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WELMEC

European Cooperation in Legal Metrology

Guide on Directive 75/107/EEC Measuring Container Bottles

WELMEC

European Cooperation in Legal Metrology

WELMEC is a co-operation between the legal metrology authorities of the Member States of the European Union and EFTA.

This document is one of a number of Guides published by WELMEC to provide guidance to packers, importers and the Competent Departments responsible for ensuring the prepackages meet the specified requirements.

The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EU Directives.

Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

Published by:
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E-mail: secretary@welmec.org
Website: www.welmec.org

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1 Introduction

1.1. WELMEC Working Group 6 (WG 6) was set up to discuss, and propose solutions for, the problems associated with the trading of prepackaged products between EEA countries. It was decided that a set of documents for inspectors, which could be used by Competent Departments (a list of Competent Departments is seen in Annex 5) in all EEA countries, should be produced. The intention of the documents is to achieve a uniform level of enforcement.

1.2. This document is part of a series of documents published by WELMEC, which are primarily intended to provide guidance to all those concerned with the application of Directives 76/211/EEC and 2007/45/EC for prepacked products. The documents are intended to lead to a uniform interpretation and enforcement of these directives and assist in the removal of barriers to trade.

Documents agreed by WELMEC are published on their website at http://www.welmec.org/latest/guides.html

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1.3. Directive 76/211/EEC states[1] "In the case of products in quantities expressed in units of volume, one of several methods of meeting the measuring and checking requirements is to use, when making up the prepackage, a measuring container of the type defined in the Directive relating thereto, filled under the conditions prescribed in that Directive and herein".

1.4. The relevant Directive is "Council Directive 75/107/EEC of 19 December 1974 on the approximation of the laws of the Member States relating to bottles used as measuring containers". In this document this Directive is referred to as the Directive**.** Measuring container bottles are referred to as MCB.

1.5. This document is intended to give guidance to manufacturers of MCB and authorities responsible for ensuring compliance with the requirements of the Directive and how they can be met. The document also considers the International Organisation for Legal Metrology's recommendation[2] for MCB.

[1] Directive 76/211/EEC, Annex I, 4, last paragraph.
[2] OIML R138, 2007(E), "Vessels for Commercial Transactions".

2 Scope

2.1. The Directive defines a 'measuring container bottle' as a bottle[3]:

- made of glass or other rigid and stable substance,
- designed to be stoppered, and intended for storage, transport or delivery of liquids,
- having a Nominal Capacity between 0.05 l and 5 l inclusive,
- that can be measured with sufficient accuracy, when filled to a specified level or specified percentage of their Brim Capacity.

The Nominal Capacity and the Brim Capacity are defined in Section 4.1.

2.2. Bottles that are not covered by the Directive include bottles:

- made of flexible materials, such as thin plastic material,
- that are not designed to be capped or stoppered,
- used for non-liquid products, such as thick sauces,
- with a Nominal Capacity less than 50 ml or more than 5 l,
- that are not manufactured to measure with sufficient accuracy.

2.3. MCB that are '3' marked have to[4]:

- meet the requirements of the Directive, and
- be subject to metrological control specified in the Annexes[5].

2.4. MCB are permitted, by Directive 76/211/EEC, to be used when making up prepackages, where the quantity is expressed in units of volume, when filled to the appropriate fill level[6].

2.5. There is no prohibition on the manufacture of non '3' marked MCB, and any produced do not have to meet the requirements nor be subject to metrological controls. These bottles cannot be used as measures for the purposes of Directive 76/211/EEC. Methods of manufacture are described in Annex 3.

[3] Directive 75/107/EEC, Article 1.
[4] A reversed epsilon, the EC sign indicating an exemption from pattern approval prescribed in Annex I, 6.3 of Directive 2009/34/EC. An example of this sign is seen in Annex 1 of this document.
[5] Directive 75/107/EEC, Article 2.
[6] Directive 76/211/EEC, Annex I, 4, last paragraph.

3 Free movement of MCB

3.1. No Member State may refuse, prohibit or restrict the marketing and use of MCB which satisfy the requirements and tests specified in the Directive for reasons concerning[7]:

- their volume,
- the determination of their volume, or
- the methods by which they have been checked.

3.2. Non '3' marked MCB are not given free movement by the Directive, although subsequent European legislation indicates that this should be allowed except for certain stated reasons[8].

4 Technical Requirements

4.1. The technical requirements are contained in Annex I of the Directive which commences with the definition of terms relating to the capacity of the MCB at a standard temperature of 20 °C. The technical requirements are[9]:

- the Nominal Capacity, V_n, is the volume which is marked on the bottle. It is the volume of liquid which the MCB is deemed to contain when it is filled in the conditions of use for which it is intended,
- the Brim Capacity of a bottle, is the volume of liquid it contains when filled to the brim, and
- the Actual Capacity of a bottle, is the volume of liquid it in fact contains when it is filled exactly under the conditions corresponding theoretically to the Nominal Capacity.

4.2. The Directive recognises that there are two methods of filling bottles, which are[10]:

- filling to a constant level, where liquid is introduced and the MCB is filled up to the stated fill height, and
- filling to a constant vacuity, where the MCB is filled to the brim and then a specific quantity is removed.

4.3. The Directive goes on to require[11] that the manufacture of the MCB should be such to ensure that the distance between the theoretical filling level for the Nominal Capacity and the brim level and the difference between the Brim Capacity and Nominal Capacity, shall be perceptibly constant for all MCB of the same type, that is for all MCB made to the same design.

