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AMENDMENTS

Item no.	Date	Page	Location	Details of change
1	02/2014	-	unspecified	Clarified meaning and made minor editorial changes, e.g. 'CRM' to 'ACRM'; 'direct selling to the public' to 'trading direct with the public'; 'reference laboratory' to 'Legal Metrology Authority laboratory', definition of a master meter.
2	02/2014	4-6, 10-12, 14-16, 18, 20.	See details for new terms	Added terms: control/ transfer instrument; dead weight; variations of density; dynamic test; marking; material test; MPU; MPV; not to be used for trade (trading with the public); rail vehicles – coupled wagon; Secretary; various terms relating to servicing licensees; verifier; weight. Deleted terms: administering authority; maximum transit speed of automatic rail weighbridges; belt conveyor; various terms relating to certification; examples of CoAs; printing device; reference load; subsequent verification; sealing (securing) device; stamping; trade measurement CRM.
3	02/2014	23	stamping	Removed stamping section. Information relating to sealing and marking will be made available on the NMI website in due course.
4	11/2014	21-22	Appendix A	Added Appendix A for the classes and subclasses of servicing licences.

PREFACE

This document contains terminology and general information to accompany and support the National Instrument Test Procedures (NITPs) and *Sampling and Test Procedures for Prepackaged Articles* that are published by the National Measurement Institute (NMI) at:

<http://www.measurement.gov.au/Publications/NMIVDocuments/Pages/default.aspx>

The terms used in this document are intended to complement the definitions given in the following documentation:

- *National Measurement Act 1960* (Cth);
- *National Measurement Regulations 1999* (Cth);
- *National Trade Measurement Regulations 2009* (Cth);
- *JCGM 200:2012 International Vocabulary of Metrology – Basic and General Concepts and Associated Terms*; and
- *OIML International Vocabulary of Terms in Legal Metrology*.

This document also provides the classes and subclasses of servicing licences in Appendix A.

Disclaimer

Nothing in this document is intended to constitute legal advice express or implied and readers should obtain their own advice from a legal practitioner on any information on which they seek to rely for any legal purpose.

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A

Absolute Value of the Maximum Permissible Error

The value of the maximum permissible error (MPE), regardless of its sign (positive or negative). Some examples are:

- if the MPE of a weighing instrument is equal to ± 2 g, the absolute value of this error is $|\pm 2| \text{ g} = 2 \text{ g}$;
- if the MPE of a fuel dispenser meter is equal to $\pm 0.3\%$, the absolute value of this error is $|\pm 0.3\%| = 0.3\%$;
- if the MPE of an area measuring instrument is equal to $\pm 2 \text{ dm}^2$, the absolute value of this error is $|\pm 2| \text{ dm}^2 = 2 \text{ dm}^2$;
- if the MPE of a vehicle tank is equal to $\pm 20 \text{ L}$, the absolute value of this error is $|\pm 20| \text{ L} = 20 \text{ L}$; and
- if the MPE of an instrument is equal to $\pm 2 \text{ mm}$, the absolute value of this error is $|\pm 2| \text{ mm} = 2 \text{ mm}$.

Accuracy

The closeness of the agreement between the result of a measurement and the true (conventional) value of the measured quantity.

Accuracy Class

Classes of instruments which meet particular metrological requirements that are intended to keep errors within certain limits.

Actual Scale Interval

The value – expressed in units of mass – of the difference between values corresponding to two consecutive scale marks for analogue indication; or the difference between two consecutive indicated values for digital indication.

Additional Device for Fuel Dispensers

A part or a device, other than an ancillary device, required to ensure correct measurement or intended to facilitate the measuring operations, or which could in any way affect the measurement. Main additional devices are:

- anti-drain device;
- gas elimination device;
- gas indicator;
- sight glass;
- filter;
- pump;
- device used for the transfer point;

- anti-swirl device;
- branches or bypasses; and
- valves, hoses.

Additional Indicating Device

Any device which is a slave or part of an approved instrument that duplicates the primary measurement result or primary measurement and price data for that instrument; the device may be the only source of information to the purchaser or vendor.

Adjustment

Alteration of the measurement parameters typically intended to bring the instrument within the allowable MPEs for an instrument in use. Adjustment of a measuring system should not be confused with *calibration*, which is a prerequisite for adjustment. After a measuring system has been adjusted, it must be verified.

Adjustment Device

An approved device incorporated into a measuring system to reduce errors within the allowable MPE or better. The adjustment device generally only allows shifting of the error curve parallel to itself.

Alcoholic Beverage Measure

An instrument or material measure that is used to determine the volume of alcoholic beverage. It is usually filled on request. Alcoholic beverage measures may be one of the following categories:

- liquor measures;
- drinking vessels; and
- portable vessels.

Analogue Indication

An indication enabling the continuous evaluation of the equilibrium position to a fraction of the scale interval.

Analogue Indicator

An indicator on which the value of the physical quantity measured is indicated by an index and graduated scale; one is fixed and the position of the other is a continuous function of the magnitude of the physical quantity being measured.

Ancillary Device

A device intended to perform a particular function, directly involved in elaborating, transmitting or displaying measurement results.

Main ancillary devices are:

- zero-setting device;
- repeating indicating device;
- printing device;
- memory device;
- price-indicating device;
- totalising indicating device;
- conversion device;
- pre-setting device; and
- self-service device.

