GLASS PACKAGING GENERAL QUALITY SPECIFICATION

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ŞİŞECAM

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1. SCOPE

This document includes quality requirements of pressurized containers as beverage, mineral water, beer; pharmaceutical, vial and serum bottles; high alcohol bottles, wine and champagne bottles; food containers, water and general-purpose bottles (cosmetic products, sampling bottles, etc.) and decorated bottles. However, if customer special requirements exist, the relevant customer specification must be taken into account.

2. CONFIDENTIALITY

This document ensures that the parties have a clear understanding of the expected quality requirements. The parties may not share the provided information with third parties without the prior written consent of TÜRKİYE ŞİŞE ve CAM FABRİKALARI A.Ş. (hereinafter referred to as “Şişecam”).

3. DEFINITIONS AND ABBREVIATIONS

3.1 Type of glass

The glass containers produced by Şişecam Glass Packaging that are used to protect and submission to the market of our customers’ products are made of soda-lime-silica glass as a Type III of glass. In pharmaceutical bottles, the SO_3 coating can be applied according to customer demands to provide Type II glass.

3.2 AQL

AQL (Acceptable Quality Level) is the quality level that determines accept – reject limits of product during and after production according to sampling plans given in ISO, ANSI or equivalent standards.

AQL is determined according to the accept / reject limits corresponding to sampling plans given in ISO, ANSI or equivalent standards. In decorated products visual decor differences, other than the ones that can affect brand awareness and legal conditions, are not considered within the scope of error if they are not noticed from a distance of 1 meter.

Critical Defects:

The defects that cause risk to human health or adversely affect the filling company’s reputation (missing logo etc.) or cause problems during the filling process at the customer’s facilities.

Major Defects:

The functional defects that cause problems during the filling process at the customer’s plant, deterioration of the product or adversely affect the filling company’s image.

Minor Defects:

The non-functional defects that do not negatively affect the filling process and can be seen from a distance of 1 meter with the naked eye.

3.3 Amounts

Pallet: The total number of bottles in a pallet.

Package: The total number of bottles in a package.

Lot: The total number of bottles that are produced within a production period (fundamental production entries do not change). If a mould set or glass composition changes in a production period, the lot number changes. If required by our customers, the lot interval (e.g. weekly, daily, etc.) can be changed.

3.4 Technical

Blow-Blow (BB): Blow-blow production process.

Press-Blow (PB): Press-blow production process.

Narrow Neck Press Blow (NNPB): Narrow neck press blow is a production process.

3.5 Other Abbreviations

AGR:	American Glass Research
ANSI:	American National Standards Institute
ASTM:	American Society for Testing and Materials
AQL:	Acceptable Quality Level
CTU:	Coating Thickness Unit
DIN:	German Institute for Standardization
ISO:	International Standards Organization
TSE:	Turkish Standards Institute

4. RELEVANT STANDARDS – LEGISLATIONS – REGULATIONS

Şişecam Glass Packaging has established and enforces a quality management system, food safety management system and environment management system in its facility, ensuring continuity.

The following standards are referred to in this quality specification:

- 75/107/EEC: On the approximation of the laws of the Member States relating to bottles used as measuring containers (Out of scope for pharmaceutical and food container products).
- ISO 2859: Sampling Standard
- ASTM C147: Standard Test Methods for Internal Pressure Strength of Glass Containers
- ASTM C148: Standard Test Methods for Polariscopic Examination of Glass Containers
- ASTM C149: Standard Test Method for Thermal Shock Resistance of Glass Containers
- ASTM C738: Standard Test Method for Lead and Cadmium Extracted from Glazed Ceramic Surfaces
- ASTM C675-91: Standard Test Method for Alkali Resistance of Ceramic Decorations on Returnable Beverage Glass Containers
- ASTM D3359-23: Standard Test Methods for Rating Adhesion by Tape Test
- ASTM E308: Standard Practice for Computing the Colours of Objects by Using the CIE System
- DIN 52295: Standard Test Method for Impact Strength of Glass Containers
- TS 7771 EN ISO 8113: Glass containers - Resistance to vertical load - Test method
- Turkish Food Codex Regulation on Materials and Articles Which are Intended to Come into Contact with Foodstuffs
- Good Manufacturing Process Applications and Registrations of Facilities that Produce Materials and Articles Which are Intended to Come into Contact with Foodstuffs.
- Regulation on packaging waste control
- EU Directive 94/62/EC of 20 December 1994 on packaging and packaging waste
- EU Regulation 1935/2004 of 27 October 2004 on materials and articles intended to come into contact with food.

