U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate

Standard Reference Material 1411

Soft Borosilicate Glass

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is intended for use in performance evaluation of chemical methods of analysis and in calibrating instrumental methods of analysis. It consists of platelets of soft borosilicate glass having the certified chemical composition shown below:

Constituent	Percent by Weight[a]	Uncertainty[b]
SiO_2	58.04	0.16
B_2O_3	10.94	0.23
Na_2O	10.14	0.23
Al_2O_3	5.68	0.11
BaO	5.00	0.14
ZnO	3.85	0.19
K_2O	2.97	0.10
CaO	2.18	0.05
MgO	0.33	0.04
SrO	0.09	0.01
Fe_2O_3	0.050	0.008
TiO_2	0.02	0.01

[a] The certified value listed for a constituent is the present best estimate of the "true" value based on the results of the cooperative program for certification.

[b] The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method bias, between laboratory variability, and material variability.

This glass contains approximately 0.5% fluorine. This value is not certified and is given for information only.

The overall direction and coordination of the cooperative analysis leading to certification were performed by G.D. Bowling, Chairman of ASTM Subcommittee C-14.02 on Chemical Analysis of Glass and Glass Products.

The procurement and development of this material as an SRM was under the direction of the joint NBS-ASTM Glass Research Associate Program. This program was coordinated through ASTM by: M.J. Cellarosi, Chairman of ASTM Committee on Glass and Glass Products; H.E. Hagy, Chairman of Subcommittee 14.91 on Standard Reference Materials; and A.C. Seifert, NBS-ASTM Research Associate.

The technical and support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Office of Standard Reference Materials by L.J. Kieffer.

Gaithersburg, MD 20899
August 2, 1985

Stanley D. Rasberry, Chief
Office of Standard Reference Materials

(Over)

This material was tested for homogeneity at NBS by P.A. Pella, Gas and Particulate Science Division, using x-ray fluorescence spectrometry. Duplicate measurements were made on seven elements in each of fifteen samples chosen at random from the lot of material. The results did not indicate any significant heterogeneity among the samples.

The material for this SRM was furnished to NBS by the Manville Corporation of Denver, CO. It was ground and formed into disks at Corning Glass Works, Corning, NY.

The laboratories submitting data for certification of this SRM were:

Anchor Hocking, Lancaster, OH

Corning Glass Works, Corning, NY

Emhart Materials Testing Laboratory, Windsor, CT

National Bureau of Standards, Gaithersburg, MD

Owens-Corning Fiberglas, Granville, OH

Owens-Illinois, Toledo, OH

Wheaton Glass, Millville, NJ