

GLASS TERMINOLOGY

1. **Anneal:** To prevent or remove objectionable stresses in glassware by controlled cooling.
2. **Binder (Fibrous Glass):** Substances employed to bond or hold the fibers together.
3. **Blister:** An imperfection a relatively large bubble or gaseous inclusion.
4. **Check:** An imperfection; a surface crack in a glass article.
5. **Chill Mark:** A wrinkled surface condition on glassware, resulting from uneven contact in the mold prior to forming.
6. **Chip:** An imperfection due to breakage of a small fragment from an otherwise regular surface.
7. **Cord:** An unattenuated glassy inclusion, possessing optical and other properties differing from those of the surrounding glass.
8. **Cullet:** Waste or broken glass, usually suitable as an addition to raw batch.
9. **Devitrification:** Crystallization in glass.
10. **Dice:** The more or less cubical fracture of tempered glass.
11. **Fiber:** An individual filament made by attenuating molten glass. A continuous filament is a glass fiber of great or indefinite length. A staple fiber is a glass fiber of relatively short length (generally less than 44 cm).
12. **Fusion:** Joining by heating.
13. **Glass Ceramic:** A material melted and formed as a glass, then converted largely to a crystalline form by processes of controlled devitrification.
14. **I.D.:** Inside diameter.
15. **Lampworking:** Forming glass articles from tubing and rod by heating in a gas flame.
16. **Lap:** (1) An imperfection; a fold in the surface of a glass article caused by incorrect flow during forming. (2) A process used for mating ground surfaces.
17. **Liquidus Temperature:** The maximum temperature at which equilibrium exists between the molten glass and its primary crystalline phase.
18. **Mat (Fibrous Glass):** A layer of intertwined fibers bonded with some resinous material or other adhesive.
19. **O.D.:** Outside diameter.
20. **Out-of-Round:** Asymmetry in round glass articles.
21. **Sealing:** Joining by heating..
22. **Seed:** An extremely small gaseous inclusion in glass.
23. **Softening Point:** The temperature at which a uniform fiber, 0.5 to 1.0 mm in diameter and 22.9 cm in length, elongates under its own weight at a rate of 1 mm per minute when the upper 10 cm of its length is heated in a prescribed furnace at the rate of approximately 5°C per minutes. For a glass of density near 2.5, this temperature corresponds to viscosity of $10^{7.6}$ poises.

24. **Standard Taper:**

Ⓕ is the symbol used to designate interchangeable glass joints, stoppers, and stopcocks complying with the requirements of ASTM E 676, and requirements of ASTM E 675. All mating parts are finished to a 1:10 taper.

Ⓖ is the designation for spherical (semi-ball) joints complying with ASTM E 677. The complete designation of a spherical joint also consists of a two-part number of 12/2, with 12 being the approximate diameter in millimeters of the ball and 2 the bore in millimeters of the ball and the socket.

Ⓗ is the designation for tapered stopcocks using a fluorocarbon plug complying with ASTM E 911. All mating parts are finished to a 1:5 taper.

The size of a particular piece appears after the appropriate symbol. Due primarily to the greater variety equipped with fittings, a number of different types of identifications are used, as follows:

- **Standard Taper Joints:** a two part number, **Ⓕ**24/40, with 24 being the approximate diameter in millimeters at the large end of the taper and 40 the axial length of taper, also in millimeters.
- **Standard Taper Stopcocks:** a single number, **Ⓕ**2, with 2 being the approximate diameter in millimeters of the hole or holes through the plug.
- For the fluorocarbon stopcock plug, a single number is used, as with glass stopcock plugs. Thus, a **Ⓗ**2 means a stopcock with a hole of approximately 2 mm in the plug.
- **Standard Taper Bottles:** a single number, **Ⓕ**19, with 19 being the approximate diameter in millimeters of the opening at top of neck.
- **Standard Taper Flasks:** (other than most boiling flasks) a single number **Ⓕ**19, with 19 again being the approximate diameter in millimeters at top of neck.

For dimensional details of the various **Ⓕ** stoppers, see the individual listing in Corning's catalog.

25. **Stone:** An imperfection; crystalline contaminations in glass.
26. **Stria:** A cord of low intensity generally of interest only in optical glass.
27. **Tempered Glass:** Glass that has been rapidly cooled under rigorous control from near its softening point to increase its mechanical and thermal strength.
28. **Thermal Endurance:** The relative ability of glassware to withstand thermal shock.
29. **Weathering:** Attack of a glass surface by atmospheric elements.
30. **Working Range:** The range of surface temperature in which glass is formed into ware in a specific process. The "upper end" refers to the temperature at which the glass is ready for working (generally corresponding to a viscosity of 10^3 to 10^4 poises), while the "lower end" refers to the temperature at which it is sufficiently viscous to hold its formed shape (generally corresponding to a viscosity greater than 10^6 poises). For comparative purposes, when no specific process is considered, the working range of glass is assumed to correspond to a viscosity range from 10^4 to $10^{7.6}$ poises.

For additional product or technical information, please visit our web site at www.corning.com/lifesciences or call at 1.800.492.1110. International customers can call at 978.635.2200.

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