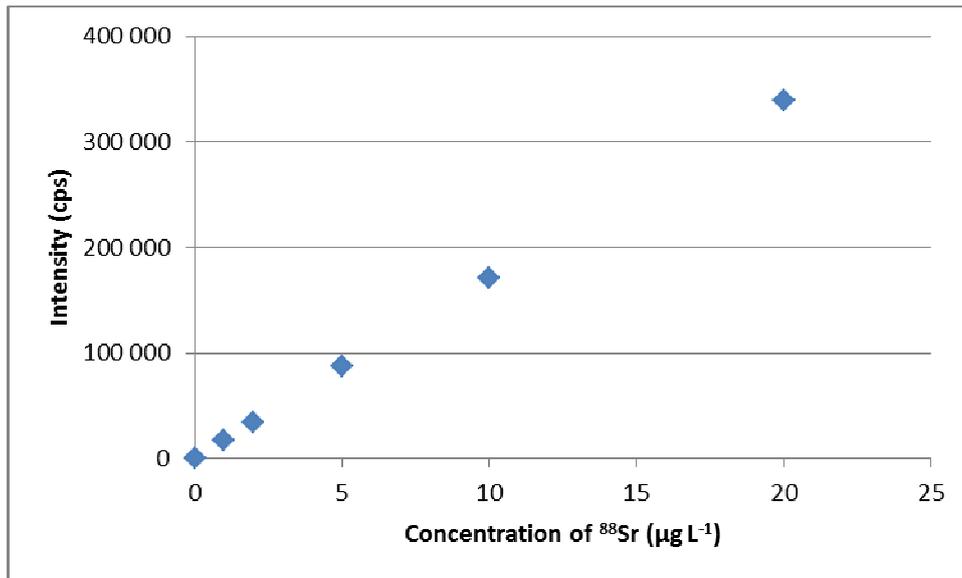
Any figure covering two columns should be placed at the top or bottom of the page.



**Figure 1 – Example of a ‘nested design’ for an experiment from which different precision measures can be evaluated using ANOVA**

The format of axes labels in figures should be consistent throughout the document. Use either of the following two options:

- 1) ‘Quantity (unit)’, for example Mass concentration (mg L<sup>-1</sup>). An example is shown in Figure 2.
- 2) ‘Quantity/unit’, for example Wavelength/nm, Temperature/K etc. This is the metrological option recommended, e.g. by the BIPM. The character ‘/’ is a division sign. It forms part of an equation together with the number on the axis. Example: ‘Mass/kg = 1.5’.



**Figure 2 — Calibration curve for strontium with ICP-MS. Intensity versus concentration of strontium measured at mass 88**

## 5 Lists

### 5.1 Construction of lists

Lists should be introduced by:

- a) a sentence,
- b) a complete grammatical proposition followed by a colon, or
- c) the first part of a proposition.

Lists, whether ordered or otherwise, should normally be left-aligned to the starting point of the introductory paragraph (including paragraph number, if any).

EXAMPLE:

Preferred list alignment:

Item 1;

Item 2.

Not recommended:

Item 1;

Item 2.

### 5.2 Unordered lists

Lists without numbering or other ordering are common for separating points which have no special priority order, and for which there is no need to refer to separate items. Each item in an unordered list should be preceded by a dash or a bullet and terminated with a semicolon, except for the final list item which should be completed with a full stop.

As far as possible the format of ordered lists should be consistent within a document; that is, unordered lists should use only one of the above formats in any one guideline.

### 5.3 Ordered lists

Ordered lists are used where there is an important priority order for different items or where there is a need to refer to individual items from elsewhere in the text. Each item in an ordered list should be preceded by

- an Arabic numeral (1, 2, ...) followed by a full stop,
- a lower case Roman numeral (i, ii, iii ...) followed by a parenthesis, or
- a lower case letter followed by a parenthesis.

As far as possible the format of ordered lists should be consistent within a document; that is, ordered lists should use only one of the above formats in any one guideline.

### 5.4 Multilevel lists

A multilevel list includes a number of items each of which is itself a list. A multilevel list may be any combination of ordered and unordered lists.

Where a multilevel list requires two levels of ordering the list identifiers should not be the same for both levels. For example:

i) Item 1

a) Sub-category 1,

b) Sub-category 2.

is preferred to

i) Item 1

i) Sub-category 1,

ii) Sub-category 2.

Sub-categories in multilevel lists should be indented (as above) so that the structure of the list is easily visible.

In other respects the choice of list identifiers and format is at the discretion of the editor, bearing in mind the formats chosen for simple ordered and unordered lists in the remainder of the document.

Note that for unordered multilevel lists, solid bullet markers (•, ▪) usually stand out more than leading dashes (-) and are therefore more likely to be suitable as the top-level marker in multilevel lists.

