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## DEPARTMENT OF TRADE AND INDUSTRY

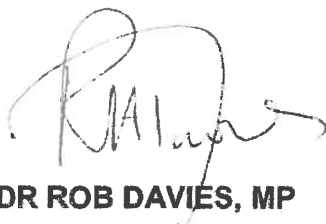
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24 AUGUST 2018

**NOTICE IN TERMS OF SECTION 38(1) OF THE LEGAL METROLOGY ACT, 2014  
(ACT NO. 9 OF 2014)**

By virtue of the powers vested in me in terms of section 38(1) of the Legal Metrology Act, 2014 (Act No. 9 of 2014), I, Dr Rob Davies, Minister of Trade and Industry, hereby-

- (a) make the regulations in the Schedule published hereunder; and
- (b) determine that the regulations shall commence on the date of publication of this Notice, unless any regulation determines otherwise.



**DR ROB DAVIES, MP**

**MINISTER OF TRADE AND INDUSTRY**

**DATE:.....17/8/2018**

## TABLE OF CONTENTS

### *Part I*

#### *Definitions and application of requirements of the Act*

1. Definitions
2. Application of requirements of the Act

### *Part II*

#### *Registration of importers, manufacturers, persons who offer for sale any prescribed measuring instrument, product or service*

3. Requirements for registration
4. Offence in connection with registration of importers, manufacturers or persons who offered for sale any prescribed measuring instrument, product or service
5. Samples and information

### *Part III*

#### *Measurement standards*

6. General requirements
7. Measurement standards for mass
8. Measurement standards for volume
9. Measurement standards for length

**Part IV****Market surveillance inspectors**

10. Qualifications of market surveillance inspectors
11. Appointment of market surveillance inspectors

**Part V****Sale of goods**

12. Goods destined for export
13. Seller or importer to take precaution regarding the quantity of goods purchased for resale
14. Delivery note, invoice or other writing to accompany goods delivered
15. General requirements for issuing delivery note, invoice or other writing
16. Goods to be measured after despatched
17. Liquid products in vehicle tanks and bulk containers
18. Duties of person conveying goods
19. Dealers to retain delivery notes

**Part VI****Requirements for marking of prepackages and prescribed quantities**

20. Markings on prepackaged products and prescribed quantities
21. Goods or articles ordered by purchaser in person
22. Non-consumer packages
23. Standard temperature for sale of prepackaged liquid products

24. Marking of equivalent statement of quantity on prepackaged products
25. Qualification of statement of quantity on prepackaged products
26. Prepackaged products sold other than by measurement unit

### ***Part VII***

#### ***Special requirements for sale of goods sold other than in prepackaged form***

27. Price descriptions
28. Standard temperature for liquid products measured at time of sale
29. Purchase of milk by mass
30. Measurement units in which quantity of certain goods must be expressed

### ***Part VIII***

#### ***Accuracy of measurement when determining quantity of goods***

31. Suitable instruments to be used and made available
32. Tolerances permitted on determination of quantity of goods
33. Accuracy of vessels or containers used for sale of liquids
34. Authorisation to deviate from requirements

### ***Part IX***

#### ***Compliance schemes***

35. Quantity mark scheme
36. Measurement mark scheme
37. Application for registration certificate
38. Offences in respect of compliance schemes marks

**Part X*****Measuring instruments, products or services not conforming to legal metrology  
technical regulations***

39. Directive
40. Confiscation
41. Destruction
42. Return to country of origin

**Part XI*****Measuring instruments and containers used for prescribed purposes***

43. Measurement units, prefixes, symbols and their usage
44. Permissible nominal values (denominations) of weights and of material measures
45. Measuring instruments not to be subject to initial or subsequent verification and prohibition from use of certain measuring instruments
46. Use of units for indication of results of measurements
47. Form of values of graduation
48. Reading by simple juxtaposition
49. Advance of indication by digital indicators
50. Extent of rounding error permitted
51. Indication by several indicators
52. Notice in connection with periodic verification of measuring instruments as envisaged in section 24(2) of Act

53. Measuring instruments acquired unverified to be verified before use for prescribed purpose
54. Measuring instruments deemed to be unverified after having been re-installed
55. Acceptability of declared quantity
56. Method of determining tare or gross mass of containers, railway trucks or road vehicles
57. Weighing instruments used for determining axle mass loads of vehicles
58. Measuring instruments not intended for use for prescribed purpose
59. Duties of person submitting or using measuring instruments
60. Verification on premises of designated repair or verification body
61. Marking of number of approval certificate
62. Removable parts
63. Interchangeable or reversible parts
64. Marking of capacity or denomination
65. Affixing of verification mark
66. Defacing of verification mark and authority for further use
67. New and used measuring instruments
68. Weighing instruments: position of balance and means of balancing at zero load
69. Placing of indicators of weighing instruments
70. Construction and strength of weighing instruments and measuring instruments
71. Positioning of weighing instruments
72. Knife-edges and bearings
73. Steelyards and travelling or sliding poises on weighing instruments

74. Testing of movable and suspended weighing instruments
75. Testing of fixed weighing instruments
76. Testing of weighing instruments for error
77. Composition of test loads
78. Testing of weighing instruments for repeatability
79. Testing of weighing instruments for constancy when load is kept on measuring instrument
80. Testing of weighing instruments for constancy at zero balance
81. Testing of vibrating weighing instruments for sensitivity
82. Testing of weighing instruments for strength of levers
83. Testing of weighing instruments on movement of knife-edges and bearings
84. Conventional weighing instruments
85. Beam scales, balances, post office letter beam scales and mechanical non-self-indicating counter scales
86. Responsibility of users of measuring instruments
87. Weights for coarse measurement
88. Weights for fine measurement
89. Conformity to appropriate technical regulations
90. Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals
91. Automatic rail-weighbridges
92. Automatic weighing instruments
93. Cream test scales

94. Road vehicle scale for determination of mass of road vehicles in motion or axle by axle
95. Conventional length measuring instruments
96. Length measuring instruments including self-indicating measures of length
97. Area-measuring instruments
98. Conventional measures of volume
99. Dipping measure
100. Graduated glass measures for pharmaceutical dispensing and comparable measurement
101. Measuring flasks
102. Pipettes
103. Burettes
104. Vehicle tanks
105. Vehicle tanks provided with gauges
106. Liquid-measuring devices
107. Measuring devices and systems for measurement of cryogenic liquids and specified liquid gases
108. Liquid meters and liquid meter systems
109. Milk meter systems
110. Liquid petroleum gas meter systems
111. Liquid meter systems for predetermined quantities
112. Lubricating oil dispensers
113. Liquid fuel dispensers

- 114. Water meters
- 115. Gas meters for domestic use
- 116. Vessels or containers used for sale of liquids

## ***Part XII***

### ***Verification and repair bodies***

- 117. Requirements for designation of verification bodies
- 118. Responsibilities of verification body
- 119. Withdrawal of designation of verification body
- 120. Verification certificate
- 121. Reporting of verification results
- 122. Rejection certificate
- 123. Registration and qualifications of verification officers
- 124. Requirements for designation of repair bodies
- 125. Responsibilities of designated repair body
- 126. Withdrawal of designation of repair body
- 127. Registration and qualifications of persons responsible for repair (also referred to as “repairer”)
- 128. Certificate of repair
- 129. Reporting of repair results
- 130. Restrictions with respect to repair and verification of measuring instruments
- 131. Commencement of Part XII

**Part XIII****Distinctive marks**

- 132. Approval mark
- 133. Rejection mark
- 134. Verification mark
- 135. Protective mark
- 136. Repair mark

**Part XIV****Measuring instruments, vessels or containers exempted from type approval and verification**

- 137. Measuring instruments
- 138. Conditions, restrictions and requirements
- 139. Declaration of an instrument as unfit for further use
- 140. Measuring instruments not exempted under regulation 3
- 141. General exemptions

**Part XV****Application for evaluation and approval of measuring instruments**

- 142. Application of measuring instruments in terms of section 22 of Act
- 143. Marking on specimen
- 144. Period of validity of type approval certificate

**Part XVI**

**Regulation pertaining to periodic verification**

145. Requirements

**Part XVII**

**General**

146. Repeal

147. Short title and commencement

**Part I**

**Definitions and application of requirements of Act**

**Definitions**

1. In these Regulations, unless the context indicates otherwise, a word or expression to which a meaning has been assigned in the Act, has the same meaning, and—

**“accredited”** means accredited in terms of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act No. 19 of 2006) as amended or accredited by a member of the recognition arrangement of the International Laboratory Accreditation Co-operation;

**“area-measuring instrument”** means a measuring instrument which is designed and constructed to measure and automatically indicate the surface area of leather or such other material as may be described in the type approval documentation when passed through the leather or such material;

**"automatic rail-weighbridge"** means an automatic weighing instrument having load receptors, inclusive of rails for conveying railway wagons, that determines the mass of wagons or trains or both wagons and trains, by weighing them in motion;

**"automatic weighing instrument"** means a weighing instrument provided with a self-acting mechanism that weighs without the intervention of an operator and that follows a predetermined program of automatic processes characteristic of the instrument;

**authorised officer"** means any duly appointed market surveillance inspector, an employee of an organ of state furnished with a written inspection authority issued by the Chief Executive Officer in terms of section 6 of the Act or any police officer;

**"bearings"**, in relation to the lever and stay pivots of a weighing instrument fitted with knife-edges, means all surfaces and points intended to be in contact with the knife-edges;

**"burette"** means a delivering measure of volume for pharmaceutical dispensing and comparable measurement, made of glass in the form of a pipette, but having a glass tap in the tip for controlling delivering or for controlling filling and delivering, provided that the datum level defining the capacity of a burette which is filled from the bottom may be the rim of a narrowed top section;

**"capacity"—**

- (a) as marked or indicated on a measuring instrument in accordance with regulation 64 of Part XI, in respect of—
  - (i) a weighing instrument, means the maximum mass which it is designed and constructed to measure in a single operation, including the mass balanced by any graduated and denominated tare adding device with

which the measuring instrument may be provided, but excluding the range of the scale on a difference chart;

(ii) a length, area or volume measuring instrument, other than a liquid meter, water meter, gas meter or other continuous length, area or volume measuring instrument or a simple material measure of length or volume, means the maximum length, area or volume for which it is designed and which it is constructed to measure in a single operation;

(iii) any measuring instrument which is designed to measure continuously, means the maximum measurement which it can indicate:

Provided that any graduated measuring instrument to which subparagraphs (i), (ii) and (iii) of this definition relate may indicate values equivalent to a maximum of nine graduations above or one graduation below the nominal capacity of the measuring instrument;

(b) in respect of a conventional measure of volume, means the maximum defined quantity for which it is designed;

**"combination meters"**, in respect of a water meter, means a system that consists of one large meter, one small meter and a device that, without using any source of energy other than that of the fluid being measured, automatically so directs the water through either meter that neither of the meters operates outside of its designed operating range;

**"compartment"**, in respect of a vehicle tank, means any one of the portions into which the tank may have been subdivided

**"compliance scheme"** means a scheme introduced by the Minister in terms of section 37 of the Act;

**"conical measure"**, in respect of a conventional measure of volume, means a measure of volume of which the diameter at the brim is not more than two thirds of the diameter at the bottom;

**"consumer"** means any person who purchases a product or service for his or her own use through retail sales agencies or other means, but does not include a person purchasing a product for further processing or any other industrial or institutional use;

**"containing measure"**, in respect of a conventional measure of volume, means a measure of volume intended to contain the defined quantity when filled to any datum level;

**"continuous totalizing automatic weighing instrument"** means an automatic weighing instrument for continuously weighing a bulk product on a conveyor belt, without systematic subdivision of the mass and without interrupting the movement of the conveyor belt;

**"measure of length"** means a length measure of conventional design bearing scale marks or graduation lines or having suitable end surfaces which indicate distances in units of length;

**"measure of volume"** means a volume measure of conventional design used for measuring liquid substances and having a datum level or levels which define the quantity or quantities which can be measured by means thereof;

**"cream test beam scale"** means any weighing instrument having an equal armed beam with knife-edge pivots and with cream test bottle holders suspended below the beam;

**"cream test torsion balance"** means any weighing instrument having an equal armed beam with torsion band pivots and with cream test bottle holders above the beam;

**"delivering measure"**, in respect of a conventional measure of volume, means a measure of volume intended to deliver a defined quantity after having been filled to any datum level;

**"delivery note"** means any separate piece of paper of such colour and size as readily to permit a clear and legible statement being made thereon and actually bearing such a statement of all information required by the Act and these Regulations to be furnished in respect of any goods actually being delivered to a purchaser;

**"denomination"**, in respect of a measuring instrument, means the name and value of the measurement unit used, for expressing the magnitude of the quantity;

**"electronic indicator"**, in respect to a water meter, means an indicator with electronic indication fitted to a water meter, which measures the volume of water passing through it, and displays other values or indications associated with the operation of the meter or measuring system in which it is installed;

**"environment"**, in respect of measuring instruments and devices for measuring, means—

- (a) sound (noise), vibration, ionizing and nonionizing radiation; and
- (b) pollution of air, water, soil and food products;

**"gas meter"** means a measuring instrument which is designed and constructed for use in a gas supply system to measure and automatically indicate the volume of combustible gas passed through it in a continuous stream and used by a consumer for domestic purposes;

**"gauge"** means a gauge to indicate the nominal value or result of measurement in respect of a vehicle tank or any other tank;

**"graduated measure"**, in respect of conventional measures of length, means a measure of length on which graduations between the principal scale marks represent distances less than the nominal length of the measure;

**"health"** includes-

- a) Measuring instruments and devices used to measure the physical aspects of humans, including height, weight, temperature, blood pressure, respiratory volume, hearing and vision;
- b) Pharmaceutical dispensing and dispensing, by a medical practitioner, of his own prescription;
- c) Measuring instruments, substances and devices used in chemical, biological and bio-chemical analysis (including counting) to identify biological and chemical substances and species and to determine content, concentration, proportions and counts;

**"index"**, in respect of a measuring instrument, means that part of the indicating device, the position of which with reference to the scale marks, enables the result of a measurement to be defined;

**"indication"** means the quantity value provided by a measuring instrument or a measuring system, whether provided by—

- (a) the presentation in visual or acoustic form or the transferral to another device; or

(b) the position of a pointer on the display for analogue outputs, the display or printed number for digital outputs, a code pattern for code outputs or an assigned quantity value for material measures;

**"length measuring instrument"** means a measuring instrument which is designed and constructed to measure and automatically indicate the length of fabrics or other materials, as described in the type approval documentation, when passed through it;

**"load measuring device"**, in respect of a weighing instrument, means that part of the measurement instrument by means of which the mass of the load is measured;

**"load receptor"**, in respect of a weighing instrument, means that part of the measuring instrument on or in which the load is supported or from which the load is suspended;

**"load transmitting device"**, in respect of a weighing instrument, means that part of the measuring instrument by means of which the force produced by the load acting on the load receptor is transmitted to the load measuring device;

**"liquid-measuring device"** means an apparatus for delivering predetermined volumes of liquid into drums, barrels, bottles or other receptacles, but does not include a liquid fuel dispenser and any liquid meter system for predetermined quantities;

**"liquid meter"** means a measuring instrument which is designed and constructed to measure and to automatically indicate the volume of liquid passed through it in a continuous stream, but does not include a water meter;

**"liquefied petroleum gas meter system"** means an installation comprising a liquid meter and ancillary equipment, designed and constructed specifically for measuring liquefied petroleum gas in bulk;

**"liquid meter system for predetermined quantities"** means an installation comprising a liquid meter and ancillary equipment, designed and constructed specifically for measuring and delivering predetermined quantities of liquid into drums, barrels, bottles or other receptacles;

**"lubricating oil dispenser"** means a liquid measuring system comprising a liquid meter and ancillary equipment designed and constructed specifically for measuring and dispensing lubricating oil for servicing motor vehicles;

**"liquid fuel dispenser"** means a measuring assembly that comprises a pump, a meter and ancillary equipment for the measurement and delivery of liquids into the tanks of vehicles, boats or small aircraft or into other receptacles, as approved during type approval;

**"material measure"** means a physical object of known value and denomination used to determine the value of a quantity by direct comparison;

**"maximum permissible error"** means the extreme value of measurement error, with respect to a known reference quantity value, permitted by specifications or regulations for a given measurement, measuring instrument or measuring system;

**"measuring flask"** means a glass measure of volume for pharmaceutical dispensing and comparable measurement and comprising a bulb, with cylindrical neck of relatively small diameter, which bears a datum level line representing the denomination of the measure, provided that the neck may be graduated in deficiency or in excess of the datum;

**"measuring system"** means a set of one or more measuring instruments and often other devices, including any reagent and supply, assembled and adapted to give

information used to generate measured quantity values within specified intervals for quantities of specified kinds;

**"meat"** means meat of any description, whether fresh, pickled, marinated, dried, salted, chilled, frozen, cooked or processed, and includes all dressed or undressed carcasses;

**"mechanical water meter"—**

- (a) means a self-contained integrating measuring instrument that continuously determine the volume of water flowing through it, that—
- (i) employ a direct mechanical process involving the use of the volumetric chambers with mobile walls (volumetric water meters) or the action of the velocity of the water on the rotation rate of a moving part (velocity meters); and
  - (ii) has a mechanical or electronic integral indicating device (indicator); and
- (b) includes a meter of which the measuring element and the indicator form a measuring assembly which is intended to be verified before being installed in the meter body in which it will be used and which meter body must comply with all applicable requirements and must have been type approved;

**"milk"** includes fresh, pasteurised, sterilised, homogenised or skimmed milk, including long life milk, but does not include milk extracted from plants;

**"milk meter system"** means an installation comprising a liquid meter and ancillary equipment, designed and constructed specifically for measuring milk in bulk and used for—

- (a) the reception of milk by collecting tankers or in dairies or depots; or
- (b) the delivery of milk;

**"modified"**, in respect of a measuring instrument for which a type approval certificate has been issued in terms of section 22 of the Act, including any attachment, device or ancillary equipment used with such instrument, means a change that does or may alter some of its metrological or technical characteristics, its ranges or its applicability;

**"new"**, in respect of a measuring instrument, means a measuring instrument which has never been used since having been made;

**"nominal length"**, in respect of a measure of length, means the maximum length which the measure is designed to measure;

**"non-automatic weighing instrument"** means an instrument that requires the intervention of an operator during the weighing process;

**"non-self-indicating"**, in respect of a measuring instrument, means a measuring instrument in which the position of equilibrium is obtained entirely by the operator;

**"pipette"** means a delivering measure of volume for pharmaceutical dispensing and comparable measurement, made of glass in the form of a cylindrical tube bearing one or more datum level lines or graduations and having a constricted tip at the bottom of such diameter as to retain liquid in the pipette when the top thereof is closed;

**"post office letter beam scale"** means a beam scale or beam balance as defined in SANS 302 that is intended only for the weighing of letters for the determination of postal charges;

**"pre-payment water meter system"** means a measuring system consisting of a meter and ancillary devices which include but are not limited to a valve to open and close the water supply and a device to allocate the proportionate volume of water for an amount

of monetary credit. The components maybe mechanical or electronic or a combination of the two and credit may be entered by the insertion of money or some other means;

**"principal indicator"**, in respect of a measuring instrument, means any indicator which provides the initial or the principal visual indication or printing of values of quantities measured by the measuring instrument;

**"principal scale marks"**, in respect of a measure of length, means the two marks or end surfaces, the distance apart of which represents the nominal length of a measure of length;

**"repaired"**, in respect of a measuring instrument, means any such measuring instrument which has been repaired after—

- (a) obliteration of the verification mark thereon by a market surveillance inspector or verification officer; or
- (b) obliteration of a defaced verification mark thereon by a repairer in terms of the Act or these Regulations;

**"reading by simple juxtaposition"** means the reading of the result of a measurement where successive figures have been so juxtaposed as to give the result of the measurement without the need for calculation;

**"reject"**, in respect to a measuring instrument, means a decision of legal relevance that a measuring instrument does not comply with statutory requirements for verification and prohibiting its use for applications requiring mandatory verification;

**"rejection mark"** means a mark, in the form of a six pointed star, applied to a measuring instrument in a conspicuous manner to indicate that the measuring

instrument does not comply with the statutory requirements for verification and in a manner that obliterates the previously applied verification mark;

**"repair mark"** means a mark applied to a measuring instrument in a conspicuous manner confirming that a repair of the measuring instrument was carried out and compliance with statutory requirements was guaranteed;

**"result of a measurement"** means the value of the measured quantity obtained by a measurement;

**"retail"**, in respect of a selling transaction, means any sale to a consumer, and includes a transaction whereby a consumer purchases directly from a wholesaler, manufacturer or any other sales outlet;

**"road vehicle scale"** means a vehicle scale intended for the measurement of the mass of road vehicles;

**"rounding"**, in respect of digital indication, means the rounding, by the indicating device of a measuring instrument, of the result of a measurement, up or down, to the nearest discrete figure;

**"rounding error"**, in respect of a digital indicator, means the difference between the digital indication and the result which the measuring instrument would indicate if the indicator were an analogue indicator;

**"SABS 1650"** means the South African National Standard entitled "Liquid Fuel Dispensers";

**"safety"** includes measuring instruments and devices for determining the value of quantities and for checking the observance of permissible limits in occupational safety and accident prevention;

**"SANS 289"** means the South African National Standard entitled "Labelling requirements for prepackaged products (prepackages) and general requirements for the sale of goods subject to legal metrology control", as amended;

**"SANS 302"** means the South African National Standard entitled "Non-automatic, undenominated beam scales and balances subject to legal metrology control", as amended;

**"SANS 303"** means the South African National Standard entitled "Non-automatic, non-self-indicating or semi-self-indicating, un-graduated counter scales subject to legal metrology control", as amended;

**"SANS 319"** means the South African National Standard entitled "Measuring systems - Cryogenic liquids and other selected liquid gases in vertical tanks - Pressure differential method", as amended;

**"SANS 344"** means the South African National Standard entitled "Dynamic measuring devices and systems for cryogenic liquids", as amended;

**"SANS 458"** means the South African National Standard entitled "Tolerances permitted for the accuracy of measurements in terms of legal metrology legislation including prepackaged products", as amended;

**"SANS 689"** means the South African National Standard entitled "Automatic rail-weighbridges", as amended;

**"SANS 863"** means the South African National Standard entitled "Continuous totalizing automatic weighing instruments- Belt weighers", as amended;

**“SANS 1529-1”** means the South African National Standard entitled “Water meters for cold potable water: Metrological characteristics of mechanical water meters of nominal bore not exceeding 100 mm”, as amended;

**“SANS 1529-9”** means the South African National Standard entitled “Water meters for cold potable water: Requirements for electronic indicators used with mechanical water meters, electronic water meters and electronic prepayment water measuring systems”, as amended;

**“SANS 1649”** means the South African National Standard entitled “Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals”, as amended;

**“SANS 1697”** means the South African National Standard entitled “Verification standards for the verification of mass measuring instruments, including commercial standard masspieces”, as amended;

**“SANS 1698”** means the South African National Standard entitled “Verification standards for the verification of volume-measuring instruments, including commercial standards of volume”, as amended;

**“SANS 1840”** means the South African National Standard entitled “Manufacture of measuring container bottles”, as amended;

**“SANS 1841”** means the South African National Standard entitled “Control of the quantity of contents in prepacked packages within the prescriptions of legal metrology legislation”, as amended;

**“SANS 10378”** means the South African National Standard entitled “General requirements for the competence of verification laboratories”, as amended;

**"self-indicating"**, in respect of a measuring instrument, means a measuring instrument in which the position of equilibrium is obtained without the intervention of an operator;

**"semi-self-indicating"**, in respect of a measuring instrument, means a measuring instrument with a self-indication measuring range, in which the operator intervenes to alter the limits of this range;

**"steelyard"** means, in addition to the weighing instrument so designated, the load measuring device in the form of a steelyard on any weighing instrument so equipped;

**"the Act"** means the Legal Metrology Act, 2014 (Act No. 9 of 2014);

**"turn"**, in respect of a vibrating weighing instrument, means the displacement of the beam or steelyard to the full extent of its travel either way from the horizontal position of balance, and the mass required to effect such turn does not include the mass required to correct any error;

**"true value"**, in respect to quantity, means the value which characterizes the quantity perfectly defined;

**"type evaluation"** means the sequence of all the steps taken in the course of the evaluation and approval, or rejection, of a type, starting with the submission of the request for type approval and culminating in a certificate or notice of type approval or rejection;

**"ullage"** means the distance between the free surface of the product and the container top reference point, measured along the vertical measurement axis;

**"undue yielding"**, in respect to any part of a weighing instrument, means to yield to such an extent as to cause a permanent deformation of the part or to cause incorrect measurement by the weighing instrument, whether such permanent deformation or

incorrect measurement is immediately apparent or is apparent only after repeated application of the load that causes the part to yield;

**"value"**, in respect of a given quantity, means the magnitude of the quantity expressed as the product of a number and the appropriate unit of measurement;

**"vehicle tank"** means a measure of volume in the form of a container, which may or may not be subdivided into two or more compartments, the tank or each compartment having a capacity of not less than 200 L, mounted on a motor truck or trailer, or on a railway truck, and used for the sale or delivering of liquids by measure of volume, but does not include a vehicle tank provided with a removable measuring gauge or gauges and a vehicle tank provided with a liquid meter;

**"vibrating weighing instrument"** means a weighing instrument in which the beam or steelyard oscillates when disturbed from rest in its position of balance;

**"weighing instrument"** means any measuring instrument that serves to determine the mass of a body by using the action of gravity on such body;

### **Application of requirements of the Act**

2. (1) The purposes relating to the use or possession for use of any measuring instrument or the measurement of a product or a service for which a technical regulation has been published by the Minister under Section 15 of the Act or for which interim requirements and conditions pertaining to the use thereof has been set by the CEO under Section 22(2)(c) of the Act or for any other applicable provision of the Act must be in relation to a prescribed purpose as defined in the Act.

(2) Any person who, at the commencement of the Act or these Regulations, use for a prescribed purpose, any equipment which was allowed to be used under the requirements of any other law requiring compliance to a South African National Standard, may continue to use the equipment for a period of 24 months from the commencement of these Regulations or for such additional period as the Minister may determine by notice in the *Government Gazette*.

(3) The person referred to in subregulation (2) above must submit a proposal to the CEO to introduce a legal metrology technical regulation as contemplated in Section 16(1) of the Act within six months from the commencement of these Regulations.

## ***Part II***

### ***Registration of importers, manufacturers, persons who offer for sale any prescribed measuring instrument, product or service***

#### **Requirements for registration**

3. (1) (a) Any manufacturer, importer or person who offer for sale or supply any prescribed measuring instrument, product, or provides a service, falling within the ambit of the Act prior to the date of these regulations coming into effect, must apply for registration with the National Regulator within three years from the date of these regulations coming into effect.

(b) Any manufacturer, importer or person who offer for sale or supply any prescribed measuring instrument, product, or provide a service, falling within the ambit of the Act after the date that these regulations come into effect, must apply for

registration with the National Regulator within three years from the date of these regulations coming into effect.

(2) Application for registration must be done by completing an application form available from the National Regulator and submitting the application form and any additional information required to the National Regulator.

(3) The National Regulator must issue a certificate as evidence of registration to a person registering. Irrespective of any amendments to the registration certificate, the registration certificate is valid for a five-year period from the date of first registration, after which a new application must be completed if the business of manufacturing, importing of any commodity or product, or providing of a service is still active.

(4) When any change in the information provided to the National Regulator occurred since registration, the registered person must notify the National Regulator within 30 days of such changes. Such changed information must be notified to the National Regulator in a format as prescribed by the National Regulator.

(5) An amended registration certificate indicating the changes must be issued by the National Regulator.

**Offence in connection with registration of importers, manufacturers or persons who offered for sale any prescribed measuring instrument, product or service**

4. Any person who manufactures, imports, offers for sale or supplies any prescribed measuring instrument, product, or provides a service falling within the ambit

of the Act that fails to register as prescribed in section 11 of the Act, is guilty of an offence in terms of the Act.

**Inspection, seizing and retention of measuring instruments products or services by market surveillance inspectors**

5. (1) Any person who imports, manufactures, users or any person who offers for sale or supply, any prescribed measuring instrument, product or service, herein after referred to as a sample, to which a legal metrology technical regulation applies, must at the request of the market surveillance inspector, and within the period stated in the request, and at that person's own cost—

- (a) place at the disposal of the market surveillance inspector, any sample, as may be specified in the request, in order to inspect, examine, test or analyse; or
- (b) furnish the market surveillance inspector such documentation as may be specified in the request with regard to the inspection; and
- (c) comply with the sampling requirements of a legal metrology technical regulation that is in force on the request of a market surveillance inspector.

(2) The market surveillance inspector may open products or instruments in order to examine any sample obtained in terms of this Act, or have it tested or analysed, in order to determine whether the prescribed measuring instrument, product or service, or any component, material or substance concerned therewith complies with or has the characteristics of or has been manufactured in accordance with a legal metrology technical regulation applicable in terms of this Act.

(3) If any sample obtained in terms of this Act is damaged or destroyed during the process of inspecting, examining, testing or analysing such sample, the National Regulator is not liable for the damage to or destruction of that sample, except where the damage is due to negligence of the National Regulator.

