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## Instructions for writing calibration certificates

The calibration certificates issued by MIKES-Aalto Mittaustekniikka, are generated and distributed electronically and signed digitally. If for some reason a paper certificate has to be issued, refer to older version 3.2 of these instructions.

All the texts on the cover page are in three languages. The certificate can be filled in Finnish, English, or Swedish, whichever is most practical for the situation. The language to be used must be agreed with the customer before writing the certificate. Templates are available in English and Finnish.

### 1 Procedure for preparing a certificate

#### 1.1 Before calibration

Before starting the calibration, reserve a number for the certificate (Chapter 3.3).

Create a folder with name T-R\_XXXX in folder

```
\\work\T405\MIKES-Aalto\Calibrations\
```

Prepare a Calibration Checklist for the calibration (Chapter 2.5), check items in section “Before calibrating,” and store the checklist in the opened folder.

#### 1.2 After calibration

Prepare the certificate using Word (Chapter 3). Name your calibration certificate file as T-R\_XXXX.docx, where XXXX is the running number of the certificate. Place the certificate in the folder you created in Chapter 1.1. All work with the certificate takes place within this folder.

Place possible appendixes in the folder. Name them with the same name as the certificate, e.g. Excel attachment as T-R\_XXXX.xlsx. Lock the Excel attachments for unintentional changes, <File>, <Info>, <Protect Workbook>, <Always Open Read-Only>.

Check your certificate using the Checklist (Chapter 2.5). After checking, notify the person who checks the certificate that the certificate is ready for checking.

Checking the certificate takes place within the directory. Rename new versions and leave old versions in the folder. When ready, both calibrator and checker are happy with the contents and have filled in the Checklist.

Save final version of the certificate as PDF and sign it digitally. Get the checker to sign it as well.

### 1.3 After signing

Check the final points in the Checklist, “After signing the certificates.” Attach stickers (Chapter 2), return the devices, send the certificate, have the calibration invoiced (Chapter 6), complete the paper work.

Zip the folder where you have worked your certificate. Save the zip-file T-R\_XXXX.zip in folder

```
\\work\T405\MIKES-Aalto\Calibrations\REPORTS\
```

Move the original folder to your own collections.

### 1.4 Archiving files

Every now and then, the Quality Manager reviews the certificates in directory

```
\\work.org.aalto.fi\T405\MIKES-Aalto\Calibrations\REPORTS\
```

and transfers them to the non-erasable archive in the same directory.

### 1.5 Paper copies

If a paper copy of a certificate is prepared for a customer, two originals are written. One is given to the customer and one is archived in MRI’s archive (drawer in the small entrance room of room 3528 behind the fridge). The archive certificate may also be a photocopy of the signed certificate delivered to the customer.

## 2 Calibration stickers

The calibrated artifacts are marked with stickers. The sticker may be attached either to the calibrated equipment or to the box of the device, depending on the situation. Calibration date and the number of the calibration certificate are written to the stickers. Stickers are available from the Head of Calibration Services.

Own devices are marked with stickers if the devices are in general use. This concerns e.g. DVM’s, Current-to-Voltage converters, pyroelectric radiometers, humidity meters, etc. Devices that are used by dedicated personnel only, and whose calibration history is maintained with some other methods, do not have to be marked. This concerns e.g. irradiance lamps, trap detectors, standard filters, whose use is limited, calibration history is maintained in a database, and marking is in many cases complicated.

Fine felt tip pen with permanent ink should be used. Pen types

- PILOT Super Color Marker, and

- PILOT CD-DVD Marker

have been tested for the ink quality and can be used with the calibration stickers.

### 3 Calibration certificates

All calibration certificates written must have the same structure and carry the same information. Therefore, there are sample certificates that can be used as a form when writing a certificate. These sample files are located in the network server in the directory

\\work.org.aalto.fi\T405\MIKES-Aalto\Calibrations\Templates\

The sample certificates are available in two languages. The latest versions can be determined from dates. Presently they are English\_2022.docx and Finnish\_2022.docx.

In addition, there are sample certificates named Report\_2022.docx and Raportti\_2022.docx. These certificates do not contain anything that would relate with the activities of National Standards Laboratory. The certificate is labelled “MITTAUSPÖYTÄKIRJA” / “MEASUREMENT REPORT.” These templates are used with internal calibrations and measurements for customers that are outside the official scopes of MIKES-Aalto but have to be reported and archived.

The most recent version of this file, AnnexC.docx, is stored in

\\work.org.aalto.fi\T405\MIKES-Aalto\Quality\QMS\

#### 3.1 Filling the certificates

The sample certificates have been pre-formatted for unified appearance. Avoid changing titles, structure, and formatting of the certificates. Fill in the information specific for the calibration. Check that the automatic fields (dates, page numbering) are correct.

#### 3.2 Contents of the certificate

The content of the certificate should be as is in the sample files.

The headings in the certificate (after the cover page) should be:

- Calibrated artefacts (Kalibroidut laitteet)
- Calibration method (Kalibrointimenetelmä)
- Measurement standards used in calibration and traceability (Kalibroinnissa käytetyt mittanormaalit ja jäljitettävyys)

- Calibration conditions (Kalibrointiolosuhteet)
- Measurements (Mittaukset)
- Calibration results and measurement uncertainty (Kalibrointitulokset ja mittausepävarmuus)
- Remarks (Huomautukset)

With field calibrations, or other rare calibrations where no detailed equipment lists have been written, you may include chapter “Equipment needed (Tarvittavat laitteet)” where you list the devices needed to assist preparation for the calibration visit. Such information can also be included in the Remarks-section.

Do not use other heading names unless necessary. Further information on the contents under each heading is given in the blank certificates.

