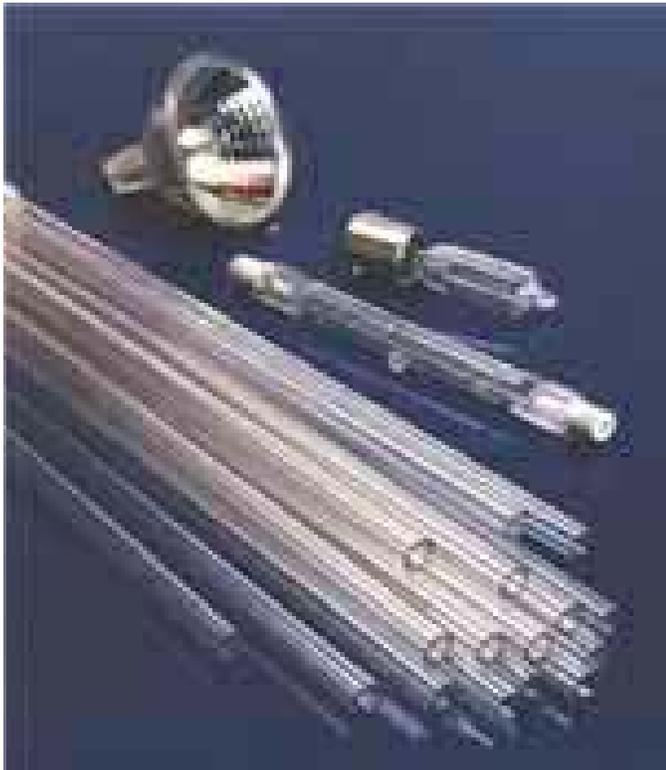




MOMENTIVE

performance materials

Lamp Tubing



Momentive Performance Materials is the world's leading producer of fused quartz for lighting applications. Four basic types of lamp grade quartz are available, each designed to fulfill specific performance requirements. Together, these materials cover a wide variety of applications.

Type 214

The worldwide standard for clear fused quartz lamp tubing. GE 214 is high purity, high transmittance, high temperature material with a low hydroxyl (OH)- content. It is suitable for a broad range of mercury, halogen and other quartz lamp applications.

Description The industry standard clear fused quartz material. Economical and available in a full range of sizes. Excellent visual, thermal and mechanical properties with low hydroxyl content and tight dimensional tolerances.

Typical Applications High performance and high temperature lamps such as mercury and quartz halogen, ultraviolet (UV) lamps, thermocouples, semiconductor quartzware, wave-guide handles, and other high temperature products.

Type 219

Known as "Ozone-Free" or "Germicidal" quartz tubing, GE 219 transmits UV-A and UV-B while blocking the deep, high energy wavelengths that cause ozone generation and pose the greatest exposure risks. Type 219 transmits the 253.7 nanometer mercury emission very efficiently, making it an ideal material for disinfection applications and various other UV treatments.

Description Clear fused quartz tubing doped with titanium oxide to block deep UV radiation. Visual and dimensional characteristics are identical to Type 214, while thermal and mechanical properties are similar. Commonly called "germicidal" or "ozone-free" quartz.

Typical Applications Anti-bacterial and other lamps where UV transmittance in the germicidal range is required, but where deeper UV radiation or ozone generation is undesirable.

Type 254

A doped quartz material that blocks virtually all UV-B and UV-C radiation. Type 254 has a transmittance cutoff

Physical Properties

	214	219	254
Density (g/cc)	2.2	2.21	2.21
Thermal Expansion Coefficient (cm/cm °C)	5.5×10^{-7}	5.9×10^{-7}	6.7×10^{-7}
Softening Point (°C)	1683	1660	1615
Annealing Point (°C)	1215	1204	1163
Strain Point (°C)	1120	1106	1066
Index of Refraction	1.4585	1.456	1.460
Specific Heat (J/kg °K) (0-50 °C)	670	700	690
Compressive Strength (Pa)	$>1.1 \times 10^9$	$.94 \times 10^9$	$.55 \times 10^9$
Young's Modulus (Pa)	7.2×10^5	7.5×10^6	7×10^6
Electrical Resistivity (ohm cm @ 350 °C)	7×10^9	2.5×10^{10}	5×10^{10}
Dielectrical Constant (@ 1MHz)	3.75	5.8	6

wavelength between 350 and 400 nanometers. It is ideal for lamps requiring maximum visible transmittance with nearly complete UV protection. Applications for GE 254 are those where UV exposure to people or property is undesirable, including some quartz halogen and metal halide lamps and other UV sources.

Description UV-blocking cerium-doped clear fused quartz which absorbs essentially all UV-B and UV-C radiation while maintaining transmittance efficiency in the visible spectrum range.

Typical Applications UV-sensitive high temperature applications including halogen and discharge lamps where UV radiation would create personal or material exposure risks. Eliminates need for coatings, filters and lenses for UV blocking.

Type 021A

This is a dry synthetic fused silica material providing high transmittance in the deep ultraviolet range. It combines the advantages of low hydroxyl content with ultra high purity to yield superior UV transmittance and resistance to solarization for a variety of UV lamp applications including water purification, ozone generation, paint and ink curing, and chemical processing.

Description Clear synthetic fused silica with high UV transmittance and ultra high purity. Provides maximum transparency to deep UV and resistance to solarization. Low hydroxyl content plus excellent visual, thermal, mechanical and dimensional properties.

Typical Applications Envelopes and sleeve tubing for UV and ozone producing lamps; curing, chemical processing and germicidal lamps; and the most advanced semiconductor applications. Also solarization sensitive applications.

Types 214A, 219A and 254A

These are identical to the standard types but are produced with a lower hydroxyl content. "A" products contain <1ppm (OH)- and are intended for metal halide lamps and other applications where the quartz must be devoid of hydroxyl as well as all dissolved gases.

Description Identical to the standard varieties but with hydroxyl and other dissolved gas content essentially eliminated.

Typical Applications Metal halide lamp envelopes and other applications requiring hydroxyl-free material.

Dimensional Tolerances

OD Range	Wall as % of OD	Tolerances				Bowl 1220 mm
		OD	Wall	Siding	Ovality	
<5mm	>18%	± 2.50%	± 10%	± 10%	2.0 %	2.44mm
5mm- 13 mm	>18%	± 2.00%	± 10%	± 10%	1.5%	2.0mm
6mm- 13mm	<18%	± 1.25%	± 8%	± 8%	1.5%	2.0mm
13mm-30mm	<18%	± 1.50%	± 8%	± 8%	1.5%	2.0mm
30mm-60mm	<18%	± 1.50%	± 10%	± 10%	1.5%	2.0mm

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