(4) The result of any inspection, examination, test or analysis of any sample of a prescribed measuring instrument, product or service, to which a legal metrology technical regulation applies, is regarded to be valid for the whole consignment or batch from which the sample was obtained or to the similar services offered by the supplier, until the contrary is proved, or unless otherwise specified in legal metrology technical regulation that is in force.

### ***Part III***

#### ***Measurement Standards***

##### **General requirements**

6. (1) The prescribed requirements for the measurement standards referred to in section 19 of the Act used by the personnel employed by the National Regulator or any appointed service provider, designated verification and repair bodies are indicated in the relevant technical regulations or a relevant SANS document.

(2) All measurement standards shall be traceable to the national standard or in the absence of such national standard to an international standard acceptable to the National Regulator. Unless otherwise specified in this part of the regulations, measurement standards shall comply with requirements set by the National Regulator for that measurement standard and be calibrated at least every 12 months

and a calibration certificate, issued by an accredited calibration laboratory, will be proof of traceability.

(3) Unless otherwise specified in this part of the regulations, the expanded uncertainty,  $U$  (for coverage factor  $k = 2$ ), for the measurement standard (including its indicating device), shall be less than  $1/5$  of the applicable maximum permissible error of the measuring system under test for type approval and shall be less than a  $1/3$  of the applicable maximum permissible error of the measuring system under test for initial or subsequent verification.

(4) Unless otherwise specified in this part of the regulations, reference materials used as measurement standards in testing and verification shall be traceable to the national standard or in the absence of a national standard to an international standard acceptable to the National Regulator. A calibration certificate, issued by an accredited calibration laboratory or equivalent for the equipment used to determine the value of the reference materials will be proof of traceability.

(5) Instruments used for auxiliary measurements during repair or verification of measuring instruments shall be accurate to ensure that, in the test results, no error of more than  $1/10$  of the smallest applicable tolerance of the measuring instrument being repaired or verified will be caused.

### **Measurement standards of mass**

7. All measurement standards used by the personnel employed by the National Regulator or any appointed service provider, designated verification or repair body for the inspection, verification or repair of—

- (a) Weighing instruments and commercial standard weights, that are required to be verified in terms of the Legal Metrology Act, 2014; and
  - (b) Weighing instruments used to determine the mass of reference material used to verify weighing instruments;
- must comply with SANS 1697.

### **Measurement standards of volume**

8. All measurement standards used by the personnel employed by the National Regulator or any appointed service provider, designated verification or repair body of volume, for the inspection, verification or repair of—

- (a) Volume measuring instruments and commercial standards of volume, that are required to be verified in terms of the Legal Metrology Act, 2014; and
  - (b) Measuring instruments used to determine the quantity of reference material;
- must comply with SANS 1698.

### **Measurement Standards of Length**

9. All measurement standards used by the personnel employed by the National Regulator or any appointed service provider, designated verification or repair body, for the verification of—

- (a) Length measuring instruments; and
  - (b) Conventional length measuring instruments;
- must comply with the errors permitted in Table 1:

1	2
<b>TABLE 1</b>	
<b>MEASURES OF LENGTH</b>	
<b>Denomination</b>	<b>Error permitted in excess or in deficiency</b>
30 m and above	3,5 mm
3 m and above, but under 30 m	2,5 mm
1 m and above, but under 3 m	0,5 mm
50 mm and above, but under 1 m	0,25 mm
under 50 mm	0,05 mm

#### ***Part IV***

#### ***Market Surveillance Inspectors***

##### **Qualifications of market surveillance inspectors**

10. No person must in terms of section 6(1) of the Act be appointed as a market surveillance inspector unless—

- (a) he or she holds a relevant tertiary qualification in the field of engineering, health, safety or environment; and
- (b) he or she has completed in-house training as set by the National Regulator on—
  - (i) the Legal Metrology Act and Regulations,
  - (ii) theoretical subjects; and
  - (ii) practical work,
 as determined from time to time.

**Exercising the powers of a market surveillance inspectors**

11. No person may exercise the powers of a market surveillance inspector unless he or she is appointed by the CEO in terms of the Act and holds an inspection authority issued by the Chief Executive Officer.

**Part V****Sale of Goods****Goods destined for export**

12. (a) The provisions of these regulations apply to prepackaged goods destined for sale outside the Republic unless they conform to any written requirements specified by the foreign purchaser.

(b) If the prepackaged goods exported do not comply with these regulations, the exporter shall submit requirements specified by the foreign purchaser to the National Regulator for confirmation.

(c) After the National Regulator has confirmed the requirements specified by the foreign purchaser the prepackaged goods will be allowed for export.

**Seller or importer to take precaution regarding quantity of goods purchased for resale**

13. Any person who—
- (a) has purchased any prepackaged goods for resale; or
  - (b) imports any such goods for resale,
    - (i) which bears a statement of quantity; or

(ii) is deemed to be of a certain quantity in terms of any provision of these regulations;

must take such precaution as will ensure that the actual quantity of the goods is the quantity represented, subject to any applicable tolerance permitted in terms of these regulations or any other regulation in terms of the Act, irrespective of the origin of such goods.

#### **Delivery note, invoice or other writing to accompany goods delivered**

14. Except where otherwise provided in this regulation any goods transmitted, conveyed or delivered to any purchaser in pursuance of a sale by measure or by number must be accompanied by a correctly dated delivery note, invoice or other writing.

#### **General requirements for issuing delivery note, invoice or other writing**

15. (1) The delivery note, invoice or other writing must state the following:
- (a) the names and full addresses of the seller and the purchaser; and
  - (b) a clear and legible statement of the quantity of such goods unless—
    - (i) the quantity of such goods is indicated on the goods in the manner prescribed in SANS 289, as amended from time to time; or
    - (ii) such delivery note is accompanied by a cash register slip which contains a list of separate prices respectively corresponding to each selling price marked on each separate item or quantity of goods.

(2) A delivery note, invoice or other writing accompanying prepackaged quantities that are permitted in terms of SANS 289 to be unmarked as to quantity, must contain—

- (a) a statement of the number of prepackaged units of each prescribed quantity to be delivered; and
- (b) the mass of the respective prescribed quantities being delivered.

(3) A delivery note, invoice or other writing need not accompany the goods where—

- (a) the goods are unprocessed or unmanufactured agricultural produce, cream or milk which have been produced in the Republic and where such goods are transmitted, conveyed or delivered in pursuance of a sale in bulk by or on behalf of the producer thereof;
- (b) the goods, after having been taken from bulk, are measured or counted, as the case may be, in the presence of the purchaser or his agent at the time of sale and such goods are delivered to the purchaser or his agent on the same occasion and on the premises of the seller;
- (c) a purchaser or his agent in person orders the goods at the premises of the seller, stating the quantity of the goods to be supplied, and such goods, after having been taken from bulk and made up in prepackaged form at the time of sale without having been measured or counted in the presence of the purchaser or his agent, as the case may be, are delivered to the purchaser or his agent on the same occasion and on those premises;

- (d) the quantity of the goods supplied as contemplated in paragraph (c) must be in accordance with that ordered or when of some other quantity, such other quantity is made known to the purchaser or his agent by the seller when being delivered;  
or
- (e) the purchaser or his agent specifies the quantity of the goods to be supplied in a transaction by retail, either explicitly or by implication, at the premises of the purchaser such goods are delivered to the purchaser or his agent on the same occasion on those premises and—
  - (i) the quantity of the goods supplied is the quantity specified explicitly or by implication by the purchaser or his agent; or
  - (ii) where the goods are of a different quantity, such other quantity is made known to the purchaser or his agent by the seller when being delivered.

#### **Goods to be measured after despatched**

16. (1) Where the quantity of goods, which have been despatched to a purchaser in pursuance of a sale in bulk, is to be measured en-route to or at the place of delivery—

- (a) the delivery note, invoice or other writing accompanying such goods must be endorsed to that effect; and
- (b) the statement of quantity must be inserted or attached immediately after the quantity of the goods has been determined.

(2) In cases where the statement of quantity is in the form of a printed ticket obtained from a person in charge of the instrument used for determining the

quantity of the goods, such ticket must be attached to the delivery note, invoice or other writing—

- (a) immediately after the quantity of the goods has been determined; and
- (b) before the delivery note, invoice or other writing is handed over to the purchaser or his agent.

### **Liquid products in vehicle tanks and bulk containers**

17. (1) A delivery note, invoice or other writing issued in connection with liquid goods that vaporize at ambient atmospheric pressure and which are kept at a temperature below 0 °C to maintain their liquid state and are prepackaged in a bulk delivery vehicle or bulk container intended for sale as a non-consumer package and sold by volume, must clearly show the temperature of the liquid product at the temperature at which it is maintained in order to maintain its liquid state.

(2) A delivery note, invoice or other writing issued in connection with liquid goods, other than those in subregulation (1), which are prepackaged in a bulk delivery vehicle or bulk container intended for sale as a non-consumer package and sold by volume, must clearly show the temperature of the liquid product at the time of packing, its coefficient of expansion and the quantity thereof at 20 °C.

(3) Any measuring instrument used to determine the quantity of the liquid and convert its volume to 20 °C must be verified in terms of any regulation pertaining to such instrument.

(4) For the purposes of this regulation any thermometer used for the determination of temperature must be calibrated by an accredited calibration laboratory and its accuracy must be traceable to the national standard.

#### **Duties of person conveying goods**

18. Any person in possession of a delivery note, invoice or other writing relating to any goods being transmitted, conveyed or delivered by him or her in pursuance of a sale must—

- (a) produce such delivery note, invoice or other writing to any authorised officer when so requested by him or her;
- (b) hand over such delivery note, invoice or other writing to the purchaser or his agent before any part of the goods is off-loaded;
- (c) in any case where the quantity of the goods has been determined at the place of delivery, hand over such delivery note, invoice or other writing to the purchaser or his agent before leaving such place.

#### **Dealers to retain delivery notes**

19. A delivery note, invoice or other writing issued in respect of any goods delivered in pursuance of a sale to a dealer and handed over to the dealer or his agent as prescribed in Regulation 15, must be retained by him or her for the duration of the possession of the goods after receipt, during which period it must be kept at hand and be produced to an authorised officer on demand.

**Part VI*****Requirements for marking of prepackages and prescribed quantities*****Markings on prepackaged products and prescribed quantities**

20. Prepackages made up prior to being offered for sale must comply with all applicable requirements of SANS 289, as amended.

**Goods or articles ordered by purchaser in person**

21. (1) Where purchaser or his agent in person orders goods or articles stating the quantity of the goods or articles to be supplied and such goods or articles, after having been taken from bulk and made up in prepackaged form at the time of sale without having been measured or counted in the presence of the purchaser or his agent, are delivered to the purchaser or his agent on the same occasion and on those premises, the goods or articles are not required to be marked with a statement of quantity, provided that—

- (a) the quantity of the goods or articles supplied is in accordance with that ordered;
- or
- (b) when of some other quantity, such other quantity is declared to the purchaser or his agent by the seller when being handed over.

(2) The requirement contemplated in subregulation (1) does not apply to beverages and other goods with special requirements contained in Annexure E of SANS 289 for measurement at the time of sale, that are supplied from bulk for consumption at the premises of the seller.

**Non-consumer packages**

**22.** (1) Any goods or articles—

- (a) which are sold by quantity expressed in terms of a measurement unit; or
- (b) by number; and
- (c) which are required by a purchaser other than a person buying from the retail trade, for his own use and not for resale, may be made up by the manufacturer or packer in non-consumer packages which do not bear a statement of quantity, provided that where such goods or articles are transmitted, conveyed or delivered in bulk to the purchaser and are enclosed in an outer container, such container must bear a statement of the quantity in accordance with SANS 289 unless, when delivered, it is accompanied by a delivery note, invoice or other writing in accordance with the provisions of Regulations 15 to 20.

(2) Non-consumer packages contemplated in subregulation (1) must comply with all requirements pertaining to non-consumer packages contained in SANS 289.

(3) Any person who offers for sale in the retail, a non-consumer package that does not comply with all requirements for consumer packages contained in SANS 289 will be guilty of an offence in terms of the Act.

**Standard temperature for sale of prepackaged liquid products**

**23.** (1) The statement of quantity on prepackaged liquid products packed by volume, other than on the retail premises, from which they are sold, must reflect the volume at a temperature of 20 °C unless otherwise prescribed in these regulations or SANS 289, as amended.

(2) The represented volume of a quantity of a liquid product packed by volume on the retail premises, from which it is sold, must be the volume at the ambient temperature at which it is measured unless such volume has been converted to the volume at 20 °C.

### **Marking of equivalent statement of quantity on prepackaged products**

24. A prepackaged product may be marked with an equivalent quantity statement in an unauthorised measurement unit in addition to the required quantity statement provided that the equivalent quantity statement may not be more prominent or appear more times than the required quantity statement.

### **Qualification of statement of quantity on prepackaged products**

25. (1) A statement of quantity must be unambiguous and without a qualification that renders it misleading or without meaning.

(2) The following qualifications are allowed—

- (a) the "drained mass" must be indicated in addition to the total net mass on the products required by SANS 289 to bear a drained mass;
- (b) the quantity of a liquid product may be qualified by a statement of content at 20 °C;
- (c) the mass of an animal carcass may be indicated as "cold mass";
- (d) the words "contents", "net mass" or "net" may be used with a statement of quantity; and

- (e) the "stretched" length may be indicated in addition to the "un-stretched" length in the case of elastic materials provided that both such lengths are shown simultaneously. In the case of cotton crepe bandage and conforming bandage the stretched length only may be shown.

### **Prepackaged products sold other than by measurement unit**

**26.** Prepackaged goods or articles which may be sold other than by reference to a measurement unit must bear no direct or indirect reference alluding to quantity in terms of any measurement unit or number, including numbers which might be construed as such a reference either—

- (a) on the goods, package or container;
- (b) on the label attached thereto or inserted in a transparent container;
- (c) on any invoice, delivery note or other writing.

## ***Part VII***

### ***Special requirements for sale of goods sold other than in prepackaged form***

#### **Price descriptions**

**27.** (1) When any articles or goods are offered for sale by means of a price description displayed on or near retail premises for the purpose of drawing the attention of prospective purchasers—

- (a) the quantity of such articles or goods when actually sold to a purchaser must, subject to any tolerance that may be prescribed for the measurement of such goods or articles, not be less than that quantity which the purchaser should

receive for the amount paid by him or her or demanded from him or her and should be calculated at the price per measurement unit or by number shown on the price description which has been so displayed; unless

- (b) the seller has made known to the prospective purchaser before concluding the sale that the price description which has been so displayed will not apply to the prospective transaction.

(2) Any price description displayed or advertised in connection with any article or goods sold by volume, mass, length or area and making reference to quantity must be expressed in terms of a permissible measurement unit only and unless such price description refers to an available prepackaged quantity of such article or goods, it must be in the form of a unit price expressed in Rand or cents per—

- (a) millilitre (mL, ml or mℓ);
- (b) litre (L, l, ℓ);
- (c) kilolitre (kL, kl, kℓ);
- (d) cubic metre (m<sup>3</sup>);
- (e) milligram (mg);
- (f) gram (g);
- (g) kilogram (kg);
- (h) metric tonne (t);
- (i) millimetre (mm);
- (j) metre (m);
- (k) square metre (m<sup>2</sup>); or
- (l) hectare (ha),

as the case may be.

(3) In the case of articles or goods sold by mass or volume such unit price may also be expressed in rand or cents per 100 g or 100 mL respectively.

(4) Unwrapped cuts or pieces of meat and meat carcasses must, when displayed for sale on the premises of a retail butcher and having the price thereof marked or displayed thereon, have the net mass as clearly marked or displayed thereon as the price in characters and figures not less than half the height of the characters and figures used for the price.

#### **Standard temperature for liquid products measured at time of sale**

**28.** The represented volume of a quantity of a liquid product sold by volume and measured at the time of sale, must be the volume at the ambient temperature at which it is measured, unless such volume is converted to the volume at 20 °C for the purposes of the transaction: provided that a quantity of liquid product which has been artificially heated and which has a temperature above 20 °C when being measured, must be the volume of the said product at a temperature of 20 °C.

#### **Purchase of milk by mass**

**29.** A factory, dairy or milk depot may purchase a quantity of milk from a producer thereof by mass: provided that where the equivalent of the volume of a quantity of milk is to be determined from the mass of that quantity, the density of milk must be taken as 1,03 kg/L.

**Measurement units in which quantity of certain goods must be expressed**

**30.** (1) For the purpose of complying with the relevant provisions of section 34 and 35 of the Act in respect of—

- (a) goods or articles sold by quantity expressed in terms of a measurement unit; or
- (b) any service rendered, the quantity of which is expressed in any measurement unit;

only an appropriate measurement unit, specified in regulations, issued under the Measurement Units and Measurement Standards Act, 2006 (Act 18 of 2006), must be used, unless—

- (i) exemption in writing for deviating from this has been granted under the provisions of the Measurement Units and Measurement Standards Act, 2006 as amended; or
- (ii) it is used in connection with a purpose or an article exempted in the regulations made under the Measurement Units and Measurement Standards Act, 2006 as amended.

(2) The use of any measurement unit or its symbol in connection with any contract, bargain, sale, purchase or transaction must be—

- (a) in accordance with the rules specified in regulations, issued under the Measurement Units and Measurement Standards Act, 2006 (Act 18 of 2006) referred to in subregulation (1); and
- (b) expressed in the manner prescribed in SANS 289, unless permission in writing for deviating from this has been granted by the National Regulator.

**Part VIII**

***Accuracy of measurement when determining quantity of goods***

**Suitable instruments to be used and made available**

31. (1) Any person who—

- (a) measures the quantity of goods or articles in the presence of a purchaser; or
- (b) in the retail trade, prepacks goods or articles for sale;

must use a measuring instrument suitable for the purpose and must make such instrument available to—

- (i) an authorised officer who wishes to check the quantity of prepackaged goods or articles; or
- (ii) a purchaser who wishes to measure the quantity of the goods or articles purchased by him or her.

(2) This requirement will not apply when a vessel is used for the measurement of liquids in accordance with Regulation 33(1).

(3) Any person, other than a person referred to in subregulation (1) or a person packing goods in terms of a registration certificate issued under the quantity mark scheme referred to in Regulation 35, who prepacks goods for sale must—

- (a) keep a suitable measuring instrument for the purpose of checking the quantity of such goods; and
- (b) make such measuring instrument available to an authorised officer who wishes to check the quantity of such goods.

(4) An instrument referred to in subregulations (1) and (3) will be deemed to be suitable if it fulfils the requirements of SANS 458.

(5) In addition to the requirements of Item 4(4)(c) of SANS 458 and where a deficiency error is not permitted for prepackages of the goods being measured, for example certain goods sold by number, an instrument used in terms of—

- (a) subregulation (1) of this regulations must have a permitted maximum permissible error not exceeding 2 % at the point of measurement of such goods; and
- (b) subregulation (3) of this regulations must have a permitted maximum permissible error not exceeding 2 % at the point of measurement of such goods and must be adjusted at the time of verification to have no negative error.

#### **Tolerances permitted on determination of the quantity of goods**

**32.** Tolerances and permissible differences between the represented or marked quantity of goods and the actual quantity of such goods are those prescribed in SANS 458, as amended, unless the requirements of Regulation 33(1) and (2) of this part apply.

#### **Accuracy of vessels or containers used for sale of liquids**

**33.** (1) A vessel or container used for the purpose of determining the quantity of a prepackaged liquid sold therein must be of a nominal volume not exceeding 5 L, provided that—

- (a) such a vessel or container may only be used for the measuring off of any liquid in the retail trade at the time of sale of such liquid, if it has a narrow neck and is presented to the retail dealer by the purchaser;
- (b) if the denomination of volume thereof is indelibly marked thereon, and

(c) such a vessel or container must be filled to the brim.

(2) The volume of any container manufactured, supplied or used for the purpose of determining the quantity of beer, spirit coolers, alcoholic fruit beverages, alcoholic fruit beers or ales that are supplied from bulk for consumption on the premises, must be—

- (a) defined by an indelible line or indentation at least 25 mm in length, distant not less than 10 mm and not more than 35 mm from the brim; and
- (b) when such container is filled when the meniscus of the product is up to the bottom of such line or indentation, it must hold at least the volume which must be indicated thereon, in a position close to such line or indentation in clear and legible figures and letters not less than 5 mm in height.

#### **Authorisation to deviate from requirements**

**34.** The National Regulator may—

(a) give written permission to deviate from the requirements of:

- (i) these regulations;
- (ii) SANS 289; or
- (iii) SANS 458,

as the National Regulator may deem fit and under any conditions that the National Regulator may deem necessary, unless the requirements of paragraph (b) apply;

(b) not give permission for the sale of any prepackaged products that are deficient of the quantity marked on the packages unless—

- (i) the National Regulator receives a guarantee to the effect that the sale is to an end user and not for resale; and
- (ii) the purchaser and seller agree to such sale.

### ***Part IX***

#### ***Compliance schemes***

##### **Quantity mark scheme**

- 35.** (a) The quantity mark must be the "e" mark as defined in SANS 1841.
- (b) No person may apply a quantity mark to prepackaged goods unless registered as a quantity mark company under SANS 1841.
- (c) A quantity mark may only be applied or used in a manner authorized in subregulation (b) above.
- (d) A person will be deemed to have applied a quantity mark to prepackaged goods if he or she has—
- (i) applied that quantity mark to any container or covering of the goods concerned or to any label attached to said goods or to any container or covering thereof;
  - (ii) placed or enclosed the goods concerned in any container or covering to which the quantity mark has been applied or to which is attached any label to which the quantity mark has been applied; or
  - (iii) in connection with the sale of the goods concerned, directly or indirectly referred to the quantity mark in a manner or under circumstances likely to convey the impression that the quantity of goods complies with the requirements of SANS 1841.

**Measurement mark scheme**

36. (a) The measurement mark must be the "ə" mark defined in SANS 1840.

(b) No person may apply a measurement mark to a measuring container bottle unless the company is registered as a manufacturer of measuring container bottles under SANS 1840.

(c) A measurement mark may only be applied or used in a manner authorised in in terms of paragraph (b).

(d) A person will be deemed to have applied a measurement mark to measuring container bottles if he or she has—

- (i) applied the measurement mark to any measuring container bottle falling within the scope of SANS 1840;
- (ii) applied the measurement mark to any measuring container bottle that does not fall within the scope of SANS 1840; or
- (iii) in connection with the sale of any container, directly or indirectly referred to the measurement mark in a manner or under circumstances likely to convey the impression that the container complies with the requirements of SANS 1840.

**Application for registration certificate**

37. (1) An application for a registration certificate to apply the quantity mark or the measurement mark must be made to the National Regulator.

(2) The National Regulator may—

- (a) issue a registration certificate for a five year period on such conditions as may deem necessary;

(b) withdraw or, subject to such condition as may deem necessary, suspend a registration certificate or terminate suspension of such registration certificate.

(3) The holder of a registration certificate contemplated in subregulation (2)(a) which has been withdrawn in terms of subregulation (2)(b), or which has expired due to effluxion of time or for any other reason, must at the written request from the National Regulator immediately return that registration certificate to the National Regulator.

### **Offences in respect of compliance schemes marks**

38. Any person who applies the marks contemplated in Regulations 35 and 36, without being in possession of a registration certificate issued by the regulator in terms of Regulation 37 is guilty of an offence in terms of the Act.

## ***Part X***

### ***Measuring instruments, products or services not conforming to legal metrology technical regulations***

#### **Directive**

39. (1) Where a non-conformance relating to a measuring instrument, product or service is found, the National Regulator must direct in writing that such measuring instrument, product or service be brought into compliance with any relevant technical regulation as required by section 18(1) of the Act.

(2) Should the person to whom such directive is issued fail to bring the measuring instrument, product or service into conformance with the relevant legal

metrology technical regulation, the National Regulator may direct in writing that such measuring instrument, product or service be confiscated, destroyed or returned to the country of origin in such manner as the National Regulator may deem fit.

(3) A directive issued by the National Regulator in terms of subregulation (1), may—

- (a) be withdrawn in writing by the National Regulator if no steps have been taken by the National Regulator within 120 days of the date of issue of the directive;
- (b) be withdrawn, in writing within 30 days, from the date that evidence of conformity of the measuring instrument, product or service covered in a directive was submitted to and accepted by the National Regulator;
- (c) remain valid, where the directive for any measuring instrument, product or service cannot be served on the manufacturer, importer, seller or supplier for any reason.

(4) Any person issued with a directive is responsible to ensure that each measuring instrument, product or service which does not conform to a legal metrology technical regulation is kept separate from the compliant products and is not removed from the premises specified, supplied or sold.

(5) A person issued with any directive is further responsible for any costs or losses incurred in keeping such measuring instrument, product or service in his or her possession or under his or her control at or on any premises specified in the directive by the National Regulator, including where the measuring instrument or products are kept at the premises of or under the control of the National Regulator or returned to country of origin or destroyed.

(6) A person is guilty of an offence if that person acts in contravention of a directive issued in terms of section 18 of the Act.

### **Confiscation**

**40.** (1) Where the National Regulator directs in writing in terms of regulation 39(2) that a person has failed to meet the requirements of a directive issued in line with section 18(1) of the Act and regulation 39(1), the National Regulator may confiscate the non-compliant measuring instrument or product, as follows—

- (a) Confiscation may be in the form of the physical removal of a measuring instrument, or product to a location identified by the National Regulator.
- (b) Non-compliant measuring instruments or products confiscated may be disposed of in accordance with the internal procedures of the National Regulator.
- (c) The confiscation of measuring instruments, products or services in terms of the Act or Regulations does not affect the person's liability for any fees that may be or become payable by that person in respect of the measuring instrument, product or service or any other punishment in terms of the Act or any other legislation.
- (d) Any cost incurred by the National Regulator for the confiscation, destruction, storage, transportation or otherwise dealing with the measuring instrument, product or service may be recovered from the person issued with a directive.

(2) Any measuring instrument or product in respect of which a directive in terms of regulation 39(1) has been issued which has been confiscated becomes the property of the National Regulator.

**Destruction**

41. The National Regulator, after confiscation of the non-compliant measuring instrument, product or service, may destroy the non-compliant measuring instrument, product or service. Destruction shall be carried out as determined by the National Regulator.

**Return to country of origin**

42. (1) The National Regulator may direct in writing that a person who has failed to meet the requirements of a directive issued in terms of regulation 39(1) and Section 18 of the Act return the measuring instrument, product or service to the country of origin. Return to country of origin must be in line with the following:

- (i) All costs incurred in returning the measuring instrument or product to the country of origin must be for the account of the importer, supplier, agent or any person using such measuring instrument or product or service.
- (ii) Documented proof that the measuring instrument or product has been returned to the country of origin must be supplied to the National Regulator within 14 days from the date that the order has been issued by the National Regulator.

(2) A person is guilty of an offence if that person acts in contravention of a written notification by the National Regulator issued in terms of subregulation (1).

**Part XI*****Measuring instruments and containers used for prescribed purposes*****Measurement units, prefixes, symbols and their usage**

43. (1) Subject to the provisions relating to use of a measurement unit specified in any provision of any technical regulation, the recognised measurement units and prefixes for the purposes of the technical regulations are the measurement units and their multiples and submultiples and prefixes specified in the regulations issued under Measurement Units and Measurement Standards Act, 2006.

(2) No recognised measurement unit or multiple or sub-multiple thereof must for the purposes of the technical regulations be designated by any symbol other than a symbol specified in the regulations referred to in subregulation (1), subject to any provision in any technical regulation relating to their usage.

**Permissible nominal values (denominations) of weights and of material measures**

44. The permissible nominal values (denominations) of weights, of material measures of length and of material measures of volume are those specified in an applicable technical regulation or relevant South African National Standard.

**Measuring instruments not to be subject to initial or subsequent verification and prohibition from use of certain measuring instruments**

**45.** (1) A market surveillance inspector or verification officer must not initially or subsequently verify the following:

- (a) Any measuring instrument which—
- (i) is not sufficiently strong to withstand the wear and tear of ordinary use for the purpose for which it is used or intended to be used;
  - (ii) does not meet the requirements prescribed for its class or type in the Act and in these regulations unless such measuring instrument is of the model approved in terms of section 22 of the Act;
  - (iii) is not complete;
  - (iv) is not in a clean state;
- (b) any weighing instrument which—
- (i) has a broken scoop, pan, plate or other part, which is vital to its operation;
  - (ii) has a scoop, pan or plate of such size or shape as may lead to incorrect measuring, either through its fouling the housing of the weighing instrument or because its size or shape may cause proper contact between knife-edges and bearings to be disturbed;
  - (iii) has a goods plate which is readily absorbent of moisture, whether because of the material of which it is made or on account of faulty glazing or of the extent to which it is cracked or chipped;

- (iv) has proportional counterpoises the total value of which added to the full steelyard or dial reading does not correspond to the marked capacity of the weighing instrument, unless authorization to verify is granted by the National Regulator;
- (c) micrometre scales, unless of a model approved in terms of section 22 of the Act;
- (d) box-end beam scales, except those used in post offices for measuring the mass of letters;
- (e) counter steelyards, unless of a model approved in terms of section 22 of the Act;
- (f) any measuring instrument prohibited under section 29 of the Act or under these regulations;
- (g) any non-metric measuring instrument;
- (h) any measuring instrument unless it is of a model approved in terms of section 22 of the Act, and it is clearly and indelibly marked with the number of the certificate of approval as described in Part XV, unless such measuring instrument is exempted from type approval;
- (i) any measuring instrument of a model or modified model which has been refused approval in terms of section 22 of the Act or in respect of which a certificate of approval has been withdrawn.

