Bureau International des Poids et Mesures

HELP WITH SEARCHING

KCDB restricted web portal

KCDB 2.0
v. 2022-02-02
www.bipm.org/kcdb

KCDB

PREFACE

The key comparison database - KCDB – is the supporting database for the implementation of the Mutual Recognition Arrangement of the International Committee for Weights and Measures (CIPM MRA) that was implemented in 1999. It contains data on Calibration and Measurement Capabilities (CMCs) and comparison results of measurements in physics, ionizing radiation, chemistry and biology. The KCDB is an evidence based database: all data included have been reviewed by international groups of experts and approved for mutual recognition.

The KCDB website www.bipm.org/kcdb gives access to the following services with open access:

- searching on published CMCs in the KCDB
- searching on published comparison information, reports and results
- information on statistics and recent news on issues linked to CMCs and comparisons
- a set of guidance documents.

The KCDB website also provides a restricted access platform for users that allows the creation and review of CMCs. It also provides tools for the registration of comparisons and submission of comparison reports and associated documents. Statistics on the review process are available via a restricted access area. The restricted access area is available for persons involved in the review process and its coordination, only.

This document gives an overview of the facilities available on the KCDB website.

Complementary, video clips demonstrating selected KCDB activities will successively be made available on the BIPM web [https://www.bipm.org/en/about-us/kcdb-help.html] and YouTube [https://www.youtube.com/user/TheBIPM].

Contents

1 Home page 4
2 CMC : Search 7
2.1 Quick search – CMCs 7
2.1.1 Filter for Quick Search - CMCs **8**
2.2 Advanced search – CMCs 11
2.3 Numerical search 14
3 Comparisons : Search 16
3.1 Quick search – Comparisons 16
3.1.1 Filter for Quick Search - Compaisons **16**
3.2 Advanced search – Comparisons 19
4 News : Search 22
5 Statistics: CMCs and Comparisons 23
5.1 CMS statistics 23
5.1.1 Export CMC statistics by country **23**
5.1.2 Number of CMCs by metrology area **23**
5.1.3 Number of CMCs by RMO **23**
5.1.4 Number of CMCs by approval year **24**
5.2 Key comparisons by state or economy 24
5.3 Supplementary comparisons by state or economy 24
5.4 More comparison statistics 24
5.4.1 Number of key and supplementary comparisons by metrology area ... **24**
5.4.2 Number of key and supplementary comparisons by organization **24**
5.4.3 Number of key and supplementary comparisons by country **24**
5.4.4 Number of key and supplementary comparisons by year **24**
6 List of editorial modifications 25
6.1.1 Accessible field size of Comparison interactive forms **26**
7 Revision History 26

1 HOME PAGE

The home page gives open access to four main sections:

- **CMC**: Search
- **Comparisons**: Search
- **News**: Search for recent news on issues linked to CMCs and comparisons
- **Statistics**: CMCs and comparisons.

Direct links to the BIPM web **BIPM.org** and the list of **CIPM MRA Participants** are situated at the top of the screen, where it is also possible to reach the restricted user area via **Login**.

Quick access to documents related to i) the KCDB, ii) the CIPM MRA, and iii) the CLASSIFICATION OF SERVICES (established by the Consultative Committees of the CIPM for each metrology area) are listed at the bottom of the Home page.

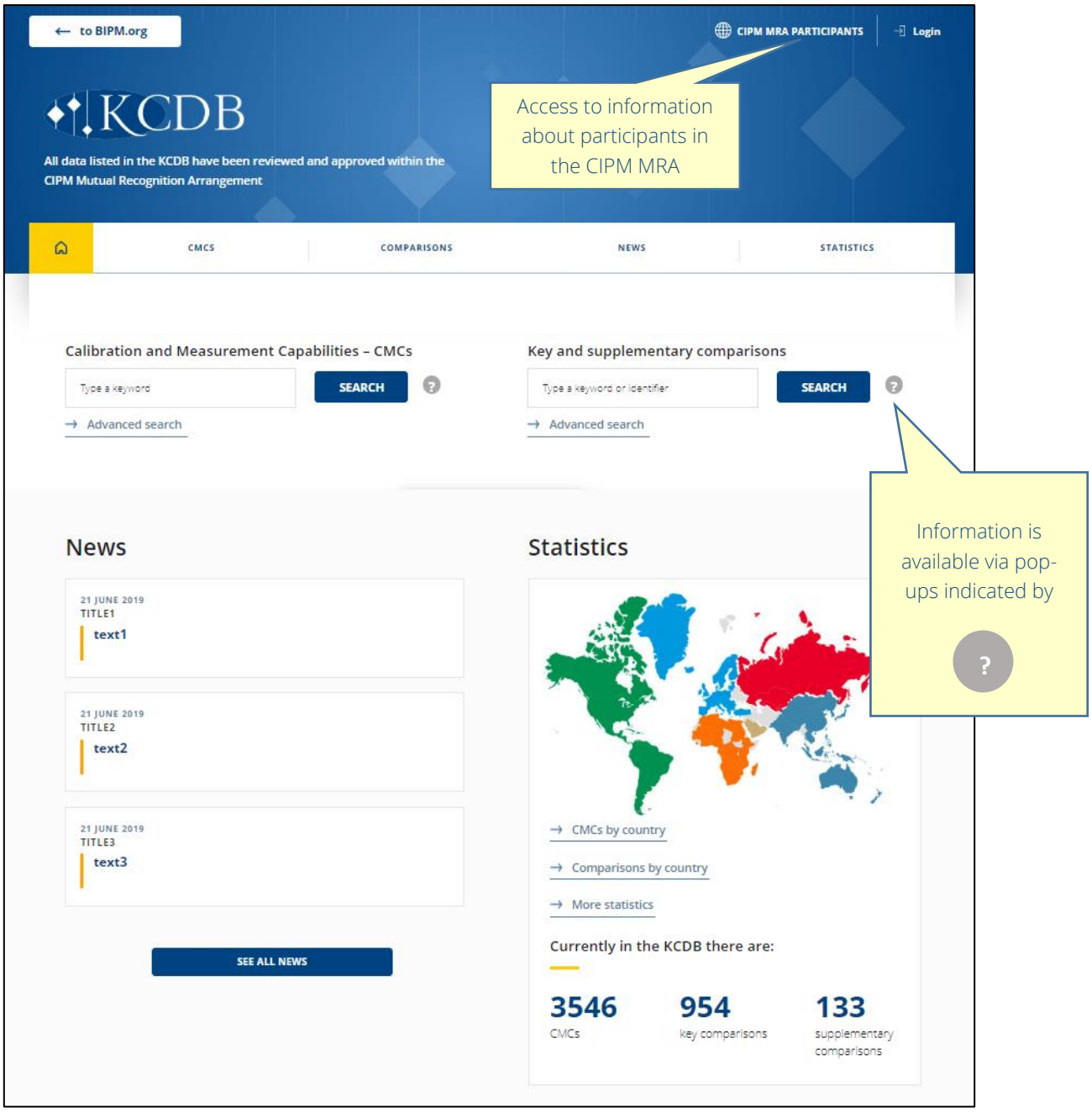

Figure 1-a *Upper part of the KCDB home page.*

Figure 1-b *Lower part of the KCDB home page.*

2 CMC : SEARCH

Two different search methods are available:

- Quick search, where free search words are indicated by the user
- Advanced search, where a set of predefined menus are available and additional tools are accessible.