Note: An ancillary device may or may not be subject to legal metrology control according to its function in the measuring system or to national regulations, which govern the use of the device.

Approved Pattern

A pattern of measuring instrument approved under the *National Measurement Regulations 1999* (Cth).

Approaches (Aprons or surrounds)

The parts of the weigh zone that are neither the load receptor nor part of it.

Area Measuring Instrument

A measuring instrument that determines the area of a flat bodied article by passing the article under, over or between sensors which may be mechanical or electronic. According to its method of operation, an area measuring instrument may be classified as automatic or non-automatic.

(a) Automatic Area Measuring Instrument

An area measuring instrument that does not require the intervention of an operator during the measuring process.

(b) Non-automatic Area Measuring Instrument

An area measuring instrument that requires the intervention of an operator during the measuring process. For example, depositing or removing the article to be measured from the receptor, and obtaining the result.

Associated Measuring Instruments

Instruments connected to a calculator, correction device or conversion device for measuring certain characteristics of a liquid, in order to make a correction and/or conversion.

Attended Service Mode

An operating mode of a self-service arrangement in a service station where the controller is present and controls the authorisation for the delivery.

Australian Certified Reference Material

A reference material certified under the *National Measurement Regulations 1999* (Cth).

Authorisation of a Measuring System

An operation that brings a measuring system into a condition suitable for the commencement of the measurement.

Automatic Rail Weighbridge

A weighing instrument that has a load receptor, inclusive of rails for conveying railway vehicles.

(a) Maximum Operating Speed

The maximum velocity of a wagon that the instrument is designed to weigh-in-motion. Weighing results above this maximum velocity may be subject to an excessive relative error.

(b) Minimum Operating Speed

The minimum velocity of a wagon that the instrument is designed to weigh-in-motion. Weighing results below this minimum velocity may be subject to an excessive relative error.

(c) Range of Operating Speed

The difference between the minimum and maximum operating speeds at which a wagon may be weighed-in-motion.

Automatic Weighing Instrument

See Weighing Instrument.

Auxiliary Indicating Devices

(a) Complementary Indicating Device

An adjustable device by means of which it is possible to estimate in the measurement units the value corresponding to the distance between a scale mark and the indicating component.

(b) Device for Interpolation of Reading (Vernier or Nonius)

A device connected to the indicating element that sub-divides the scale of an instrument, without special adjustment.

(c) Extended Indicating Device

A device that temporarily changes the actual scale interval to a value less than the verification scale interval, following a manual command.

(d) Indicating Device with a Differentiated Scale Division

A digital indicating device in which the last figure after the decimal sign is clearly differentiated from the other figures.

(e) Rider

Detachable poise that may be placed and moved, either on a graduated bar integral with the beam, or on the beam itself.

Axle Weigher

A weighing instrument that measures the weight of each axle on a vehicle.

B

Base Conditions

The standard conditions to which a measured material is converted. Base conditions should not be confused with the 'rated operating conditions' and 'reference conditions' which apply to influence quantities.

Batch Testing Mark

A graphical mark in the form approved in writing given by the Secretary. A typical example of a stylistic scale is shown below:



Belt Weigher

An automatic weighing instrument used for continuously weighing a bulk product on a conveyor belt, without systematic subdivision of the weight and without interrupting the movement of the conveyor belt.

(a) Single Speed Belt Weigher

A belt weigher that is installed with a conveyor belt designed to operate at a single belt speed, designated as the nominal speed.

(b) Variable Speed Belt Weigher

A belt weigher that is installed with a conveyor belt designed to operate at more than one speed. This includes multi-speed belt weighers that have varying speeds, which are specific for any operation.

Beverage Dispenser

A measuring instrument which dispenses a predetermined volume of a beverage (spirit, beer, wine, water, fruit juice, etc).

Bogie Weigher

A weighing instrument which measures the weight of each bogie of a wagon or vehicle.

Brim Measure

A material measure (e.g. alcoholic beverage measure) in which the capacity is defined by the brim.

C

Calculator – Liquid-Measuring System

A part of the meter that receives the output signals from the measuring device(s) and possibly, from associated measuring devices. This part then processes the signals, and if appropriate, stores the results in its memory until they are used. In addition, the calculator may be capable of communicating both ways with peripheral equipment.

Calibration

The set of operations that (under specified conditions) establishes the relationship between the indicated or nominal value of an instrument and the corresponding known value of the measured quantity.

Capacity

The volume that is marked on a material measure.

Capacity Mark

An indication of the capacity of a volume measure by a denominated line on the measure.

Carrying Rollers

The means by which a conveyor belt is supported on a fixed frame.

Centre-e

The mid-point of the verification scale interval. This point is usually mid-way between the two points where the actual scale interval changes.

Certificate of Approval

A certificate issued by the Chief Metrologist approving the pattern of a measuring instrument. The certificate may include conditions imposed on the approval. Refer to NMI P 106 for common examples.

Certified Measuring Instrument

A measuring instrument certified under Regulation 37 of the *National Measurement Regulations 1999* (Cth).

Note: A certified measuring instrument is sometimes referred to as a 'master' instrument, particularly when it is used to assign certified values to reference materials or as a reference instrument.

Changeover Point

See Indication Changeover Point.

Checking Facility

A facility that is incorporated in a measuring system, which enables significant faults to be detected and acted upon.

