

The image features a collection of laboratory glassware against a light blue background. On the left is a 500 ml Erlenmeyer flask containing a blue liquid. In the center is a large graduated cylinder with a yellow liquid, marked from 0 to 1600 ml. To its right is a 2000 ml Erlenmeyer flask containing a green liquid. Further right is a 50 ml burette with a white stopcock and a 50 ml pipette. On the far right is a 50 ml graduated cylinder containing a red liquid. The SIBATA logo, a green diamond with a white cross, is positioned to the left of the main text.

SIBATA

Laboratory Glassware

Product Catalog

ISO 9001
REGISTERED



SIBATA

SIBATA Scientific Technology Ltd. is a highly-respected manufacturer of Scientific Instruments and Laboratory Glassware. This Tokyo-based company was established in 1927 and has produced their own borosilicate glass since 1940.

SIBATA is noted in Japan and the USA for its high quality instruments for the measurement of air and water pollution. SIBATA laboratory glassware meets the highest Japanese and US government standards.

In 1974, SIBATA established a plant on Taiwan to produce laboratory glassware for the Japanese market. This glassware was not only of high quality and accuracy but was also available at very competitive prices.

In 1981, SIBATA developed the line of color-coded pipets, volumetric flasks, and graduated cylinders which are contained in this catalog. This line met and continues to meet the appropriate US Federal and ASTM Specifications.

Schott-Ruhrglass of Germany supplies SIBATA its glass tubing. Schott's Durobax and Duran 50 brand borosilicate tubing is recognized worldwide for its high quality. Duran 50, which is used to make SIBATA's volumetric flasks and laboratory glassware has essentially the same composition and properties as Pyrex 7740 or Kimble KG-33. Durobax is similar to Kimble N-51A and is used in the manufacturing of SIBATA's cylinders and pipets.

SIBATA is a certified ISO 9001 company.

BOMEX beakers, erlenmeyer flasks, filter flasks & BELLWETHER burets are manufactured in China in accordance with International Standards. The glass used in their manufacture is BJTY; it is a type of hard borosilicate glass which is widely used to produce a comprehensive range of labware and science equipment throughout the world.

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Beakers

BOMEX brand, Griffin, Low Form, Double Scale, Graduated

BOMEX 1500 Series Beakers meet ASTM E 960 Type I Specifications for Classification, Design, Capacity & Dimensions, and Markings. Feature easy-pour spout; white, permanent graduations and a large marking square. Made from sturdy borosilicate glass with a low coefficient of expansion. Manufactured with uniform wall thickness which offers optimum balance between thermal shock resistance and mechanical strength. Cat. No.'s 1500-250 through 1500-2000 feature a double-graduated metric scale. Accuracy: $\pm 5\%$ of full capacity.

Cat. No.	Capacity (mL)	Graduation Range (mL)	Approx. O.D. x Height (mm)	Graduation Interval (mL)
1500-50	50	10-40	41 x 58	10
1500-100	100	20-80	50 x 69	10
1500-150	150	20-140	58 x 80	20
1500-250	250	25-200	68 x 95	25
1500-400	400	50-350	75 x 111	25
1500-600	600	100-500	88 x 123	50
1500-800	800	100-750	99 x 137	50
1500-1000	1000	100-900	106 x 148	50
1500-2000	2000	200-1800	129 x 190	100



Burets

BELLWETHER brand, Class B, w/ PTFE Stopcock

BELLWETHER 2420 Series Burets meet ASTM E 287 Class B Specifications. Made from accurate uniform wall tubing to insure the stipulated capacity tolerances. Feature durable, permanent markings; fine, sharp lines and large, easy-to-read numbers. The stopcocks are carefully ground and finished to assure a leak-free operation. These burets are ideal for use in school and institutional laboratories not requiring the accuracy of a Class A model.

Cat. No.	Capacity (mL)	Graduation Interval (mL)	Approx. O.D. x Height (mm)	Tolerance (\pm mL)	Stopcock Bore (mm)
2420-25	25	0.10	11 x 600	0.06	0.06
2420-50	50	0.10	13 x 780	0.10	0.10
2420-100	100	0.20	17 x 780	0.20	0.20



Crucibles

SIBATA brand, Goch Type, High Form, with Fritted D



SIBATA 1305 Series Goch Crucibles, with fritted disc filters, meet ISO 4793 Specifications. Suitable for analytical work where precipitates are dried to a constant weight at 110°C. Also suitable for higher temperatures, in which case it is advisable to heat in an electric furnace. Crucibles should not be subjected to sudden temperature changes. In order to avoid strain, they should not be removed from the furnace until the temperature has dropped to 250°C.