### **2.3. Statements of conformity, opinions, and interpretations**

As a rule of thumb, statements of conformity, opinions, or interpretations are not written to calibration certificates. However, they are allowed in the measurement reports. If a statement is to be given, the decision rule applied will be negotiated with the customer prior to issuing the certificate.

When a statement of conformity to a specification or standard is provided, the decision rule employed, taking into account the level of risk associated with the decision rule arising from uncertainty, is written to the certificate and applied. If opinions and interpretations are given, the basis upon which the opinions and interpretations have been made shall be written to the report.

Statement of conformity, opinions, and interpretations are only to be expressed by the corresponding Branch Manager, and the report containing the expression has to be accepted by the Quality Manager. In case the Branch Manager is the Quality Manager, the acceptance takes place by the Head of Calibration Services.

### **2.4. Printing the certificates**

The certificate is printed as PDF. This can be done in two ways:

1. Printing to a PDF-printer, such as PDF-Xchange-Standard
2. Saving in PDF-format: <File><Save as><PDF (\*.pdf)>

### **2.5. Signing and checking the certificates**

The front page of the certificate is signed by the person carrying out the calibration (on the right), and the person who checks the certificate, typically the branch manager

(on the left). Personnel are not allowed to check and approve work of their superiors in the organizational chart defined in the Quality System document.

Certificates are checked against a checklist stored in

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\\work.org.aalto.fi\T405\MIKES-Aalto\Calibrations\Templates\
```

The present version is Calibration\_Cheklist\_Nov\_2022.xlsx. The checklist has two columns. The first column is checked and signed item by item by the person carrying out the calibration. The second column is then checked and signed by the checker. The checklist is opened and stored in the very beginning when starting calibrations, and it follows the calibration. At the end, it is saved with the certificate in the archive.

### 3.3 Certificate numbering

Each certificate has a unique number in the form T-R XXXX, where XXXX is a running number. There is a list of performed calibrations in the directory

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\\work.org.aalto.fi\T405\MIKES-Aalto\Calibrations\
```

of the network server, where the last number can be checked. The latest file is named Cal2022.xls. Next year the file will be Cal2023.xls and so on. Fill this file concerning your own calibration. Reserve a number for the certificate already when starting or preparing for the calibration, and in any case before sending the certificate to a customer. If for some reason appearing later, you do not use the certificate number, cross it over in the list and write explanation to the right-most cell indicating why the number was not used.

## 4 Internal certificates

There are certain calibrations, such as aperture area measurements and multimeter calibrations that are needed for maintenance of the scales, but where Aalto does not have a contract with MIKES. These calibrations need to be documented as calibration certificates, but official calibration certificates cannot be issued. Such results are written in a series of Internal Calibration Certificates. These certificates should be written using the template Report\_2022.docx.

Internal calibration certificates bear the same format as official calibration certificates. Instructions on official certificates apply wherever practical. The main difference is that these certificates are labelled “Mittauspöytäkirja” / “Measurement Report.” In the template used, all texts and logos referring to National Standards Laboratory, VTT-MIKES or MRA CMC have been removed.

Internal calibration certificates are named INT\_XXX.docx, where XXX is the running number of the certificate. Prepare and archive them with the same procedure as the calibration certificates (Chapter 1).

Numbering of the performed calibrations is recorded in the list CAL\_INT.xls. File name is not changed annually.

## 5 Calibrations outside the official CMC scopes

Basically, all calibrations written as official certificates should be compatible with BIPM CMC database:

<https://www.bipm.org/kcdb/>

It is sometimes a necessity to perform calibrations that violate these principles, i.e. the results are outside the accepted CMC entries or ranges. To deal with these problems there are two acceptable ways:

- 1) If all or most of the results are outside the scopes of the CMC, the results should not be written as official certificates. The results will be written as Measurement Reports as explained in Chapter 4. One exception occurs: These reports will be assigned a T-R XXXX number, and the reports are archived and treated as official calibration certificates. This procedure applies e.g. to calibration of rare quantities, where there is no regular calibration need, and therefore writing the quality system needed to get acceptance to CMC would require too much work as compared to volume of calibrations.
- 2) Sometimes most of the work carried out is compatible with the CMC database, but some values are outside the scopes. In such cases, official certificates will be issued, but the non-conformities have to be identified in the certificates. A suitable way to do this is e.g. to print non-conforming values in *Italic* font, and write a statement: “Values reported in *Italic* font are outside the official scope of the laboratory.”

In all of the cases above, the customer has to be notified about the procedure, and the reason has to be explained. Before starting the calibrations, it should be made clear with the customer that he/she understands the situation and that he still wants the measurements to be performed.

## 6 Invoicing and feedback

Invoicing of the calibrations takes place through Aalto. Calibration details are sent to the financial secretary of the group, who then takes care of the invoicing. Include in the e-mail the following information:

in Finnish:

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Asiakkaan nimi ja laskutusosoite:

Asiakkaan yhteyshenkilö, puhelinnumero:

Kalibroinnin kohde (laite ja/tai suure):

Todistuksen nro:  
Kalibroinnin hinta (alv 0%):  
Asiakkaan viite:  
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in English:

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Customer's name and invoicing address:  
Customer's contact person and phone number:  
Calibrated item (device and/or quantity):  
Certificate number:  
Calibration price (VAT 0%):  
VAT No. (EU excluding Finland):  
Customer's reference:  
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With foreign EU customers, note the VAT number.

Feedback is collected electrically. Include one of these texts in the E-mail when you send the certificate:

“We would appreciate your feedback on our calibration services. Please take a minute to complete a survey in <https://webropol.com/s/mrifedback>”

“Vastaanotamme mielellämme palautetta kalibrointipalveluistamme. Palautetta voi antaa täyttämällä kyselyn osoitteessa <https://webropol.com/s/mrifedback>”