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Tolerances permitted for the accuracy of measurements of products (including prepackaged products) in terms of legal metrology legislation

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Table of changes

Change No.	Date	Scope
Amdt 1	2008	Amended to update the foreword, to add an introductory paragraph to the normative references clause (clause 2), to change requirements in the subclauses on prepackages made up for sale on the retail premises from which they are sold (4.3), prepackages other than those made up for sale on the retail premises from which they are sold using a suitable instrument (4.5), and prepackaged products with special allowances for loss of quantity (4.6), to change the titles of two clauses in the annex on test procedures for the determination of the actual quantity of frozen products with added water or glazed products (clause D.3 and D.5), and to add a new informative annex on guidelines for application of tolerable deficiencies with respect to measurement of products at the time of sale or when making up prepackages (annex F).
Amdt 2	2011	Amended to move reference to legislation to the foreword, to update the requirements for accuracy of measurement and to update the test procedure in annex D.

Foreword

This South African standard was approved by National Committee SABS SC 70D, *Legal metrology – Sale of goods*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in September 2011.

This document supersedes SANS 458:2008 (edition 1.1).

A vertical line in the margin shows where the text has been technically modified by amendment No. 2.

Reference is made to "legal metrology legislation" in the **title**, in **clause 1**, in **3.6**, **4.1.1**, **4.1.2**, **4.2.1**, **4.5.1** and **5.2.1**, and to other applicable legislation in **4.4(a)**, **(d)** and **(e)**, **4.9** and **4.10.2** and the note to **F.4.2**. In South Africa, this means the Trade Metrology Act, 1973 (Act No. 77 of 1973) (as amended from time to time) and the Regulations promulgated in terms of the Act, and any other applicable legislation in South Africa. **Amdt 1; amdt 2**

Annexes A, B, C and D form an integral part of this standard. Annexes E and F are for information only. **Amdt 1**

Introduction

This standard covers requirements normally regulated by legal metrology legislation for the accuracy of measurements applicable to service delivery or applicable when goods are measured for sale. The standard is not concerned with other regulations such as those pertaining to tolerances for specified ingredients. The requirements in this standard are equivalent to those of SADCMEL Document 4 which is based on the requirements of the International Organization of Legal Metrology (OIML), Recommendation R 87, *Quantity of product in prepackages*.

Included in the standard are tolerance and related requirements, including inspection methods, for all measurements, which reflect the needs of legal metrology authorities within the SADC region. The standard contains a complete set of requirements that covers all types of measurement irrespective of their application in the market place or the place or time of measurement.

South African industry and consumer organizations were consulted for input into the SADCMEL document, which was drafted with the aim of harmonizing technical regulations pertaining to the accuracy of legal measurements and the removal of barriers to trade within the SADC region, as required by the SADC Protocol on Trade.

Contents

Tolerances permitted for the accuracy of measurements of products (including prepackaged products) in terms of legal metrology legislation

1 Scope

This standard specifies legal metrology requirements for

a) the accuracy of measurements regulated by legal metrology legislation (see foreword) including the measurement of goods when prepackaged or at the time of sale in constant or random (non-constant) nominal quantities of mass, volume, linear measure, area, or count;

b) sampling plans and procedures for use by legal metrology officials in verifying the quantity of product in prepackages;

NOTE The sampling plans are not suitable for use in the quantity control processes of packers.

c) examination of the quantity of product in prepackages including the determination of average tare masses, the drained quantity of products in a liquid medium, and the actual quantity of frozen products; and

d) special conditions with regard to products that might lose moisture (desiccating) after packing and foodstuff in a liquid medium that is not intended to be consumed.

NOTE The requirements in this standard are based on the international recommendations specified in OIML R 87 and are applicable in the SADC region. Packers for export outside the SADC region are advised to familiarize themselves with the requirements of the country of intended export.

2 Normative references

The following referenced document is indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained by the SABS Standards Division. **Amdt 1**

OIML R 87, *Quantity of product in prepackages*.

3 Terminology

3.1
actual quantity
quantity of product that a prepackage contains as determined by measurement carried out by legal metrology officials

3.2 average error
sum of individual prepackage errors considering their arithmetic sign divided by the number of prepackages in the sample

3.3
content of a prepackage
actual quantity of product in a prepackage

3.4
inadequate prepackage
non-conforming prepackage
negative error
prepackage with an individual prepackage quantity less than the nominal quantity

3.4.1
***T1* error**
inadequate prepackage found to contain an actual quantity less than the nominal quantity minus the applicable tolerable deficiency (*T*) but not less than twice the applicable tolerable deficiency (2*T*) for the nominal quantity, is deemed to have a *T1* error (see 3.15)

3.4.2
T2 error
inadequate prepackage found to contain an actual quantity less than the nominal quantity minus twice the applicable tolerable deficiency (*T*) for the nominal quantity, is deemed to have a *T2* error (see 3.15)

3.5
individual prepackage error
difference between the actual quantity of product in a prepackage and its nominal quantity

3.6
in-service maximum permissible error
maximum error allowed on an instrument when in service and used for measurements regulated by legal metrology legislation

3.7
inspection lot
batch
definite quantity of some prepackages produced at one time under conditions that are presumed uniform and from which a sample is drawn and inspected to determine compliance with specified requirements for acceptance or rejection of the inspection lot as a whole

3.8
nominal quantity
Qn
quantity of product in a prepackage that is declared on the label

3.9
non-automatic measuring instrument
instrument that requires the intervention of the operator during the measurement process to determine the measurement result or to decide whether the result is acceptable

NOTE A non-automatic instrument can be
a) electronic, mechanical or a combination of the two, as applicable,
b) graduated or non-graduated, and
c) self-indicating, semi-self-indicating or non-self-indicating.

3.10
packing material
tare
packaging
packaging material
everything of the prepackage that is meant to be left over after use of the product, except for items naturally contained in the product

NOTE 1 Use includes consumption or product subjected to treatment.

NOTE 2 Packing material is generally used to contain, protect, handle, deliver, preserve, transport, display, inform about and serve as an aid (e.g. food serving tray) while using the product it contains.

3.11
prepackage
combination of a product and any packing material in which the product is prepacked

3.12
prepackaged product
commodity that is made up as a unit or an entity and the quantity of which has been determined and indicated on its label before being offered for sale irrespective of whether such unit or entity is enclosed in a container, wrapped in any manner or unenclosed

3.13
random sampling
sample prepackages being chosen randomly

NOTE All the prepackages in the lot have the same probability to be included in the sample.

3.14
sample size
required number of prepackages taken from an inspection lot and used to provide information that will serve as the basis for a decision on the compliance of the inspection lot

3.15
tolerable deficiency
tolerable negative error
T
deficiency in quantity of product permitted in a prepackage
cf. inadequate prepackage (3.4)

3.16
valid verification status
status of a measuring instrument that complies with all the legal metrology requirements for initial or subsequent verification

4 Metrological requirements

4.1 General

4.1.1 Goods to be sold by net quantity

All goods shall be sold by net quantity excluding the quantity of any packaging material unless exemption is given for specific types of goods in this standard or in any other applicable legal metrology legislation (see foreword).