Cat. No.	Capacity (mL)	Porosity	Pore Size (μ m)	Approx. O.D. x Height (mm)
1305-1250A	30	EC	160-250	34 x 60
1305-1100A	30	C	40-100	34 x 60
1305-140A	30	PC	16-40	34 x 60
1305-116A	30	M	10-16	34 x 60
1305-105A	30	F	4-5.5	34 x 60
1305-2250A	50	EC	160-250	40 x 60
1305-2100A	50	C	40-100	40 x 60
1305-240A	50	PC	16-40	40 x 60
1305-216A	50	M	10-16	40 x 60
1305-205A	50	F	4-5.5	40 x 60



EXTRA COARSE [160-250 μ m] (liquid and gas dispersion, coarse filtration); COARSE [40-100 μ m] (preparative fine filtration and work with crystalline products, mercury filtration); PARTLY COARSE [16-40 μ m] (analytical work with medium-fine precipitates, fine gas filtration); MEDIUM [10-16 μ m] (analytical fine filtration preparative work with the finest precipitates); FINE [4-5.5 μ m] (filtration of fine precipitates, mercury valve, extraction apparatus)



Cylinders

SIBATA brand, Class A, Double Metric Scale, Graduated, To Contain

SIBATA 2351A Series Graduated Cylinders meet ASTM E 1272 Class A, Style I Specifications. Feature hexagonal bases for added stability. All cylinders with the exception of the 2000mL size feature protective hexagonal bumper guards.

Cat. No.	Capacity (mL)	Graduation Interval (mL)	Tolerance (\pm mL)	Approx. O.D. x Height (mm)
2351A-5	5	0.1	0.05	7 x 126
2351A-10	10	0.1	0.05	8 x 182
2351A-25	25	0.2	0.15	17 x 210
2351A-50	50	0.5	0.25	24 x 218
2351A-100	100	1.0	0.40	30 x 236
2351A-250	250	2.0	1.00	41 x 301
2351A-500	500	5.0	2.00	53 x 362
2351A-1000	1000	10.0	3.00	70 x 422
2351A-2000	2000	20.0	6.00	90 x 478




Cylinders

SIBATA brand, Class B, Double Metric Scale, Graduated, To Contain

SIBATA 2351 Series Graduated Cylinders meet ASTM E 1272 Class B, Style I Specifications. Feature hexagonal bases for added stability. All cylinders with the exception of the 2000mL size feature protective hexagonal bumper guards.

Cat. No.	Capacity (mL)	Graduation Interval (mL)	Tolerance (\pm mL)	Approx. O.D. x Height (mm)
2351-10	10	0.1	0.10	8 x 182
2351-25	25	0.2	0.30	17 x 210
2351-50	50	0.5	0.40	24 x 218
2351-100	100	1.0	0.60	30 x 236
2351-250	250	2.0	1.40	41 x 301
2351-500	500	5.0	2.60	53 x 362
2351-1000	1000	10.0	5.00	70 x 422
2351-2000	2000	20.0	10.00	90 x 478




Cylinders

SIBATA brand, Student, Plastic Hexagonal Base, Double Metric Scale, Graduated, To Contain

SIBATA 2355 Series Student Graduated Cylinders meet ASTM E 1272 Class B, Style I Specifications for Classification and Tolerances. These cylinders are made of two parts: a strong, accurate glass graduate and a detachable, sturdy plastic hexagonal base which absorbs impacts and reduces breakage. All cylinders feature protective hexagonal bumper guards.

Cat. No.	Capacity (mL)	Graduation Interval (mL)	Tolerance (\pm mL)	Approx. O.D. x Height (mm)
2355-10	10	0.1	0.10	13 x 177
2355-25	25	0.2	0.30	16 x 210
2355-50	50	0.5	0.40	24 x 212
2355-100	100	1.0	0.60	30 x 232



Filter Holders

SIBATA brand, Glass Microanalysis, 47mm

SIBATA 6168 Series Filter Holders are offered with a wide variety of components for different applications. Available with fritted glass support base for general and biological applications, or with removable stainless steel screen support base and PTFE gasket for ultraclean filtrate or proteinaceous solutions. The 300mL borosilicate glass funnel is graduated from 75 to 300mL in 25mL subdivisions. The anodized aluminum clamp features a tension screw to firmly lock the clamp in place.