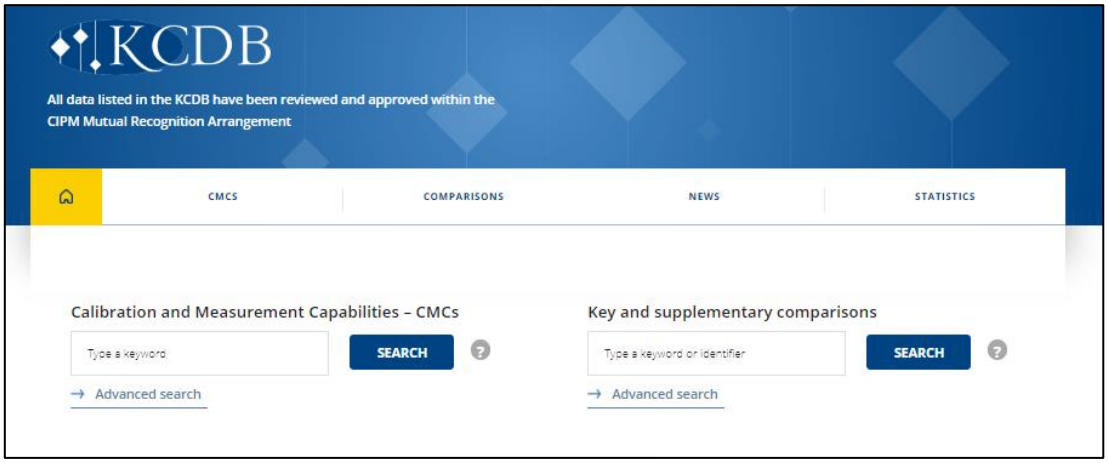

Figure 2 *Search facilities.*

2.1 QUICK SEARCH – CMCS

Quick search is available either from the home page, or by clicking on the tab **CMCS**. The quick search is realized using the open source facility *Elasticsearch*[1]. Search for CMCs is accomplished by giving one or several keywords.[2] A space will be interpreted as the logical operator 'AND'. The logical operator 'OR' can also be used.

A 'fuzziness' of one character is applied. This means that a search word will indicate 'hits' is only one character differs from the search result.

Example: If the word 'NIM' is indicated, this will also give hits on for example 'NIS' and 'NIMT'.

To limit hits to 'NIM', this can be overcome by using the character vertical double-quotes (") before and after the word. A word within "" will not be subject to fuzziness, in the example given above this would be overcome by writing "NIM".

Each CMC resulting from Quick Search is listed as a separate entity.

[1] References given to commercial products are given uniquely for the aim of technical information.
[2] The following fields are indexed: country, institute, RMO, metrology area, branch, institute service identifier, added comments, instrument/artefact, instrument type/method, quantity, nuclide/source, reference standard, international standard, chemical matrix and analyte.

2.1.1 Filter for Quick Search - CMCs

A set of filters is displayed to the left of the search result page, indicating the initial number of occurrences of each filter component. The filters can be activated or deactivated by ticking the box OR by clicking on the underscored item.[3]

[3] It should be noted that the illustrations containing CMC information and contents are only examples and may not be included in the actual database.

