KAVALIER

PRODUCT DATA SHEET

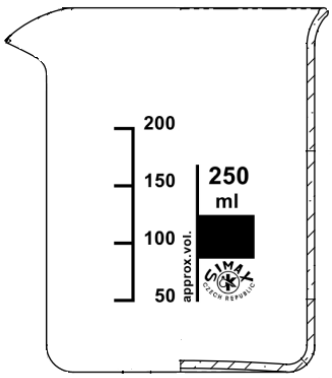
308/23

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

Object of the declaration: **BEAKERS, low form, with spout, w/o print**

Mel Nr.	Product Code	Batch Nr.	Capacity/ ml	d [mm]	h [mm]
KAVA632417010250	1632417010250		250	70	95

Scheme of the glass item



Material specification:		
Beaker	clear	Borosilicate glass SIMAX®
Print	white	in fired-on, chemically resistant ceramic enamel
Purpose of use	laboratory glassware Suitable for work with higher mechanical effort, more resistant against stroke and smash	

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.

- ISO 3819:2020 - Laboratory glassware — Beakers
  - Maximum permissible errors in dimensions fulfill the values specified in Table 1 - ISO 3819:2020

Table 1 – ISO 3819:2020

Dimensions of low form beakers		
Nominal capacity [ml]	**External diameter [mm] ± 5%**	**Overall height [mm] max.**
5	22	32
10	26	37
25	34	52
50	42	62
100	50	72
150	60	82
250	70	97
400	80	113
500	85	118
600	90	128
800	100	138
1000	105	148
2000	130	188
3000	150	214
5000	170	274
10000	220	360

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.

Characteristics of Borosilicate glass SIMAX®

- **Acid resistance** Class I. ISO 1776
- **Hydrolytic resistance** Class I. HGB1 to ISO 719; HGA1 to ISO 720
- **Alkali resistance** Class II. ISO 695
- **Coefficient of mean linear thermal expansion α: 3,3 x10^{-6} K^{-1}** ISO 7991; (20/300 °C)
- **Pharmaceutical use**

	European Pharmacopoeia (EP)	*US Pharmacopoeia (USP)*	*Japanese Pharmacopoeia (JP)*
Glass	Eur. Ph.10th – 3.2.1	USP <660>	JP16

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	**µg As/g**	**max 0,1**	**< 0,001**

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

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%

- **Chemical characteristics Borosilicate glass SIMAX® (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 %

- **Temperature resistance**

The maximum permissible short-term operating temperature is 500 °C
The recommended permissible temperature is 350 °C. This temperature may be exceeded for a short period.
The maximum thermal shock resistance is ΔT = 100 K.

Before using, the glass surfaces of the Beakers have to be checked for damages such as scratches, cracks or nicks. Damaged beakers must not be used for safety reasons.

Chemical properties:

Physical Properties:

Coefficient of mean linear thermal expansion α	(20/300°C)	ISO 7991	$(3,3 \pm 0,1) \times 10^{-6}\ K^{-1}$
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)			63×10^3 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	$4,9 \cdot 10^{-3}$

Additional information:

The producer confirms hereby that the characteristics, measures and accuracy of the products listed above are in full conformity with the provisions of the standard.
The producer also 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. 44 100 940602 issued by TÜV CERT, Certification Body at TÜV NORD CERT GmbH.

The certificate is issued for the customer: **VWR®, Part of Avantor**

Sázava, 21. 06. 2023
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
-61-