

ICS 81.040.01

CCS L 50



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 7962.21-2019

**Test method of colourless optical glass -- Part 21: Resistance to
attack by aqueous alkaline solutions**

Issued on: August 30, 2019

Implemented on: March 1, 2020

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

1 Scope	1
2 Normative references	1
3 Principle	1
4 Reagent	1
5 Instrument	2
6 Preparation of the tested sample	3
7 Test Step	4
8 Calculation of results	6
9 Classification and judgment	7
10 Test report	7
Appendix A (informative appendix) Structure changes of this part compared with ISO 10629.1996	9

Foreword

GB/T 7962 "Test Method for Colorless Optical Glass" is divided into the following 23 parts.

- Part 1.Refractive index and dispersion coefficient;
- Part 2.Fizeau Plane Interferometry for Optical Uniformity;
- Part 3.Optical uniformity holographic interferometry;
- Part 4.Temperature coefficient of refractive index;
- Part 5.Stress birefringence;
- Part 6.Young's modulus, shear modulus and Poisson's ratio;
- Part 7.Streakness;
- Part 8.Bubble degree;
- Part 9.Light absorption coefficient;
- Part 10.X-ray resistance;
- Part 11.Precision test of visible refractive index;
- Part 12.Intraspectral transmittance;
- Part 13.Thermal conductivity;

- Part 14. Acid resistance stability;
- Part 15. Moisture resistance stability;
- Part 16. Linear expansion coefficient, transition temperature and sag temperature;
- Part 17. Ultraviolet and infrared refractive index;
- Part 18. Kjeldahl hardness;
- Part 19. Abrasion;
- Part 20. Density;
- Part 21. Alkali resistance stability;
- Part 22. Phosphoric acid resistance stability;
- Part 23. Weather resistance stability.

This part is Part 21 of GB/T 7962.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the redrafting method to amend and adopt ISO 10629.1996 "Test of the alkali resistance stability of optical glass blanks in alkaline solution at 50 degrees C"

Test method and classification.

Compared with ISO 10629.1996, this part has many adjustments in structure. Appendix A lists this part and ISO 10629.1996.

A list of changes in chapter numbers.

The technical differences between this part and ISO 10629.1996 and the reasons are as follows.

---Regarding normative reference documents, this section has made technically different adjustments to adapt to my country's technical conditions and adjustments.

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

- * Replace ISO 2768-1.1989 with GB/T 1804-2000, which is equivalent to the international standard;
- * Replace ISO 3696.1987 with GB/T 6682-2008 which is modified to adopt international standards;
- * Deleted ISO 3585.1991;
- * Added reference to GB/T 903 and GB/T 1185-2006.

---Unify "2-propanol" as "isopropanol" (according to its molecular formula and function, the

two are the same substance, and the name is unified according to Chinese custom).

---Chapter 6 adds 6.1 material requirements (to reduce the difference in test results caused by material differences).

--- Change the 6.1 polishing and fine grinding process requirements of ISO 10629.1996 to the quality requirements of this part 6.2 (conducive to the implementation of the standard).

--- Modify the measurement accuracy of 6.3 size (reduce the difference in surface area of the tested sample).

---The content of Chapter 7 shall be re-divided and modified according to the test requirements and test steps, and the tolerances have been increased (conducive to the implementation of the standard).

---The grade of optical glass alkali resistance stability is tabulated after the decimal point, and the test report format is added.

This section has made the following editorial changes.

--- Amend the standard name to "Colorless Optical Glass Test Method Part 21. Alkali Resistance Stability";

---Informative Appendix A has been added.

Please note that certain contents of this document may involve patents. The issuing agency of this document is not responsible for identifying these patents.

This part was proposed by China Machinery Industry Federation.

This part is under the jurisdiction of the National Optical and Photonics Standardization Technical Committee (SAC/TC103).

Drafting organizations of this section. Chengdu Guangming Optoelectronics Co., Ltd., China Ordnance Industry Standardization Institute, Shanghai Optics, Chinese Academy of Sciences

Institute of Precision Machinery.

1 Scope

This part of GB/T 7962 specifies the principle, test procedure, data processing and classification of the alkali resistance stability test method of colorless optical glass.

This section applies to colorless optical glass, other types of glass can be used as reference.

2 Normative references

The following documents are indispensable for the application of this document. For dated

reference documents, only the dated version applies to this article

Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 903 colorless optical glass

GB/T 1185-2006 Surface defects of optical parts

GB/T 1804-2000 General Tolerances Tolerances of linear and angular dimensions without tolerances (equivISO 2768-1.1989)

GB/T 6682-2008 Analytical laboratory water specifications and test methods (ISO 3696.1987, MOD)

3 Principle

Put the polished test sample into a sodium hydroxide test solution with a temperature of 50°C and a concentration of 0.01mol/L to etch for a specified time,

Weighing measures the mass loss of the tested sample, and calculates the erosion depth based on the glass density. According to the time $t_{0.1}$ and the invasion depth required to reach 0.1μm

The change of the surface of the tested sample after the completion of the etching determines the alkali resistance stability level of the tested glass.

4.1 General

During the test, unless otherwise specified, chemical reagents should be used.

4.2 Water

It shall meet the requirements of secondary water specified in GB/T 6682-2008.

4.3 Test solution

Dilute the sodium hydroxide solution with water to control and adjust the pH value so that the pH value = 12 +/- 0.1.

4.4 Nitric acid (HNO₃)

Dilute with analytical grade to pH 4.5+/-0.1.

4.5 Sodium hydroxide solution

Concentration cNaOH=0.1mol/L.