- EU Commission decision 2001/171/EC establishing the conditions for a derogation for glass packaging in relation to the heavy metal concentration levels established in Directive 94/62/EC on packaging and packaging waste.
- EU Directive 2004/12/EC of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste
- EU Directive 2005/20/EC of 9 March 2005 amending Directive 94/62/EC on packaging and packaging waste
- EU Commission decision 2006/340/EC Amending Decision 2001/171/EC of the European Parliament and of the Council for the purpose of prolonging the validity of the conditions for a derogation for glass packaging in relation to the heavy metal concentration levels established in Directive 94/62/EC
- EU Commission regulation 2023/2006 of 22 December 2006 on good manufacturing practice for materials and articles intended to come into contact with food.
- Prop 65/California's Toxics in Packaging Prevention Act.
- Council Directive 84/500/EEC of 15 October 1984 on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs.
- Commission Directive 2005/31/EC of 29 April 2005 amending Council Directive 84/500/EEC as regards a declaration of compliance and performance criteria of the analytical method for ceramic articles intended to come into contact with foodstuffs.
- French Regulation - DGCCRF fiche MCDA no: 2 (version du 1.05.2016).
- Germany 64 Lebensmittel- und Futtermittelgesetzbuch (LFGB) B80.03-1 & B80.03-4.
- Italian Ministerial Decree of 21st March 1973 - Disciplina igienica degli imballaggi, recipienti, utensili, destinati a venire in contatto con le sostanze alimentari o con sostanze d'uso personale. 1973, Glass Category A.
- TS ISO 4802-1: Hydrolytic resistance of the interior surfaces of glass containers (only for pharmaceutical products).
- USP (U.S Pharmacopeia Convention) Chemical Resistance – Glass Containers (only for pharmaceutical products).
- ISO 15378 Primary packaging materials for medicinal products (only for pharmaceutical products).
- ISO 7086: Glass hollowware in contact with food — Release of lead and cadmium — Part 1: Test method. Part 2: Permissible limits
- Toxics in Packaging Clearing House/TPCH (formely known as CONEG) defined state laws.
- European Lead content limits for jewellery as set out in Commission Regulation No 836/2012 amending REACH regulation 1907/2006/EC

5. SPECIFICATION AND TOLERANCES

5.1 Raw Material

As Şişecam Glass Packaging, our products are made of soda-lime-silica glass and main sources of our raw materials are shown in the table below.

Main Raw Material Resource
Sand
Feldspar, feldsparic sand, perlite
Lime
Dolomite
Soda
Sodium sulfate
Cullet

Apart from the main raw materials mentioned above, other auxiliary materials are used in the process, such as those that affect the glass colour or facilitate melting. Initial control is completed on raw materials used in the glass recipe, which are detected in certain percentages according to glass analysis test results. To monitor and control heavy metal content in glass containers, the 94/62/EC, 2001/171/EC, and 2006/340/EC directives, as well as the Regulation on Packaging Waste Control, are followed.

5.2 Hot End Coating

To maintain glass strength and increase the efficiency of cold end coating of glass packaging in production, monobuthyltintrichloride is in use as hot end coating material. Hot end coating is applied immediately after glass packaging production under high temperature conditions. Following hot end coating application, an inert tin-oxide film layer which is chemically connected to glass, is formed outside of the bottle. Hot end coating application protects the bottle and prepares a suitable surface for an effective cold end coating application. If the hot end coating film on the bottle is too thick, the colour of the product changes. If it is too thin, the effectiveness of hot end coating reduces. The level of hot end coating is measured by a hot end coating measurement device (AGR Hot End Coating Measurement System).

5.3 Cold End Coating

The cold end coating system is applied to the external surface of glass containers by spray just after the annealing process. This coating prevents scratches during the conveying and transporting of the containers and facilitates their movement during the filling process.

The cold-end coating material applied to the product does not come into contact with the inner surface of the glass packaging and, therefore, does not interact with the food contained within. This application is carried out in compliance with Good Manufacturing Practices (GMP) and in accordance with Regulation (EC) No 1935/2004, Regulation (EC) No 2023/2006, and relevant legislation on food contact materials and articles.

The effectiveness of the cold end coating is controlled by measuring the slip angle of the container. A polyethylene-based wax is commonly used as the cold end coating chemical, but different coating materials can be used depending on customer demands or the intended purpose. The effectiveness of the cold end coating is measured using a slip angle test device (AGR Tilt Table) or measured using a manual rub test. The manual rub test is a qualitative test.

A container is held in each hand at approx. 45° to each other. They are then pressed firmly together with elbows bent and rubbed against each other no more than once in any one direction or in the same position around the body circumference. There should be no audible grinding or significant abrasion damage.

5.4 Dimensional-Geometrical Measurements

5.4.1 Height

Height is checked in accordance with approved technical drawing.

5.4.2 Diameter

Diameter is checked in accordance with approved technical drawing.

5.4.3 Finish Dimensions

Finish Dimensions are checked in accordance with approved technical drawing.

5.4.4 Parallelism

If the vertical axis of the finish is not parallel to the vertical axis of the body, it is known as a parallelism defect. There is a limit value for parallelism, and this varies according to the finish

dimensions. If the container is out of limits, problems may occur during the capping process. In order to measure this limit, container height is measured circumferentially through the finish, then a maximum-minimum height difference is compared with the specification limit.

5.4.5 Saddle Finish

Excessively sunken finish surface over limits of the container, this parameter is measured in large finish sized containers.

5.4.6 Perpendicularity / Lean

The finish and body are misaligned vertically to a degree that affects filling. The deviation of the container's finish from the vertical axis is measured as the container is rotated 360°.

5.4.7 Bent Neck

A neck where the finish is tilted to one side that affects the product's filling performance.

5.4.8 Oval Body

Oval body defect affects the labelling and printing process performance of the container.

5.5 Inhomogeneity

Raw materials that make up the composition of glass must be homogenous, and the percentage of each material must be within acceptable limits. A radical change in production conditions or raw material composition may cause an inhomogeneity defect.

5.6 Volume

The tolerances for the products which are related to 75/107/EEC directive are given below. Volume measurements for the products included in 75/107/EEC conform with the requirements of this regulation. The volume tolerances in technical drawings are compatible with the table shown below.