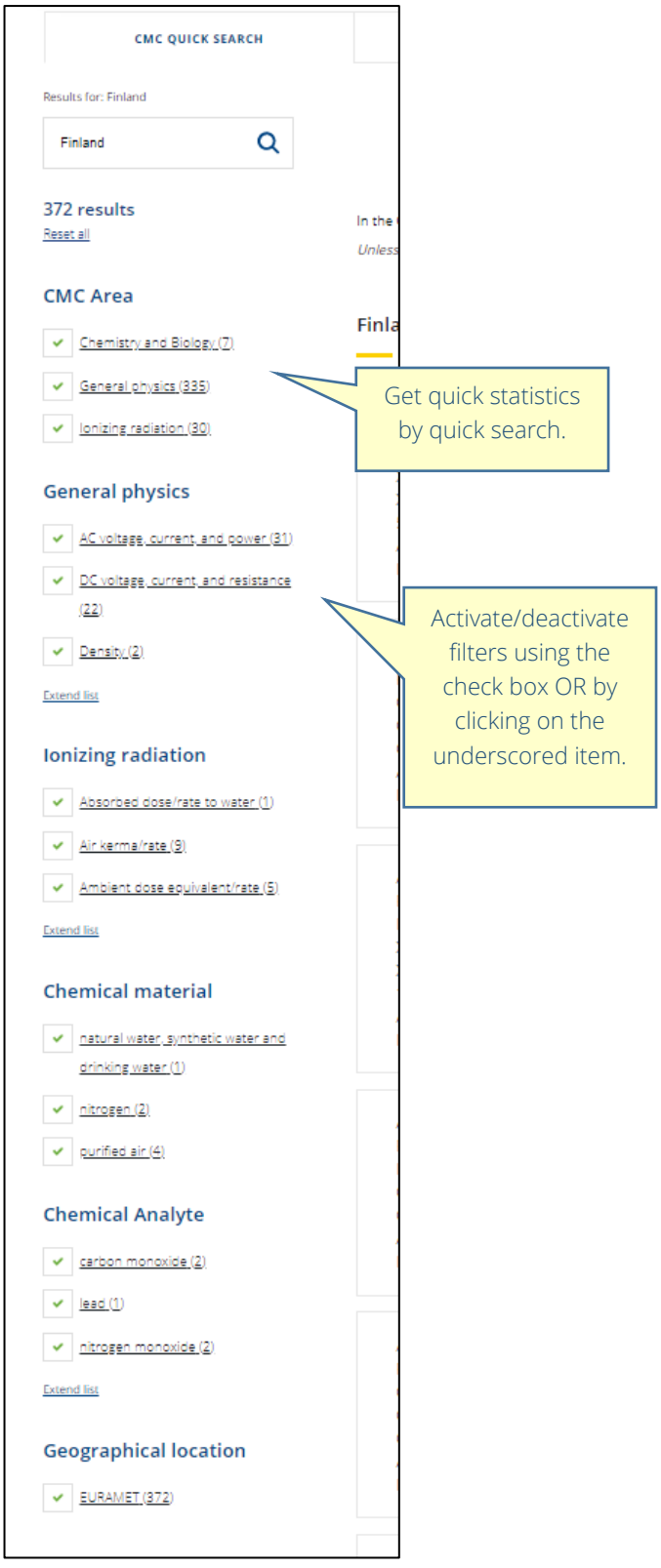

Figure 3-a *Example of a filter list obtained by using quick search.*

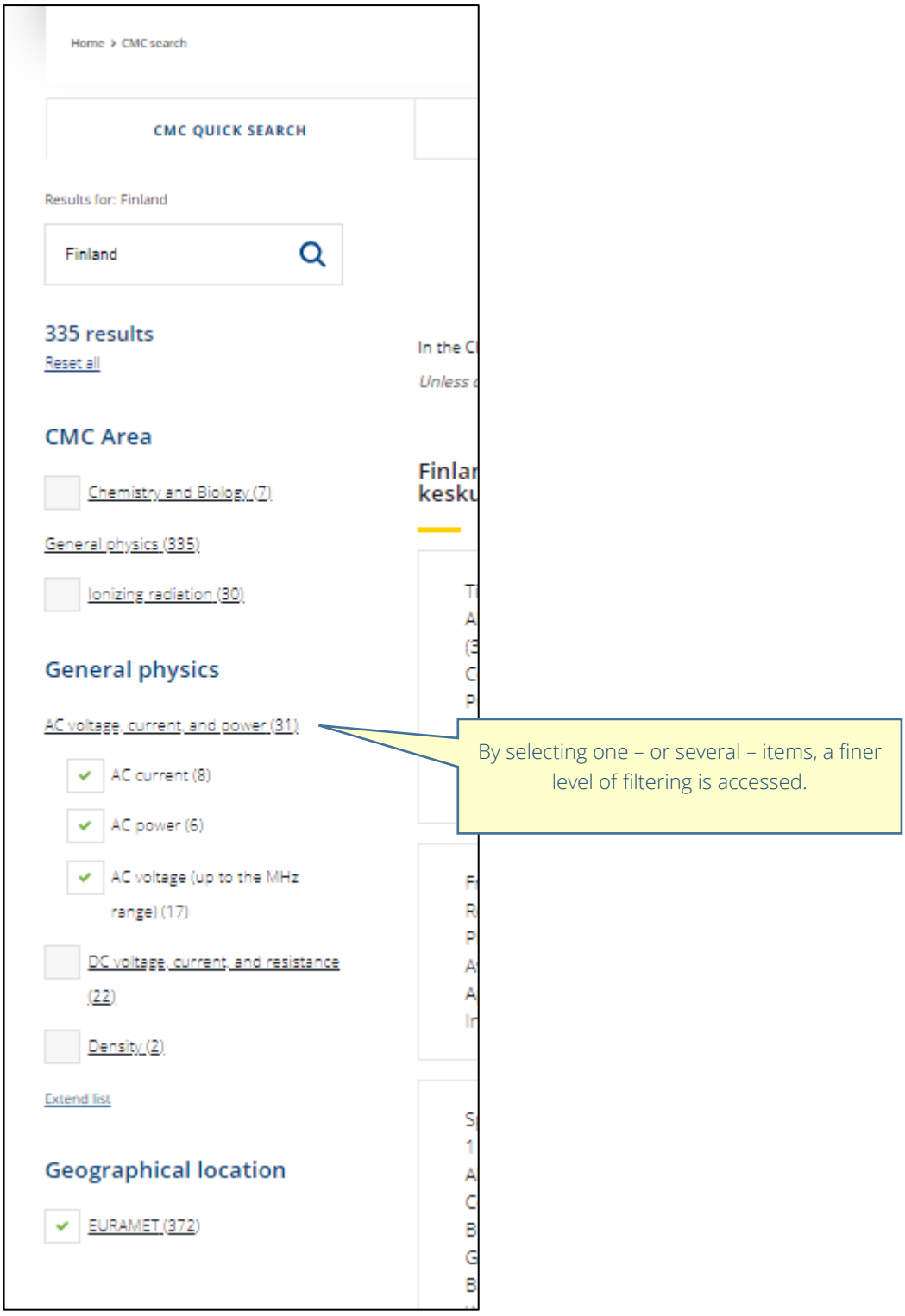

Figure 3-b *Example of refined filtering.*

Figure 4 *Each CMC appears in a cell as a result after quick search.*

2.2 ADVANCED SEARCH – CMCS

The Advanced Search for CMCs allows searching within one metrology area.

Following the selection of a metrology area, a set of predefined dropdown menus related to the classification of services becomes available.

The search for CMCs may be complemented by

i) a free keyword search. A space will be interpreted as the logical operator 'AND'. The logical operator 'OR' can also be used.

In "Other filters" are available:

ii) filtering on one or several countries

iii) filtering on the approval date within a time interval[4]

iv) filtering on a unit of the measurand that can be combined with – as an option – with a selected range for the measurand value and/or the expanded uncertainty (Numerical search).

[4] CMCs published before 2004, date at which the date of approval of CMCs by the JCRB started being published, have been given the date 2001 by default.

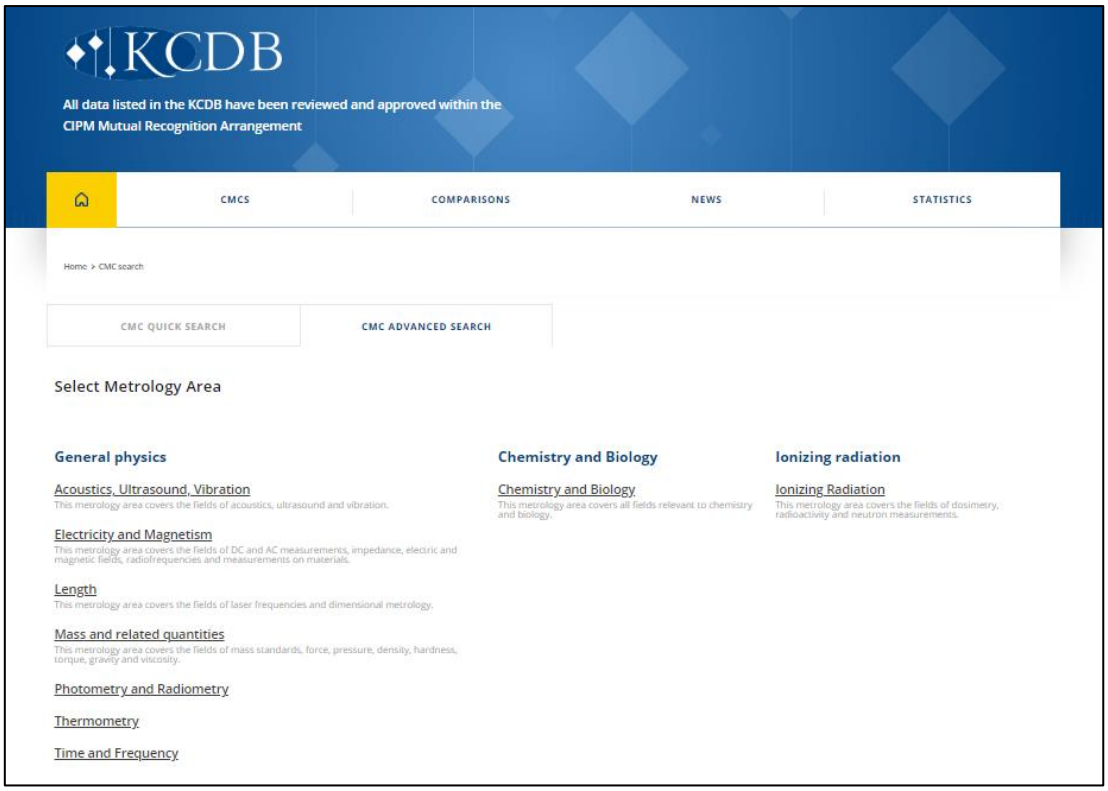

Figure 5 *The advanced search on CMCs targets each metrology area.*

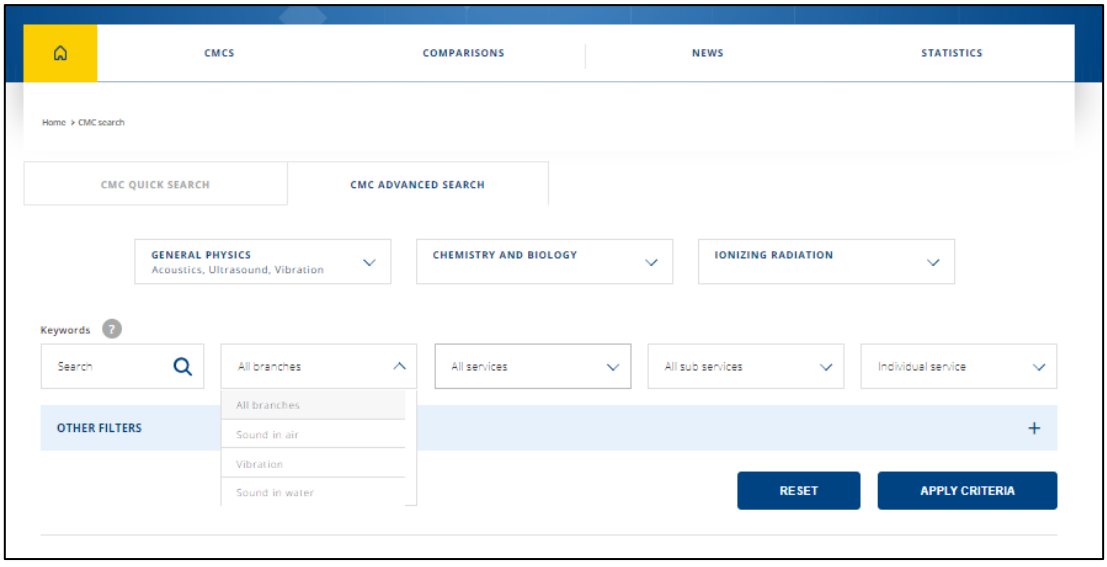

Figure 6 Example of the main form for advanced searching on CMCs.