Filter Diameter: 47mm; **Prefilter Diameter:** 35mm; **Effective Filtration Area:** 9.6cm²
Maximum Capacity: 350mL; **Graduated Volume:** 300mL
Connection: Silicone Stopper (No. 8) & Neoprene Stopper (No.'s 6,7,8)
Sterilization: Autoclavable (at 121°C / 250°F for 20 minutes)

Cat.No.	Description
6168-4711	Funnel, 47mm, 300mL
6168-4721	Glass Support Base, for Stainless Steel Screen, 47mm
6168-4722	Glass Support Base, Fritted, 47mm
6168-4731	Stainless Steel Screen (SUS316)
6168-4741	PTFE Gasket (pack of 10)
6168-4751	No. 8 Silicone Stopper (fits 1000mL Flask)
6168-4751N	No. 6 Neoprene Stopper (fits 250mL Flask)
6168-4752N	No. 7 Neoprene Stopper (fits 500mL Flask)
6168-4753N	No. 8 Neoprene Stopper (fits 1000mL Flask)
6168-4762	Anodized Aluminum Clamp

General & Biological Applications
Funnel (cat. no. 6168-4711); Glass Support Base (Fritted) (cat. no. 6168-4722); Silicone Stopper (cat. no. 6168-4751); Anodized Aluminum Clamp (cat. no. 6168-4762).
Ultraclean Filtrate or Proteinaceous Solutions
Funnel (cat. no. 6168-4711); Glass Support Base (SS Screen) (cat. no. 6168-4721); Stainless Steel Screen (cat. no. 6168-4731); PTFE Gasket (pk/10) (cat. no. 6168-4741); Neoprene Stopper (cat. no. 6168-4752N); Anodized Aluminum Clamp (cat. no. 6168-4762).



Flasks

BOMEX brand, Erlenmeyer, Narrow Mouth, Heavy-Duty Rim, Graduated

BOMEX 1800 Series Erlenmeyer Flasks meet ASTM E 1404 Type I, Class 1 Specifications for Classification, Design, Capacity & Dimensions, and Markings. Feature heavy-duty rims to reduce chipping; white, permanent graduations and a large marking square. Made from sturdy borosilicate glass with a low coefficient of expansion. Manufactured with uniform wall thickness which offers optimum balance between thermal shock resistance and mechanical strength. Accuracy: ±5% of full capacity.

Cat. No.	Capacity (mL)	Rubber Stopper No.	Graduation Range (mL)	Approx. O.D. x Height (mm)	Graduation Interval (mL)
1800-125	125	5	50-125	65 x 107	25
1800-250	250	6	50-225	79 x 133	25
1800-500	500	7	100-500	100 x 173	50
1800-1000	1000	9	250-1000	124 x 214	50



Flasks

BOMEX brand, Filtering, Heavy Wall, Tubulation, Graduated

BOMEX 1870 Series Filtering Flasks meet ASTM E 1406 Type II, Class 1 Specifications for Classification, Design, Capacity & Dimensions, and Markings. Feature heavy-duty rims to reduce chipping; white, permanent graduations and a large marking square. Made from sturdy borosilicate glass with a low coefficient of expansion. Manufactured with uniform wall thickness which offers optimum balance between thermal shock resistance and mechanical strength. Tubulation Outside Diameter is 10mm. Accuracy: ±5% of full capacity.

Cat. No.	Capacity (mL)	Rubber Stopper No.	Graduation Range (mL)	Approx. O.D. x Height (mm)	Graduation Interval (mL)
1870-250	250	6	75-250	85 x 142	25
1870-500	500	7	150-500	104 x 184	50



Flasks

SIBATA brand, Volumetric, Class A, Snap-Cap, To Contain

SIBATA 2303A Series Volumetric Flasks meet ASTM E 288 Class A Specifications. Feature machine-blown bodies and heavy-beaded, heavy-tubing necks, tooled for snap-cap fit. The graduation line is sharp and permanent; large, white, block-letters allow the labeling to be easily read. All sizes are supplied with a snap cap.

Cat. No.	Capacity (mL)	Tolerance (±mL)	Approx. O.D. x Height (mm)	Snap Cap No.
2303A-5	5	0.02	21 x 59	1
2303A-10	10	0.02	26 x 85	1
2303A-25	25	0.03	37 x 110	2
2303A-50	50	0.05	49 x 136	3
2303A-100	100	0.08	58 x 164	3
2303A-200	200	0.10	74 x 205	4
2303A-250	250	0.12	78 x 225	4
2303A-500	500	0.20	96 x 260	5
2303A-1000	1000	0.30	122 x 300	6



Flasks



SIBATA brand, Volumetric, Class A, Micro, Hexagonal Base, ⌘ Stopper, To Contain

SIBATA 2306A Series Micro Volumetric Flasks meet ASTM E 237 Specifications. Feature machine-blown bodies and heavy-beaded, heavy-tubing necks, tooled for ⌘ stoppers. The graduation line is sharp and permanent; large, white, block-letters allow the labeling to be easily read. Both sizes feature hexagonal bases for added stability and are supplied with a ⌘ ground glass stopper.

