

BS EN 15904:2010



BSI Standards Publication

# Glass packaging — Standard tolerances for flaconnage

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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

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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of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

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## 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	
<i>C</i>		<i>T<sub>c</sub></i>		<i>C</i>		<i>T<sub>c</sub></i>		<i>C</i>		<i>T<sub>c</sub></i>	
ml		ml		ml		ml		ml		ml	
		±				±				±	
		Ø	⬭ <sup>a</sup>			Ø	⬭ <sup>a</sup>			Ø	⬭ <sup>a</sup>
Over	Up to and including	Round	Non round	Over	Up to and including	Round	Non round	Over	Up to and including	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	<sup>a</sup> 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:

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

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

— For non-round bottles:

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

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

## 4 Height tolerances

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

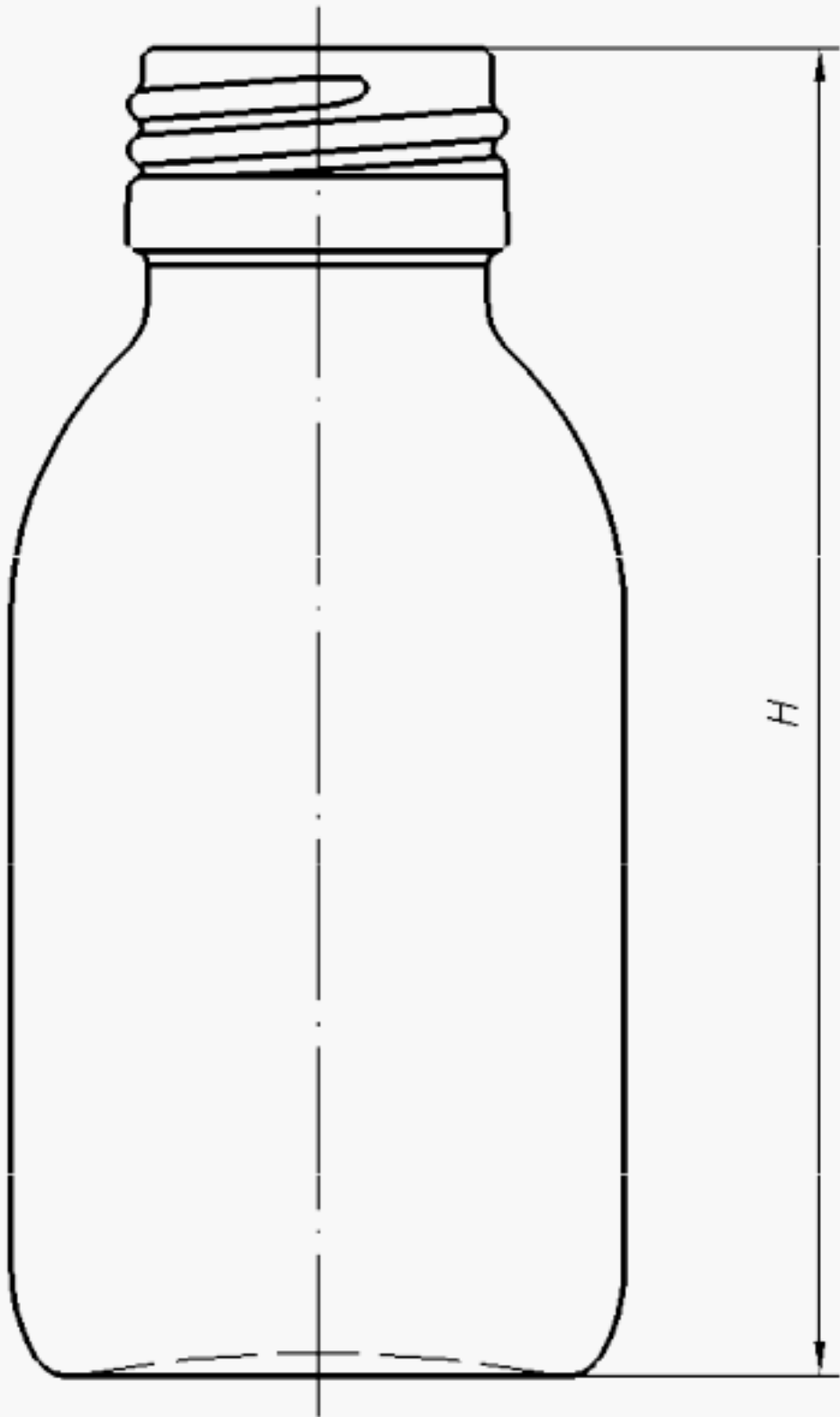


Figure 1 — Height



Table 2 — Height and height tolerances

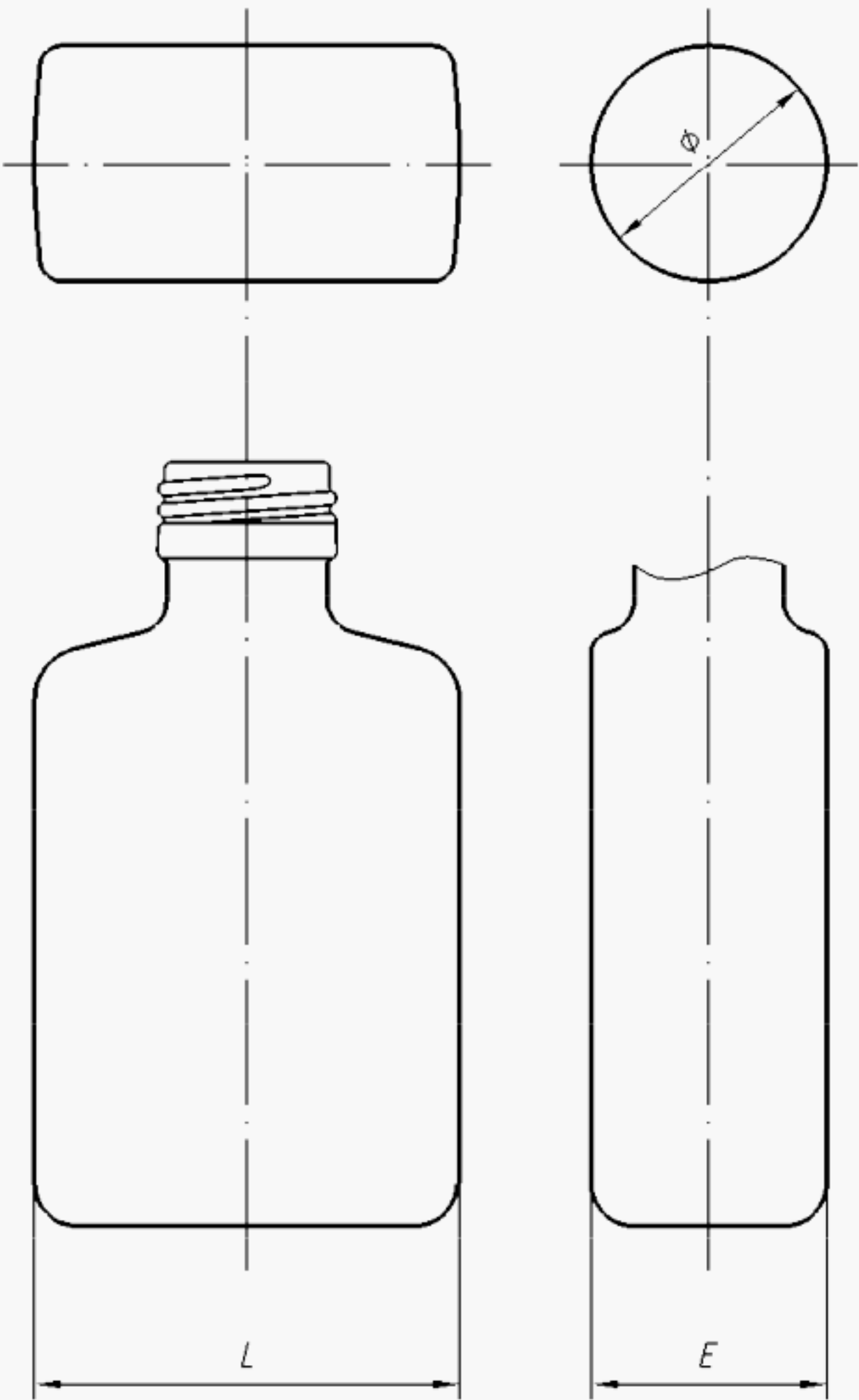
Height <i>H</i> mm		Tolerances <i>Th</i> mm
Over	Up to and including	±
4	35	0,5
35	65	0,6
65	90	0,7
90	115	0,8
115	140	0,9
140	165	1,0
165	190	1,1
190	215	1,2
215	240	1,3
240	265	1,4
265	290	1,5
290	315	1,6
315	340	1,7
340	365	1,8

