
	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 1 of 12

## Class of Test Structure – Calibration

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 2 of 12

## INTRODUCTION

The field of metrology is broadly divided into two main areas of measurement:

- Engineering metrology which deals with the measurement of size, angle, shape, topography, relative positioning and the like, and the calibration of machines and instrument used in such measurements.
- Physical metrology which covers the measurement of mass, volume, density, fluid flow, pressure and force and the examination of machines and instruments used in these measurements.

Accreditation in the field of Metrology is described by classes and sub-classes of test.

These classes and sub-classes are fixed descriptors. Detailed descriptions of the laboratory's accredited capabilities are contained in one text that appears under the particular sub-class of test and which contains the following elements:

- Measurement ranges for each parameter;
- A least uncertainty of measurement; (A Calibration Measurement Capability (CMC) in terms of uncertainty of measurement)
- Where applicable, a reference to a standard, specification, or in house calibration procedure.

For example:


- 1.41 Pressure and vacuum measuring devices.
  - .01 Pressure gauges Calibration in the range 1.5 kPa to 70 MPa including test gauges as defined in AS 1349 with least uncertainties of measurement of 0.05%

This Class of Test Structure includes the calibration of equipment used for electrical, heat and temperature measurements.

## CLASS OF TEST STRUCTURE

### 5.01 Limit Gauges

- .01 Plain plug gauges
- .02 Plain ring gauges
- .03 Plain gap gauges
- .04 Taper plug gauges
- .05 Taper ring gauges
- .06 Parallel screw plug gauges
- .07 Parallel screw ring gauges
- .08 Adjustable thread caliper gauges for parallel threads
- .09 Taper screw plug gauges
- .10 Taper screw ring gauges
- .11 Adjustable thread caliper gauges for taper threads
- .12 Profile gauges
- .13 Position and receiver gauges
- .14 Spline and serration gauges
- .15 Other limit gauges

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 3 of 12

## 5.02 Jigs, Fixtures, Cutting Tools and Components

- .01 Jigs and fixtures
- .02 Cutting tools
- .03 Components

## 5.03 Engineering metrology equipment

- .01 Surface plates
- .02 Toolmakers' flats
- .03 Straightedges
- .04 Squares
- .05 Angle plates
- .06 Bevel protractors
- .07 Engineer's parallels
- .08 Precision spirit levels
- .09 Micrometer water levels
- .10 Precision vee blocks
- .11 Optical flats
- .12 Optical parallels
- .13 Thread measuring accessories
- .14 Sine bars and sine tables
- .15 Dividing heads and tables
- .16 Eccentric mandrels
- .17 Micrometer heads
- .18 Internal/External micrometers
- .19 Micrometer height and depth gauges
- .20 Electronic indicators, dial gauges and test indicators
- .21 Bore gauges
- .22 Electronic/vernier/dial calipers
- .23 Electronic and vernier height and depth gauges
- .24 Feeler gauges
- .25 Extensometers
- .26 Steel rules and measuring tapes
- .27 Micrometer setting gauges
- .28 Other measuring instruments and tools

## 5.04 Machine tools

- .01 Geometric features
- .02 Positioning accuracy
- .03 Performance tests


## 5.05 Surface topography

- .01 Surface texture
- .02 Roundness
- .03 Roundness standards

## 5.06 Gears, splines and serrations

## 5.07 Length and angle standards

- .01 Angle gauges and precision polygons
- .02 External cylindrical Standards

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 4 of 12

- .03 Internal cylindrical standards
- .04 Gauge blocks and accessories
- .05 Length bars and accessories
- .06 Precision circular scales
- .07 Precision gaticules
- .08 Precision linear scales
- .09 Surface finish reference standards
- .10 Screw pitch reference standards
- .11 Spherical standards

#### **5.08 Dimensional Precision Instruments**

- .01 Auto collimators
- .02 Alignment telescopes
- .03 Optical plumb lines
- .04 Optical levels
- .05 Photogrammetric cameras
- .06 Laser alignment and leveling equipment
- .07 Electronic levels
- .08 Engineers' comparators
- .09 Height setting micrometers
- .10 Length measuring machines
- .11 Coordinate length measuring machines
- .12 Screw diameter measuring machines
- .13 Screw pitch measuring machines
- .14 Gear and hob measuring equipment
- .15 Precision projection apparatus
- .16 Dial gauge calibrators
- .17 Extensometer calibrators
- .18 Displacement instruments