Note: The checking of a transmission device aims to confirm that all transmitted information (and only that information) has been successfully received by the receiving equipment.

- **Automatic Checking Facility**

A checking facility operating without the intervention of an operator.

Continuous Indicating Device

An indicator enabling the continuous evaluation of the equilibrium position to a fraction of the scale interval. The value of the physical quantity measured is indicated by an index and graduated scale, one of which is fixed while the position of the other is a continuous function of the magnitude of the physical quantity being measured.

Continuous Totalising Automatic Weighing Instrument

See Belt Weigher.

Control Instrument

A device used to measure a quantity by comparison with an appropriate standard of measurement as specified in the relevant National Instrument Test Procedure.

Control Method

The method used to determine the amount (e.g. weight or volume) of the product used as the test load during material tests. This will generally involve a control instrument.

Conversion Device – Liquid-Measuring System

A device in a liquid-measuring system which automatically converts the volume measured at metering conditions into a volume at base conditions, or into a weight. The device takes account of the characteristics of the liquid (temperature, pressure, density, relative density), which may either be measured using associated measuring instruments, or stored in the memory of the instrument.

Conversion Factor

The ratio of the converted quantity (i.e. quantity at base conditions) to the original quantity (i.e. quantity at metering conditions).

Corner Test

See Eccentricity Test.

Correction Device – Liquid-Measuring System

A device connected to or incorporated in the meter to automatically correct the measured quantity at the time of measurement. This occurs from the device taking into account the flow rate and/or characteristics of the liquid to be measured (viscosity, temperature, pressure) and the pre-established calibration curves.

The characteristics of the liquid may either be measured using associated measuring instruments, or stored in the memory of the instrument.

Creep

With all environmental conditions and other variables remaining constant, this is the change in output from a measuring device that occurs during the period of its operation.

D

Damping

The progressive reduction or suppression of the free oscillation of a measuring system.

Data Plate

A plate or label on an instrument that bears the mandatory descriptive markings.

Date Mark

See Verification Mark.

Dead Load

The weight of the load receptor and other load supporting structures of the instrument. The value of this weight is to be permanently balanced or cancelled out in the weight indicating or measuring system.

Dead Weight (Substitution Loads)

The weight of the uncertified mass used during the verification of non-automatic weighing instruments using the substitution method.

Deflection

The deviation of the moving element of an instrument relative to a defined position.

Density

Mass of a sample or body divided by its volume.

(a) Bulk density

Mass of solid sample, that is typically porous or granular, divided by the volume which includes the volume of pores and interstices within the sample.

(b) Relative density (specific gravity)

Ratio of density to a reference density, usually the density of water at 4 °C.

Note: Relative density is also known as specific gravity (SG).

The ratio between a 20 °C sample density and 4 °C reference water density is represented as 'SG (20 °C/4 °C)'. If the water reference density is recorded at 20 °C it is known as 'SG (20 °C/20 °C)'.

(c) True density

Mass of solid sample divided by its volume measured with any pores and/or interstices excluded.

Descriptive Markings

The descriptive markings carried by the instrument as described in the Certificate(s) of Approval.

Dial

The part of an indicating device, fixed or moving, which carries the scale(s).

Digital Indication

An indication in which the scale marks, generally composed of a sequence of aligned figures, do not permit interpolation to fractions of the scale interval.

Digital Rounding Error

Error associated with a digital indication not permitting interpolation to fractions of the scale interval.

Discontinuous Indicating Device

An indicator generally composed of a sequence of aligned figures that do not permit interpolation to fractions of the scale interval.

Discrimination

The ability of a weighing instrument to react to small variations of load.

Displacement Transducer (Speed Sensor)

A device on a belt conveyor providing information that either corresponds to the displacement of a defined length of the belt or is proportional to the speed of the belt.

Drift

The slow variation with time of a metrological characteristic of a measuring instrument.

Durability

The capability of a measuring instrument to keep its performance characteristics over a period of use.

Dynamic Test

The tare weight of an empty wagon that is determined in-motion when coupled empty wagons pass over an automatic rail-weighbridge.

Dynamic Wagon Tare

The tare weight of an empty wagon that is determined in-motion when coupled empty wagons pass over an automatic rail-weighbridge.

E

Eccentricity Test

A test to determine the indications produced when the same load is placed at different positions on a load receptor of a weighing instrument.

Electronic Instrument

An instrument equipped with electronic devices.

End-and-end Measurement

The determination of a measurement relating to a vehicle (whether loaded or not) by adding together separate measurements of weight supported (singularly or in combination) by different axles of the vehicle. The separate measurements are determined by separate operations of a weighbridge.

Error

Observed value (V_{obs}) minus true value (V_{ref}).

(a) Absolute error

The value of the error, regardless of its sign (positive or negative).

F

Flow rate (Feeding Flow rate) – Belt Weigher

(a) Maximum Flow rate

The design flow rate obtained with the maximum capacity of the belt weigher and the maximum speed of the belt.

(b) Maximum Operating Flow rate

The maximum flow rate obtained for site conditions when the belt weigher is tested. This must be marked on the data plate as Q_{max} .

(c) Minimum Flow rate

The design flow rate above which the weighing unit complies with the specified requirements.

(d) Minimum Operating Flow rate

The minimum flow rate obtained for site conditions when the belt weigher is tested. This must be marked on the data plate as Q_{min} .