### 5.5 Example of a non-ordered list

The fibre content as a mass fraction in per cent,  $w_{\text{fibre}}$ , is given by:

$$w_{\text{fibre}} = \frac{(b - c) \times 100}{m} \quad (3)$$

where:

- $m$  is the mass (g) of the sample. Approximately 1 g of sample is taken for analysis;
- $b$  is the loss of mass (g) during ashing of the sample;
- $c$  is the loss of mass (g) during ashing of a blank.

## 6 Simplifying editing and revision

### 6.1 Using styles

It is recommended to use the styles for body text (Normal) and heading and figure captions used in this template. In order not to create new styles for all changes the automatic style creation can be turned off in Word.

### 6.2 Use of automatic numbering

The headings, captions for figures, tables and formulas are set up with automatic numbering. It is recommended to use that throughout the document.

### 6.3 Use automatic cross-referencing

Use bookmarks to simplify cross-referencing when there is no built-in numbering style.

When referencing to a particular heading, table, figure, equation etc. the section should start with a capital letter. Examples: 'See Table 4'; 'As shown in Figure 2...'; 'Equation (1) contains...'.

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## 7 Empty section

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## Annex A – Examples of lists of editors, authors and contributors

### A.1 Example 1 – a Eurachem Guide

#### Acknowledgements

This document has been produced by members of the Eurachem Method Validation Working Group and others co-opted for this task. Those who have contributed to this edition are listed below.

#### Project group

Vicki Barwick	LGC (UK)
Pedro P. Morillas Bravo	Canal de Isabel II Gestión (ES)
Stephen L. R. Ellison	LGC (UK)
Joakim Engman	National Food Agency (SE)
Elin L. F. Gjengedal	Norwegian University of Life Sciences (NO)
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Florent Vanstapel	University Hospital Leuven, Leuven (BE)
Isabelle Vercauteren	BELAB (BE)
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Perihan Yolci Ömeroglu	Okan University (TR)
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#### Recommended citation

This publication should be cited\* as: “B. Magnusson and U. Örnemark (eds.) Eurachem Guide: The Fitness for Purpose of Analytical Methods – A Laboratory Guide to Method Validation and Related Topics, (2<sup>nd</sup> ed. 2014). ISBN 978-91-87461-59-0. Available from [www.eurachem.org](http://www.eurachem.org).”

*\*Subject to journal requirements*

## A.2 Example 2 – a joint Eurachem Guide

This example follows the rules in this Guide showing all organisations.

### **Editors**

Michael H Ramsey University of Sussex (UK)

Stephen L R Ellison LGC (UK)

### **Composition of the Working Group**

#### ***Eurachem member***

Michael H Ramsey (Chair) University of Sussex (UK)

#### ***EUROLAB member***

Manfred Golze BAM, Germany

#### ***CITAC member***

Ilya Kuselman National Physical Laboratory, Israel

#### ***Nordtest representatives***

Christian Grøn DHI – Water & Environment, Denmark

#### ***AMC representatives***

Michael Thompson University of London, UK

#### ***Observer***

Marc Salit NIST, USA

This publication should be cited\* as:

“M H Ramsey and S L R Ellison (eds.) Eurachem/EUROLAB/CITAC/Nordtest/AMC Guide: *Measurement uncertainty arising from sampling: a guide to methods and approaches Eurachem* (2007). ISBN 978 0 948926 26 6. Available from [www.eurachem.org](http://www.eurachem.org)”

## Annex B – Outline of joint guides

### B.1 Outline of Eurachem/CITAC guides

Some Eurachem Guides are prepared together with CITAC and/or other organisations. See current Eurachem “uncertainty guide” for outline of cover, first page and back cover. The CITAC logotype should be used together with the Eurachem logotype.



## Annex C – Examples of styles for bibliographic references

### C.1 Eurachem Guides

B. Magnusson and U. Örnemark (eds.) Eurachem Guide: The Fitness for Purpose of Analytical Methods – A Laboratory Guide to Method Validation and Related Topics, (2nd ed. 2014). Available from [www.eurachem.org](http://www.eurachem.org).

### C.2 Joint Eurachem Guides

S. L. R. Ellison, B. King, M. Rösslein, M. Salit, A. Williams (eds.) Eurachem/CITAC Guide: Traceability in Chemical Measurement – A guide to achieving comparable results in chemical measurement (2003). Available from [www.eurachem.org](http://www.eurachem.org) and [www.citac.cc](http://www.citac.cc).

### C.3 Reports and Guides

EUROLAB Technical Report 1/2006, Guide to the Evaluation of Measurement Uncertainty for Quantitative Test Results, EUROLAB (2006). Available from [www.eurolab.org](http://www.eurolab.org).

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laboratories (IUPAC Technical Report); Pure Appl. Chem. 78(1) 145-196 (2006).

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