Nominal capacity Vn in milliliters	Maximum permissible errors	
	As % of Vn	In milliliters
50 to 100	-	3
100 to 200	3	-
200 to 300	-	6
300 to 500	2	-
500 to 1000	-	10
1000 to 5000	1	-

The compliance of the products to 75/107/EEC regulation is tested and evaluated during production according to the formulas given below.

1) $V_{avg} + k.s \leq Ts$
2) $V_{avg} - k.s \geq Ti$
3) $s \leq F(Ts - Ti)$

Vn = Nominal capacity	Ts = Upper limit	k = 1,57 (constant num.)	s = Standart dev.
Vavg = The average of the actual capacities of the bottles	Ti = Lower limit	F = 0,266 (constant num.)	

- Şişecam applies the reverse epsilon "3" mark with a minimum height of 3 millimeters in accordance with Directive 75/107/EEC.
  The digits used to indicate the nominal volume, printed in liters, centiliters, or milliliters, have the following minimum heights:

- At least 6 mm for nominal volumes over 100 cl,
- At least 4 mm for nominal volumes between 20 cl and 100 cl,
- At least 3 mm for nominal volumes of 20 cl or less.

The nominal filling volume is followed by the unit symbol as specified in accordance with the provisions of Council Directive No 71/354/EEC of 18 October 1971 on the approximation of the laws of the Member States relating to units of measurement, as amended by the Act concerning the conditions of accession and the adjustments to the Treaties.
Additionally, Şişecam's registered trademark, the reverse epsilon "3" mark, and an indication of the brim capacity expressed in centilitres and not followed by the symbol cl, and/or an indication of the distance in millimetres from the brim level to the filling level corresponding to the nominal capacity, followed by the symbol mm, in such a manner as to avoid confusion with the previous indication, in figures of the same minimum height as those expressing the corresponding nominal capacity, according to the method or methods of filling for which the bottle is intended.
If the products are not covered by 75/107/EEC regulation, these products are checked according to the limits in the customer specification / technical drawing. As a special application, the volume of oil bottles is above the nominal in the batch average. In high alcohol products, wine and champagne bottles, the party average is kept above the nominal volume if our customers demand that the filling average be kept above the nominal volume value for the 76/211/ EEC standard, which is the legal requirement.
The capacity (filling or brimful capacity) control limits according to regulation or customer demands are specified with tolerances given in the technical drawing.

5.7 Weight

Weight is checked periodically at both the hot and cold ends. Weight limits are specified by considering volume tolerances and potential defects that may occur due to weight change.

5.8 Internal Pressure Strength

According to carbonization level and usage of the products, minimum internal pressure strength level is determined. 1 vol of CO_2 is approximately equal to 2 gr of CO_2 in 1 liter of liquid.
Internal pressure strength test is applied according to 1 minute pressure strength test method indicated in ASTM C 147 standard. If the pressure test machine cannot convert actual pressure to 1 minute pressure, the formula indicated below is applied.

Pressure as Psi	Pressure as kg/cm^2	Pressure as Bar
P_R=1.38 P_{60} + 25.9	P_R=1.38 P_{60} + 1.82	P_R=1.38 P_{60} + 1.79

P_R = Actual pressure
P_{60} = 1 minute pressure

While performing the pressure test, the target pressure value is set to product specification value and pressure test is applied per technical drawing specification.
While performing the pressure test, target pressure is set to at least 35 bar and pressure test is applied if there is no other customer demand.

5.9 Thermal Shock Test

Thermal shock test is applied according to ASTM C 149 standard. The water temperature on the cold bath will be 21°C. To provide ΔT= 50°C temperature difference between baths, hot bath's temperature set to 71°C. The test bottles that immersed in hot bath allowed to soak 5 minutes, then transferred to cold bath within 15 ± 1 seconds. The bottles allowed to soak in cold bath for 30 seconds then removed from basket and then each bottle controlled individually.
Note: If a cold bath temperature other than 21°C is used, the specified differential may be decreased by 0.5°C for each increase of 5.6°C above the recommended cold bath temperature.

5.10 Vertical Load Resistance

Vertical load resistance level is important in terms of capping, storing and shipping. A vertical load test is applied according to TS 7771 EN ISO 8113 standard. Vertical load resistance limits differ according to product categories.

5.11 Impact Resistance

Impact test is applied at 4 contact points (at 90°) according to DIN 52295 standard.

5.12 Thin Wall Thickness

If the glass wall thickness of glass packaging is under a specified limit, this may lead to the product breaking during or after the filling process, this is known as thin wall thickness defect.

5.13 Temper Grade

Bottles are conveyed through Annealing Lehr to remove residual tension inside bottles. Temper grade inside bottle is checked according to ASTM C148 standard. According to this standard, the interior end of the container is viewed through the open container finish. The highest order retardation colour at the bottom of the container is compared to the retardation color seen at the standard discs.
If $\mathbf{T}_A$ number ≤ 3 then $\mathbf{T}_A = \mathbf{T}_R$
If $\mathbf{T}_A$ number > 3 then $\mathbf{T}_R$ number is calculated according to the formula as follows:
$\mathbf{T}_R = \mathbf{T}_A * 4.06 / T$
In this formula.
T : Wall thickness of the bottle (mm)
$\mathbf{T}_R$: Real temper number
$\mathbf{T}_A$: Apparent temper number
$\mathbf{T}_R$ value must be equal or lower than 4.