(e) Regulating Device

A device intended to ensure a programmed feeding flow rate.

Fuel Dispenser

A measuring system intended for dispensing fuel, typically for motor vehicles, small boats and small aircrafts.

Flow Rate – Liquid Measuring System

(a) Maximum Flow Rate

The maximum design flow rate approved and marked on the data plate as Q_{max} .

(b) Minimum Flow Rate

The minimum design flow rate approved and marked on the data plate as Q_{min} .

G

Gas Detector

A device, which will detect any air, vapour or liquid in a fuel line.

Gas Elimination Device

A device or devices in a liquid metering system that removes any air or gas in the liquid prior to measurement.

Gas Indicator

A device allowing easy observation of any air or gas bubbles that may be present in a liquid flow.

Gas Separator

A device used for continuously removing any air or gas in a liquid.

Glass Strike

A flat glass plate designed to assist in filling a brim measure being tested to its full capacity.

Graduated Measure

A measure that serves to determine a volume of liquid contained within a cylinder of either glass or plastic corresponding to a graduated line.

Graduation Line

A denominated line on the measure that indicates capacity.

Gross Value

Indication of the weight of a load on a weighing instrument when no tare or pre-set tare device is in operation.

H

Hose Dilation

The volume increase or decrease of a hose when subjected to a change in internal pressure.

Hysteresis

The property of an instrument whereby its response to a given stimulus depends on the sequence of preceding stimuli.

I

Index

The fixed or movable part of an indicating device whose position, with reference to the scale marks, enables an indicated value to be determined.

Indicating Device

Part of the measuring device from which the direct reading of a result is obtained.

(a) First Element of an Indicator

In an indicating device comprising several elements, this is the element that carries the scale with the smallest scale interval.

(b) Flow Rate Indication Device – Belt Weigher

A device that indicates instantaneous flow rate, either as the weight of the product conveyed in unit time, or as a percentage of the maximum flow rate.

(c) Semi-digital Indicator

An indicator, in which the value of the physical quantity measured is represented by a series of aligned digits, marked on rotating elements in such a manner that a change of digit on one element is caused by the rotation of the element on its right; the right-hand element is an analogue indicator.

Indication Changeover Point

The point on a digital scale where the indication changes up or down one scale interval—usually half way between any two scale intervals.

Initial Intrinsic Error

The intrinsic error of a measuring instrument determined prior to all performance tests.

In-motion Test

A test that uses in-motion reference wagons on a load receptor to determine an error.

In-service Inspection

The examination of an instrument by a trade measurement inspector to check that:

- the verification mark is valid; and
- the errors do not exceed the MPEs permitted for an in-service inspection.

An in-service inspection does not permit the instrument to be marked with a verification mark.

Inspector

See trade measurement inspector.

Inspector's Mark (also see Verification Mark)

The mark allocated to a trade measurement inspector under the *National Measurement Act 1960* (Cth) to use when verifying a measuring instrument for use for trade.

Instrument with Price Scales

An instrument that indicates the total price by means of a price chart or scale related to a range of unit prices.

Intrinsic Error

The error of a measuring instrument used under reference conditions.

L

Legal Metrology Authority Laboratory

A laboratory that supports the national measurement system by performing functions within the scope of its appointment. For example:

- An approving authority laboratory as appointed under sub-regulation 76(1) of the *National Measurement Regulations 1999* (Cth) to conduct pattern approval testing of measuring instruments.
- A certifying authority laboratory as appointed under Regulation 73 of the *National Measurement Regulations 1999* (Cth) to certify/ recertify measuring instruments and reference materials.
- A verifying authority laboratory as appointed under Regulation 73 to verify/ reverify reference standards of measurement and physical quantities of an artefact.
- A utility meter verifier as appointed under the *National Measurement Act 1960* (Cth) to verify utility meters.

Length Measuring Instrument

An instrument that serves to determine the length of a flat bodied article by passing the article under, over, or between sensors that may be mechanical or electronic. According to its method of operation, a length-measuring instrument may be classified as automatic or non-automatic.

(a) Automatic Length Measuring Instrument

An instrument that does not require the intervention of an operator during the measuring process.

(b) Non-automatic Length Measuring Instrument

An instrument that requires the intervention of an operator during the measuring process. For example, depositing or removing the article to be measured from the receptor, and obtaining the result

Level-indicating Device

A device used to indicate whether or not an instrument is at a level position.

Licensee's Mark (also see Verification Mark)

See Servicing Licensee's Mark.

Line Measure

A volume measure where the capacity is defined by a denominated line marked on the side of the measure.

Load

A weight applied to a load receptor or the reference load applied to a belt weigher.

Load Cell

A transducer used in the measurement of force. It converts the input quantity (, i.e. mass or force) into an output quantity (e.g. change in the total electrical resistance).

See also Measurement Transducer.

Load-measuring Device

Part of a weighing instrument used for measuring the weight of a load by means of an equilibrium device that balances the force coming from the load transmitting device with an indicating or printing device.

Load Receptor

The part of a weighing instrument intended to receive a load.

(a) Weigh Table

The load receptor of a belt weigher.

(b) Inclusive of Conveyor

A load receptor that includes an entire conveyor.

Load-transmitting Device

Part of a weighing instrument for transmitting the force produced by the load acting on the load receptor, to the load-measuring device.

