

ASSOCIATE MEMBER INSTITUTION STATEMENT

KENYA BUREAU OF STANDARDS

37TH APMP GENERAL ASSEMBLY

25th November, 2021

1 INTRODUCTION

The Kenya Bureau of Standards (KEBS) was established in 1974 by an Act of Parliament. KEBS' mandate was based on an integrated approach to a quality infrastructure, namely: standardization, metrology and conformity assessment.

The functions of KEBS may be summarised as follows:

- to promote standardization in industry and commerce;
- to realize, maintain and disseminate units of measurement that are traceable to the International System of Units (SI);
- to provide conformity assessment services: testing, certification and inspection;
- to develop standards;
- to encourage or undertake educational work in relation to metrology, standardization and conformity assessment.

In implementing these functions, KEBS operates, among others, a *Standards Information Centre* and hosts the *WTO National Enquiry Point* on standards, conformity assessment and technical regulations.

2 KEBS AND THE REGULATED METROLOGY AGENCIES

The Government of Kenya continues to streamline the legal framework governing KEBS and other Government agencies contributing to the national quality infrastructure. This initiative aims to delineate and enhance their complimentary roles. One of these agencies is the Weights and Measures department, which handles most of the regulated metrology nationally.

The enactment of the *East African Community Standardisation, Quality Assurance, Metrology and Testing Act, 2006 (EAC SQMT Act)* has created the ideal framework for the development of national quality systems in the region. The enactment of the proposed *East African Community Metrology Bill* shall also create and entrench the framework for national measurement systems in the region.

3 METROLOGY SERVICES

3.1 Measurement standards

KEBS metrology maintains national measurement standards in the following fields:

- Mass
- Length (Dimensional metrology)
- Temperature and Humidity
- Pressure
- Force, Torque and Hardness
- Volume and Flow
- Density and Viscosity
- Electrical DC and Low Frequency (AC/DC)
- Electrical energy and Instrument Transformers
- Time and Frequency
- Photometry
- Acoustics and Vibration
- Ionizing Radiation Dosimetry
- Medical laboratory

Calibration services are offered in all the noted measurement fields.

3.2 Future measurement fields

Metrology plans to establish Power and High Frequency, Radiometry, enhance medical laboratory and Quantum physics laboratories in the near future.

3.3 Measurement comparisons

3.3.1 Recent measurement comparisons

See appendix I

3.3.2 Planned Measurement comparisons

3.3.2.1 There are various comparisons which have been planned through RMO and Sub RMO in Time & frequency, Force, AC/DC, Density and Temperature measurement fields.

3.4 Instrumentation services

The Instrumentation section has the capability of handling a wide range of test and measurement equipment. It easily caters to most of metrology's instrumentation needs.

3.5 Quality management and accreditation

In line with the corporate policy, Metrology is committed to providing quality services to its customers. The department's quality management system is based on the KS ISO/IEC 17025 standard.

The laboratories have already transited from ISO 17025:2005 to the new ISO 17025:2017 Standard.

The Quality Management System was approved by the RMO AFRIMETS and was approved as fit for purpose for submission of CMCs in the fields of Force, Pressure, Temperature, AC/DC, Acoustics & Vibrations, Length and Electrical Energy as per the requirements of the CIPM MRA

Five laboratories have been accredited by the German Accreditation Body *Deutsche Akkreditierungsstelle (DAkkS)*, three labs have been peer reviewed by AFRIMETS. Application for extension of accreditation of scope for the remaining laboratories has been submitted to DAkkS for evaluation.

4 INTERNATIONAL AND REGIONAL CO-OPERATION

4.1 International and regional cooperation

KEBS maintains several memberships to various international bodies relevant to metrology. The following are those associated with the metrology programme:

- **BIPM**

Kenya is a Member State of the BIPM (International Bureau of Weights and Measures) on acceding to the metre convention from 1st January 2010. KEBS actively participates in BIPM activities.

KEBS participated in the 26th General Conference on Weights and Measures (CGPM) meeting between 13th and 16th, November 2018 in Versailles, France.

- **IMEKO**

KEBS continues to be an active member of the International Measurement Confederation (IMEKO).

- **AFRIMETS**

KEBS is a founder member of the Intra-Africa Metrology System (AFRIMETS) the regional metrology organization (RMO) for Africa. KEBS participated in the 2021 AFRIMETS GA held virtually. Currently KEBS holds the Vice Chairman scientific in the AFRIMETS EXCOM

- **SADCMET**

KEBS is an active Associate Member of SADCMET and chairs a working group namely: *Time and Frequency* of the technical committee on JCRB matters (TC1). KEBS participate in 2021 SADCMET GA virtually.