Cat. No.	Capacity (mL)	Tolerance (±mL)	Approx. O.D. x Height (mm)	⌘ Stopper No.
2306A-1	1	0.01	10 x 79	9
2306A-2	2	0.015	12 x 90	9



Flasks

SIBATA brand, Volumetric, Class A, ⌘ Stopper, To Contain

SIBATA 2306A Series Volumetric Flasks meet ASTM E 288 Class A Specifications. Feature machine-blown bodies and heavy-beaded, heavy-tubing necks, tooled for ⌘ stoppers. The graduation line is sharp and permanent; large, white, block-letters allow the labeling to be easily read. All sizes are supplied with a ⌘ ground glass stopper.

Cat. No.	Capacity (mL)	Tolerance (±mL)	Approx. O.D. x Height (mm)	⌘ Stopper No.
2306A-5	5	0.02	21 x 72	9
2306A-10	10	0.02	26 x 96	9
2306A-25	25	0.03	37 x 123	9
2306A-50	50	0.05	49 x 152	13
2306A-100	100	0.08	58 x 181	13
2306A-200	200	0.10	74 x 220	16
2306A-250	250	0.12	78 x 239	16
2306A-500	500	0.20	96 x 279	19
2306A-1000	1000	0.30	122 x 327	22
2306A-2000	2000	0.50	157 x 396	27



Flasks

SIBATA brand, Low-Actinic Amber, Volumetric, Class A, Φ Stopper, To Contain

SIBATA 2307A Series Low-Actinic Amber Volumetric Flasks meet ASTM E 288 Class A Specifications. Feature machine-blown bodies and heavy-beaded, heavy-tubing necks, tooled for Φ stoppers. The graduation line is sharp and permanent; large, white, block-letters allow the labeling to be easily read. The low-actinic amber stained glass provides protection for materials sensitive to light. All sizes are supplied with a Φ ground glass stopper.

Cat. No.	Capacity (mL)	Tolerance (\pm mL)	Approx. O.D. x Height (mm)	Φ Stopper No.
2307A-10	10	0.02	26 x 96	9
2307A-25	25	0.03	37 x 123	9
2307A-50	50	0.05	49 x 152	13
2307A-100	100	0.08	58 x 181	13
2307A-200	200	0.10	74 x 220	16



Funnels

SIBATA brand, Buchner, with Fritted Disc



SIBATA 1311 Series Buchner Funnels, with fritted disc filters, meet ISO 4793 Specifications. Used for applications when filter paper and membranes cannot withstand the chemical attack of the filtrate. Funnels are constructed with heavy-walled stems; top rims are beaded for extra strength.

Cat. No.	Capacity (mL)	Porosity	Pore Size (μ m)	Diameter of Disc (mm)	Approx. Height Above Disc (mm)	Approx. Stem Length x O.D. (mm)
1311-3250A	30	EC	160-250	34	45	55 x 8
1311-3100A	30	C	40-100	34	45	55 x 8
1311-340A	30	PC	16-40	34	45	55 x 8
1311-316A	30	M	10-16	34	45	55 x 8
1311-305A	30	F	4-5.5	34	45	55 x 8
1311-11250A	60	EC	160-250	39	60	70 x 9
1311-11100A	60	C	40-100	39	60	70 x 9
1311-1140A	60	PC	16-40	39	60	70 x 9
1311-1116A	60	M	10-16	39	60	70 x 9
1311-1105A	60	F	4-5.5	39	60	70 x 9
1311-17250	140	EC	160-250	65	55	85 x 12
1311-17100	140	C	40-100	65	55	85 x 12
1311-1740	140	PC	16-40	65	55	85 x 12
1311-1716	140	M	10-16	65	55	85 x 12
1311-1705	140	F	4-5.5	65	55	85 x 12

EXTRA COARSE [160-250 μ m] (liquid and gas dispersion, coarse filtration); COARSE [40-100 μ m] (preparative fine filtration and work with crystalline products, mercury filtration); PARTLY COARSE [16-40 μ m] (analytical work with medium-fine precipitates, fine gas filtration); MEDIUM [10-16 μ m] (analytical fine filtration preparative work with the finest precipitates); FINE [4-5.5 μ m] (filtration of fine precipitates, mercury valve, extraction apparatus)



Funnels

BELLWETHER brand, Squibb, Separatory, Pear-Shaped, Φ Stopper, PTFE Stopcock

BELLWETHER 1530 Series Separatory Funnels meet ASTM E 1096 Type 4 Specifications for Classification, Design, & Markings. Feature smooth tooled tips. The stopcock bores, body openings, and stems are carefully aligned for even liquid flow with fast cut-off. All sizes supplied with a Φ ground glass stopper.