Lubricating Oil Measure

A measuring instrument that serves to determine a volume of lubricating oil usually sold for use in motor vehicles.

M

Mark

See Verification Mark.

Marking

The application of a Verification Mark.

Mass

See Weight.

Master Meter

A flowmeter that is the reference standard of measurement, e.g. it has a current certificate issued under Regulation 13, Regulation 21 or Regulation 37 of the *National Measurement Regulations 1999* (Cth).

Material Test

A test carried out using a complete measuring instrument and the specific type of material that it is intended to measure.

Maximum Area

The maximum area that an area measuring instrument is designed to accommodate.

Maximum Capacity

The maximum volume a vehicle tank is designed to accommodate; similarly, the maximum weighing capacity of a weighing instrument, not taking into account the additive tare capacity.

Maximum Length

The maximum length that the measuring instrument is designed to accommodate.

Maximum Permissible Error (MPE)

The maximum difference—positive or negative—allowed by regulation, between the indication of an instrument and the corresponding reference value for the measurement.

MPE Change Point

The point where the value of MPE changes. For example, for a Class 3 (Class III , Class III) weighing instrument, the value of the MPE changes at 500e from $\pm 0.5e$ to $\pm 1.0e$ and again changes at 2 000e from $\pm 1.0e$ to $\pm 1.5e$.

Maximum Permissible Uncertainty (MPU)

The maximum uncertainty permitted in the verification of an Inspectors' Class standard

under the *National Measurement Regulations 1999* (Cth).

Maximum Permissible Variation (MPV)

The maximum amount by which an Inspectors' Class standard of measurement may differ from the value given for its denomination in the *National Measurement Regulations 1999* (Cth).

Maximum Safe Load

The maximum static load that can be carried by a weighing instrument without permanently altering its metrological qualities.

Maximum Tare Effect

The maximum capacity of an additive tare device or of a subtractive tare device.

Measurand

The particular quantity subject to measurement.

Measurement

The determination of number or physical quantity, other than for descriptive purposes only.

Measurement Receptor

A fixed or mobile table which may be in the form of a series of rollers, or a conveyor on which an article to be measured is placed.

Measurement Transducer

A device used in measurement, which provides an output quantity that has a specified relation to the input quantity. The part may be autonomous or use an external power source.

Measuring Instrument

A thing by means of which a measurement may be made or a component of such a thing.

Measuring System

A system which comprises the measuring device, and all the ancillary devices and additional devices.

Meter for Volumes of Liquids

An instrument intended to continuously measure, memorise and display the volume of a liquid passing through the measurement transducer at metering conditions.

Note: A meter includes at least a measurement transducer, a calculator

(including adjustment or correction devices if present) and an indicating device.

Metering Conditions

The conditions of a liquid, of which the volume is to be measured, at the point of measurement (e.g. temperature and pressure of the measured liquid).

Minimum Area

The smallest area that can be measured without the possibility of an excessive relative error.

Minimum Capacity

The value of a load below which weighing results may be subject to an excessive relative error.

Minimum Delivery

The smallest length which can be measured without the possibility of an excessive relative error.

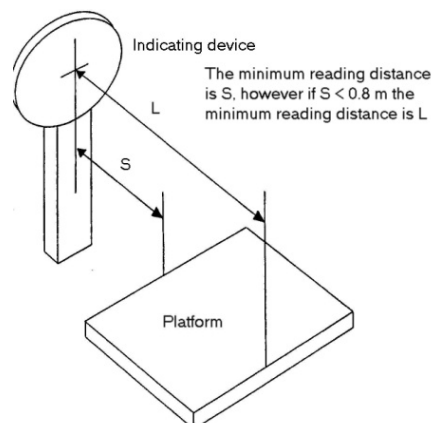
Minimum Measured Quantity of a Measuring System (V_{min})

The smallest volume of liquid for which a measurement is metrologically acceptable for that system.

Note: In measuring systems intended to deliver, this smallest volume is referred to as the 'minimum delivery'. In those intended for receiving operations, it is referred to as the 'minimum receipt'.

Minimum Reading Distance

The shortest distance that an observer may freely approach an indicating device to take a reading under normal conditions of use. This approach is considered to be free for the observer if there is a clear space of at least 0.8 m in front of the indicating device as shown in the diagram below.



Minimum Specified Price Deviation

The calculated price required to be paid that corresponds to a minimum specified volume deviation.

Minimum Specified Volume Deviation

The absolute value of the MPE for the minimum measured quantity of a volume measuring system (V_{\min}).

Minimum Totalised Load

The quantity, in units of mass, below which a totalisation may be subject to excessive relative errors.

Module

The part of a measuring instrument which performs specific function(s), that can be examined separately. The modules of a weighing instrument are subject to specified partial error limits.

Multi-interval Instrument

An instrument that has one weighing range, which is divided into partial weighing ranges, each with different scale intervals. The weighing range is determined automatically according to the load applied, which includes both increasing and decreasing loads.

Multiple Range Instrument

An instrument that has two or more weighing ranges with different maximum capacities and scale intervals for the same load receptor. Each range extends from zero to its maximum capacity.

N

Net Value

Indication of the weight of a load placed on a weighing instrument after operation of a tare device.

Non-automatic Weighing Instrument (NAWI)

See Weighing Instrument.