(2) The use for any prescribed purpose of the following measuring instruments is prohibited—

- (a) any instrument of which the beam has an unstable action both when the balance, beam scale or counter scale is loaded or unloaded (accelerating type);

- (b) any instrument of which the steelyard or counter platform scale have an unstable action both when the steelyard or counter platform scale is loaded or unloaded (accelerating type);
- (c) any weighing instrument of the type known as a "Union" scale;
- (d) any swan-necked beam scale;
- (e) any steelyard—
  - (i) having a capacity of less than 50 kg;
  - (ii) which is reversible or has more than one load-hook;
  - (iii) not provided with a zero graduation;
- (f) any dead mass scale.

### **Use of units for indication of results of measurements**

46. (1) Unless otherwise approved by the National Regulator or as described in the provisos following Table 2, any indication of the result of a measurement by any graduated measuring instrument, other than a material measure, which is to be approved in terms of section 22 of the Act, or any indication of the result of a measurement by any new graduated measuring instrument, other than a material measure, which does not require to be approved in terms of section 22 of the Act, must be indicated in terms of only one unit of the measurement units referred to in regulation 2 of this Part and any figured subdivisions of such units must be indicated as decimal submultiples thereof.

(2) Unless otherwise approved by the National Regulator, the applicable measurement unit referred to in subregulation (1) must be that shown in Column 4, Table 2 in respect of the category of measuring instrument, other than a material measure.

1	2	3	4
<b>TABLE 2</b>			
Category of measuring instrument	Capacity, if measurement is of a fixed quantity equal to capacity	Capacity, if measurement is of various quantities up to capacity	Units
a. Weighing instruments	(i) 1 kg or more (ii) 1 g or more but less than 1 kg (iii) less than 1 g	more than 1 kg more than 1 g but not more than 1 kg not more than 1 g	kg g mg
b. Length measuring instruments	(i) 1 m or more (ii) less than 1 m	more than 1 m not more than 1 m	m mm
c. Area measuring instruments	(i) 10 m <sup>2</sup> or more (ii) less than 10 m <sup>2</sup>	more than 10 m <sup>2</sup> not more than 10 m <sup>2</sup>	m <sup>2</sup> dm <sup>2</sup>
d. Volume measuring instruments.	(i) 1 L or 1 dm <sup>3</sup> or more	more than 1 L or 1 dm <sup>3</sup>	1 L or 1 dm <sup>3</sup>
	(ii) less than 1 L or 1 dm <sup>3</sup>	not more than 1 L or 1 dm <sup>3</sup>	mL or cm <sup>3</sup>

Provided that—

- (a) in respect of a weighing instrument having a capacity of more than 1 000 kg, the unit may be the metric tonne (t);
- (b) in respect of a volume measuring instrument for liquids having a capacity of more than 1 000 L the unit may be the kilolitre (kL) or the cubic metre (m<sup>3</sup>);
- (c) where the capacity according to Column 3—
- (i) in the case of a weighing instrument is 1 kg or 1 g, the unit for the terminal indication may be 1 kg or 1 g, respectively;
- (ii) in the case of a length measuring instrument is 1 m, the unit for the terminal indication may be 1 m;

- (iii) in the case of a volume measuring instrument is 1 L, the unit for the terminal indication may be 1 L;
- (d) any capacity referred to in the Table 2 is the total value indicated directly or indirectly on the indicating dial or graduated scale of the measuring instrument including the value of any means of increasing the measuring range including, in the case of a weighing instrument, any loose proportional counter poise, but excluding the value compensated by any loose weight in the case of a semi-self-indicating weighing instrument or by any separate adding tare compensating device.

#### **Form of values of graduations**

47. On any new graduated measuring instrument the value of the smallest graduation is in the form of  $1 \times 10^n$ ,  $2 \times 10^n$ , or  $5 \times 10^n$  of a measurement unit authorised by the Act where the exponent "n" is a positive or negative whole number or zero.

#### **Reading by simple juxtaposition**

48. (1) Except as otherwise provided in a regulation of this Part, the graduations and the figures on any new graduated measuring instrument must be so arranged as to give the result of any measurement on the principle of reading by simple juxtaposition, including the value of any or proportional counterpoise which is indicated on the dial of any weighing instrument with which such weight or counterpoise is used.

(2) Loose weights used with semi-self-indicating weighing instruments and loose proportional counterpoises used in conjunction with steelyards on weighing instruments are excluded from the provision of subregulation (1).

### **Advance of indication by digital indicators**

49. Unless otherwise approved by the National Regulator, when the value of the quantity indicated by any continuously indicating digital or semi-digital indicator is increasing, the change to the next higher figure in any decade higher than the units decade must occur when the indication in the units decade is moving between its highest figured graduation and zero or is moving the last one tenth of its travel towards zero, whichever is the lesser, and the change in the higher decades must be completed when the indication in the units decade has reached zero and conversely when the value of the quantity indicated is decreasing, the change to the next lower figure must occur when the indication in the units decade is moving between zero and its highest figure graduation or for the first one tenth of its travel from zero and the change in the higher decades must be completed when the indication in the units decade has reached the highest figured graduation or has moved one tenth of its travel.

### **Extent of rounding error permitted**

50. Except as otherwise provided in a regulation of this Part or in a certificate issued in terms of section 22 of the Act, the rounding error must not exceed 0,5 of the

value of one increment of the indicating scale on any measuring instrument with digital indication: Provided that such error may exceed 0,5 of the value of one such increment by not more than 0,2 of such value if this is necessary to overcome any uncertainty in the indication.

### **Indication by several indicators**

51. (1) Except as otherwise provided for in a technical regulation or in a certificate issued in terms of section 22 of the Act, where a measuring instrument has more than one indicator included in the verification of the measuring instrument, whether analogue or digital or whether the indication is visual or is a printed record—

- (a) the value of the smallest graduations of all of the analogue indicators must be the same;
- (b) the value of the smallest graduations of all of the digital indicators, including printers, must be the same; and
- (c) the value of the smallest graduation of a digital indicator, including a printer, operating in conjunction with an analogue indicator, may be smaller than but must not be more than the value of the smallest graduation of the analogue indicator;

(2) The result of a measurement indicated by the several indicators, with any digital indication corrected for rounding error, must not differ, one from another, by more than the permissible error or by more than the permissible error on that indicator which has the greater value of the smallest graduation where these values

differ provided that there shall be no difference in the results indicated by the several digital indicators.

(3) Permissible errors in visual indication or in printing must be related to the respective value of the graduations of each of the visual indicators or printers provided that, where the value of the graduations of a printer is smaller than the value of the graduations of an associated analogue indicator, the allowances must relate only to the value of the graduations of the analogue indicator and the printer may record the result of a measurement equal to the analogue indication, rounded to the nearest printer increment.

**Notice in connection with periodic verification of measuring instruments as envisaged in section 24(2) of Act**

52. (1) The National Regulator may by notice in the *Government Gazette* in respect of any measuring instrument which in terms of this Act is required to be verified—

- (a) prescribe maximum intervals within which all such measuring instruments, or a certain class or kind of such measuring instrument, must be verified; or
- (b) call upon every person possessing any such measuring instrument to make available such measuring instrument to any designated verification laboratory, or if no designated verification laboratory exists for such measuring instrument to any regional office of the National Regulator, for the purpose of being verified unless it is a measuring instrument bearing a verification mark and is covered by

a verification certificate which is valid for the period contemplated in paragraph (a) and for the year to which the notice in question applies.

(2) The National Regulator may take such steps as may be deemed expedient to bring any notice published under subregulation (1) to the attention of persons affected by it.

### **Measuring instruments acquired unverified to be verified before use for prescribed purpose**

53. Any measuring instrument stipulated in regulation 52 which does not have a valid verification status when acquired for use for any prescribed purpose must, prior to being put into use for such purpose, be submitted to any designated body for initial or subsequent verification.

### **Measuring instruments deemed to be unverified after having been re-installed**

54. Any measuring instrument which has been re-installed after it has been verified must be deemed to be unverified until such time as it has been verified in its new position.

**CONTINUES ON PAGE 130 - PART 2**



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**AIDS HELPLINE: 0800-0123-22 Prevention is the cure**

**Acceptability of declared quantity**

55. Subject to any applicable provision of any technical regulation, the quantity of any product or thing, determined as the result of a measurement by a measuring instrument permissible for use in terms of the Act and suitable for measuring the quantity of the article or thing in question, must, when declared for the purpose of the provisions of any law or by-law, be deemed to be the acceptable quantity of such article or thing.

**Method of determining tare or gross mass of containers, railway trucks or road vehicles**

56. (1) Except as otherwise provided in any regulation of this Part, when the tare or gross mass of any container, railway truck or road vehicle or combination of railway trucks or road vehicles is to be determined for any prescribed purpose, the measuring of such mass must be carried out upon a suitable weighing instrument having a goods platform or platforms of such size as to allow of the mass of such container, truck, road vehicle or combination being measured as one complete unit and during such measuring, the entire container, truck or road vehicle or combination must be stationary on the platform or platforms and if a combination of trucks or road vehicles must be uncoupled to form separate units in order that their tare or gross mass be measured as prescribed herein, each such separate unit must be entirely disconnected before the measuring takes place.

(2) Notwithstanding the provisions of subregulation (1), the gross mass or tare of any railway truck or combination of railway trucks forming a train or of any road vehicle or combination of road vehicles may be determined for a prescribed purpose while any such truck or vehicle is—

- (a) stationary and is coupled with other such trucks or road vehicles not on the platform or platforms of the weighing instrument and such mass may be determined in the case of a combination by adding together the individual truck or road vehicle loads; or
- (b) in motion, whether or not coupled to other trucks or road vehicles not on the platform or platforms of the weighing instrument and such mass may be determined by adding together the individual axle mass loads of the truck or road vehicle or combination:

Provided that the determination of mass is made by means of a weighing instrument or combination of weighing instruments which complies with any provision of any regulation of this Part applicable to any weighing instrument suitable to be used for the determination of mass as set out in paragraph (a) or (b)—

- (i) approved for such purpose of use in terms of section 22 of the Act; or
- (ii) the National Regulator has evaluated the method of determining the mass of such trucks or road vehicles and has satisfied itself as to the accuracy thereof and that all parties to the transaction are in agreement thereto.

(3) Notwithstanding the provisions of subregulation (1), the gross mass or tare of any road vehicle or of a combination of such vehicles may be determined for the purpose of the relevant provisions of the National Road Traffic Act by adding

together the individual axle mass loads of such vehicle or vehicles, as obtained by the measuring thereof by means of weighing instruments referred to in regulation 57 of this Part.

### **Weighing instruments used for determining axle mass loads of vehicles**

**57.** Any weighing instrument used or intended to be used for the determination of an axle mass load of a road vehicle for the purpose of the relevant provisions of the National Road Traffic Act must be a verified road vehicle weighing instrument or combination of road vehicle weighing instruments which complies with the regulations of this part applicable to axle mass load weighing instruments.

### **Measuring instruments not intended for use for prescribed purpose**

**58.** Where any person keeps a measuring instrument on premises or at a place where he carries out an act which falls within the mandate of the Act, a permanent and conspicuous notice must be affixed on a suitable and conspicuous part of any unverified measuring instrument which is kept on such premises or at such place and which is not used or possessed for a prescribed purpose:

**"NOT TO BE USED FOR ANY PRESCRIBED PURPOSE"**

### **Duties of person submitting or using measuring instruments**

**59.** A market surveillance inspector or verification officer may require the person submitting any measuring instrument for type approval, verification or using any measuring instrument for a prescribed purpose to—

- (a) dismantle it sufficiently to enable a market surveillance inspector or verification officer to examine the working parts;
- (b) provide sufficient labour for the proper and expeditious handling of the standards or any material which may be used in the testing of such measurement instrument;
- (c) provide measurement standards complying with the requirements of Part III of these Regulations to a market surveillance inspector or verification officer to undertake the prescribed tests;
- (d) provide facilities for the measuring or re-measuring of the quantity of any product used for the testing of a measuring instrument;
- (e) open any locking device on such measuring instrument or on any measuring instrument or ancillary equipment used in conjunction therewith; or
- (f) furnish a market surveillance inspector or verification officer with a sufficient number of coins of appropriate denomination, or with a sufficient number of suitable metal discs, for the purpose of undertaking the prescribed tests of any coin-operated measuring instrument, which coins or discs must be returned to the submitter or be left in the measuring instrument on completion of the testing.

**Verification on premises of designated repair or verification body**

**60.** Measuring instruments may by arrangement, be verified initially or subsequently on the premises of a manufacturer or repairer thereof or a dealer if there is no stipulation in a technical regulation prohibiting such initial or subsequent verification at a premises other than the one where it is used.

**Marking of number of approval certificate**

**61.** Any new measuring instrument of a model in respect of which a certificate has been issued in terms of section 22 of the Act must be clearly and indelibly marked with the number of such certificate, in the manner prescribed in Part XIII of these Regulations.

**Removable parts**

**62.** No measuring instrument must have any readily removable part of which the removal of such part would affect the accuracy of the measuring instrument, unless the part is such that the measuring instrument cannot be used without it.

**Interchangeable or reversible parts**

**63.** No measuring instrument must have any readily interchangeable or reversible parts, unless the interchange or reversal does not affect the accuracy of the measuring instrument or unless such interchangeable or reversible parts are clearly and indelibly marked to indicate their positions on the measuring instrument.

**Marking of capacity or denomination**

**64.** Every measuring instrument must have its capacity or its denomination, as the case may be, indelibly and conspicuously marked on it in the manner prescribed by any technical regulation applicable to the measuring instrument or in the manner required by the National Regulator in respect of a model of measuring instrument approved in terms of section 22 of the Act, except for weights in regulation 87 and 88.

**Affixing of verification mark**

**65.** Except as otherwise provided in any technical regulation of this Part applying to a measuring instrument of a specific class or kind or as provided on approval of a model of in terms of section 22 of the Act, every measuring instrument must be provided with a means to receive the verification mark in an easily accessible and essential part of the measuring instrument.

**Defacing of verification mark and authority for further use**

66. (1) When a market surveillance inspector or a verification officer finds that any measuring instrument is false, defective or inaccurate or does not meet any requirement of the Act or of any technical regulation, the market surveillance inspector or a verification officer must reject the measuring instrument and must deface any existing verification mark thereon by means of a rejection mark, provided that where there is no plug for a verification mark on the measuring instrument, the market surveillance inspector or a verification officer must place the rejection mark in the most visible position.

(2) As contemplated in section 38(1)(f) of the Act, where a market surveillance inspector or a verification officer employed by the National Regulator has rejected any measuring instrument as set out in subregulation (1), for a reason other than its being false, defective, or inaccurate, the market surveillance inspector or a verification officer employed by the National Regulator may authorise the owner or user, in writing, to continue to use such measuring instrument for such reasonable period as the market surveillance inspector or a verification officer employed by the National Regulator may in the circumstances deem necessary.

**New and used measuring instruments**

67. Except as otherwise provided in any technical regulation and except as provided for in the provisions of regulation 68(2)(c), where any requirement of any

regulation applies specifically to a new measuring instrument, such requirement must apply equally to such measuring instrument when it is no longer new.

### **Weighing instruments: Position of balance and means of balancing at zero load**

**68.** (1) (a) Unless otherwise prescribed in a technical regulation relating to a specific type of instrument, the position of balance of a weighing instrument at zero load must be indicated—

- (i) in the case of a vibrating weighing instrument, by the beam or steelyard returning to the horizontal position of equilibrium when disturbed therefrom;
- (ii) in the case of a self-indicating or semi-self-indicating weighing instrument with analogue indication and in the case of a weighing instrument provided with a difference chart, by the index coming to rest at the zero graduation, or vice versa; and
- (iii) in the case of a self-indicating weighing instrument with digital indication, by the number "0" appearing on the main indicator and the balance indicator, where provided, being at zero balance position.

(b) In the case of any weighing instrument provided with a spirit level or other level indicator to indicate its reference position, the position of balance prescribed in this subregulation must be indicated when the weighing instrument is in its reference position.

(c) Paragraph (a) of this subregulation must not apply in the case of a weighing instrument approved in terms of section 22 of the Act if such

measuring instrument is so constructed as not to be in balance or not to indicate zero when unloaded.

(2) (a) Except as otherwise provided in any regulation of this Part or in terms of the approval of a weighing instrument under section 22 of the Act—

- (i) every weighing instrument must be provided with a means for balancing the measuring instrument at zero load, in accordance with any appropriate provision of subregulation (1);
- (ii) a self-indicating weighing instrument with digital indication must be provided with a means for indicating the position of balance at zero load:

Provided that, where the balance indication is itself digital or not continuous, the weighing instrument must be correct within one quarter of the value of the smallest graduation of the main indicator when the position of balance is indicated.

(b) (i) Except as otherwise provided in any regulation of this Part where the balance of a weighing instrument at zero load is manually adjustable by means of a continuously operating rotatable device, one full turn (360° rotation) of such device must not affect the position of balance by more than 0,1 % of the capacity of the weighing instrument, or in the case of a self-indicating weighing instrument by more than 0,1 % of the capacity of such weighing instrument or by more than the value of the smallest graduation of such weighing instrument, whichever is the lesser.

(ii) The means for balancing a zero load of any weighing instrument, other than a weighing instrument having only digital indication, must operate continuously when being adjusted.

(iii) The means for balancing at zero load of a weighing instrument having only digital indication may operate in discrete steps, the value of each step being not more than one quarter of the value of the smallest graduation of the weighing instrument.

(c) On a new or repaired weighing instrument the means for balancing must be equally adjustable either way when the weighing instrument is submitted for verification by a mechanic or it has been repaired or maintained by such a person.

(d) (i) Except as otherwise provided in any regulation of this Part a weighing instrument, which has digital indication may be provided with a device which, when set in operation by means of a push-button, automatically resets the indication to zero.

(ii) Where a device referred to in subparagraph (i) does not also adjust the balance in accordance with any appropriate provision of subregulation (1), an additional device must be provided for balancing as required.

(e) (i) Except as otherwise provided in any regulation of this Part, a weighing instrument may be provided with a device which automatically maintains the weighing instrument in balance at zero load or which automatically compensates, in the indication of the result of a measurement, for an out of balance condition at zero load.

(ii) A device referred to in subparagraph (i) may be an apparatus for setting the indication to zero when the load is within a pre-determined range about zero or in an appropriate case and where approved in a certificate issued in

terms of section 22 of the Act an apparatus known as an "automatic calibrator", for periodically simulating a pre-determined load, comparing this with the indication and, within a pre-determined range, adjusting the indication to correspond with the simulated load, thus in effect compensating for an out of balance condition at zero load.

(iii) A device referred to in subparagraph (i) must be so arranged that the zero load balance is maintained or imbalance is compensated for so as to be within one quarter of the value of the smallest graduation of the main indicator and so that zero is indicated when there is no load on the weighing instrument.

(iv) Any means provided for switching a device referred to in subparagraph (i) out of operation must not be available to an operator.

(v) The operation of any device referred to in subparagraph (i) must be delayed for such a period and the pre-determined range of the device must be so limited, taking the delay period into consideration, that the device does not operate during the placing of any load on the load receptor of the weighing instrument by any means normally employed for placing such load.

### **Placing of indicators of weighing instruments**

69. (1) Except where a weighing instrument operates automatically or where the operation of loading and unloading the load receptor is controlled from a position where the operator can observe the indication of at least one indicator, including at least one printer if any printer is provided, the indicator must be so placed that the person operating the indicator or observing the indication has a clear and

unobstructed view of the load receptor, unless otherwise approved by the National Regulator.

(2) Any additional indicator not placed in accordance with subregulation (1) is deemed not to be verified in any verification of the weighing instrument.

### **Construction and strength of weighing instruments and measuring instruments**

**70.** (1) Any measuring instrument must be—

- (a) so designed and constructed of such material as will effectively preclude inaccurate measurement owing to any property of the product being measured; and
- (b) sufficiently strong to withstand, without distortion, a load equal to the capacity of the measuring instrument or the maximum pressure at which it is designed to work for the duration of the verification periods as specified.

(2) A measuring instrument must be such that correct measurement is not affected by—

- (a) fluctuation in supply voltage and frequency;
- (b) externally or internally generated electromagnetic or electrostatic interference;
- (c) atmospheric conditions such as humidity or pollution;
- (d) vibration from any source;
- (e) other environmental conditions; or
- (f) constructional conditions e.g. civils.

(3) Where technical regulations for specific types of measuring instrument identify and set requirements for specific influence factors and disturbances, the requirements in subregulation (2)(a) to (f) are deemed to have been complied with if the measuring instrument complies with the specified requirements pertaining to it.

### **Positioning of weighing instruments**

71. A movable weighing instrument must only be used in locations where environmental conditions cannot unduly affect their accuracy and be positioned and operated on a firm and rigid base, free from vibration.

### **Knife-edges and bearings**

72. (1) Except as otherwise provided in a technical regulation for a specific type of instrument where the load transmitting device of a weighing instrument comprises a beam or lever system with knife-edges and bearings—

- (a) the knife-edges and bearings must be so fitted as to allow the beam, steelyard or levers to move freely;
- (b) the knife-edges must be firmly secured in position, must be in true parallelism and, where the design so requires, must be coplanar and must bear throughout the length of the parts designed to be in contact with the bearings;

- (c) any knife-edges with round shanks must either have an interference or tapered fit in the holes in which they are fitted or set screws or bolts must so secure the knife-edges in position that they cannot twist;
- (d) any lateral displacement between knife-edges and bearings must be limited by friction plates, studs or shoulders so arranged that the contact between the knife-edge and the friction element is at a point on an extension of the line of contact between the knife-edge and the bearing; and
- (e) the knife-edges, bearings and friction surfaces must be made of hardened steel or agate or other material approved by the National Regulator.

(2) No weighing instrument must have packing at the knife-edges which, in the opinion of the market surveillance inspector or verification officer, either consists of an excessive number of pieces or is in any other respect unsuitable for its purpose or have caulking at the knife-edges unless the caulking is required by the design of the weighing instrument for securing the knife-edges and is so applied as not to interfere with the proper seating of the knife-edges or affecting the accuracy of measurement.

(3) Any portable weighing instrument of which the load transmitting device comprises a lever or levers with knife-edges and bearings must be so constructed that the contact between knife-edges and bearings or between the load receptor and the load transmitting device cannot be disturbed during use or transportation, provided that a locking or relieving device may release the contact between knife-edges and bearings.

**Steelyards and travelling or sliding poises on weighing instruments**

73. (1) On any weighing instrument except a weighing instrument to which regulation 89 applies of which the load measuring device, or part thereof, including a tare beam, is a steelyard—

- (a) the upper surface or edge of the steelyard must be in a perfectly straight plane over the graduated portion; and
- (b) adequate stops must be provided to prevent any of the poises from travelling behind the zero graduation or off the steelyard.

(2) On a weighing instrument to which subregulation (1) applies—

- (a) the graduations on a steelyard must consist of notches or indelible lines so defined that the position of the travelling or sliding poise or poises with respect thereto is easily discernible;
- (b) notches and graduation lines must be evenly cut or marked in one plane at right angles to the steelyard, must be uniformly spaced and parallel to each other and any error in the marking of the graduations must not exceed one-fifth of the distance between graduations or the allowance of error on the weighing instrument, whichever is the lesser;
- (c) where notches and graduation lines are used in combination, the lines must clearly correspond to their equivalent notches;
- (d) on a new steelyard the distance between notches or graduation lines, measured from centre to centre, must be not less than 1,5 mm;

- (e) the width of graduation lines on a new steelyard must not exceed one quarter of the distance between them, measured from centre to centre;
- (f) where any new steelyard has two or more poises, the graduations relating to all of the poises except the smallest must consist of notches, unless otherwise approved by the National Regulator; and
- (g) where any weighing instrument has more than one steelyard the graduations on each steelyard, except the minor steelyard, must consist of notches.

(3) On a weighing instrument to which subregulation (1) applies—

- (a) no loose material shall be permitted in or on any travelling or sliding poise;
- (b) where lead is used for adjusting purposes on any travelling or sliding poise, it must not come into contact with the steelyard;
- (c) a sliding poise on a new or repaired un-notched steelyard or steelyard bar must be provided with a set-screw or with a spring loaded brake to retain it in any set position;
- (d) a new or repaired travelling or sliding poise must be so constructed that no part thereof, including the set-screw where one is provided, can easily be detached;
- (e) a travelling or sliding poise must be of such shape and design that its position with respect to each notch or graduation on the steelyard is definitely indicated and easily readable;
- (f) a new travelling or sliding poise must be of such shape and be so fitted that no foreign bodies can lodge in any cavity or hollow; and
- (g) a travelling or sliding poise must be so made that its centre of gravity cannot change except in respect of the normal movement of the poise.

### **Testing of movable and suspended weighing instruments**

**74.** A movable weighing instrument provided with a base must be tested in a level position and a weighing instrument, which is suspended in use, must be suspended during testing.

### **Testing of fixed weighing instruments**

**75.** A road or rail vehicle scale, whether or not self-contained, and a non-self-contained platform scale or other weighing instrument which requires to be fixed in position when used must be tested in situ.

### **Testing of weighing instruments for error**

**76.** (a) Except as otherwise provided in any technical regulation, before any weighing instrument is tested for errors, the weighing instrument must be properly balanced at zero load in accordance with the appropriate provisions of regulation 68; and

(b) except as otherwise provided in a technical regulation and as far as is practicable a weighing instrument must be tested for errors at loads from zero up to its capacity.

### **Composition of test loads**

77. Except as otherwise provided in any technical regulation or where impracticable, any test load applied to a weighing instrument in the course of a test for errors must consist of measurement standards that comply with the requirements in Part III of these Regulations, provided that where a sufficient number of such measurement standards are not available, suitable constant load, applied in successive quantities not exceeding the total of the available weights, may be used in conjunction therewith to make up the load progressively to or near the capacity of the weighing instrument.

### **Testing of weighing instruments for repeatability**

78. Except as otherwise provided in any technical regulation, when—
- (a) the same load is applied repeatedly to the load receptor of a weighing instrument the weighing instrument must indicate the mass of the load correctly on each application of the load;
  - (b) the load applied to the load receptor of a weighing instrument is progressively increased or decreased the load at each step must be indicated correctly.

### **Testing of weighing instruments for constancy when load is kept on measuring instrument**

**79.** Except as otherwise provided for in any technical regulation, when the same load is kept on the load receptor of a weighing instrument for any period of up to eight hours, the weighing instrument must indicate the mass correctly at any time during this period, provided that in the case of a weighing instrument incorporating electronic components, a suitable warming-up period shall be allowed before commencement of the test.

### **Testing of weighing instruments for constancy at zero balance**

**80.** (a) Except as otherwise provided in any technical regulation, after the balance of any weighing instrument at zero load has been properly adjusted any error of zero balance indication resulting from loading and unloading the weighing instrument must not exceed one-half of the allowance of error prescribed for the weighing instrument in respect of a load not exceeding one-half of the capacity of the weighing instrument.

(b) In the case of a self-indicating weighing instrument such error must not exceed 0,25 of the value of the smallest graduation or exceed any greater allowance of error which may be permitted in terms of any technical regulation on balance at zero load.

(c) For the purpose of this test, the load may remain on the weighing instrument for a period of not more than 30 minutes.

### **Testing of vibrating weighing instruments for sensitivity**

81. A vibrating weighing instrument must as far as is practicable be tested for sensitivity, the ratio of displacement of the indicating element to the increase in the mass of the load which produces such displacement, at any load up to its capacity and at any such load the mass required to effect turn of the beam or steelyard from its position of balance must not exceed the turning allowance prescribed for its class and capacity: Provided further that in the case of the test at capacity the mass required to turn the beam or steelyard from its position of balance excludes the addition of one-half of the applicable turning allowance.

### **Testing of weighing instruments for strength of levers**

82. The strength of levers or other working parts of a weighing instrument when loaded to its capacity must be rejected if it yields unduly.

### **Testing of weighing instruments on movement of knife-edges and bearings**

83. Except as otherwise provided in any technical regulation, in the case of any weighing instrument provided with knife-edges and bearings, when the weighing instrument is loaded to one-half of its capacity, the load being centrally placed on or in

the load receptor and, where applicable, also so placed on the pan for weights, any difference in the accuracy of the weighing instrument resulting from moving the knife-edges or bearings laterally within the limits of their movement must not exceed the value of the appropriate allowance of error at a load equal to one half of the capacity.

### **Conventional weighing instruments**

**84.** (1) A conventional weighing instrument, manufactured prior to the publication of these Regulations, of any of the following classes or kinds must conform to any applicable technical regulation that pertains to it, consistent with the design of the measuring instrument and relative to each class or kind—

- (a) (i) equal-armed balances or beam scales;
- (a) (ii) post office letter scales;
- (b) equal-armed counter scales having capacities not exceeding 50 kg;
- (c) single-unequal armed steelyards having capacities not less than 50 kg;
- (d) wall scales having two unequal-armed levers connected in series;
- (e) compound lever scales of the following types, having load measuring devices comprising steelyards with travelling or sliding poises and with or without loose proportional counterpoise weights:
  - (i) counter-platform or bench scales having capacities of not more than 150 kg;
  - (ii) platform scales;
  - (iii) hopper or tank scales;

- (iv) overhead track scales;
- (v) vehicle scales; and
- (vi) crane scales;

(2) Any such measuring instrument which so conforms may be verified without being required to be of a model approved in terms of section 22 of the Act, unless, in the opinion of a market surveillance inspector or verification officer any such measuring instrument is of unusual or novel design or has any feature which may facilitate inaccurate measurement.

