

Properties of Glass

Vials and inserts from National Scientific are manufactured from the highest-quality borosilicate glass, selected for its purity and dimensional stability.

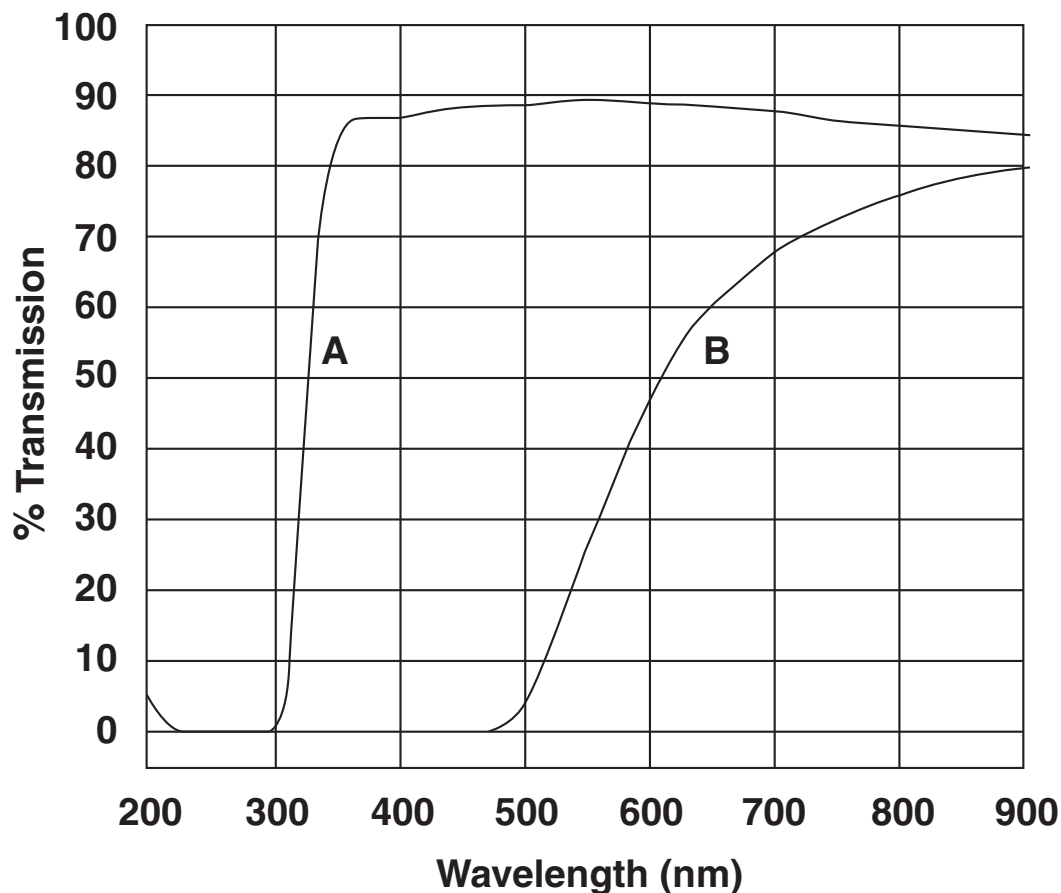
Clear glass products are manufactured from 33 expansion borosilicate glass with a low coefficient of expansion and very high resistance to chemical attack. It has low alkali content and is free of elements from the calcium, magnesium, and zinc group of heavy metals. The total of combined oxides of arsenic and antimony is less than 0.005%. 33 expansion borosilicate glass meets the requirements for Type I Class A glass of ASTM E438.

Amber glass products are manufactured from N-51A borosilicate glass, which has a relatively low coefficient of expansion and high chemical durability. N-51A borosilicate glass meets the requirements for Type I Class B glass of ASTM E438.

Approximate Chemical Composition for Borosilicate Glass

	33 EXPANSION CLEAR GLASS	N-51A AMBER GLASS
Silicon Dioxide (SiO ₂)	80%	72%
Boron Oxide (B ₂ O ₃)	13%	12%
Aluminum Oxide (Al ₂ O ₃)	3%	7%
Calcium Oxide (CaO)	0.1%	1%
Magnesium Oxide (MgO)	Not Detected	Not Detected
Sodium Oxide (Na ₂ O)	4%	6%
Potassium Oxide (K ₂ O)	0.1%	2%
Barium Oxide (BaO)	<0.1%	<0.1%

Optical Properties of Glass



A=33 expansion clear glass
B=N-51A amber glass