#### **5.09 Survey and alignment equipment**


- .01 Theodolites
- .02 Optical plumb lines
- .03 Optical levels
- .04 Laser alignment and levelling equipment
- .05 Survey staffs
- .06 Survey tapes
- .07 Tape testing benches
- .08 Electronic distance measuring (EDM) equipment
- .09 Baselines

#### **5.10 Masses**

- .01 Determination of mass

#### **5.11 Weighing devices**

- .01 Precision laboratory balances
- .02 Industrial balances
- .03 Industrial weighing appliances
- .04 Hopper weighing systems
- .05 Other weighing devices

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 5 of 12

#### 5.12 Volumetric equipment

- .01 Volumetric glassware
- .02 Special laboratory volumetric apparatus
- .03 Industrial volumetric proving measures
- .04 Standard measures
- .05 Pipe provers
- .06 Industrial storage tanks
- .07 Road and rail tankers
- .08 Other equipment

#### 5.13 Density Measurement

- .01 Density of solids
- .02 Density of liquids
- .03 Density of gases

#### 5.14 Hydrometers

- .01 Density hydrometers
- .02 Alcoholometers
- .03 Brix hydrometers
- .04 LPG hydrometers
- .05 Other hydrometers

#### 5.15 Densitometers

- .01 Liquid densitometers
- .02 Gas densitometers
- .03 Other densitometers

#### 5.16 Flow measuring devices


- .01 Anemometers
- .02 Sonic Nozzles
- .03 Orifice meters
- .04 Gas meters
- .05 Liquid meters
- .06 Current meters
- .07 Open channel water meters
- .08 Weir type structures
- .09 Other devices

#### 5.17 Oil and gas measurement systems

- .01 Gas Emission Tester-Analyzer
- .02 Other Oil and Gas Measurement Tester

#### 5.18 Measuring instruments on type approval tests

- .01 Non-automatic weighing devices
- .02 Liquid measuring instruments
- .03 Liquor dispensers
- .04 Length measuring instruments
- .05 Area measuring instruments
- .06 Farm milk tanks
- .07 Load cells

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 6 of 12

- .08 Weighing-in-motion systems
- .09 Belt conveyor weighers
- .10 Totalising hopper weighers
- .11 Automatic catchweighers
- .12 Multi-dimensional measuring instruments
- .13 Automatic tank level gauges
- .14 Gas measuring instruments

#### 5.19 Barometers

- .01 Aneroid barometers
- .02 Barographs
- .03 Mercury barometers
- .04 Gauge barometers
- .05 Altimeters
- .06 Other barometers

#### 5.20 Pressure and vacuum measuring devices

- .01 Pressure gauges
- .02 Vacuum gauges
- .03 Pressure transducers/transmitter
- .04 Pressure recorders
- .05 Mercury manometers
- .06 Other liquid manometers
- .07 Digital manometers
- .08 Pressure control devices

#### 5.21 Pressure gauge testers

- .01 Pneumatic operated piston gauges
- .02 Hydraulic operated piston gauges
- .03 Pressure calibrators

#### 5.22 Force measuring devices


- .01 Elastic force measuring devices/ Proving Ring
- .02 Load cells
- .03 Force gauges
- .04 Other devices

#### 5.23 Speed measuring devices

- .01 Tachometers
- .02 Speedometers
- .03 Velocity transducers
- .04 Other devices

#### 5.24 Torque measuring devices

- .01 Torque wrenches/drivers
- .02 Torque transducers/analyzers/meters
- .03 Torque multiplying gearboxes
- .04 Other devices

