Standard Quality Conditions

Agreed between:

Sklárny Moravia, akciová společnost

Úsobrno č.p. 79

679 39 Úsobrno

and

A. Required bottle parameters

A.1 General requirements

1. Bottles and jars („bottles“ thereinafter) are produced from colourless or colored glass. There is allowed some slight diversity of colour saturation, on one particular bottle, the slight diversity of colour saturation is allowed just in range caused by variation of glass wall thickness. Colourless glass is flint glass, which can contain light gray, green or blue tone, which is especially perceptible in larger glass thickness. Products are considered as „extra clear“ also during the proces of color change between standard flint and extra flint. These products feature glass with higher luminosity and slight blue or pink tone.
   Following table determines colour parameters of glass in wall thickness of **2 mm**. (If thicker wall is analysed, the output is re-calculated to values equal to 2 mm wall thickness).

Glass colour	Luminosity (%)	Dominant wavelength ƛ (nm)	Parameter „a“ red/green	Parameter „b“ yellow/blue
Standard flint	> 88	- -	> -1,5	< 3,5
Amber	45 - 80	> 575		

2. The bottles are made from third or fourth class glass with hydrolytic resistance against water at **98°C** (ISO 719).
3. The bottles are produced and supplied in accordance with EC 1935/2004.
4. Warranty for our bottles is 6 months from delivery date, max 12 months from production date, if it wasn´t agreed different condition (in part C).

A.2 Physical properties

1. It is required that the bottles are well cooled; sharply unconfined permanent internal stress corresponding to the path difference, max. 100 nm/cm is allowed for bottle up to 1 l included and 120 nm/cm for bottle over 1 l (with determination uncertainty of 10%). It is possible to test only bottles made of transparent glass.
2. It is required, that the bottle have to withstand the resistance test against sudden temperature change by **45°C**. (bottles are tested for temperature change from 65°C to 20°C, with method according to ISO 7459). Bottles are not intended for filling by content with temperature higher than **80°C**.

3. Bottles without complicated patterns have to withstand internal pressure test by pressure of **0,5 MPa**.

   Bottles with rotational shapes, without emphasized punt in the bottom, and simpler square bottles may be produced with pressure resistance up to **1,2 MPa**, but this requirement have to be consulted in advance. (Bottles with internal pressure resistance higher than 0,5 MPa are tested according to ISO 7458)

4. Bottles are by default coated by hot-end coating (SnO_2) and cold-end coating (TEGOGLASS RP 40 LT or T5) to improve surface resistance against scratching. If client requires bottle with no hot-end coating or cold-end coating applied, for example by reason of consecutive bottle decoration, this request have to be mentioned in the order.

5. Bottles are produced with resistance for consecutive process of decoration and burning up to **583°C**. For bottles made of black glass, bottles with complicated shape and bottles with uneven glass thickness (bottles with thick bottom), it is necessary to appoint longer heat-up time and also longer cool-down time (Total proces duration is min. 240 minutes).

6. Internal surface of bottles not older than 6 months from production date must not show glass corrosion.

A.3 Dimensional and volumetric tolerances

1. Unless otherwise stated in technical documentation (product drawing), total bottle height tolerance is calculated: ± (**0,6 + 0,004 * H**), where H is bottle height in mm and the value is rounded up the entire tenth.

2. Unless otherwise stated in technical documentation (product drawing), the tolerance for bottle diameter in the widest part of bottle is calculated: ± (**0,5 + 0,012 * D**), where D is bottle diameter in mm and the value is rounded up the entire tenth. Ovality of bottle body may be within limits given by permitted tolerances of bottle diameter.

3. Deviation from vertical axis of the bottle higher than 120mm incl. must not be higher than **0,3 + 0,1 * H** (value rounded to the entire tenth), where H is bottle height in mm. For bottles lower than 120 mm, the deviation from vertical axis must not be higher than **1,5 mm**. For bottles higher than 300 mm, the deviation from vertical axis must not be higher than **3,5 mm**. Exceptions from this rule have to be mentioned on particular product drawings.