Cat. No.	Capacity (mL)	Φ Stopper No.	Stopcock Plug Size	Approx. O.D. x Stem Length (mm)	Approx. Total Length (mm)
1530-100	100	22	2	8 x 50	230
1530-250	250	22	4	10 x 60	285
1530-500	500	27	4	12 x 70	340
1530-1000	1000	27	4	12 x 70	395





SIBATA brand, Reusable Glass, Measuring (Mohr), Class A, Color-Coded, with Colored Markings, To Deliver

SIBATA 2010A Series Measuring Pipets meet ASTM E 1293 Style 1, Class A Specifications. They are graduated to the baseline above the tip (tempered), and are also calibrated to Deliver. Feature permanent amber markings and color-codings which are enameled onto the glass. The top end of sizes 5 to 25mL is constricted.

Cat. No.	Capacity (mL)	Tolerance (\pm mL)	Graduation Interval (mL)	Approx. O.D. x Height (mm)	Color Code
2010A-01-c	0.1	0.0025	0.01	6 x 300	white
2010A-02-c	0.2	0.004	0.01	6 x 300	black
2010A-1-d	1.0	0.01	0.1	7 x 360	red
2010A-1-c	1.0	0.01	0.01	7 x 360	yellow
2010A-2-d	2.0	0.01	0.1	7 x 360	green
2010A-5	5.0	0.02	0.1	8 x 365	blue
2010A-10	10.0	0.03	0.1	10 x 370	orange
2010A-25	25.0	0.1	0.1	13 x 455	white



SIBATA brand, Reusable Glass, Serological, Class A, Color-Coded, with Colored Markings, To Deliver

SIBATA 2011A Series Serological Pipets meet ASTM E 1044 Style 1 Specifications. They are graduated to the tip (tempered), and are also calibrated to Deliver. Feature permanent amber markings and color-codings which are enameled onto the glass. The top end of sizes 5 to 25mL is constricted.

Cat. No.	Capacity (mL)	Tolerance (\pm mL)	Graduation Interval (mL)	Approx. O.D. x Height (mm)	Color Code
2011A-01-c	0.1	0.0025	0.01	6 x 300	white
2011A-02-c	0.2	0.004	0.01	6 x 300	black
2011A-1-d	1.0	0.01	0.1	7 x 360	red
2011A-1-c	1.0	0.01	0.01	7 x 360	yellow
2011A-2-d	2.0	0.01	0.1	7 x 360	green
2011A-5	5.0	0.02	0.1	8 x 365	blue
2011A-10	10.0	0.03	0.1	10 x 370	orange
2011A-25	25.0	0.1	0.1	13 x 455	white



SIBATA brand, Reusable Glass, Volumetric, Class A, Color-Coded, with Colored Markings, To Deliver

SIBATA 2040A Series Volumetric Pipets meet ASTM E 969 Class A Specifications. The graduation line is sharp and permanent. They are calibrated to Deliver. Feature permanent amber markings and color-codings which are enameled onto the glass.

Cat. No.	Capacity (mL)	Tolerance (\pm mL)	Approx. Length (mm)	Color Code
2040A-05	0.5	0.005	300	2-black
2040A-1	1.0	0.006	345	blue
2040A-2	2.0	0.006	355	orange
2040A-3	3.0	0.01	360	black
2040A-4	4.0	0.01	365	2-red
2040A-5	5.0	0.01	375	white
2040A-6	6.0	0.01	390	2-orange
2040A-7	7.0	0.01	410	2-green
2040A-8	8.0	0.02	430	blue
2040A-9	9.0	0.02	436	black
2040A-10	10.0	0.02	440	red
2040A-13	13.0	0.03	460	white
2040A-15	15.0	0.03	460	green
2040A-20	20.0	0.03	475	yellow
2040A-25	25.0	0.03	480	blue
2040A-50	50.0	0.05	540	red
2040A-100	100.0	0.08	600	yellow



Pipets

SIBATA brand, Reusable Glass, Volumetric, Wide-Tip Opening, To Deliver

SIBATA 2040 Series Wide-Tip Volumetric Pipets meet ASTM E 969 Class B Specifications for Tolerance. The wide-tip opening facilitates rapid fill and drain of viscous liquids, slurries, and suspensions. The graduation line is sharp and permanent. They are calibrated to Deliver. Feature permanent amber markings which are enameled onto the glass. Sizes 1, 2, & 5mL do not have drawn tips, while sizes 10mL through 100mL feature standard drawn tips.