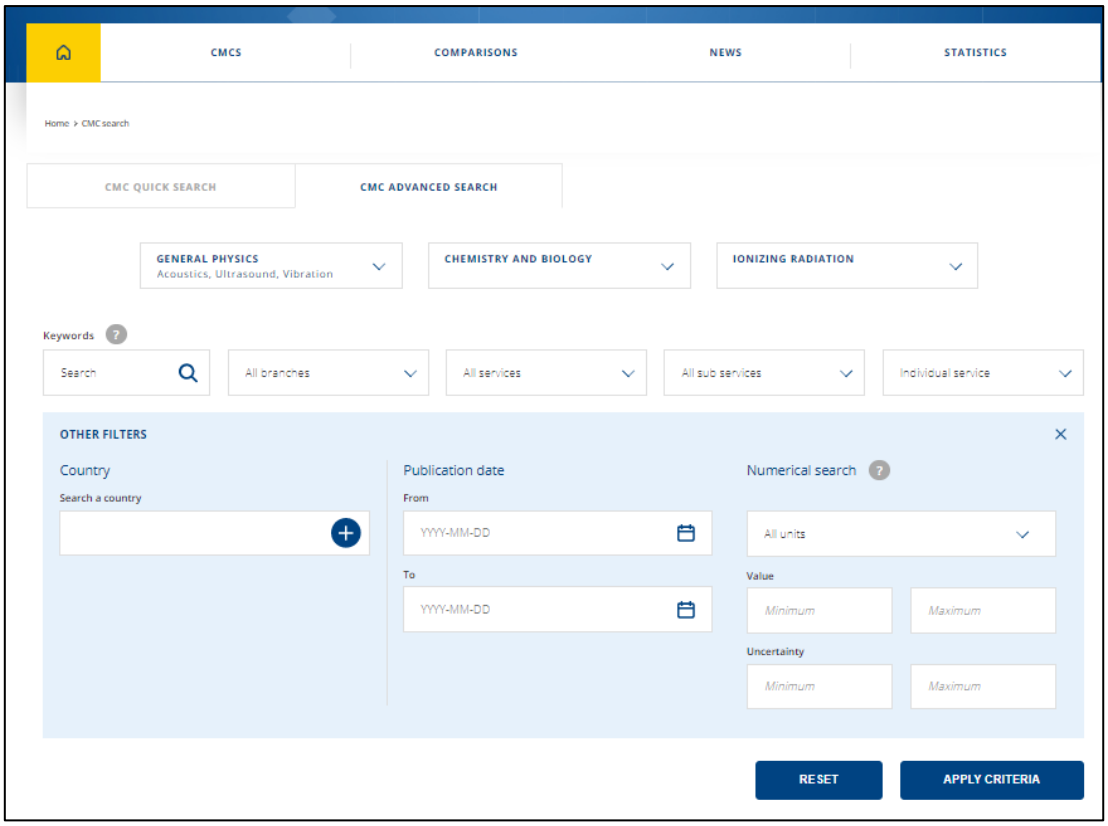

Figure 7 *Complementary filters for advanced search on CMCs.*

Search results obtained via advanced search are listed in a table.

Table format allows sorting of the data.

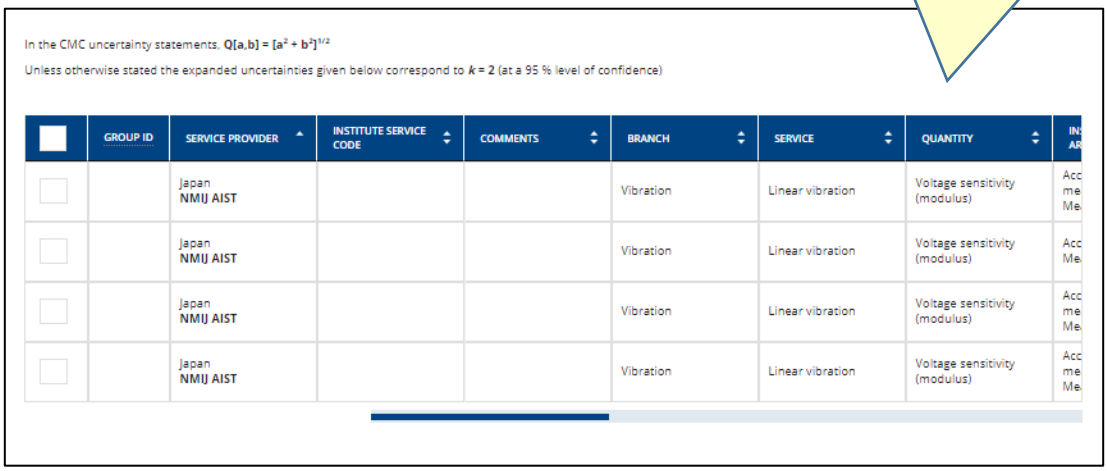

Figure 8-a Example of displayed results from advanced search on CMCs – left part.

Information in additional columns is displayed by scrolling the table horizontally.

The selected CMCs may be exported to a formatted spread sheet (Excel). This file can be used to establish the CMC record for an institute.

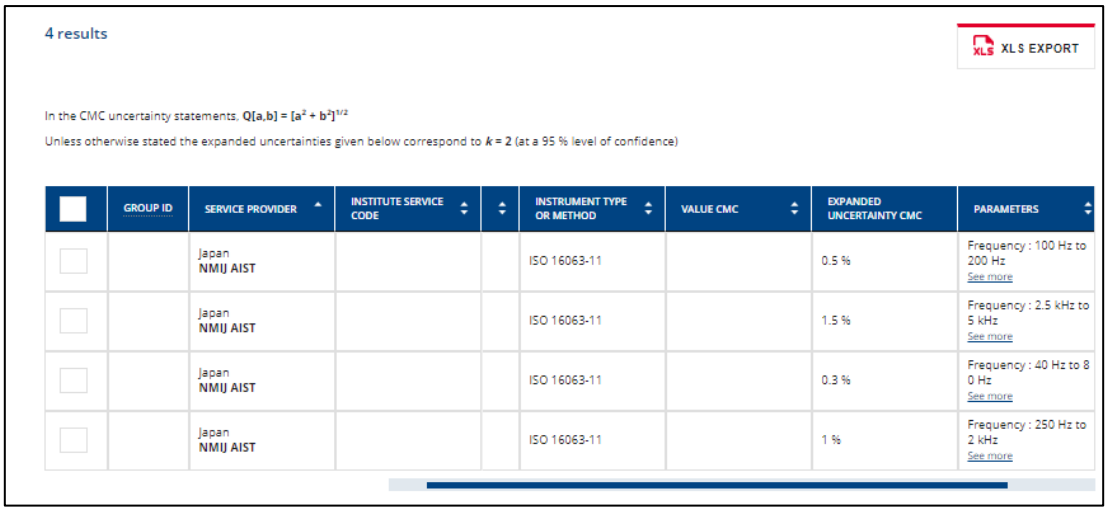

Figure 8-b *Example of displayed results on CMCs from an advanced search on CMCs – right part.*

The extreme-left column indicates an icon if the listed CMC is related to another CMC.[5]

Examples:

i) In electricity and magnetism, real and imaginary parts of a measurand are declared as separate CMCs, but are related.

ii) In chemistry and biology, several analytes may be detected simultaneously within the same chemical matrix. These are regarded as separate CMCs, but are related.

iii) In ionizing radiation, several radionuclides may be detected simultaneously within the same matrix. These are regarded as separate CMCs, but are related.