4. Unless otherwise stated in technical documentation (product drawing), tolerances for dimensions of finish are set by following table:

Nominal dimension for finish diameter values (mm)	Tolerance (mm)	Nominal dimension for finish height values (mm)	Tolerance (mm)
0 - 20	± 0,4	Lower than 20 (incld.)	± 0,3
20,1 - 25	± 0,5	Higher than 20	± 0,4
25,1 - 30	± 0,6		
30,1 - 40	± 0,7		
40,1 - 50	± 0,8		
50,1 - 60	± 0,9		
Higher than 60	± 1,0		

5. Tolerances for other untolerated bottle dimensions (except above mentioned) are set by following table:

Nominal dimension (mm)	Tolerance (mm)
0 - 10 (incld.)	± 0,5
10 - 50 (incld.)	± 1,0
50 - 150 (incld.)	± 2,0
150 - 250 (incld.)	± 2,5
250 - 350 (incld.)	± 3,0

6. The bottles put on the smooth horizontal surface must not sway and spin around.
7. Side seams and seams near the bottom are not allowed higher than **0,5 mm**, mould seams not bigger than **0,3 mm** are allowed in the label area. Seams on the sealing surface of finish must not exceed **0,2 mm**; on the outer side of threaded finish must not exceed **0,3 mm**; on other types of finish must not exceed **0,5 mm**.
8. Finish dimensions have to be in accordance with bottle drawing, or separate drawing of finish detail. In this case, bottle drawing is set over drawing of finish. Unless otherwise stated, internal diameter in finish is measured in depth of 3 mm from upper edge of finish. Ovality of bottle finishes may be within limits of allowed tolerances of relevant diameter.
9. The sealing surface of the finish must not be distorted. Misalignment of the finish in the vertical and horizontal planes must not be more than **0,2 mm**. For finishes intended for cork stoppers, the misalignment must not be more than **0,4 mm**.
10. Deflection from the collinearity of the finish and bottom plane is not allowed for more than **0,6 mm** at the finish with average up to 30 mm and **0,7 mm** at the finish over 30 mm.
11. Thickness of bottle wall and bottom is set by following table:

	Filling capacity of bottle (l)			
	≤ 0,2 (incld.)	0,2 – 0,5 (incld.)	0,5 – 1,25 (incld.)	> 1,25
Walls of rotational bottle without handle	1,2 mm	1,4 mm	1,4 mm	1,8 mm
Walls of non-rotational bottle or with handle	1 mm	1,2 mm	1,4 mm	1,8 mm
bottom	1,6 mm	2 mm	2 mm	3 mm

Note: Bottles with thick bottom have bottom thickness marked on drawing.

12. Unless otherwise stated in product drawing, for filling and brimfull capacity of bottle is set following capacity tolerance:

Filling capacity of bottle (ml):	**Tolerance (ml):**
Up to 100	± 4
100 – 200 (incl.)	± 6
200 – 400 (incl.)	± 8
400 – 1000 (incl.)	± 10
1000 – 1300 (incl.)	± 12
1300 – 2000 (incl.)	± 15
2000 – 3000 (incl.)	± 20

A.4 Unallowable defects

Bottles have to be supplied without following defects:

a) partially or completely choked neck
b) choked bore, which does not comply the requirement for minimum through bore dimension, measured up to 70 mm from top of the finish
c) glass fibers inside the bottle
d) spikes inside the bottle finish
e) stuck glass on inside surface of bottle
f) overpresses in the finish
g) defective sealing surface of finish
h) checked finish
i) sharp seam in finish or body, which expressively overlaps the bottle surface
j) open blisters larger than 1 mm *
k) cracks
l) fissures, except in finish area, if they decrease the internal pressure resistance of the bottle
m) devitrification
n) marked cat's scratch (feeder mark), if it disrupts surface or decrease inner pressure resistance
o) stones bigger than 1 mm
p) encapsulated blisters bigger than 6 mm; encapsulated blister 2- 6 mm, if their quantity is higher than 4 pc and they make clumps.*
q) contamination of the inside of bottle by hazardous chemical substances.

Note: Size is valid for round blisters. Oval-shaped blisters are calculated according to: V = (width+length)/2

Occurrence of bottles with above mentioned defects in the delivery is set by appropriate AQL, see more in part B.2.