5.14 Corrosion

If products are exposed to high humidity levels, significant day-night temperature differences, or long-term storage in an open area, elements such as alkali oxides or silicon dioxide may begin to diffuse and migrate to the outer surface through water. Since diffusion occurs on the inner surface of the bottle, a cloudy appearance develops, and if the process continues, crystallization can occur. The occurrence of corrosion is related to the amount of water and the surface area of the glass. If the amount of condensed water on the glass surface is low, but the water remains on the surface for an extended period, corrosion happens more quickly.
Corrosion has two levels. The first level of corrosion occurs when alkali oxides in the glass dissolve,

resulting in a cloudy appearance and the formation of small crystals. This level of corrosion can be removed by rinsing before the filling process. The second level of corrosion occurs after the alkali oxides have dissolved, at this stage, the silica structure begins to dissolve, leading to more pronounced crystallization. Because the silica structure is damaged, the cloudy appearance cannot be completely cleared. Therefore, products showing the first level of corrosion can still be used after rinsing, but those with second-level corrosion cannot be used by our customers. If corrosion is detected in empty bottles, they must be washed or rinsed under suitable conditions before filling; if impurities remain inside, the bottles cannot be used.

5.15 1,1- Difluoroethane (DFE) Treatment

1-1,difluoroethane (DFE)-based dealkalization process can be applied to the inner surfaces of glass packaging to reduce surface alkalinity and minimize the risk of corrosion caused by environmental conditions. This process can only be performed on equipped production lines
DFE treatment enables the glass type of the applied products to transition from Type III to Type II, in accordance with the ISO 4802-1/2010: Glassware – Hydrolytic Resistance of the Interior Surfaces of Glass Containers – Part 1: Determination by Titration Method and Classification (Second Edition) standard. The application is analysed in production plant by (Şişecam inhouse method) rapid test method with methylene red.

5.16 Hydrolytic Resistance

Hydrolytic resistance analysis is periodically applied to pharmaceutical products. This analysis indicates the chemical resistance of glass products against water. Soda-lime-silica-based glass packaging products are typically made as standard Type III glass. To produce Type II glass, an SO_3 coating is applied to the inner surface of the products to increase chemical resistance; serum bottles are produced using this method. The hydrolytic resistance of pharmaceutical bottles made as Type III is tested according to the TS ISO 4802-1 standard, while serum bottles made as Type II are tested according to US or European Pharmacopoeia standards to ensure they remain within the specified limits.

5.17 Line Simulation Test

Line simulation testing can be conducted to validate process stability and product quality under dynamic filling conditions. The AGR Line Simulator is designed to provide an accelerated, reproducible, and standardized abuse treatment in the laboratory. This treatment simulates abrasions due to container-to-container contact, which are characteristic of normal filling and handling lines. The line simulator is an ideal tool for evaluating the strength of samples by pre-conditioning them, taking into account the effects they will be exposed to on filling lines prior to other tests such as vertical load, internal pressure resistance, thermal shock, and impact resistance testing. The analysis can be applied to product groups that are sensitive to resistance tests.

6. CRITERIA AND CONSIDERATIONS TO BE APPLIED IN LIGHTWEIGHTING APPLICATIONS

Lightweighting refers to design modifications carried out with the aim of reducing the bottle weight. When the lightweighting process is applied solely by reducing the glass volume (without altering the external geometric dimensions of the product), it may introduce risks that could impact product performance.

6.1 Risks

6.1.1 Reduction in Wall Thickness

Reducing the glass volume during lightweighting can lead to a decrease in wall thickness, which may adversely affect the following bottle characteristics:

• Internal pressure resistance
• Impact resistance
Vertical load resistance
Such effects may result in bottle breakages during filling, transportation, and storage processes.

6.1.2 Perceived Fill Level
Although the same nominal volume of liquid is filled, an increase in the headspace may create a perception of underfilled product for the consumer. This may negatively affect brand perception and consumer satisfaction.

6.1.3 Variations in Performance Parameters
As a natural consequence of weight reduction, products included in lightweighting projects may exhibit a decrease in performance parameters such as impact resistance, vertical load resistance, internal pressure resistance, and glass distribution, compared to non-lightweighted products — provided they remain within the specified limits.
It is recommended that filling conditions, as well as the logistics, storage, and transportation conditions of the relevant products, be reviewed and that any necessary additional measures be implemented where required.

6.2 Application Method and Recommendations
• Geometric optimization should be the primary approach in lightweighting projects. Necessary changes in diameter, height, and other shape-defining dimensions should be planned to avoid loss of strength.
• Design changes that could adversely affect production efficiency (reduce yield) should be avoided. The lightweighting process should contribute positively to bottle cost and must not result in performance degradation during production processes.

6.3 Special Note
Unless otherwise mutually agreed between the parties, our mineral water products are not suitable for pasteurization.

7. DESIGN TARGET RECOMMENDATIONS FOR CARBONATED BEVERAGES'S HEADSPACE

This category includes carbonated soft drinks, sparkling mineral waters, sparkling wines, beers, ciders and carbonated flavoured wines. The maximum design headspace (for a pasteurised containers) is given in column A (see Table 1). Where customer requirements permit, it is recommended that the design headspace of non-pasteurised bottles conforms to the values and ranges in column B and C (see Table 1).

Nominal volume (ml)	Design headspace [ullage] (ml)		
	A. Pasteurised	B. Non-pasteurised bottle	C. Non-pasteurised bottle
	2-12 g /l CO_2	2-6 g/l CO^2	≥ 6 g/l CO^2
50			5
100			10
125			10
200			15 to 20
250			15 to 20
330	25		15 to 25
350			20 to 27
375			20 to 30
500	33		20 to 33
700			30 to 45
750	50	12 to 50	30 to 50
1 000	58	17 to 58	35 to 58
1 250	66		40 to 72
1 500	83		50 to 87

Table 1 – Design headspace recommendation for carbonated beverages

Ref. CETIE FS07.00 October 2020 Rev2.