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 7 of 12

### 5.25 Testing machines

- .01 Tension and universal machines in tension
- .02 Compression and universal machines in compression
- .03 Vickers hardness machines
- .04 Rockwell hardness machines
- .05 Brinell hardness machines
- .06 Rockwell superficial hardness machines
- .07 Vickers low-load hardness machines (HVO.2 to HVS)
- .08 Vickers micro-hardness machines (less than HVO.2)
- .09 Izod impact machines
- .10 Charpy impact machines
- .11 Resilience testing machines
- .12 Deadweight rubber hardness testers
- .13 Deadweight micro-hardness rubber testers
- .14 Rubber hardness meters (durometers)
- .15 Plastic hardness testers
- .16 Torsion machines
- .17 Tension-torque machines
- .18 Road friction testers
- .19 Other testing machines

### 5.26 Ancillary mechanical testing equipment

- .01 Portable Brinell measuring microscopes
- .02 Indenters for hardness machines
- .03 Hardness blocks for metals testing
- .04 Hardness blocks for rubber and plastic testing
- .05 Thickness gauges for textiles, rubber and plastic
- .06 Specimen cutters for rubber and plastic
- .07 Paper products testing equipment
- .08 Other equipment

### 5.27 Ancillary testing equipment for construction materials


- .01 Test sieves
- .02 Ovens
- .03 Dial gauges and other displacement measuring devices
- .04 Vicat apparatus
- .06 Penetrometers and penetration cones
- .07 Penetration needles
- .08 Nuclear moisture/density gauges
- .09 Other equipment

### 5.28 Resistors, resistance boxes and potential dividers

- .01 Precision resistors, resistance boxes and conductance boxes
- .02 Volt ratio boxes and potential dividers
- .03 DC shunts
- .04 AC shunts
- .05 Other devices

### 5.29 Capacitors

- .01 Precision capacitors

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 8 of 12

- .02 Capacitance attenuators
- .03 Capacitance potential dividers
- .04 Other devices

### 5.30 Magnetic materials and instruments

- .01 Magnetic materials
- .02 Magnets, solenoids and Helmholtz coils
- .03 Magnetic permeameters
- .04 Magnetic frames and squares
- .05 Fluxmeters/ Gauss meters
- .06 Magnetometers and search coils
- .07 Hibbert magnetic standards and other flux linkage generators
- .08 Flux density meters
- .09 Other Instrument

### 5.31 Inductors and transformers

- .01 Inductors, self and mutual
- .02 Ratio transformers
- .03 Power transformers and reactors
- .04 Current transformers and protective current transformers
- .05 Voltage transformers and protective voltage transformers
- .06 Audio transformers
- .07 R.F. transformers
- .08 Pulse transformers
- .09 Auto transformers
- .10 Phase shifting transformers
- .11 Reference ballasts
- .12 Neutral earthing transformers
- .13 Other transformer

### 5.32 Voltage standards

- .01 Standard cells
- .02 Electronic e.m.f. reference devices

### 5.33 Precision transfer instruments

- .01 A.C./D.C. transfer instrument


### 5.34 Electrical Instrument calibrators

- .01 D.C. voltage
- .02 A.C. voltage
- .03 DC current
- .04 AC current
- .05 Resistance
- .06 Capacitance
- .07 Inductance
- .08 Others

### 5.35 Electrical Indicating and Recording instruments

- .01 D.C. voltmeters
- .02 A.C. voltmeters



	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 9 of 12

- .03 D.C. ammeters
- .04 A.C. ammeters
- .05 Wattmeters
- .06 Varmeters
- .07 Phase angle indicators
- .08 Power factor meters
- .09 Ohmmeters
- .10 LCR meters
- .11 Galvanometers and null detectors
- .12 Electricity meters
- .13 Graphic recording instruments
- .14 Digital storage recorders
- .15 Instrumentation tape recorders
- .16 Electric field strength meters
- .17 Digital multimeters/ Analog multitesters
- .18 pH meters
- .19 Conductivity meters
- .20 Resistivity meters
- .21 Clamp meters
- .22 Other instruments

#### **5.36 Bridges, potentiometers, test sets**


- .01 D.C. bridges
- .02 D.C. potentiometers
- .03 A.C bridges
- .04 A.C. potentiometers
- .05 Ratiometers
- .06 Current transformer testing sets
- .07 voltage transformer testing sets
- .08 Partial discharge test equipment
- .09 High voltage test sets