(3) (a) The load transmitting device of any weighing instrument referred to in subregulation (1) must consist of a lever or a system of levers together with any necessary connecting links or rods.

(b) The pivots which connect levers together, which connect levers to their fulcrums and which connect load receptors or load measuring devices to levers, must consist of knife-edges and bearings.

(c) Pivot knife-edges must be positioned on the levers only.

(d) Where knife-edges are secured in such a manner as to allow of ready alteration to the ratio of the lever arm such alteration must be possible by means of a mechanical appliance only.

(e) No tare device must be provided on any weighing instrument referred to in subregulation (1) unless specially approved by the National Regulator.

**Beam scales, balances, post office letter beam scales and mechanical non-self-indicating counter scales**

85. (1) (a) The applicable general requirements for measuring instruments prescribed in this Part of the regulations must apply to the measuring instruments falling within the scopes of SANS 302 and SANS 303, as amended, and to post office letter beam scales unless this regulation prescribes other requirements therefor.

(b) A non-automatic, un-denominated beam scale or balance must comply with the requirements of SANS 302.

(c) A non-automatic, non-self-indicating or semi-self-indicating, un-graduated counter scale must comply with the requirements of SANS 303, as amended.

(d) A post office letter beam scale must conform to the applicable requirements for a beam scale specified in paragraph (b), provided that a post office letter beam scale—

- (i) must not be classified into an accuracy class;
- (ii) must have a goods pan of suitable design to carry letters;
- (iii) unless new, may have its knife edges inserted in box ends on the beam;
- (iv) may be arranged so as not to be in equilibrium when unloaded, the pan for weights being permanently pre-loaded to counter balance a set mass;
- (v) may be arranged so that the travel is on the goods pan side only; and

- (vi) must have a maximum permissible error and sensitivity allowance, relevant to its capacity, prescribed in table 3, irrespective of whether it is new or in actual use, and if it is not of a tabulated capacity the permissible error and sensitivity allowance must be in proportion to the allowances tabulated.

1	2	3
<b>TABLE 3</b>		
Capacity of measuring Instrument	Maximum permissible error/ sensitivity allowance	
	Box-end type	Continuous knife-edged type
20 g	120 mg	60 mg
50 g	180 mg	90 mg
100 g	240 mg	120 mg
200 g	300 mg	150 mg

(e) A measuring instrument with an unusual or novel design or with any feature which is not in accordance with the requirements of this regulation, must be type approved in terms of Section 22 of the Act and comply with any requirements or conditions imposed at the time of such type approval.

(f) A measuring instrument to which this regulation applies, that was subjected to initial verification in terms of any regulation before it was replaced by this regulation need only comply in design and construction with the regulation or any type approval requirements applicable at the time of initial verification and need not necessarily comply with all the requirements in this regulation, but must be subjected to the accuracy tests, maximum permissible error and sensitivity allowance prescribed in this regulation.

(g) Cream test scales are exempted from the requirements of this regulation and must comply with the requirements of regulation 93.

(2) (a) Non-automatic, un-denominated beam scales and balances, irrespective of whether or not subregulation (1)(f) is applicable, must be verified in accordance with the requirements of Annex AA of SANS 302, as amended, provided that—

- (i) in the case of post office letter beam scales the maximum permissible error and sensitivity allowances in subregulation (1)(d)(vi) are applicable and verification test procedures must be suitably modified to allow for the requirements of subregulation (1)(d)(iv) and (v); or
- (ii) any measuring instrument that has been type approved in terms of subregulation (1)(e) must also comply with any test and special maximum permissible error requirements prescribed at the time of type approval.

(b) Non-automatic, non-self-indicating or semi-self-indicating, un-graduated counter scales, irrespective of whether or not subregulation (1)(f) is applicable, must be verified in accordance with the requirements of Annex AA of SANS 303, as amended, provided that any measuring instrument that has been type approved in terms of subregulation (1)(e) must also comply with any test and special maximum permissible error requirements prescribed at the time of type approval.

## Responsibilities of users of measuring instruments

**86.** In addition to any requirement of the Act or any other applicable regulation the requirements of Annex BB of SANS 302 and Annex BB of SANS 303, as applicable, must be complied with by persons using, for a prescribed purpose, the measuring instruments to which this regulation applies.

## Weights for coarse measurement

**87.** (1) Except as otherwise approved by the National Regulator, new weights for coarse measurement having nominal values of 1 g up to 20 kg inclusive must conform to the following specifications—

- (a) weights of 1 g to 2 kg must be of generally cylindrical shape with a flat button handle;
- (b) weights of 5 kg to 20 kg must be of block shape and generally rectangular parallelepipedic having a centre section lower than the end sections and provided with a rigid bar handle between the end sections, cast integrally with the body of the weight and entirely within the parallelepiped;
- (c) the collar and the edge of the handle of a cylindrical weight and the arises of all weights must be rounded;
- (d) the adjusting hole in a cylindrical weight must consist of an open cavity of circular cross-section in the centre of the bottom surface and extending into the body of the weight to a depth approximately equal to one third of the height of the weight;

- (e) the adjusting hole in a block weight must consist of an open cavity of rectangular cross-section in the bottom surface and extending into one end section of the body of the weight to a depth approximately equal to one third of the height of that end section;
- (f) the cross-section area of the adjusting cavity of a cylindrical or block weight must be greater at the base of the cavity than at its opening;
- (g) the denomination of a cylindrical weight and the name or trade mark, if any, must be embossed on a sunken field or impressed on the upper surface of its top:

Provided that the denomination may be repeated on the body of a weight having a value of 500 g or more;

- (h) the denomination of a block weight and the name or trade mark, if any, must be embossed or impressed on the upper surface of its central section;
- (i) the prescribed denomination must be in the following form:
  - 1 g; 2 g; 5 g; 10 g; 20 g; 50 g; 100 g; 200 g; 500 g, 1 kg; 2 kg; 5 kg; 10 kg;
  - or 20 kg
- (j) the designed dimensions of cylindrical weights must be as set out in table 4 of this regulation and the weights must conform to these dimensions within ordinary manufacturing tolerances except where limits are specified;
- (k) the designed dimension of block weights must be as set out in table 5 of this regulation and the weights must conform to these dimensions within ordinary manufacturing tolerances except where limits are specified;

- (l) newly manufactured weights must have sufficient lead in their adjusting cavities to ensure that the lead is securely fixed, and at least two thirds of the depth of the adjusting cavity is void of lead;
- (m) be made in one piece of a single metal or metal alloy with a density of not less than  $7 \text{ g/cm}^3$  and not more than  $9,5 \text{ g/cm}^3$ , with a hardness not less than that of cast brass and with corrodibility and friability not more than that of grey cast iron;
- (n) have an adjusting hole that contains lead;
- (o) be free of flaws;
- (p) be smooth on all its surfaces, to a degree of smoothness at least equal to that of grey cast iron carefully cast in a mould of fine sand, except for the denomination and any name or trade mark where this appears;
- (q) not bear any inscription other than the denomination and, if desired, a name or trade mark, provided that the latter must be in letters smaller than the height of the figures and letters of the denomination;
- (r) any weight for coarse measurement of a nominal value of 100 g or less must be made of brass or any other metal or alloy specified in this subregulation, other than cast iron;
- (s) iron or steel weights for coarse measurement must be blacked, black-leaded or protected by galvanising or other suitable process.

(2) (a) Every weight for coarse measurement of a nominal value of 20 g or more must be provided with only one hole located in the underside of the weight which must be of such design as to permit of ready adjustment of the weight without risk

of fracture and such hole must be undercut and plugged with lead sufficiently thick to ensure that it will remain securely in position.

(b) In the case of a weight for coarse measurement other than a block weight, such adjusting hole must be centrally positioned.

(c) Lead must not project above the rim of the adjusting hole of any weight.

(3) (a) The permissible denominations of weights for coarse measurement must be 1 g or more in accordance with Table 6 of this regulation.

(b) A weight for coarse measurement must not be marked with a denomination in more than one measurement unit.

(4) The National Regulator may approve weights for coarse measurement that do not conform to the specifications in subregulation (1) of this regulation.

(5) Each mass piece for coarse measurement must be evaluated against the requirements of this Part and be tested for accuracy by comparison with an appropriate standard weight by means of a beam scale or a precision balance or another specially prepared weighing instrument which has been tested in accordance with the requirements set out in SANS 1697, or as amended.

The allowances of error on weights for coarse measurement are prescribed in Table IV of Table of Allowances in the Annexure.

(7) (a) A weight for coarse measurement provided with an adjusting hole must have the verification mark placed on the lead in such hole.

(b) A weight for coarse measurement not provided with an adjusting hole must have the verification mark placed on the bottom surface of the weight provided that where the small size of a weight makes it impracticable to place any or an additional verification mark in this position, a certificate must be issued in lieu thereof.

1	2	3	4	5	6	7	8	9	10	11	12
<b>TABLE 4</b>											
	Denomination										
	1 g	2 g	5 g	10 g	20 g	50 g	100 g	200 g	500 g	1 kg	2 kg
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Mean diameter of body	6	6	8	10	13	18	22	28	38	48	60
Diameter of handle	5,5	5,5	7	9	11,5	16	20	25	34	43	54
Diameter of collar at centre	3	3	4,5	6	7,5	10	13	16	22	27	36
Radius of groove forming collar	0,9	0,9	1,25	1,5	1,8	2,5	3,5	4	5,5	7	9
Radius of arises	0,5	0,5	0,5	0,5	0,5	1	1	1,5	1,5	2	2
Radius of edge of handle	0,5	0,5	0,7	0,8	1	1,5	2	2,25	3	4	5
Minimum diameter of adjusting cavity (open end).	-	-	-	-	5	6	6	9	12	15	22
Maximum diameter of adjusting cavity (open end)	-	-	-	-	6	7	7	10	13	17	24
Minimum height of denomination figures	1	1	1	1	1,5	2	2	3,2	3,2	5	5
Slope of shoulder beyond collar radius	-	-	-	-	10°	10°	10°	10°	10°	10°	10°
Height	according to metal										

Provided that the body may have a designed 1° inclusive taper.

1	2	3	4
<b>TABLE 5</b>			
	Denomination		
	5 kg	10 kg	20 kg
	mm	mm	mm
Overall length at top	152	193	234
Length at bottom	150	190	230
Width at top	77	97	117
Width at bottom	75	95	115
Height of end sections	94	109	139
Length of end sections at top	36	46	61
Length of centre section	80	101	112
Height of centre section at sides	30	38	52
Height of centre section at middle	36	46	64
Diameter of handle	19	25	29
Distance of centre of handle from top of weight	18	25	30
Minimum length of adjusting cavity	28	28	28
Maximum length of adjusting cavity (open end)	30	30	30
Minimum width of adjusting cavity (open end)	16	20	20
Maximum width of adjusting cavity (open end)	18	22	22
Radius of arises	5	6	8
Minimum height of denomination figures	12	16	20

1	2
<b>TABLE 6</b>	
Weights for coarse measurement.	
Denominations	
Any multiple of 1 000 kg or 1 mg or of 1 t	1 kg
1 000 kg or 1 mg or 1 t	500 g
500 kg	200 g
200 kg	100 g
100 kg	50 g
50 kg	20 g
20 kg	10 g
10 kg	5 g
5 kg	2 g
2 kg	1 g

### Weights for fine measurement

- 88.** (1) Except as otherwise provided in this regulation any weight for fine measurement—
- (a) must be made of brass or of another corrosion resistant and non-magnetic metal or alloy specified in regulation 87(1)(m), other than iron, or if of a value of 500 mg or less may be made of aluminium or aluminium alloy;
  - (b) having nominal values of 1 g up to 20 kg must either conform to the specifications prescribed in subregulation (4) or must be of generally cylindrical shape having a height not more than one and one half of the mean diameter or be flat and circular in shape, with button handles or other suitably shaped handles;
  - (c) having nominal values of 500 mg or less must be constructed—
    - (i) of wire shaped into one, two or five sections to indicate the numerical values, of  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  respectively; or
    - (ii) of flat plate, and having one edge or corner turned up;
  - (d) must conform to the requirements of regulation 87(1)(f) in all other applicable respects;
  - (e) must, except where the small size of a weight makes it impossible, have the inscription of their denominations lightly engraved, embossed or stamped on their upper surfaces in the following form:

1 mg; 2 mg; 5 mg; 10 mg; 20 mg; 50 mg; 100 mg; 200 mg, 500 mg; 1 g;  
2 g; 5 g; 10 g; 20 g; 50 g; 100 g; 200 g; 500 g; 1 kg; 2 kg; 5 kg; 10 kg or  
20 kg.

(2) A weight for fine measurement need not be provided with an adjusting hole, but any weight provided with an adjusting hole must conform to the following requirements:

- (a) One hole located in the top or underside of the weight which must be of such design as to permit the ready adjustment of the weight without risk of fracture and such hole must be undercut and plugged with lead sufficiently thick to ensure that it will remain securely in position;
- (b) in the case of a weight for fine measurement other than a block weight, such adjusting hole must be centrally positioned;
- (c) block weights must have an adjustment cavity formed by the inside of the tubular handle or, if the handle is solid, an adjustment cavity shall be cast within one of the sides of the weight;
- (d) lead must not project above the rim of the adjusting hole of any weight;
- (e) the adjustment cavity shall be designed to prevent the accumulation of foreign matter or debris, to permit a secure cavity closure and to allow the cavity to be opened for additional adjustments; and
- (f) newly manufactured weights must have sufficient lead in the adjustment cavity to ensure that the lead is securely fixed and that at least half of the total volume of the adjusting cavity shall be empty.

(3) The denominations of weights for fine measurement must be in accordance with Table 7 or Table 8 of this regulation.

(4) New weights for fine measurement of denominations of 18 g or 9 g for use with cream test scales must be of cylindrical shape and must have the same dimensions except for height as the 20 g and 10 g weights.

(5) Each weight for fine measurement must be evaluated against the requirements of this Part of the regulations and be tested for accuracy by comparison with an appropriate standard weight by means of a precision balance which has been tested in accordance with the requirements set out in SANS 1697, as amended.

(6) The allowances of error on weights for fine measurement are prescribed in Table V and Table VI, Table of Allowances in the Annexure.

(7) (a) A weight for fine measurement provided with an adjusting hole must have the verification mark placed on the lead in such hole.

(b) A weight for fine measurement not provided with an adjusting hole must have the verification mark placed on the top or bottom surface of the weight except where the small size of the weight makes this impracticable, in which case a certificate must be issued in lieu thereof.

1	2	3	4
<b>TABLE 7</b>			
<b>Weights for fine measurement other than metric carat weights.</b>			
20 kg	200 g	2 g	20 mg
10 kg	100 g	1 g	10 mg
5 kg	50 g	500 mg	5 mg
2 kg	20 g	200 mg	2 mg
1 kg	10 g	100 mg	1 mg

500 g	5 g	50 mg	
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and for use with cream test scales only – 18 g and 9 g

### Metric carat weights

1	2	3	4
<b>TABLE 8</b>			
10 000 CM	200 CM	5 CM	0,1 CM
5 000 CM	100 CM	2 CM	0,05 CM
2 000 CM	50 CM	1 CM	0,02 CM
1 000 CM	20 CM	0,5 CM	0,01 CM
500 CM	10 CM	0,2 CM	0,005 CM

### Conformity to appropriate technical regulations

89. (1) Except as otherwise provided in any technical regulation and SANS document relating to a measuring instrument of a specific class or kind, or in a certificate issued in terms of section 22 of the Act, any measuring instrument which is required to be of a model approved in terms of section 22 of the Act must conform to any applicable provision of a technical regulation and SANS document consistent with the design of the measuring instrument

(2) Any new installation or any new system of measurement of a design not previously approved, which incorporates any measuring instrument of a model approved in terms of section 22 of the Act together with ancillary equipment which is necessary to the operation of the measuring instrument or which extends the scope of its operation and which may affect its measuring accuracy must, before the measuring instrument and such ancillary equipment are put into use for a prescribed purpose, be referred to the National Regulator for evaluation, testing and approval in

terms of section 22 of the Act, unless approval of the ancillary equipment comprising such installation or system was included in the approval of the measuring instrument.

**Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals**

90. (1) (a) All non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals must be constructed according to the relevant requirements of SANS 1649.

(b) The provisions of regulations 69, 70, 71, 72, 73, 74 to 83, and 93 of this part do not apply to non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals.

(2) Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals shall be verified in accordance with the requirements of Annex AA of SANS 1649.

(3) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision of the Act or any other applicable regulation in terms of the Act, the requirements of Annex BB of SANS 1649 shall be complied with by persons using instruments to which this regulation applies, for a prescribed purpose.

### **Automatic rail-weighbridges**

**91.** (1) All automatic rail-weighbridges must conform to the requirements of SANS 689 and any similar requirement in this part of the regulations shall not apply.

(2) Automatic rail-weighbridges shall be verified according to the requirements of Annex AA of SANS 689.

(3) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision in the Act or any other applicable regulation in terms of the Act, the requirements of Annex BB of SANS 689 shall be complied with by persons using automatic rail-weighbridges for a prescribed purpose.

### **Automatic weighing instruments**

**92.** (1) Any adjusting or compensating device of an automatic weighing instrument must be effectively secured to the weighing instrument and must be protected against tampering.

(2) The self-acting mechanism on an automatic weighing instrument with intermittent feed and discharge must be so constructed that, when the weighing instrument is operating, feeding is prevented while the weighing instrument is discharging and vice versa.

(3) Where an automatic weighing instrument is provided with an incorporated test mass arrangement or certified weights, such arrangement of mass or

weights, including any supporting rig that may be included in such mass arrangement, must be verified.

(4) (a) Except as otherwise provided in this regulation, in addition to testing by any method prescribed in this regulation for any specific type of automatic weighing instrument, the accuracy of the throughput of material must be tested by operating the weighing instrument under actual working conditions and using, where possible, the material the mass of which is normally measured by the weighing instrument.

(b) In the case of an automatic weighing instrument provided with an intermittent feed, the total mass of material determined in at least three measuring cycles of operation must be verified by means of a suitable certified weighing instrument, either before or after the material has passed through the automatic weighing instrument, and the error in respect of each cycle must not exceed double the allowance of error prescribed in paragraph (d), but the total error in respect of three or more cycles must not exceed such prescribed allowance of error.

(c) In the case of an automatic weighing instrument of the continuous type, the quantity of material to be used and the method of testing for accuracy of throughput is prescribed in subregulation (7) and (8) of this Part.

(d) Except as otherwise provided in any regulation of this Part, the difference between the mass of material determined by means of the independent weighing instrument and the mass indicated by the automatic weighing instrument must not exceed the limits of error specified in the Table 9, for any mass of material measured:

1		2
TABLE 9		
Material		Range of error
(i)	Grain, grain products, sugar or similar free-flowing materials	0,25 % in excess or in deficiency.
(ii)	Cement, coal, coke, ore or similar materials	0,5 % in excess or in deficiency.
(iii)	Granulated or powdered fertiliser	0,5 % in excess or in deficiency.
(iv)	Raw fish	0,5 % in excess or in deficiency.
(v)	Liquids	0,25 % in excess or in deficiency.
(vi)	Tacky materials or viscous liquids	0,5 % in excess or in deficiency.
(vii)	Bagasse	0,5 % in excess or in deficiency.

(e) The operation of the self-acting mechanism and of any controls on an automatic weighing instrument must be checked by the observation thereof during at least three cycles of operation of the weighing instrument when in actual normal use.

(5) Any self-indicating or other type of load-measuring device provided on an automatic weighing instrument and which may be coupled at will to the load receptor and load transmitting device for checking the accuracy of the setting for the predetermined quantity of material, must be tested together with the automatic weighing instrument itself.

(6) (a) Where an automatic weighing instrument, used for the measurement of the mass of predetermined quantities of materials, comprises an equal-armed beam or an unequal-armed lever from which a load receptor, and a receptacle for certified weights or for proportional counterpoises, are respectively suspended—

- (i) the equal-armed beam need not be marked for its class, but where more than one such weighing instrument of the same type is used on any one premises, each such beam or unequal-armed lever must be identified with its respective scale by the impression or stamping on the beam of the serial number of the weighing instrument or of another appropriate identification mark and any proportional counterpoises must be similarly identified;
- (ii) a device in the form of a steelyard or of a self-indicating load measuring device may be provided for determining, in the measurement of a batch of material, the mass of any residue which is less than the predetermined quantity;
- (iii) any counting or totalising device with which the weighing instrument may be provided must accurately indicate the number of completed cycles of operation of the weighing instrument or the total mass measured in a number of completed cycles of operation of the weighing instrument, as the case may be, in respect of a batch of material; and
- (iv) any printing device with which the weighing instrument may be provided must record the total mass measured in a number of completed cycles of operation of the weighing instrument together with the mass of any residue of material the mass of which is measured.

(b) The weighing instrument must be balanced with any compensating device out of action or set for zero compensation and with the receptacle for weights and the load receptor empty.

(c) Each weight used with the weighing instrument must be certified and each proportional counterpoise must be tested when verifying the weighing instrument.

(d) Load the load receptor with certified weights, the weighing instrument so loaded and with equivalent certified weights or appropriate counterpoises in or on the receptacle for weights, must indicate equilibrium correctly at any load up to its capacity, any compensating device being out of action.

(e) With discharge prevented, when any quantity of certified weights or appropriate counterpoises, up to capacity, is placed in or on the receptacle for weights and any compensating device is correctly adjusted, the weighing instrument must indicate equilibrium correctly after a quantity of material has been fed into the load receptor until the self-acting mechanism stops the feed.

(f) When an automatic weighing instrument is loaded as described in paragraph (d) or (e), the mass required to effect turn of the beam or lever, any error been eliminated, must not exceed the appropriate turning allowance prescribed in Table II or Table III of the Annexure to this Part, respectively—

- (i) in respect of an automatic weighing instrument having a capacity of not more than 50 kg; or
- (ii) in respect of an automatic weighing instrument having a capacity of more than 50 kg.

(g) The tests of the weighing instrument specified in paragraphs (b) to (f) must be carried out in addition to the tests specified in subregulation (5).

(7) (a) An automatic weighing instrument which incorporates a self-indicating load measuring device by means of which the predetermined mass may be set and is used for the measurement of the mass of predetermined quantities of materials, must be provided with a counting or totalising device and such device must indicate the number of completed cycles of operation of the weighing instrument or the total mass measured in a number of completed cycles of operation of the weighing instrument, as the case may be.

(b) Where an automatic weighing instrument referred to in paragraph (a) is provided with a printing device such device must record the total of the results of measurements in terms of a unit of mass, provided that where such a measuring instrument is also provided with a totalising counter the weighing instrument may be used without the printer.

(c) Where an automatic weighing instrument referred to in paragraphs (a) and (b) is provided with a means for measuring the mass of any residue in a batch of material which is less than the predetermined quantity, the mass of such residue must be included in the total mass printed.

(d) An automatic weighing instrument referred to in paragraph (a) or (b) must be tested in accordance with the applicable provisions of regulation 90 in addition to the provisions of subregulation (5).

(8) (a) An automatic weighing instrument, which incorporates a self-indicating load measuring device and is used for the measurement of the mass of approximating predetermined quantities of material, must be provided with a totalising

device which indicates and adds the actual values of the approximately predetermined quantities, for which the measuring instrument is set.

(b) Where an automatic weighing instrument referred to in paragraph (a) is provided with a means for measuring the mass of any material or debris left in the load receptor after the discharge of a load, the total mass indicated in a number of completed cycles of operation of the weighing instrument must not include the mass of such material or debris.

(c) Where an automatic weighing instrument referred to in paragraph (a) is provided with a printing device, such device must record the total mass of the results of measurements in terms of a unit of mass.

(d) Where an automatic weighing instrument referred to in subregulation (a) of subregulation (6) is provided with a means for measuring the mass of any residue in a batch of material which is less than the predetermined quantity, the mass of such residue must be included in the total mass printed.

(e) An automatic weighing instrument referred to in paragraph (a) must be tested in accordance with the applicable provisions of regulation 90 and the market surveillance inspector or verification officer may, in his discretion, also apply the tests prescribed in subregulation (5).

(9) (a) All continuous totalizing automatic weighing instruments must comply with the requirements of SANS 863 and any similar requirement in this regulation is not applicable.

(b) Continuous totalizing automatic weighing instruments must be verified according to the requirements of Annex AA of SANS 863.

(c) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision in the Act or any other applicable regulation in terms of the Act, the requirements of Annex BB of SANS 863 shall be complied with by persons using continuous totalizing automatic weighing instruments— belt weighers for a prescribed purpose.

(10) An automatic continuously totalising weighing instrument constructed on the principle of a conveyor belt scale, but without the belt, for measuring the mass of material in bulk, which is previously divided into discrete quantities, must conform to the provisions of regulation 90 in addition to the applicable provisions of subregulation (9).

(11) Unless described in type approval documentation, the verification mark must be placed upon a lead plug inserted in a conspicuous and easily accessible part of the beam or some other essential part of an automatic weighing instrument and upon the lead in the adjusting hole of any weights used with the weighing instrument, or in the case of other counterpoises, the date stamp must be placed upon the lead in the adjusting hole, and in appropriate cases protective marks must be affixed to prevent unauthorised access to the working parts.

### **Cream test beam scales and torsion balances index**

93. (1) Where a cream test beam scale or torsion balance is provided with an index pointer moving over a graduated scale—

- (a) the clear interval between the graduations must be not less than 1 mm; and
- (b) the width of the pointer at its extremity must not exceed the width of any graduation line.

(2) The pointer of a cream test beam scale or torsion balance provided with a graduated indicating or sector plate or a graduated difference chart must have travel beyond the extreme graduations for a distance of not less than the distance between the smallest graduations, whether the scale is unloaded or is loaded to capacity.

(3) Where a gravity ball is provided on a cream test beam scale or torsion balance—

- (a) it must be set as to ensure, as far as is practicable, that the scale turns equally readily whether it is unloaded or loaded to capacity; and
- (b) its retaining screw in the case of an unenclosed gravity ball must be covered by a stud or plug suitable for receiving the verification mark.

(4) (a) When certified weights equal to half the capacity of a cream test beam scale or torsion balance are placed on each pan or bottle holder in any position normally occupied by a cream test bottle, the scale must be in an equilibrium state (two forces that are equal and opposite) within the limits of one-half of the turning allowance.

(b) When certified weights equal to the capacity of a cream test beam scale or torsion balance are evenly distributed on each pan or bottle holder, the scale must indicate equilibrium within the limits of the turning allowance.

(c) A cream test beam scale or torsion balance, whether unloaded or loaded with certified weights equal to the capacity of the scale, must turn in accordance with Table 10, any error having been corrected:

1	2	3
<b>TABLE 10</b>		
Capacity not exceeding	Turning allowance	
	At the time of verification	Measuring instruments in actual use
240 g	75 mg	150 mg
300 g	200 mg	400 mg

(5) (a) A self-indicating cream test scale must be tested according to regulation 90.

(b) The allowances of error for self-indicating cream test scales are those prescribed for self-indicating weighing instruments in regulation 90.

(6) (a) The certifying stamp must be placed—

- (i) in the case of a cream test beam scale, in accordance with the provisions of SANS 302;
- (ii) in the case of a cream test torsion balance, upon the sealing plug provided on the gravity ball or, where no gravity ball is fitted or where the gravity ball is within the housing, upon a lead plug inserted in the housing which must be sealed; or
- (iii) in the case of a self-indicating cream test scale, in accordance with the provisions SANS 1649.

(b) Protective marks (seals) must be affixed to prevent unauthorised access to the working parts of any cream test scale provided with a housing.

### **Road vehicle scale for determination of the mass of road vehicles in motion or axle by axle**

94. (1) A road vehicle scale used for measuring the tare or gross mass of a road vehicle or vehicles in motion or axle by axle must conform to section 22(2)(c) of the Act, unless otherwise provided in a certificate issued in terms of Section 22 of the Act.

(2) (a) A road vehicle scale used for measuring the tare or gross mass of a road vehicle or vehicles, in accordance with the provisions of regulation 56, by adding together the individual axle mass loads of a road vehicle or vehicles, must be incorporated in a system designed to do such measuring while the vehicle is or vehicles are in motion.

(b) Unless otherwise provided in a certificate issued in terms of section 22 of the Act, each of the approaches to a road vehicle scale referred to in paragraph (a) must—

- (i) for a distance of not less than 10 m adjoining the load receptor be constructed of concrete or any other similar construction product and be capable of sustaining, without undue yielding, a load of 20 t across any line at right angles to the direction of travel of a vehicle moving over the load receptor; and
- (ii) for a distance of 20 m, which includes the required 10 m in subparagraph (i), be such that a vehicle will move smoothly over the load receptor and the correct measurement of the mass of the vehicle not be adversely affected.

## Conventional length measuring instruments

95. (1) (a) A measure of length must comply with regulations 44, 45, 46, 47, 48, 52, 53, 58, 59, 60, 62, 64, 65 and 66 consistent with its design and any such measure which so conforms may be verified without having to be of a model approved in terms of section 22 of the Act.

(b) A measure of length of a novel design or which is made of a material that may facilitate fraud must not be verified.

(2) (a) A measure of length must be made of stainless steel, steel, brass, ivory, hard wood, woven tape, reinforced fibreglass or other material of similar durability.