4.4. It is recognised that there will be variations in manufacture and there is a need for sufficient accuracy in order to meet the Directive 76/211/EEC requirements for prepackages, so the Directive specifies the maximum permissible errors (both positive and negative)[12]. These errors are seen in Table 1.

[7] Directive 75/107/EEC, Article 3.
[8] For instance Regulation (EC) 764/2008 relating to the application of certain national technical rules to products lawfully marketed in another Member State.
[9] Directive 75/107/EEC, Annex I, 1.
[10] Directive 75/107/EEC, Annex I, 2.
[11] Directive 75/107/EEC, Annex I, 2, last paragraph.
[12] Directive 75/107/EEC, Annex I 3.

Note that the maximum permissible errors given in Table 1 are not valid for a single MCB, but are used to calculate T_s and T_i[13] when carrying out a reference test according to Annex II of the Directive.

Table 1: Maximum Permissible Errors

Nominal Capacity, V_n, in millilitres				Maximum permissible errors	
				as a % of V_n	in millilitres
from	50	to	100	-	3
from	100	to	200	3	-
from	200	to	300	-	6
from	300	to	500	2	-
from	500	to	1 000	-	10
from	1 000	to	5 000	1	-

4.5. The Directive states in Annex I, 3, last paragraph, that the systematic exploitation of tolerances shall be prohibited. WELMEC WG 6 recommends, that if the regular checks show an average volume of the MCB that differ from the Nominal Capacity of the MCB, the manufacturer shall (if possible) take the necessary measures to bring the production closer to the Nominal Capacity of the bottle.

It is good practice for the manufacturer to inform the packer about the average capacity of each batch of MCB, especially when it is not possible to take the necessary measures suggested above.

4.6. The practical determination of the Actual Capacity of the MCB can be made by[14]:

- measuring the quantity of water at 20 °C which the MCB actually contains when filled to the level theoretically corresponding to the Nominal Capacity, or
- a method of equivalent accuracy.

4.7. The latter would permit weighing the quantity of a liquid of known density needed to fill the MCB to the required level, and determining the volume by dividing this weight by the density, using equipment of appropriate accuracy. See WELMEC document 6.9 “Pre-packages – Uncertainty of Measurement” for assessing the suitability of equipment.

[13] Directive 75/107/EEC, Annex II, 3.
[14] Directive 75/107/EEC, Annex I, 4.

5 Approval of Marks

5.1. In order that the manufacturer of an MCB can be easily identified, the Directive requires[15] that:

- every manufacturer of MCB shall submit for approval by the Competent Department, a mark by which he can be identified. The form of this mark is for the manufacturer to decide.
- once the Competent Department has given its approval it shall inform the other Competent Departments in other Member States and the Commission thereof within a month.

5.2. It would seem that marks may not be approved, grounds for refusing approval include that:

- it is similar to another approved mark, or
- it may get confused with other legal marks or registered marks, such as the 'e' mark or a company registered trade mark.

5.3. The Directive does not specify how the Competent Department shall inform each other and the Commission of the marks. This may have been accomplished in the past using post, fax or e-mail.

5.4. The recommended method is to place the marks and information on a website and ensure all Competent Departments are aware of the site. This latter method enables each Competent Department to maintain its own list up to date and have access to all other approved marks.

6 Indications

Each MCB shall bear the following indelible, easily legible and visible indications[16]:

6.1. On its side, on the bottom rim or on the bottom (base) of the MCB:

- an indication of its Nominal Capacity in litres, centilitres or millilitres in figures at least the height shown in Table 2,
- the figures shall be followed by the symbol for the unit of measurement used that is ml, cl or l. It is recommended that this has the same height as the figures,
- the manufacturer's approved identity mark, and
- the '3' mark, being at least 3 mm high[17]. An example of the '3' mark is shown in Annex 1.

Table 2: Minimum Height of Nominal Capacity

Nominal Capacity	Minimum height (mm)
Not more than 200 ml	3
More than 200 ml and not more than 1 000 ml	4
Greater than 1 000 ml	6

[15] Directive 75/107/EEC, Annex I, 5.
[16] Directive 75/107/EEC, Annex I, 8.1.
[17] Directive 75/107/EEC, Annex I, 5.

6.2. On the bottom or on the bottom rim, in such a manner as to avoid confusion with the above indications, and in figures of the same minimum height as those expressing the corresponding Nominal Capacity, according to the method of filling intended for the MCB[18]:

- an indication of the distance in millimetres from the brim level to the filling level corresponding to the Nominal Capacity (sometimes referred to as the fill height), followed by the symbol mm. (an example is seen in Figure 1), and/or
- an indication of the Brim Capacity expressed in centilitres and **NOT** followed by the symbol cl (an example is seen in Figure 2).

6.3. Other indications may appear on the MCB provided that they do not give rise to confusion with the compulsory indications. It is normal for the pattern identity and mould number to also appear on the MCB.

6.4. When the figures indicating the Nominal Capacity is larger than those stated in Table 2, the fill height indication also has to be in the same larger height.

Figure 1: An example of fill height indications

- Nominal Capacity,	75 cl
- the approved identity mark,	modified circle
- the reversed epsilon, not as prescribed,	3
- the fill height,	30 mm

[18] Directive 75/107/EEC, Annex I, 8.2.

Figure 2: An example of Brim Capacity indications

- Nominal Capacity,	50 cl
- the approved identity mark,	3 lobed shaped
- the reversed epsilon, not as prescribed,	3
- the Brim Capacity (in cl),	52

7 Responsibilities

Manufacturer

7.1. By applying the '3' mark to an MCB the manufacturer is certifying that the bottle meets all the requirements of the Directive.