4.1.2 All quantity markings to comply

The requirements of this standard apply to all quantities marked on a prepackage in accordance with legal metrology legislation (see foreword) for the labelling of prepackages or as otherwise indicated at the time of measurement including any supplementary statements of quantity, unless appropriately qualified.

4.2 General measurements and the measurement of goods at the time of sale

4.2.1 A suitable instrument shall be used for any measurement regulated by legal metrology legislation (see foreword) including quantities of goods when taken from bulk and measured at the time of sale (see 4.4 for suitability of instruments).

4.2.2 The quantities referred to in 4.2.1 shall not be deficient of the quantity represented, indicated or marked unless such deficiency is due to an error on the instrument used and is within the permitted maximum error for such instrument at the point of measurement.

4.3 Prepackages made up for sale on the retail premises from which they are sold

4.3.1 The net quantity of the product in prepackages, made up for sale on the retail premises from which they are sold, by individually measuring each package, shall be determined by means of a suitable measuring instrument conforming to the requirements of 4.4 unless the requirements of 4.3.3 apply. If the instrument used for the prepackaging is not available to consumers, another suitable non-automatic measuring instrument shall be made available to consumers for checking the quantity of such prepackages. **Amdt 1**

4.3.2 The quantity of the product in the prepackages referred to in 4.3.1 shall not be deficient of the net quantity represented, indicated or marked unless such deficiency is due to an error on the instrument used and is within the maximum error permitted for such instrument. The packer shall not exploit the permitted tolerances on instruments. The average and individual prepackage requirements in 4.5.2 and 4.5.3 do not apply. Unless otherwise exempted, prepackers shall make allowance for a possible shrinkage or loss of quantity after packing to ensure that prepackages will comply with all requirements of this standard at the time of sale to consumers.

4.3.3 Where prepackages are made up on a retail premises for distribution and sale on other premises the requirements of 4.5 apply to such prepackages. In the case where such prepackages are also sold on the premises where they are prepacked a suitable non-automatic measuring instrument, as specified in 4.4, shall be made available to consumers for checking the quantity of such prepackages. **Amdt 1**

4.3.4 The requirements of 4.3.1 shall not apply to bread sold by mass and baked in the retail for sale on the premises at which it is baked. Such bread shall comply with the requirements of 4.5, and in this case a suitable non-automatic measuring instrument, as specified in 4.4, shall be made available to consumers for checking the quantity of such bread. **Amdt 1**

4.4 Suitability of instruments

An instrument used for measuring as indicated in 4.2.1 and 4.3.1 and the instrument for checking as indicated in 4.3.1 and 4.3.3 shall be an instrument that complies with the following requirements:

a) it shall be of an approved type if type approval is required by legislation (see foreword);

b) it shall have a valid verification status;

c) the in-service maximum permissible error for the quantity measured shall not exceed the applicable tolerable deficiency (*T*) in table A.1(a) or (b) for the goods being measured;

d) it shall not be used below any minimum quantity permitted to be measured as specified in type approval documentation or in any other applicable legislation (see foreword); and

e) instruments used as indicated in 4.2.1 and for checking purposes as indicated in 4.3.1 and 4.3.3 shall be of a type permitted by legislation (see foreword) for direct sales to the public.

4.5 Prepackages other than those made up for sale on the retail premises from which they are sold using a suitable instrument

4.5.1 General requirements for compliance

Prepackages other than those referred to in 4.3.1 but including those made up on retail premises to which the requirements of 4.3.3 apply, shall comply with the applicable requirements of this standard at any level of distribution including the point-of-pack, during import, distribution and wholesale transactions, and retail sale (e.g. where prepackages are offered or exposed for sale or sold). Where necessary, packers shall make allowance for a possible shrinkage or loss of quantity after packing. These requirements and those of 4.4 a), b) and d) also apply to packers who pack according to the requirements of 4.5 and who use instruments required by legal metrology legislation to check the quantity in prepackages for quantity control purposes. **Amdt 2**

SANS 1841 prescribes additional requirements for these instruments and should be adhered to by packers participating in a quantity mark scheme provided for in terms of legal metrology legislation (see foreword). **Amdt 2**

4.5.2 Average requirement

In the case of prepackages with a constant nominal quantity, the average actual quantity of the product in prepackages in an inspection lot shall be at least equal to the nominal quantity. In the case of prepackages with a random nominal quantity, the total actual quantity of the product in prepackages in an inspection lot shall be at least equal to the total nominal quantity.

NOTE If compliance with this requirement is determined by sampling an inspection lot (see 5.4.4), the requirements for statistically valid results and the method of application described in 5.4 are applicable.

4.5.3 Individual prepackage requirement

4.5.3.1 The actual quantity of product in a prepackage shall accurately reflect the nominal quantity but reasonable deviations are prescribed for certain prepackages (see annex A for applicable tolerable deficiencies). **Amdt 1**

4.5.3.2 Prepackages for which tolerable deficiencies are prescribed shall comply with the following requirements: **Amdt 1**

a) not more than 2,5 % of prepackages shall have a negative error exceeding the tolerable deficiency given in annex A, as applicable (T1 error); and
NOTE If the actual quantity of product in prepackages is determined by sampling an inspection lot in accordance with the requirements in 5.4.4, the relevant requirements for acceptance of the inspection lot given in column 4 of table 1 or table 2 are applicable.

b) no prepackage shall have a negative error exceeding twice the tolerable deficiency prescribed in annex A, table A.1(a) or (b), as applicable (T2 error). **Amdt 1**

4.6 Prepackaged products with special allowances for loss of quantity

4.6.1 The products specified in tables A.2 and A.3 in annex A, when packed by mass in packages that are not hermetically sealed, shall comply with the requirements of 4.3.2 or 4.5, as applicable, for at least

a) in the case of the goods specified in table A.2, seven days after the day of packing, or

b) in the case of the goods specified in table A.3, 12 h after packing or baking, as applicable, or up until delivery by the packer or the baker to a dealer for resale, or to an end user in the case of a direct sale to an end user, whichever is the longer period.

After the elapse of this period, the individual package tolerable deficiency may be exceeded due to moisture loss and the average requirement need not be fulfilled. **Amdt 1**

4.6.2 Wine and other alcoholic beverages when packed in a container, or having a closure which is not moisture retaining, shall comply with the requirements in 4.3.2 or 4.5 for at least 12 months after the month of packing.

4.7 Prepackaged foodstuffs on which the drained mass is indicated

4.7.1 When a solid foodstuff is packed in a liquid medium as described in 4.7.2, the drained net mass of the foodstuff shall be indicated on the label, in addition to the total net mass, and the drained net mass shall comply with the requirements in 4.5. Annex C gives the method for the determination of the drained mass.

