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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Type 101 Sealing Glass¹

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^{ε1} NOTE—Section 11 was changed editorially in September 1995.

1. Scope

1.1 This specification covers Type 101 sealing glass for use in electronic applications.

NOTE 1—This specification is primarily intended to consider glass as most generally used, this is, glass in its transparent form as normally encountered in fabricating electronic devices. X1.3 lists sealing metals and alloys that are compatible with this glass. Type 101 glass in other forms such as powdered, crushed, sintered, fibrous, etc. are excluded. The requirements of this specification, as applied to these forms, must be established in the raw glass prior to its conversion.

2. Referenced Documents

2.1 ASTM Standards:

C 336 Test Method for Annealing Point and Strain Point of Glass by Fiber Elongation²

C 338 Test Method for Softening Point of Glass²

C 598 Test Method for Annealing Point and Strain Point of Glass by Beam Bending²

D 150 Test Methods for A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials³

D 257 Test Methods for D-C Resistance or Conductance of Insulating Materials³

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specification⁴

E 228 Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer⁴

F 14 Practice for Making and Testing Reference Glass-Metal Bead-Seal²

F 140 Practice for Making Reference Glass-Metal Butt Seals and Testing for Expansion Characteristics by Polarimetric Methods²

F 144 Practice for Making Reference Glass-Metal Sandwich Seal and Testing for Expansion Characteristics by Polarimetric Methods²

3. Ordering Information

3.1 Orders for material under this specification shall include the following information:

3.1.1 Form,

3.1.2 Type of glass,

3.1.3 Dimensions,

3.1.4 Marking and packaging, and

3.1.5 Certification (if required).

4. Chemical Composition

4.1 The typical chemical composition of this glass is as follows (Note 2):

Major Constituents	Weight %
Silica (SiO ₂)	56.0
Alumina (Al ₂ O ₃)	1.5
Soda (Na ₂ O)	4.0
Potash (K ₂ O)	8.5
Lead oxide (PbO)	29.0
Antimony trioxide (Sb ₂ O ₃)	1.0, max
Arsenic trioxide (As ₂ O ₃)	1.0, max
Halogens	0.2, max

NOTE 2—Major constituents may be adjusted to give the desired electrical and physical properties to the glass. However, no change shall be made that alters any of these properties without due notification of, and approval by, the user.

5. Physical Properties

5.1 The material shall conform to the physical properties prescribed in Table 1. For electrical properties see Table 2 and its Footnote A.

6. Workmanship, Finish, and Appearance

6.1 The glass shall have a finish that ensures smooth, even surfaces and freedom from cracks, checks, bubbles, and other flaws of a character detrimental to the strength or life of the component or device for which its use is intended.

7. Test Methods

7.1 *Softening Point*—See Test Method C 338.

7.2 *Annealing Point*—See Test Method C 336 or Test Method C 598.

7.3 *Thermal Expansion Coefficient*—Pretreat the specimen

¹ This specification is under the jurisdiction of ASTM Committee C-14 on Glass and Glass Products and is the direct responsibility of Subcommittee C14.04 on Physical and Mechanical Properties.

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² *Annual Book of ASTM Standards*, Vol 15.02.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.