Cat. No.	Capacity (mL)	Tolerance (\pm mL)	Approx. Length (mm)	Approx. Tip I.D. (mm)
2040-1-1.9MM	1.0	0.01	320	1.9
2040-2-2.4MM	2.0	0.01	330	2.4
2040-5-3MM	5.0	0.02	346	3.0
2040-10-3MM	10.0	0.02	440	3.0
2040-20-3MM	20.0	0.03	478	3.0
2040-25-3MM	25.0	0.03	475	3.0
2040-50-3MM	50.0	0.05	538	3.0
2040-100-3MM	100.0	0.10	605	3.0




Stoppers

SIBATA brand, F Stopper, Ground Glass

SIBATA F Ground Glass Stoppers meet ASTM E 675 Specifications. This stopper is lightweight yet very strong to reduce chipping and breakage, thus minimizing replacement costs. The flat top allows the stopper to stand on its head which frees the user's hand and minimizes potential contamination. Interchangeable with other common flask stoppers and fits all standard labware of comparable F size.

Cat. No.	F Stopper No.	Approx. Length of Ground Zone (mm)	Height Above Ground Joint (mm)
03081	9	14	10
03082	13	14	13
03083	16	16.5	18
03084	19	19	18
03085	22	20.5	20
03087	27	21	21




Stoppers

SIBATA brand, F Stopper, Polyethylene

SIBATA F Polyethylene Stoppers meet ASTM E 675 Specifications. These stoppers are made with closed bottoms and polyethylene which conform to F stopper dimensions. The three unit rings on the base provide an efficient seal. Can be used in place of the conventional F flask stoppers.

Cat. No.	F Stopper No.
009	9
013	13
016	16
019	19
022	22
027	27



Technical Information

Glassware Properties

Duran 50	
Standards: Type I, Class A Borosilicate conforming to ASTM E-438.	
Composition	(percent approx.)
SiO ₂	81.0%
B ₂ O ₃	13.0%
Al ₂ O ₃	2.0%
Na ₂ O/K ₂ O	4.0%
Properties	
Coefficient of Expansion	32 x 10 ⁻⁷ cm/cm/°C
Annealing Point	568°C
Softening Point	815°C
Density	2.23 g/cm ³
Thermal Shock Resistance	250°C
Products: Volumetric Flasks and other Laboratory Glassware	

Durobax	
Standards: Type I, Class B Borosilicate conforming to ASTM E-438.	
Composition	(percent approx.)
SiO ₂	72.0%
B ₂ O ₃	12.0%
Al ₂ O ₃	7.0%
Na ₂ O/K ₂ O /CaO	9.0%
Properties	
Coefficient of Expansion	49 x 10 ⁻⁷ cm/cm/°C
Annealing Point	565°C
Softening Point	783°C
Density	2.36 g/cm ³
Thermal Shock Resistance	200°C
Products: Cylinders and Pipets	

BJTY			
Standards: Equivalent to Type I, Class A Borosilicate conforming to ASTM E-438.			
Composition	(percent approx.)	Trace:	(percent approx.)
SiO ₂	80.4%	As ₂ O ₂ plus Sb ₂ O ₃	0.01%
B ₂ O ₃	13.0%	PbO	0.1%
Al ₂ O ₃	2.4%	MgO	0.1%
Na ₂ O	3.9%	ZnO	0.1%
		CaO	0.3%
		K ₂ O	0.3%
		BaO	0.2%
Properties			
Coefficient of Expansion	32 x 10 ⁻⁷ cm/cm/°C		
Annealing Point	560°C		
Softening Point	820°C		
Density	2.23 g/cm ³		
Thermal Shock Resistance	200°C		
Products: Beakers, Burets, Erlenmeyer Flasks, Filter Flasks, Separatory Funnels			

Care of Glassware

Good laboratory technique demands clean glassware, because the most carefully executed piece of work may give an erroneous result if dirty glassware is used. In all instances, glassware must be physically clean; it must be chemically clean; and in many cases it must be bacteriologically clean or sterile. All glassware must be absolutely grease-free. The safest criteria of cleanliness is uniform wetting of the surface by distilled water. This is especially important in glassware used for measuring the volume of liquids. Grease and other contaminating materials will prevent the glass from becoming uniformly wetted. This in turn will alter the volume of residue adhering to the walls of the glass container and thus affect the volume of liquid delivered. Furthermore, in pipets and burets, the meniscus will be distorted and the correct adjustments cannot be made. The presence of small amounts of impurities may also alter the meniscus.