4.7.2 A liquid medium can be any of the following products, possibly in mixtures and also where frozen or quick-frozen, provided that the liquid is merely an adjunct to the essential elements of that preparation and thus not a decisive factor for the purchase:

a) aqueous solutions of food acids,

b) aqueous solutions of salts,

c) aqueous solutions of sugars,

d) aqueous solutions of other sweetening substances,

e) brine,

f) fruit or vegetable juices in the case of fruit or vegetables,

g) mixtures of edible oil and water,

h) vinegar, and

i) water.

4.7.3 Savoury sauces such as tomato sauce or gravy are not included and products packed in these need not be marked with their drained mass.

4.8 Tolerable deficiencies

Tolerable deficiencies and products with special requirements are described in annex A, as follows:

a) table A.1(a) specifies the tolerable deficiencies (*T*) for prepackages that contain general products excluding those in (b) and (c) below;

b) table A.1(b) specifies tolerable deficiencies for prepackages that contain specified products; and

c) tables A.2 and A.3 specify the desiccating products to which the requirements of 4.6 apply.

4.9 Standard reference temperatures for prepackaged liquid products

Unless otherwise specified in applicable legislation (see foreword), liquid products packed in accordance with the requirements of 4.5 and marked with a quantity by volume shall comply with applicable requirements when at a temperature of 20 °C, and products that need to remain frozen to maintain their consistency for intended use shall comply with applicable requirements when at the temperature required to maintain their consistency. Liquid products packed in accordance with the requirements of 4.3 shall comply with applicable requirements at the temperature at which measured.

4.10 Frozen or glazed products

4.10.1 In cases where products in prepackages are frozen with added water or where they are glazed to preserve their quality, any excess ice or the glaze shall be regarded as packing material when the net quantity of the prepackages is being determined. Annex D describes the method for the determination of the net quantity of prepackages in which the product is frozen or glazed.

4.10.2 Where other applicable legislation (see foreword) makes provision for the net mass to include moisture (including liquids such as brine) absorbed during the processing and freezing of the product, to a prescribed maximum limit, the actual moisture loss between the frozen and unfrozen prepackage up to the maximum prescribed limit, shall be taken into consideration when the error on such prepackage is determined. This is only applicable in cases where products are thawed in accordance with the requirements of annex D before inspection.

4.10.3 In the case of frozen products, if no water is added at the time of freezing, the net mass shall be determined in the frozen state exclusive of the packing material.

5 Inspection procedures and reference tests

The following procedures, as applicable, shall be used for the inspection of all prepackages provided that the requirements of clause 4 of this standard are respected.

NOTE The requirements in 5.3 and 5.4 are based on the statistical principles of control given in annex E.

5.1 Inspection procedures

The prescribed tests shall be performed in accordance with quality acceptance inspection by sampling prepackages at any level of distribution including the point-of-pack, during import, distribution and wholesale transactions, and retail sale. Relevant test procedures are given in annexes B, C and D. This standard does not preclude a legal metrology official from conducting any other test at any level of distribution for the purpose of verifying that prepackages comply with the requirements of this or any other standard.

5.2 Accuracy of measurement

5.2.1 Unless otherwise prescribed, inspection measuring instruments shall have a resolution of not more than 0,1T of the prepackage being measured in the case of instruments with digital indication, and not more than 0,2T of the prepackage being measured in the case of instruments with analogue indication that permits interpolation between discreet divisions, for example, analogue weighing instruments, glass measures and tape measures. Any error on the measuring instrument shall be taken into consideration when measurements are made. Irrespective of the method used, the uncertainty of measurement when the actual content of a prepackage is measured shall not exceed 0,2T of the prepackage being measured. These requirements and those of 4.4 a), b) and d) also apply to packers who pack according to the requirements of 4.5 and who use instruments required by legal metrology legislation to check the quantity in prepackages for quantity control purposes. **Amdt 2**

SANS 1841 prescribes additional requirements for these instruments and should be adhered to by packers participating in the quantity mark scheme provided for in terms of legal metrology legislation. **Amdt 2**

5.2.2 When measurements made in terms of 4.2 or prepackages made up in compliance with 4.3 are inspected, the errors on the instruments used for the respective measurements shall be taken into consideration. Should these instruments comply with the requirements of 4.4, they may be used to measure the goods being inspected, if this is practical.

5.3 Procedure for inspecting compliance with the average requirement when prepackages are sampled

When compliance with the average requirement in 4.5.2 is determined by means of sampling of an inspection lot, the procedure in 5.3.1 to 5.3.7 shall be used.

5.3.1 Determine the actual error on each prepackage in the selected sample.

5.3.2 Calculate the total prepackage error by adding together the individual prepackage errors determined in 5.3.1.

5.3.3 Divide the total prepackage error by the sample size to calculate the average error.

5.3.4 Evaluate the sample for compliance

a) if the average error in 5.3.3 is zero or a positive number, the inspection lot passes, or

b) if the average error is a negative number, proceed to 5.3.5.

5.3.5 Compute the standard deviation of the individual prepackage errors found in 5.3.1.

5.3.6 Compute the sample error limit by multiplying the standard deviation determined in 5.3.5 by the sample correction factor given in column 3 of table 1 or table 2, as applicable, for the relevant sample size given in column 2.

5.3.7 Correct the average error by adding the sample error limit determined in 5.3.6 to the average error and evaluate the sample for compliance

a) if the corrected average error is zero or a positive number, the inspection lot passes, or

b) if the corrected average error is a negative number, the inspection lot fails.

5.4 Characteristics of inspection lots and sampling plans

When compliance of prepackages is determined by means of sampling of an inspection lot, the procedure in 5.4.1 to 5.4.5 shall be followed to determine the characteristics of the inspection lot, the sample size, the sample correction factor and the number of prepackages permitted to have *T*1 errors.

5.4.1 Assume inspection lots to be homogeneous if there is no indication to the contrary.

5.4.2 Select sample prepackages using random sampling.

5.4.3 Take an inspection lot from the production line that consists of all prepackages not rejected by the checking system. Take care to prevent other than normal operating adjustments or other corrective actions in the production and prepackage filling process. Ensure that sample prepackages are collected after the point of final checking by the packer.

5.4.4 When sample prepackages are

a) collected from the production line, ensure that the size of the inspection lot is equal to the maximum hourly output of the production line without any restriction to the size of the inspection lot,

b) not collected from the production line at the premises of the packer, and when

   1) the production line output exceeds 10 000 prepackages per hour, ensure that the size of the inspection lot is equal to the maximum hourly output of the production line without any restriction to the inspection lot size, or

   2) the production line output is less than or equal to 10 000 prepackages per hour, ensure that the size of the inspection lot does not exceed 10 000 prepackages.

c) selected from an inspection lot at a location other than the premises of the packer or where the production line output cannot be determined, use the largest sample size given in table 1 or table 2, as applicable.

5.4.5 Use the sampling plan in tables 1 and 2 to determine the sample size, sample correction factor and number of prepackages permitted to have *T*1 errors. Use table 1 for all prepackages provided that when the prepackages are destroyed in order to carry out the test and if absolutely necessary, for economic or practical reasons, that a smaller sample size is required, table 2 may be used. In the case of inspection lots of less than 100 prepackages, do not utilize sampling and measure 100 % of the inspection lot.