Note: If a screw-type finish is used and the beverage has a carbonation level ≥ 1,2 g/l CO_2, a suitable container and closure should be agreed between the glass maker, closure maker and packer/filler.

There is no physical reason that percentage headspaces should be greater for smaller volume containers, as the thermal expansion of a product is proportional to volume. However, the above recommended values follow industrial practice and imply a higher safety margin for the lower capacity containers. Elsewhere in the document, recommendations are given only as % of nominal capacity.

Design headspaces for beer containers should not fall below 3,4% and ideally be around 4 – 7% to allow for pasteurization.

8. SAMPLING METHOD

The product checks on our customers' stocks are implemented in accordance with the sampling method detailed in this section. Sampling of the final product is performed according to ISO 2859 standard tables. The sampling method is determined according to lot quantity, and General Inspection Level I, II or III is applied. Controls are implemented and results are evaluated against acceptable quality limits at the corresponding sampling levels to determine whether to accept or reject the production lot.

SAMPLING CODE LETTERS

Lot Quantity	General Sampling Levels		
	I	II	III
2 - 8	A	A	B
9 - 15	A	B	C
16 - 25	B	C	D
26 - 50	C	D	E
51 - 90	C	E	F
91 - 150	D	F	G
151 - 280	E	G	H
281 - 500	F	H	J
501 - 1200	G	J	K
1201 - 3200	H	K	L
3201 - 10000	J	L	M
10001 - 35000	K	M	N
35001 - 150000	L	N	P
150001 - 500000	M	P	Q
500001 and greater	N	Q	R

STANDARD SAMPLING PLAN

Sampling Code Letter	Sampling Size	Acceptible Quality Limits													
		0,01	0,015	0,025	0,04	0,065	0,1	0,15	0,25	0,4	0,65	1	1,5	2,5	4
		Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
A	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 1
B	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 1	↕
C	5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 1	↕	↓
D	8	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↕	↓	1 2
E	13	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 1	↕	1 2	2 3
F	20	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 1	↕	↓	↕	↕
G	32	↓	↓	↓	↓	↓	↓	↓	↓	0 1	↕	↓	1 2	2 3	3 4
H	50	↓	↓	↓	↓	↓	↓	↓	0 1	↕	1 2	1 2	2 3	3 4	5 6
J	80	↓	↓	↓	↓	↓	↓	0 1	↕	↕	↕	2 3	3 4	5 6	7 8
K	125	↓	↓	↓	↓	0 1	0 1	↕	↓	1 2	2 3	3 4	5 6	7 8	10 11
L	200	↓	↓	↓	↓	↕	↕	↓	1 2	2 3	3 4	5 6	7 8	10 11	14 15
M	315	↓	↓	↓	0 1	↓	↕	1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22
N	500	↓	↓	0 1	↕	↓	1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	↓
P	800	↓	0 1	↕	↓	1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	↓	↓
Q	1250	0 1	↕	↓	1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	↓	↓	↓
R	2000	↑	↑	1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	↑	↑	↑	↑

9. PACKAGING

Packaging standards are prepared and developed based on customer needs and the type of shipment. Packaging is carried out according to these standards, which may include the use of plastic or cardboard separators as required by the customer.

For pharmaceutical bottles, packages shrink-wrapped with plastic film are arranged with separators between the rows. The number of packages per row, the pallet size, and the total number of rows are specified in the packaging standard.

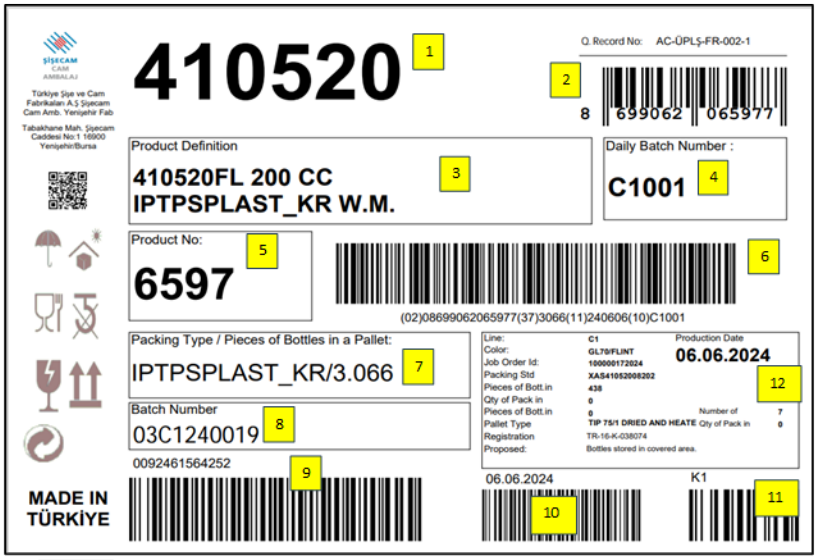
To protect the products from external conditions, the pallet is covered with polyethylene film. The products are then delivered to the customer on the pallet.