Washing -- Wash glassware as quickly as possible after use. If a thorough cleaning is not possible immediately, soak the glassware in water. If labware is not cleaned immediately, it may become impossible to remove the residue. When washing, soap, detergent, or cleaning powder (with or without an abrasive) may be used. The water should be hot. For glassware that is exceptionally dirty, a cleaning powder with a mild abrasive reaction will give more satisfactory results. However, the abrasive should not scratch the glass. During the washing, all parts of the glassware should be thoroughly scrubbed with a brush. Do not use cleaning brushes that are so worn that the spine hits the glass. Serious scratches may result. Scratched glass is more prone to break during experiments. Any mark in the uniform surface of glassware is a potential breaking point, especially when the piece is heated. Do not allow acid to come into contact with a piece of glassware before the detergent (or soap) is thoroughly removed. If this happens, a film or grease may be formed.

Rinsing -- It is imperative that all soap, detergents, and other cleaning fluids be removed from glassware before use. After cleaning, rinse the glassware with running tap water. When graduates, flasks, and similar containers are rinsed with tap water, allow the water to run into and over them for a short time, then partly fill each piece with water, thoroughly shake and empty at least six times. Pipets and burets are best rinsed by attaching a piece of rubber tubing to the faucet and then attaching the delivery end of the pipets or burets to a hose, allowing the water to run through them. If the tap water is very hard, it is best to run it through a deionizer before using. Rinse the glassware in a large bath of distilled water. Rinse with distilled water. To prevent breakage when rinsing or washing pipets, cylinders, or burets, be careful not to let tips hit the sink or the water tap.

Drying & Storing -- Dry beakers, flasks, and other labware by hanging them on wooden pegs or placing them in baskets with their mouths downward and allowing them to dry in the air. Dry burets, pipets, and cylinders by standing them on a folded towel. Protect clean glassware from dust. This is done best by plugging with cotton, corking, or taping a heavy piece of paper over the mouth or placing the glassware in a dust-free cabinet. Store glassware in specially designed racks. Avoid breakage by keeping pieces separated.

Freeing Seized Ground Joints

If a ground joint sticks, the following procedure will generally free it. Immerse the joint in a glass container of freshly poured carbonated liquid. You will be able to see the liquid penetrate between the ground surfaces. When the surfaces are wet (allow 5 to 10 minutes submersion), remove the joint and rinse with tap water. Wipe away any excess water. Then gently warm the wall of the outer joint by rotating it for 15 to 20 seconds over a low Bunsen burner flame. Wear heat-resistant gloves to avoid burns. Be sure that 50% of the inner surface is wet before inserting the joint in the flame. Remove from the flame and gently twist the two members apart. If they do not come apart, repeat the procedure. Never use force when separating joints by this method.

Heating

When heating glassware, refer to the laboratory or instruction manual for the given heat source for additional information.

Bunsen Burners -- Adjust the Bunsen burner to get a large soft flame. It will heat slowly but more uniformly. Uniform heat is a critical factor for some chemical reactions. Adjust the ring or clamp holding the glassware so that the flame touches the glass below the liquid level. Heating above the liquid level does nothing to promote even heating of the solution and could cause thermal shock and breakage of the vessel. A ceramic-centered wire gauze on the ring will diffuse the burner flame to provide more even heat. Heat all liquids slowly. Fast heating may cause bumping, which in turn may cause the solution to splatter.

Do not heat glassware directly on electrical heating elements. Excessive stress will be induced in the glass, and this can result in breakage.

Hot Plates -- There are several types of hot plates. Some are electrical, some are water heated. They may be ceramic or metal-topped. Refer to the instruction manual before using a hot plate for the first time. Always use a hot plate larger than the vessel being heated.

Scratched Glassware -- Do not heat glassware that is etched, cracked, nicked, or scratched. It is more prone to break and should be replaced.

Mixing & Stirring

Use a rubber policeman on glass stirring rods or use PTFE rods to prevent scratching the inside of a vessel. Do not look down into any vessel being heated or containing chemicals. Do not point a vessel's open end at another person. A reaction may cause the contents to be ejected. Spattering from acids, caustic materials, and strong oxidizing solutions on the skin or clothing should be washed off immediately with large quantities of water.