Table 1 — Sampling plan for non-destructive testing

1	2	3	4
Number of prepackages in an inspection lot	**Number of prepackages in the sample (sample size)**	**Sample correction factor** Sample correction factor X standard deviation of the sample (s) = Sample error limit (see 5.3.6)	**Number of prepackages in a sample permitted to have *T*1 errors**
100 to 500	50	0,379	3
501 to 3 200	80	0,295	5
More than 3 200	125	0,234	7

Table 2 — Sampling plan for destructive testing

1	2	3	4
Number of prepackages in an inspection lot	**Number of prepackages in the sample (sample size)**	**Sample correction factor** Sample correction factor X standard deviation of the sample (s) = Sample error limit (see 5.3.6)	**Number of prepackages in a sample permitted to have *T1* errors**
100 and above	20	0,640	1

Annex A
(normative)

Tolerable deficiencies for prepackages and products with special requirements

Table A.1(a) — Tolerable deficiencies in actual content for prepackages that contain general products not otherwise specified in table A.1(b)

1	2	3
Nominal quantity of product (Qn) in g or mL	**Tolerable deficiency *(T)*** [a]	
	Percent of Qn	**g or mL**
0 to 50	9	–
50 to 100	–	4,5
100 to 200	4,5	–
200 to 300	–	9
300 to 500	3	–
500 to 1 000	–	15
1 000 to 10 000	1,5	–
10 000 to 15 000	–	150
Above 15 000	1	–

[a] *T* values are to be rounded up to the next tenth of a gram or a millilitre for Qn less than or equal to 1 000 g or 1 000 mL, and to the next whole gram or millilitre for Qn higher than 1 000 g or 1 000 mL.

Nominal quantity of product (Qn) for all linear dimensions [b]	**Percent of Qn**
Qn of 5 m or less	No tolerable deficiency allowed
Qn exceeding 5 m	2

[b] Includes all dimensions such as length, width, thickness, diameter and circumference, etc.

Nominal quantity of product (Qn) in area	**Percent of Qn**
All Qn	3

Nominal quantity of product (Qn) in count	**Percent of Qn**
Qn of 50 items or less	No tolerable deficiency allowed
Qn exceeding 50 items	1[c]

[c] Compute the *T* value by multiplying the nominal quantity by 1 % and rounding the result up to the next whole number. The value may be larger than 1 % due to the rounding but this is accepted because the products are whole items and cannot be divided.

Nominal quantity of solids (Qn) sold by cubic measure	**Percent of Qn**
All Qn	**2**

Amdt 1

Table A.1(b) — Tolerable deficiencies in actual content for prepackages that contain specified products

1	2	3	4
Item	**Product**	**Tolerable error Percent of *Qn***	
		Deficiency	**Excess**
1	Bread (all types)	5 %	10 % applicable only to bread required to be sold by mass but exempted from a quantity indication.
2	Fresh fruit and vegetables	5 %	Unrestricted
3	Poultry packed in mass bands and with the nominal mass declared as the lowest mass in the band	0	Unrestricted
4	Industrial and medical gasses including dissolved gasses but excluding liquid petroleum gasses	5 %	Unrestricted
5	Seed sold by count	Quantities not exceeding 50 items = 0 More than 50 items but not more than 1 000 items = 2 % More than 1 000 items = 4 % (See footnote [c] in table A.1(a))	Unrestricted
6	Coal, anthracite, coke and charcoal	As prescribed in table A.1(a)	10 % applicable only when required to be sold by mass but exempted from a quantity indication.
7	Liquid petroleum gasses (propane and butane and mixtures thereof)	3 %	Unrestricted
8	Sheet width and length for perforated rolls and width and total length for unperforated rolls of tissue paper that is sold as or under the name of toilet paper or that has the appearance of toilet tissue paper when wound in the form of a roll with a width not exceeding 140 mm	2 %	Unrestricted

Table A.2 — Products packed by mass and that comply with the requirements in 4.6.1(a)

1	2
Item	**Product**
1	Camphor
2	Carbonate of soda
3	Cheese
4	Dried fruit
5	Dried fish and dried meat products
6	Epsom salts
7	Fertilizers
8	Fresh fruit and vegetables, excluding mushrooms
9	Pasta products
10	Seed
11	Seed potatoes
12	Soap (household and laundry bars)
13	Soap (flakes, powder and detergent powder)
14	Soap (toilet and medicinal)
15	Sorghum malt
16	Tobacco/snuff
17	Twines/cordage
18	Washing salts
19	Wool (knitting)
20	Yeast

Table A.3 — Products packed by mass and that comply with the requirements in 4.6.1(b)

1	2
Item	**Product**
1	Bread (all types)
2	Cake and other flour confectionery
3	Mushrooms

Annex B
(normative)

Inspection procedure outline for the determination of the quantity in prepackages

B.1 General

This annex gives inspection procedures for checking the quantity of product in prepackages packed in accordance with 4.5 and incorporates the applicable requirements of clause 5. It may be used as it is with due consideration of specific requirements prescribed for individual products or groups of product or to develop equivalent procedures more suitable to identified circumstances. Applicable requirements shall be used when prepackages packed in accordance with 4.3.2 are being inspected.

B.2 Procedure

B.2.1 Define the inspection lot in accordance with 5.4.

B.2.2 Where sampling of the inspection lot to determine compliance is to be carried out, determine a sample size appropriate for the inspection lot from column 1 of table 1 or table 2 depending on whether or not destructive testing will be used.

NOTE Use the sample size in table 2 only when absolutely necessary (see 5.4.4).

B.2.3 Determine the tolerable deficiency (T), if any, appropriate for the nominal quantity (quantities) of the prepackage in accordance with annex A (see 4.8).

NOTE Where prepackages with random quantities are inspected, the random quantities might fall within different ranges of tolerable deficiency and each prepackage will need to be compared with its respective tolerable deficiency in B.2.7.

B.2.4 Determine the number of prepackages equal to 2,5 % of the inspection lot that are allowed to have a $T1$ error if sampling will not be used. Where sampling will be used, determine the number of prepackages allowed to have a $T1$ error from column 4 of table 1 or table 2, as applicable (see 4.5.3).

NOTE Ignore this subclause if no deficiency in the prepackages is allowed.

B.2.5 Measure and record the net quantity of each prepackage. To determine the net quantity of certain prepackages, the following procedures are applicable:

a) B.3 gives requirements for inspection by gravimetric means including the determination of tare masses;

b) B.4 gives requirements for inspection by volumetric means;

c) B.5 gives requirements for the inspection of linear measurements;

d) annex C gives requirements for the determination of the drained mass of a foodstuff that is packed in a liquid medium; and

e) annex D gives requirements for the determination of the net quantity of prepackages that contain frozen products with added water or glazed products.

B.2.6 Determine the individual prepackage error (see B.3, B.4 or B.5, as applicable).

