

Specifications of Cell Window Materials

General Description of Materials

Each window material is selected for use in spectrophotometer cells based on their physical properties which include light transmission and suitability for cell manufacture. The glass materials are suitable for use in the visible and near IR, the quartz material is suitable for use in the UV, visible and near IR.

How to Choose a Material

The most important consideration is the wavelength at which you will be making your analysis. If you are working in the visible or near IR only a glass material would be the most cost effective. When working in the ultraviolet the quartz material must be used. Each material has characteristics which make it the correct choice for your particular application. Please consult the table below for the specifications for each material.

Material Codes

The material code is the second element of a cuvette's part number. It will always be a letter and it signifies the material that the optical window is made from. The non-optical body of the cell is usually made from a different grade of material and is not suitable for optical use. An example part number is: "1/Q/10". The "Q" in the part number identifies the far UV quartz windows.

Material Code: G	Standard Glass	Material: B270, optical crown glass
Specification	Value	Units
Refractive Index	1.5251	n_e at 546nm
	1.5230	n_d at 588nm
Density	2.55	g/cm^3
Modulus of elasticity	$E=71.5$	$10^3 N/mm^2$
Coefficient of Thermal Expansion	$95 \times 10^{-7}/K$	temperature range = 20-300°C
Useable optical range	334 to 2500	nanometers

Material Code: SOG	Special Optical Glass	Material: K5
Specification	Value	Units
Refractive Index	1.52458	n_e at 546nm
	1.52249	n_d at 588nm
Density	2.59	g/cm^3
Modulus of elasticity	$E=71.0$	$10^3 N/mm^2$
Coefficient of Thermal Expansion	$96 \times 10^{-7}/K$	temperature range = 20-300°C
Useable optical range	320 to 2500	nanometers

Material Code: PX	Pyrex®	Material: Borosilicate
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Specification	Value	Units
Refractive Index	1.473	n_d at 587.6nm
Density	2.23	g/cm ³
Modulus of elasticity	E=64	10 ³ N/mm ²
Coefficient of Thermal Expansion	33 x 10 ⁻⁷ /K	temperature range = 20-300°C
Useable optical range	320 to 2500	nanometers

Material Code: Q	Spectrosil®	Material: Far UV Quartz
Specification	Value	Units
Refractive Index	1.551	200nm
	1.506	254nm
	1.488	300nm
	1.470	400nm
	1.458	600nm
	1.450	1000nm
Density	2.2	g/cm ³
Modulus of elasticity	73x10 ⁶	Kpa
Coefficient of Thermal Expansion	5.3 x 10 ⁻⁷ /K	temperature range = 0-1000°C
Useable optical range	170 to 2700	nanometers