KAVALIER

PRODUCT DATA SHEET

412/23

Issuer´s name/ producer: **KAVALIERGLASS, a.s.**
Issuer´s address/Producer: **Křížová 1018/6, Prague 5**
office: Sklářská 359, 285 06 Sázava, Czech Republic

Object of the declaration: **GLASS TUBES**

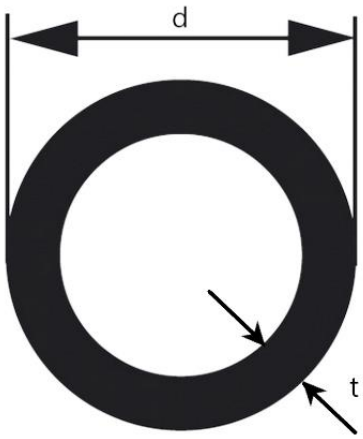
Product IDN

1632246200180

Description

d [mm]	t [mm]	l [mm]
20,0 ± 0,25	1,8 ± 0,1	1500 ± 10

Scheme of the glass item



Material specification:		
Glass tube	clear	**Borosilicate glass 3.3 SIMAX®, acc. to ISO 3585** glass with high thermal and chemical resistance
Purpose of use	Application in technical, pharmaceutical, laboratory or food industry	

Chemical properties:

	water at 98 °C	ISO 719	HGB1
• Hydrolytic resistance	water at 121 °C	ISO 720	HGA1
	glass grains, test B	Ph. Eur., chap. 3.2.1	HGA1
• Acid resistance		ISO 1776	1
• Alkali resistance		ISO 695	A2
The heavy metal content for the elements lead, cadmium, mercury and hexavalent chromium			below 100 ppm

Physical Properties:

Coefficient of mean linear thermal expansion α	(20/300°C)	ISO 7991	$(3,3 \pm 0,1)\ x10^{-6}\ K^{-1}$
Density ρ			$(2,23 \pm 0,02)\ g.cm^{-3}$
Thermal conductivity	at 100°C		$1,2\ W.m^{-1}.K^{-1}$
Temperatures at viscosity of η in *dPa.s*	10^4 working point	ISO 7884	1260 °C
	$10^{7,6}$ softening point	ISO 7884	820 °C
	$10^{13,2}$ annealing point	ISO 7884	558 °C
Transformation temperature T_g		ISO 7884-8	525 °C
Modulus of elasticity /Young's modulus (E)			$63x10^3$ MPa
Poisson's ratio			0,19
Maximum permissible short-term operating temperature			500 °C
Maximum permissible long-term operating temperature			300 °C
Minimum permissible operating temperature			-40 °C

Optical Properties:

Simax glass refractive index (λ = 589.30 nm) n_d	1,472
Photoelastic constant	$3,6.10\text{-}6\ MPa^{-1}$
Solar transmittance	≥ 91,8% λ = (300 – 2500) nm

Electrical Properties:

At current temperatures, SIMAX glass mass is non-conducting material – it is an insulant.

Specific electric resistance in a moisture-free medium (20 °C)	greater than 1013 – 1015 W×cm
Permittivity ε (20 °C, 1 MHz)	4,6
Loss angle tg δ	$4,9\ .\ 10^{-3}$

The object of the certificate described above is in conformity with the requirements of the following standards and regulations:

Glass characteristics:

- ISO 3585 Borosilicate glass 3.3 – Properties

  - Chemical durability (art. 4.1, 4.2, 4.3, 4.4)
  - Physical properties (art. 5.1, 5.2, 5.3, 5.4, 5.5, 5.6)

- Glass containers for pharmaceutical use

  - Eur. Ph 10th Edition - 3.2.1 Glass Type I.

Supporting data:

TEST / European Pharmacopoeia 10, Art. 3.2.1	UNIT	LIMIT	RESULT
Hydrolytic resistance - inner surfaces, test A	ml 0,01 mol/l HCl/100ml of leachate	**max 0,40**	**0,04**
Hydrolytic resistance - glass grains, test B	mol 0,02/l HCl/g	**max 0,1**	**0,038**
Arsenic content	mg As/g	**max 0,1**	**< 0,001**

FOOD CONTACT:

- Commission Regulation (EU) No. 2023/2006

Good manufacturing practice for materials and articles intended to come into contact with food

- Regulation EC No 1935/2004 of 27 October 2004

Directive on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC

- Regulation of Czech Health Ministry Decree No. 38/2001 Coll.

Directive on articles intended to come into contact with foodstuffs

- Directive 84/500EEC of 15 October 1984

Directive on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs.

- ISO 7086-1:2000 Glass hollowware in contact with food

Release of lead and cadmium – Part 1: Test method

- ISO 7086-2:2000 Glass hollowware in contact with food

Release of lead and cadmium – Part 2: Permissible limits

- ISO 719:2000 Glass - Hydrolytic resistance of glass grains at 98 °C

Method of test and classification

- ASTM E438 Standard Specification for Glasses in Laboratory Apparatus

Classification, chemical requirements of the glass

No heavy metals (lead, cadmium, mercury and hexavalent chromium):

- **Regulation (EC) No. 987/2008 of 8 October 2008 amending Regulation (EC) No. 1907/2006 – REACH as regards Annexes IV and V – glass was exempted from the obligation to register.**
  The object of declaration does not contain any substances from the REACH – Candidate list of SVHC.

- **Directive 2011/65/EC (RoHS II), amended by 2015/863/EC, on the restriction of the use of certain hazardous substances in electrical and electronic equipment, Annex II - extension of limitation regarding 4 additional substances.**

Chemical characteristics (acc. to Regulation No 1907/2006/EC):

Composition:	**CAS No.**	**EINECS No.**	**Component:**	**Concentration /Percent:**
	65997-17-3	266-046-0	Glass, oxide, chemicals	100%

Chemical stability: Stable

- **Chemical characteristics of borosilicate glass (**approximate values**)** ASTM E438

Component	Content (percentage by weight)
SiO_2	80,3%
B_2O_3	13,0%
Al_2O_3	2,4%
$Na_2O + K_2O$	4,3%

Additional information:

These products are made of borosilicate glass, which does not harm the human health. Its characteristics are constantly tested and comply fully with the standard ISO 3585 Borosilicate glass 3.3 –Properties.

The producer declares that the products are safe when used in usual and proper way.

The producer has installed the Quality Assurance System according to ISO 9001 and thus guarantees that all products delivered to the market are in full conformity with the technical documentation and with all fundamental requirements to such products.
Certificate No. 04 100 940602 issued by TÜV CERT, Certification Body at TÜV NORD CERT GmbH.

The certificate is issued for the customer: **AUXILAB S.L.**

Sázava, 01. 09. 2023
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Place and date of issue

Ing. Kristýna Machová
……
Project Quality Engineer

KAVALIERGLASS, a.s.
Křižová 1018/6, 150 00 Praha 5
office: Sklářská 359, 285 06 Sázava
Czech Republic
IČ: 474 68 815
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