B.2.7 Determine if the inspection results comply with the individual prepackage requirement in 4.5.3 following the steps in B.2.7.1 and B.2.7.2.

B.2.7.1 In the case of prepackages where no tolerable deficiency is allowed, the inspection lot fails if any prepackage is found to have a negative error as indicated in B.2.6. If the prepackages measured comply with this requirement, the average of the sample will be correct and there is no need to carry out any further evaluation.

B.2.7.2 In the case of prepackages where a tolerable deficiency is prescribed, compare all negative individual prepackage errors obtained in B.2.6 with the value(s) for *T* determined in B.2.3 and the number of prepackages allowed to have a *T*1 error as determined in B.2.4, and proceed as follows:

a) if the number of prepackages that have a *T*1 error exceeds the number determined in B.2.4, the inspection lot fails; or

b) if any prepackage has a *T*2 error, the inspection lot fails; or

c) if the prepackages for which a tolerable deficiency is prescribed comply with this requirement, proceed to B.2.8.

B.2.8 Determine if the inspection results comply with the average prepackage requirement in 4.5.2, following the steps in B.2.8.1 or B.2.8.2 to B.2.8.5, as applicable.

B.2.8.1 Where sampling is not used and all prepackages in the inspection lot are measured, calculate the total prepackage error by adding together the individual prepackage errors determined in B.2.6 and evaluate for compliance. If the total prepackage error is

a) equal to zero or a positive number, the inspection lot passes, or

b) a negative number, the inspection lot fails.

B.2.8.2 Where sampling of the inspection lot is used to determine compliance, carry out the following procedure as described in 5.3:

a) calculate the total prepackage error by adding together the individual prepackage errors determined in B.2.6; and

b) divide the total prepackage error by the sample size to calculate the average error.

B.2.8.3 Evaluate the average error in B.2.8.2(b) for compliance. If the average error is

a) equal to zero or a positive number, the inspection lot passes and no further action is necessary, or

b) a negative number, proceed as in B.2.8.4.

B.2.8.4 Correct the average error as follows:

a) compute the standard deviation of the individual prepackage errors determined in B.2.6;

b) compute the sample error limit by multiplying the standard deviation determined in (a) by the sample correction factor given in column 3 of table 1 or table 2, as applicable, for the relevant sample size given in column 2; and

c) correct the average error by adding the sample error limit determined in (b) to the average error and evaluate the sample for compliance in accordance with B.2.8.5.

B.2.8.5 If the corrected average error is

a) zero or a positive number, the inspection lot passes, or

b) a negative number, the inspection lot fails.

B.3 Special procedures for quantity determination by gravimetric means

B.3.1 Determination of the net quantity of product and the average mass of packing material

B.3.1.1 When non-destructive testing is undertaken, it is necessary to subtract the mass of the packing material (see 3.10) from the actual gross mass of the prepackage to determine the net quantity of product therein. The average mass of the packing material is used if the criteria in table B.1 are complied with. Determine the net quantity of product Q_p using the following equation:

$$Q_p = Q_g - Q_T$$

where

Q_p is the net quantity of product;

Q_g is the gross mass of the prepackage;

Q_T is the average tare mass of the packing material.

B.3.1.2 Determine the average mass of the packing material by the following the steps in B.3.1.2.1 to B.3.1.2.7.

B.3.1.2.1 Use may be made of unused packing material of the same type used for the prepackages being inspected or use may be made of packing material that has been used as part of a prepackage and has been separated from the product and cleaned using normal household procedures used by consumers of the product (e.g. the material should not be dried in an oven).

B.3.1.2.2 Packing material used for the average mass determination shall be clean and dry.

B.3.1.2.3 Randomly select an initial tare sample of 10 or more packing materials (e.g. from the sample taken from an inspection lot or from a lot of unused packing materials at the point-of-pack), and measure the mass of each packing material. When packing material from the inspection lot is used, first measure and record the gross mass of each prepackage to be opened for tare determination for use in B.3.1.2.5.

B.3.1.2.4 Where prepackages are filled with a protective gas, this forms part of the packing material and where prepackages are sealed under a vacuum, this will affect the actual net mass determination. First measure, in both cases, each prepackage in the sample selected as a tare sample in B.3.1.2.3 with the packing material in its normal state ready for sale. Puncture the prepackage (packing material) to allow the contents to attain atmospheric pressure and again measure each prepackage in the sample. Determine the effect of the gas or vacuum, as applicable, by subtracting the mass of each punctured prepackage from the mass of the respective sealed prepackage. Determine the effect of the gas or the vacuum by using the following equation:

$A = B - C$

where

A is the effect of the gas or the vacuum;

B is the mass of the sealed prepackage;

C is the mass of the punctured prepackage.

Determine the average mass of the effect of the gas or the vacuum, and add this algebraically to the mass of the average tare value determined in accordance with B.3.1.2.5 and table B.1, as applicable (i.e. added gas will increase the tare value and vacuum will reduce the tare value).

B.3.1.2.5 Add together the individual packing material masses determined in B.3.1.2.3 and divide by the number of samples to determine the average tare mass (ATM). Calculate the sample standard deviation of the initial tare sample and proceed in accordance with one of the criteria in table B.1.

Table B.1 — Criteria for the determination of tare mass

1	2
If	**Then**
The ATM is equal to or less than 10 % of the nominal quantity of product	Use the ATM to determine the actual quantity of product in the prepackages in accordance with B.3.1.2.6
The ATM exceeds 10 % of the nominal quantity, and the standard deviation determined in B.3.1.2.5 is equal to or less than 0,25*T*	Use a total of 25 packing materials to compute the ATM and determine the actual quantity of product in the prepackages in accordance with B.3.1.2.6
The ATM exceeds 10 % of the nominal quantity, and the standard deviation determined in B.3.1.2.5 exceeds 0,25*T*	An ATM cannot be used. It is necessary to determine and use each individual tare mass (destructive testing). Determine the actual quantity of product in each prepackage in accordance with B.3.1.2.6

B.3.1.2.6 Measure the individual prepackage gross mass and subtract the average mass of the packing material determined in B.3.1.2.5 or the actual mass of each packing material, as applicable, (see table B.1 for criteria) to determine the actual net mass of the prepackages.

NOTE Where the average mass of the packing material is used for prepackages with a constant nominal quantity, an alternative procedure is to add the average mass of the packing material to the nominal quantity to obtain a calculated gross mass and subtract this from the individual gross masses to determine the individual prepackage errors in B.3.1.2.7.

B.3.1.2.7 Determine the actual error of each prepackage by subtracting the nominal quantity from the actual net mass of each prepackage.

B.3.2 Determination of the quantity of liquid by gravimetric means

B.3.2.1 When gravimetric testing is used to determine the actual contents of prepackages containing liquids labelled in units of volume, the nominal mass of the liquid product in the prepackage shall be calculated taking air buoyancy into consideration. The density of the liquid shall be at the specified reference temperature. Liquid products shall comply with applicable requirements when at the reference temperatures specified in 4.9. Calculate the nominal mass of

the liquid product in the prepackage from its nominal value by using the following equation:

$$Q_m = \frac{V \times (d - 0{,}0012)}{0{,}99985}$$

where

Q_m is the mass of the liquid, in grams, calculated from its volume;

V is the volume of the liquid, in millilitres;

d is the density of the liquid, in grams per millilitre.

