

An old favorite

Borosilicate Capillaries

The properties of borosilicate glass make it the most popular material among researchers for the fabrication of electrodes and micro-pipettes. Its low softening temperature combined with its mechanical strength, chemical durability, high electrical resistivity, and its ability to withstand thermal stress, make these capillaries the most widely used in the world. Clark borosilicate capillaries are offered in a variety of diameters and wall thickness (standard or thin walled) with or without an inner filament. They are available in fused multi-barrel configurations, as well as in theta style. Single barrel glass is available in 75 mm (3 in), 100 mm (4 in) and 150 mm (6 in) lengths.

- High quality borosilicate glass
- Five outside diameters available
- Available with either thin or standard wall
- Ratio of outside to inside diameters preserved to tip
- Economical

Borosilicate Thin Wall without Filament



Borosilicate Thin Wall without Filament

Order #	OD mm	ID mm	Length mm	Qty.
W4 30-0037	1.0	0.78	75	500
W4 30-0035	1.0	0.78	100	500
W4 30-0036	1.0	0.78	150	500
W4 30-0049	1.2	0.94	75	350
W4 30-0047	1.2	0.94	100	350
W4 30-0048	1.2	0.94	150	350
W4 30-0064	1.5	1.17	50	225
W4 30-0065	1.5	1.17	75	225
W4 30-0062	1.5	1.17	100	225
W4 30-0063	1.5	1.17	150	225

Discounts on Quantity Purchases:

Discount apply to only single part number quantities (no mixing).

1 to 4	none
5 to 9	5%
10+	10%

Specifications

Composition	80.9% SiO ₂ 12.9% B ₂ O ₃ 4.4% Na ₂ O 1.8% Al ₂ O ₃
Softening Temp.	815°C
Dielectric Constant	4.7

Borosilicate Standard Wall without Filament

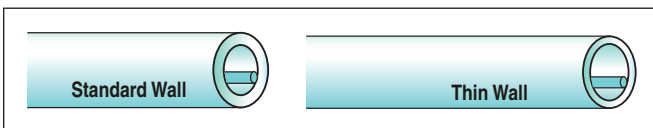


Borosilicate Standard Wall without Filament

Order #	OD mm	ID mm	Length mm	Wall	Qty.
W4 30-0018	1.0	0.58	75	0.21	500
W4 30-0016	1.0	0.58	100	0.21	500
W4 30-0017	1.0	0.58	150	0.21	500
W4 30-0043	1.2	0.69	75	0.25	350
W4 30-0042	1.2	0.69	100	0.25	350
W4 30-0041	1.2	0.69	150	0.25	350
W4 30-0056	1.5	0.86	75	0.32	225
W4 30-0054	1.5	0.86	110	0.32	225
W4 30-0053	1.5	0.86	100	0.32	225
W4 30-0055	1.5	0.86	150	0.32	225
W4 30-0073	2.0	1.16	75	0.42	125
W4 30-0070	2.0	1.16	100	0.42	125
W4 30-0071	2.0	1.16	150	0.42	125
W4 30-0127	3.0	1.62	75	0.69	55
W4 30-0080	3.0	1.62	100	0.69	55
W4 30-0081	3.0	1.62	150	0.69	55

Clark Capillary Glass (continued)

Borosilicate with Filament

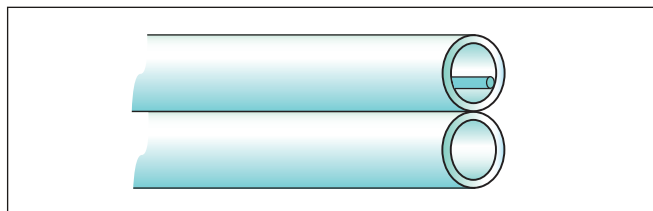


- Easy filling
- Available in standard or thin wall configurations with selection of three outside diameters
- Exceptionally low tip impedance (less than 50 MΩ)
- Good for patch clamp pipettes and microinjection needles

Borosilicate with Filament

Order #	OD mm	ID mm	Length mm	Qty.
Borosilicate Standard Wall with Filament				
W4 30-0034	1.0	0.50	75	500
W4 30-0032	1.0	0.50	100	500
W4 30-0033	1.0	0.50	150	500
W4 30-0021	1.0	0.58	75	500
W4 30-0019	1.0	0.58	100	500
W4 30-0020	1.0	0.58	150	500
W4 30-0046	1.2	0.69	75	350
W4 30-0044	1.2	0.69	100	350
W4 30-0045	1.2	0.69	150	350
W4 30-0060	1.5	0.86	75	225
W4 30-0057	1.5	0.86	100	225
W4 30-0058	1.5	0.86	150	225
W4 30-0076	2.0	1.16	75	125
W4 30-0074	2.0	1.16	100	125
W4 30-0075	2.0	1.16	150	125
W4 30-0084	3.0	1.62	75	55
W4 30-0082	3.0	1.62	100	55
W4 30-0083	3.0	1.62	150	55
Borosilicate Thin Wall with Filament				
W4 30-0040	1.0	0.78	75	500
W4 30-0038	1.0	0.78	100	500
W4 30-0039	1.0	0.78	150	500
W4 30-0052	1.2	0.94	75	350
W4 30-0050	1.2	0.94	100	350
W4 30-0051	1.2	0.94	150	350
W4 30-0068	1.5	1.17	75	225
W4 30-0066	1.5	1.17	100	225
W4 30-0067	1.5	1.17	150	225
W4 30-0128	2.0	1.56	75	125
W4 30-0077	2.0	1.56	100	125
W4 30-0078	2.0	1.56	150	125