By clicking on the icon, the related CMCs will be displayed.

2.3 NUMERICAL SEARCH

The advanced search gives access to search on the numerical values of measurand or uncertainty.[6]

[5] The icon is generated by indicating a group identifier when editing the CMC.
[6] Certified Reference Material values are not covered by the numerical search, only the given CMCs.

It is necessary to indicate the metrology area and unit for the search. If only the metrology area is indicated, all registered units will be available for the search within the chosen metrology area. A limited set of units is available if the sub-service (General physics), category (Chemistry and Biology) or branch (ionizing radiation) has been selected.

Empty minimum and maximum values for measurand and uncertainty are interpreted as $-\infty$ and $+\infty$, respectively. Both absolute and relative uncertainties are included. Prefixes, such as mm, are available for comfort but do not act as filter – all derviatives from the base unit 'm' will be included.

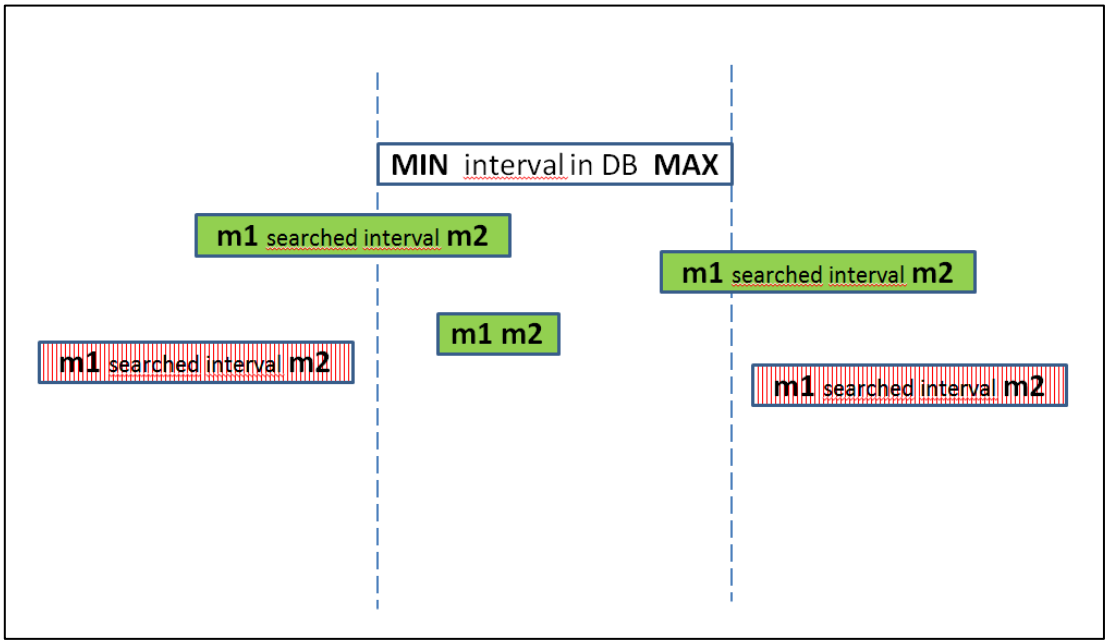

Figure 8-c *Illustration of inclusion of 'hits'. The declared measurand or uncertainty interval of the CMC is represented by the white rectangle. Any indicated interval that overlaps with the declared interval will be interpreted as a 'hit' (green plain rectangles). Indicated intervals with no overlap with the declared interval will be filtered from the search results (red striped rectangles).*

In some cases, the range of the CMC in indicated "reversed", for example the smaller value of the uncertainty has been indicated as the upper limit, to be aligned on the measurand value. This has no impact on the search: the search function checks that the range indicated by the user for search covers either the upper or lower limit of the CMC.

This search facility is ***inclusive***, i.e. as soon as search value corresponds to a part of the published range for a CMC, the published CMC will be listed.

3 COMPARISONS : SEARCH

Two different methods of search are available:

- Quick search, where free search words are idicated by the user
- Advanced search, where a set of predefined menus are available.

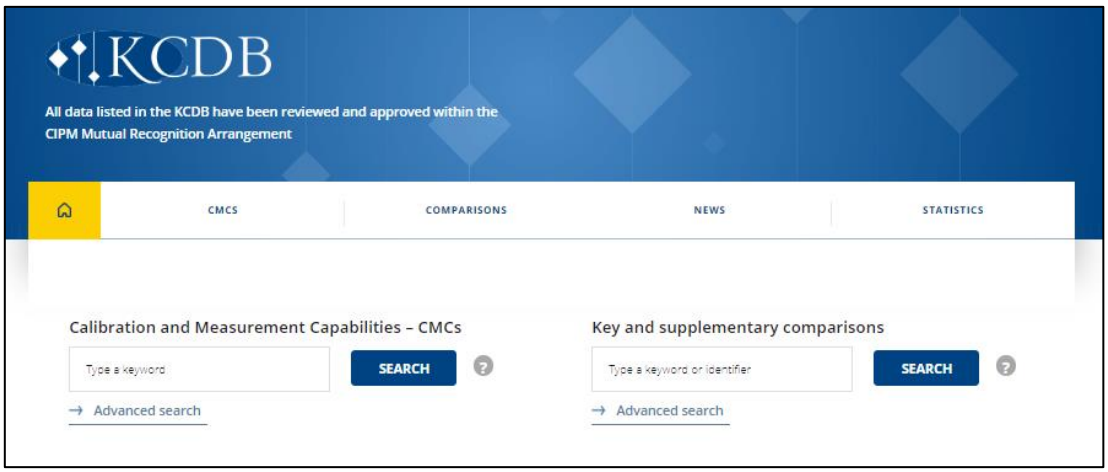

Figure 9 *Free access to search facilities on comparisons.*

3.1 QUICK SEARCH – COMPARISONS

Searching for Comparisons is accomplished here by giving one or several keywords.[7] A space will be interpreted as the logical operator 'AND'. The logical operator 'OR' can also be used.

Each Comparison resulting from Quick Search is listed as a separate entity.

3.1.1 Filter for Quick Search - Compaisons

A set of filters is displayed to the left of the search results indicating the initial number of occurrences of each filter component. The filters can be activated or deactivated by ticking the box OR by clicking on the underscored item[8]

[7] The following fields are indexed: comparison identifier, country, validity, description, sub-field, country, measurand, institute, start and end year, transfer device, status, RMO, comparison type, metrology area and organization.

[8] It should be noted that the illustrations containing comparison information and contents are only examples and may not be included in the actual database.