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.  $\varnothing D$  + 0,1

Tolerance  $E$  = Tolerance  $L$

Figure 2 — Diameter and width

Table 3 — Diameter tolerances

Diameter		Tolerance
mm		$\varnothing D$ mm
Over	Up to and including	$\pm$
	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:

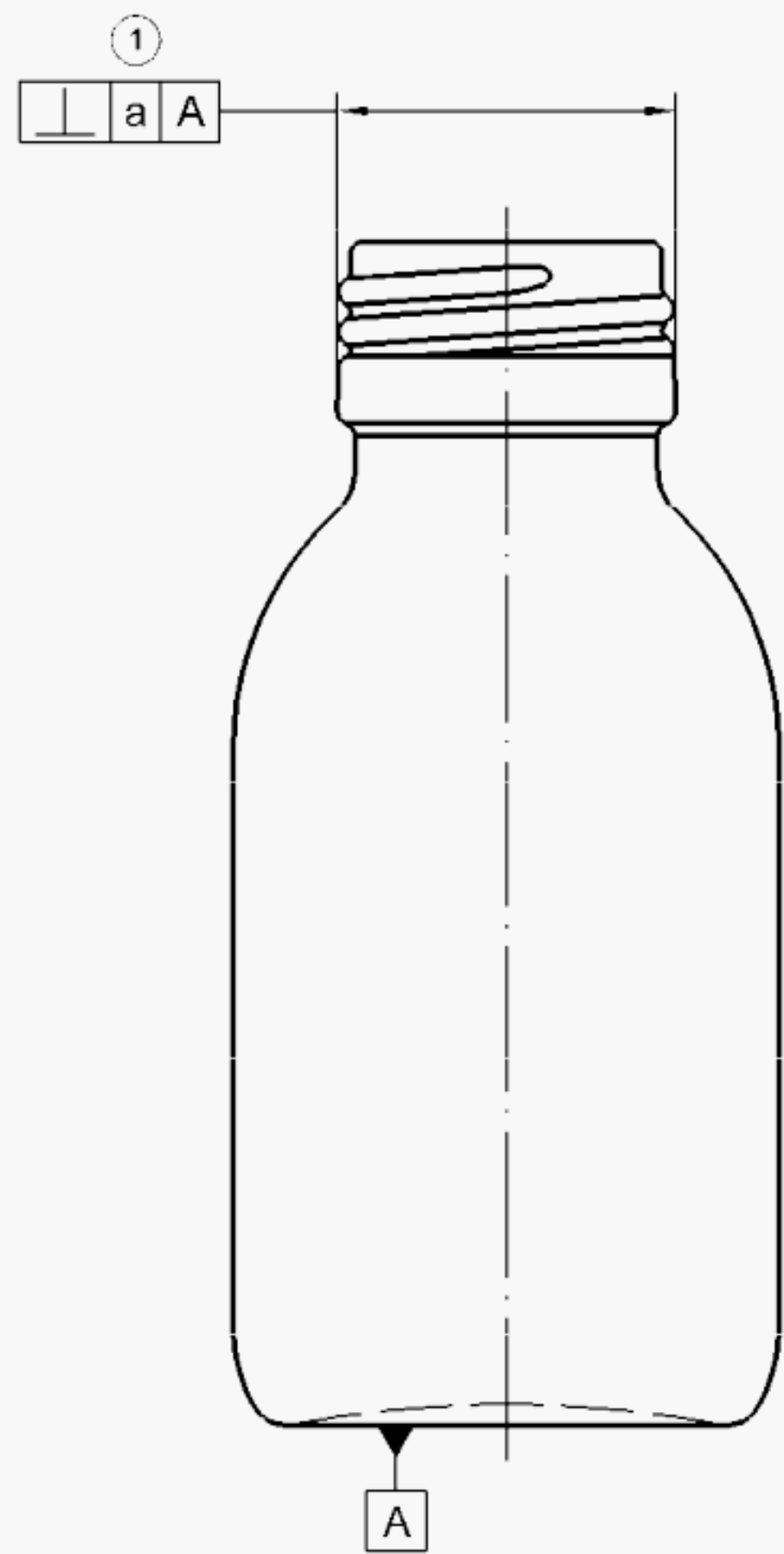
$L \leq 50 \quad T_l = 0,008L + 0,5$

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



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 <i>H</i> mm		Tolerances <sup>a</sup> <i>T<sub>v</sub></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
<sup>a</sup> 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)

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







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