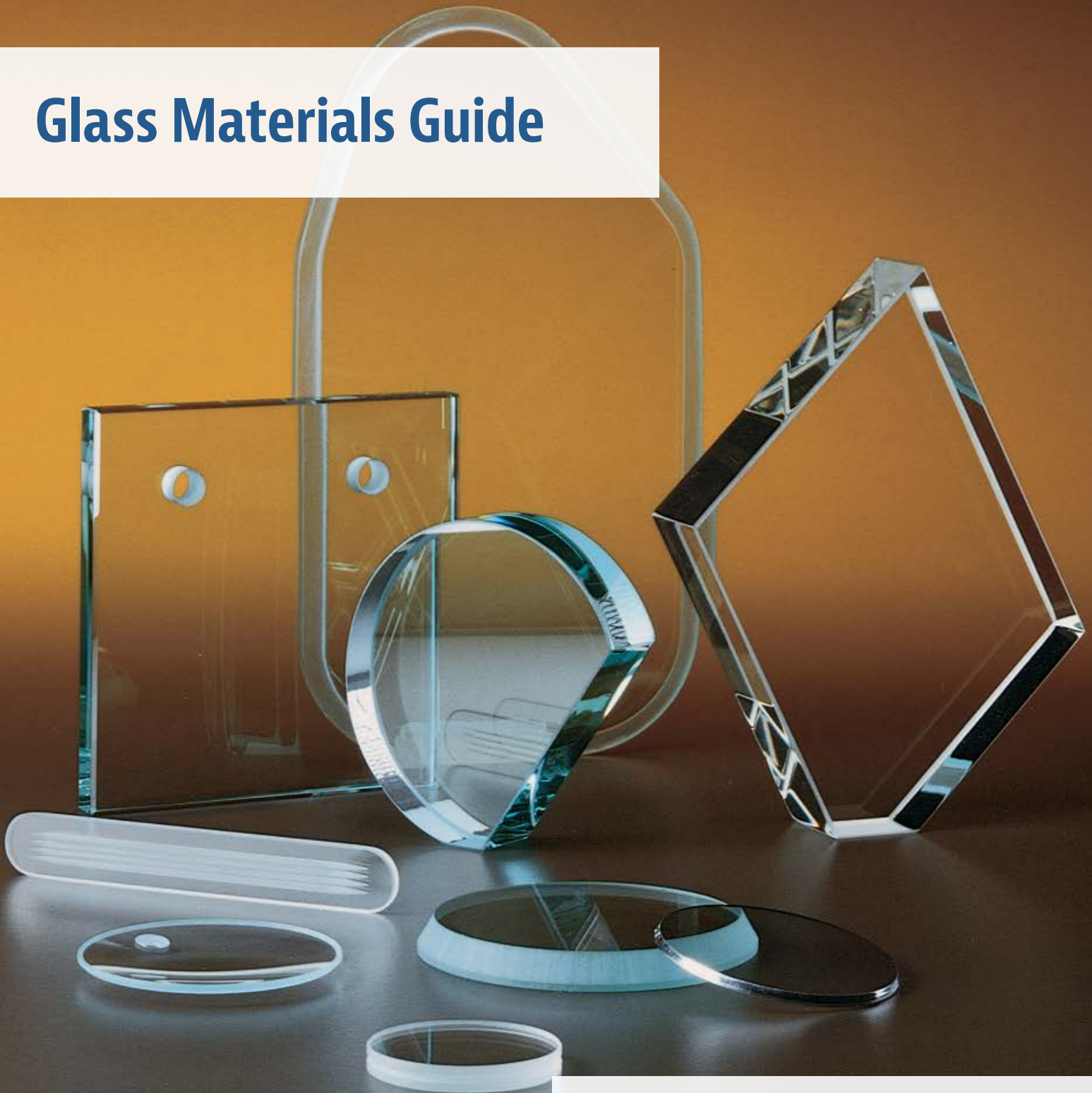


Glass Materials Guide



SG SWIFT GLASS
Excellence in Fabrication



Glass Materials Guide

Glass is a highly versatile material, which makes it suitable for the manufacture of parts and products used in a wide range of industrial applications and processes. The composition of glass material and the manufacturing and treatment operations to which it is subjected influence the properties it demonstrates. In turn, the properties affect how the material and, consequently, the finished component performs within the application environment. For this reason, it is essential to consider the key performance requirements—e.g., refractive index, viscosity, corrosion resistance, and thermal and dielectric properties—for the component before deciding on a material.

At Swift Glass, we offer fabrication capabilities for a broad selection of glass materials, including from CORNING®, SCHOTT, GE, Heraeus, and more. By maintaining a large material inventory, we make it easier for our customers to find a material that meets their needs. We've put together the following guide to help customers navigate our vast material selection and identify which one has the physical properties and performance capabilities to suit their next project.

Glass Material Selection at Swift Glass

We stock glass materials from a variety of manufacturers and brands. Our material selection includes the following:

Borosilicate Glass

Borosilicate glass primarily consists of silica and boron trioxide. It is known for its low coefficient of thermal expansion and high resistance to thermal shock, both of which make it well-suited for use in environments with fluctuating temperatures. The material also demonstrates excellent durability, chemical resistance, and clarity, even in high-temperature applications. These qualities make it a viable option for biomedical and research applications.

The types of borosilicate glass we offer include:

- ▶ **CORNING® Eagle 2000®:** This lightweight, low-density glass has a low coefficient of thermal expansion, excellent transmission properties, and superior surface quality and flatness.
