Lingyan | Empowering Science Worldwide

Lingyan Tec Co., Ltd.

LABORATORY

Glass Test Tubes



www.lingyantec.com

Lingyan | Empowering Science Worldwide

LABORATORY GLASS TEST TUBES

Laboratory glass test tubes are basic laboratory vessels commonly used for experiments, testing, cultivation, and sample handling, and are widely used in biology, chemistry, pharmaceuticals, food, and environmental testing.

This product is manufactured from different types of glass materials (such as Borosilicate glass, Neutral glass, etc.) and offers excellent heat resistance, chemical stability, and mechanical strength to meet the requirements of use under various experimental conditions.

Amber glass test tube options are also available for light-sensitive samples and reagents that require protection from light during storage, handling, and transport.



MATERIAL

3.3 High borosilicate glass test tube

A laboratory test tube made of borosilicate glass 3.3, characterized by high chemical stability, good heat resistance, and strong thermal shock resistance; suitable for most routine laboratory procedures and boiling applications.

5.0 Neutral borosilicate glass test tube

A laboratory test tube made of neutral borosilicate glass, with good chemical resistance and moderate heat resistance. It is suitable for sample containment, storage, and medium-temperature use under general laboratory conditions, but should not be heated directly over an open flame.

7.0 Low-borosilicate glass test tube

A laboratory test tube made of Low-borosilicate glass, offering basic transparency and chemical stability, but with relatively limited heat resistance and thermal shock resistance. It is suitable for general observation, simple mixing, gentle heating, and routine sample storage.

Soda-lime glass test tube

A laboratory test tube made of soda-lime glass, featuring relatively low cost, good formability, and basic transparency; however, its heat resistance, thermal shock resistance, and chemical stability are comparatively limited, making it suitable for storing dry powders and general samples.

3.3 High Borosilicate Glass Main Chemical Components (%)

SiO_2	B_2O_3	Al_2O_3	K_2O	Na_2O	Fe_2O_3	CaO	As_2O_3
80.52	12.99	1.96	0.04	4.26	0.02	0.20	0.001

5.0 Neutral Borosilicate Glass Main Chemical Components (%)

SiO_2	B_2O_3	Al_2O_3	CaO	Na_2O	K_2O
74.0	11.0	5.4	1.5	6.4	0.7

7.0 Low-Borosilicate Glass Main Chemical Components (%)

SiO_2	Al_2O_3	B_2O_3	CaO	MgO	BaO	$Na_2O + K_2O$	Fe_2O_3
70–72	5–7	6.5–7.5	2.5–3.5	0.2–0.5	1–2	10–12	0.1–0.3

Comparison of Typical Physical Properties of Different Glass Materials

Glass material	Average linear thermal expansion coefficient α (20–300 °C)	Glass transition temperature Tg	Annealing point (η=10^{13} dPa·s)	Softening point (η=$10^{7.6}$ dPa·s)	Working point (η=10^{4} dPa·s)	Density (25 °C)
3.3 Borosilicate glass	3.3 × 10^{-6}/K	525 °C	560 °C	825 °C	1260 °C	2.23 g/cm³
5.0 Neutral glass	4.9 × 10^{-6}/K	565 °C	565 °C	785 °C	1160 °C	2.34 g/cm³
7.0 Low-borosilicate glass	(7.0±0.1) × 10^{-6}/K	550±15 °C	—	750±10 °C	1110±20 °C	2.46±0.02 g/cm³
Soda-lime glass	9.1 × 10^{-6}/K	525 °C	530 °C	720 °C	1040 °C	2.50 g/cm³w

Note:
Density is mass per unit volume, and its value varies slightly with temperature; as temperature increases, the material volume usually expands and the density decreases slightly.