(b) The principal qualities of the material of which a measure of length is made must be such that—

- (i) an increase or decrease in temperature of 8 °C above or below the reference temperature does not result in a variation in its measuring length exceeding the allowance of error;
- (ii) in the case of a measure of length which is required to be used under a specified tension or in respect of which a tension is specified in subregulation (8)(d), an increase or decrease of 10 % in tension does not result in a variation in its measuring length exceeding the allowance of error; and
- (iii) the measure cannot become permanently distorted with normal use or with changes in environmental conditions.

(3) (a) A measure of length must be straight, the material free from flaws and of sufficient strength and durability to withstand wear and tear in their operational state.

(b) A new measure of length made of wood or of another material of similar durability and rigidity must have both ends capped or tipped with metal, which must be permanently secured in position.

(c) Any sliding or calliper arm of a measure of length must have no more play than is required for easy movement and when moved, the measuring surface of such arm must remain perpendicular to the longitudinal edge of the measure.

(d) A measure of length made of wood or of another material of similar durability and rigidity and constructed as a T-square must have the free end of the measuring blade capped or tipped with metal permanently secured in position and must have the measuring edge of the crosspiece provided with a securely fixed edging of metal, extra hard wood or similarly durable substance.

(e) A measure of length made of any material other than brass or wood must be provided with a suitable means, near the beginning of the measuring scale, for receiving the certifying stamp.

(4) (a) The nominal lengths must be in accordance with Table 11:

1	2	3
<b>TABLE 11</b>		
200 m	10 m	1 m
100 m	5 m	0,5 m or 50 cm
50 m	3 m	0,3 m or 30 cm
30 m	2 m	0,2 m or 20 cm
20 m	1,5 m	0,1 m or 10 cm

(b) Partial nominal values - nominal values of graduations 1 m or  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  of 1 m where the exponent "n" is a negative whole number, provided that major graduations of the measure may be subdivided.

(5) (a) The surfaces forming the principal end scale marks of a measure of length must be flat, parallel to each other and perpendicular to the longitudinal edge of the measure.

(b) The graduation lines of a measure of length must be clear, distinct, of equal width, parallel to each other and must extend to and be perpendicular to the longitudinal edge of the measure:

Provided that, in the case of a measure of length made of round section, one end of such lines must be on a straight line running along the length of the measure and in the case of a measure of length provided with sliding or calliper arms the lines need not extend to an edge.

(c) The width of graduation lines of a graduated measure of length must be such that it cannot cause any inaccuracy in the results of measuring, provided that the width of any such line must not be more than 1 mm.

(d) Figured graduation lines of a graduated measure of length must be distinguished by their being longer than the nearest four intermediate lines on either side.

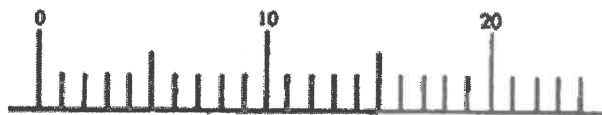
(e) Where every graduation line of a measure of length is figured all such lines may be of equal length or where every second graduation line of a measure of length is figured all such figured lines may be of the same length and all intermediate graduation lines must be of the same length but shorter than the figured lines.

(f) Measures of length not figured nor marked in accordance with the provisions of paragraph (e), must bear figuring and marking in accordance the following diagram:

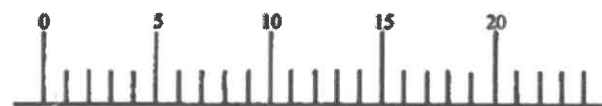
Numerical value of smallest graduation

(i)  $1 \times 10^n$

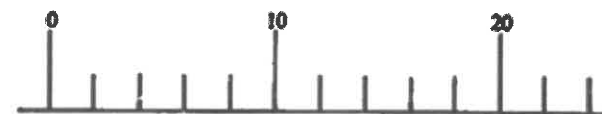
Arrangement of graduation lines and figures



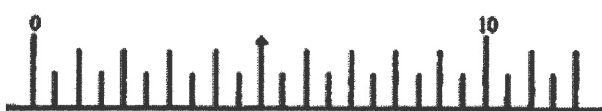
or

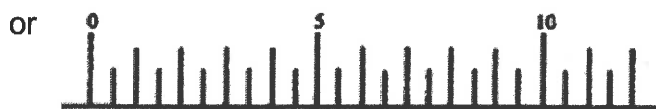


(ii)  $2 \times 10^n$



(iii)  $5 \times 10^n$





(g) On a tape measure provided with a link at the zero end, which forms a part of the measuring length, the link section need not be graduated.

(h) On a tape measure, the zero mark must be either at the end of the link or at the inside of a fixed hook where one is provided, or at any point on the tape: Provided that—

- (i) where the zero mark is on the tape, there must be no scale marks or graduations in advance of the zero, but this part of the tape may bear the marking of the nominal length of the measure and other marking required;
- (ii) where a sliding or hinged hook is provided, the zero mark must be on the inside of the hook when this is extended (for outside measurement) and on the outside of the hook when this is retracted (for inside measurement);
- (iii) where both a link and a hook are provided, the zero mark must be at the hook, as required in accordance with proviso in subparagraph (ii), or on the tape; and
- (iv) a tape measure which is wound in a case or frame when not in use may be graduated beyond its nominal length for a distance equal to not more than 0,05 m of its nominal length or 0,5 m, whichever is the lesser.

(6) (a) A rigid measure of length must be marked with the denomination denoting its nominal length near the extreme end of the measure: Provided that the letters of the denomination must be of a size compatible with that of the figures denoting numerical values, but in no case less than one half of the size of such figures.

(b) A tape measure of length must be marked with the denomination denoting its nominal length near the beginning of the measuring scale, or on the case or frame.

(c) Figures on a measure of length denoting values in decimal submultiples of the metre or in mm or, where permitted, in cm, do not required to be followed by the relevant symbol of the measurement unit: Provided that, where the figures denote mm or cm rather than decimal submultiples of the metre, the figure denoting each metre must be followed by the symbol m and these figures and symbols must be larger than, or of a contrasting colour to, the intermediate figures.

(7) Where a measure of length is calibrated at a temperature other than 20 °C or under a tension greater than that specified in subregulation (8)(d), such other temperature or tension must be marked on the measure near the beginning of the measuring scale.

(8) (a) The allowances of error on measures of length are prescribed in Table VIII of the Annexure.

(b) A measure of length must be tested for accuracy at its principal scale marks and at as many graduations as the market surveillance inspector or verification officer considers necessary, by comparison with a measurement standards that comply with the requirements in Part III of these Regulations.

(c) During testing, a measure of length must, as far as is practicable, be supported through its whole length on a plane and even base.

(d) A tape or linked measure of length must be subjected, during testing, to the tension marked on the measure, or if this is not marked, to the following tension:

- (i) A tape measure made of a material other than metal: 10 N;
- (ii) A metal tape measure: 50 N; and
- (iii) A linked measure: 70 N.

(9) A measure of length must have the verification mark placed near the beginning of the measuring scale on each graduated side, provided that, in the case of a linked measure or a tape measure in a protective case, the verification mark must be indelibly marked on a sticker that cannot be removed without damaging the sticker or on a disc permanently secured to such measure.

### **Length measuring instruments including self -indicating measures of length**

**96.** (1) The capacity of a length measuring instrument and the value of the smallest graduation of indication must be marked on the indicating dial or on a non-destructible plate securely attached to an essential part of the measuring instrument and in a prominent position.

(2) On a length measuring instrument of which the measuring device is a roller—

- (a) the measuring roller must be made of a material strong enough to preclude any deformation of the roller or change in its dimensions in normal use;

- (b) the peripheral surface of the measuring roller must be made of a material that are roughened sufficiently to prevent slipping of the material being measured relative to the roller;
- (c) the axis of the measuring roller must be perpendicular to the direction of travel of the material;
- (d) the measuring roller and any pressing or driving roller or device must be truly parallel when in position for measuring;
- (e) where required due to the construction or method of introducing the material to be measured into the measuring instrument, an index or datum line must be provided on the length measuring instrument for denoting the beginning and the end of the quantity of material measured;
- (f) a device must be provided to prevent indication of measurement without material passing through the measuring instrument and to prevent the measuring instrument from continuing to register when the end of a piece of material being measured has passed the measuring roller; and
- (g) must not impact on the material which is measured e.g. change the shape or density of the material.

(3) In the case of a length measuring instrument for use in the retail trade—

- (a) a device for resetting the indicator or counter to zero must be provided;
- (b) the resetting device must be so arranged that the rollers are freed when the device is operated;

- (c) the resetting device may operate automatically in conjunction with a marking or cutting device or manually by means of a special control;
- (d) the device specified in subregulation (2)(f) must be interlocked with the resetting device so that material cannot be introduced into the measuring instrument until it has been reset; and
- (e) the lengths measured and the money values, where provided, must be indicated on both the seller's and purchaser's sides of the measuring instrument.

(4) (a) The value of the smallest graduation of a length measuring instrument must be  $1\text{ m}$  or  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  of  $1\text{ m}$  where the exponent "n" is a negative whole number.

(b) In the case of a length measuring instrument for use in the retail trade—

- (i) the value of the smallest graduation on the dial must be not more than  $0,1\text{ m}$ ;
- (ii) where the value of the smallest graduation is  $0,1\text{ m}$ , the distance between graduation lines measured from centre to centre must be not less than  $15\text{ mm}$  and where the value of the smallest graduation is less than  $0,1\text{ m}$  such minimum distance must bear the same relation to the value of the graduations, but must be not less than  $1,5\text{ mm}$ ;

Provided that this requirement must not apply to a measuring instrument which indicates lengths by means of a digital or semi-digital counter on which each graduation is figured;

- (iii) where a measuring instrument indicates money values, the distance between money value graduation lines measured from centre to centre must be not less than 0,6 mm;
- (iv) the width of any graduation line must be not more than one quarter of the distance between graduation lines but not less than 0,2 mm or more than 1 mm; and
- (v) the width of any index pointer, line or cord must be not greater than the width of the graduation lines.

(c) In the case of a length measuring instrument for use in the wholesale trade—

- (i) the value of the smallest graduation on the dial must be not more than one ten-thousandth of the capacity of the measuring instrument; and
- (ii) where the value of the smallest graduation is 1m, the distance between graduation lines measured from centre to centre must be not less than 15 mm and where the value of the smallest graduation is less than 1m such minimum distance must bear the same relation to the value of the graduations but must be not less than 1,5 mm:

Provided that this requirement must not apply to a measuring instrument which indicates lengths by means of a digital or semi-digital counter on which each graduation is figured.

(5) Graduations of a length-measuring instrument must be figured at intervals of not more than 10 graduations and where the indications are partly enclosed,

the aperture through which the indication is read must be large enough to permit the next lower figured graduation to be read.

(6) (a) Any totalising counter, ticket printer, pre-setting device or other ancillary device on a length measuring instrument must function properly throughout its range and printed results of measurements must be clearly legible.

(b) Any length-measuring instrument approved after the promulgation of these regulations, which is intended for measuring a stretchable material, must be provided with a relaxing device to ensure that the material is not stretched while it is being measured.

(c) A length-measuring instrument provided with a pre-setting counter must be provided with a locking device which, once the required length has been measured, will prevent any further measurement until the counter is again set.

(7) (a) A length-measuring instrument provided with a price computing chart must be examined to ensure that the indications of unit prices and money values are in correct alignment with the indications of length and at least three computations must be checked to ensure their general accuracy.

(b) When a measurement standard tape that complies with the requirements in Part III of these regulations or a measured length of material normally measured by a length measuring instrument is passed through the measuring instrument at right angles to the axis of the measuring roller, indications must be accurate throughout the measuring range of the measuring instrument whether the test direction flow is forward or backward.

(c) In the case of a length-measuring instrument for use in the retail trade the indications on both the seller and purchaser sides must agree.

(d) Unless a length-measuring instrument is provided with a device to prevent reverse action, a measurement standard tape that complies with the requirements in Part III of the regulations or measured material must be passed through the measuring instrument in a reverse direction in order to discover any possible backlash in the mechanism and such backlash must not exceed one-tenth of the value of the smallest graduation.

(e) When the end of a piece of material being measured by a length measuring instrument has passed the measuring roller, the result of measurement must not be more than one half of the value of the smallest graduation.

(8) The errors permitted on length measuring instruments are shown in

Table 12:

1	2	3
<b>TABLE 12</b>		
Length tested	Error permitted	
	In deficiency	In excess
Up to 1 m	5 mm	10 mm
Over 1 m but under 5 m	10 mm	20 mm
5 m and over	0,2 % of the length measured	0,4 % of the length measured

(9) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described it shall be applied in a conspicuous, essential and accessible part of a length measuring instrument or in a cup securely attached thereto.

(b) Protective marks (seals) must be applied to the measuring instrument to prevent unauthorised access to any adjusting device or to the working parts, in a position as described in the type approval documentation.

### **Area-measuring instruments**

97. (1) The measuring capacity of an area measuring instrument and value of the smallest graduation of indication must be indelibly marked on the indicating dial or on a non-destructible plate permanently secured to an essential part of the measuring instrument and in a prominent position.

(2) (a) An area-measuring instrument of the multi-roller type must be so constructed that the material to be measured is flattened but not stretched or damaged when fed through the measuring rollers.

(b) The correct adjustment of any device for resetting the indicating mechanism of an area measuring instrument or for setting the adjusting shaft which effects the raising and lowering of the rollers must be ensured by means of lock nuts or by other satisfactory means.

(c) An area-measuring instrument of which the measuring device does not comprise of measuring rollers must be so constructed that the material to be measured is not stretched or damaged when fed through the measuring device, provided that the transporting device may be so arranged as to flatten the material without interfering with its makeup.

(3) (a) The measurement unit for the indication of the area measured by an area-measuring instrument must be the  $\text{dm}^2$ .

(b) An area-measuring instrument referred to in subregulation (2)(c) which does not flatten the material being measured may be provided with a device for compensating, in the indication of area, for unevenness or wrinkling of the material:

Provided that such compensation must not exceed 0,5 % of the area measured.

(4) (a) An area-measuring instrument must be tested for accuracy of measurement by means of measurement standard templates that comply with the requirements in Part III of these regulations.

(b) Each template must be passed through an area measuring instrument at least five times in various positions, the indication being reset to zero before each pass, and the error in respect of each pass must not exceed the allowance of error prescribed in subregulation (5) of this regulation, while the average error in respect of the five or more passes must not exceed one half of such prescribed allowance of error.

(c) A template may also be passed through an area measuring instrument several times without the indication being reset to zero, and the total error must not exceed the allowance of error prescribed in subregulation (5) of this regulation.

(d) For an area-measuring instrument having a sufficiently large capacity a combination of the templates may be used and such combination of templates may be passed through the measuring instrument successively, or together without overlapping, in such a manner as to pass under as many sets of measuring

rollers as possible, or through as wide a section of a measuring device not provided with rollers as possible, the indication in either case not being reset to zero until all templates used in combination have been passed through the measuring instrument, provided that only templates of the same thickness must be used in such a combination.

(5) The errors permitted on area measuring instruments are shown in

Table 13:

1	2
<b>TABLE 13</b>	
Area tested	Error permitted in excess (under registration) or in deficiency (over registration)
Up to 100 dm <sup>2</sup>	1,5 dm <sup>2</sup>
Over 100 dm <sup>2</sup> to 200 dm <sup>2</sup>	2 dm <sup>2</sup>
Over 200 dm <sup>2</sup> to 500 dm <sup>2</sup>	2,5 dm <sup>2</sup>
Over 500 dm <sup>2</sup>	0,5 % of area measured

(6) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described, it shall be applied in a conspicuous, essential and accessible part of the area measuring instrument or in a cup securely attached thereto.

(b) Protective marks (seals) must be applied to the measuring instrument to prevent unauthorised access to any adjusting device or to the working parts, in a position as described in the type approval documentation.

### Conventional measures of volume

98. (1) A conventional measure of volume of any of the following classes or kinds must conform to regulations 44, 45, 46, 48, 52, 53, 59, 60, 61, 63, 64, 65, 66 and 67 consistent with the design of the measure and, in particular, to regulations 99 to 104 relative to each class or kind, and any such measure which so conforms may be verified without requiring to be of a model approved in terms of section 22 of the Act—

- (a) any measure of volume of conventional design;
- (b) dipping measures used for the measurement of milk;
- (c) vehicle tanks calibrated to hold a fixed quantity;
- (d) graduated glass measures for pharmaceutical dispensing and comparable measurement;
- (e) measuring flasks;
- (f) pipettes; and
- (g) burettes.

(2) (a) Any measure may be made of any durable material approved by the National Regulator e.g. glass, tin, tin alloy, pewter, brass, bronze, copper, tin plate, white metal, aluminium, aluminium alloy, nickel, nickel-plated steel, chromium-plated steel, stainless steel or galvanised sheet iron.

(b) Any measure made of brass, bronze or copper must be well tinned all over on the inside.

(c) The coating of tin, nickel or chromium on a plated measure must be uniform and must show no sign of peeling.

(d) Where the National Regulator has approved iron or mild steel which is not plated or galvanised as the material of which a measure for a special purpose may be made, such measure must, where necessary with regard to the material to be measured, be coated all over on the inside with a protective coating to prevent deterioration of the measure.

(3) (a) A measure must be constructed as not to be easily damaged, dented, lose its shape.

(b) Where a measure has strengthening ribs or bands, such ribs or bands must not be of such form as to show, by indentation or otherwise, divisions inside the measure which might be mistaken for quantity indications.

(c) Except as otherwise provided in any regulation of this Part, a single value metal measure having a capacity of 200 mL or more, except a dipping measure for milk, must be provided with a lip or other suitable retainer to prevent spilling:

Provided that—

- (i) such lip or retainer must not increase the size of the measure by more than 10 % of the nominal capacity;
- (ii) such lip or retainer must extend from the brim of the measure at an angle of not less than 30° from the vertical;
- (iii) such retainer may incorporate a bonnet or funnel;

Provided further that the retainer must extend from the brim at an angle of not less than 30° from the vertical for not less than one third of its circumference.

(d) Except as otherwise provided in any regulation of this Part, a measure must be of such shape that it is completely emptied when tilted to an angle of 120° from the vertical.

(e) A measure provided with a discharge tap must be of such shape and the tap must be so positioned that the measure can be completely emptied without tilting.

(f) A metal measure may be provided with a bottom rim, provided that the depth of such rim is not greater than is required to protect the bottom of the measure.

(g) A measure must not have a false bottom.

(4) (a) The denomination of a measure, other than a vehicle tank or a graduated glass measure for pharmaceutical dispensing and comparable measurement, must be in accordance Table 14:

1	2	3
<b>TABLE 14</b>		
<b>(i) Single value measures</b>		
<b>Denominations</b>		
Any multiple of 10 L above 500 L		
500 L	2 L	20 mL
200 L	1 L	10 mL
100 L	750 mL	5 mL
50 L	500 mL	2 mL
25 L	375 mL	1 mL
20 L	200 mL	
10 L	100 mL	
5 L	50 mL	
and for the sale of potable spirits only – 25 mL		
<b>(ii) Subdivided or graduated glass measures, other than graduated glass measures, measuring flasks, pipettes and burettes for pharmaceutical dispensing and comparable measurement:</b>		
<b>Total denominations</b>		
5 L and under, as in section (i) of this table		
<b>Value of graduations</b>		
0,2 mL or 0,5 mL or $1 \times 10^n$ , $2 \times 10^n$ or $5 \times 10^n$ of 1 mL or of 1 L, where the exponent "n" is a positive whole number or zero		
<b>(iii) Subdivided or graduated non-transparent measures provided with gauge glasses</b>		
<b>Total denominations</b>		
5 L and above, as in section (i) of this table, provided that graduations may extend to not more than 10 % above the total value		
<b>Value of graduations</b>		
0,05 L; 0,1 L; 0,2 L; 0,5 L or $1 \times 10^n$ , $2 \times 10^n$ or $5 \times 10^n$ of 1 L, where the exponent "n" is a positive whole number or zero		

(b) Every measure must have its denomination clearly and indelibly marked on the outside of the body thereof and not on any handle, bottom, rim or lid.

(5) Except as otherwise provided in any regulation of this Part, the datum level or levels, respectively, defining the capacity of values of—

- (a) a single value metal measure must be the brim which, in the case of such measure provided with a lip or retainer, is the bottom of the lip or retainer;
- (b) a single value glass measure having a capacity of less than 200 mL must be the brim and a glass measure having a capacity of 200 mL or more, where the datum level is the brim must not be permitted;
- (c) a single value glass measure of which the datum level is not the brim must be an indelible, horizontal line not less than 25 mm in length, placed not less than 10 mm or more than 35 mm from the brim;
- (d) a graduated glass measure, having a total capacity of 5 L or under, other than a measure for pharmaceutical dispensing and comparable measurement, must be the respective graduations defined by indelible horizontal lines not less than 25 mm in length, and not less than 2,5 mm apart.

(6) Except as otherwise provided in any regulation of this Part, a non-transparent measure must not be subdivided unless the measure is fixed in position and is provided with a graduated gauge.

(7) (a) Every measure of volume must be tested for accuracy, by means of water, against a corresponding measurement standard measure, pipette or burette that complies with the requirements in Part III.

(b) A containing measure must be tested for accuracy by transferring the water from a measurement standard delivering measure, which

complies with the requirements of Part III of the regulations, to the measure being tested.

(c) A delivering measure must, where practicable, be tested by transferring the water from the delivering measure being tested to a measurement standard containing measure, that complies with the requirements in Part III of these Regulations, or, where this is not practicable, the inside of the delivering measure must be thoroughly wetted and drained before the water is transferred from a measurement standard delivery measure, that complies with the requirements in Part III of the regulations, to the delivering measure being tested.

(d) When testing a graduated glass measure or other glass measure of which the datum level is a line, the level of the water must be taken at the bottom of the meniscus and readings must be taken at the top of the lines.

(e) Notwithstanding the provisions of paragraph (a), (b) and (c), where any factor precludes the method of direct comparison with a measure of volume, the net mass of the liquid contained in or delivered by a measure may be determined by means of a suitable weighing instrument, that complies with the requirements in Part III of these Regulations, such mass being converted to measure of volume on the basis of the density of the liquid.

(8) (i) The errors permitted on vehicle tanks or compartments thereof are prescribed in regulation 104(6).

(ii) The errors permitted on measures other than vehicle tanks are prescribed in Table VIII; Table IX; Table X; I and Table XI in the Annexure.

(9) (a) The verification mark on a glass measure must be etched or sandblasted beneath or near the denomination mark.

(b) The verification mark on a metal measure other than one provided with a lip or retainer must be placed on a solder stud, or other similar means, near the denomination mark.

(c) The verification mark on a metal measure provided with a lip or retainer must, wherever practicable, be placed on a solder stud or other similar means, at a convenient point on the inside of the lip or retainer.

### **Dipping measure**

**99.** A metal dipping measure for measuring milk must conform to the applicable provisions of regulation 46 of this Part and, in addition, to the following provisions:

- (a) A metal dipping measure must—
- (i) have a capacity not exceeding 1 L;
  - (ii) be of circular or elliptical section with vertical sides; and
  - (iii) be provided with a long handle to preclude the hand from being placed in the milk into which the measure is dipped.
- (b) The height of a metal dipping measure must be not less than one and one half times or more than twice the mean diameter of the section.

## **Graduated glass measures for pharmaceutical dispensing and comparable measurement**

100. (1) Except as otherwise provided in this regulation, a graduated glass measure for pharmaceutical dispensing and comparable measurement must conform to the applicable provisions of regulation 98.

(2) A graduated glass measure for pharmaceutical dispensing and comparable measurement may be of inverted conical, of beaker or of cylindrical shape and must have a level base at right angles to the vertical axis of the measure.

(3) (a) The datum levels of a graduated glass measure for pharmaceutical dispensing and comparable measurement must be the respective graduations, which must be clear and distinct and etched or engraved parallel to the base and to one another.

(b) Where back graduations are provided on the glass measure they must correspond to front graduations when the measure is standing on a level plane.

(c) The clear interval between graduations may not be less than 1,5 mm.

(4) The denominations of graduated glass measures for pharmaceutical dispensing and comparable measurement must be in accordance with Table 15:

1	2
<b>TABLE 15</b>	
Total denominations:	
1 L or 1 000 mL	50 mL
500 mL	20 mL
250 mL	10 mL
200 mL	5 mL
100 mL	
Value of graduations:	
0,5 mL, 1 mL, 2 mL, 5 mL, 10 mL, 20 mL, 50 mL, 100 mL	

(5) (a) A graduated glass measure for pharmaceutical dispensing and comparable measurement must be placed upon a level plane during its testing for accuracy.

(b) All figured graduations and as many intermediate graduations as the market surveillance inspector or verification officer considers necessary must be tested.

(6) The verification mark must be permanently inscribed e.g. etched or sandblasted, near to the mark denoting the total capacity of the measure.

### Measuring flasks

**101.** (1) Except as otherwise provided in this regulation, a measuring flask must conform to the applicable provisions of regulations 98 and 100.

(2) (a) A measuring flask may have any value of denomination not exceeding 5 L, provided that such denomination meets the requirements of paragraph (b).

(b) The value of the graduations of a measuring flask must be  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  of 1 mL, where the exponent "n" is a positive or negative whole number or zero, provided that, where the denomination exceeds 1 L, the graduations may be figured as submultiples of 1 L.

(3) The errors allowed on a measuring flask must be in accordance with Table X in the Annexure or the value of the smallest graduation of such measuring flask whichever is the lesser, in excess or in deficiency.

## Pipettes

102. (1) Except as provided in this regulation, a pipette must conform to the applicable requirements of regulations 98 and 100.

(2) (a) A pipette may have any value of maximum denomination not exceeding 5 L, provided that such denomination meets the requirements of paragraph (d) of this subregulation.

(b) A pipette may be provided with an enlarged section upon which no graduation lines must appear.

(c) A pipette may be provided with a narrowed top section upon which no graduation lines must appear.

(d) The value of the graduations of a pipette must be  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  of 1 mL, where the exponent "n" is a positive or negative whole number or zero, provided that, where the total denomination exceeds 1 L, the graduations may be figured in submultiples of 1 L.

(3) The errors allowed on a pipette are one-half of the allowances in Table XI, in the Annexure.

### **Burettes**

**103.** (1) A burette must conform to the applicable provisions of regulations 98, 100, and 102.

(2) The errors allowed on a burette are one-half of the allowances in Table XI, in the Annexure.

### **Vehicle tanks**

**104.** (1) (a) A vehicle tank must be designed to deliver a single value quantity of liquid or a single value quantity from each compartment into which it may have been subdivided.

(b) The strength and construction of a vehicle tank must be such that, when containing any quantity of liquid, which it is designed to measure, any distortion of the tank will not cause incorrect measurements.

(c) All quantity indicators, piping and valves of a vehicle tank must be of such strength, design, construction and material that they withstand usage without the accuracy of the instrument being impaired.

(d) The delivery piping connected to a tank must be of such design and construction that, when the vehicle on which the tank is mounted is standing on a level plane, complete delivery can be made from the tank or from any compartment thereof.

(e) The delivery piping of a vehicle tank, including the manifold outlet where one is provided, must be so constructed as to preclude any liquid being trapped in any empty compartment while delivery is taking place from a compartment.

(f) A tank, or each compartment thereof, must be provided with an air-release vent pipe or pipes so as to prevent the formation of interior air pockets and so as to permit the influx of air to the compartment during the discharge of liquid.

(g) The filler opening of a tank or compartment must be of such size and construction as to readily permit visual internal inspection.

(h) (i) A tank, or each compartment thereof, must be provided with a dome, centrally situated at the highest part of the top of the tank or compartment and having a cross-section area such that, when the surface of the liquid contained in the tank is within the dome, the addition of a quantity of liquid equal to the allowance of error in excess will cause a rise in the surface of not less than 5 mm.

(ii) A dome referred to in paragraph (i) must be of such size that when the tank or compartment is filled to its capacity, there remains not less than 1,75 % of the capacity as ullage space for expansion of the liquid.

(1) (a) Each compartment of the tank or the tank itself must have its nominal capacity clearly and indelibly marked on at least one side thereof or on the dome thus:

"CAPACITY..... L TO INDICATOR".

(b) Where a tank has more than one compartment, each compartment must be marked with a number and its outlet valve must bear the same number.

(3) (a) The datum level of a tank or compartment must be defined by an indicator comprising a plated or polished flat circular metal disc of at least 25 mm diameter, rigidly fixed within the dome and at the centre thereof.

(b) If the indicator referred to in paragraph (a) is adjustable, it must be so constructed that it can be sealed in such a manner as to prevent any change in its position without the seal being broken.

(4) (a) Where an emergency valve is provided for closing the discharge outlet from a tank or compartment, verification of the tank or compartment must be done with such emergency valve open and the tank must bear a conspicuous notice that such emergency valve must be open when the tank is filled in use.

(b) The whole of the inside of a tank or compartment must be thoroughly wetted and then drained before verification.

(5) (a) All tests for accuracy of a tank or compartment must be made with the tank in a level position and with all emergency valves open.

(b) The whole of the inside of a tank or compartment must be thoroughly wetted and then drained before commencement of any test for accuracy.

(c) A tank or compartment must be tested for accuracy, by means of water, against a measurement standard measure that complies with the requirements in Part III of these Regulations, or by other means approved by the National Regulator.