- ▶ **CORNING® Eagle XG®:** This environmentally friendly glass has a low density and high surface quality. It exhibits excellent thermal properties and chemical resistance.
- ▶ **SCHOTT BOROFLOAT® 33 Glass:** This environmentally-friendly, lightweight float glass combines excellent transmission with superior chemical & thermal resistance, is suitable for anodic bonding and exhibits a high surface hardness and low inherent fluorescence.
- ▶ **SCHOTT D263®:** This thin glass has excellent chemical resistance and surface quality.
- ▶ **SCHOTT SUPREMAX® Glass:** Identical in its properties to SCHOTT's BOROFLOAT® 33 Glass, this rolled borosilicate glass is 12% lighter than soda-lime glass and offered up to 57.2 mm thick.



CORNING® GORILLA® Glass

CORNING® GORILLA® Glass provides outstanding performance and durability with distinct advantages, such as improved damage resistance, outstanding surface quality, and accurate touch sensitivity, over other cover materials. It is:

- Tough
- Damage resistant (helps protect against damage)
- Durable
- Scratch resistant
- Beautiful/elegant/sophisticated

The type of CORNING® GORILLA® Glass we offer is:

- ▶ CORNING® GORILLA® Glass 3



Fused Silica Glass

Fused silica glass features a cross-linked 3D structure that yields excellent thermal shock resistance with virtually no thermal expansion. It is available in industrial, commercial, and UV grades.

Our fused silica glass offerings include:



- ▶ CORNING® HPFS® 7980 Industrial Grade: This high-purity, non-crystalline silica glass offers excellent optical properties, including low refractive index and exceptional transmissivity.
- ▶ CORNING® HPFS® 7980 UV Grade: This UV-grade glass comes with options for a low content of inclusion and/or a high refractive index homogeneity.

Gauge Glass

Gauge glass is used for the transparent tube components of level sensors, which allow operators to observe liquid levels in tanks, boilers, and other fluid handling equipment. Given the nature of level sensor applications, the material must be engineered to endure high temperatures and high/low pressures.