Not to be Used for Trade (Trading) with the Public

An approved measuring instrument, but one that is not approved for use in direct sale to the public.

See Trading Direct with the Public.

O

Over-range Blanking Point

The point above maximum capacity where the indications on non-automatic weighing instruments must blank out or show non-numerical characters.

P

Pattern of an Instrument

The definitive design of a measuring instrument, of which all the components that affect its metrological properties, are suitably defined.

Performance

The ability of a measuring instrument to accomplish its intended functions.

Permanently Marked

A marking that endures for the life of the instrument.

Pointer

A fixed or moving indicator, which carries the index.

Poise

A sliding weight used on a steelyard or tare bar to affect equilibrium.

Pre-selection

The means used to pre-set a weight for a totalised load.

Pre-set Tare Device

A device used for subtracting a pre-set tare value from a gross or net weight, and that indicates the result of the calculation. The weighing range for net loads is reduced accordingly.

Pre-setting Device

A device, which permits the selection of the quantity to be measured and which automatically stops at the end of the measurement of the selected quantity. The pre-set quantity may be volume, area, weight or the related price to pay.

Price-computing Instrument

An instrument that calculates the total price on the basis of indicated measurement value and unit price.

Price-labelling Instrument

A price-computing instrument that prints the measurement value, unit price and total price for an article.

Primary Indication

An indication (displayed, printed or memorised), which is subject to legal metrology control.

Note: Indications other than primary indications are commonly referred to as secondary indications.

Protein Measuring Instrument

A measuring instrument that determines the concentration of protein in a sample of grain.

R

Rail Vehicles

(a) Coupled wagon

A wagon joined with other wagons

(b) Reference Wagon

A wagon of known weight that is typical of those to be used for weighing on an instrument, and which has been selected for the purposes of in-motion testing.

(c) Wagon

A loaded or unloaded railway goods vehicle that is recognised by an instrument as a vehicle to be weighed.

(d) Total Train

A number of coupled wagons whose totalised weight is to be obtained.

Rail Weighbridge

See Automatic Rail Weighbridge.

Range of Measurement

The range between the minimum and the maximum values that can be measured.

Reference Material

A material of which the properties are used for the calibration of measuring instruments, the assessment of a measuring method or for assigning values to materials.

See also Australian Certified Reference Material.

Reference Point

A nominal measurement value at which a measuring instrument is tested for accuracy.

Reference Standard of Measurement

A standard of measurement (other than an Australian primary standard of measurement, Australian secondary standard of measurement, recognised-value standard of measurement or State primary standard of measurement) that has been verified in accordance with the *National Measurement Regulations 1999* (Cth) and for which the Certificate of Verification has not expired.

Typical examples of reference standards of measurements are:

- a standard volume measure which has a current certificate under Regulation 13;

- a weight calibrated against a reference standard which has a current certificate under Regulation 13.

Relative Error

See Error.

Repeatability

Closeness of agreement between measured values obtained by replicate measurements of the same quantity under the same conditions of measurement.

Repeatability Error

An error, which is the difference between the largest and smallest results of successive measurements of the same quantity carried out under the same conditions.

S

Safe Fill Level

The capacity to which a tank or tank compartment can be filled to avoid accidental over flow i.e. maximum capacity less 230 L or 97% of maximum capacity, whichever is smaller.

Scale

An ordered set of scale marks, together with any associated numbering, that form part of an indicating device.

(a) Scale Base Line

An imaginary line that runs through the centres of all the shortest scale marks.

(b) Scale Interval

The difference between the scale values corresponding to two successive scale marks.

(c) Scale Marks

A line or other mark on an indicating device that corresponds to one or more defined values; for digital and semi-digital indications, the numbers themselves are equivalent to scale marks.

(d) Scale Spacing

The distance between any two consecutive scale marks, measured along the base line.

Sealing (Securing)

A means to prevent unauthorised access to an adjustment device or other parameters of a measuring instrument that might alter the metrological characteristics of the instrument without access being detected. Sealing may be mechanical or electronic (e.g. password protection).

Secretary

The Secretary of the department—under which NMI operates—within the Australian Government.

Self-service Arrangement

An arrangement that allows the customer to use a measuring system for the purpose of obtaining liquid for his or her own purchase.

Self-service Device

A specific device that is part of a self-service arrangement and which allows one or more measuring systems to perform in this self-service arrangement.

Note: The self-service device includes all the elements and constituents that are mandatory for a measuring system to perform in a self-service arrangement.

Sensitivity

The quotient of a change in indication of a measuring instrument quantity and the corresponding change in the value of the quantity being measured.

Servicing Licensee

A person to whom a licence is granted under the *National Measurement Act 1960* (Cth).

Servicing Licensee's Mark (also see Verification Mark)

The mark approved under the *National Measurement Act 1960* (Cth) by the Secretary for use by, or on behalf of, a servicing licensee when verifying a measuring instrument.

Sight Glass

A device for checking, before start-up and after shutdown, that all or part of the measuring system is filled completely with liquid.

Simple Juxtaposition

Refers to the arrangement of digits of an indicator to permit reading without the need for calculation.

Stability

Refers to the property of a measuring instrument, whereby its metrological properties remain constant in time.

Stamper

A device fitted to an area-measuring instrument that stamps or imprints an item being measured with the area determined.

Substitution Method

A method in which a known value of the quantity measured is replaced by a quantity with a similar value.

