

BS EN 15904:2010



BSI Standards Publication

Glass packaging — Standard tolerances for flaconnage

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale



National foreword

This British Standard is the UK implementation of EN 15904:2010.

The UK participation in its preparation was entrusted to Technical Committee PKW/0/-/7, Packaging - Glass.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2010

ISBN 978 0 580 65727 6

ICS 55.100

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2010.

Amendments issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15904

October 2010

ICS 55.100

English Version

Glass packaging - Standard tolerances for flaconnage

Emballages en verre - Tolérances standard pour
flaconnage

Verpackungen aus Glas - Standardgrenzabweichungen für
Flakons

This European Standard was approved by CEN on 5 May 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2010 CEN All rights of exploitation in any form and by any means reserved
worldwide for CEN national Members.

Ref. No. EN 15904:2010: E

Contents

Page

Foreword.....	3
Introduction.....	4
1 Scope	5
2 Product group bottles and other glass containers	5
3 Brimful capacity tolerances.....	5
4 Height tolerances.....	7
5 Diameter and width tolerances.....	8
6 Verticality tolerances.....	11
Bibliography.....	13

Foreword

This document (EN 15904:2010) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This document is based on CE.T.I.E. (International Technical Centre for Bottling and related Packaging) data sheet DT15.00 series.

Efficient packaging is of great importance for the distribution and the protection of goods. Insufficient or inappropriate packaging can lead to damage or wastage of the contents of the pack.

1 Scope

This European Standard specifies the tolerances for the bottles intended to be used for pharmaceutical products, cosmetic and perfumery products and chemical products.

The following tolerances are concerned:

- brimful capacity;
- height;
- diameter and width;
- verticality.

The following types of bottles are excluded from this standard:

- “miniatures”;
- small bottles for extracts, essences, etc.;
- small jars (e.g. individual portions of jam).

2 Product group bottles and other glass containers

Three groups of bottles have been identified:

1) Flacons for pharmaceutical purpose and medicine bottles of all kinds

This group includes, for example, injection containers, drop bottles, infusion bottles, cough syrup bottles and other bottles and jars (ointment jars) used for pharmaceutical products.

2) Flacons for cosmetic

This group includes all bottles and similar containers used for cosmetic products, e.g. nail varnish, hair tonic, perfume and also cream jars.

3) Flacons for techno-chemical purposes

This group includes, for example, bottles for ink, varnish, glue, heavy chemicals, furniture polish stain remover, pest destruction agents and denatured alcohol.

3 Brimful capacity tolerances

The brimful capacity tolerances shall be as given in Table 1.

Table 1 — Brimful capacity tolerances

Brimful capacity		Tolerances		Brimful capacity		Tolerances		Brimful capacity		Tolerances	
C		T_c		C		T_c		C		T_c	
ml		ml		ml		ml		ml		ml	
		±				±				±	
Over	Up to and including	\emptyset	 a	Over	Up to and including	\emptyset	 a	Over	Up to and including	\emptyset	 a
		Round	Non round			Round	Non round			Round	Non round
1	3	0,6	0,7	191	198	3,9	4,7	454	464	7,2	8,6
3	8	0,7	0,8	198	205	4	4,8	464	474	7,3	8,8
8	13	0,8	1	205	211	4,1	4,9	474	484	7,4	8,9
13	18	0,9	1,1	211	218	4,2	5	484	495	7,5	9
18	24	1	1,2	218	225	4,3	5,2	495	507	7,6	9,1
24	30	1,1	1,3	225	232	4,4	5,3	507	519	7,7	9,2
30	36	1,2	1,4	232	239	4,5	5,4	519	530	7,8	9,4
36	41	1,3	1,6	239	246	4,6	5,5	530	541	7,9	9,5
41	47	1,4	1,7	246	253	4,7	5,6	541	554	8	9,6
47	52	1,5	1,8	253	260	4,8	5,8	554	568	8,1	9,7
52	57	1,6	1,9	260	267	4,9	5,9	568	580	8,2	9,8
57	63	1,7	2	267	274	5	6	580	595	8,3	9,9
63	69	1,8	2,2	274	282	5,1	6,1	595	609	8,4	10
69	75	1,9	2,3	282	289	5,2	6,2	609	624	8,5	10,2
75	81	2	2,4	289	297	5,3	6,4	624	640	8,6	10,3
81	86	2,1	2,5	297	305	5,4	6,5	640	655	8,7	10,4
86	92	2,2	2,6	305	313	5,5	6,6	655	673	8,8	10,6
92	98	2,3	2,8	313	321	5,6	6,7	673	691	8,9	10,7
98	104	2,4	2,9	321	329	5,7	6,8	691	712	9	10,8
104	110	2,5	3	329	337	5,8	7	712	736	9,1	10,9
110	116	2,6	3,1	337	345	5,9	7,1	736	760	9,2	11
116	122	2,7	3,2	345	354	6	7,2	760	790	9,3	11,2
122	128	2,8	3,4	354	362	6,1	7,3	790	820	9,4	11,3
	134	2,9	3,5	362	370	6,2	7,4	820	850	9,5	11,4
	140	3	3,6	370	379	6,3	7,6	850	880	9,6	11,5
	146	3,1	3,7	379	388	6,4	7,7	880	910	9,7	11,6
	152	3,2	3,8	388	397	6,5	7,8	910	940	9,8	11,8
	158	3,3	4	397	406	6,6	7,9	940	970	9,9	11,9
	164	3,4	4,1	406	415	6,7	8	970	1050	10	12
164	171	3,5	4,2	415	425	6,8	8,2	a Except special profiles.			
171	178	3,6	4,3	425	435	6,9	8,3				
178	185	3,7	4,4	435	444	7	8,4				
185	191	3,8	4,5	444	454	7,1	8,5				