Comparison of Typical Chemical Properties of Different Glass Materials

Glass material	Hydrolytic resistance (ISO 719)	Acid resistance (DIN 12116)	Alkali resistance (ISO 695)	ASTM E 438	Heavy metal content (Pb/Cd/Hg/Cr^{6+})
3.3 Borosilicate glass	Class HGB 1	Class S1	Class A2	—	< 100 ppm
5.0 Neutral glass	Class HGB 1	Class S1	Class A2	Type I, Class B	< 100 ppm
7.0 Low-borosilicate glass	Class HGB 1 or Class HGB 2	Class S1	Class A2	—	—
Soda-lime glass	Class HGB 3	Class S1	Class A2	Type II	< 100 ppm

Note:
HGB denotes the hydrolytic resistance class of glass grains; in general, a class with a lower numerical value indicates better hydrolytic resistance, lower alkali extractability, and higher chemical stability.

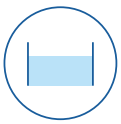
STRUCTURE

In terms of product structure, laboratory glass test tubes typically consist of the glass tube body, the rim structure, and the bottom structure.



Mouth configuration

Depending on the design, this may be a plain rim, flared rim, or threaded finish



Glass tube body

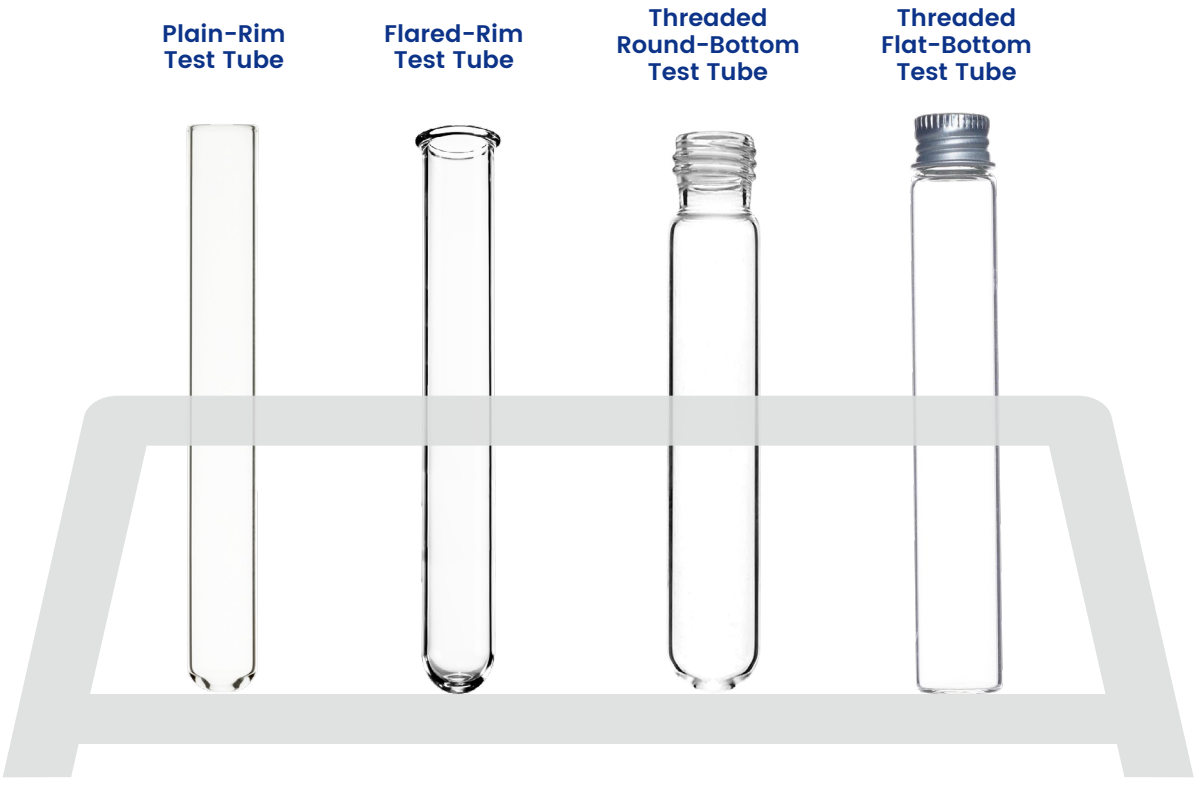
The main body used for containing and observing samples



Bottom configuration

Most are round-bottomed, although other forms may also be used depending on the application.

