

# INTERNATIONAL STANDARD

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## **Glass — Resistance to attack by a boiling aqueous solution of mixed alkali — Method of test and classification**

*Verre — Résistance à l'attaque par une solution aqueuse bouillante d'un  
mélange alcalin — Méthode d'essai et classification*



Reference number  
ISO 695:1991(E)

## **Foreword**

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 695 was prepared by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*.

This third edition cancels and replaces the second edition (ISO 695:1984), of which it constitutes a technical revision.

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# Glass — Resistance to attack by a boiling aqueous solution of mixed alkali — Method of test and classification

## 1 Scope

This International Standard specifies

- a) a method for determining the resistance of glass to attack by a boiling aqueous solution of sodium carbonate and sodium hydroxide. The resistance is measured inversely by the loss in mass per unit surface area of the glass;
- b) a classification of glass according to the alkali resistance determined by the method of this International Standard.

NOTE 1 The method of test according to this International Standard is also applicable for determining the alkali resistance of glass ceramics.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 683-13:1986, *Heat-treatable steels, alloy steels and free-cutting steels — Part 13: Wrought stainless steels.*

ISO 719:1985, *Glass — Hydrolytic resistance of glass grains at 98 °C — Method of test and classification.*

ISO 720:1985, *Glass — Hydrolytic resistance of glass grains at 121 °C — Method of test and classification.*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods.*

ISO 3819:1985, *Laboratory glassware — Beakers.*

ISO 4799:1978, *Laboratory glassware — Condensers.*

## 3 Principle

3.1 Immersion of two sample pieces, each having a total surface area of 10 cm<sup>2</sup> to 15 cm<sup>2</sup> in a boiling aqueous solution of equal volumes of sodium carbonate,  $c(\text{Na}_2\text{CO}_3) = 0,5 \text{ mol/l}$ , and sodium hydroxide  $c(\text{NaOH}) = 1 \text{ mol/l}$ , for 3 h. Calculation of the loss in mass per unit surface area of the glass.

## 4 Reagents

During the test, unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity (grade 3 water complying with the requirements of ISO 3696).

4.1 **Acetone**,  $\text{CH}_3\text{COCH}_3$ .

4.2 **Hydrochloric acid**, solution,  $c(\text{HCl}) \approx 1 \text{ mol/l}$ .

4.3 **Hydrochloric acid**, solution,  $c(\text{HCl}) \approx 2 \text{ mol/l}$ .

4.4 **Hydrofluoric acid**,  $c(\text{HF}) \approx 22 \text{ mol/l}$  (i.e.  $\approx 400 \text{ g HF/l}$  solution).

4.5 **Sodium carbonate**, solution,  $c(\text{Na}_2\text{CO}_3) = 0,5 \text{ mol/l} \pm 0,01 \text{ mol/l}$ , freshly prepared for each test.

4.6 **Sodium hydroxide**, solution,  $c(\text{NaOH}) = 1 \text{ mol/l} \pm 0,02 \text{ mol/l}$ , freshly prepared for each test.

## 5 Apparatus

5.1 **Test vessel**, of pure silver, alkali-resistant silver