U. S. Department of Commerce
Frederick B. Dent
Secretary

National Bureau of Standards
Richard W. Roberts, Director

National Bureau of Standards Certificate

Standard Reference Material 708

Relative Stress-Optical Coefficient
Lead Silica Glass
and
Borosilicate Glass

This Standard Reference Material consists of a set of two types of glass; Glass A, a lead silica glass, 2.0 x 4.5 x 15 cm, about 625 g; and Glass B, a borosilicate Glass, 2.0 x 4.0 x 15 cm, about 275 g. Selected lots of these glasses are certified and designed for use in checking the calibration of equipment for the determination of the physical properties of glass, specifically, the relative stress-optical coefficient.[1]

Relative Stress-Optical Coefficient, C, at λ = 546.1 nm:

	Brewsters *
Glass A	2.857 ± 0.001 **
Glass B	3.652 ± 0.001

* 1 Brewster = 10^{-12} m^2/N

** 95% confidence interval for the mean.
For Glass A, n=6; for Glass B, n = 5.

The technical measurements leading to the certification were performed under the direction of R. M. Waxler and A. Napolitano, NBS Inorganic Materials Division.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R. E. Michaelis.

Washington, D. C. 20234
September 15, 1973

J. Paul Cali, Chief
Office of Standard Reference Materials

(over)

SUPPLEMENTAL INFORMATION

The additional characterization of these glasses listed below is NOT certified, but is provided for information only.

	GLASS A	GLASS B
CHEMICAL		
Constituent	Nominal Composition (% by wt)	
SiO_2	(46)	(70)
PbO	(45)	
K_2O	(6)	(8)
Na_2O	(2)	(1)
B_2O_3	-	(17)
Al_2O_3	-	(3)
Li_2O	-	(1)
R_2O_3	(1)	
PHYSICAL		
Softening Point, °C[2]	(602)	(720)
Annealing Point, °C[2]	(432)	(516)
Strain Point, °C[2]	(392)	(471)
Index of refraction, N_D (after fine annealing)	(1.61822 ± 0.00020)	(1.48744 ± 0.00016)
Dispersion, υ	(36.6 ± 0.3)	(65.6 ± 0.0)

REFERENCES

[1] Relative Stress-Optical Coefficients of Some National Bureau of Standards Optical Glasses, Roy M. Waxler and Albert Napolitano, J. Res. NBS (U.S.A.) 59, No. 2, 121-5 (August 1957).

ASTM Recommended Practices for Measurement of Glass Stress-Optical Coefficient. Publication pending.

[2] ASTM Designation C338-57 (1968); ASTM Designation C336-71; ASTM Designation C598-72, ASTM Book of Standards, Part 13, 1973.