(6) Errors must be allowed on a tank or compartment, in excess or in deficiency, in accordance with Table 16:

1	2	3
<b>TABLE 16</b>		
Capacity of tank or compartment	Error allowed	
	In excess	In deficiency
200 L	1,5 L	0,75 L
over 200 L and up to 500 L	3 L	1,5 L
over 500 L and up to 1 000 L	5 L	2,5 L
over 1 000 L and up to 2 000 L	8 L	4 L
over 2 000 L	8 L and in addition 2 L for every 1 000 L in excess of 2 000 L	4 L and in addition 1 L for every 1 000 L in excess of 2 000 L

(7) (a) The verification mark must be applied in a conspicuous, essential and accessible part of the instrument either on the dome or at the outlet valve of a tank or a compartment.

(b) Protective marks (seals) must be applied to the indicator to prevent unauthorised access to any adjusting device or to the working parts.

### Vehicle tanks provided with gauges

**105.** (1) Except as otherwise provided in this regulation, a tank must also conform to the provisions of regulation 104(1)(a), (c), (d), (f) and (4).

(2) (a) A tank must be of such shape as will make correct measurement possible at any graduation on a gauge.

(b) When of elliptical design, a tank must have a horizontal major axis of a length not exceeding one and one-half times the length of the minor axis.

(3) A separate gauge must be provided for each compartment and, when the gauge is in the tank or compartment, it must be centrally situated with respect to the longitudinal and diametrical axes in a cylindrical tank and the longitudinal and major axes in an elliptical tank.

(4) A gauge must be identified with the tank or compartment to which it belongs by means of a number clearly and indelibly marked on the gauge and corresponding to a number similarly marked on the tank or compartment.

(5) (a) A gauge must be so constructed as to retain, as required, the height of liquid when the gauge is removed from the tank or compartment.

(b) A gauge must comprise a tube of glass or other transparent material, protected by a metal casing and provided with a graduated scale indicating the volume of liquid contained in the corresponding tank or compartment to various levels.

(c) Graduation lines on a gauge must be clear and distinct.

(d) The distance between graduation lines of a gauge, measured from centre to centre, must be not less than 2 mm.

(e) The width of any graduation line of a gauge must be not less than 0,2 mm or more than one-quarter of the distance between the lines measured from centre to centre, provided that the width of any such line must be not more than 1mm .

(f) Figured graduations of a gauge must be distinguished by their lines being longer than the nearest four intermediate lines on either side.

(6) (a) The user of the gauge must provide the manager in charge of the legal metrology regional office concerned with an accurate full scale diagram, on suitable drawing paper, of the quantity marks on each gauge.

(b) Each diagram referred to in paragraph (a) must be cross referenced (numbered) to identify it with the gauge and the tank.

(c) Each diagram referred to in paragraph (a) must be retained by the legal metrology regional office concerned and must be used for the purpose of verifying any gauge which may have been repaired or replaced, subsequent to its verification.

(7) (a) All tests for accuracy of a vehicle tank or compartment must be made with the tank in a level position and with all emergency valves open.

(b) The whole of the inside of a tank or compartment must be thoroughly wetted and then drained before any test for accuracy and before initial verification.

(c) A vehicle tank or compartment must be tested for accuracy, by means of water, against a measurement standard measure that complies with the

requirements in Part III of these Regulations, or by other means approved by the National Regulator.

(d) Each figured graduation of each gauge and as many intermediate graduations as the market surveillance inspector or verification officer considers necessary must be tested and the volume indicated at each graduation must not differ from the contained volume by more than the allowance of error:

Provided that any error in the indication of the volume of the successive quantities added or withdrawn must not exceed the allowance of error in respect of such added or withdrawn quantity.

(8) Errors must be allowed on the gauge of a tank or compartment, in excess or in deficiency, in accordance with Table 17:

1	2	3
<b>TABLE 17</b>		
Quantity tested or value of graduation	Error allowed	
	In excess	In deficiency
Up to 10 L	0,1 L	0,05 L
over 10 L up to 100 L	1 %	0,5 %
over 100 L up to 200 L	0,75 %	0,375 %
over 200 L up to 300 L	1,5 L	0,75 L
over 300 L up to 1 600 L	0,5 %	0,25 %
over 1 600 L up to 2 000 L	8 L	4 L
over 2 000 L	8 L and in addition 2 L for every 1 000 L in excess of 2 000 L	4 L and in addition 1 L for every 1 000 L in excess of 2 000 L

(9) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described, it shall be applied on a soft solder plug or stud in a conspicuous, essential and accessible part of the instrument.

(b) Protective marks must be applied to the measuring instrument to prevent unauthorised access to any adjusting device, working parts or in a position as described in the type approval documentation.

### **Liquid-measuring devices**

106. (1) A liquid-measuring device must be designed to determine the quantity of liquid to be delivered and to repeat such determination indefinitely, without the quantity requiring to be reset, provided that provision may be made for the predetermination by an operator of various quantities to be delivered.

(2) (a) A liquid-measuring device must have its measuring capacity and the number of the certificate of approval of the model, marked on the body of the liquid-measuring device or on a metal plate permanently affixed thereto; provided that, in the case of a liquid-measuring device which incorporates a transparent measuring chamber or chambers, the capacity of each such chamber must be conspicuously marked thereon or in close proximity thereto so that it is visible during use and such measuring chamber must not bear any legend other than the said capacity marking, and the number of the certificate of approval of the model if not marked near the indication of the measuring capacity of the instrument.

(b) Where provision is made on a liquid-measuring device for the predetermination of various quantities to be delivered, such predetermination must be clearly defined on the liquid-measuring device and the denomination of such quantities must be clearly marked.

- (3) A liquid-measuring device must be so constructed that—
- (a) there is no leakage at any point, especially at any joints, glands and sight glasses, where the latter are provided;
  - (b) the formation of air pockets is prevented;
  - (c) all valves are effective for their purpose and, where gland nuts are provided, such nuts must not require to be tightened to an extent which makes valve operation difficult; and
  - (d) means are provided for sealing any calibrating or volume adjusting mechanism.

(4) (a) Where a liquid-measuring device is provided with a measuring chamber which is alternately filled and emptied, adequate means must be provided for the expulsion of air from the chamber while it is being filled and for admission of air thereto while it is being emptied.

(b) Where measurement by a liquid-measuring device is effected by means of a piston moving in a measuring chamber or chambers, such piston and chamber must not comprise the pump for drawing the liquid into the chamber.

(5) (a) A liquid-measuring device which measures a quantity of liquid by inference from the pressure on the liquid flowing through an orifice and the time for which the liquid flows through such orifice must be provided with means for maintaining such pressure and time at levels which ensure the delivery of the correct quantity.

(b) Where a liquid-measuring device referred to in paragraph (a) is provided with a nozzle which remains filled at the end of a delivery, such nozzle must

be of a "non-drip" type and the outlet must be protected so as to prevent draining of such nozzle.

(6) (a) Where liquid-measuring devices are fitted with electronic components that may affect their metrological integrity such components must be designed such that they are not susceptible to environmental influences and if failure occurs, the liquid-measuring device either stops operating or the metrological integrity including any primary or supplementary indication is not affected.

(b) The type approval authority shall decide, in consultation with the submitter for type approval, on any additional tests of electronic components that may be required.

(7) Where the supply of liquid for a liquid-measuring device is not visible to an operator or where such measuring instrument is not provided with a transparent measuring chamber or chambers, means must be provided for informing the operator when the supply of liquid is below the minimum level required for accurate measurement.

(8) Where a liquid-measuring device is provided with a totalizer, the figures of such totalizer must be clearly legible and where provision is made for resetting such totalizer, the figures must be properly aligned when the totalizer is set to zero.

(9) A liquid-measuring device must be installed and operated in such manner as to deliver the correct volumes.

(10) (a) As far as is practicable, the liquid which is normally measured by a liquid-measuring device must be used for testing the liquid-measuring device.

(b) After the liquid-measuring device and any delivery hose or pipe attached thereto have been thoroughly flushed, each separate measuring chamber or measurement unit must be tested for accuracy and constancy of delivery by allowing the liquid to flow from the liquid-measuring device directly into an appropriate measurement standard of volume that comply with the requirements in Part III of these regulations:

Provided that, where the capacity of the liquid-measuring device or some other factor precludes the method of direct comparison with a measure of volume, the net mass of the liquid delivered must be determined by means of a weighing instrument that comply with the requirements in Part III of these Regulations and such net mass must be converted to measure of volume on the basis of the density of the liquid.

(c) Where a liquid-measuring device provides for the delivery of various predetermined quantities, each such quantity or as many such quantities as considered necessary must be tested.

(d) Tests of a liquid-measuring device must be repeated a sufficient number of times to provide reliable data.

(e) These tests must be carried out at ambient conditions.

(11) Error must be allowed on liquid-measuring devices, when new, repaired or in trade use, in accordance with Table 18 and Table 19.

1	2
<b>TABLE 18</b>	
(a) For liquid-measuring devices other than liquid-measuring devices for delivering quantities of 25 mL or 50 mL of potable spirits into drinking glasses in the retail trade:	
Quantity delivered	Error allowed in excess or in deficiency
Up to 10 mL	0,4 mL
Over 10 mL and up to 20 mL	4 %
Over 20 mL and up to 30 mL	0,8 mL
Over 30 mL and up to 50 mL	3 %
Over 50 mL and up to 60 mL	1,5 mL
Over 60 mL and up to 200 mL	2,5 %
Over 200 mL and up to 250 mL	5 mL
Over 250 mL and up to 500 mL	2 %
Over 500 mL and up to 700 mL	10 mL
Over 700 mL and up to 1 L	1,5 %
Over 1 L and up to 1,5 L	15 mL
Over 1,5 L and up to 2 L	1 %
Over 2 L and up to 3 L	20 mL
Over 3 L and up to 5 L	0,7 %
Over 5 L and up to 6 L	35 mL
Over 6 L and up to 10 L	0,6 %
Over 10 L and up to 12 L	60 mL
Over 12 L and up to 50 L	0,5 %
Over 50 L and up to 100 L	250 mL
Over 100 L	0,25 %

1	2
<b>TABLE 19</b>	
(b) For liquid-measuring devices for delivering quantities of potable spirits into drinking glasses in the retail trade:	
Quantity delivered	Error allowed in excess only
25 mL	1,25 mL
50 mL	2,5 mL

(12) (a) The verification mark must be applied in one of the following ways as prescribed in type approval documentation:

(i) By means of a stamp on a lead plug inserted into a conspicuous, easily accessible and essential part of the liquid-measuring device and, in the case of a liquid-measuring device provided with metal displacers for altering the volume of the measuring chambers, the verification mark shall be placed upon the displacers unless they can be sealed in position.

If necessary to protect delicate liquid-measuring devices when stamping the verification mark it is permissible to replace the lead with sealing wax and to apply the mark to the melted wax;

(ii) by means of a verification sticker applied to a conspicuous part of the liquid-measuring device without obscuring any of the required markings or the view of the liquid in a transparent measuring chamber. Such sticker shall not be removable without destruction;

(iii) by means of imprinting the verification mark on a lead seal secured to the body of the liquid-measuring device by inserting sealing wire through a hole in the body in a conspicuous position that does not interfere with the metrological integrity of the liquid-measuring device; or

(iv) the reverse of one of the seals required in subparagraph (b) may also be used to apply the verification mark.

(b) Seals must be affixed to the liquid-measuring device to prevent unauthorised adjustment or access to the working parts or measuring chambers, except as otherwise

provided in terms any additional requirements that may have been set at the time of type approval.

### **Measuring devices and systems for measurement of cryogenic liquids and specified liquid gases**

**107.** (1) (a) All measuring systems for measuring the mass of liquid gases specified in clause 1.4 of SANS 319 when contained in vertical tanks of known dimensions and using the pressure differential method for level determination must comply with the requirements of SANS 319.

(b) From the date of implementation of this regulation no measuring system for liquid gases using the pressure differential method may be fitted to a new installation incorporating a horizontal tank for use for a prescribed purpose.

(c) A horizontal tank fitted with a measuring system for liquid gases using the pressure differential method and used for a prescribed purpose prior to the date of implementation of this regulation, is exempted from compliance with requirements for tanks provided that the measuring system is verified according to the requirements of Annex AA of SANS 319.

(d) Measuring systems for static measurement of the mass or volume of liquid gases in tanks using methods other than a pressure differential method, must comply with any applicable provisions of the regulations in this Part, consistent with the design and method of measurement.

(2) (a) All measuring devices and systems, excluding mass flow meters, for the dynamic measurement of cryogenic liquids, must comply with the requirements of SANS 344.

(b) Mass flow meters must comply with the provisions of regulation 108, pertaining to liquid measuring systems other than water.

(c) Meters and systems for dynamic measurement of liquefied carbon dioxide, or nitrous oxide must comply with the provisions of regulation 108, pertaining to liquid measuring systems other than water.

(3) (a) Unless exempted in terms of Annex BB of SANS 319, measuring systems to which the requirements of subregulation (1)(a) apply must be verified in accordance with the requirements of Annex AA of SANS 319.

(b) Measuring devices and systems to which the requirements of subregulation (2)(a) apply must be verified in accordance with the requirements of annex AA of SANS 344.

(4) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision in the Act or any other applicable regulation in terms of the Act, the requirements of Annex BB of SANS 319 and Annex BB of SANS 344, as applicable, must be complied with by persons using, for a prescribed purpose, the instruments to which subregulation (1)(a) and subregulation (2)(a) apply.

## Liquid meters and liquid meter systems

**108.** (1) (a) A meter must be—

- (i) so designed and constructed as to measure correctly the volume of the liquid or liquids for which it is to be used;
- (ii) made of such materials as will effectively preclude inaccurate measurement due to any corrosive or other injurious property of the liquid being measured;
- (iii) so constructed and installed that there is no leakage at any point of the installation;
- (iv) provided with a means for accurately taking the temperature of the liquid stream at the meter in the case of a fixed installation for wholesale delivery;
- (v) provided with a suitable device for adjusting the relation between the indicated and actual volume of liquid passing through it, or suitable change gears must be provided for such purpose:

Provided that a bypass arrangement must not be used as an adjusting device;

- (vi) provided with a means for sealing the calibration adjusting mechanism, the registering mechanism and any working parts of a meter to prevent unauthorised access (tampering) thereto.

(b) (i) A meter may be provided with a manually operated or automatic temperature compensating device which adjusts the measuring or recording mechanism so as to indicate the volume of the measured quantity of liquid at 20°C:

Provided that, where a manually operated compensator is used, an accurate Celsius thermometer must be fitted in the liquid stream immediately before the meter inlet

opening, and provided further that, where an automatic compensator is used, a means for taking the temperature at such point must be provided.

(ii) The temperature range of a compensating device referred to in subparagraph (i) and the coefficient of expansion or other data on which the compensation is based must be clearly and indelibly marked on the outside of the temperature compensating device.

(2) A meter must be equipped with—

- (a) a means for automatically breaking the syphon action in the delivery piping or hose in the case where the delivery piping or hose is not detachable from the meter and where the delivery piping or hose is arranged to empty by gravitation at the end of a delivery;
- (b) a device of suitable size, design and construction, fitted as closely as possible to the meter on the inlet side thereof, for the purpose of separating and eliminating any air or vapour from the liquid stream before the liquid enters the meter, such device being provided with effective means to allow air or vapour to escape therefrom or to by-pass the meter, as may be required, or for the purpose of stopping the flow of liquid and air or vapour to the meter in the event that air or vapour is present in the liquid stream:

Provided that, where the viscosity or other physical property of a liquid renders such separating or flow-stopping device ineffective, other suitable means for preventing the entry of air or vapour into the meter must be provided;

- (c) a suitable filter or strainer, fitted in the liquid stream on the inlet side of the meter to prevent foreign particles from entering the meter;

- (d) any other ancillary device that may be required by the National Regulator to ensure the accuracy of the meter under all conditions which may arise during its use;
- (e) a plate, permanently attached to the meter unless it is a meter incorporated in a lubricating oil dispenser or in a liquid fuel dispenser, on which the maximum and minimum rate of flow for which the meter is type approved is marked in terms of litres per minute (L / min); and
- (f) a plate, permanently attached or sealed to the meter, on which the product or products for which the meter may be used is marked in addition to any other information required by the National Regulator.

(3) The figures on all meter dials, counters and recorders must—

- (a) be clearly legible;
- (b) in the case of any re-set type of counter, be in proper alignment when the counter is set to zero:

Provided that, where the figures are re-set in the forward or increasing direction, they must be obscured during the entire re-setting operation unless the re-setting operation, once started, cannot be stopped until the zero indication is reached.

(4) (a) Where a meter is not provided with a non-return check valve, the registration mechanism of a recording device must not be reversible by reversing the direction of liquid flow through the meter.

(b) A meter must be installed in such a manner as to provide ready and convenient access to the position of the verification mark and to the protective mark arrangements.

(c) (i) Where a meter is provided with a flexible delivery hose and the control valve is situated at the outlet thereof, such hose must be of a non-expandable type and a spring loaded check and non-return valve must be provided downstream of the control valve to ensure that the hose remains filled, unless otherwise approved by the National Regulator for a special purpose.

(ii) Any hose, which is required to be drained after a delivery must be so fitted as to allow complete discharge of liquid.

(d) The ratio between the maximum and minimum type approved flowrates of the measuring system must be at least 5. The measuring system must be designed so that the flowrate is between the minimum type approved flowrate and the maximum type approved flowrate, except at the beginning and at the end of the measurement or during interruptions.

(e) (i) The maximum flow rate of a meter must be limited during use to within any margins in the range between the marked maximum and the prescribed minimum flow rates if such limitation is required for the purpose of ensuring maximum efficiency of air or vapour elimination and accuracy of measurement which could be influenced by the physical properties of the liquid being measured or by any other adverse condition arising during its use.

(ii) The limiting of the flow rate provided for in subparagraph (i) must be effected by such means and in such manner as may be required by the National Regulator.

(iii) Any orifice plate or flow rate controller required in terms of subparagraph (i) and (ii) must, unless otherwise approved by the National

Regulator, be situated on the outlet side of the meter and means for sealing must be provided for any such device which is adjustable or can be tampered with.

(f) Instruments for auxiliary measurements such as thermometers and hydrometers must comply with the relevant requirements in SANS 1698.

(5) A liquid meter system used for transferring of liquid where the piping both upstream and downstream of the meter is normally filled with the liquid must be provided with means for delivering the measured liquid into or through a verification device used as a standard.

(6) (a) Liquid meters and liquid meter systems must be verified in-situ unless otherwise permitted by the National Regulator.

(b) The liquid which is normally measured by a liquid meter must be used for testing the meter in the case where the meter is used for a single product.

(c) In the case where a liquid meter is not fitted with a temperature compensator it may be used for delivering more than one product, if it has been verified with the liquid having the higher viscosity according to following—

- (i) verified with diesel and used for diesel and power paraffin;
  - (ii) verified with power paraffin and used for power paraffin and all grades of petrol;
- or
- (iii) verified with any grade of petrol and used for all grades of petrol and similar liquids such as benzene which is not of a higher viscosity than petrol.

(d) After the liquid meter system has been thoroughly flushed, a liquid meter must be tested for accuracy and constancy by direct comparison with a certified measure of volume, or by other means approved by the National Regulator—

- (i) at its maximum rate of flow or at the maximum rate of which the liquid meter system is capable, provided that the latter rate must not exceed the maximum flow rate marked on the meter;
- (ii) at one-half of its maximum rate of flow; and
- (iii) at one-fifth of its maximum rate of flow or at the minimum flow rate where this is less than one-fifth of the maximum and is marked on the liquid meter.

(e) For the purpose of the tests prescribed in paragraph (d), the reduced flow rates must be affected by manipulation of the discharge control valve or by other suitable means.

(f) For tests prescribed in paragraph (d)(i), (ii) and (iii), the measurement by the liquid meter must be correct, whether the reset counter, where fitted, is or is not reset to zero before a test is commenced.

(g) Special tests may be prescribed by the National Regulator to establish—

- (i) the efficiency of any ancillary equipment used with the liquid meter system; and
- (ii) the effect on the accuracy of the liquid meter of any possible condition which may arise during the use of the liquid meter system as a result of the peculiarities of the system as a whole.

(h) Any inefficiency or adverse effect revealed during the tests referred to in paragraph (g) must not affect the accuracy of measurement by the liquid meter system by more than the prescribed allowance of error.

(i) Where a liquid meter system is provided with a temperature-compensating device, such device must be tested for efficiency and shall not affect the accuracy of measurement of the liquid meter system by more than the prescribed allowance of error.

(j) Where an automatic temperature-compensating device is provided with a setting device for selecting various densities or coefficients of expansion of liquid to be measured, such setting device must be tested for efficiency and must not affect the accuracy of measurement by the liquid meter system by more than the prescribed allowance of error.

(k) Any test may be repeated as many times as the market surveillance inspector or verification officer considers necessary.

(l) Where practicable the through-put during a test must be not less than the quantity delivered by the liquid meter in the course of one minute.

(m) Where the flow rate or capacity or other circumstance precludes the testing of a liquid meter system by direct comparison with a certified measure of volume, the net mass of liquid delivered through the liquid meter must be determined by means of a weighing instrument complying with the relevant requirements in SANS 1698 and, for the purpose of comparing its volume with the liquid meter reading, such net mass must be converted to measure of volume on the basis of the average temperature at which the liquid has passed through the liquid meter system

and the density of the liquid at such average temperature, and where a liquid meter system is provided with a temperature compensating device the mass so determined must, for the purpose of comparing its volume with the liquid meter reading, be converted to a measure of volume at 20 °C on the basis of the density of the liquid at 20 °C:

Provided that any liquid meter system tested in terms of this subregulation must be provided with a means for measuring the temperature of the liquid stream at the liquid meter.

(n) The National Regulator may compile and supply test sheets and tables of density and conversion factors for use by a market surveillance inspector or verification officer in carrying out the various prescribed tests applicable to liquid meters or liquid meter systems.

(o) The National Regulator may prescribe test procedures for the testing of automatic temperature compensating devices.

(7) Except as otherwise provided in this regulation or in any regulation relating to a liquid meter of a specific class or kind or used for a specific purpose, error is permissible on a liquid meter in accordance with Table 20, Table 21 and Table 22.

1	2	3
<b>TABLE 20</b>		
For a new or repaired liquid meter system		
Quantity tested	Error allowed	
	At flow rates from half-maximum up to maximum	At flow rates below half-maximum
	In excess only	In excess only
Up to 500 mL	5 mL	5 mL
Over 500 mL and up to 2 L	1 %	1 %
Over 2 L and up to 4 L	20 mL	20 mL
Over 4 L and up to 50 L	0,5 %	0,5 %
Over 50 L and up to 100 L	250 mL	0,5 %

Over 100 L	0,25 %	0,5 %
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1	2	3	4	5
<b>TABLE 21</b>				
For a liquid meter system in actual use when verified by a market surveillance inspector or verification officer.				
Quantity tested	Error allowed			
	At flow rates from half-maximum up to maximum		At flow rates below half-maximum	
	In excess	In deficiency	In excess	In deficiency
Up to 500 mL	5 mL	2,5 mL	5 mL	2,5 mL
Over 500 mL and up to 2 L	1 %	0,5 %	1 %	0,5 %
Over 2 L and up to 4 L	20 mL	10 mL	20 mL	10 mL
Over 4 L and up to 50 L	0,5 %	0,25 %	0,5 %	0,25 %
Over 50 L and up to 100 L	250 mL	125 mL	0,5 %	0,25 %
Over 100 L	0,25 %	0,125 %	0,5 %	0,25 %

1	2	3
<b>TABLE 22</b>		
Drain test: For a new, repaired or liquid meter system in actual use when verified by a market surveillance inspector or verification officer.		
Product tested	Error allowed	
	At flow rates from 0 to 500 L/min	At flow rates from 500 L/min up to maximum flow rate
Petrol	-1 L	-1,5 L
Diesel, Paraffin	-1,5 L	-2 L

(8) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described it shall be applied in a conspicuous, essential and accessible part of the liquid meter housing.

(b) Protective marks (seals) must be applied to the measuring instrument to prevent unauthorised access to any adjusting device or working parts, or in a position as described in the type approval documentation.

### **Milk meter systems**

**109.** (1) Except as otherwise provided for in this regulation, the meter in a milk meter system must conform in particular to any applicable provision of regulation 108.

(2) (a) The meter in a milk meter system must be so constructed that the end cover of its measuring chamber may be easily detached to facilitate cleaning of the chamber and its associated parts.

(b) Any removable part of the measuring chamber referred to in paragraph (a), such as an oscillating piston or gears, must be clearly and indelibly marked with at least the last three figures of the serial number of the milk meter, which whole number must also be similarly marked on the milk meter, or such part must be identified with the milk meter to which it belongs in such a manner as may be specified when the model is approved in terms of section 22 of the Act.

(3) In a receiving milk meter system—

- (a) before the start of any normal measuring operation, the meter, piping and air eliminator must be primed, unless otherwise provided by the National Regulator;
- (b) where the National Regulator has provided that the meter piping and air eliminator may be completely empty before the first intake in a series of measurements, the market surveillance inspector or verification officer must,

when the meter is first verified, determine by means of tests, the difference between the indication of the quantity of the first intake and the average indication of the quantity of the next three consecutive intakes of like quantities and a notice stating this difference must be permanently and conspicuously affixed on or close to the meter in the following manner:

**"QUANTITY TO BE ADDED TO METER READING FOR FIRST  
INTAKE ..... L"**

- (c) at the end of any normal measuring operation, the intake hose and any piping upstream of the air eliminator must be automatically emptied of milk;
- (d) where the receiving tank is at a lower level than that of the meter outlet, a device must be provided for automatically maintaining the meter full of milk at the end of a delivery; and
- (e) where milk is received by a collecting tanker, the length of the intake hose must be not more than 6 m and the hose must have such a bore and be so arranged that it will be emptied of all milk by the suction of the pump.

(4) The provisions of subregulation (3) do not apply to delivery systems.

(5) (a) Provision must be made in a receiving system for the disconnection or isolation of the outlet piping and the connection of a delivery hose or other suitable pipe at a suitable point for the purpose of testing the milk meter.

(b) The user of any milk meter system must have in his possession—

- (i) a test measure that complies with the relevant requirements in SANS 1698 of suitable design and having a capacity sufficient for measuring the volume of liquid which will pass through the meter at its maximum rate of flow during a period of at least one minute:

Provided that the measure must be so designed as to minimise frothing of milk delivered into it;

- (ii) all such ancillary equipment, including valves, couplings and other items, as may be required for testing the meter and including, in the case of a receiving system, a non-expandable delivery hose or other suitable delivery pipe, fitted with a control valve near to its outlet and an air vent valve downstream of the control valve where such control valve is fitted to the filler pipe of a test measure.

(6) (a) Milk, provided by the user of the meter, must be used for testing a milk meter system and the through-put during each test must be not less than the quantity measured by the meter in the course of one minute at the maximum rate of flow of the meter.

(b) A receiving system must be prepared for the tests for accuracy of the milk meter by having the outlet piping disconnected or otherwise isolated and by having the delivery hose or pipe referred to in subregulation (5)(a) suitably connected.

(c) (i) The meter in any milk meter system must be tested for accuracy in accordance with regulation 108(6)(b), (d), (e), (f) and (g):

Provided that, where the pump in a receiving system is of a positive displacement type and is arranged for a single fixed rate of flow only, the meter may be tested at such rate of flow only.

(ii) The proviso to subparagraph (i) must not apply where the National Regulator has permitted the verification of the meter in a milk meter system other than in situ and the normal pump referred to in that proviso is not used.

(iii) At the end of each delivery to the test measure during tests prescribed in subparagraph (i), the air vent valve on the filler pipe downstream of the control valve must be opened to the atmosphere where a measure having the control valve fitted to its filler pipe is used.

(d) When a milk meter is tested in accordance with this subregulation, any error must not exceed 0,25 % in excess or in deficiency of the volume measured.

(7) When the meter in a receiving system has been found to measure correctly when tested in accordance with subregulation (6), the milk meter system must be tested for accuracy and constancy when measuring predetermined quantities of milk by the following method:

- (a) After the test measure has been drained, a quantity of milk, equivalent to approximately half the capacity of the test measure must be measured through the meter into the test measure and the meter reading must be noted.
- (b) The meter must then be operated, with its outlet disconnected from the test measure, until the supply of milk is depleted and the meter stops registering.

- (c) The milk in the test measure must then be drained into the empty supply vessel and again measured through the meter into the test measure until the meter stops registering, and the meter reading must be noted.
- (d) The operation described in paragraph (c) must be repeated as many times as the market surveillance inspector or verification officer considers necessary.
- (e) At the end of a test according to paragraphs (a), (b), (c) and (d), any difference between the various meter readings must not exceed 1,5 L.
- (f) Where circumstances preclude testing by the method specified in paragraphs (a), (b), (c) and (d), the system may be tested by any method approved by the National Regulator which will have the same effect.

(8) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described it shall be applied in a conspicuous, essential and accessible part of the milk meter housing.

(b) Protective marks (seals) must be applied to the measuring instrument to prevent unauthorised access to any adjusting device or to any working parts, or in a position as described in the type approval documentation.

### **Liquefied petroleum gas meter systems**

**110.** (1) Except as otherwise provided in this regulation, the liquefied petroleum gas meter system must conform to provisions of regulation 108(1), (3), (4) and (5).