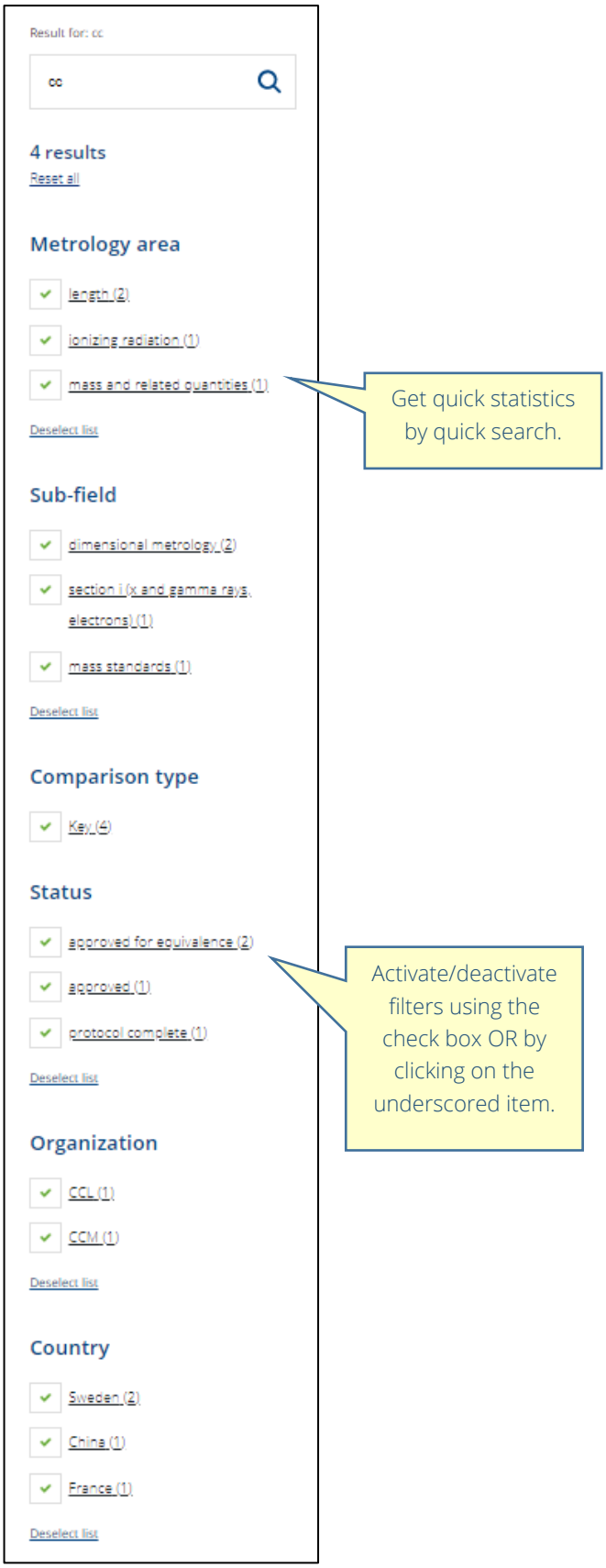

Figure 10-a *Example of filters obtained for comparisons by a quick search.*

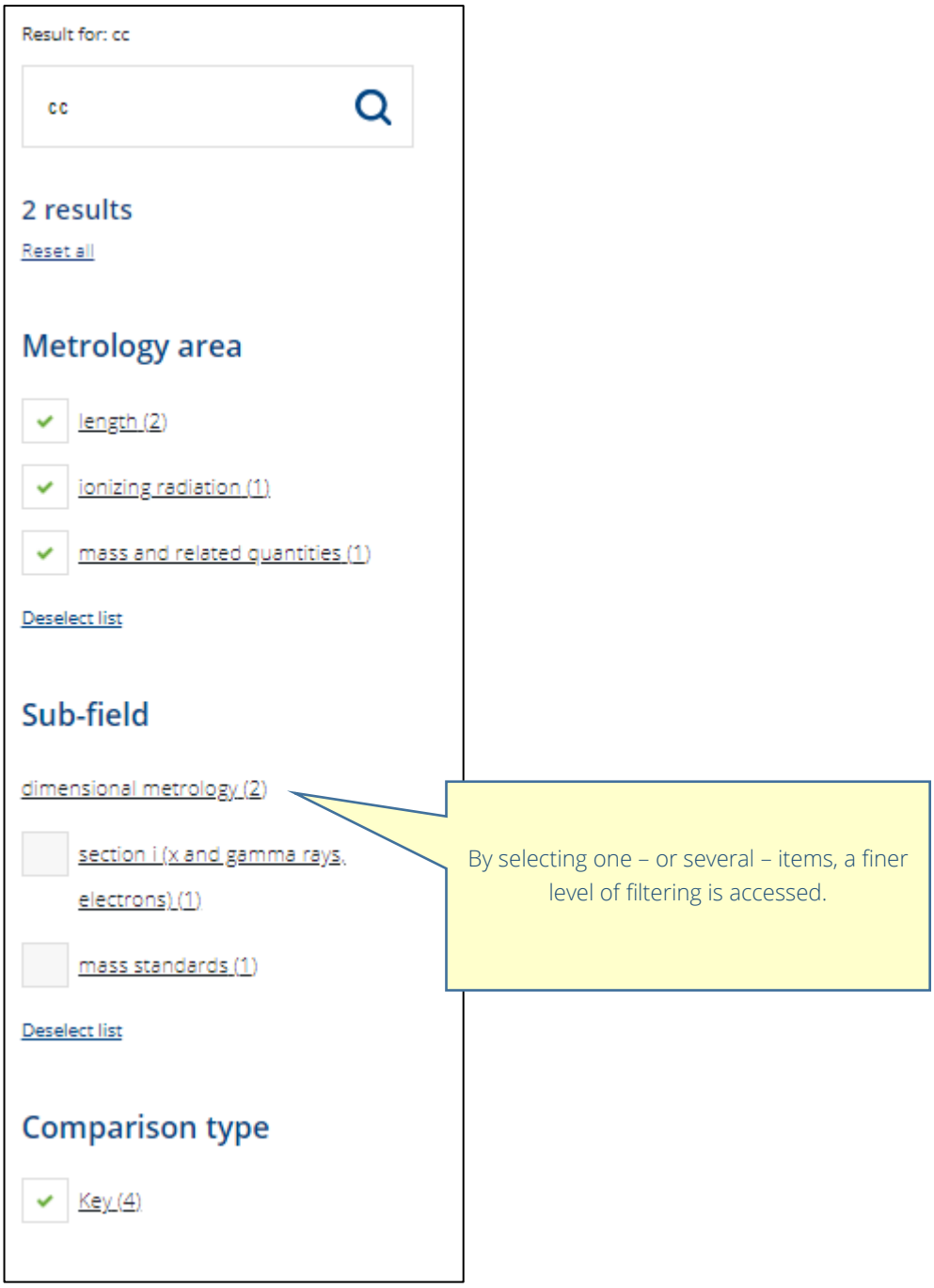

Figure 10-b Example of a refined filtering on comparisons.