The Directive does not specify how the manufacturer should ensure that the Nominal Capacities are within the permitted errors. Generally moulds increase in size as they wear, and a manufacturer needs to have a suitable system in place to ensure that the Directive's accuracy requirements are met.

7.2. It is recommended that regular checks are carried out on Actual Capacities of MCB manufactured, and that records of these checks are kept. See reference to "records recorded on the manufacturers' check-card"[19].

An example of manufacture's checks is seen in Annex 2.

Competent Departments

7.3. Competent Departments are responsible for:

a) approving marks,
b) notifying other Competent Departments and the Commission of the marks that have been approved, and
c) checking that MCB comply with the provisions of the Directive.

7.4. Clearly there must be a Competent Department in each Member State responsible for approving marks. The method of submitting marks for approval and for approving and notifying marks will be dependent on national requirements.

7.5. The Competent Department responsible for checking compliance with the Directive may be different to that which approves the mark. It may be a government body or contracted to a non-government body. In either case it is recommended that the results of all checks (Annex II of the Directive and any other checks carried out by Competent Departments permitted by Annex I, 7 of the Directive) are forwarded to the market surveillance authority so that appropriate market surveillance programmes[20] can be developed, and copied to the National Metrological Institute.

7.6. There is nothing in the Directive to indicate that a manufacturer outside the Community cannot have their mark approved. It is recommended that this is accomplished by the Member State where the MCB will be imported for use in the Community.

7.7. The checks required by Annex I, 6 of the Directive shall be carried out on the premises of[21]:

- the place of the manufacturer, or, if this is not practical,
- on the premises of the importer or his agent established within the Community.

7.8. The statistical check shall[22] be carried out in accordance with the accepted methods of quality acceptance inspection. Its effectiveness shall be comparable to that of the reference method specified in Annex II of the Directive.

[19] Directive 75/107/EEC, Annex II, 1, Paragraph 2.
[20] Regulation (EC) 765/2008, Chapter III.
[21] Directive 75/107/EEC, Annex I, 6.

Other methods of test are permitted as long as they have the same effectiveness.

7.9. The Directive states[23] "This Directive shall not preclude any checks that may be carried out by the Competent Departments of the Member States in the course of trade". This permits Competent Departments to carry out any other checks on any premises other than those of the manufacturer or importer.

7.10. This would permit additional checks on the compliance of MCB with the provisions of the Directive to be carried out. These checks include:

- checks on the premises of packers or importers of prepackages that use MCB,
- checks on the compliance of markings, and
- identification of MCB not bearing an approved manufacturer's mark.

Checks on the Actual Capacity of a bottle can be carried out but, similar to market controls on prepackages (see WELMEC document 6.7 "Guide for Market Control on Prepackages for Competent Departments"), it is unlikely to have a sufficiently large batch available to make a meaningful check using the reference method (see Section 8).

8 Reference Method[24]

Sampling

8.1. The sample shall be drawn from a batch corresponding to an hour's production, in principle. It is possible to carry out the checks:

- at the end of the production line, although the temperature of the MCB and the speed of the line need to be considered, or
- from the warehouse, although sampling the MCB may be problematical.

Which ever method is used, a random sample should be taken.

8.2. Should the test on a sample be unsatisfactory, the Directive permits, but does not make it mandatory for, a second test to be carried out either[25]:

a) on another sample from a batch corresponding to a longer period, or
b) where the production has been subject to a check recognized by the Competent Departments of the Member State, on the results recorded on the manufacturers' check-cards.

Capacity Measurement

8.3. The method is specified[26] as:

a) the MCB (empty) shall be weighed,
b) the MCB shall be filled with water at 20 °C of a known density, up to the filling level appropriate to the method of checking used (fill height or Brim Capacity), and
c) the filled MCB shall be weighed.

[22] Directive 75/107/EEC, Annex I, 6.
[23] Directive 75/107/EEC, Annex I, 7.
[24] Directive 75/107/EEC, Annex II.
[25] Directive 75/107/EEC, Annex II, 1.
[26] Directive 75/107/EEC, Annex II, 2.

8.4. The check shall be carried out by means of a legal measuring instrument, suitable for effecting the necessary operations[27]. What is 'legal' will depend on national legislation.

8.5. Error in measuring the capacity shall not be greater than one-fifth of the maximum permissible error (mpe) corresponding to the Nominal Capacity of the MCB[28]. It is recommended that 0.2 mpe error is taken as being the uncertainty of measurement at the 95 % confidence level. WELMEC document 6.9 "Prepackages - Uncertainty of Measurement" can assist in estimating the uncertainty of measurement.

Sample Size

8.6. There are two methods of checking compliance, each with a different sample size[29]:

a) the standard deviation method, using a sample size of 35, and
b) the average range method, using a sample size of 40.

8.7. With modern technology and the use of spreadsheets, there seems little benefit in using the average range method. The standard deviation method is likely to take less time in carrying out the check.

[27] Directive 75/107/EEC, Annex II, 2.
[28] Directive 75/107/EEC, Annex II, 2.
[29] Directive 75/107/EEC, Annex II, 3.

9 Use of MCB in Making up Prepackages

9.1. Directive 76/211/EEC requires[30] that MCB are 'of the type defined in the Directive relating thereto[31], filled under the conditions prescribed in that Directive and herein'. MCB only relate to capacities of 50 ml to 5 l. The conditions relate to the volume being at 20 °C and that the 3 packers' rules[32] are met. The uncertainty of measurement, from both the error permitted on the MCB and the measurement of the liquid level should be taken into account when establishing the appropriate fill height and control limits.

