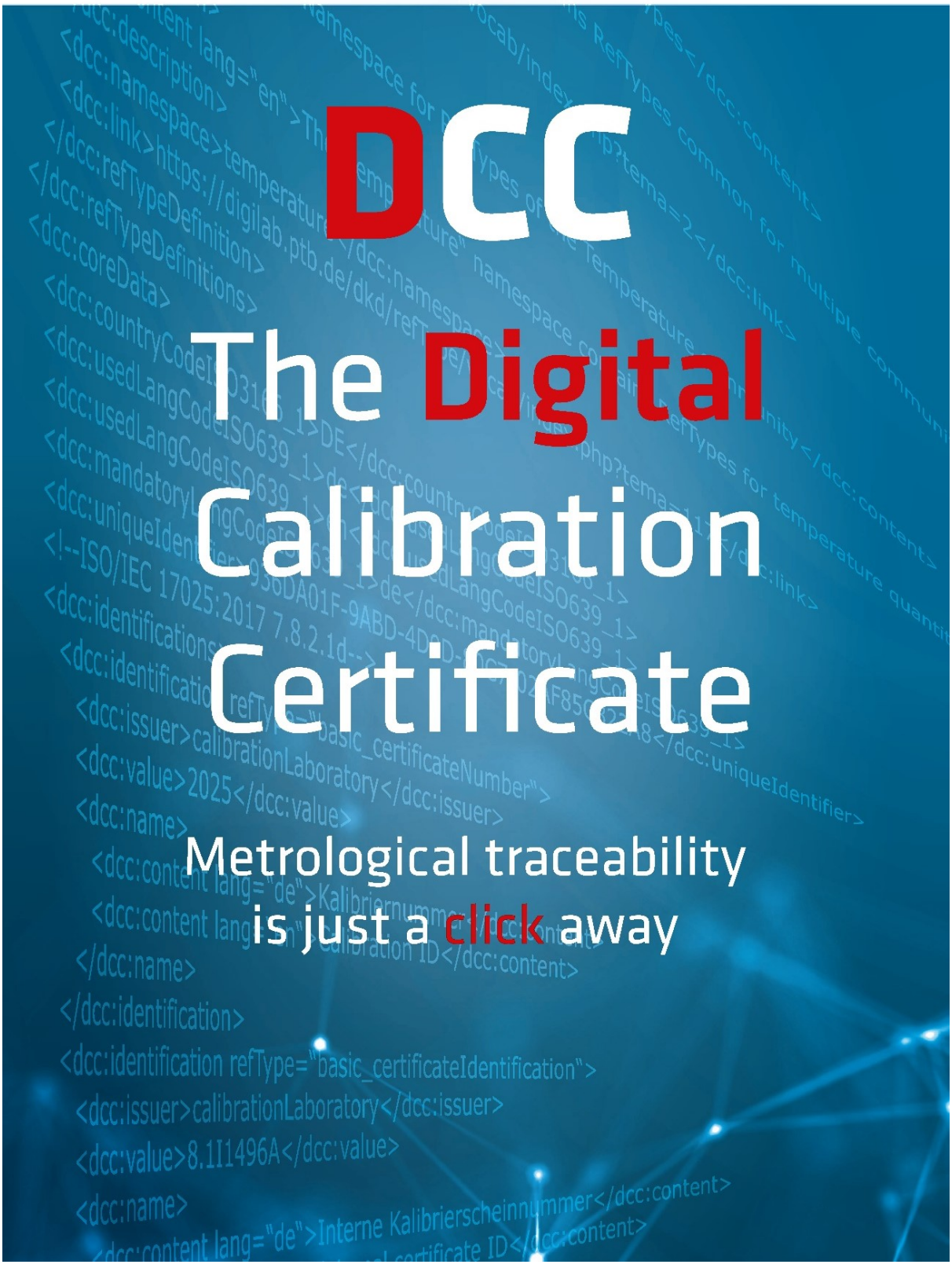
QI DIGITAL

BAM
Bundesanstalt für Materialforschung und -prüfung

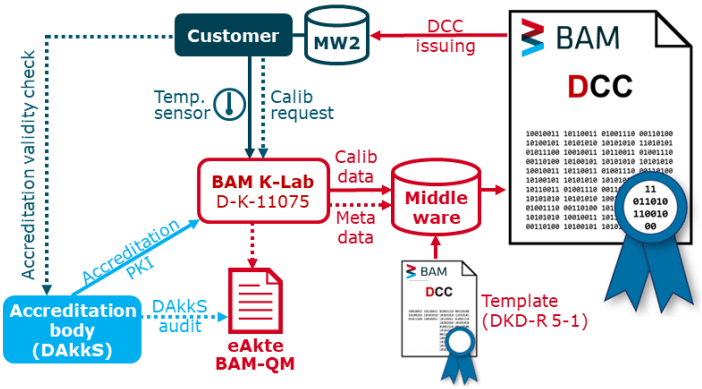


DCC: The digital calibration certificate

Metrological traceability is just a click away

Automation in the metrological traceability of measurements bears high potential for a more effective quality management with less human interaction and reduced risks from manual data processing. A *digital calibration certificate* (DCC) contains all metrological and administrative information in a fully machine-readable and machine-interpretable form. Being compliant to the ISO/IEC 17025 standard and other quantity and process specific requirements, the DCC is ultimately aspired to be provided as *the* valid and original calibration certificate, also within the scope of an accreditation. Hence, an additional human-readable counterpart in an analogue (paper) or digital (*e.g.* PDF) form is no longer required.

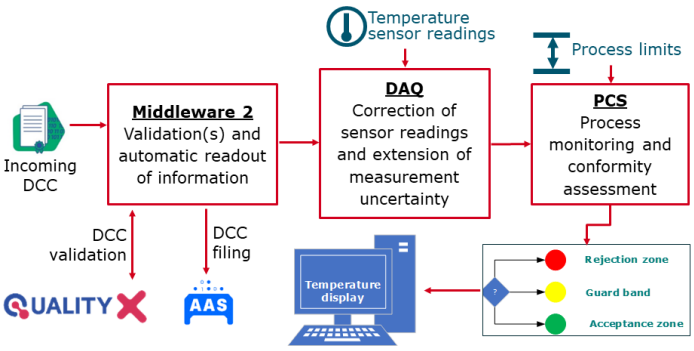
The DAkkS-accredited calibration laboratory (D-K-11075-08) of the German Federal Institute for Materials Research and Testing (BAM) has established valid DCCs for calibrations of resistance thermometers (*e.g.* Pt100) within the national QI-Digital initiative. These XML documents are automatically generated using a self-implemented middleware that is compiling the metadata (*i.e.* customer-, order-, item- and method data) and combines it with the measured calibration data and influence conditions into a process- and lab-specific DCC template.



Process flow for the automated generation of an accredited DCC (eAttestation) in the BAM calibration lab