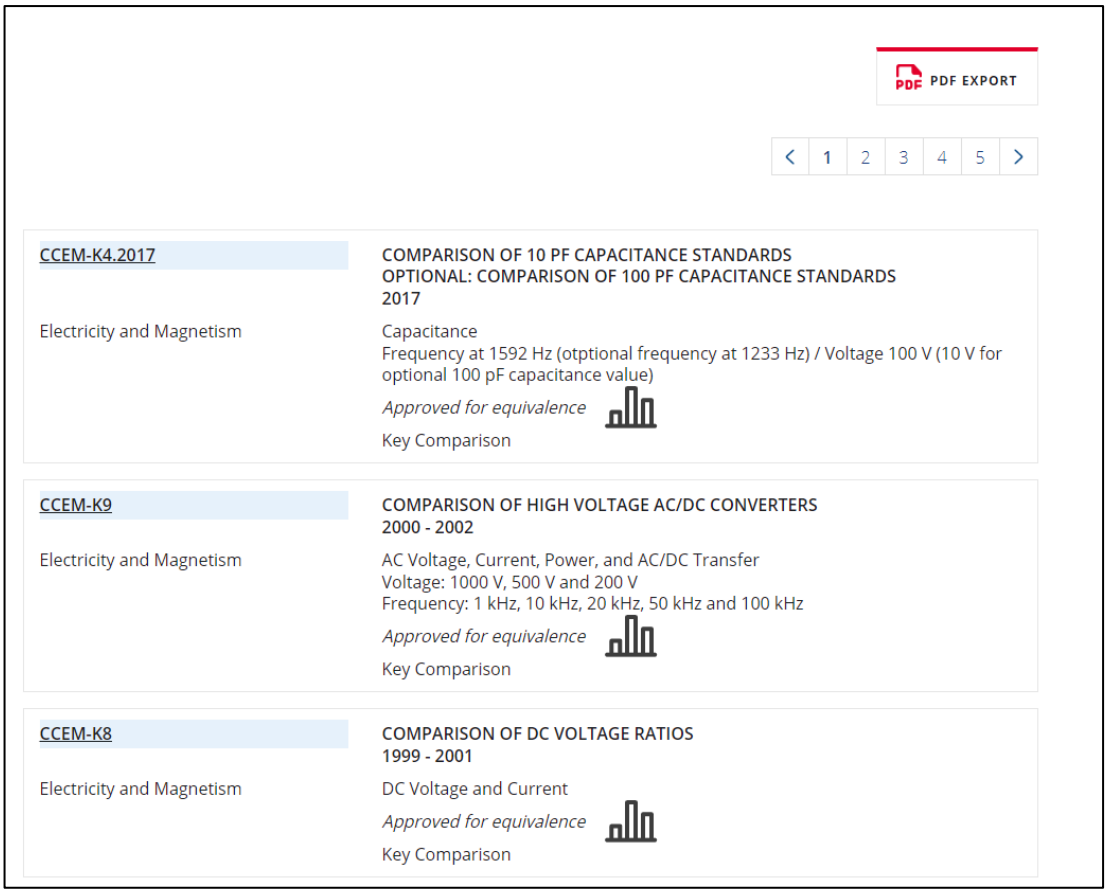

Figure 11 Each comparison appears in a cell as a result after quick search.

3.2 ADVANCED SEARCH – COMPARISONS

The Advanced Search is carried out via a set of predefined dropdown menus covering metrology area and related sub-field, type of comparison, and organising body of the comparison. The search may be completed by

i) giving one or several keywords. A space will be interpreted by the logical operator 'AND'. The logical operator 'OR' can also be used.

In "Other filters" are available:

i) filtering on country (of pilot or participant).

ii) filtering on stautus/progress of the comparison.

iii) filtering on the measurement period.

iv) filtering on the validity (current or archived[9]).

[9] Comparisons classified as obsolete are archived and are still available in the KCDB.