9.2. Unless other means of controlling the contents are employed, MCB can only be used for monitoring content fill if they are used with a height measuring device such as a templet. An example of a templet is shown in Annex 4. The templet should bear the following inscriptions:

- identity mark,
- identity of MCB for which it is to be used,
- the nominal quantity being packed,
- graduations to permit the determination of fill quantity errors,
- the operational temperature of the liquid, and if that temperature is not 20 °C, a description of the liquid and the apparent thermal coefficient of cubical expansion[33] by reference to which the templet has been graduated, and
- if it is to be used over a closure a statement to that effect and the identity of the closure.

9.3. The templet should either be graduated in millilitres or in millimetres. In the latter instance a conversion chart should be available so that actual volume errors in the liquid fill can be determined and so the records can show that the 3 packers' rules have been meet.

9.4. When setting the target fill volume, the packer should take into account the following:

- variation in the filling process,
- variation in the MCB, and
- possible error in determining the fill height using the templet.

9.5. For the MCB to be suitable, for the portion of the templet scale between TU2 and the fill height, 1 mm difference in liquid height should correspond to at least one-fifth of the TNE. Also in this range the meniscus should be clearly visible and there should be no distortion.

10 Certification of a Templet

10.1. Because of the variation in thickness of the material, of which the MCB are made, in the relevant part of the neck, templets should be calibrated by reference to MCB conforming

[30] Directive 76/211/EEC, Annex I, 4.
[31] Directive 75/107/EEC.
[32] Directive 76/211/EEC, Annex I, 1.
[33] That is the thermal coefficient of cubical expansion of the liquid minus the thermal coefficient of cubical expansion of the material of the MCB.

close to the average design specification. The calibration procedure consists of the following:

a) Establish a calibration curve or equivalent tabulation relating to liquid levels with differences, expressed in millilitres at the intended operational temperature, from the scale mark corresponding to the nominal volume, in respect of the pattern of MCB in question. This 'master' calibration function must be established by means of experimental measurements on not less than 10 MCB, which have been selected as being as close as practicable to the average design height, diameter (or breadth) and capacity at the nominal fill level.

b) Templets should be constructed in accordance with the master calibration curve or tabulated function as described in a) above, against which they must be verified by testing the scale marks by linear measurements, at three or more points relative to the brim or closure seating, that is the nominal volume scale mark and the two extreme scale marks. The maximum error of position allowed is ±0.5 mm.

c) The MCB is filled with water at 20 °C to the fill level marked on it. The level is adjusted by reference to a depth gauge and should be measured centrally, inside the bottle, to the point where the end of the depth gauge just, and only just, touches the surface of the water.

d) Where the templet is to be used at 20 °C, it is then placed in position either on the naked brim or on a suitable uniform closure, depending on which method is to be used, and the nominal volume scale mark viewed horizontally against the bottom of the water meniscus. The maximum error allowed is ±0.5 mm.

e) Where the templet is marked with an operational temperature other than 20 °C, the procedure in d) above is modified as follows as the position of the nominal volume scale mark will have been appropriately adjusted using the apparent thermal coefficient of cubical expansion for the liquid:

   i) for an operational temperature below 20 °C the numerically smaller limiting value of the coefficient should be used,
   ii) for an operational temperature above 20 °C the numerically larger coefficient should be used, and
   iii) after the MCB is filled as in c) above, water is inserted or extracted equal in volume to the amount by which the nominal volume of the liquid, with which the templet is intended to be used, would have increased or decreased in volume respectively if its temperature were to change from 20 °C. The nominal volume scale mark is checked (over a closure if specified), a maximum error of ±0.5 mm is allowed.

10.2. Where the templet is being used over a closure, the component of variability of the measurement of the fill level attributable entirely to it should not exceed ±1 mm and must be taken into account in establishing the target quantity. To determine the variability take at least 10 normally filled and closed MCB from the line and measure on each the distance from the bottom on the MCB to the top of the closure, remove the closure and determine the distance from the bottom of the MCB to the brim. Subtract for each bottle the second from the first to determine the increase in height attributable to the closure. The average of these heights gives the distance, the nominal volume scale mark should have been adjusted from the fill height marked on the MCB, and the standard deviation of

these differences will give the component of variability due to the closure assuming the MCB has uniform height.

11 Example: MCB and Templet Control

11.1. With information from the producer about the bottles

A packer is packing bottles of drink with a nominal quantity (Q_n) of 200 ml in an MCB with a neck diameter of 25 mm at the fill height. The filling process has a standard deviation of 5 ml and TNE is 9 ml.
Information from the producer of the bottles states that the average volume of the bottles is 200.3 ml and the standard deviation is 1.0 ml.

The cross sectional area of the MCB at the fill height is:

$$\pi \times r^2 = 3.14 \times 1.25^2 = 4.91 \text{ cm}^2$$

Therefore 1 mm change in liquid height is equivalent to 0.49 ml.

Table 3: Uncertainties of measurement

Element	Value	Divisor (distribution)	Multiplier (sensitivity)	Std. uncertainty (ml)
MCB	4[34] × 1 ml = 4 ml	2	1	2
Templet error	0.5 mm = 0.245 ml	√3	1.3	0.18
Reading error	0.5 mm = 0.245 ml	√3	1.3	0.18

Since the uncertainty from the MCB is dominant (more than 10 times the contribution from the templet) normally only the uncertainty from the MCB is used. But in this example we will show the calculation:

$$\text{Uncertainty} = \sqrt{2^2 + 0.18^2 + 0.18^2} = 2.02 \text{ ml}$$

Combining this with the filling variation gives an overall variation of:

$$\sqrt{2.02^2 + 5^2} = 5.39 \text{ ml}$$

The target quantity needs to be the greater of:

$Q_n + K = 200 + (-0.3) = 199.7$ ml
TU1 + 2s + K = 191 + 2 × 5.39 + (-0.3) = 201.5 ml
TU2 + 3.72s + K = 182 + 3.72 × 5.39 + (-0.3) = 201.8 ml

$K = Q_n$ – average volume of bottles = 200.0 – 200.3 = -0.3 ml

The target quantity is then 201.8 ml.