The types of gauge glass we offer are:

- ▶ **Standard Gauge Glass:** These glass materials are suitable for use in low-pressure applications, such as low-pressure boilers, closed tanks, and restaurant equipment.
- ▶ **High-Pressure Gauge Glass:** These glass materials meet high-pressure code 7740, meaning they are appropriate for applications that involve higher temperatures and pressures than standard gauge glass can withstand.
- ▶ **Redline Gauge Glass:** These glass materials feature a red line between two white lines. This design element makes it easier for personnel to read the liquid level.
- ▶ **Heavy-Wall Gauge Glass:** These glass materials are used in applications with higher temperatures and pressures than high-pressure gauge glass can withstand. Redline variations are available to facilitate level reading for personnel.
- ▶ **MAXOS® Type A Transparent Gauge Glass:** This glass material is designed for use in armored-type liquid level gauges used in moderate-pressure applications.
- ▶ **MAXOS Type A High-Pressure Gauge Glass:** This glass material is designed for use in armored-type liquid level gauges used in applications with non-steam pressures up to 5,000 psi.
- ▶ **MAXOS Type B Reflex Gauge Glass:** This glass material is designed for use in armored-type liquid level gauges. It features vertical prisms along the viewing length of the glass, making gauges easier to read at a distance.

Some of the related glass components we provide include:

- ▶ **Glass Gaskets:** Glass gaskets are resistant to mild acids, hot water, inert gas, and alkaline compounds, which makes them suitable for use in a variety of high-pressure, high-temperature applications.
- ▶ **Oil Cup Glass:** These glass cylinders are used as oil reservoirs within lubricating devices.
- ▶ **Glass Cylinders/Rods/Tubing:** These components are employed in various industrial, scientific and architectural applications. Tubing is available in standard, redline and heavy-wall variations.

Low-Iron Glass

Low-iron glass—also sometimes referred to as optically clear glass—has a lower iron content than other glass materials, which results in the elimination of the greenish tint that characterizes thicker sheets of traditional glass. These materials offer excellent surface flatness and light transmission properties. They can be AR coated to improve transmission and chemically strengthened to improve strength and durability. Typical applications include displays and aquariums, both of which rely on materials with excellent optical clarity.



Our low-iron glass selection includes:

- ▶ **SGG Diamant®:** This glass material transmits up to 92% of visible light, depending on the thickness.
- ▶ **Vitro Starphire®:** This glass material contains less than 10% of the iron found in conventional glass, allowing more light to pass through its surface. While it has a distinctive blue edge in thicker glass, its surface remains crystal-clear.
- ▶ **Pilkington Optiwhite™:** This glass material is nearly colorless—even at the edges—allowing for maximum light transmission and color purity.

Optical Color Filters

Optical color filters are designed to transmit and block particular wavelengths or ranges of wavelengths. They are available in longpass (passes only long wavelengths), shortpass (passes only short wavelengths), and bandpass (passing a bank of wavelengths while blocking both longer and shorter wavelengths) variations. Typical applications for these materials include photographic equipment, optical instruments, and stage lighting.

We supply optical filters from the following manufacturers:

- ▶ **HOYA:** These optical filters are used in cameras, optical instruments, research equipment, and educational materials.
- ▶ **Kopp:** These optical filters are ideal for use in a variety of industries, including aerospace, energy, industrial equipment, life sciences, lighting, manufacturing, medical and scientific, military and defense, and transportation.
- ▶ **SCHOTT:** These optical filters are carefully produced using sophisticated industrial processes.



Quartz Glass

Quartz glass exhibits excellent heat resistance, light transparency, chemical stability, and electrical insulation. Additionally, its purity results in superior optical and thermal properties, making it ideal for semiconductor manufacturing and laboratory applications.



The quartz glass materials we have available are:

- ▶ **GE® 124:** This glass material is made from crystalline silica. It demonstrates similar properties to fused silica except for lower transmissivity in the UV spectrum and a much lower OH content.
- ▶ **Heraeus TSC-3®:** This glass material has a high purity and very low bubble content. It is ideal for use in semiconductor manufacturing equipment and etch systems.