10. SHIPMENT

FIFO (First In, First Out) is applied to products as much as possible based on the production period. The packaging of the products being shipped is inspected. The cleanliness of the shipment vehicle's interior and the flatness of the vessel are checked. External packaging must be clean to prevent interior contamination, and it should not be loose, wet, torn, or emit any unpleasant odour. Pallet barcode label information must be accurate and complete.

11. TRACEABILITY

Product traceability is ensured through the pallet barcode label. All production records can be accessed retroactively using the pallet barcode number.



1	Mold Number	410520
2	EAN Number	08699062065977; 869 Country Code, 9062 Company Code, 0 Control Digit, 6597 Product Code, 7 Control Digit
3	Product Definition	410520FL 200 CC IPTPSPLAST_KR W.M.
4	Daily Lot Number	C1001; C1 Production Line, 001 Number of days of production on the relevant line
5	SAP Product Code	6597
6	Global Commercial Product Code	(02)0869 9062 0 6597 7 (37) 3066 (11) 240606 (10) C1001 0869 -> Country Code 9062 -> Company Code 6597 -> Product Code 7 -> Control Digit (37) 3066 -> Quantity (11) 240606 -> Production Date (10) C1001 -> Daily Lot Number
7	Packaging Type	TPŞ PLAST_KR/3.066
8	Production Lot Number	03C1240019; 03 Sisecam Factory Code, C1 Production Line, 24 Year, 0019 Number of production orders on the line during the year
9	Barcode	0092461564252; 9. Line, 24 Year, 61 Factory Code, 564252 Number of Pallets Produced in the Factory During the Year
10	Production Date	6.06.2024
11	Quality Code	K1; Approval
12	Details of Packaging	

12. CUSTOMER COMPLAINT EVALUATION

As glass is by nature a fragile material, it is the responsibility of the filling company to ensure that appropriate warnings and symbols are displayed on the packaging to inform the end consumer. The Customer shall be solely responsible for any damages that may arise with end consumers due to the use of the product in a manner that is non-compliant with the specifications and the aim of the product and its design. The Customer acknowledges and agrees to indemnify and hold Şişecam harmless against any and all losses, whether material or non-material, incurred as a result thereof. Şişecam reserves the right to recourse from the Customer for any damages incurred.

Şişecam Glass Packaging considers any complaints received from customers as a significant tool for quality improvement.

The company aims to facilitate uninterrupted production on its customers' production lines. This specification, prepared to support this objective, seeks to minimize risks in our customers' production processes to the greatest extent possible. Customer complaint is meticulously addressed, with accurate and prompt feedback provided to ensure the highest level of customer satisfaction. Customer dissatisfactions (complaints) and customer complaints' evaluation process are defined below.

It is important that our customers communicate their complaints to Şişecam in a manner that allows them to be assessed as quickly and accurately as possible providing full details of the complaint.

If it is believed that the product exceeds the specification limits production should be stopped immediately. ***If production is not stopped in such a situation, Şişecam Glass Packaging will not be held responsible for any resulting losses.***

In this context, the process related to customer complaints is managed according to the flowchart provided below.

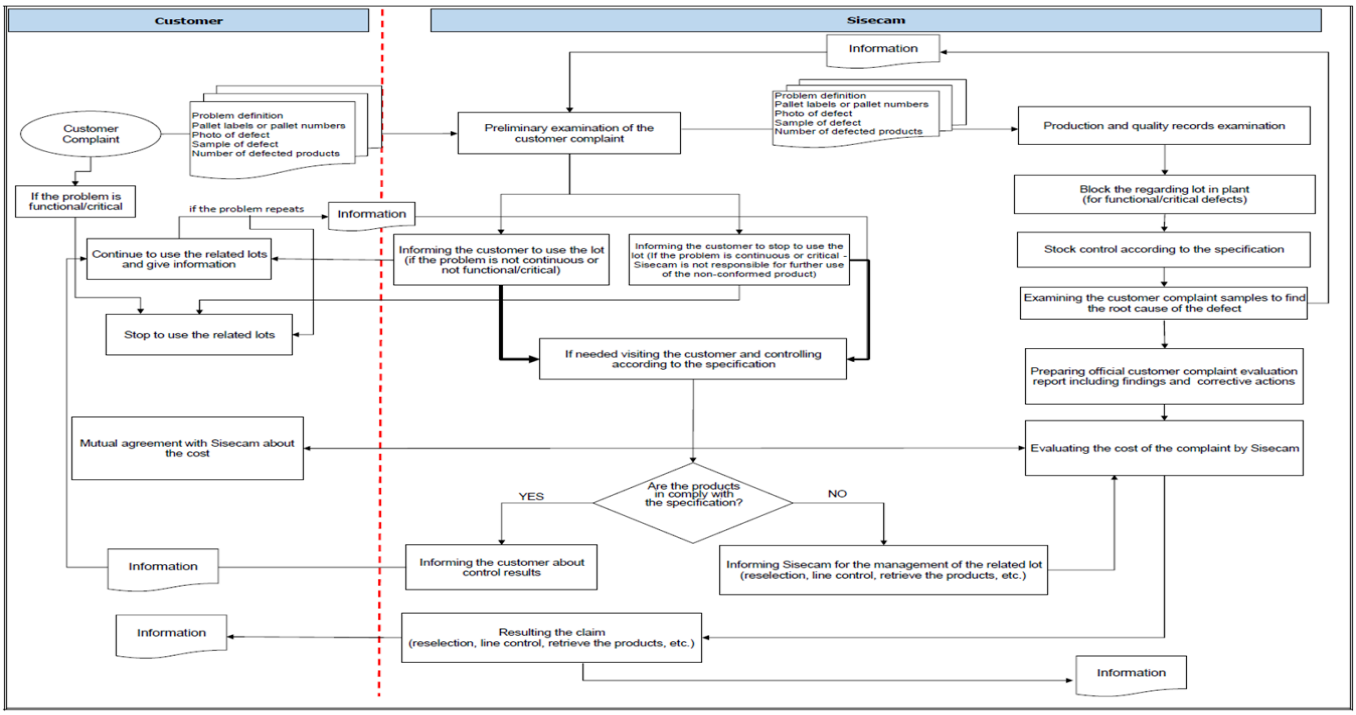
a) The customer should inform Şişecam Glass Packaging's relevant Customer Relations and Order Management Department. If the department cannot be reached, the Customer Quality Department should be contacted. To obtain a prompt response and guidance on the appropriate actions to take, telephone contact is acceptable; however, this should be followed up with an email providing full details of the complaint. Verbal complaints alone cannot be tracked within our customer complaints system.