Since the DCCs are issued as accredited calibration certificates (*eAttestations*), they are also equipped with the novel *digital accreditation symbol*, provided by the German national accreditation body (DAkkS). This qualified electronic seal, after successful validation by the receiver, verifies the active accreditation status of the issuing body at the time of sealing (authorization). As it also provides all other functionalities of an electronic seal, (*i.e.* data integrity and authenticity), it can fully replace a digital signature on accredited DCCs.

The provided machine-interpretability of the metrological and administrative data in a DCC allows to automate metrological traceability and quality management in laboratories and industrial measurement technology. Here, the automated validation, transfer, and processing in the local quality management system releases manual workload and simultaneously reduces the risks from unconscious mistakes (*e.g.* from manual data transfer). Additionally, the DCC holder may benefit from relaxed process limitations by utilizing the measurement uncertainty, instead of relying on device specifications or tolerances, which can give rise to further economic advantages.



Fully automated utilization of a DCC with validation, metrological traceability and a quality assured process conformity assessment

We present the described generation and utilization of our eAttestations *at the push of a button* on the example of a thermal process monitoring, by means of a DCC demonstrator. Furthermore, in-depth insights into DCC sealing, validation, source code, good practice and the metrological benefits can be provided.

Free DCC Sample Download:
https://netzwerke.bam.de/Netzwerke/Content/EN/Standard-Articles/Networks/QI-Digital/dcc.html