T

Tare Device

A graduated or non-graduated device used for resetting the indication of a weighing instrument to zero when the load is placed on the load receptor.

(a) Additive Tare Device

A tare device that does not alter the weighing range of the instrument for net loads.

(b) Automatic Tare Device

A tare device used for balancing the load automatically without the intervention of an operator.

(c) Digital Tare Device

A tare device that allows a tare value to be manually entered into an instrument in integral multiples of a scale interval using rotary or thumb-wheel switches, a key board, or similar means.

(d) Non-automatic Tare Device

A tare device used for balancing a load by an operator.

(e) Pre-set (Stored) Tare Device

A facility used to enter one or more tare values into the memory of an instrument for separate recall for use in a weighing operation.

(f) Recall Tare Device

A facility used for recalling the tare value selected, during a weighing operation, by means of a non-latching push-button.

(g) Semi-automatic Tare Device

A tare device used for balancing a load automatically following a single manual command.

(h) Subtractive Tare Device

A tare device which reduces the weighing range of an instrument for net loads.

(i) Tare-weighing Device

A tare device that stores the tare value, and is capable of indicating or printing it whether or not the instrument is loaded.

Tare-setting Range

The maximum load that can be removed from or added to an indication using a tare device.

Tare Value

The weight of a load, determined by a tare-weighing device.

defines the start and stop of volume measurement).

Test Load

A quantity of product (typical of the product to be used) of known weight traceable to national standards of measurement.

Toggle

See Indication Changeover Point.

Totalisation Device

A device that uses information supplied by the measuring unit to display the total volume, weight of the loads conveyed, or sum of the area of single items.

Totalisation Indicating Device

A device that receives information from the totalisation device and indicates the total quantity measured.

Totalisation Scale Interval

The value, expressed in units of mass, of the difference between two consecutive indicated values, for general and partial totalisation devices, with the automatic weighing instrument in its normal weighing mode.

Track Switches

Switches mounted in the vicinity of a weighing instrument and operated by a locomotive and first rail wagon after the locomotive, while in-motion to control a weighing process.

Trade Measurement Inspector

A trade measurement inspector appointed under the *National Measurement Act 1960* (Cth).

Trading Direct with the Public

A transaction (selling or buying) in which the settlement is associated with indications provided by a measuring system. Any party has access to the place of measurement, however one of them must be a consumer.

Note: The consumer can be any person, including the buyer or the seller.

Transfer Instrument

See Control Instrument.

Transfer Point – Liquid-Measuring Systems

A point at which the liquid is defined as being delivered or received (the transfer point

U

Uncertainty of the Determination of an Error

An estimate characterising the range of values within which the true value of an error lies. This includes components due to the standard and its use, and components due to the verified or calibrated instrument itself.

V

Verification

The examination of an instrument, in accordance with the relevant NITP, to ascertain whether it performs within the relevant MPEs and can be marked with a verification mark. The examination shall be performed by either a trade measurement inspector, a servicing licensee, an employee of a servicing licensee—or in the case where the instrument is a utility meter, a utility meter verifier.

(a) Initial Verification

Verification of a new measuring instrument that does not bear a verification mark and has never been verified before.

(b) Subsequent Verification

Verification of a measuring instrument following repair, maintenance or adjustment affecting the metrological performance, sealing, or verification mark of a measuring instrument.

(c) Reverification

Verification of a measuring instrument that is already verified (e.g. has a valid verification mark).

Verification Mark

In relation to utility meters, a utility meter verifier's mark. In relation to any other measuring instrument, either an inspector's mark or a servicing licensee's mark.

Verification Scale Interval

The value, expressed in units of mass, used for determining the classification, and calculating the MPEs for verification and in-service inspection of an instrument.

Verifier

A person who is permitted to verify measuring instruments under the *National Measurement Act 1960* (Cth).

W

Wagon Weight

(a) Maximum Wagon weight

The largest in-motion load that an installation is approved to weigh for a particular site.

(b) Minimum Wagon weight

The wagon weight below which, a weighing-in-motion result may be subject to an excessive relative error.

Weigh Length

The distance between two imaginary lines at the half distance between the axes of an end weighing roller(s) and the axes of the nearest carrying roller(s).

Weigh Zone

The zone in which a wagon must be located when it is weighed.

Weighing-in-motion

Weighing objects that are in motion.

(a) Wagon Weighing

The weighing-in-motion of a train of coupled wagons to obtain a weight indication or printout of the individual wagons.

(b) Partial Weighing

Weighing a wagon in two or more parts on the same load receptor. The results are automatically added to indicate or print the wagon weight.

(c) Train Weighing

The weighing-in-motion of a number of coupled wagons to obtain a totalised weight of all the wagon weights.

(d) Uncoupled Wagon Weighing

The weighing-in-motion of wagons that travel independently across a load receptor. This is usually achieved through an incline of the approach to the load receptor.

Weighbridge

A weighing instrument that has a load receptor and a capacity of three tonnes or more, which is used to determine the weight of a vehicle or of livestock.

Weighing Instrument

An instrument that serves to determine the weight of a body by using the action of gravity on this body. The instrument may also be used to determine other quantities, magnitudes, parameters or characteristics related to weight. According to its method of operation, a weighing instrument may be classified as automatic or non-automatic.

(a) Automatic Weighing Instrument

An instrument that does not require the intervention of an operator during the weighing process.