(2) (a) The meter in a liquefied petroleum gas meter system must be operated under pressure from a pump.

(b) A device must be provided in a liquefied petroleum gas meter system, situated as closely as possible to the meter on the outlet side thereof, for automatically maintaining the pressure required in the liquefied petroleum gas meter system in order to prevent vaporisation of the product being measured.

(c) Any flexible delivery hose provided in a liquefied petroleum gas meter system must be non-expansible and suited to the product being measured, and must have the control valve together with a spring-loaded check and non-return valve situated at its outlet, or must have a self-sealing coupling for connection to the receiving vessel.

(d) A vapour line must be provided in a liquefied petroleum gas meter system for use when required for equalising the pressure in the supply tank and in the measure used for testing the meter.

(e) A vapour line in a liquefied petroleum gas meter system must not be used between the supply tank and the receiving vessel during the delivery of the product to a purchaser.

(3) (a) The vapour line referred to in subregulation (2)(d) must be connected, the pressure equalised and the liquefied petroleum gas meter system, including the test measure, flushed before any initial test of a meter is commenced.

(b) The meter in a liquefied petroleum gas meter system must be tested in accordance with the provisions of regulation 108(6)(a) to (m), where applicable.

(4) The permissible errors on a meter in a liquefied petroleum gas meter system must be twice those specified in regulation 108(7).

### **Liquid meter systems for predetermined quantities**

111. (1) Except as otherwise provided in this regulation, the liquid meter system for predetermined quantities must conform to provisions of regulation 108(1), (2), (3), (4) and (5).

(2) A liquid meter system for predetermined quantities must be designed to determine the quantity of a liquid to be delivered and to repeat such determination indefinitely, without the quantity requiring to be reset: Provided that provision may be made for the predetermination by an operator of the system of various quantities to be delivered.

(3) (a) A liquid meter system for predetermined quantities must have the full details of its measuring capacity marked on the meter or on the housing if the meter is enclosed or on a metal plate permanently affixed thereto.

(b) Where provision is made in a system for the predetermination of various quantities to be delivered, such predetermination must be clearly defined on the liquid meter system for predetermined quantities and the denomination of such quantities must be clearly marked on the system.

(4) A liquid meter system for predetermined quantities not provided with an eliminator referred to in regulation 108(2)(b), must not operate when the supply of liquid is reduced to the minimum level this is to prevent air from entering the meter.

(5) (a) The type of liquid which is normally measured by a liquid meter system for predetermined quantities must be used for testing the system and the liquid must be provided by the user of the system.

(b) After the liquid meter system for predetermined quantities and any delivery hose or pipe attached there to have been thoroughly flushed, the meter must be tested for accuracy and constancy of delivery by allowing the liquid to flow from the system directly into an appropriate measurement standard of volume that comply with the requirements in Part III of these Regulations:

Provided that, where the capacity of the system or some other factor precludes the method of direct comparison with a measure of volume, the net mass of the liquid delivered must be determined by means of a weighing instrument that comply with the requirements in Part III of these Regulations and such net mass must be converted to the measure of volume on the basis of the density of the liquid.

(c) Where a liquid meter system for predetermined quantities provides for the delivery of various predetermined quantities, each such quantity or as many such quantities as the market surveillance inspector or verification officer considers necessary, must be tested.

(d) Tests of a liquid meter system for predetermined quantities must be repeated a sufficient number of times as the market surveillance inspector or verification officer considers necessary to provide reliable data.

(6) Permissible errors allowed on the meter of a liquid meter system for predetermined quantities, in excess or in deficiency, in accordance with Table 18 in regulation 107.

### Lubricating oil dispensers

**112.** (1) Except as otherwise provided in this regulation, the system must conform to provisions of regulation 108(1), (2), (3), (4) and (5), where applicable.

(2) (a) The meter in a dispenser must be operated under pressure from a pump.

(b) Where the pump of a dispenser is driven by a compressed air motor, the air gland on the motor and the oil gland on the pump must be separated by a space open to the atmosphere, or an air escape vent must be provided between the glands.

(c) Where it is impracticable to provide a dispenser with an air or vapour eliminating device referred to in regulation 108(2)(b), it must be provided with a float-operated valve at the upstream end of the intake pipe, to stop the supply of oil to the dispenser before the oil in the supply tank reaches a level which will permit air to enter the system.

(d) The valve referred to in paragraph (c) may be provided with a small vent or other suitable device, opening below the surface of the oil at its lowest level, to release the vacuum in the suction pipe when the supply of oil is exhausted.

(e) The delivery outlet nozzle of a dispenser must be of a "non-drip" type and must incorporate a spring-loaded check and non-return valve to ensure that the delivery spout, nozzle and any delivery hose remain filled.

(f) Any clock-type indicator on the meter of a dispenser must be so constructed that the index pointers can be reset to zero in the decreasing direction only.

(g) All pointers of a clock-type indicator on a meter of a dispenser must be reset in one operation and there must be a stop to prevent resetting below zero.

(3) (a) The value of the smallest graduation on the meter of a dispenser must be not more than 0,01 L.

(b) The distance between the graduation lines on any clock-type indicator on the meter of a dispenser must be not less than 2 mm when measured from centre to centre at the base line.

(4) (a) Any delivery hose or hose connecting the pump and meter of a dispenser must be non-expandible.

(b) Where any hose of a dispenser is retractable on a reel, the length of the hose, measured from the reel to the tip of the delivery outlet nozzle, must be not more than 7 m.

(c) Where any hose of a dispenser is not retractable, the length of the hose, measured from the meter in the case of a rigidly mounted meter, or from the end of the rigid piping in the case of a meter situated at the delivery end of the hose, must be not more than 4 m.

(d) The length of any hose connecting the end of a rigid delivery pipe and a hose reel of a dispenser must be not more than 0,6 m.

(e) The pump of a dispenser must be appropriate for the viscosity of the product being measured and must be such that the rate of flow of the product through the meter is within the limits for proper measurement

(5) (a) The meter of a dispenser must be so installed that the indicator is visible to the operator and to a purchaser.

(b) Any cover over the meter of a dispenser or any aperture or recess in which the meter is mounted must be of such size and must be so constructed and fitted as to allow ready access to the meter and particularly to the verification mark and protective marks thereon.

(c) If more than one meter of a dispenser is fed by the same pumping unit the accuracy of any of these dispensers must be within the prescribed error allowance when all are operated simultaneously.

(d) The maker's model designation must be clearly and indelibly marked on the pumping unit of a dispenser.

(6) (a) The meter of a dispenser must be tested for accuracy and constancy—

- (i) at the maximum rate of flow of which the dispenser is capable; and
- (ii) at one quarter of such maximum rate of flow.

(b) At least one delivery of a quantity of not less than 5 L must be tested during each test and the market surveillance inspector or verification officer may, in addition, test any number of deliveries of such other quantities as he considers necessary.

(c) To test the efficacy of the float-operated valve referred to in subregulation (2)(c), oil must be pumped through the meter at the maximum rate of flow obtainable and delivered into a certified measure from a supply which is insufficient to fill the measure, and when the meter stops indicating, the supply must be replenished and delivery continued until the measure is filled to the same level as was obtained during the test specified in paragraph (a)(i) and the volume then indicated by the meter must not differ from the volume in the measure by more than 10 mL.

(d) In order to simulate the condition required for the test specified in paragraph (c) the suction pipe may be removed from the normal supply and placed in a supply which just covers the float-operated valve and be returned to the normal supply when the meter stops indicating, the pump being stopped while the transfer takes place.

(7) Permissible error allowed on the meter of a dispenser, in excess only, in accordance with Table 23:

1	2
<b>TABLE 23</b>	
Quantity delivered	Error allowed in excess only
up to 500 mL	5 mL
over 500 mL and up to 2 L	1 %
over 2 L and up to 4 L	20 mL
over 4 L	0,5 %

### Liquid fuel dispensers

**113.** (1) All liquid fuel dispensers must be constructed according to the relevant requirements of SABS 1650.

(2) Liquid fuel dispensers must be verified in accordance with the requirements of annex B of SABS 1650.

(3) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision of the Act or any other applicable regulation in terms of the Act, the requirements of Annex C of SABS 1650 shall be complied with by persons using instruments to which this regulation applies, for a prescribed purpose.

## Water meters

114. (1) All mechanical water meters of normal bore not exceeding 100 mm, used for the measuring of cold potable water, excluding combination meters, must comply with SANS 1529-1.

(2) Water meters referred to in subregulation (1) must be verified in accordance with the requirements of Annex B or C of SANS 1529 -1, as applicable.

(3) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision of the Act or any other applicable regulation in terms of the Act, the requirements of Annex D of SANS 1529-1 shall be complied with by persons using instruments referred to in subregulation (1)(a), for a prescribed purpose.

(4) In addition to the applicable requirements referred to in subregulation (1), mechanical water meters fitted with electronic indicators, electronic water meters and electronic pre-payment water measuring systems, must comply with SANS 1529-9.

(5) Water meters referred to in subregulation (4) must be verified in accordance with the requirements of Annex B or C of SANS 1529 -9, as applicable.

(6) In addition to any requirement of the Act or any other applicable regulation in terms of the Act and unless the user is exempted by any provision of the Act or any other applicable regulation in terms of the Act, the requirements of Annex D of SANS 1529-9 must be complied with by persons using instruments referred to in subregulation (4), for a prescribed purpose.

**Gas meters for domestic use**

- 115.** (1) A new gas meter must be of a positive displacement type.
- (2) A gas meter must be made of such material as will effectively preclude inaccurate measurement owing to any corrosive or other injurious property of the gas being measured and must be sufficiently strong to withstand, without distortion, the maximum pressure at which it is designed to work.
- (3) A gas meter must be so constructed that—
- (a) there is no external leakage of gas when the meter is subjected to an internal pressure of 1,25 times the maximum pressure at which it is designed to work or of 5 kPa, whichever is the greater, for a period of not less than two minutes; and
- (b) its indicator moves continuously when the meter is subjected to an inlet pressure, equivalent to the maximum pressure at which it is designed to work or to 1,25 kPa, whichever is the greater, and when gas is passing through the meter at a rate of 0,2 % of its maximum rate of flow.
- (4) The direction of flow of gas through a gas meter must be marked clearly and indelibly on the meter by means of an arrow or by means of the word "IN" at the inlet.
- (5) The counter of a new gas meter must, for the purpose of testing, be provided with a graduated indicator by means of which the quantity of gas measured is continuously indicated and the value represented by the smallest graduation on the test

indicator must be not more than the quantity of gas passed through the meter during one working cycle.

(6) A separate test indicator need not be provided on a gas meter on which the value of the smallest graduation on the main quantity indicator is not more than the value specified in subregulation (5).

(7) The value represented by the smallest graduation on the quantity indicator of a gas meter, excluding the test indicator referred to in subregulations (5) and (6), must be not more than 0,05 of that quantity which will pass through the meter in one hour at the maximum rate of flow, provided that this value must be  $1 \times 10^n$  of  $1 \text{ m}^3$ , where "n" is a positive or negative whole number or zero.

(8) On any gas meter provided with a multi-pointer type of quantity indicator, the index pointers must move in a clockwise direction only for increasing quantities.

(9) Any ancillary device, such as a pressure or flow rate controller, recording device, automatic or coin operated shut-off mechanism or a similar device, must not be used on or in conjunction with a gas meter, unless any such ancillary device is approved in terms of section 22 of the Act.

(10) Where a gas meter has any protruding shaft or other working part for the attachment of an ancillary device and such shaft or part is not in use it must be enclosed with a sealed cover.

(11) The following information must be legibly, indelibly and permanently marked on a gas meter or on a plate permanently attached thereto:

(a) the maker's name or trade mark, type designation and serial number;

- (b) the approved model number;
- (c) the maximum rate of flow at which the meter is designed to operate, in cubic metres per hour, which may be expressed as "Q max..... m<sup>3</sup>/h";
- (d) the capacity of the meter per revolution or working cycle, which may be expressed as "V.....m<sup>3</sup>" or "V.....dm<sup>3</sup>"; and
- (e) any other information which may be required on approval of the model in terms of section 22 (1) of the Act.

(12) The actual capacity of a gas meter per revolution or cycle of operation must not differ by more than 5 % from the marked capacity per revolution.

(13) Subject to the provisions of subregulation (14), any difference between the pressure at the inlet and the mean pressure at the outlet of a gas meter must not exceed 0,125 kPa when the meter is tested at any prescribed rate of flow and when the pressure at the inlet of the meter is 0,5 kPa:

Provided that in the case of a gas meter fitted with an automatic or coin-operated shut-off mechanism the requirements of this subregulation must not apply during the automatic shutting-off period.

(14) When a gas meter is tested as described in subregulation (13) and there is any oscillation of pressure between the highest and the lowest pressure at the outlet such oscillation must not exceed 0,075 kPa.

(15) Except where a gas meter is tested in situ or in other special circumstances, air may be used as the testing medium.

(16) Unless other means or conditions for testing a gas meter have been approved by the National Regulator, such a meter may be tested for accuracy and

constancy by passing air through the meter from a measurement standard holder that comply with the requirements in Part III of these regulations at a pressure of 0,5 kPa.

(17) The tests of a gas meter must be carried out at—

- (a) the marked maximum rate of flow of the meter, or, if this rate is greater than the maximum operating rate of the measurement standard holder, at the maximum attainable rate;
- (b) one-half of the marked maximum rate of flow of the meter;
- (c) 0,6 % of the marked maximum rate of flow of the meter; and
- (d) any other rate of flow, not less than 0,6 % of the marked maximum, which the market surveillance inspector or verification officer may consider necessary.

(18) The temperature of the testing medium must not differ by more than 1 °C from that of the surrounding air, the meter being at the same temperature as the surrounding air.

(19) Any error on a gas meter must not exceed the amounts shown in Table 24.

1	2	3	4	5
<b>TABLE 24</b>				
Rate of flow	For new or repaired meters		For meters in use	
	in excess (under-registration)	in deficiency (over registration)	in excess (under-registration)	in deficiency (over registration)
Any prescribed rate of flow	3 %	2 %	5 %	5 %

(20) (a) The verification mark must be applied in a position as described in the type approval documentation, if not described it shall be applied in a conspicuous, essential and accessible part of the gas meter housing.

(b) Protective marks (seals) must be applied to the measuring instrument to prevent unauthorised access to any adjusting device or to the working parts, in a position as described in the type approval documentation.

### **Vessels or containers used for sale of liquids**

**116.** (1) Any vessel or container manufactured or supplied for the sale by volume of any liquid must, subject to any applicable tolerance prescribed for prepackaged liquids in this Part of these Regulations and SANS 1840, be large enough to hold the volume of liquid specified thereon or the volume it is intended to contain or specified on order by the user and over and above such volume the vessel or container must have such ullage space as may be required or as may have been specified on order.

**Part XII****Verification and repair bodies****Requirements for designation of verification bodies**

**117.** (1) The requirements for a body to be designated as a verification body under section 7 of the Act, that undertakes either initial, subsequent or both initial and subsequent verification of measuring instruments on behalf of the National Regulator, are as follows:

- (a) A body that wishes to be designated, as a verification body must—
- (i) be accredited to verify measuring instruments. In the absence of this accreditation, the body applying for designation should provide evidence of compliance to the requirements set by the National Regulator in consultation with stakeholders;
  - (ii) submit an application and proof of accreditation or evidence of compliance for such designation to the National Regulator;
  - (iii) be legally identifiable;
  - (iv) be free from any commercial, financial and other pressure that might affect their judgment.
  - (v) implement procedures to ensure that persons or organisations external to the body cannot influence the results of activities performed by the body;
  - (vi) have a documented training program in place for the verification officers in its employ that will ensure they have knowledge of the technology and

- applications of the instruments that are to be examined and also of the initial and subsequent verification processes;
- (vii) document the education, training and competence of each person;
  - (viii) provide evidence of compliance to the government imperative on BBBEE level four (4) as well as any other government legislation that affects their business; and
  - (ix) enter into an agreement or contract set by the National Regulator on the requirements of carrying out verification under the control of the National Regulator.
- (b) once a body applying for designation as a verification body has met the criteria in paragraph (a), the National Regulator must issue a certificate officially designating such body.

### **Responsibility of verification body**

**118.** After designation the verification body acting on behalf of the regulator, must—

- (a) maintain their accreditation in terms of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 or maintain requirements set by the National Regulator in the absence of such a recognized accreditation scheme;
- (b) notify the National Regulator in writing of all verifications or rejections undertaken and include the following particulars relating to every measuring instrument in

respect of which a verification certificate or rejection certificate has been issued—

- (i) the make, model, approval number, class and measuring capacity of the measuring instrument; and
  - (ii) the place where the measuring instrument is used for a prescribed purpose;
- (c) the particulars which have been furnished under paragraph (b) have to be submitted within five working days after the end of the month in which the verification or rejection took place in a format as specified by the National Regulator;
- (d) in the case of a rejection, inform the National Regulator immediately in writing of all non-compliances found and reasons for rejecting the measuring instrument as well as action taken by the verification body to ensure compliance or to ensure that the measuring instrument is removed from use;
- (e) ensure that market surveillance inspectors have access to their business premises and records in line with section 20 of the Act;
- (f) maintain records of—
- (i) type approval pattern description documentation of instruments verified and rejected by the verification body;
  - (ii) verifications undertaken;
  - (iii) rejections under section 25(3) of the Act;
  - (iv) list of verification officers in employ as well as all employment documentation;

- (v) appointment, qualification and training records of verification officers;
  - (vi) verification officer resignations;
  - (vii) verification marks and protective marks used by the verification officer which includes procedures for issuing, loss and withdrawal; and
  - (viii) contracts with users of measuring instruments;
- (g) supply the equipment needed for the verification officer's to undertake their work in line with section 19 of the Act, and
- (h) notify the National Regulator in writing of the employment of a verification officer or of the termination of the services of a verification officer within 14 days of that event taking place;
- (i) ensure that a verification officer is physically present whilst performing the verification on the measuring instrument and apply the verification and protective marks immediately after the verification has taken place.

### **Withdrawal of designation of verification body**

**119.** (1) Any contravention of the requirements of the Act, or any other Act, or the agreed criteria in the agreement or contract will result in the withdrawal of the designation of the verification body.

(2) The designated verification body forfeits the right to verify measuring instruments from the date of the suspension or withdrawal of their accreditation by the Accreditation Body or the withdrawal of the designation by the National Regulator.

(3) The National Regulator must publish an updated register of all designated verification bodies including those verification bodies of which the designation to verify has been withdrawn or suspended.

### **Verification Certificate**

**120.** (1) A verification carried out must be accompanied by a verification certificate that details the work undertaken and a statement that the measuring instrument meets all requirements of the relevant technical regulations and can be used for a prescribed purpose.

(2) A verification certificate may only be issued to the user of a measuring instrument by a registered verification officer.

(3) Each verification certificate must include at least the following information—

- (i) the title "Verification Certificate";
- (ii) the name, address and designation number of the verification body;
- (iii) a unique serial number on all its pages to identify that each page is recognized as a part of the verification certificate;
- (iv) page numbers and a clear identifier of the number of pages in the verification certificate, e.g. page 1 of 1 or a statement at the beginning of the certificate "This certificate consists of 1 page" or a statement at the end of the certificate "End of Certificate";
- (v) the name and address of the client;

- (vi) the number of the procedure used by the verification body, in terms of their documented management system, to establish whether the measuring instrument is in a verifiable condition;
- (vii) a description and unambiguous identification of the measuring instruments verified, including a description and serial number of components that has an influence on the metrological integrity of the measuring instrument and the type approval number of the instrument or components, if the measuring instrument requires type approval in terms of section 22 of the Act;
- (viii) a statement that will serve as proof that the measurement standards used are directly related to the reading or obtaining of the results of measurement and are traceable to a national standard.
- (ix) The following data must be included as a minimum—
  - (aa) calibration certificate number of the measurement standards used;
  - (bb) date of calibration of measurement standards;
  - (cc) identification of the measurement standards, e.g. serial numbers, description, set number;
  - (dd) whether the measuring standards are owned by the verification body or are loaned measurement standards;
- (x) the latest security intervention value, which must be indicated on the verification certificate, if the measuring instrument being verified is secured by means of a software seal;
- (xi) expiry date of the verification certificate, if a verification period has been prescribed for the measuring instrument being verified;

- (xii) the initials, surname and signature of the verification officer responsible for the verification, latest security intervention value, serial number of the verification mark, date of verification and a seal number used for identification of the responsible verification officer;
- (xiii) the following statement "*The measuring instrument(s) was/were tested and found to comply in all respects with the requirements of the Legal Metrology Act, 2014 (Act No. 9 of 2014) and may be used for a prescribed purpose as intended by the Act.*"; and
- (xiv) a symbol identifying the National Regulator;
  - (4) No other declarations, identification symbols or statements other than those referred to in subregulation (3) are allowed on a certificate of repair.

### **Reporting of verification results**

**121.** (1) For every verification the following must be documented, as a minimum, for the interpretation of test results—

- (a) reference to the applicable verification certificate;
- (b) status of the measuring instrument immediately before verification (e.g. initial or subsequent verification);
- (c) observations made during the preliminary examination may be combined in a single statement, however, any non-complying aspect needs to be separately documented;

- (d) indication that each test has passed or failed, for example by means of a code such as a tick or a cross, or by indicating the result of measurement or error, for all tests where an error limit is prescribed, including the conventional true value at which the specific tests were done;
- (e) a statement of all the applicable maximum permissible errors. This requirement does not include technical requirements such as limits of indication on weighing measuring instruments or time delay on fuel dispensers. All stated maximum permissible errors must either be expressed in a unit of measurement or as required in these regulations e.g. expressed as a percentage or in terms of scale intervals, as long as the same method is used throughout the document;
- (f) specific test conditions, such as environmental conditions, where these could affect the accuracy of test results;
- (g) initials, surname, signature, and identification of the person responsible for the verification; and
- (h) date of verification.

(2) The information referred to in subregulation (1)(a) to (h), which is required to be documented, is not intended to be supplied with the verification certificate but may be given to the customer in every case or on request.

(3) Despite subregulation (2), the information referred to in subregulation (1)(a) to (h) must be kept on file for inspection by a market surveillance inspector.

## Rejection Certificate

**122.** (1) A rejection certificate must be issued, by a verification body or the National Regulator, for an instrument that is false, inaccurate or defective.

(2) Results of any tests conducted need not be attached to the rejection certificate but must be recorded as required in regulation 121.

(3) The rejection certificate must contain at least the following:

- (a) the title "Rejection Certificate" and a serial number;
- (b) the name and address of the verification body;
- (c) the name and address of the client;
- (d) a description and unambiguous identification of the measuring instrument rejected;
- (e) a statement that will serve as proof that the measurement standards directly related to the reading or obtaining of the results of measurement is traceable to a national standard when the rejection is related to the inaccuracy of the instrument and the following data must be included as a minimum—
  - (i) calibration certificate number;
  - (ii) date of calibration of measurement standards;
  - (iii) identification of measurement standards e.g. serial numbers, description, set number; and
  - (iv) whether it is the verification body's own or loan measurement standards;
- (f) date of rejection;
- (g) reason for rejection of the instrument;

- (h) initials, surname and signature of the verification officer responsible for the rejection and a seal number used for identification of the responsible verification officer;
- (i) the following statement: "The measuring instrument has been rejected and may not be used for a prescribed purpose in terms of the Legal Metrology Act, 2014 (Act No. 9 of 2014)."; and
- (j) a symbol identifying the National Regulator.

(4) No other declarations, identification symbols or statements other than those referred to in subregulation (3) are allowed on a rejection certificate.

### **Registration and qualifications of verification officers**

**123.** (1) A person who wishes to be appointed as a verification officer must—

- (a) submit an application to the National Regulator furnishing the following information: name, surname, identity number, race, gender, e-mail address of verification officer, telephone details of the verification officer, name of current employer that the verification officer is working for, verification body designation number of current employer, physical and postal address of the current employer, details regarding the educational level of the verification officer, previous work experience, category of measuring instrument for which the verification officer is applying for, declaration that the information provided is correct, date of application and signature of verification officer, signature of a

representative from the designated laboratory authorizing the application on behalf of the designated laboratory; and

- (b) any additional information that the National Regulator may deem necessary for the registration of the officer.

(2) No person may be appointed as a verification officer in terms of section 8 (1) of the Act, unless—

- (a) he or she has shown by undergoing an assessment of his or her knowledge of the appropriate provisions of the Act and relevant Technical Regulations and has, in accordance with a curriculum laid down from time to time by the National Regulator, passed an assessment in—

- (i) theoretical subjects so prescribed by the National Regulator; and  
(ii) practical work in verifying all measuring instruments or the particular kind of measuring instrument.

(3) No person may act as a verification officer, unless he or she is—

- (a) employed by the National Regulator; or  
(b) employed by a verification body designated in terms of section 7 of the Act to verify all measuring instruments or the particular kind of measuring instrument in respect of which such verification officer is qualified to act in terms of subregulation (1) and holds a certificate issued by the National Regulator identifying the verification officer and indicating that the verification officer is qualified to act in respect of all measuring instruments or a particular kind of measuring instrument.

**CONTINUES ON PAGE 258 - PART 3**



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### Requirements for designation of repair bodies

**124.** (1) A body that wishes to be designated as a repair body under section 9 of the Act, which undertakes the repair of measuring instruments falling within the ambit of the Act, must—

- (a) be accredited to repair measuring instruments;
  - (b) in the absence of this accreditation, the body applying for designation must provide evidence of compliance with the requirements set by the National Regulator in consultation with stakeholders;
  - (c) submit an application form and proof of accreditation or evidence of compliance to the National Regulator for such designation;
  - (d) be legally identifiable;
  - (e) be free from any commercial, financial and other pressure that might affect their judgment and implement procedures to ensure that persons or organisations external to the body cannot influence the results of activities performed by the body;
  - (f) have a documented training program in place for the repairers in its employ which will ensure they have knowledge of the technology and applications of the instruments that are to be examined and also of the subsequent verification process and document the education, training and competence of each person;
  - (g) provide evidence of compliance to the government imperative on BBBEE level four (4) as well as any other government legislation that affects their business;
- and

(h) enter into an agreement or contract with the National Regulator on requirements of carrying out repairs under the control of the National Regulator.

(2) Once a body applying for designation as a repair body has met the criteria referred to in subregulation (1), the National Regulator may issue a certificate officially designating such body.

### **Responsibilities of designated repair body**

**125.** After designation contemplated in regulation 124, the repair body must—

- (a) maintain their accreditation in terms of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act or maintain requirements set by the National Regulator in the absence of such a recognized accreditation scheme;
- (b) notify the National Regulator in writing of all the repairs undertaken and include the following particulars relating to every measuring instrument in respect of which a certificate of repair has been issued—
  - (i) the make, model, approval number, class and measuring capacity of the measuring instrument; and
  - (ii) the place where the measuring instrument is used for a prescribed purpose;
- (c) the particulars, which have been furnished under paragraph (b), have to be submitted within five working days after the end of the month in which the repair took place in a format as specified by the National Regulator;

- (d) inform the National Regulator within five working days, and in writing, of any measuring instruments that could not be repaired as well as action taken by the repair body to ensure that the unrepaired measuring instrument is not used for a prescribed purpose;
- (e) have a documented training program in place for the repairers in its employ that is appropriate to the measuring instrument being repaired;
- (f) ensure that market surveillance inspectors have access to their business premises and records in line with section 20 of the Act;
- (g) maintain records of—
  - (i) type approval pattern description documentation of instruments for which the repair body will issue a certificate of repair
  - (ii) repairs undertaken;
  - (iii) list of repairers in employ of the repair body as well as all employment documentation;
  - (iv) appointment, qualifications and training records of repairers;
  - (v) repairers resignations;
  - (vi) protective marks used by the repairers which includes procedures for issuing, loss and withdrawal;
  - (vii) repair or maintenance contracts with users of measuring instruments; and
  - (viii) Certificates of repair issued for measuring instruments repaired;
- (h) supply the equipment needed for the repairer to undertake their work in line with section 19 of the Act;

- (i) notify the National Regulator in writing of the employment of a repairer or of the termination of the services of a repairer within 14 days of that event taking place; and
- (j) issue users with a certificate of repair in writing in the format specified by the National Regulator as to the compliance of the measuring instrument that has been repaired, and forward a copy of certificate to the National Regulator; and
- (k) ensure that a repairer is physically present whilst performing the test on the measuring instrument and apply the repair and protective marks immediately after the test has taken place.

#### **Withdrawal of designation of repair body**

126. (1) Any contravention of the requirements of the Act, or any other Act, or the responsibilities in regulation 125 may result in the suspension or withdrawal of the designation of the repair body.

(2) The repair body forfeits the right to repair from the date of—

- (a) suspension or withdrawal of their accreditation by the accreditation body; or
- (b) suspension or withdrawal of the designation by the National Regulator.

(3) The National Regulator must publish an updated register of repair bodies of which the designation to repair has been suspended or withdrawn.

**Registration and qualifications of persons responsible for repair (also referred to as "repairer")**

**127.** (1) A person who wishes to be registered as a person responsible for repair must—

- (a) submit an application to the National Regulator furnishing the following information: name, surname, identity number, race, gender, contact details (including e-mail address) of the repairer, name of employer the repairer is working for, repair body designation number of current employer, physical and postal address of current employer, details regarding the educational level of the repairer, previous work experience, category of measuring instrument for which the repairer is applying for, declaration that the information provided is correct, date of application and signature of repairer, signature of a representative from the designated repair body authorizing the application on behalf of the designated repair body; and
- (b) supply any additional information upon request to the National Regulator.