b) To resolve a complaint satisfactorily, the customer should provide the relevant Customer Relations and Order Management Department or Customer Quality Department with all pertinent information, including photographs and samples of defective products. The necessary details include product name, product code, product delivery date, delivery quantity, defect definition(s), quantity of defective products, barcode number, production date and shift, phase of the process where the defect was detected, and defect frequency (rare, intermittent, or continuous). These details are essential for ensuring a prompt and accurate investigation of the complaint. If the above details are not available, the product barcode number is the minimum information required to initiate the Customer Complaint Process.

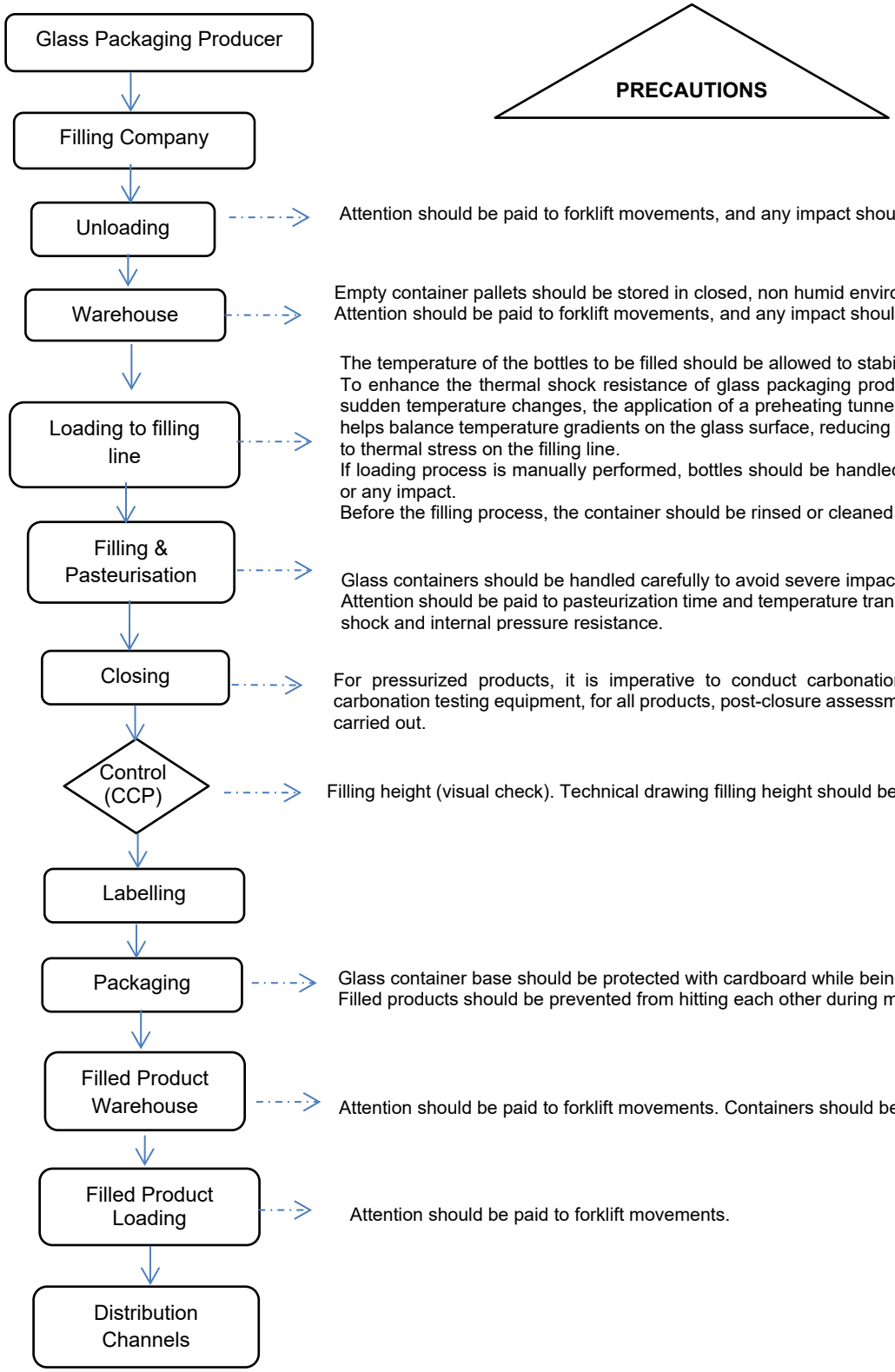
c) Following receipt of a written complaint, samples of defective products and other relevant details, Şişecam Glass Packaging will begin an investigation within its premises and if necessary, within the customers' facilities. According to the defect group and defect limits (AQL), the complaint will be examined, and the customer will be informed of the result.