Calculate the actual volume of the liquid product in a prepackage from its mass by using the following equation:

$$V = \frac{Q_m \times 0{,}99985}{d - 0{,}0012}$$

where

V is the volume of the liquid, in millilitres, calculated from its mass;

Q_m is the mass of the liquid, in grams;

d is the density of the liquid, in grams per millilitre.

NOTE The above formulae compensate for the effect of the difference in air buoyancy between the liquid being measured and masspieces used to calibrate inspection scales and having a density equal to 8 g/mL.

B.3.2.2 When errors are determined by comparing the actual masses of the liquid with the calculated nominal mass, determine the tolerable deficiencies (T) from table A.1(a) according to the marked nominal volume and then convert to the calculated mass, using the above formula, before checking the errors for compliance.

B.4 Special procedures for quantity determination by volumetric means

If necessary and the required accuracy of measurement can be achieved, determine the net quantity of individual prepackages in B.2.5 by making use of a certified volumetric measure. This method is not recommended for liquids with characteristics that do not allow complete draining from the packing material. The requirements in B.4.1 to B.4.4 apply when this method is used.

B.4.1 Requirements for use of volumetric measures

B.4.1.1 Volumetric measures calibrated as wet (delivery) measures (usually marked **Ex** on the measure to indicate that it was wetted with water before calibration) shall be used as follows:

a) before initial use, wet the measure by filling it at least to the prepackage nominal quantity with water, empty and drain for the drainage period specified on the calibration certificate; and

b) after every measurement, empty the liquid that has been measured, rinse the volumetric measure with water and drain for the drainage time specified on the calibration certificate, before each subsequent measurement.

NOTE In this case the liquid being measured should preferably be compatible with water to avoid an unwanted reaction with the water used to wet the measure before testing.

B.4.1.2 Volumetric measures calibrated as dry (container) measures (usually marked ℓn on the measure to indicate that it was dry when calibrated) shall be used as follows:

a) before initial use, ensure that the volumetric measure is completely dry; and

b) after every measurement, empty the liquid that has been measured, rinse the volumetric measure with water and dry before the next measurement.

B.4.2 Temperature of measurement

Before measurement, stabilize the liquid at the reference temperature specified in 4.9. Should this not be practical, use the coefficient of expansion of the liquid being measured to correct the volume at the temperature of measurement to volume at the specified reference temperature.

B.4.3 Emptying of prepackages

Drain the contents of prepackages into the volumetric measure as completely as possible. Any method may be used to facilitate draining, provided that it does not affect the characteristics or quantity of the liquid, and that any change in temperature is taken into account.

B.4.4 Determination of individual prepackage error

Determine the individual prepackage error by subtracting the nominal quantity (Qn) of the prepackage from the actual net quantity as measured using the volumetric measure.

B.5 Special procedures for quantity determination of linear measurements

B.5.1 When an article is marked with more than one dimension (e.g. timber marked with its length, width and thickness), inspect each dimension separately for compliance. If any dimension on the articles in the inspection lot being inspected fails either the individual prepackage or average requirement, the inspection lot fails.

B.5.2 Where the actual dimension of an article appears to be inconsistent (e.g. the width varies), make at least five measurements at approximately equal intervals along the length of the dimension being inspected to determine the average dimension for each article. Use the average value of the dimension to evaluate compliance. In cases where a minimum value (of a dimension) is marked (e.g. minimum thickness), the average dimension does not apply and none of the measurements made shall be less than the marked minimum value.

B.6 Use of templates to determine volume

Templates designed for use with measuring container bottles may be used to determine the volume of liquid contained therein provided that bottles and associated templates are manufactured according to a controlled process that will ensure the accuracy of measurement required in 5.2.1, as applicable, and that the use thereof is acceptable to the national responsible body.

Annex C
(normative)

Method for the determination of the drained quantity of foodstuffs packed in a liquid medium

The following test method shall be used for the determination of the actual quantity of foodstuffs (drained mass) packed in a liquid medium.

C.1 Time of inspection

Determine the drained mass after the equilibrium of the solution process has been completed. An inspection may be carried out from the time that the prepackages are ready to be marketed according to the manufacturer or when distribution has taken place and up to the end of any period specified in the third column of table C.1. Do not carry out an inspection before the elapse of the period given in the second column of table C.1 should the manufacturer indicate that the prepackages are not ready to be marketed.

Table C.1 — Period of time for inspection

1	2	3
Product	**Period of time for inspection**	
	From	**To**
Fruit, vegetables and other vegetable foodstuffs (except for strawberries, raspberries, blackberries, kiwifruit, loganberries)	30 d after packaging	Tenability
Strawberries, raspberries, blackberries, kiwifruit, loganberries	30 d after packaging	2 years after packaging
Products made from salted fish, anchovies, sardines, marinades, stewed fish goods, preserved fish; mussels, shrimps and suchlike.	Immediately after packaging	14 d after packaging
Marinades of fried fish	48 h after packaging	14 d after packaging
Sausages and other meat products	5 d after packaging	Tenability
Other products	14 d after packaging	Tenability

C.2 Inspection sample

Use the sample determined in B.2.2 and used to check for compliance of the net quantity of prepackages.

NOTE Since this will be a destructive test, the whole inspection lot can never be used.

C.3 Temperature of sample

Store the samples in the temperature range specified by the packer or between 20 °C and 24 °C (inclusive) for a period of 12 h before testing.

C.4 Apparatus

C.4.1 Flat sieve with a square mesh that has apertures of nominal size 2,8 mm and a nominal wire thickness of 1,2 mm for draining the product from a prepackage. The diameter of the sieve should be 20 cm for use with prepackages of 850 mL or less, and 30 cm for use with containers over 850 mL. If the nominal quantity is 2,5 kg or more, the quantity may, after weighing the whole amount, be divided among several sieves.

C.4.2 Drip pan.

C.4.3 Weighing instrument that complies with the requirements in 5.2.1, for the determination of mass.

C.5 Determination of the actual quantity of product

C.5.1 Determine the mass of the sieve and its drip pan.

C.5.2 Open the prepackage and pour the product and liquid medium across the sieve. Distribute the product and liquid medium over the surface of the sieve but do not shake the material on the sieve. Tilt the sieve to an angle of approximately 17° to 20° from horizontal to facilitate draining. Carefully invert by hand all solid product, or parts thereof, with cups or cavities if they fall on the sieve with cups or cavities up. Drain the cups or cavities in soft products (e.g. sliced fruit) by tilting the sieve. Drain for two minutes.