Clear Float Glass (Soda Lime)

Clear float glass encompasses a variety of glass materials, including soda lime glass. Due to its ability to be re-softened and re-melted, it is commonly used for glass window panes and containers.

Our clear float glass selection includes:

- ▶ **Guardian Clear Float Glass:** This clear and distortion-free glass material is available in a variety of sizes and thicknesses to accommodate any flat glass application.
- ▶ **Vitro Clear Float Glass (formerly a PPG product):** This glass material is appropriate for applications that require a versatile, reliable, and aesthetic product.
- ▶ **Vitro Solargray® Glass (formerly a PPG product):** This glass material is commonly used for commercial structures due to its cool medium-gray color and ability to control solar heat gain and glare.
- ▶ **LimeX by Swift Glass:** Swift Glass offers a special, extra thick soda lime glass in thicknesses up to 1.25 inches. This material can be tempered for more durability.



Specialty Glass Materials

In addition to the standard glass materials listed above, we also offer a wide range of specialty glass materials for highly specific or unique customer applications, such as:

- ▶ Annular Edge Glass by Swift Glass
- ▶ CORNING® 1723® Aluminosilicate Glass
- ▶ SCHOTT ROBAX® Ceramic Glass
- ▶ SCHOTT B 270® Crown Glass

▶ SCHOTT N-BK7® Crown Glass

▶ Lead Glass

▶ Pixel 73™ Patterned Glass

▶ Solite™ Patterned Glass

▶ Skytex Patterned Glass

▶ Welder's Glass

▶ Wire Glass



Glass Fabrication Capabilities at Swift Glass

Our glass fabrication capabilities, combined with our broad selection of glass materials, allow us to accommodate virtually any glass component need. Our service offerings include:

▶ [CNC machining](#)

▶ [Surface lapping and polishing](#)

▶ [Glass drilling](#)

▶ [Thermal glass tempering and chemical glass strengthening](#)

▶ [Waterjet cutting](#)

▶ [Edge grinding and polishing](#)

▶ [Glass wafer fabrication](#)

▶ [Corning® Gorilla® Glass fabrication](#)

▶ [Inspection](#)

▶ [Clean room operations for optics applications](#)

Contact Swift Glass for Your Custom Glass Fabrication Needs

Based in Elmira, NY, Swift Glass is an ISO 9001:2015 certified and ITAR registered company. We've provided industry-leading glass parts and products for nearly 100 years. By using us for their glass fabrication needs, our customers benefit from our:

- ▶ **Reputation for project excellence**
- ▶ **Exceptional products and services**
- ▶ **Streamlined and flexible domestic production operations**
- ▶ **Budget-conscious fabrication solutions**

To learn more about our glass materials or to speak with one of our experts about your material requirements, [contact us](#) today.



About Swift Glass

To meet our clients' diverse application needs, Swift Glass is proud to offer glass CNC machining, waterjet glass cutting, thermal glass tempering, edge polishing and grinding, chemical glass strengthening, surface polishing and lapping, glass drilling, and glass wafer services. To ensure optimal quality in everything we do, we employ a wide range of sophisticated inspection tools, including a coordinate measuring machine (CMM), polarimeter, optical comparator, high-powered microscope, and multi-surface profiler.

We're happy to offer our expertise and recommendations, ensuring customers receive the best possible glass solution for their specific needs.

To learn more about glass material and their optical properties, or to discuss the concepts outlined here in greater detail, reach out to Swift Glass today. As an ISO 9001:2015- certified, ITAR-registered, industry-leading fabricator of glass parts, we're proud to serve as the premier specialist in all aspects of glass fabrication.

View Our **Resource Library**



131 W. 22nd Street Elmira, NY 14902

Phone 607.733.7166 Fax 607.732.5829 Email quality@swiftglass.com