d) If the complaint is related to packaging, it is important to identify and report the problem while the product remains in the delivery vehicle. It is also vital to determine if the 'delivery safety attachment' (L-shaped brackets and strap which hold the product in position) is in place. Related packaging problems may be as follows: dirty pallet, collapsed pallet, loose shrink wrap, tear in shrink wrap, wet shrink wrap, broken pallet wood, missing base nylon, mouldy pallet, non-conforming packaging standard. In such a situation, photographs of the product, as well as the vehicle's number plate, should be taken before unloading. The complaint should be reported to the relevant Sales Department or the Customer Quality Department within ten working days. A packaging complaint which falls outside the 10-working day limit will not be processed.

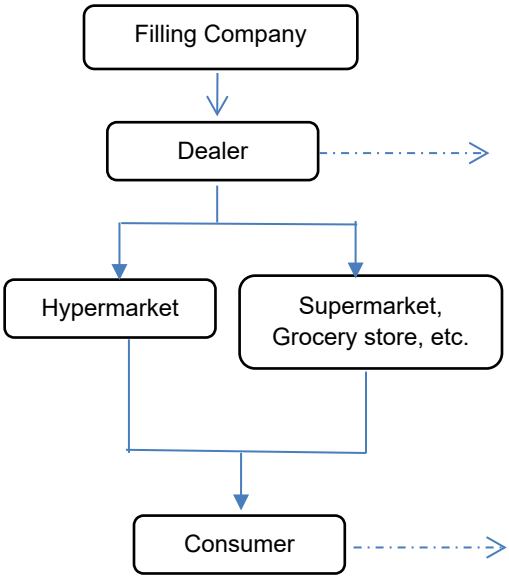
e) If the customer stores pallets improperly (e.g. open and dusty area, in direct sunlight and/or on an uneven surface), Şişecam Glass Packaging will not be held responsible for any subsequent complaint.


Customer
Sisecam
Information
Customer Complaint
Problem definition
Pallet labels or pallet numbers
Photo of defect
Sample of defect
Number of defected products
Preliminary examination of the customer complaint
Problem definition
Pallet labels or pallet numbers
Photo of defect
Sample of defect
Number of defected products
Production and quality records examination
If the problem is functional/critical
if the problem repeats
Information
Block the regarding lot in plant (for functional/critical defects)
Continue to use the related lots and give information
Informing the customer to use the lot (if the problem is not continuous or not functional/critical)
Informing the customer to stop to use the lot (If the problem is continuous or critical - Sisecam is not responsible for further use of the non-conformed product)
Stock control according to the specification
Stop to use the related lots
Examining the customer complaint samples to find the root cause of the defect
If needed visiting the customer and controlling according to the specification
Preparing official customer complaint evaluation report including findings and corrective actions
Mutual agreement with Sisecam about the cost
Evaluating the cost of the complaint by Sisecam
Are the products in comply with the specification?
YES
NO
Information
Informing the customer about control results
Informing Sisecam for the management of the related lot (reselection, line control, retrieve the products, etc.)
Information
Resulting the claim (reselection, line control, retrieve the products, etc.)
Information

13. RULES TO BE FOLLOWED BY FILLING COMPANIES



14. RULES TO BE FOLLOWED IN DISTRIBUTION CHANNELS



Control
CCP

Headspace of bottle should not be completely filled.
Attention should be paid to the storage location and method
Control of packaging (tears, with or without cardboard)

The headspace of bottle should not be completely filled.
The conformity of area where pallets are stocked should be monitored.

Products with a fill level so high that the headspace is not visible should not be purchased.

PRECAUTIONS

Pallets should be stored in a cool, enclosed area (should not be exposed to direct sunlight)
Glass containers should be handled carefully to avoid severe impacts with other containers or metal surfaces while shipping or handling.

Glass container with or without packaging should be transported with covered trucks.

Boxes should not be thrown away or allowed to trall on ground while loading to transfer vehicles.

Front showcases, ground level areas, and outside of supermarkets are not suitable for stocking individual bottles. Any impact or drops should be prevented.

Bottles should not be bumped or dropped while purchasing.
Purchased bottles should not be shaken or hit against each other or metal surfaces while carrying or during transport.
Care should be taken not to drop them when placing them in the refrigerator; if dropped, they should be covered with a wet cloth and set aside.
Bottles should not be shaken before opening and a proper bottle opener should always be used.
Full products should not be placed in the freezer.

15. RELATED DOCUMENTS

Product category based technical specifications are given separately in the documents below.

SPEC.AC.0553 : Pressurized Containers Technical Specification
SPEC.AC.0554 : Food Containers, Water Bottles, General Purpose Containers Technical Specification
SPEC.AC.0555 : Pharmaceutical, Vials and Serum Bottles Technical Specification
SPEC.AC.0556 : Hight Spirit, Wine and Champagne Bottles Technical Specification
SPEC.AC.0557 : Decorated Containers Technical Specification
MAN.AC.0001 : Catalogue of Glass Defects

TÜRKİYE ŞİŞE VE CAM FABRİKALARI A.Ş. APPROVAL	CUSTOMER APPROVAL
Date - Stamp - Signature	**Customer Name** **Date - Stamp - Signature**