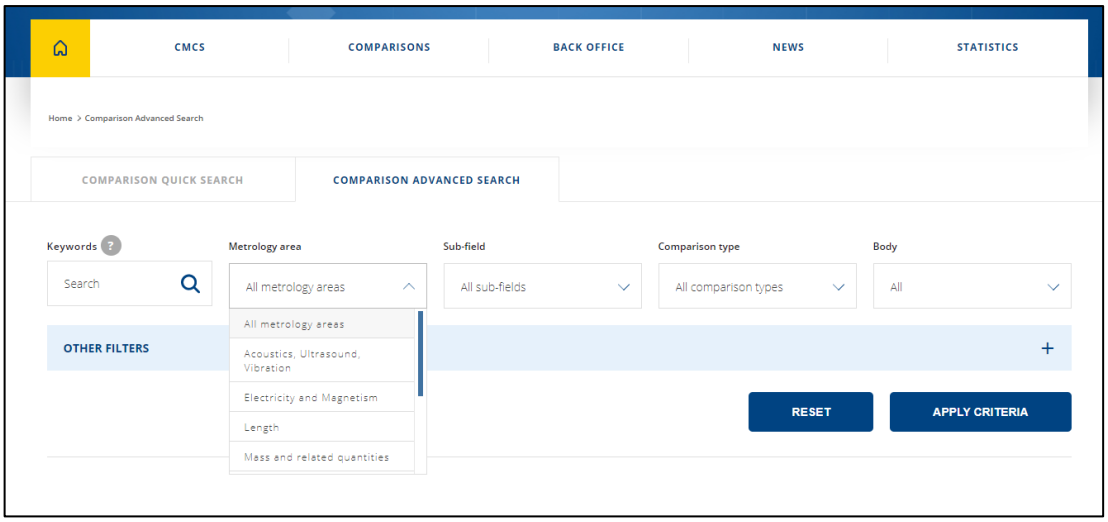

Figure 12 *The advanced search on comparisons targets each metrology area.*

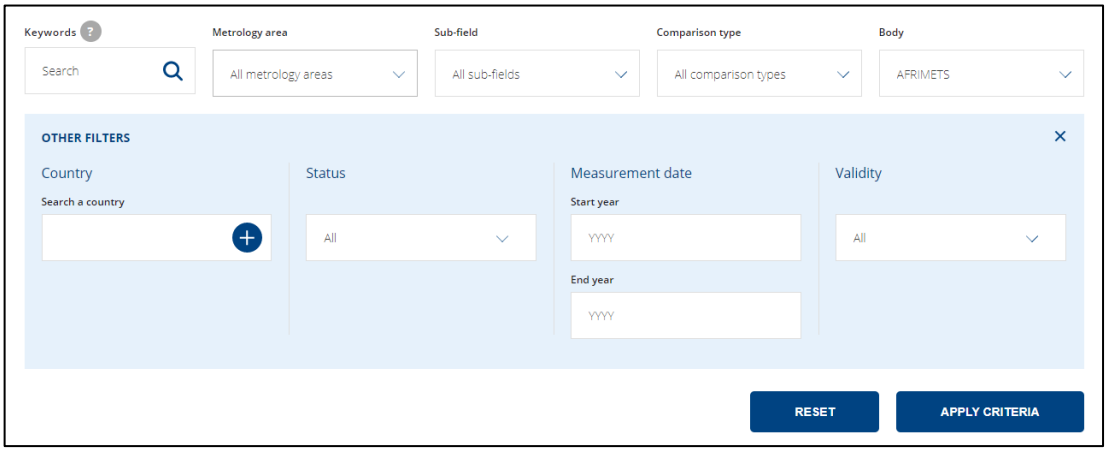

Figure 13 *Complementary filters available for advanced search on comparisons.*

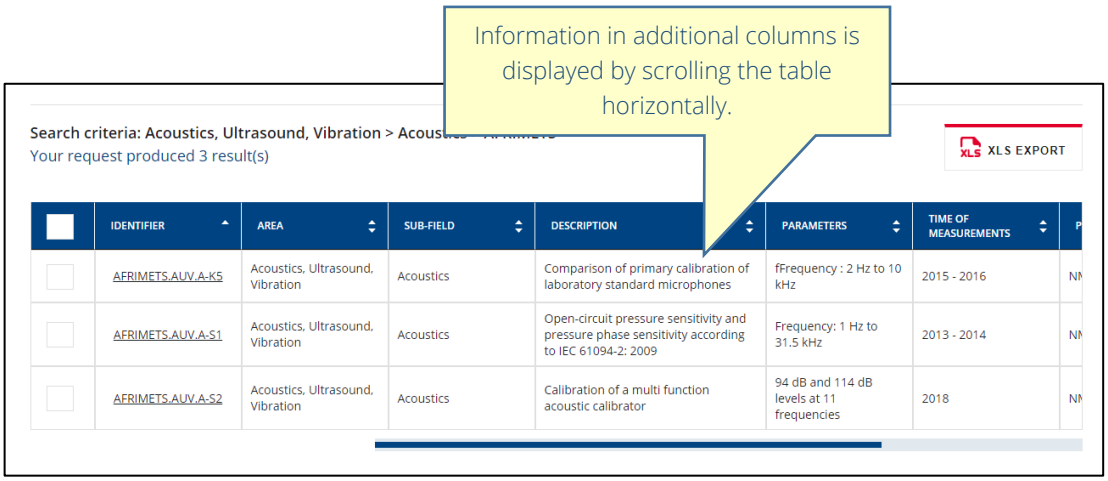

Figure 14-a *Example of displayed results from advanced search on comparisons – left part.*

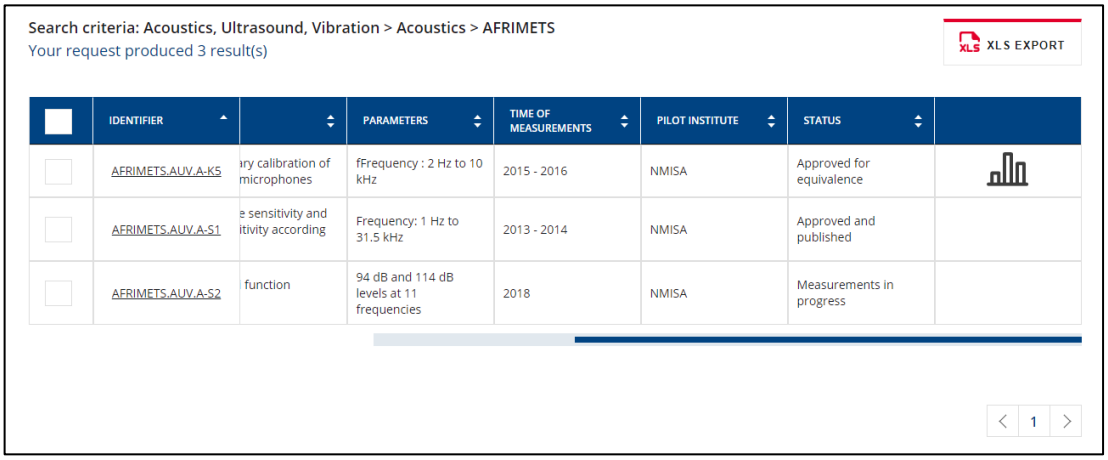

Figure 14-b *Example of displayed results from advanced search on comparisons – right part.*

4 NEWS : SEARCH

When new data has been published, a short notice is added and displayed on the Home Page. These news are stored and are searchable under the tab “News”

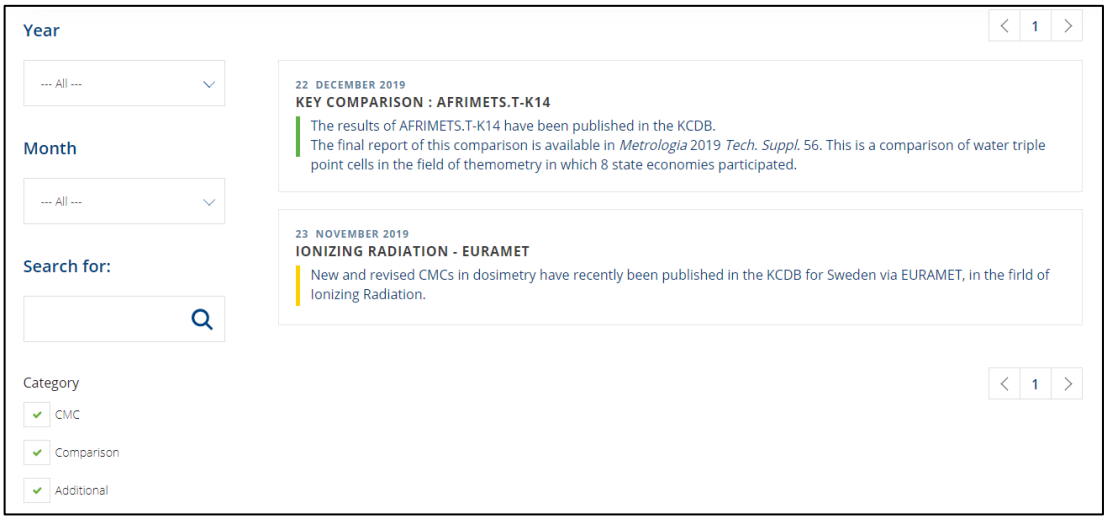

Figure 15 *Example of displayed results from search on news.*

5 STATISTICS: CMCS AND COMPARISONS

A statistical tool is available from the KCDB Home Page, covering selected information on CMCs and Comparisons. For sevral of the functions, the user may generate targeted data via a menu.

5.1 CMS STATISTICS

Choosing “CMC statistics” four displays on CMC data are made available. All numerical contents and graphs can be exported to a pre-formatted spread sheet.

5.1.1 Export CMC statistics by country

The number of CMCs for each country, metrology area and expertise are exported to a formatted spread sheet.

5.1.2 Number of CMCs by metrology area

The CMCs as a function of each metrology area are displayed in a histogram. The data may be filtered for an RMO or for a country.

5.1.3 Number of CMCs by RMO

The CMCs as a function of each RMO are displayed in a histogram. The data may be filtered for a metrology area.

5.1.4 Number of CMCs by approval year

The CMCs as a function of approval year are displayed in a histogram. The data may be filtered for a metrology area. An additioanl filter may be applied for an RMO, alternatively for a country.

5.2 KEY COMPARISONS BY STATE OR ECONOMY

A table listing the number of key comparisons by state or economy is generated. The numerical data and corresponding graph are available by exporting the data to a pre-formatted spread sheet.

5.3 SUPPLEMENTARY COMPARISONS BY STATE OR ECONOMY

A table listing the number of supplementary comparisons by state or economy is generated. The numerical data and corresponding graph are available by exporting the data to a pre-formatted spread sheet.

5.4 MORE COMPARISON STATISTICS

Choosing “More comparison statistics” four displays on comparison data are made available. All numerical contents and graphs can be exported to a pre-formatted spread sheet.

5.4.1 Number of key and supplementary comparisons by metrology area

The data is represented in a stacked histogram, with the possibility to filter the data on organization.

5.4.2 Number of key and supplementary comparisons by organization

The data is represented in a stacked histogram, with the possibility to filter the data on metrology area.

5.4.3 Number of key and supplementary comparisons by country

The data is represented in a stacked histogram, with the possibility to modulate the choice of country, and filter the data on metrology area.

5.4.4 Number of key and supplementary comparisons by year

The data is represented in a stacked histogram, with the possibility to modulate the choice of yer(s) and filter the data on metrology area.

6 LIST OF EDITORIAL MODIFICATIONS

Date	Modification
2020-04-07	Added information to Section 2.1. Added Section 5.
2022-02-02	Added inforation on numerical search, p. 15

Bureau
International des
Poids et
Mesures

Bureau International des Poids et Mesures
BIPM - Pavillon de Breteuil F-92312 Sèvres Cedex FRANCE