It is assumed that more than 50 items are checked within a production period, otherwise a sampling allowance (using z-factor) would also be required.

[34] 4s is used to cover 99.9% of the batch statistically.

11.2. Without information from the producer about the bottles

If the packer does not have access to reliable information about the average volume and the standard deviation of the bottles used, then the 'Value' for the MCB in Table 3 above should be changed to the tolerance for the specific bottle size from the Directive[35].

If the tolerance is changed to the corresponding value for a 200 ml MCB (6 ml) in the example above, then the calculation is:

Table 4: Uncertainties of measurement

Element	Value	Divisor (distribution)	Multiplier (sensitivity)	Std. uncertainty (ml)
MCB	6 ml	2	1	3
Templet error	0.5 mm = 0.245 ml	$\sqrt{3}$	1.3	0.18
Reading error	0.5 mm = 0.245 ml	$\sqrt{3}$	1.3	0.18

Since the uncertainty from the MCB is dominant (more than 10 times the contribution from the templet) normally only the uncertainty from the MCB is used. But in this example we will show the calculation:

$$\text{Uncertainty} = \sqrt{3^2 + 0.18^2 + 0.18^2} = 3.01 \text{ ml}$$

Combining this with the filling variation gives an overall variation of:

$$\sqrt{3.01^2 + 5^2} = 5.84 \text{ ml}$$

The target quantity needs to be the greater of:

$Q_n + K = 200 + (0) = 200.0$ ml
TU1 + 2s + K = 191 + 2 × 5.84 + (0) = 202.68 ml
TU2 + 3.72s + K = 182 + 3.72 × 5.84 + (0) = 203.7 ml

$K = Q_n$ – average volume of bottles = 200.0 – 200.0 = 0 ml

The target quantity is then 203.7 ml.

It is assumed that more than 50 items are checked within a production period, otherwise a sampling allowance (using z-factor) would also be required.

[35] Directive 75/107/EEC, Annex I, 3.

Annex 1 The Reversed Epsilon Mark

From Directive 71/316/EEC, Annex I:

6.3. **Sign of exemption from EEC pattern approval**

Example: 

Annex 2 Example of Manufacturer's Checks

At production start and at the end:

One sample is taken comprising one bottle from each mould in the machine.

The volume of each bottle is measured, and it is checked that the requirements of the Directive is fulfilled.

During the production:

For every 48 hours (2 days) of production one sample is taken comprising at least 1/3 of the moulds in the machine.

The volume of each bottle is measured and it is checked that the requirements of the Directive is fulfilled.

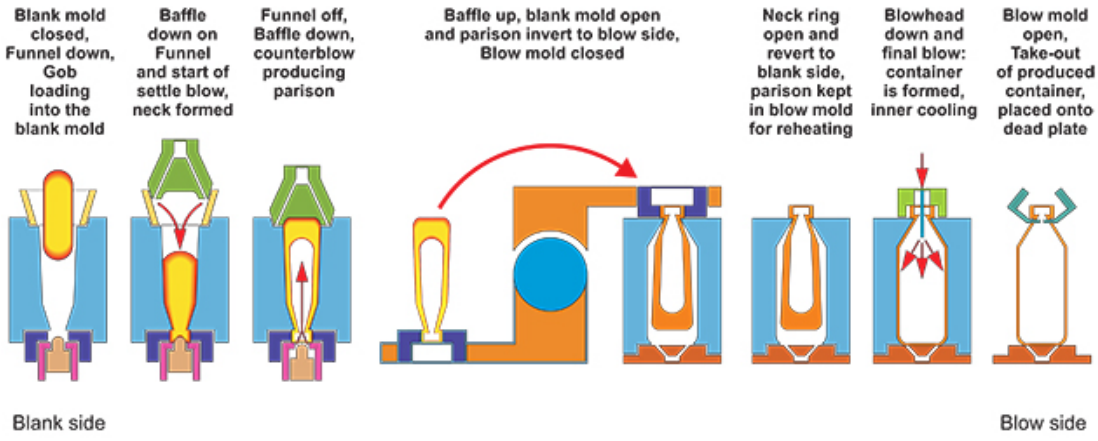
Annex 3 Methods of Manufacture

It is possible to adjust the amount of glass in the gob by ±1 gram when using the methods blow/blow and pressure/blow.

When using the method narrow neck pressure blow the amount can't be adjusted.