A.5 Identification and packaging

1. Bottles have identification marks in bottom or near bottom, according to product drawing.
2. Fundamental identification mark for backtracking of bottle in one delivery is pallet label. Each pallet is supplied with two pallet labels. If client wants to use own design of pallet labels, it is necessary to mention this in the order.
3. Individual bottles can be identified by invisible printing (date + time) near bottle bottom. Usually, clear and amber bottles, which are not intended for decoration, are marked.
4. Packaging of bottles is performed according to requirement of the client. By default, pallets are packed in that way, so the bottles will be protected from weather conditions. Pallets are not hermetically sealed. It is supposed, that the client provide washing or pressured-air cleaning before filling of bottles.

B. Inspection of deliveries

B.1 Way of delivery inspection at client's side

Delivery is inspected by statistic inspection in accordance with ISO 2859-1, more specifically by inspection through one selection for control level I.

Delivery quantity	Scope of selection	P_{AQL} 0,0		P_{AQL} 1,0		P_{AQL} 2,5		P_{AQL} 4,0		P_{AQL} 6,5	
		c	z	c	z	c	z	c	z	c	z
3201-10000	80	0	1	2	3	5	6	7	8	10	11
10001-35000	125	0	1	3	4	7	8	10	11	14	15
35001-150000	200	0	1	5	6	10	11	14	15	21	22
150001-500000	315	0	1	7	8	14	15	21	22	21	22
>500000	500	0	1	10	11	21	22	21	22	21	22

c – admissible quantity of defective products in selection
z – inadmissible quantity of defective products in selection

B.2 Admissibility of individual defects in delivery – AQL

Critical defects – defects which might threaten consumer's health, or which can cause health damage during the filling process.

AQL = 0,065

Types of defects in this category:

- glass filaments inside of product (“bird swings”)
- spikes inside of product, which can break
- stuck or loose glass inside of product, it is impossible to remove it by compressed air, flushing out, or turning the bottle upside down
- partially or fully choked neck
- significant light spots with wall thickness lower than 0,5mm, which can cause easy destruction of bottle
- teared finish
- sharp seam in finish or body, which expressively overlaps the bottle surface
- contamination of the inside of bottle by hazardous chemical substances

Major defects 1 – severe defects, which can lead to destruction of the content.

AQL = 1

Types of defects in this category:

- damage of finish sealing surface, which provably obstructs the gasproofness of closure
- finish malformation, which obstructs the application of closure
- checks under finish
- overpress in finish, which can lead to ineffectivity of closure sealant material
- finish non-parallelism (deviation from paralelism of finish and bottom) higher than admissible limit
- fissures in finish, neck, body and bottom – only for bottles from transparent glass and rotational bottles from non-transparent glass
- open blister bigger than 5 mm
- stone in glass bigger than 2 mm with internal stress
- insufficient internal through bore up to depth of 70mm, measured from upper edge of finish
- reduced sudden thermal shock resistance – only for plain, rotational shapes
- product not comply with previously agreed internal pressure resistence – for rotational shapes only

Major defects 2 - severe defects, which can lead to product breakage, or reduce the usability of bottles
AQL = 2,5

Types of defects in this category:

- cracks and fissures, except in finish, if this reduce internal pressure resistance of bottle
- stones in glass of size 1-2 mm
- open blister of size 1-5 mm
- wall or bottom thickness lower than 2/3 of thickness mentioned in part A.3
- reduced sudden thermal shock resistance – for non-rotational bottles, and rotational bottles with inscriptions/engravings
- capacities out of tolerances – only for simply shaped bottles
- significant deformation or warp/sunken bottles, which causes problems with filling or decoration
- fissures in finish, neck, body and bottom – for complex-shaped bottles made of non-transparent glass

Major defects 3 – defects, which can particularly reduce usability of bottles

AQL = 4,0

Types of defects in this category:

- heavy mould seams and shifts, if they lead to problems during processing of bottles
- deformed thread or bead, if it does not affect the application of closures
- capacities out of tolerances – for complex-shaped bottles and for bottles with very narrow necks
- bottle height or diameter do not comply
- deviation from axis is higher than allowed limit
- encapsulated blisters with diameter higher than 6mm; encapsulated blisters with diameter 2 – 6 mm, if their quantity is higher than 4 pcs and they make clumps.
- significant surface roughness in label area
- defects in bottle handle (if any)
- “bald spots” in grounded areas, if their size is higher than ¼ of total area of grounded surface
- contaminated outside surface of bottle (emulsion, lubricants)

Minor defects – bottle appearance defects, which are less important, and does not affect the usability parameters of glass container.

