MEASUREMENT UNCERTAINTY

The true value of any measurement cannot be definitively known. The uncertainty of a measurement result is the doubt associated with that measurement result. It involves the quantification of influences associated with a measurement result. Essentially, measurement uncertainty establishes a boundary for which we are confident that the measurement result will lie between. Examples of sources of uncertainty include:

- Environmental Conditions
- Test Methods
- Measurement Equipment
- Traceability
- Resolution
- Precision
- Reproducibility
- Repeatability
- Accuracy

Uncertainty due to repeatability can be quantified by calculating the standard deviation of a set of measurements using:

STANDARD DEVIATION OF A SAMPLE

$$s_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

$n =$ The number of measurements

$\bar{x} =$ The average of all measurements

$x_i =$ Each measurement value

CURRENT SERVICES: CALIBRATION

- Mass: 1mg to 1000kg
- NAWI: Classes I, II, III, and IIII
- Volume: 10ml to 5 gallons

FUTURE SERVICES: CALIBRATION

- Temperature- liquid in glass thermometers -40C to 300C
- Pressure
- Dimension

CONTACT US

Power Lane, Ministry of Works Compound, Belmopan

Tel: (501) 822-0446/0447
Hotline: 0-800-283-5587
WhatsApp:(501)-628-6867

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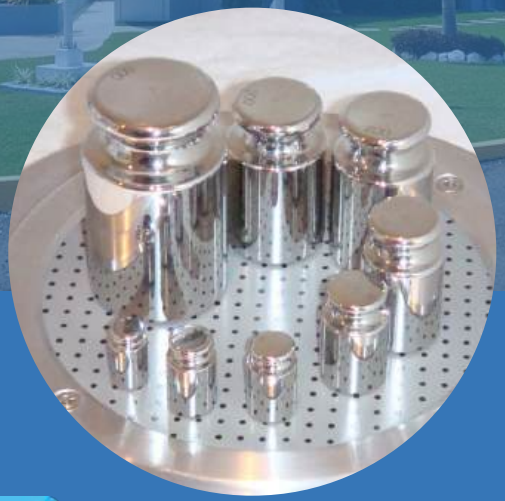
INDUSTRIAL METROLOGY

METROLOGY COMES FROM THE GREEK WORDS METROS WHICH MEANS TO MEASURE, AND LOGOS WHICH MEANS THE STUDY OF



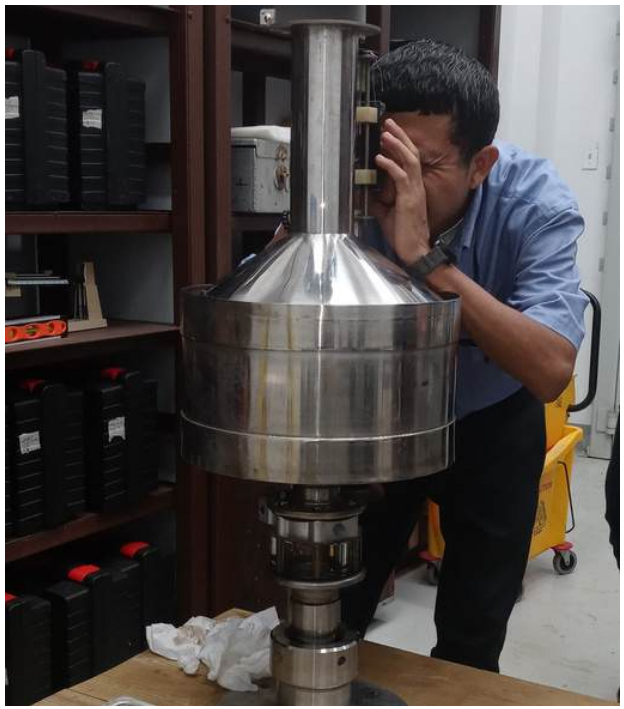
Belize Bureau of Standards

PURPOSE

Industrial metrology ensures the adequate functioning of measurement instruments used in industry, in production and testing process by comparing it to a known value thereby ensuring traceability of it's measurements.

CALIBRATION

Calibration is the activity of checking, by comparison with a standard, the accuracy of a measuring instrument of any type. It provides confidence in the use of the measuring instrument. It is NOT an adjustment or repair of a measuring instrument.



Metrology includes all theoretical and practical aspects of the pillars of Quality Infrastructure and is an essential aspect of all sectors of the economy. Eg, trade, health, environment, manufacturing, transportation etc,

SI UNITS

From 20 May 2019 all SI units are defined in terms of seven constants that describe the natural world. This assures the future stability of the SI and opens the opportunity for the use of new technologies, including quantum technologies, to implement the definitions. The seven constants are chosen in such a way that any unit of the SI can be written either through a defining constant itself or through products or quotients of defining constants.

SI base unit	Name	Symbol	Defining Constant	Numerical value	Unit
time	second	s	hyperfine transition of frequency of Cs	9,192,631,770	Hz
length	meter	m	speed of light	299,792,458	m s-1
mass	kilogram	kg	Planck constant	6.62607015 x 10-34	J s
electric current	ampere	A	elementary charge	1.602176634 x 10-19	C
thermodynamic temperature	kelvin	k	Boltzmann constant	1.380649 x 10-23	J K-1
amount of substance	mole	mol	Avogadro constant	6.02214076 x 1023	mol-1
luminous intensity	candela	cd	luminous efficacy	683	lm W-1