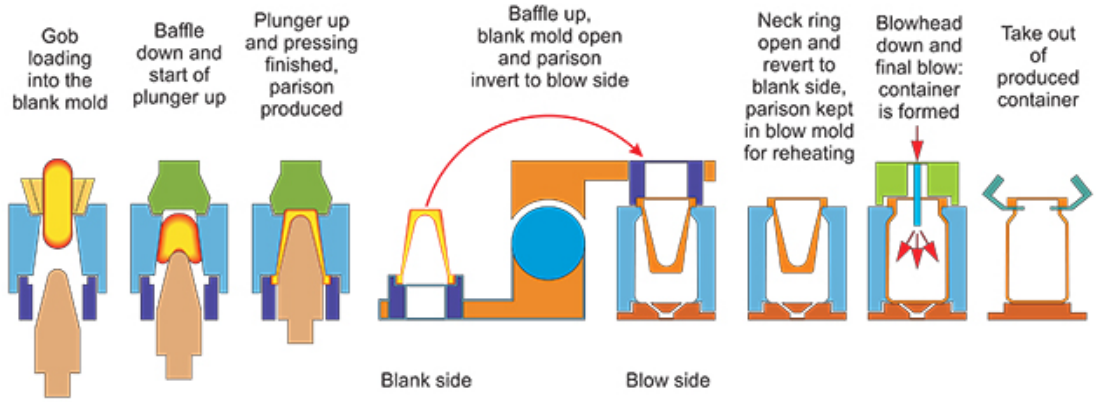
Blow and Blow Process

- In the Blow and Blow process, compressed air blows a cavity into the molten gob in the blank mold of the forming machine thereby creating a preform shape known as a parison.
- From there the parison is transferred to the blow mold where compressed air is used to blow the bottle into its final shape.



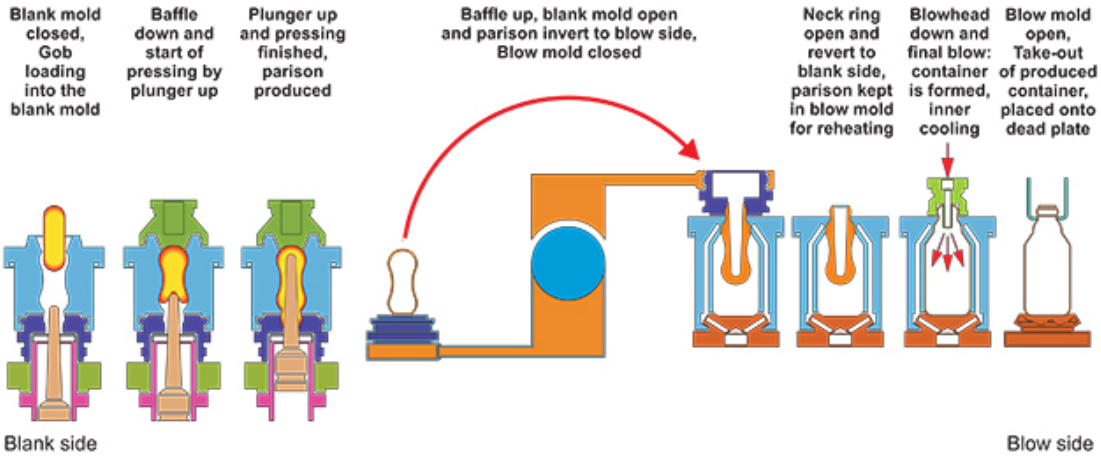
Wide Mouth Press and Blow Process

- In the Wide Mouth Press and Blow process, a metal plunger is used to press the cavity into the gob to create the parison in the blank mold.
- The parison is then inverted and compressed air blows the container into its final shape. This process is used to manufacture containers with wide finish diameters (38mm and larger).