#### **5.37 Frequency and time measuring instruments and standards**

- .01 Frequency meters
- .02 Wavemeters
- .03 Counters
- .04 Time Interval meters
- .05 Clocks and watches
- .06 Stroboscopes
- .07 Tachometers
- .08 Frequency standards
- .09 Time interval calibration
- .10 Coordinated Universal Time (CUT)
- .11 Sound level meters

#### **5.38 Waveform measuring instruments**

- .01 Frequency characteristics
- .02 Input characteristics
- .03 Timing characteristics

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 10 of 12

- .04 Distortion
- .05 Other characteristics

### 5.39 Power supplies

### 5.40 Signal sources

- .01 Frequency characteristics
- .02 Output characteristics
- .03 Modulation characteristics
- .04 Sweep characteristics
- .05 Other characteristics

### 5.41 Electronic equipment

- .01 High voltage impulse and disturbance tests
- .02 Transducer indicators and calibrators
- .03 Charge amplifiers
- .04 Doppler radar equipment
- .05 EMI/EMC Equipment
- .06 Miscellaneous equipment and tests

### 5.42 High voltage equipment

- .01 Direct voltage tests
- .02 Alternating voltage tests
- .03 Impulse voltage tests
- .04 Impulse current tests
- .05 Partial discharge tests
- .06 Dielectric tests
- .07 Switching impulse voltage tests
- .08 Other tests


### 5.43 Optical fibre systems instruments

### 5.44 Calibration of temperature measurement equipment

- .01 Rare metal thermocouples
- .02 Base metal thermocouples
- .03 Temperature fixed points
- .04 Metallic resistance thermometers
- .05 Semi-conductor thermometers
- .06 Liquid-in-glass thermometers
- .07 Optical pyrometers
- .08 Radiation pyrometers and infra-red thermometers
- .09 Vapour pressure thermometers
- .10 filled metal systems
- .11 Bimetallic systems
- .12 Digital quartz frequency units
- .13 Digital temperature indicator systems

### 5.45 Calibration of ancillary temperature measuring instruments

- .01 Portable potentiometers
- .02 Digital voltmeters

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 11 of 12

- .03 Resistance bridges
- .04 Indicators, recorders and controllers
- .05 Temperature Transmitters (T/C and RTD)
- .06 Strip lamps
- .07 Blackbody sources
- .08 Other equipment

#### **5.46 Calibration of clinical thermometers**

- .01 Liquid-in-glass
- .02 Disposable
- .03 Electronic

#### **5.47 Testing of temperature controlled enclosures**

- .01 Ovens, Furnaces and baths
- .02 Incubators
- .03 Autoclaves and sterilizing ovens
- .04 Industrial freezers
- .05 Chamber
- .06 Other enclosures

#### **5.48 Hygrometry**

- .01 Calibration of humidity measuring devices
- .02 Measurement of relative humidity
- .03 Measurement of dew point
- .04 Testing of environmental/humidity chambers

#### **5.49 Ancillary testing equipment for paints and petroleum products**

- .01 Wet film thickness gauges
- .02 Fineness of grind gauges
- .03 Viscometers
- .04 Flow cups
- .05 Scratch needles
- .06 Ovens
- .07 Pensky-Martens apparatus
- .08 Other equipment

#### **5.50 Electromedical Devices**

- .01 Approval test
- .02 Performance test


#### **5.51 Surface Temperature Measurement**

#### **5.52 Photometry Equipment**

- .01 Lux meter/Light meter

#### **5.53 Particle Counters**

- .01 Air type
- .02 Liquid type

	Philippine Accreditation Bureau Guidance Document Class of Test Structure- Calibration	Document ID	LA/GD14
		Issue Number	01
		Revision Number	0
		Effectivity Date	January 2015
		Page	Page 12 of 12

### ISSUE AND AMENDMENT RECORD

<b>Title</b>	<b>Issue</b>	<b>Date</b>	<b>Amendment</b>
Class of Test Structure – Calibration	01	January 2015	Initial Issue