C.5.3 Weigh the pre-weighed drip pan and sieve containing the product and calculate the drained mass of the product as follows:

$$P = P_{e2} - P_{e1}$$

where

P is the drained mass of the product;

P_{e1} is the mass of the clean sieve and drip tray;

P_{e2} is the mass of the sieve and drip tray plus product after draining.

C.5.4 Before the sieve is used again, ensure that it is clean and free of product debris. The sieve need not be dry as long as it is weighed accurately immediately before being used.

C.5.5 Check for compliance with 4.7.

Annex D
(normative)

Test procedures for the determination of the actual quantity of frozen products with added water or glazed products

The following test methods, as applicable, shall be used for the determination of the net quantity of prepackages in B.2.5 when the contents of the prepackages are frozen with added water or glazed. In the case of frozen products, if no water is added at the time of freezing, this procedure is not used and the net mass shall be determined in the frozen state exclusive of packing material. If a product does not fall within one of the categories of products in this annex the most appropriate method for removing excess ice from the outside of the product (see 4.10.1), shall be used. **Amdt 2**

NOTE Since this will be a destructive test, sampling should be carried out in accordance with B.2.2.

D.1 Apparatus

D.1.1 Flat sieves of diameter 20 cm and 30 cm that have square mesh openings of nominal size 2,8 mm and a nominal wire thickness of 1,2 mm for draining the water from a product.

D.1.2 Drip pan.

D.1.3 Weighing instrument that complies with the requirements in 5.2.1, for the determination of mass.

D.2 Frozen fruit and vegetables

D.2.1 Determine the mass of the appropriate sieve and its drip pan after wetting the sieve and draining for two minutes. The diameter of the sieve should be 20 cm for use with prepackages with a nominal mass not exceeding 1,4 kg and 30 cm in the case of prepackages of mass exceeding 1,4 kg.

D.2.2 Immerse the prepackage in water maintained at 25 °C ± 10 °C with a continuous water flow. If the prepackage is not water-tight, place it in a plastic bag and remove any excess air using a vacuum and then seal it securely. Avoid agitating the prepackage while it is thawing. When all of the ice has melted, remove it from the water bath and wipe it dry. Open the prepackage with care and a minimum of agitation.

D.2.3 Transfer the product to the sieve by distributing evenly in one sweeping motion. Incline the sieve to approximately 17° to 20° from the horizontal to facilitate drainage without shifting the product. Drain for two minutes.

D.2.4 Weigh the pre-weighed drip pan and sieve containing the product and determine the actual net quantity of the product.

D.3 Glazed products including fish and fishery products (products covered with a film of ice to preserve their quality) **Amdt 1**

D.3.1 Determine the mass of the appropriate sieve and its drip pan after wetting the sieve and draining for two minutes. Use a sieve with a diameter of 20 cm in the case of prepackages with a nominal mass not exceeding 900 g and a sieve with a diameter of 30 cm in the case of prepackages with a nominal mass exceeding 900 g.

D.3.2 Remove the product from the prepackage and place it in a wire mesh basket large enough to hold the contents. Subject the product to a gentle spray of cold water until the ice glaze is removed. Agitate the product with care to avoid damage or loss of any natural water contained in the product.

D.3.3 Transfer the product to the sieve and incline the sieve to approximately 17° to 20° from the horizontal to facilitate drainage without shifting the product. Drain for two minutes.

D.3.4 Weigh the pre-weighed drip pan and sieve containing the product and determine the actual net quantity of the product.

D.4 Frozen fish and fishery products

D.4.1 Determine the mass of the appropriate sieve and its drip pan after wetting the sieve and draining for two minutes. Use a sieve with a diameter of 20 cm in the case of prepackages with a nominal mass not exceeding 450 g and a sieve with a diameter of 30 cm in the case of prepackages with a nominal mass exceeding 450 g.

D.4.2 Open the prepackage and place the product in a wire mesh basket large enough to hold the contents of the prepackage and with openings small enough to retain the product while thawing. Immerse the wire mesh basket in a water bath (e.g. a container with 15 L of water) at 25 °C ± 10 °C so that the top of the basket extends above water level. Introduce water at 25 °C ± 10 °C at the bottom of the container in a continuous flow until all excess ice has melted. Take care not to remove any water occurring naturally in the product. The frozen core of each item should not defrost completely unless it contains added water.

D.4.3 Transfer the product to the sieve and incline the sieve to approximately 17° to 20° from the horizontal to facilitate drainage without shifting the product. Drain for two minutes.

D.4.4 Weigh the pre-weighed drip pan and sieve containing the product and determine the actual net quantity of the product.

D.5 Frozen poultry carcasses **Amdt 1**

If the poultry being inspected is encompassed with ice or it is suspected that water was added to the abdominal cavity before or during the freezing process, the method in D.5.1 to D.5.6 is used to thaw the product.

D.5.1 Remove the carcass from the packing material and place it in a strong waterproof plastic bag with the abdominal cavity facing towards the closed end of the bag. Ensure that the bag is big enough and that it can be sealed properly, but that it is not unduly large. Remove as much air as possible from the bag by compressing, and close securely.

NOTE Until such time as this test is carried out, keep the samples frozen under the conditions in which they were stored before selection as the inspection sample.

D.5.2 Immerse the bag containing the frozen carcass in a water bath maintained at 42 °C ± 1 °C with the closed end positioned such that water from the bath cannot leak into the bag. It may be held in position by means of weights if necessary.

D.5.3 Leave the bag in the water bath until all excess ice is melted. If necessary to check that all excess ice has melted, the bag may be opened and the temperature in the abdominal cavity measured.

NOTE To prevent the loss of natural water in the product, keep the flesh of the poultry frozen as far as possible, and allow only surrounding ice to melt.

D.5.4 Determine the mass of the drip pan and the 20 cm sieve after wetting the sieve and draining for five minutes.

D.5.5 Remove the carcass from the bag and place it in the sieve with the abdominal cavity facing down and allow to drain for five minutes. If the abdominal cavity contains offal packed in separate packing material, take the offal out of the packing material and place it in the sieve with the carcass to drain.

D.5.6 Weigh the pre-weighed drip pan and sieve containing the carcass and offal, if applicable, and determine the actual net quantity of the product.

Annex E
(informative)

Statistical principles of control

The requirements of this standard are based on the statistical principles of control in this annex as contained in OIML R 87, which should be consulted for the full international requirements.

E.1 Uncertainties

The expanded uncertainties at the 95 % confidence level associated with measuring instruments and test methods used for determining quantities should not exceed 0,2 *T*. Examples of the source of uncertainty include the maximum permissible error and repeatability in measuring instruments, variations in packing materials, and fluctuations in density determinations caused by the differing amounts of solids in the liquid or temperature changes.

E.2 Significance levels

E.2.1 The significance level for type I risk (the value which is the upper limit of this type of error) should be 0,005. The tests should determine if the average of the quantity of product in a prepackage has a one-sided significance level of 99,5 % using coefficients as derived from Student's *t* distribution. The significance level should comply with the following:

$\alpha_p \leq 0{,}5\ \%$ for $\mu = Q_n$

where

α_p is the significance level;

μ is the average quantity of product in the inspection lot;

Q_n is the nominal quantity of the prepackages in the inspection lot.