AQL = 6,5

Types of defects in this category:

- rough and bulged surface
- matte surface, “maps” on surface
- rocker bottoms and sunken push-ups
- beplastered bottom
- cords in body longer than 50 mm and 70 mm for bottles with capacity bigger than 0,5l.
- accentuated and sharp wrinkles in body or bottom, or area with fine wrinkles bigger than 6cm^2.
- uneven glass distribution in the bottom
- bad lettering and engraving/inscription not well-shaped

Exceeding of applicable AQL for above mentioned defects is reason for complaint.

B.3 Admissible % of bottle breakage during filling and packaging

Admissible % of bottle breakage during filling and packaging is set by following table:

Bottle shape	Flint and extra-flint glass	Amber glass	Black non-transparent glass
Simple, rotational bottle without complex engraving/inscriptions, without orientation mark	0,3 %	0,4 %	0,5 %
Simple, rotational bottle without complex engraving/inscriptions, with orientation mark	0,4 %	0,5 %	0,7 %
Simple, rectangular bottle without complex engraving/inscriptions, without orientation mark	0,3 %	0,5 %	0,7 %
Simple, rectangular bottle without complex engraving/inscriptions, with orientation mark	0,4 %	0,5 %	0,8 %
Bottle with complex shape and engraving/inscription	0,7 %	0,8 %	1,1 %

C. Additional requirements agreed with client

D. Rules for complaints

Our target is to supply bottles in agreed quality. In case, that there will be appearance of bottles with defects beyond these agreed standard quality conditions in the delivery, the client has the right to complaint. Warranty for our bottles is 6 months from delivery date , max 12 months from production date, if it wasn´t agreed different condition (in part C).

The procedure for complaint is following:

1) The complaint is placed to the attention of company salesperson, who takes care of particular business case.
2) The complaint has to be placed in written form (fax, letter, e-mail). A letter of complaint has to contain following information:
    - delivery note identification number
    - number of filled bottles
    - total quantity of delivered bottles
    - quantity of defective bottles
    - The reason of complaint (defect description). It is very helpful, if there's also an information, if the problem appears on particular mould number (mould number is located in the bottom or near the bottom of bottle), or if the appearance of defect is not related with mould number
    - copies of pallet labels
    - photos of complained bottles with defect, or samples of defective bottles will be sent to Sklárny Moravia (at supplier costs)
    - Heat-treatment curve for bottles which were decorated.

    All these information are important for complaint qualification and for determination of defect cause. Without these data and information, it is not possible to accept the complaint!
3) It is not allowed to scrap or waste the bottles – this decision have to be made by supplier's salesperson. Salesperson have to inform the client within 3 work days, if supplier wants to withdraw the bottles, or to propose following steps in complaint.
4) The result of complaint (if it was accepted or rejected) will be sent to client within 14 days after all informations about complaint were received (this includes also delivery of samples, if requested, and also visit at client's place, if it is necessary). The client will also obtain proposal of steps, which will be taken by supplier to prevent future appearance of complained problem by supplier salesperson, or supplier quality representative.

It is not possible to apply the complaint, if the bottles damage cause is:

- unappropriate warehousing and manipulation at client's side
- by effect of big temperature shock (this is valid especially for the winter time, when the bottles are transported from non-heated warehouse and filled by hot content, where the difference of temperatures is higher than 45°C)
- the damage appears during decoration of bottles arranged by client (for example by cause of incorrect parameters set for decoration process)

Date of agreement:

Supplier representative: Client representative:

…..... ….....

(signature) (signature)