For products requiring sealed storage, a closure system may also be provided, such as caps and seal rings, to meet requirements for sample preservation, contamination prevention, and usage control.





SPECIFICATIONS

Common specifications (O.D. × Length)
10×75 mm, 12×75 mm, 12×100 mm, 15×125 mm, 15×150 mm, 18×150 mm, 25×150 mm, 25×200 mm, etc.

Reference capacities
Approx. 3 mL, 5 mL, 8 mL, 10 mL, 25 mL, 50 mL, 75 mL, etc.

Color
Clear glass and amber light-protective glass are available.

Shape
Available options include plain rim/ flanged rim, round bottom/flat bottom, and graduated/non-graduated.

Customization
Specific dimensions and configurations can be customized to customer requirements.

Optional accessories:
Caps, seal ring

Cap Types for Laboratory Glass Test Tubes

Type	Image	Key Features	Suitable for Autoclaving	Applications	Remarks
Phenolic resin cap (Bakelite cap)		A classic laboratory configuration, resistant to high-temperature steam and convenient for handling and sealing after sterilization.	Yes	Suitable for repeated sterilization, repeated use, and traditional microbiological culture	Commonly fitted with a white rubber Seal ring
Polypropylene cap		Lightweight, offers good chemical resistance, moderately priced, and widely used	Yes (typically up to 121 °C)	General sample storage, routine culture, and routine sterilization	One of the common standard configurations
Polycarbonate cap		Good mechanical strength and suitable for Autoclaving	Yes, but not suitable for prolonged repeated sterilization	Can be used as an optional solution for high-temperature applications	Repeated sterilization will shorten service life and reduce mechanical performance
Aluminum cap (all aluminum)		Wider temperature resistance range, higher mechanical strength, and better barrier properties	Yes	Applications such as culturing, storage, and transport	Usually fitted with a rubber seal ring
Pierceable sealing cap		Facilitates syringe puncture for sample injection, sampling, or replenishment, helping maintain a sealed/ anaerobic environment	Possible (specific suitability depends on the cap material and stopper material)	Anaerobic culture, aseptic sampling, and handling of sensitive samples	Commonly an open-hole cap + butyl rubber stopper

Seal Ring Types for Laboratory Glass Test Tubes

Type	Image	Key Features	Temperature Resistance / Sterilization Performance	Applications	Remarks
Foamed PE Seal ring		Low cost; suitable for basic sealing and leak prevention	Generally not recommended for high-temperature sterilization	Room-temperature sealing; storage of general samples	Economical option
Silicone Seal ring		Good elasticity; suitable for routine high-temperature laboratory applications	Withstands Autoclaving at 121 °C	Routine sterilization, routine culture, and sealing of general samples	Some high-temperature silicone grades can withstand even higher temperatures
Silicone + PTFE Composite Seal ring		The PTFE contact surface offers excellent chemical inertness, while the silicone layer provides sealing performance	Suitable for more demanding applications	Strong acids and alkalis, solvent systems, high-purity samples, diagnostic reagents	Suitable for applications with stringent requirements for extractables and compatibility
Rubber Seal ring		A traditional sealing method suitable for routine use	Some configurations are suitable for Autoclaving, depending on the rubber formulation and cap design	Routine culture media, general sample storage, standard sealing	Commonly used in traditional test tubes
PTFE Seal ring		Highly chemically inert and resistant to most acids, alkalis, and organic solvents	Depends on the specific design; some configurations can be used for sterilization	Sealing of samples with high chemical compatibility requirements	Moderate sealing elasticity; often used in combination with other materials



FEATURES

Excellent material properties

Depending on the glass material used, the product may provide good hydrolytic resistance, acid resistance, heat resistance, and chemical stability, helping to maintain sample stability and purity.

Excellent heat resistance

Borosilicate glass test tubes have a low coefficient of linear expansion and good thermal stability, making them suitable for routine heating and certain high-temperature sterilization procedures.