- **EAMET**

KEBS is actively involved in the East African Community's (EAC) initiative on a quality infrastructure (SQMT), in particular, the Metrology programme (EAMET). Review of EAC Metrology Bill is on-going.

- **APMP**

KEBS is an Associate Member of APMP from November 2010. KEBS was represented at the 2018 Annual APMP GA meeting held in November, 2018 in Singapore.

- **SIM**

KEBS has links to the Inter-American Metrology System (SIM) and currently NIST and KEBS are working on renewing their cooperation to facilitate continued technical cooperation. One of KEBS chemical metrologist has completed PhD in Chemistry at NIST through the KEBS - NIST cooperation

4.2 Bilateral cooperation

KEBS has a memorandum of understanding with the National Metrology Institute of South Africa (NIMSA) and a close working relationship with the Physikalisch-Technische Bundesanstalt (PTB), Germany. It also cooperates with the National Institute of Standards and Technology (NIST), USA.

KEBS has Metrologists attached to PTB, Germany for further studies and laboratory research due to the good bilateral relationships between KEBS & PTB.

5 CALIBRATION AND MEASUREMENT CAPABILITIES (CMCs)

A programme to have every laboratory post at least one calibration and measurement capability line in the BIPM database (KCDB), within the framework of the CIPM mutual recognition arrangement (CIPM MRA), is currently being implemented. A total of 25 CMC lines have already been published; 2 Lines in chemical metrology, 15 lines in acoustics and vibration 7 lines in Force and 3 in DC and low frequency measurements

6 METROLOGY IN CHEMISTRY

Metrology in chemistry is a new programme that has been established at KEBS. It is currently building capacity and has participated actively in the CIPM consultative committee on amount of substance (CCQM) and have published two lines of CMCs in the BIPM database (KCDB).

Personnel have participated as observers in three CCQM conferences and working groups. Three analysts have completed guest research programmes at NIST, USA in various fields, while two others have been trained on gas metrology at NMISA.

7 REGIONAL METROLOGY CONFERENCE (RMC)

This event will be held in Mombasa, Kenya between 6th and 10th, December 2021.

9. MEASUREMENT SOLUTIONS

Metrology has started offering measurement solutions as per customers requirements/requests. These products go alongside specialised trainings related to these needs. Such services have been offered in Mozambique, Ghana, Ethiopia, DRC and Nigeria

10. CONCLUSION

With the support of the Government, Metrology has continued to embark on an ambitious replacement and upgrading programme of its measurement standards and facilities. This is being implemented concurrently with personnel training to support the planned enhanced capabilities. Never the less, a commendable job has been done to maintain the old measurement standards within the laboratories. The upgrade is also being done to meet the increasingly sophisticated demands of industry.

The upgrading programme is in line with the country develop strategy/agenda as envisaged in the **Big Four Agenda** goals.

Appendix I Recent Measurement Comparisons

KCDB or NMI Number of ILC/PT	Field/subfield	Pilot lab or provider of ILC/PT	Parameters/ range of measurements	Status
AFRIMETS.EM-S1	Resistance	NMISA	1, 10, 100, 1k and 10k Ω	On going
BIPM/EM-k11a & b	Voltage	BIPM	DC -1.018V and 10V	Ongoing and almost complete
CCTF.K001-UTC TF-ILC-EAC 2018	Time & Frequency Time interval	BIPM EAC	0-1s (UTC) Stopwatch Calibration	Continuous Draft A
AFRIMETS.AUV.A-s	Acoustics	NMISA	Sound	Published
AFRIMETS.AUV.V.s3	Vibration	NMISA	Vibration	Published
AFRIMETS.FF-K4.2.2015	Volume	NIS	100 μ l	Draft B
CCM-V-K3	Viscosity	Japan		On going
AFRIMETS.M.M.k2.1	Mass	NIS	100mg-10kg	Ongoing
SADCMET.M.M.s1	Mass	NMISA	1kg	Draft A
AFRIMETS.T.s1-PRT	Temperature	NMISA	-50-450 $^{\circ}$ C	Complete
APMP.MF.k2..a & b	Force	KRISS	50-500kN	Draft B
CCQM-K143	Chemical	NIST	Comparison of copper calibration solutions prepared by NMIs and DIs	Ongoing
APMP-P33	Chemical	NIM	Cadmium in milk powder	On going