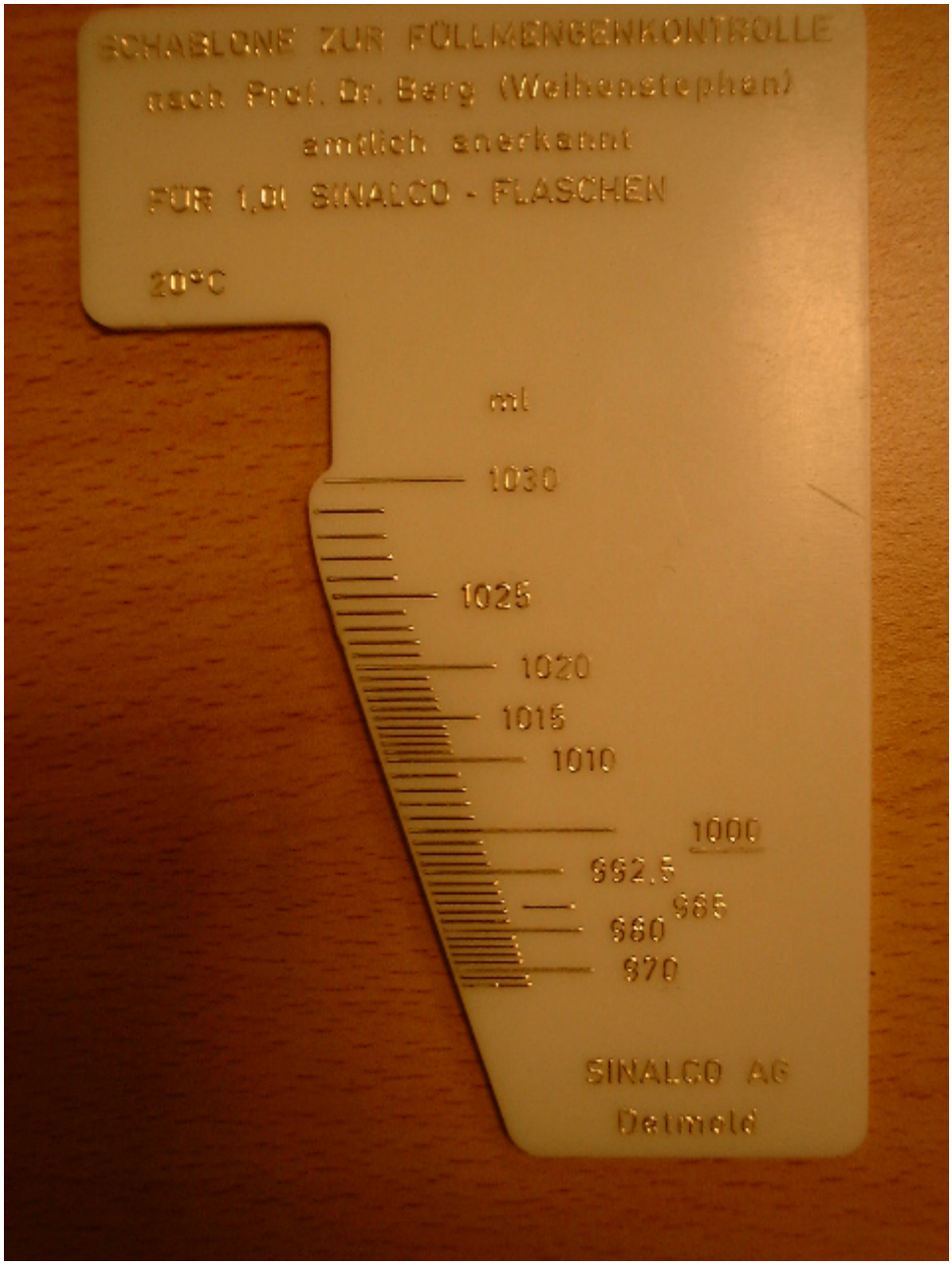


Narrow Neck Press and Blow Process

- The Narrow Neck Press and Blow process is similar to the wide mouth press and blow except the metal plunger in the blank mold is much smaller in diameter. This process is used to manufacture containers with narrow finish diameters (38mm and smaller).
- The introduction of this process has enabled glass manufacturers to increase overall productivity and reduce weight and variations in the thickness distribution of beer and beverage bottles.



Annex 4 Example of a templet used for monitoring the volume of product in an MCB



Annex 5 Competent Departments Contact Details

Correct as at January 2013

Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
AT/ Austria	Bundesamt für Eich- und Vermessungswe-sen att: Ludwig Turnwald	Gruppe A, Schiffamtsgasse 1-3 A-1020 Wien Austria	+43-1 21 1103700	+43-1 21 1103623	ludwig.turnwald@bev.gv.at
BE/ Belgium	Federal Public Service Economy, SMEs, Self- employed and En-ergy, Directorate General Quality and Safety, Regulation and Control policy, Metrology, att: Mr. Antoon Malfrere	Koning Albert II-laan 16, B-1000 Brussel Belgium	+32 2 277 71 00	+32 2 277 54 37	antoon.malfrere@economie.fgov.be www.economie.fgov.be
BG/ Bulgaria	State Agency for Metrological and Technical Surveillance – Directorate General “Metro-logical supervision”, att: Mrs. Pavleta Hristova Mrs. Tanya Tsankova	52A, G M Dimitrov Blvd. 1797 Sofia Bulgaria	+359 2 987 92 29	+359 2 939 67 01	Pavleta.Hristova@damtn.government.bg Tanya.Tsankova@damtn.government.bg www.damtn.government.bg
HR / Republic of Croatia	State Office for Metrology (DZM) att: Gordana Vivoda	Ulica grada Vukovara 78 10000 Zagreb Croatia	+385 1 610 63 20	+385 1 610 93 20	gordana.vivoda@dzm.hr www.dzm.hr
CZ / Czech Republic	Czech Metrological Institute att: Mr. Ivan Kriz	Okruzni 31 63800 Brno Czech Republic	+420 545 555 230	+420 545 555 183	IKriz@cmi.cz info@cmi.cz www.cmi.cz

Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
DK/ Denmark	Danish Safety Technolology Authority att: Ms Hanne Scherrebeck	Nørregade 63 DK-6700 Esbjerg Denmark	+ 45 33 73 21 09	+ 45 33 73 20 99	hsc@sik.dk www.sik.dk
EE (EST) / Republic of Estonia	Estonian Technical Surveillance Authority, att: Priit Poschlin;	Sõle 24a, 10614 Tallinn, Estonia	+372 667 2000	+372 667 2001	metro@tja.ee www.tja.ee
FI/ Finland	Tukes, Finnish Safety and Chemicals Agency Att: Tuomo Valkeapää	Opastinsilta 12B PBox 66 FI-00521 HELSINKI, Finland	+358 29 50 52 241	+358 9 605 474	tuomo.valkeapaa@tukes.fi www.tukes.fi
FR/ France	Ministère du redressement productif Bureau de la Métrologie att: Mr C.Bigou	Bâtiment 4 Siéyès 61, boulevard Vincent Auriol, 75703 Paris cedex 13 France	+33(0)144970955	+33(0)144970965	christophe.bigou@finances.gouv.fr www.dgcis.redressement-productif.gouv.fr/metrologie
DE/ Germany					
GR/ Greece	Ministry of Economy, Competiveness & Seafaring, Directorate of Metrology, att: A Dessis	Canning Square, GR-10181 Athens Greece	+302 10 383 7438	+302 10 330 1789	legmetro@gge.gr
HU/ Hungary	Hungary Trade Licensing Office att: Ms Csilla Vamossy	H – 1535 Budapest Pf 919 Hungary	+36 1 4585-947	+36 1 4585-927	vamossycs@mkeh.gov.hu

Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
IS/ Iceland	Neytendstofa att: Bjarni Bentsson	Borgartún 21, 105 Reykjavik Iceland	+354-510 1100	+354-510 1101	bjarni@neytendastofa.is www.neytendastofa.is
IE/ Ireland	NSAI att: Mairéad Buckley	1 Swift Square Northwood Santry Dublin 9	+353 1 807 3813	+353 1 807 3808	info@nsai.ie www.nsai.ie
IT/ Italy					
LV/ Latvia	Consumer Rights Protection Centre of the Republic of Latvia att: Mrs. Inese Velina	157, Kr.Valdemara St. Riga, LV-1013, Latvia	+371 673 39 883	+371 673 88 634	Inese.Velina @ptac.gov.lv www.ptac.gov.lv
LT/ Lithuania	State metrology service att: Mrs. Krukoniene	Algirdo 31, LT 03219 Vilnius Lithuania	+370 5 213 33 79	+370 5 216 34 69	info@lvmt.lt
LU/ Luxemburg	ILNAS – Service de Métrologie légale att: Mr.John Kirchen	rue J.F. Kennedy, L-7327 Steinsel Luxemburg	+352 33 55 07	+352 33 55 03	john.kirchen@ilnas.etat.lu
MT/ Malta	National Metrology Services att: Ing. Joseph Bartolo	Kordin Business Incubation Certre Kordin PLA 08 3000 - Malta	+356 21 661 794 +356 23 980 177	+356 23 980 178	joseph-anthony.bartolo@msa.org.mt www.ms.org.mt

Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
NL/ Netherlands	NMi-Certin B.V. att: Jeroen Rommerts	Hugo de Grootstraat 1 3314 EG Dordrecht Netherlands	+31 78 633 23 32	+31 78 633 2309	jrommerts@nmi.nl
NO/ Norway	Justervesenet att: Fride Overrein Susegg	Fetveien 99, 2007 Kjeller Norway	+47 64 84 84 84	+47 64 84 84 85	fos@justervesenet.no www.lovdata.no
PL/ Poland	Central Office of Measures att: Mr. Andrzej Czechowski	Ul. Elektoralna 2, P.O. Box P-10 PL 00-950 Warszawa Poland	+48 22 581 95 04	+48 22 620 76 97	towpacz@gum.gov.pl
PT/ Portugal	Director do Servico de Metrología Legal - Instituto Português da Qualidade att: Mr Filipe Pinto Machado	R.C. à Avenida dos Três Vales, 2825 Monte da Caparica Portugal	+351 21 294 8174	+351 21 294 8188	pmachado@mail.ipq.pt
RO/ Romania	Romanian Bureau for Legal Metrology att: Mr. Corneliu Dragomir	Şos. Vitan-Bârzeşti 11, sector 4, 042122 Bucharest Romania	+40 1 332 11 17	+40 1 332 06 15	dragomircorneliu@brml.ro www.brml.ro
SK/ Slovak Republic	Slovak Office of Standards, Metrology and Testing att: Mr. Peter Obdržálek	Štefanovičova 3 P.O.Box 76 810 05 Bratislava Slovak Republic	+421 2 5249 1147	+421 2 5249 7887	metrology@normoff.gov.sk peter.obdrzalek@normoff.gov.sk
SI/ Slovenia	Ministry of Economic Development and Technology - Metrology Institute of the Republic of Slovenia (MIRS) att: Mojca Požar	Grudnovo nabrežje 17, SI-1000 Ljubljana Slovenia	+386 1 244 2700	+386 1 244 2714	mojca.pozar@gov.si

Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
ES/ Spain	Centro Español de Metrologia att: Mr José Luis Manchado att: Ms Belén Martin	C/del Alfar, 2 28760 - TRES CANTOS(Madrid) Spain	+34 91 807 47 06 +34 91 807 47 41	+34 91 807 48 07 +34 91 807 48 07	jlmanchado@cem.minetur.es bmblasco@cem.minetur.es
SE/ Sweden	Swedish Board for Accreditation and Conformity Assessment (SWEDAC) att: Kari Björkqvist	Box 2231, S-10315, Stockholm Sweden	+46 84 06 83 04	+46 87 91 89 29	kari.bjorkqvist@swedac.se
CH/ Switzerland	Federal Office of Metrology METAS Att: Hans-Peter Vaterlaus	Lindenweg 50 CH-3084 Wabern Switzerland	+41 31 323 3304	+41 31 32 33 210	hans-peter.vaterlaus@metas.ch www.metas.ch
GB/ United Kingdom	National Measurement Office, (for mark approval) att: Paul Cole Local Government Authorities (for compliance checks) att: Howard Burnett	Stanton Avenue, Teddington TW11 0JZ Inchmurrin High Street Wookey BA5 1JZ	+44 208 943 7272 +44 1749 67 3741	+44 208 943 7270	Paul.Cole@nmo.gov.uk ask@howardburnett.com www.opsi.gov.uk/stat.htm

Associate Members Code Country	Authority Name Contact Name	Address	Phone number	Fax number	e-mail & Internet address for legislation
AL / Albania					
BA/ Bosnia and Herzego-vina	Institute of Metrology of B&A att: Asim Alikadić	Dolina 6, 71000 Sarajevo Bosnia & Herzegovina	+387 33 561 462	+387 33 714 711	asim.alikadic@met.gov.ba
MK / FYROM					
YU / Montenegro	Bureau of Metrology att: Tamara Boskovic	Vasa Raickovica 18 81000 Podgorica Montenegro	+382 20 238 230	+382 20 238 240	tamara_boskovic@yahoo.com
RS / Serbia					
TR / Turkey	Ministry of Science, Industry & Technology, DG for Metrology & Standardization Pre-packaged Section att: Mehmet TETİK-Ömer KUSMEZ	GMK Bulvari No: 128 Kat: 2 Maltepe, ANKARA Turkey	+90 312 231 7280/1252-1284	+90312 231 1694	mehmett@sanayi.gov.tr omer.kusmez@sanayi.gov.tr