Borosilicate Double and Triple Barrel Specials



- High quality borosilicate glass
- Special two barrels - one barrel with filament, one without
- Ratio of outside to inside diameter preserved to tip during pull

Borosilicate Double and Triple Barrel Specials

Order #	OD mm	ID mm	Length mm	Qty.
Double Barrel				
W4 30-0004	1.5	0.86	75	100
W4 30-0005	1.5	0.86	100	100
W4 30-0006	1.5	0.86	150	100
Triple Barrel				
W4 30-0011	1.5	0.86	75	100
W4 30-0009	1.5	0.86	100	100
W4 30-0010	1.5	0.86	150	100

Borosilicate Theta Glass



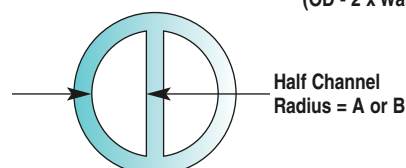
- Easy to fill
- Two channels in a single diameter

Borosilicate Theta Glass

Order #	OD mm	ID mm	Septum mm	Length mm	Qty.
W4 30-0116	1.5	0.23	0.17	75	100
W4 30-0114	1.5	0.23	0.17	100	100
W4 30-0115	1.5	0.23	0.17	150	100
W4 30-0119	2.0	0.30	0.22	75	100
W4 30-0117	2.0	0.30	0.22	100	100
W4 30-0118	2.0	0.30	0.22	150	100

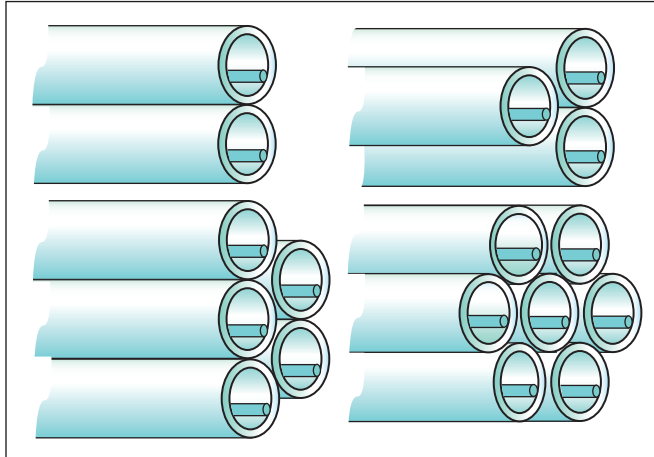
A: 0.435 mm
B: 0.59 mm

HRC = $\frac{1}{2}$
(OD - 2 x Wall Sept)



Clark Capillary Glass (continued)

Borosilicate Multi-Barrel



- High quality borosilicate glass
- Two, three, five and seven barrel configurations with filament
- Capillaries fused along their full length

Borosilicate Multi-Barrel

Order #	OD mm	Wall mm	# of Septum	Barrels	Qty.
W4 30-0003	1.5	0.86	75 mm	2	100
W4 30-0001	1.5	0.86	100 mm	2	100
W4 30-0002	1.5	0.86	150 mm	2	100
W4 30-0007	1.2	0.69	100 mm	3	100
W4 30-0008	1.2	0.69	150 mm	3	100
W4 30-0012	1.2	0.69	100 mm	5	65
W4 30-0013	1.2	0.69	150 mm	5	65
W4 30-0014	1.0	0.58	100 mm	7	60
W4 30-0015	1.0	0.58	150 mm	7	60

Aluminosilicate Capillaries with Filament



Aluminosilicate Capillaries with Filament

Order #	OD mm	ID mm	Length mm	Qty.
W4 30-0110	1.0	0.53	75	500
W4 30-0108	1.0	0.53	100	500
W4 30-0109	1.0	0.53	150	500

Specifications

Composition	51.9% SiO ₂ , 22.0% Al ₂ O ₃ , 7.8% P ₂ O ₅ , 7.7% MgO, 6.9% CaO, 2.1% B ₂ O ₃ , 1.4% BaO and 0.2% As ₂ O ₃
Softening Temperature	950°C
Dielectric Constant	6.2

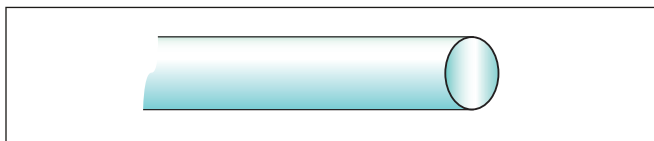
Aluminosilicate Capillaries

In recent years there has been a developing interest in fabricating micropipettes from aluminosilicate glass. Like silicon, aluminum combines with oxygen to form Tetrahedral Networks and the Al-O bonds are very strong. In comparison with borosilicate glass, **aluminosilicate** provides increased hardness, improved chemical durability, reduced electrical conductivity and a lower coefficient of thermal expansion. Also, while the original ratio of a borosilicate capillary's inner to outer diameter will remain unchanged over its total taper length, aluminosilicate glass demonstrates a marked tendency to thin out as it is drawn to a tip. This behavior allows extremely fine tips to be formed.

For more information, see:

1. Na/H Exchange, Vaugban-Jones, R.D.; Grinstein Press, Cb.1 p.8;
2. Effects of intracellular and extracellular pH on contraction in isolated mammalian cardiac muscle, Bountra, C. & Vaugban-Jones, R.D.; Journal of Physiology Volume 418 (1989)

Borosilicate Glass Rod



- High quality borosilicate glass
- Available in two diameters

Borosilicate Glass Rod

Order #	OD mm	Length mm	Qty.
W4 30-0087	1.0	75	500
W4 30-0085	1.0	100	500
W4 30-0086	1.0	150	500