(2) No person may be registered as a person responsible for repair in terms of section 10(1) of the Act, unless—

- (a) he or she has shown by undergoing an assessment of his or her knowledge of the appropriate provisions of the Act and relevant technical regulations and has, in accordance with a curriculum laid down from time to time by the National Regulator passed an assessment in—
- (i) theoretical subjects so prescribed by the National Regulator;

- (ii) practical work in repairing and testing all measuring instruments or a particular kind of measuring instrument; and
  - (iii) procedures needed to allow for the issuing of a certificate of repair for measuring instruments.
- (3) No person may act as a repairer unless—
- (a) he or she is employed by and acts on behalf of a designated repair body contemplated in section 27 of the Act; and
  - (b) he or she holds a certificate issued by the National Regulator identifying the repairer and indicating that the repairer is qualified to act as a repairer in respect of all measuring instruments or a particular kind of measuring instrument.

### **Certificate of repair**

**128.** (1) Repairs must be accompanied by a certificate of repair that details the work undertaken and a statement that the measuring instrument meets all requirements of the relevant technical regulations and can be used for a prescribed purpose for a time period of not more than 30 days from the date that the certificate of repair was issued.

(2) A copy of the certificate of repair contemplated in subregulation (1) must be forwarded to the National Regulator within five working days from the date of repair.

(3) A certificate of repair may only be issued to the user of a measuring instrument by a registered repairer.

- (4) Each certificate of repair must include at least the following information—
- (a) the title "Certificate of repair";
  - (b) the name, address and designation number of the repair body;
  - (c) a unique serial number on all its pages to identify that each page is recognised as a part of the certificate of repair;
  - (d) page numbers and a clear identifier of the number of pages in the certificate of repair, e.g. page 1 of 1 or a statement at the beginning of the certificate "This certificate consists of 1 page" or a statement at the end of the certificate "End of Certificate";
  - (e) the name and address of the client;
  - (f) the number of the procedure used by the repair body, in terms of their documented management system, to establish whether the measuring instrument is in a verifiable condition;
  - (g) a description and unambiguous identification of the measuring instruments repaired, including a description and serial number of components that has an influence on the metrological integrity of the measuring instrument and the type approval number of the instrument or components, if the measuring instrument requires type approval in terms of section 22 of the Act;
  - (h) a statement that will serve as proof that the measurement standards used are directly related to the reading or obtaining of the results of measurement and are traceable to a national standard, and the following data must be included as a minimum—

- (i) calibration certificate number of the measurement standards used;
  - (ii) date of calibration of measurement standards;
  - (iii) identification of the measurement standards, e.g. serial numbers, description, set number;
  - (iv) whether the measurement standards are owned by the repair body or are loaned measurement standards;
- (i) the latest security intervention value, which shall be indicated on the certificate of repair, if the measuring instrument being repaired is secured by means of a software seal;
- (j) expiry date of the certificate of repair;
- (k) the initials, surname and signature of the person responsible for the repair, date of repair and a number used for identification of the responsible person undertaking the repair and the designated repair body number;
- (l) the following statement of guarantee, as contemplated in section 27 (3) (b) of the Act, that the instrument is correct and verifiable: "*This/ these measuring instrument(s) was/were tested and found to comply in all respects with the requirements of the Legal Metrology Act, 2014 (Act No. 9 of 2014) and may be used for a prescribed purpose as intended by the Act for a time period of not more than 30 days from the date that the certificate of repair was issued.*"; and
- (m) a symbol identifying the National Regulator;
- (5) No other declarations, identification symbols or statements other than those referred to in subregulation (4) are allowed on a certificate of repair.

### Reporting of repair results

**129.** (1) For every repair the following must be documented, as a minimum, for the interpretation of test results—

- (a) reference to the applicable certificate of repair;
- (b) status of the measuring instrument immediately before repair (e.g. rejected, under routine maintenance, outside verification period, broken, etc.);
- (c) observations made during the preliminary examination may be combined in a single statement, however, any non-complying aspect needs to be separately documented;
- (d) indication that each test has passed or failed, for example by means of a code such as a tick or a cross, or by indicating the result of measurement or error, for all tests where an error limit is prescribed, including the conventional true value at which the specific tests were done;
- (e) a statement of all the applicable maximum permissible errors. This requirement does not include technical requirements such as limits of indication on weighing measuring instruments or time delay on fuel dispensers. All stated maximum permissible errors must either be expressed in a unit of measurement or as required in the relevant national legislation e.g. expressed as a percentage or in terms of scale intervals, as long as the same method is used throughout the document;
- (f) specific test conditions, such as environmental conditions, where these could affect the accuracy of test results;

(g) initials, surname, signature, and seal identification of the person responsible for the repair; and

(h) date of testing.

(2) The information referred to in subregulation (1)(a) to (h), which is required to be documented, is not intended to be supplied with the certificate of repair but may be given to the customer in every case or on request.

(3) Despite subregulation (2), the information referred to in subregulation (1)(a) to (h) must be kept on file for inspection by an NRCS market surveillance inspector.

### **Restrictions with respect to repair and verification of measuring instruments**

**130.** (1) A person responsible for the repair of a measuring instrument may not verify the measuring instrument after he or she has repaired the measuring instrument in such a way that the work or adjustments made changed the metrological characteristics of the measuring instrument, however, he or she must submit the measuring instrument to a verification officer for such verification.

(2) A verification officer may verify or re-verify a measuring instrument after he or she has carried out work on or made adjustments to a measuring instrument that did not change the metrological characteristics or accuracy of the measuring instrument.

(3) A verification officer, which has also been appointed as a repairer, may repair a measuring instrument after he/ she has rejected such measuring

instrument, however, the verification officer, responsible for the repair of that measuring instrument, may not verify the instrument after the repair thereof.

**131.** (1) Subject to subregulation (2), regulations 124, 125 and 126 of Part XII will come into effect one year from the date of publication of these regulations.

(2) Any designation or certificate issued, made, given or granted or actions taken under any provisions of the Law repealed must be regarded as having been issued, made, given or granted under the corresponding provisions of the Legal Metrology Act.

**Part XIII****Distinctive Marks****Approval mark**

**132.** An approved measuring instrument or module or a component of a model must be clearly and indelibly marked with the approval number issued and indicated on the certificate of approval, and in the manner as prescribed in the type approval documentation.

**Rejection mark**

**133.** A rejection mark must be a six-pointed star design, which can be in the form of—

- (a) a stamp;
- (b) a seal; or
- (c) an indelible sticker printed with six-pointed star design.

**Verification mark**

**134.** (1) A verification mark can either be in the form of a stamp, a seal or an indelible sticker or be embossed or sandblasted in the case of glassware and must clearly state the following information—

- (a) the title "Verification mark", when in the form of an indelible sticker;

- (b) the year of verification; or the date of verification when in the form of an indelible sticker;
- (c) a symbol identifying the company responsible for verification;
- (d) a symbol identifying the National Regulator, when in the form of an indelible sticker;
- (e) identification of the verification officer; and the initials, surname and signature of the verification officer responsible for the verification when in the form of an indelible sticker;
- (f) an unique serial number of the corresponding verification certificate issued for the measuring instrument when in the form of an indelible sticker;
- (g) an unique serial number of the sticker, printed on the sticker, when in the form of an indelible sticker;
- (h) an unique identification (e.g. number) of the software seal, when applicable.

(2) All verification marks are to be approved by the National Regulator whether printed or not and whether supplied by the National Regulator or a designated verification body.

(3) No other declarations, identification symbols or statements, other than those referred to in subregulation (1), are allowed on a verification mark when in the form of an indelible sticker.

## Protective mark

**135.** (1) Protective marks are applied to prohibit unauthorised or unlawful access to the measuring instrument or any adjustment devices that may influence the measurement results with the view to negating the chance of fraudulent transactions taking place.

(2) A protective mark can either be in the form of a stamp, seal or a sticker.

(3) A protective mark must comply with the following criteria:

- (a) If in the form of a seal or stamp, it must not be possible to remove the seal or stamp without damaging it to the extent that it can't be reused, and must clearly identify—
- (i) name, or abbreviated name or logo of body applying the protective mark;
  - (ii) year when seal is applied; and
  - (iii) verification officer or repairer number;
- (b) if in the form of a sticker it must be clearly marked with—
- (i) the words "seal" or "protective mark" to differentiate it from a verification mark;
  - (ii) the words "Certification void when broken";
  - (iii) name or logo of body applying the protective mark;
  - (iv) date when seal is applied; and
  - (v) verification officer or repairer number.

(c) a sticker must not be removable from the instrument without physical damage to the sticker and the same sticker should not be re-usable.

(4) A protective mark meeting the criteria subregulation (3) is not a verification mark and must not be used as such.

(5) Protective marks in the form of a sticker must be approved during the type approval of the instrument and the position of application on the instrument must be described in the type approval documentation.

(6) Where designated verification or repair bodies want to apply protective marks in the form of a sticker on instruments, the designated verification or repair body must submit the design and application of the protective mark to the National Regulator.

## **Repair Mark**

**136.** (1) In addition to the requirements stipulated in regulation 135, a registered person responsible for repair is required to indicate that the repair undertaken is correct and that the measuring instrument is in a verifiable condition by applying a repair mark to the measuring instrument in the following manner:

(a) A repair mark must be in the form of a sticker applied in close proximity to the designated verification mark position as indicated in type approval documentation.

(b) the repair mark must clearly indicate the following information—

(i) the title "Repair mark";

(ii) the date of repair in the form of "Repaired on yyyy/mm/dd";

- (iii) a symbol identifying the body responsible for the repair;
- (iv) identification of the repairer and the initials, surname and signature if the repairer;
- (v) the unique serial number of the corresponding certificate of repair; and
- (vi) an unique identification (e.g. number) of the software seal, when applicable.

(2) All repair marks are to be approved by the National Regulator whether supplied by the National Regulator or a designated repair body.

(3) No other declarations, identification symbols or statements other than those referred to in subregulation (1)(b) are allowed on a repair mark.

***Part XIV***

***Measuring instruments, vessels or containers exempted from type approval and verification***

**Measuring instruments**

**137.** Subject to regulation 138, the following measuring instruments may be used without the user or supplier being compelled to submit the instrument to type approval in terms of section 22 or to comply with the provisions of section 24 of the Act—

- (a) an instrument being automatic or non-automatic, used to determine the quantity of goods in prepackaged form in consumer and non-consumer packages as defined in SANS 289 and in a measurement unit of mass or volume or by number;
- (b) an instrument being automatic or non-automatic, used to determine the quantity of goods in prepackaged form in consumer packages as defined in SANS 289 and in a measurement unit other than mass or volume or by number; or
- (c) an automatic instrument used to determine the quantity of goods in prepacked form in non-consumer packages as defined in SANS 289 and in a measurement unit other than mass or volume or by number.

## Conditions, restrictions and requirements

**138.** In the case of a measuring instrument falling within the meaning of regulation 137, but excluding instruments used by persons complying with the requirements of SANS 1841 and permitted to apply the "e" mark—

- (a) both the supplier and the user must satisfy themselves that such instrument is suitable for the purpose for which it is used or intended to be used and is capable of correct determination of quantity;
- (b) the owner or the user must maintain and operate such measuring instrument at all times in such a manner that it determines and discharges the correct quantity of goods to be sold in prepackaged form subject to the provisions of SANS 458;
- (c) the user of such measuring instrument must take such steps as will enable him or her to detect any incorrect quantities of goods which may have been determined by the instrument;
- (d) the user of such measuring instrument must keep a suitable verified measuring instrument conforming to the requirements of SANS 458 for the purpose of checking the quantity of goods or articles which may have been determined by the instrument; and
- (e) the records of the checks contemplated in paragraph (d) must be kept for inspection by an authorised officer to prove that the applicable requirements of SANS 458 were complied with at the time of packing.

**Declaration of an instrument as unfit for further use**

**139.** (1) If the National Regulator is satisfied that any measuring instrument which falls within the meaning of regulation 137, and which is being used is—

- (a) either not suitable for or not capable of determining and discharging correct quantities of goods for sale in prepackaged form; or
- (b) not being so maintained or operated that it determines and discharges correct quantities of goods for sale in prepackaged form, the National Regulator may declare such measuring instrument as unfit for further use by informing the user thereof in writing to that effect;

(2) In the event the circumstances contemplated in subregulation (1) occur, the user must forthwith—

- (a) stop using the instrument in question; or
- (b) dismantle and remove the instrument in question from the premises where packing is performed.

(3) This regulation does not apply to a measuring instrument used by a wholesale packer for the purpose of predetermining the quantity of goods measured thereby to an approximate quantity which is thereafter adjusted for correctness by means of a verified measuring instrument by an operator.

**Measuring instruments not exempted under regulation 137**

**140.** The following measuring instruments must be subject to type approval in terms of section 22 and the requirements of section 24 of the Act in so far as they apply,

irrespective of whether those measuring instruments comply with the description set out in regulation 137—

- (a) any measuring instrument, irrespective of whether or not it is used for direct sales to the public, that is used by or supplied to a retail dealer for the purpose of determining the mass, volume, length, area or number of a—
  - (i) quantity of goods taken from bulk and measured at the time of sale in the presence of the purchaser or his agent; or
  - (ii) quantity of goods prepackaged by him or her for sale on the premises at which the goods are packed or from another premises;
- (b) any weighing instrument used or supplied for the purpose of determining a quantity of goods sold in prepackaged form and having a declared mass of more than 100kg;
- (c) any mass or volume measuring instrument used or supplied for the purpose of determining the quantity of a liquid sold in prepackaged form and having a declared volume of more than 250 L;
- (d) any automatic vending machine used or supplied for use, which itself determines the quantity of goods sold by measure of mass, length, area volume, or number unless such quantity of goods is exempted under the Act from sale by any such physical quantity;
- (e) any non-automatic instrument used in a prepacking- process to determine the quantity of individual non-consumer prepackages as defined in SANS 289 in a measurement unit other than mass or volume or by number, in which case the

error on the instrument will apply to the goods in prepackaged form and the requirements of clause 4.5 of SANS 458 need not be complied with.

### **General exemptions**

**141.** Subject to any condition prescribed in this regulation, the following measuring instruments or parts thereof, as the case may be, may be used for any appropriate prescribed purpose without the user or supplier being compelled to submit the instrument to type approval in terms of section 22 or to comply with the provisions of section 24 of the Act—

- (a) any measuring instrument, vessel or container used for determining the quantity of—
  - (i) ingredients in a mixture of concrete;
  - (ii) crushed stone by volume, including when coated with cement, tar or bitumen;
  - (iii) ready-mixed concrete, ready-mixed cement mortar, ballast or building sand by volume;
- (b) any storage tank gauged or calibrated for the purpose of determining excise duty by measurement and calculation or by direct reading of quantity;
- (c) any weighing instrument supplied or used for the determination of the mass of persons or supplied for hire or reward for the sole purpose of determining the mass of babies;

- (d) any weighing instrument used for the grading or sizing of eggs in the shell sold or purchased by number and according to grade and size;
- (e) any meter used in a water supply system other than a water meter as defined in regulation 114;
- (f) any measuring instrument used for the grading of grain sold or purchased according to grade and mass;
- (g) any measuring instrument used in land and similar surveying;
- (h) any taximeter;
- (i) any measuring instrument calibrated or indicating in any measurement unit other than a unit of mass, length, area or volume unless it is a measuring instrument which is calibrated in a unit of some other physical quantity and for which certification is specially prescribed by regulation;
- (j) any tank for use by a milk producer and provided with a graduated dipstick;
- (k) any industrial measuring instrument used in the monitoring and control of a manufacturing process;
- (l) any indicator referred to in regulation 69 which is additional to the principal indicator or indicators of a certified measuring instrument and connected to the instrument via an interface approved for such connection in terms of section 22 of the Act.

**Part XV**

***Application for evaluation and approval of measuring instruments***

**Application of measuring instruments in terms of section 22 of Act**

142. (1) Any application in terms of section 22 of the Act, read with any regulation, for the evaluation of a new, modified model or module of a measuring instrument or an installation or a system of measurement which incorporates any measuring instrument of a model approved together with any attachment, device or ancillary equipment not already approved with a view to the approval of the measuring instrument or module of a measuring instrument must be submitted to the National Regulator for type evaluation and type approval.

(2) The type approval evaluation application must—

- (a) include an application form and documentation as prescribed in a technical regulation or any other documentation required by the National Regulator in English for the purpose of type approval evaluation;
- (b) include any additional information and documents that the National Regulator may deem necessary for the purpose of conducting the type evaluation; and
- (c) include such number of printed copies of documentation as the National Regulator may require.

(3) The applicant for type evaluation must—

- (a) deliver an operational specimen, or the number of specimens required by a technical regulation, of the measuring instrument, module of a measuring instrument or any device related to the measuring instrument or module of a

- measuring instrument free of charge to the office of the National Regulator or to such other place as the National Regulator may direct;
- (b) remove such measuring instrument, module of a measuring instrument or device when it is no longer required by the National Regulator within a period prescribed by the National Regulator;
  - (c) if so required by the National Regulator, dismantle, reassemble and erect, and adjust such measuring instrument, module of such measuring instrument or device; and
  - (d) provide suitable facilities, equipment and labour for the examination and testing of such measuring instrument, module of such measuring instrument or device instrument if required by the National Regulator.

(4) If the applicant fails to remove the measuring instrument as contemplated in subregulation (3)(b), the National Regulator may dispose of said measuring instrument as the National Regulator deems fit at the cost of the submitter.

### **Marking on specimen**

**143.** Every specimen of a model of measuring instrument submitted for type approval evaluation must be clearly, indelibly and permanently marked with the markings as prescribed in a regulation or any other markings that may be required by the National Regulator for the purpose of type approval.

**Period of validity of type approval certificate**

**144.** (1) The certificate issued in terms of section 22 (2)(b) of the Act is valid for a period not exceeding 10 years from the date of the type approval certificate.

(2) The submitter or person requiring an extension of the validity period of a type approval certificate may apply for such an extension prior to the expiry date thereof but not later than six months before the expiry of the type approval certificate.

(3) The application for extension once the validity of the type approval certificate expires shall be in the same manner as prescribed in regulation 142.

**Part XVI****Regulation pertaining to periodic verification****Requirements**

**145.** (1) All the measuring instruments, or classes or kinds of measuring instruments set out in column 1 of table 25 must be verified or re-verified by the date specified in column 3, unless they were verified or re-verified before that date and within the period specified in column 2.

(2) The measuring instruments or classes of kinds of measuring instruments referred to in subregulation (1) must be re-verified at intervals not exceeding the intervals specified in column 2 and determined from the date of last verification.

(3) A conventional measuring instrument of volume made of clear glass, a conventional measuring instrument of length made of a material prescribed by regulation, water meters referred to in regulation 114 and lubricating oil dispensers must be verified before being taken into use and thereafter only on the instruction of a market surveillance inspector if he or she has reasonable grounds for believing that it has been altered materially since it was verified or, unless the original mark or verification has been defaced or has become illegible.

(4) Unless mentioned in Table 25, all measuring instruments, or classes or kinds of measuring instruments for which technical regulations or interim requirements exist must be verified before being put into use for the first time, and then at intervals not exceeding 24 months from the date of the last verification, unless

stipulated differently in any other regulation or SANS document relating to a specific measuring instrument.

<b>1</b>	<b>2</b>	<b>3</b>	
<b>TABLE 25</b>			
1	Liquid fuel dispensers including dispensers for liquid petroleum gas.	18 months	31 December 1996
2	Liquid meters excluding water meters and lubricating oil dispensers used to dispense into the engines of motor vehicles.	12 months	30 June 1996
3	Non-automatic weighing instruments including vehicle scales	24 months	31 December 1996
4	In-motion weighing systems for vehicles	36 months	30 June 1998
5	Conventional measures of volume excluding glass measures	24 months	31 December 1996
6	Liquid-measuring devices	24 months	31 December 1996
7	Vehicle tanks (Fixed value or with removable measuring gauges).	24 months	30 June 2008
8	Weights for fine and coarse measurements	24 months	30 June 2008
9	Automatic weighing instruments	24 months	30 June 2008
10	Length measuring instruments	24 months	30 June 2008
11	Area measuring instruments	24 months	30 June 2008
12	Gas Meters including modules of gas meters and domestic gas meters	12 months	From the date that this regulation was published

**Part XVII****General****Repeal**

**146.** (1) Subject to subsection (2), the Trade Metrology Regulations (G.N. R.2362/1977) are hereby repealed in its entirety.

(2) Any proclamation, notice, approval, permission, return, certificate or document issued, made, promulgated, given or granted and any other action taken under any provision of a law repealed by subsection (1), must be regarded as having been issued, made, promulgated, given, granted or taken under the corresponding provision of this Act.

**Short title and commencement**

**147.** These Regulations are called the Legal Metrology Regulations, 2017, and come into operation **on the date of publication.**

**ANNEXURE****TABLES OF ALLOWANCES****EXPLANATORY NOTES****Allowance for capacities not tabulated and for measuring instruments of approved models**

1. (1) The allowances of error for weighing instruments of capacities not specified in Table II and Table III (inclusive) of this Annexure must be in proportion to the allowances tabulated in such tables.

(2) The allowances set forth in any specific table must also apply to any model of measuring instrument if so specified in terms of the approval of the model under section 22 of the Act.

**Allowances for new and repaired weighing instruments**

2. (1) Except where specific allowances have been prescribed in any regulation of Part XI and subject to the provisions of Explanatory Note 4, the allowances set forth in Table I, Table II and Table III of this Annexure must apply to the following:

- (a) Initial verification of weighing instruments; or
- (b) subsequent verification of weighing instruments; or

- (c) weighing instruments tested in pursuance of an authority issued in terms of section 27 (3) or 30(1) of the Act.

### **Allowances for verified weighing instruments during market surveillance inspection**

3. (1) Except where specific allowances have been prescribed in any regulation of this Part or except as hereinafter provided and subject to the provisions of Explanatory Notes 2 and 4, the allowances set forth in Table II and Table III of this Annexure must be increased by one half in the case where a market surveillance inspector carries out an inspection on a weighing instrument when in actual use for a prescribed purpose.

### Errors allowed at loads up to capacity

4. Except as otherwise provided in any regulation all weighing instruments may indicate or be in error, at all loads except zero, to the extent shown in Tables I to XI:

1	2
<b>TABLE I</b>	
<b>(1) Subject to the provisions of Explanatory Note 3, above, all weighing instruments:</b>	
Load applied	Error allowed
Up to 0,5 of capacity	0,5 of tabulated or applicable turning allowance
Above 0,5 of capacity and up to capacity	Full tabulated or applicable turning allowance

1	2
<b>TABLE II</b>	
<b>Automatic weighing instruments having a capacity of not more than 50 kg</b>	
Capacity of measuring instrument	Turning allowance
500 g	2,5 g
1 kg	4 g
2 kg	6 g
3 kg	9 g
4 kg	11 g
5 kg	13 g
6 kg	15 g
7 kg	16 g
10 kg	20 g
15 kg	28 g
20 kg	33 g
30 kg	44 g
40 kg	53 g
50 kg	62 g

1	2
<b>TABLE III</b>	
<b>Automatic weighing instruments having a capacity of more than 50 kg when tested</b>	
Capacity of measuring instrument	Turning allowance
50 kg	62 g
60 kg	70 g
70 kg	78 g
80 kg	86 g
90 kg	93 g
100 kg	100 g
150 kg	130 g
200 kg	160 g
250 kg	190 g
300 kg	220 g
400 kg	270 g
500 kg	310 g
600 kg	350 g
700 kg	390 g
800 kg	430 g
900 kg	470 g
1 t	500 g
1,5 t	750 g
2 t	1 kg
2,5 t	1,2 kg
3 t	1,5 kg
4 t	2 kg
5 t	2,5 kg
6 t	3 kg
7 t	3,5 kg
8 t	4 kg
9 t	4,5 kg
10 t	5 kg
20 t	8 kg
30 t	11 kg
40 t	13 kg
50 t	15 kg

60 t	17 kg
70 t	19 kg
75 t	20 kg
80 t	21 kg
90 t	23 kg
100 t	25 kg
200 t	40 kg

1	2
<b>TABLE IV</b>	
<b>Weights: Metric weights for coarse measurement</b>	
Denomination	Allowance of error in excess only
Over 1000 kg	50 g per 1000 kg
1000 kg	50 g
500 kg	30 g
200 kg	15 g
100 kg	10 g
50 kg	6 g
20 kg	3 g
10 kg	2 g
5 kg	1 g
2 kg	600 mg
1 kg	400 mg
500 g	250 mg
200 g	150 mg
100 g	100 mg
50 g	75 mg
20 g	50 mg
10 g	35 mg
5 g	25 mg
2 g	15 mg
1 g	10 mg

1	2
<b>TABLE V</b>	
<b>Weights: For fine measurement (pharmaceutical dispensing, chemicals, precious metals and comparable goods)</b>	
Denomination	Allowance of error in excess only
20 kg	1 g
10 kg	500 mg
5 kg	200 mg
2 kg	120 mg
1 kg	80 mg
500 g	50 mg
200 g	30 mg
100 g	25 mg
50 g	15 mg
18 g & 20 g	10 mg
9 g & 10 g	7 mg
5 g	5 mg
2 g	3 mg
1 g	2 mg
500 mg	2 mg
200 mg	1 mg
100 mg	0,6 mg
50 mg	0,5 mg
20 mg	0,3 mg
10 mg	0,2 mg
5 mg	0,2 mg
2 mg	0,2 mg
1 mg	0,1 mg

1	2
<b>TABLE VI</b>	
<b>Metric carat weights</b>	
<b>Denomination:</b>	<b>Allowance of error in excess only</b>
CM	mg
10 000	100
5 000	50
2 000	20
1 000	15
500	10
200	7
100	5
50	4
20	2
10	2
5	1
2	1
1	0,5
0,5	0,5
0,2	0,2
0,1	0,2
0,05	0,2
0,02	0,2
0,01	0,2
0,005	0,1

1	2	3
<b>TABLE VII</b>		
<b>Metal measures of length</b>		
Length tested	Allowance of error	
	Long or in excess	Short or in deficiency
	mm	mm
200 m	37,5	37,5
100 m	25	25
50 m	15	15
30 m	10	10
20 m	7,5	7,5
10 m	5	5
5 m	3	3
3 m	2	2
2 m	1,5	1,5
1,5 m	1,25	1
1 m	1	0,5
500 mm	0,6	0,3
300 mm	0,4	0,2
200 mm	0,3	0,15
100 mm	0,2	0,1
10 mm	0,1	0,05

Measures of length other than metal double the allowances in Table VII, (a) above.

1	2
<b>TABLE VIII</b>	
<b>Measures of volume other than graduated glass measures for pharmaceutical dispensing and comparable measurement: Conical metal measures</b>	
Denomination	Allowance of error in excess only
100 L and over	0,1 %
50 L	65 mL
25 L	60 mL
20 L	50 mL
10 L	40 mL
5 L	25 mL
2 L	12 mL
1 L	8 mL
750 mL	6 mL
500 mL	5 mL
375 mL	4 mL
200 mL	2,5 mL
100 mL	1,5 mL
50 mL	1 mL
25 mL	0,6 mL
20 mL	0,5 mL
10 mL	0,25 mL
5 mL	0,15 mL
2 mL	0,1 mL
1 mL	0,05 mL

Measures of volume other than conical metal measures, except graduated glass measures for pharmaceutical dispensing and comparable measurement and glass measures of volume for dispensing quantities of potable spirits in retail trade double the allowances in Table VIII above, according to denomination of measure or value of graduation tested.

1	2
<b>TABLE IX</b>	
<b>Glass measures of volume for dispensing quantities of potable spirits in retail trade:</b>	
Denomination	Allowance of error in excess only
25 mL	1,5 mL
50 mL	2,5 mL

1	2
<b>TABLE X</b>	
<b>Graduated glass measures for pharmaceutical dispensing and comparable measurement: Inverted conical or beaker measures:</b>	
Approximate internal diameter of measure at graduation tested	Allowance of error in excess or in deficiency
150 mm	9 mL
140 mm	8 mL
130 mm	7 mL
120 mm	6 mL
110 mm	5 mL
100 mm	4 mL
90 mm	3 mL
80 mm	2,5 mL
70 mm	2 mL
60 mm	1,5 mL
50 mm	1 mL
40 mm	0,65 mL
30 mm	0,35 mL
20 mm	0,15 mL
10 mm	0,05 mL

1	2
<b>TABLE XI</b>	
<b>Cylindrical measures and measuring flasks:</b>	
Value of graduation tested or value of quantity between graduations tested	Allowance of error in excess or in deficiency
Over 1 L	5 mL per L
Over 500 mL and up to 1000 mL	5 mL
Over 200 mL and up to 500 mL	3 mL
Over 100 mL and up to 200 mL	1,5 mL
Over 50 mL and up to 100 mL	1 mL
Over 20 mL and up to 50 mL	0,6 mL
Over 10 mL and up to 20 mL	0,3 mL
Over 5 mL and up to 10 mL	0,2 mL
Over 2 mL and up to 5 mL	0,15 mL
Over 1 mL and up to 2 mL	0,1 mL
1 mL	0,05 mL
0,5 mL	0,03 mL
0,2 mL	0,02 mL
0,1 mL and under	10 %

**Burettes and pipettes:**

One-half of the allowances in Table XI.