That is, the probability of rejecting a correctly filled inspection lot with $\mu = Q_n$ should not exceed 0,5 %.

E.2.2 The test for type II risk should have a significance level α_p of

$\alpha_p \leq 5\ \%$ for $p = 2{,}5\ \%$

where

α_p is the significance level;

p is the probability of rejecting an inspection lot.

that is, the probability (p) of rejecting a inspection lot that contains 2,5 % of inadequate prepackages should not exceed 5 %.

E.2.3 The significance level of the tests for percentage of inadequate prepackages (type II risk) should detect inspection lots in at least 90 % of the cases, as follows:

a) lots for which the average fill is less than ($Qn - 0{,}74\ \sigma$) where σ is the sample standard deviation of the quantity of product in the prepackages of the inspection lot; and

b) lots that contain 9 % inadequate prepackages.

Annex F

Amdt 1

(informative)

Guidelines for application of tolerable deficiencies with respect to measurement of products at the time of sale or when making up prepackages

F.1 General principles

Amdt 1

This standard prescribes requirements for the accuracy of measurement of products when sold loose (i.e. not in a prepackage) and measured at the time of sale (see 4.2) and when made up in the form of prepackages. There is a differentiation between prepackaged products made up on the retail trading premises from which they are sold (see 4.3) and prepackaged products made up by packers with the intention of distributing them to other premises for sale (see 4.5).

The guidelines in this annex cover products and situations commonly found in trade and do not cover every eventuality or specific product related or other requirements that might be contained in this standard. Amdt 1

F.2 Products measured at the time of sale (see 4.2)

Amdt 1

F.2.1 Where products are measured after being ordered by a purchaser or measured in the presence of a purchaser, they should be measured using a suitable instrument that complies with all applicable requirements of 4.4. Amdt 1

F.2.2 In order to be regarded as suitable the instrument should not have an in-service error allowance, as prescribed in regulations pertaining to such instrument, which is greater than the tolerable deficiency prescribed in annex A for the type of product being measured (see 4.4(c)). Amdt 1

F.2.3 As long as a suitable instrument is used and it complies at the time of use with its maximum permissible error, any error on the quantity of the product measured and delivered to the purchaser, resulting from the error on the instrument used, will be permissible. This means that the error on the instrument becomes the permissible error for the product, and the measured quantity quoted to the purchaser is the quantity indicated on the instrument. Amdt 1

F.2.4 Examples of the applicability of the guidelines given in F.2.1 to F.2.3 are as follows:

a) A person selects loose tomatoes at a greengrocer and has them weighed to determine the price to pay when purchasing them. Amdt 1

b) A person phones a butcher and orders a half lamb to be cut up and wrapped ready for collection and payment. **Amdt 1**

c) A person presents his/her own empty gas cylinder at a hardware store to be filled on the premises. **Amdt 1**

d) A person presents a parcel to be delivered by courier and it is weighed to determine the courier fee. **Amdt 1**

e) A person orders a whisky in a bar and it is measured into a drinking glass using a tot measure. **Amdt 1**

f) A person orders a quantity of petrol at a filling station and it is delivered from a fuel dispenser. **Amdt 1**

g) A person requests a length of fabric to be cut from a larger roll at a haberdashery store and it is measured with a length measure. **Amdt 1**

F.3 Prepackages made up for sale on the premises from which they are sold (see 4.3) **Amdt 1**

F.3.1 Where products are measured and made up into prepackages before being offered for sale on the premises on which they are packed, each prepackage should be measured using a suitable instrument that complies with all applicable requirements of 4.4. **Amdt 1**

F.3.2 In order to be regarded as suitable the instrument should not have an in-service error allowance, as prescribed in regulations pertaining to such instrument, which is greater than the tolerable deficiency prescribed in annex A for the type of product being measured (see 4.4(c)). **Amdt 1**

F.3.3 As long as a suitable instrument is used and it complies at the time of use with its maximum permissible error, any error on the quantity in each prepackage resulting from the error on the instrument used will be permissible. This means that the error on the instrument becomes the permissible error for the prepackage, and the quantity marked on the prepackage or on the shelf in proximity to the prepackage is the quantity indicated on the instrument. **Amdt 1**

In this case each prepackage is assessed individually for compliance. There is no requirement that the average quantity of a batch of prepackages must be equal to or greater than the quantity marked thereon. The reason for this is that each prepackage is measured individually and will automatically assume the error of the instrument used which could be a negative error equal to the full extent of the error permitted on the instrument. If this were the case the average mass of the packages could never be equal to the nominal marked quantity as every package will be below the marked quantity but still within the permitted tolerable deficiency. **Amdt 1**

F.3.4 Examples of applicability of the guidelines given in F.3.1 to F.3.3 are as follows:

a) A greengrocer makes up prepackages of tomatoes and places them on a shelf in his/her shop before offering them for sale. **Amdt 1**

b) A butcher makes up prepackages of lamb chops and places them on a shelf in his/her butchery before offering them for sale. **Amdt 1**

F.3.5 The guidelines given in F.3.1 to F.3.3 do not apply to in-store bakeries that produce bread for sale on the premises of baking (see 4.3.4). The reason for this is that bread is not individually weighed after baking or at the time of sale. All bread, wherever produced, should comply with 4.5. **Amdt 1**

F.4 Prepackages made up for distribution before sale (see 4.5) Amdt 1

F.4.1 The requirements of 4.5 apply to manufacturers and other packing plants that generally mass produce prepackages for distribution before sale. They also apply to:

a) A retail dealer who makes up prepackages for distribution to another premises (sales outlet) for sale irrespective of whether or not the packer is the owner of the other sales outlet. Amdt 1

b) Loaves of bread baked at in-store bakeries for sale on the premises or elsewhere. Amdt 1

F.4.2 Packers are permitted to pack according to their own methods but they are responsible for ensuring that prepackages comply with all the applicable requirements of 4.5 and all other applicable requirements in this standard. Amdt 1

In this case the error on instruments used in the packing process should be taken into account to ensure that the average requirement is complied with. No mention is made in this standard of requirements for packing instruments. However, cognizance should be taken of other legal metrology legislation that requires packers to use suitable instruments to assess compliance of prepackages they produce in accordance with the requirements of this standard (see foreword) Amdt 1; amdt 2

F.4.3 Examples of the applicability of the guidelines given in F.4.2 are as follows:

a) A manufacturer produces prepackages for distribution to sales outlets. Amdt 1

b) A baker produces bread for distribution to sales outlets. Amdt 1

c) An in-store baker produces bread for sale on the premises of baking. Amdt 1

d) A supermarket chain operates a central packing plant for making up prepackages for distribution to its retail outlets. Amdt 1

e) A gas plant refills returnable cylinders for sale through hardware stores or other distribution outlets. Amdt 1

f) A retailer produces prepackages for distribution to other sales outlets that might or might not be owned by him/her. Amdt 1

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