The tolerance is expressed by the following formula (C = brimful capacity):

For round bottles:

$$T_C = \frac{-C}{2} + \frac{0,9}{10} C$$

$$+ 0,6 C \leq 1\,000\text{ml}: T_C = \frac{5}{100} C$$

$$C > 1\,000\text{ml}: T_C = \frac{C}{100}$$

For non-round bottles:

$$C \leq 1\,000\text{ml}: T_C = \frac{1,2}{10^5} C^2 - \frac{1,9C}{100} + 0,6$$

$$C > 1\,000\text{ml}: T_C = \frac{1,2C}{100}$$

4 Height tolerances

The dimensions of height and the tolerances are given in Table 2.

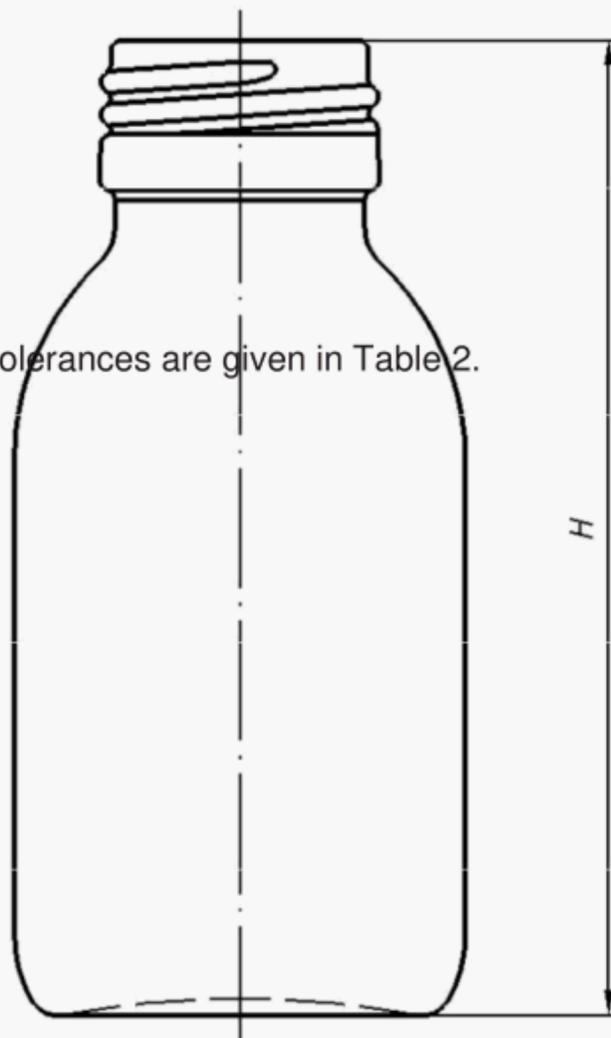


Figure 1 — Height

Table 2 — Height and height tolerances

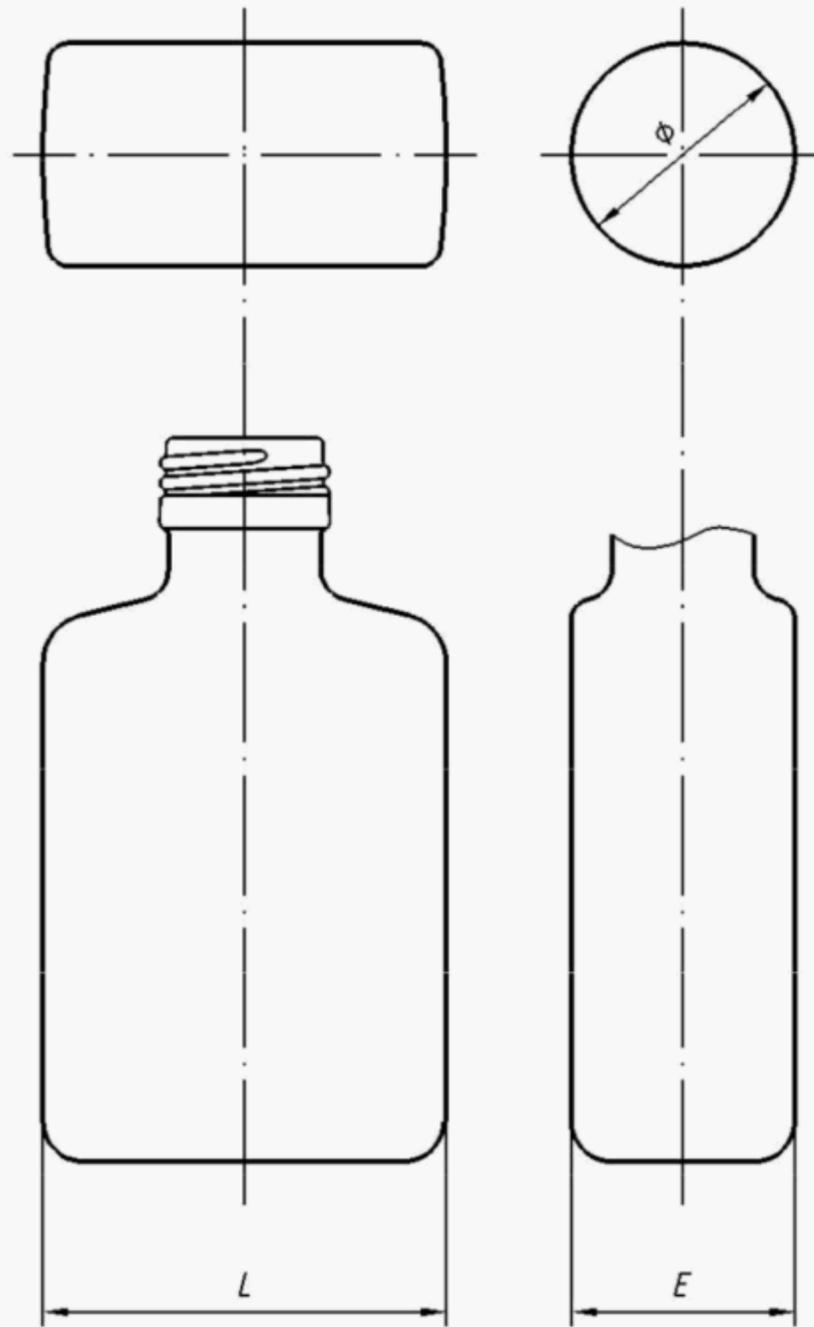
Height H mm		Tolerances <i>Th</i> mm
Over	Up to and including	±
4	35	0,5
35	65	0,6
65	90	0,7
90	115	0,8
115	140	0,9
140	165	1,0
165	190	1,1
190	215	1,2
215	240	1,3
240	265	1,4
265	290	1,5
290	315	1,6
315	340	1,7
340	365	1,8

The tolerance is expressed by the following formula:

$$Th = 0,004 H + 0,4$$

5 Diameter and width tolerances

The dimensions of diameter and width and the tolerances are given in Table 3.



Non-round bottles: Tol. L = Tol. ØD + 0,1

Tolerance E = Tolerance L

Figure 2 — Diameter and width

Table 3 — Diameter tolerances

Diameter		Tolerance
mm		ØD mm
Over	Up to and including	±
	18	0,5
18	30	0,6
30	44	0,7
44	54	0,8
54	60	0,9
60	70	1,0
70	75	1,1
75	82	1,2
82	90	1,3
90	97	1,4
97	105	1,5
105	110	1,6
110	118	1,7
118	125	1,8
125	132	1,9
132	140	2
140	148	2,1
148	155	2,2
155	162	2,3
162	169	2,4
169	175	2,5
175	182	2,6

The tolerance is expressed by the following formula:

