



鸿希玻璃
HONGXI GLASS

High borosilicate 3.3 glass tube (A level) quality standard

● Specifications and tolerance requirements

| Diameter (mm) | Tolerance | Wall thickness (mm) | Tolerance | Roundness (mm) | Straightness (%) | Length | Tolerance |
|---------------|-----------|---------------------|-----------|----------------|------------------|------------------------------------|-----------|
| 3.7 | ±0.25 | 0.5~1.0 | ±0.1 | ≤0.2 | ≤3 | According to customer requirements | ±20 |
| 5~15 | ±0.3 | 0.7~2 | ±0.5 | ≤0.3 | | | |
| 16~20 | ±0.4 | 1.0~3.0 | ±0.5 | ≤0.4 | | | |
| 20~35 | ±0.5 | 1.0~3.0 | ±0.5 | ≤0.5 | | | |
| 36~40 | ±0.7 | 1.0~4.0 | ±0.2 | ≤0.7 | | | |
| 41~59 | ±0.8 | 1.2~5.0 | ±0.2 | ≤0.8 | | | |
| 60~70 | ±1.0 | 1.2~5.0 | ±0.2 | ≤1.0 | | | |
| 75~90 | ±1.2 | 1.5~5.0 | ±0.2 | ≤1.2 | | | |
| 95~120 | ±1.5 | 1.8~5.0 | ±0.2 | ≤1.5 | | | |
| 130~150 | ±2 | 1.9~5.0 | ±0.2 | ≤2.0 | | | |
| 160~170 | ±2.5 | 2.5~7.0 | ±0.2 | ≤2.5 | | | |
| 180~200 | ±3 | 3.0~7.0 | ±0.3 | ≤3.0 | | | |
| 230 | ±3 | 5.0~7.5 | ±0.4 | ≤3.0 | | | |
| 250 | ±4 | 5.0~8.0 | ±0.8 | ≤4.0 | | | |
| 300 | ±5 | 7.0~9.0 | ±1.0 | ≤5.0 | | | |
| 315 | ±5 | 7.0~9.0 | ±1.0 | ≤5.0 | | | |

Note: The values given in the table are the data used in the normal production and operation of the company. If the customer does not put forward special requirements, they will be implemented accordingly. If there are special requirements, the supply contract shall prevail.

1. Appearance

- 1.1. Stones: There should be no more than 2 stones with a length of 1m or less, and the length of the small tail on the stones should not exceed 10mm.
- 1.2. Nodules: no more than 4 nodules with a length of less than 1mm within a length of 1m.
- 1.3. Air lines: The small air lines should not be dense, that is, not more than 1 within the range of 10mmx10mm; the length of the air lines should not exceed 100mm, no more than 1 piece within 1m length.
- 1.4. Scratches: Strict control is required.
- 1.5. Corrugated line: no obvious existence is allowed.
- 1.6. Others: Foreign matter, rust and crystallization are not allowed.
- 1.7. The total number of stones, nodules and air lines (excluding small air lines) shall not exceed 4 within the length of 1m on the glass tube.
- 1.8. End face: The end faces at both ends are basically flat, and the same end face must not have serious

fluctuations.

2. Inspection method

The outer diameter, wall thickness and roundness are measured with vernier calipers. The outer diameter is measured between 100-400mm at both ends, and the roundness is measured between 100-400mm from the end face. The length is measured with a tape measure, and the straightness is measured with special equipment. Visual inspection.

● Chemical compositions and physical and chemical properties of borosilicate glass type3.3

| Composition | SiO2 | R2O3 | R2O | A12O3 | Fe2O3 |
|--|------|------|------------------|-------|----------------------------------|
| Content | 80.3 | 13.0 | 4.2 | 2.4 | 0.035 |
| Physics performance | | | Numerical value | | Unit |
| Medium coefficient of linear expansion | | | 3.3 ± 0.1 | | 10 ⁻⁶ K ⁻¹ |
| Softening point | | | 820 ± 10 | | °C |
| Strain point temperature | | | 510 ± 10 | | °C |
| Annealing point temperature | | | 560 ± 10 | | °C |
| Average thermal conductivity(20-100°C) | | | 1.2 | | Wm ⁻¹ k ⁻¹ |
| Thermal shock | | | 240 | | °C |
| Density 20°C | | | 2.23 ± 0.02 | | g/cm ³ |
| Endure water under 98 °C | | | TS00719-HGB1 | | / |
| Endure water under 121°C | | | IS00720-HGA1 | | / |
| Acid-proof test | | | Na2O≤100 | | ug |
| Alkali-proof test | | | IS00695 | | / |
| Light transmittance | | | 91% (30nm-250nm) | | |

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