Clear and amber options

Available in clear and amber glass options to meet different needs for sample observation and light protection.

Diverse structural designs

Available in multiple configurations, including open test tubes, flanged test tubes, and screw-cap test tubes, and compatible with caps and Seal rings made from different materials to meet sealing, storage, culture, and other application requirements.

Standardized production and consistency

Available in a variety of common sizes and structural configurations, suitable for routine laboratory use and bulk procurement.

Wide applicability

Widely used for laboratory testing, sample storage, culture, chemical reactions, and other applications, and also suitable for the pharmaceutical, biological, food, and environmental testing fields.

USAGE PRECAUTIONS

1.
Before use, inspect the test tube for cracks, chips, or visible scratches; damaged glassware is not recommended for further use.

2.
Newly purchased products should be properly cleaned before first use.

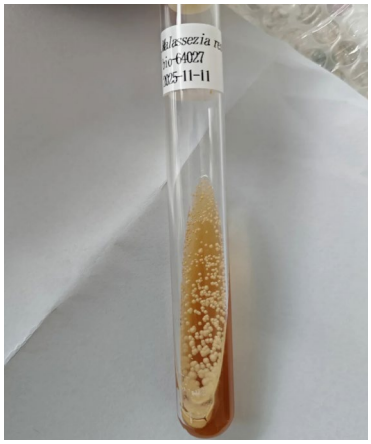
3.
Heating and cooling should be performed as slowly and evenly as possible to avoid sudden temperature changes and localized overheating; cold glass should not be placed directly on a preheated hot plate or exposed to a strong open flame.

4.
Before autoclaving, confirm the glass material and the temperature resistance of the cap and Seal ring, and use the sealing system correctly as required; for screw-cap products, the cap should generally not be fully tightened during sterilization.

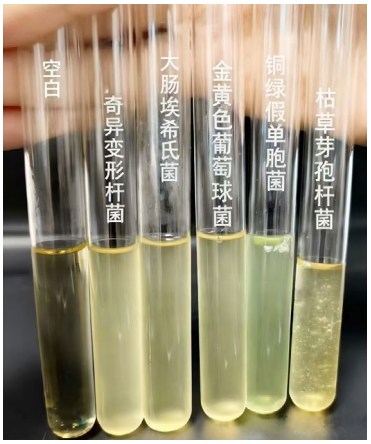
5.
For high-purity samples, strongly corrosive media, or solvent systems, sealing materials with more appropriate chemical compatibility should be selected preferentially, such as designs with PTFE contact surfaces.

APPLICATIONS

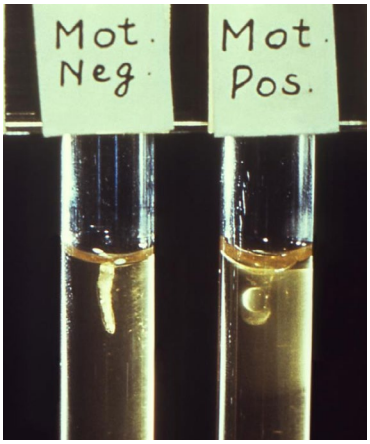
Microbiological Culture



Slant Culture Media



Broth Culture Media



Deep Culture and Stab Culture

Biochemistry and Testing



Light-Sensitive Sample Preparation and Storage



Biochemical Reaction Testing



Analytical Testing

Medical and Research Applications



Clinical Testing



Laboratory Research



Reagent Aliquoting

PACKAGING

The products are first placed into trays and heat-shrink wrapped; multiple shrink-wrapped trays are then packed into corrugated cartons; finally, the cartons are palletized and stretch-wrapped as a unit.

01 Packed into trays



02 Packed into corrugated cartons



03 Placed on pallets



04 Wrapped in carton packaging





Special packaging for large sizes



Large-size test tubes packed in cartons

Lingyan

Empowering Science Worldwide



Lingyan Tec Co., Ltd.

Address: No. 285 Renmin Road, Hengshui City, Hebei, China.
Website: www.lingyantec.com
E-mail: Owen@lingyantec.com