

Accu-Glass

Glass vs. Plastic

Benefits of Using Glass Components in Biotechnology, Medical Device, Point-of-Care & Pharmaceutical Industries



Glass in Medical Applications Offers Precision, Reliability and Flexibility

"Glass is a clean and inexpensive material that is easily manufactured for *One-Time Use Applications* frequently required in the medical field"

- Glass can be shaped, cut, polished, and marked
- Glass is clean, clear, strong, and can be sterilized
- Glass is a naturally inert material
- Glass is inexpensive, making it perfect for disposable medical or clinical laboratory applications
- Vast range of customizable inner and outer diameters with tolerances as low as ± 1 micron.

Properties & Tolerances

- Precision ID Tolerance to ± 0.0001 "
- Custom Volumetric Size Capabilities
- Standardized Custom Sizes
- Precision Volumetric Marking Measures
- Chemically and Physically Unaffected by Sterilization
- Inert and Non-Reactive with Most drugs, Bodily Fluids, or Gases
- Safe for Direct Human Contact

Measurement

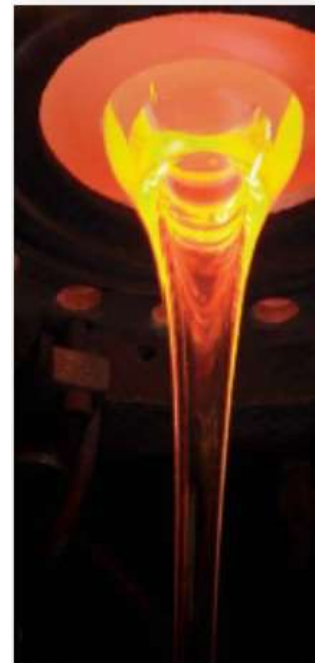
- Laser, optical, volumetric, and mass flow measurement technologies applications are employed, depending on the product, to verify dimension accuracy.

Types of Glass Used for Medical Device Applications

- *Borosilicate Glass*— Flow restrictors
- *Soda Lime Glass*—Its wide range of uses includes capillary, hematocrit, blood measurement, volumetric, and micropipette tubes with various coatings and calibrated markings, as well as crushable ampoules.
- *Specialty Formulations*—Glass chemistries can be tailored to meet specific needs for a variety of applications and properties

Precision Glass Tubing Products, Including Capillary Tube are Used For...

- Collecting and dispensing specific volumes of blood and other liquids
- Capillary flow restrictors / regulators for mobile infusion pumps and flush devices
- Ferrule tubing for diagnostic kits, and ampoules for urgent care applications



Glass is Non-Permeable, Chemically Inert, and Accommodates Tight Tolerance Components

"Many advances in manufacturing technology have brought forth new products made from glass which may have significant advantages over conventional plastics"

Glass vs. Plastic

Choosing glass over plastic may be a way to avoid undesirable chemical reactions and unwanted alterations in the properties of the fluid collection and/or storage method. A wide range of custom shapes, containers, and collection devices are available in glass. Glass offers a non-leachable interface between liquid (fluids, drugs, chemicals, etc.) and container (syringe, capillary tube, ampoule, etc.).

Chemically Inert

Disposable devices are commonplace in medical and electrical industries. Glass devices offer the advantage of being chemically inert, non-leaching, and stable at a wider range of temperatures than plastic. Leachables from plastics have the potential to chemically alter the substance with which it interfaces, leading to undesirable results.

Tight Tolerance

Accu-Glass' precision glass manufacturing process is capable of holding tolerances as low as ± 1 micrometer. This lends itself to processes and applications requiring highly controlled volumes, flow rates, and physical barriers. Large quantities of glass parts may be produced with a known size tolerance at a time and cost-effective rate.

Forming and Finishing Processes for Glass Medical Devices

Tubing and rods are formed by a unique proprietary Direct Draw and re-draw process. This process achieves a wide range of geometric shapes and precise tolerances

Cutting

A score-break method is implemented for high production speeds. When tighter tolerance specifications are required, a precision diamond saw cutting method is used to meet length and end cut requirements.

Flame Polishing

High speed flame polishing is used to smooth sharp edges that can occur during the cutting process for safe handling.

Marking/Decorating

Markings are used to designate volumetric size or specify a volumetric calibration point.

Coatings

Unique coatings can be applied to the internal surfaces of the tube.

Packaging

Accu-Glass offers many variations of product packaging to conform with your production operations.