(b) Non-automatic Weighing Instrument

An instrument that requires the intervention of an operator during the weighing process. For example, depositing or removing the article to be measured from the receptor, and obtaining the result.

(c) Graduated Weighing Instrument

An instrument allowing the direct reading of the complete or partial weighing result.

(d) Non-graduated Weighing Instrument

An instrument not fitted with a scale numbered in units of mass.

(e) Self-indicating Weighing Instrument

An instrument in which the position of equilibrium is obtained without the intervention of an operator.

(f) Semi-self-indicating Weighing Instrument

An instrument with a self-indication weighing range, in which the operator intervenes to alter the limits of this range.

(g) Non-self-indicating Weighing Instrument

An instrument in which the position of equilibrium is obtained entirely by the operator.

Weighing Range

The range between the minimum and maximum capacities.

Weighing Rollers

The rollers by means of which a conveyor belt is supported on the load receptor.

Weighing Unit

The part of a belt weigher that provides information on the weight of the load to be measured.

Weight

A material measure of mass, regulated in regard to its physical and metrological characteristics: shape, dimensions, material, surface quality, nominal value, density and magnetic properties.

The term 'weight' is also used for the result of gravity acting on a body, $G = m g$, where m is its mass and g the acceleration due to gravity.

(a) Weight in air (conventional mass)

A convention where the result of a weighing conducted in air which has not been adjusted for air buoyancy gives a mass that is reasonably close to true mass. (Conventional mass is the mass that an object would appear to have if it is weighed at a temperature of 20 °C in air of density 1.2 kg/m³ against a standard with a density of 8000 kg/m³.)

(b) True weight (true mass)

The result of weighing adjusted to eliminate the buoyancy effect of weighing in air.

Z

Zero-setting Device

A device used to set the indication to zero.

(a) Automatic Zero-setting Device

A device used to set the indication to zero automatically without the intervention of an operator.

(b) Initial Zero-setting Device

A device used to set the indication to zero automatically at the time the instrument is switched on and before it is ready for use.

(c) Non-automatic Zero-setting Device

A device used to set the indication to zero by an operator.

(d) Semi-automatic Zero-setting Device

A device used to automatically set the indication to zero following a manual command.

Zero-Setting Range

The weighing range within which any variation from zero can be re-set to zero using the zero-setting device.

Zero-Tracking Device

Device for automatically maintaining the zero indication within certain limits.

APPENDIX A. CLASSES AND SUBCLASSES OF SERVICING LICENCES

The classification of servicing licensees appointed to verify measuring instruments generally aligns with the classes and subclasses listed below.

Item	Servicing licence
1	Servicing licence relating to length measuring instruments
	1.1 Measures of length not exceeding 2 metres
	1.2 Measures of length exceeding 2 metres
	1.3 Fabric measuring instruments
2	Servicing licence relating to area measuring instruments
	2.1 Leather measuring instruments
3	Servicing licence relating to masses
	3.1 Masses not exceeding 20 kg, other than: (a) masses marked "A"; and (b) metric carat masses.
	3.2 Masses, other than the masses mentioned in item 3.1, that are: (a) marked "A"; and (b) metric carat masses
4	Servicing licence relating to measures of volume
	4.1 Volume measures
	4.2 Beverage dispensers
	4.3 Alcoholic beverage measures (drinking and portable)
	4.4 Lubricating oil measures
	4.5 Pharmaceutical dispensing measures, graduated measuring cylinders
	4.6 Brim measures for flowable solids
	4.7 Food products
	4.8 Non-food products
	4.9 Grain density measuring instruments
	4.10 Measuring container bottles
5	Servicing licence relating to liquid measuring instruments
	5.1 Fuel dispensers used for petroleum products other than LPG
	5.2 Flow meters used for petroleum products
	5.3 Flow meters used for liquids other than petroleum products
6	Servicing licence relating to weighing instruments
	6.1 Weighing instruments, classes 1 and 2
	6.2 Weighing instruments of 30 kg capacity or less, classes 3 and 4
	6.3 Weighing instruments of a capacity exceeding 30 kg, but not exceeding 3 tonnes, classes 3 and 4
	6.4 Weighing instruments of a capacity exceeding 3 tonnes, classes 3 and 4
	6.5 Belt-conveyor weighing instruments
	6.6 Automatic rail weighbridges
	6.7 Automatic packaging conveyor weighers

Item	Servicing licence
	6.8 Wheeled loaders.
	6.9 Totalising hopper weighing instruments
	6.10 Legal measuring instruments
8	Servicing licence relating to farm milk tanks
	8.1 All subclasses
9	Servicing licence relating to vehicle tanks
	9.1 All subclasses
10	Servicing licence relating to LPG dispensers
	10.1 Fuel dispensers used for LPG, other than cryogenic liquids
	10.2 Flow meters used for LPG, other than cryogenic liquids
12	Servicing licence relating to natural gas dispensers
	12.1 All subclasses
13	Servicing licence relating to multi-dimensional measuring instruments
	13.1 All subclasses
15	Servicing licence relating to quality measuring instruments
	15.1 Grain
	15.2 Cane sugar
	15.3 Wine grapes
17	Servicing licence relating to density hydrometers
	17.1 All subclasses
18	Supplementary servicing licences relating to:
	18.2 Point of sale systems