Pipetting

Do not pipet by mouth. Use a mechanical pipetting device, such as a rubber bulb or other pipetting aids available from laboratory suppliers. Do not draw any liquids into a pipet by mouth. Serious injury could result.

Temperature & Temperature Extremes

Avoid temperature extremes and always use caution. Do not put hot glassware on cold or wet surfaces, or cold glassware on hot surfaces. It may break with temperature change. Cool all labware slowly to prevent breakage.

Vacuum and Pressure Warning

Because of variations in conditions, laboratory glassware cannot be guaranteed against breakage under vacuum or pressure. Adequate precaution should be taken to protect personnel doing such work.

Ventilation

Work in a well-ventilated area. When working with chlorine, hydrogen sulfide, carbon monoxide, hydrogen cyanide, and other highly-toxic substances, always use a protective mask or perform these experiments under a fume hood in a well-ventilated area.

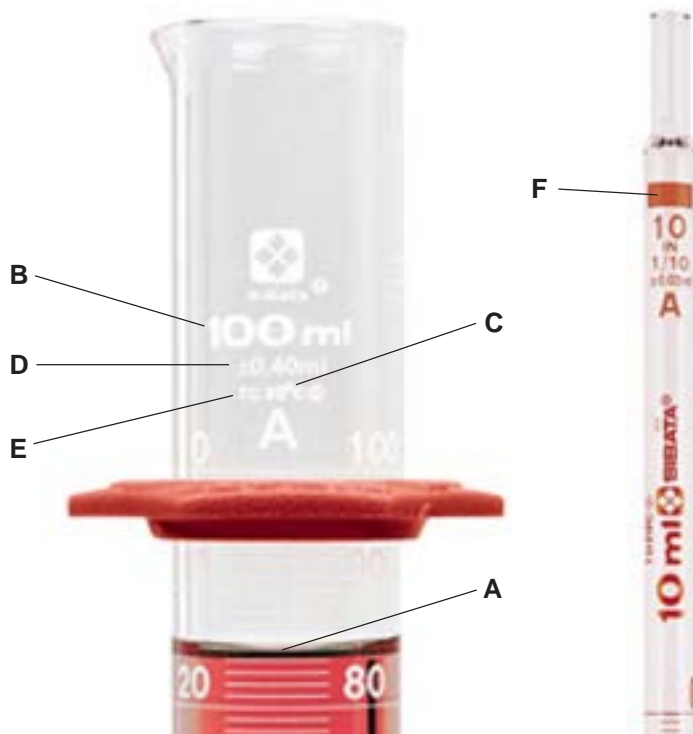
Volumetric Ware

Glass volumetric ware comprises a class of objects used to measure volume. The accuracy of volumetric ware depends on the care used in calibrating it, using the correct type of ware for the application, handling the ware properly, and insuring the ware is clean. Calibration of volumetric ware is usually done at 20°C, and the ware should be used at approximately this temperature. Refrigerated liquids should be allowed to come to room temperature before measuring them. Under normal use and care, the calibration of volumetric ware will not change.

Types of Ware -- Class A ware is manufactured to tolerances established by ASTM E-694 for volumetric ware, ASTM E-542 for calibration of volumetric ware, and the specific ASTM specification for the given piece of glassware. Class B ware is generally calibrated to twice the tolerance of Class A ware.

Calibrated Ware Markings (Refer to Pictures at Right) -- Volumetric ware is marked with lines to indicate the volume at the point of reading (**A**). In addition to the lines, the ware should be marked with its capacity (**B**), the temperature at which it should be used (**C**), its tolerance (**D**), and whether the piece was calibrated TC ("to contain") or TD ("to deliver") the stated volume (**E**). TC means that the ware is calibrated so that the mark indicates the volume held in the container. TD means the mark indicates the amount of air-free distilled water at 20°C that is delivered when it is poured out. Numbers indicating volume at certain lines are placed immediately above the line. Pipets have an additional marking, a color-coded size identity band is found just below the top end of the pipet (**F**). This band is to aid in sorting and selection of the pipet.

Reading Volumetric Ware -- ASTM E-542 details the method of reading the meniscus as follows: For all apparatus calibrated by this procedure, the reading or setting is made on the lowest point of the meniscus. The position of the lowest point of the meniscus with reference to the graduation line is horizontally tangent to the plane of the upper edge of the graduation line. The position of the meniscus is obtained by having the eye in the same plane of the upper edge of the graduation line.





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