Glass Tube Forming

Glass is a stable, highly chemically inert, practical material for many uses in industry today. Many advances in manufacturing technology have brought forth new products made from glass which may have significant advantages over conventional plastics.

CORE GLASS MEDICAL DIAGNOSTIC PRODUCTS



CAPILLARY TUBES

Glass manufacturing allows for precision diameter, thin-walled glass tubing, which produces capillary action. From blood collection & dispensing medication to spotters & pipettes, capillary tubes are safe for human contact, unaffected by sterilization and inert/non-reactive with most bodily fluids, drugs and gases. AG provides custom-designed, small diameter precision glass capillary tubes in heavy or thin walls and can color code for calibration.

Glass Capillary Tube Features

- Precision ID Tolerance to $\pm 0.0001''$
- Custom volumetric size capabilities
- Standardized custom sizes
- Precision Volumetric Marking Measures
- Chemically and physically unaffected by sterilization
- Inert and non-reactive with most drugs, bodily fluids, or gases
- Safe for direct human contact
- Capillary tubes are great for liquid measurement, liquid transfer and sample collection applications.



Capillary glass tubing is made from molten glass drawn into long lengths. These are then cut to a specific length and the ends of the tubes are flame polished. Many times the tubes are marked with a color coded fill line to designate volume calibration for applications like disposable glass micropipettes. Accu-Glass can coat tubes with heparin, (for blood collection) color code for volume calibration and package the tubes to your specific needs. Capillary tubes are great for liquid measurement, liquid transfer and sample collection applications.



Ferrule Tubing

Whether a single fiber is terminated at a device or joined to another fiber, a ferrule or connector of some type is commonly used. These must be high precision parts that ensure the fiber is optimally aligned. Therefore, fiber optic ferrules perform a critical role in the use of fiber optics in today's world.



Microbore Flow Restrictors/Regulators

Microbore restrictors are formed from molten glass with precise inside diameters (ID) as small as 25 microns, with a tolerance of ± 1 micron



Ampoules

Single-use glass ampoule packages and disposable vials used for dispensing a variety of precious liquid products.

- Single-Use, Disposable Glass Ampoule Packages
- Safe, Tamper Resistant Glass Ampoules
- Chemically and physically unaffected by sterilization
- Inert and non-reactive with most drugs, fluids, or gases



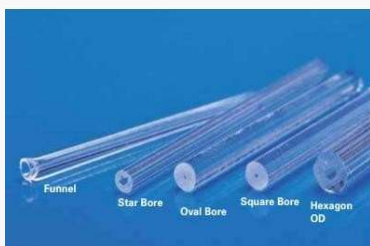
Electronic Packages and Envelopes Glass

Electronic Packages and Envelopes Glass is used in numerous electronic applications where discrete electronic components must be protected, isolated or sealed. The glass tubes can be used for insulation, passivity and hermetic sealing.



Fiber Optic Components & Ferrules

Accu-Glass manufactures glass ferrules, collimator tubes and various types of spacers for fiber optic component manufacturers.



Glass Can Accommodate Complex Shapes

- StarBore
- Oval Bore
- Square Bore
- Hexagon OD

Since 1960, Accu-Glass Has Been Exclusively Dedicated to the Engineering and Manufacturing of Precision Glass Tube Products

"Commitment to quality, engineering and service is our strength"

Our numerous clients in the medical, laboratory, point-of-care, pharmaceutical, fiber optic and electronic component industries have come to rely upon Accu-Glass as a trusted resource.

About Accu-Glass

Accu-Glass engineers custom glass solutions that solve the flow control and liquid handling needs of medical device manufacturers

Quality Assurance

Custom-designed systems are employed to provide precise dimensional measurements to meet the most demanding customer requirements. The Accu-Glass glass tube forming and manufacturing process employs SPC software for on-line monitoring and process control allowing quick reaction to production issues to maintain quality control.

Versatility

Accu-Glass offers short run production capability and quick project turnaround as well as value added assembly and services.

Certification

FDA Medical Device and ISO 9001: 2015 Registered Facility. Processes are in place to meet tight deadlines, and provide important device verification, validation, and quality controls. This ensures your device is capable of meeting all requirements.

Value Added Services

From concept to finished product packaging, you will find Accu-Glass is the leader in innovation. Our engineers work with you to develop a new glass solution or enhance an existing product.

- Unique Shapes and Custom Solutions
- Value Added Assembly and Services
- Short Run Production Capability
- Quick Project Turnaround
- Glass Sleeves and Beads



Contact Accu-Glass to see how we can help with your application...

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