For round bottles:

$$E \leq 50 \quad T_e = 0,008E + 0,4$$

$$E > 50 \quad T_e = 0,014E + 0,1$$

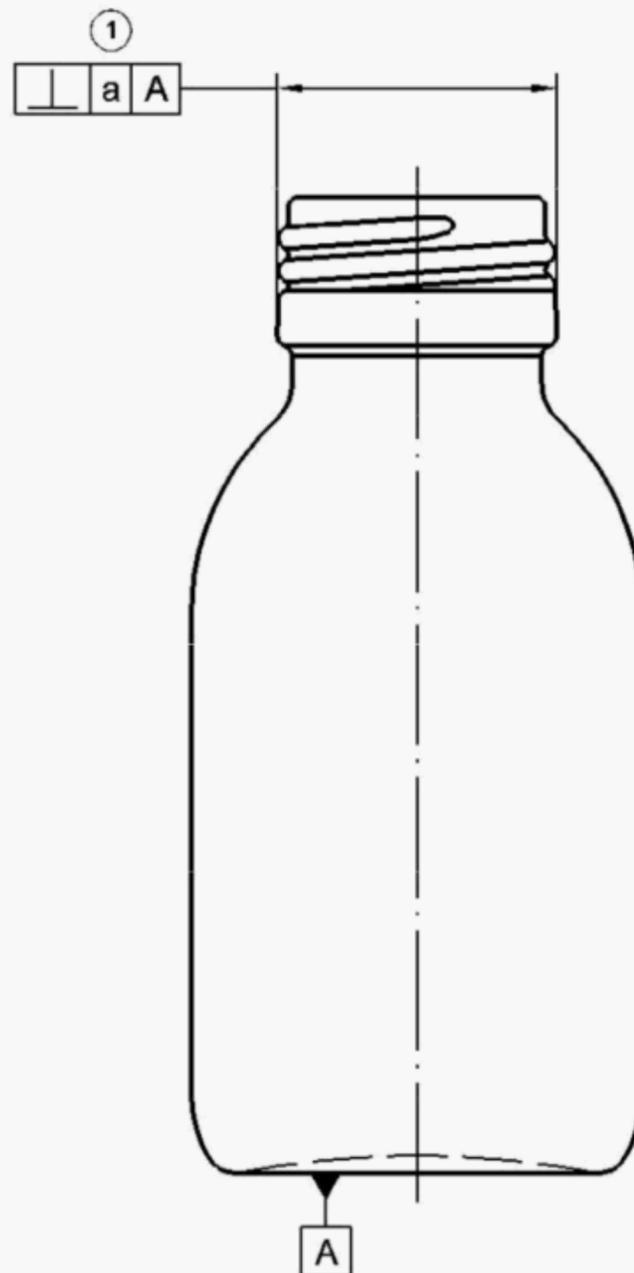
For non-round bottles:

$$L \leq 50 \quad T_l = 0,008L + 0,5$$

$$L > 50 \quad T_l = 0,014L + 0,2$$

6 Verticality tolerances

The dimensions of height and the tolerances are given in Table 4.



Key

- a) Standards EN ISO 1101 – EN 29008

Figure 3 — Verticality

Table 4 — Verticality tolerances

Height H mm		Tolerances ^a <i>T_v</i> mm
Over	Up to and including	±
	20	0,5
20	40	0,7
40	60	0,9
60	80	1,1
80	100	1,3
100	120	1,6
120	140	1,8
140	160	2,1
160	180	2,3
180	200	2,6
200	220	2,9
220	240	3,1
240	260	3,4
260	280	3,6
280	300	3,9

^a Verticality tolerance.

The tolerance is expressed by the following formula:

$$H \leq 100: T_v = 0,3 + 0,01H$$

$$H > 100: T_v = 1,3 \% \times H$$

Bibliography

- [1] EN ISO 1101, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out (ISO 1101:2004)*
- [2] EN 29008, *Glass bottles — Verticality — Test method (ISO 9008:1991)*
- [3] DT15.00, *Standard tolerances for flaconnage* ¹⁾

1) Obtainable through:

Centre Technique International de l'Embouteillage (C.E.T.I.E.), 112-114, rue La Boétie, 75008 Paris, France
www.cetie.org, TP: 0033-1-42 65 26 45, TF: 0033-1-40 07 03 21.

1

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services.

It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website www.bsigroup.com/shop. In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.
Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

Various BSI electronic information services are also available which give details on all its products and services.

Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048
Email: info@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at www.bsigroup.com/BSOL

Further information about BSI is available on the BSI website at www.bsigroup.com/standards

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies.

Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. This does not preclude the free use, in the course of implementing the standard of necessary details such as symbols, and size, type or grade designations. If these details are to be used

for any other purpose than implementation then the prior written permission of BSI must be obtained. Details and advice can be obtained from the Copyright & Licensing Manager.

Tel: +44 (0)20 8996 7070
Email: copyright@bsigroup.com

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards



raising standards worldwide™

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale