

Precision Engineered Glass

Made of Multiple Types of Glass Including Quartz



Committed to Product Excellence...
and Continuous Support

www.wilmad-labglass.com



An SP Industries Company



Precision Bore Glass and Quartz Tubing...

A proud tradition of excellence in glass and quartz engineering and manufacturing



PRECISION TUBING OF PYREX, QUARTZ AND OTHER ENGINEERED PARTS AND ASSEMBLIES

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TRADEMARKS USED IN THIS CATALOG

Throughout this catalog, references are made to many trademarks which belong to our many suppliers.

These trademarks include: WILMAD-LABGLASS (SP Industries, Inc.) PYREX and VYCOR (Corning Glass Works); Simax (Kavalier); SPECTROSIL, AMERSIL AND SUPRASIL (Heraeus Quartz America); DURAN (Schott); KG-33, N-51A (Kimble Chase).

INTRODUCTION

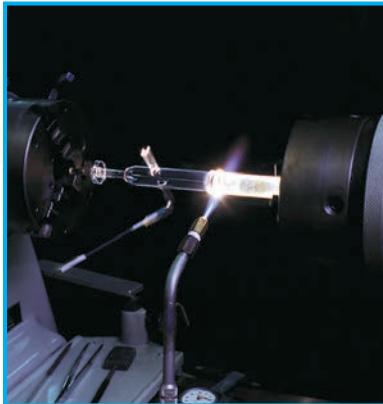
Wilmad Glass Company has been manufacturing precision glass and quartz products since 1951. Encompassed within this catalog are our manufacturing capabilities that we perfected. While our business has expanded over the years, our commitment to you, the customer, has not changed: to provide quality engineered products manufactured to the highest tolerances with the strictest quality control.

Precision Bore Tubing continues to be our core business and has earned Wilmad a worldwide reputation for quality. Our skilled glassworkers combine with our experienced engineers to translate detailed specifications into finished products that become part of high-tech aerospace systems, state-of-the-art analytical measurement equipment, and sophisticated electronic components and subassemblies.

Wilmad works in all types of glass including borosilicate, and others manufactured by Corning, Kimble or Schott. Also, we work in specialty glasses for glass-to-metal sealing. Additionally in quartz, all forms and types of natural and synthetic materials are supplied by Heraeus-Amersil.

Products offered by Wilmad include:

- Precision tubing of Quartz, Pyrex and other glasses
- Electronic glass components incorporating glass-to-metal seals
- Flowmeter and rotameter tubes
- Wave guides
- Optically flat plates, discs and slides
- Syringe barrels and plungers
- Laser envelopes
- Custom plasma torches
- High quality and precision bore square, rectangular and specialty shaped tubing
- High voltage capacitors
- Precision Dissolution Vessels



Production capabilities include:

- Heat shrinking of tubing onto precision mandrels
- Outside grinding and polishing of tubing
- Concentric grinding
- Tooling of precision components
- Finish lapping of precision components
- Glassblowing of precision assemblies
- Specialized glass-to-metal seal preparation
- Design and engineering consultations for specialty products

This catalog displays our lines of standard and custom products and highlights our production capabilities. Also included is a listing of the most popular sizes of Wilmad tooling to produce precision glass and quartz tubing and other assemblies. We welcome your inquiries to put our years of experience and manufacturing expertise to work for you.

WILMAD'S MANUFACTURING AND ENGINEERING CAPABILITIES

In this section, we detail Wilmad's extensive manufacturing capabilities. We have nearly a 60 year record of providing the best, state-of-the-art glass and quartz products. We continue to be the number one recognized name in the market for customer commitment and quality engineered products of the highest tolerances with strict quality control; the cornerstone of our operations. Only Wilmad provides a large dedicated staff with a full range of capabilities and a superior Quality Control and Assurance program. These levels of inspection standards ensure your Wilmad parts are the highest quality in the market.

MANUFACTURING CAPABILITIES

Ultra precision heat and vacuum shrinking of glass including borosilicate, quartz, lead and Suprasil forms the core of Wilmad's manufacturing operations. Tubing of various diameters up to 7" is shrunk on precision stainless steel mandrels providing extremely tight tolerances. We have both vertical and horizontal shrinking machines for virtually any size tube in lengths up to 54".

The grinding processes both concentric (where both O.D. and wall thickness is precisely controlled) and centerless (where the O.D. is controlled) can be performed to the same precision tolerances as our I.D. work. Finishing can include polishing to optical tolerances as well as beveling, chamfering, ultrasonic drilling and wet saw cutting.

In our custom fabrication shop our skilled glassblowers have many years of experience in shaping almost anything either free hand or on lathes. Facilities are available for vacuum silvering, forming glass-to-metal seals and manufacturing vacuum tube electronic feedthroughs. We offer the talent, know how and equipment to complete any job to set specifications.

QUALITY CONTROL

Wilmad's is ISO certified and has a stringent quality control program that begins with inspection of incoming material and follows through every step of the manufacturing process. Visual inspection by skilled workers during production ensures good quality. For some items microscopic inspection may be required to minimize inclusions and imperfections in the finished product. To ensure tolerances are met, Wilmad's QC inspectors use NIST calibrated micrometers, air gauges and other precision measurement equipment. Where required, items are also leak checked using our mass spectrometer.

ENGINEERING SERVICES

Wilmad glass engineers are available for consultation on any project that requires special glass or quartzware; this includes following your precision part all the way through the manufacturing process. From conceptual phase through final QC our staff ensures that a Wilmad part is a quality part. Fax or e-mail your specifications and we will be happy to quote to your requirements and in many cases suggest a possible "in stock" alternative.

CUSTOM PRODUCTS

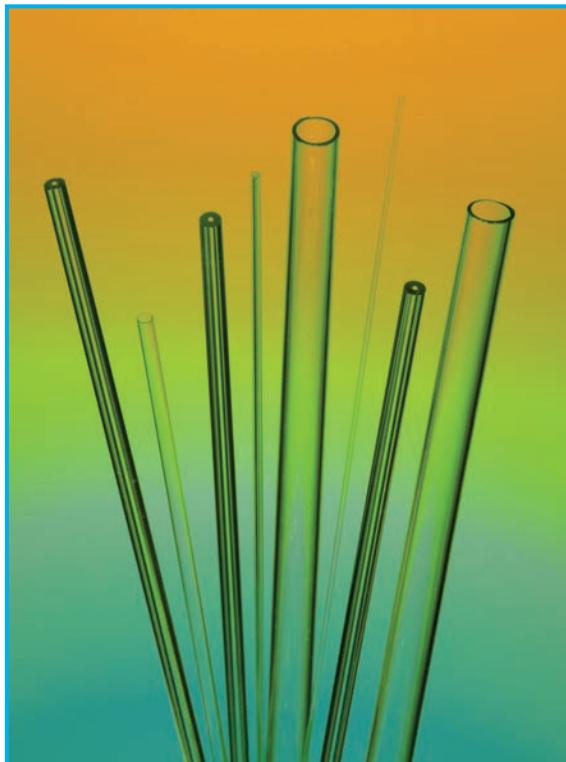
The following sections of this brochure detail many of the standard Wilmad products and product lines. Also shown are the capabilities to produce almost any glass or quartz product that one can imagine. Even if you don't see a specific item in this catalog that can meet your requirements, contact us for a feasibility consultation. If a part can be manufactured, chances are Wilmad can do it.



STANDARD PRODUCT LINES

This catalog is designed to keep our customers advised of the sizes and shapes of precision bore tubing and specialty items that we manufacture. Over the years, we have provided many products in virtually all types of glass and quartz. We are the premier manufacturer of many types of products which we supply as a finished part or as a subassembly to companies all over the world.

The following descriptions and photographs depict what we consider to be standard products; i.e., items that we have produced by the thousands over many years. Since no two customers have exactly the same requirements for a given part, we would like to offer these standard product lines as a possible starting point for your particular design. The skill and precision demonstrated by these illustrations are what you can expect from Wilmad as "standard."



PRECISION BORE TUBING

Precision bore tubing is produced by heat shrinking commercial tubing on precision mandrels.

This process, combined with appropriate finishing, is what we at Wilmad do best. In many cases, this tubing is the final product but can be just the starting point for many other products.

Wilmad precision bore tubing is available in glass and quartz in almost unlimited sizes, shapes and wall thicknesses.

Precision bore (PB) tubing by Wilmad is presented in Sections 5, 6, 7 and 8. Specifically, PB capillary tubes are presented in Section 5; PB quartz tubing in Section 7; and square PB tubing in Section 8.

The tubing tables in these sections detail the tooling and mandrels currently available. If you require a size, shape or material not listed, please submit exact specifications for availability and pricing.

Our engineers are available to assist you during the product development process and technical issues.

Our flexibility and years of experience are your assurance that we can supply precision bore glass and quartz tubing of practically any size, length, and shape to the most stringent dimensional tolerances.

STANDARD PRODUCT LINES



FLOWMETER TUBES

Wilmad produces a wide range of flowmeter tubes for both liquid and gas metering. We can provide the blank precision tube or a completely calibrated assembly depending on your requirements. We have made flowmeter tubes several inches to 3 feet long with I.D.'s ranging from a few millimeters to several inches. Tubes can be fluted or ribbed on the I.D. to provide a guide for the float.

Wilmad's success with this product line can be attributed to our skill in heat shrinking glass on precision mandrels. A rigorous quality control program with step-by-step inspections, numerous flow measurement checks, and flow calibration assures that each Wilmad flowmeter tube and rotameter meet required specifications.

SYRINGE BARRELS

Syringe barrels are another precision assembly that Wilmad provides for a number of clients. Syringes are analytical devices that require ultra-precise manufacturing and strict control skills. Syringes like these are used to accurately measure minute volumes of a liquid in automated pipeting, diluting or titration apparatus.



STANDARD PRODUCT LINES

Wilmad PB Tubing, when matched to electrical components, meets the exacting requirements of the Electronic Industry. Wilmad tubing and assemblies are proving our hard-earned reputation for quality in hundreds of applications and practically every electronic use... our craft people maintain rigid glassware tolerances to help keep these devices in service longer. Our electronic glassware is available in the various specialty glasses. We also work in synthetic and natural quartz and other glasses manufactured by Schott, Corning and Kimble-Chase. Electronic engineers have found that glass, when worked with precision and held to tolerances equally as stringent as those applicable in metal, can be successfully and profitably used as components in electronic assemblies and subassemblies. When they are needed, we can effectively produce the metal-to-glass seals necessary in many electronic applications.

VARIABLE HIGH VOLTAGE CAPACITORS

Specialized high voltage capacitors are manufactured for D.O.D. communications systems. These items illustrate many of our specialty talents. The envelope is precision bore quartz. The assembly requires quartz-to-metal seals as well as several machining and fabrication steps.

Rigid quality control guarantees that the final product meets MIL-SPEC tolerances and performance criteria.



WAVE GUIDES

These glass tubes will eventually become traveling wave tubes, components in a magnetron. In this application, precision is critical to maintain the uniformity of the microwave currents which travel through the wave guides. **Wilmad prepares the finest quality glass wave guides available anywhere.**



TUBES ENVELOPES

These are envelopes for camera tubes such as iconoscopes, image orthicons, and vidicons. Today, the most common application is in vidicon tubes, a device which relies on the phenomenon of photoconductivity to produce an electronic signal from an image of light or other radiation.

Wilmad precision tubing is the most reliable product in these sensitive devices.

STANDARD PRODUCT LINES



GLASS TO METAL SEALS

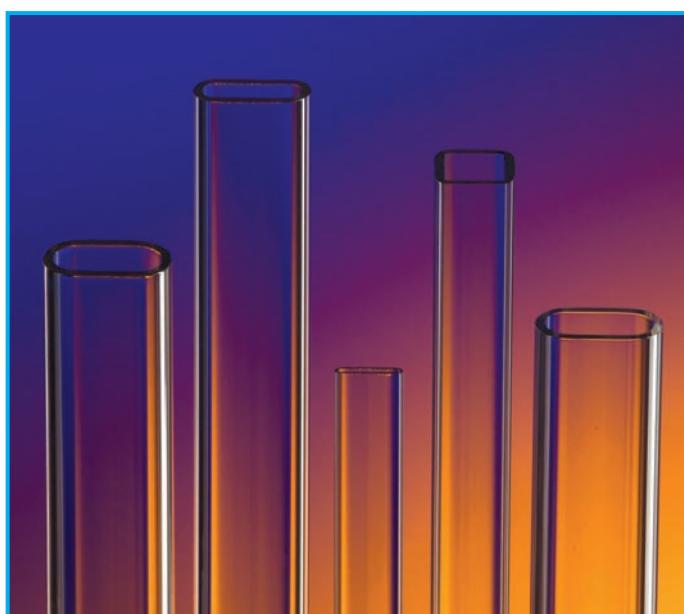
The art of sealing glass to metal involves a thorough knowledge not only of glass, but of the linear coefficients of expansion of metals as well. The samples shown are good examples of efficient glass-to-metal seals. We offer tungsten, stainless steel and platinum.

At Wilmad, we specialize in the expansion match seal in which the fusion joints between glass and metal carry linear coefficients of expansion which are identical, or nearly so. Our experience has been that the most effective seals are those which utilize nickel-cobalt-iron alloy such as Kovar.

If you require glass-to-metal seals in your operations, our engineers will be glad to discuss the subject in detail and quote on your requirements.

SQUARE AND RECTANGULAR TUBING

Wilmad offers a wide range of square and rectangular tubing manufactured in glass and quartz. Certain sizes are available in precision grade as shown in Section 8 of this catalog. High quality tubes are also available as defined in Section 9. These listed products are normally in stock for fast delivery. Wilmad can supply almost any dimension or length of these products, so if the size you need is not listed, contact our sales staff with your exact requirements. Our engineers will present a proposal to meet your requirements.



CUSTOMER SERVICES

BUSINESS HOURS

8 a.m. to 5 p.m., EST. • 800-220-5171 • Fax: 888-607-0746

PRICING

Due to the custom nature of Wilmad's precision bore product line, prices are not printed in this catalog.

CATALOG NUMBERS

Please use catalog numbers when ordering, particularly the items listed in Section 9. When ordering products previously quoted, please specify Wilmad quotation number and any pertinent drawing numbers. If you are reordering a specific part from Wilmad, please indicate the last purchase date, if possible.

SHIPMENTS

Orders are shipped F.O.B. Vineland, NJ via UPS or equivalent ground transport. If you require a faster method of shipment, please inform us of your needs at the time you place your order.

NEW PRODUCTS AND SPECIALS

While we have endeavored to present our current range of precision bore tubing products, we are constantly adding to our inventory of mandrels. You will be informed of new products through updated Technical Bulletins which we will send to you automatically when available. We can also assist you with special pieces not listed. Contact our Technical Staff to discuss your specific needs.

TERMS OF PAYMENT

Terms of payment are net 30 days, with proper approvals unless otherwise stated in a quotation or other sales agreement with our company. Applicable taxes will be applied as required by law.

DAMAGE CLAIMS/RETURN PROCEDURE

INSPECT GOODS IMMEDIATELY, ANY ISSUES MUST BE REPORTED WITHIN 10 DAYS.

FEDERAL EXPRESS: 5 DAYS

DAMAGE OR BREAKAGE

UPS Shipment

Keep all packaging material and carton with damaged ware. Call customer service with your Purchase Order Number or our Package ID number.

Air Freight, Truck and Air Parcel Post Contact customer service first for instructions according to the carriers specific claim policy. Again, save all packaging material and carton should the carrier require an inspection.

Note: On all damages we reserve the right to file a claim with the carrier so that a decision can be made as to the party responsible for damages.

SHORTAGE

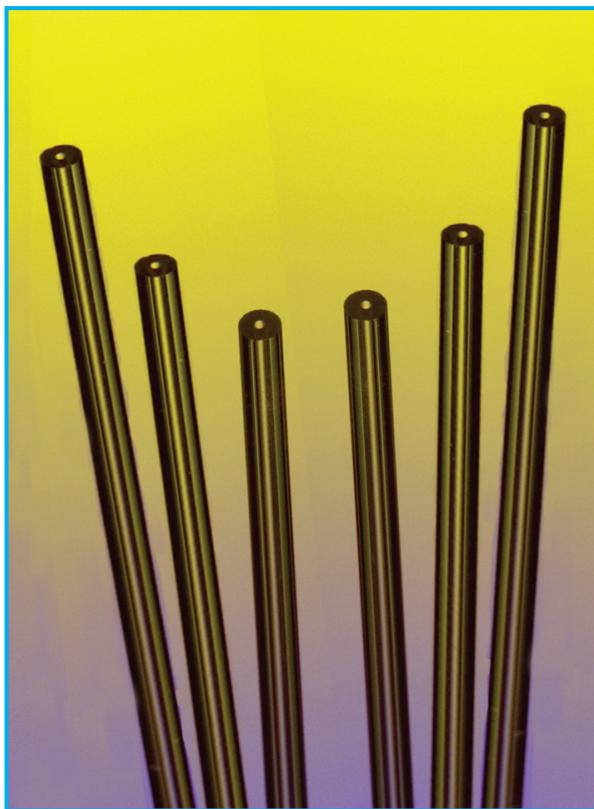
Inspect all packing material closely as small items may have been overlooked or item(s) may be on backorder. If an item is missing, notify customer service immediately.

RETURNS

We cannot accept return shipments unless we have been notified and issued a Return Material Authorization number. This number must appear on the outside of the carton and all correspondence.

RESTOCKING CHARGE

Catalog items returned due to an error in ordering are subject to a 25% restocking fee.

PRECISION BORE CAPILLARY TUBING**HEAVY WALL WEIGHTS**

The following table lists precision bore capillary in stock lengths. The dimensions given apply to Pyrex Brand, Duran and KG-33 glass. For other types of glass our tolerances will remain the same, but the dimensions will vary slightly. Tubing with I.D.s in the range from 0.0030" to 0.0985" are virtually identical for all common glasses including Pyrex, Duran, KG-33 and 8250.

We can also offer precision bore capillary tubing with various wall thickness starting at 0.007". These sizes require special handling. Contact customer service for availability and pricing.



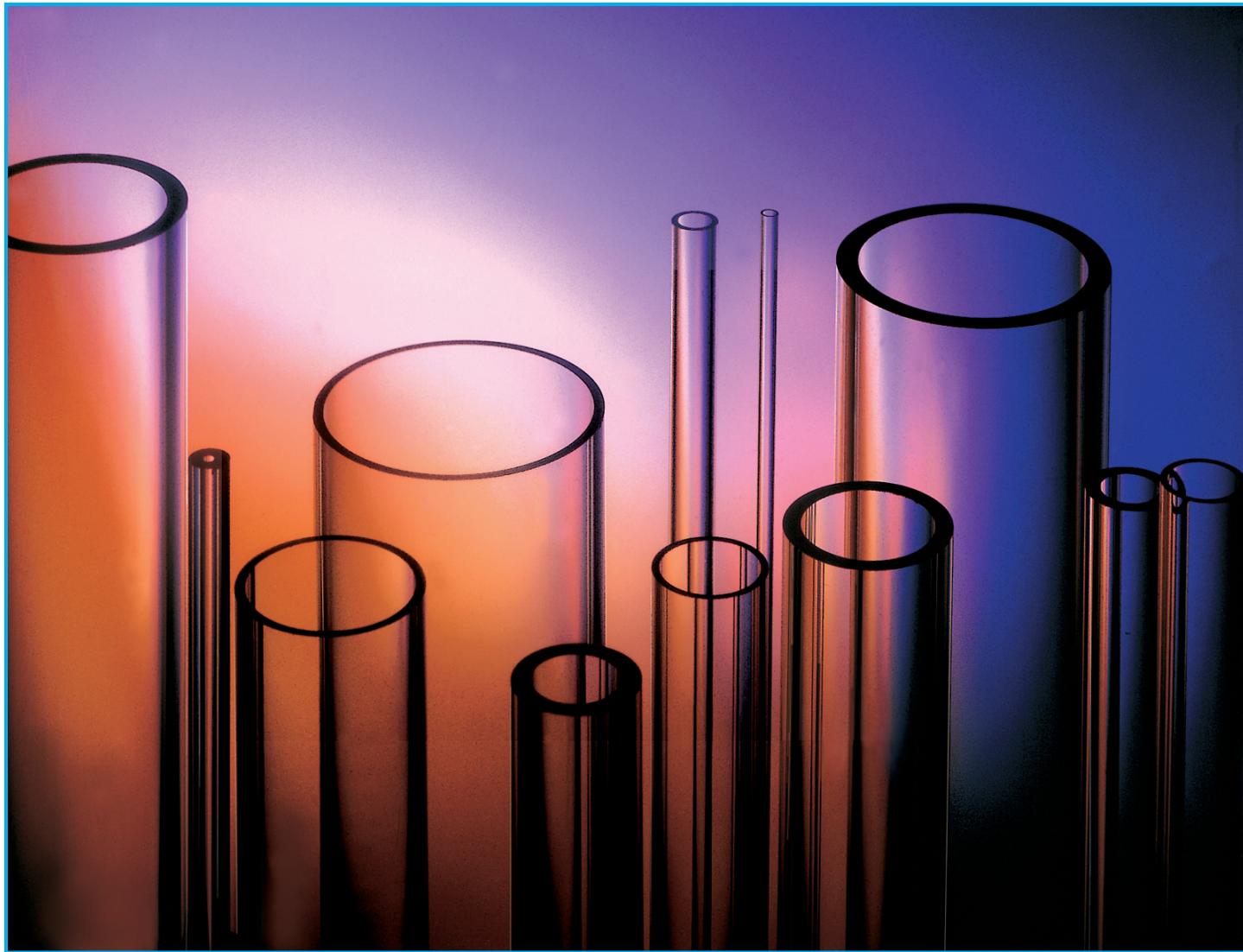
PRECISION BORE PYREX CAPILLARY TUBING

HEAVY WALL WEIGHTS

I.D. INCHES	I.D. mm	LENGTH INCHES	LENGTH mm	O.D. mm
0.0010	0.0250	48	1219.20	5-6
0.0020	0.0510	48	1219.20	5-6
0.0030	0.0762	48	1219.20	5-6
0.0040	0.1016	48	1219.20	5-6
0.0050	0.1270	48	1219.20	5-6
0.0060	0.1524	48	1219.20	5-6
0.0070	0.1778	48	1219.20	5-6
0.0080	0.2032	48	1219.20	5-6
0.0090	0.2286	48	1219.20	5-6
0.0100	0.2540	48	1219.20	5-6
0.0110	0.2794	48	1219.20	5-6
0.0120	0.3048	48	1219.20	6-7
0.0130	0.3302	48	1219.20	6-7
0.0140	0.3556	36	914.40	6-7
0.0150	0.3810	36	914.40	6-7
0.0161	0.4089	36	914.40	6-7
0.0178	0.4521	36	914.40	6-7
0.0180	0.4572	36	914.40	6-7
0.0190	0.4826	36	914.40	6-7
0.0202	0.5131	36	914.40	6-7
0.0211	0.5359	36	914.40	6-7
0.0220	0.5588	36	914.40	6-7
0.0230	0.5842	36	914.40	6-7
0.0240	0.6096	36	914.40	6-7
0.0252	0.6401	36	914.40	6-7
0.0260	0.6604	36	914.40	6-7
0.0270	0.6858	36	914.40	6-7
0.0282	0.7163	36	914.40	6-7
0.0290	0.7366	36	914.40	6-7
0.0302	0.7671	36	914.40	6-7
0.0320	0.8128	44	1117.60	6-7
0.0340	0.8636	44	1117.60	6-7
0.0351	0.8915	22	558.80	6-7
0.0360	0.9144	44	1117.60	6-7
0.0370	0.9398	36	914.40	6-7
0.0380	0.9652	44	1117.60	6-7
0.0390	0.9906	36	914.40	6-7
0.0400	1.0160	36	914.40	6-7
0.0410	1.0410	36	914.40	7-8

I.D. INCHES	I.D. mm	LENGTH INCHES	LENGTH mm	O.D. mm
0.0420	1.0668	40	1016.00	7-8
0.0438	1.0922	44	1117.60	7-8
0.0441	1.1201	44	1117.60	7-8
0.0450	1.1430	40	1016.00	7-8
0.0459	1.1658	44	1117.60	7-8
0.0460	1.1684	40	1016.00	7-8
0.0470	1.1940	40	1016.00	7-8
0.0484	1.2294	44	1117.60	7-8
0.0492	1.2497	44	1117.60	7-8
0.0500	1.2700	40	1016.00	7-8
0.0513	1.3030	44	1117.60	7-8
0.0520	1.3208	40	1016.00	7-8
0.0530	1.3462	44	1117.60	7-8
0.0544	1.3818	44	1117.60	7-8
0.0551	1.3995	43	1092.20	7-8
0.0580	1.4732	40	1016.00	7-8
0.0590	1.4986	40	1016.00	7-8
0.0604	1.5342	22	558.80	7-8
0.0613	1.5570	44	1117.60	7-8
0.0652	1.6561	44	1117.60	7-8
0.0674	1.7120	42	1066.88	7-8
0.0701	1.7805	8	203.20	7-8
0.0733	1.8618	8	203.20	7-8
0.0763	1.9380	8	203.20	7-8
0.0792	2.0117	8	203.20	7-8
0.0813	2.0650	8	203.20	7-8
0.0829	2.1057	44	1117.60	8-10
0.0842	2.1386	11	279.40	8-10
0.0850	2.1590	44	1117.60	8-10
0.0863	2.1920	8	203.20	8-10
0.0871	2.2123	8	203.20	8-10
0.0880	2.2352	40	1016.00	8-10
0.0882	2.2403	43	1092.20	8-10
0.0895	2.2733	44	1117.60	8-10
0.0900	2.2860	44	1117.60	8-10
0.0925	2.3495	8	203.20	8-10
0.0932	2.3673	8	203.20	8-10
0.0942	2.3926	8	203.20	8-10
0.0957	2.4308	42	1066.80	8-10

The dimensions given apply to Pyrex Brand, Duran or KG-33 glass. For other types of glass, our tolerances will remain the same but the dimensions will vary slightly. We have listed our most popular sizes, additional sizes available upon request.

PRECISION BORE PYREX TUBING

Wilmad Precision Bore Tubing can be manufactured in any type or brand of glass sold commercially. In this section, the I.D. listed are for Pyrex Brand, Duran or KG-33 glasses. Lengths listed are the maximum available from current in-house tooling and mandrels. If you require an I.D. or length not listed, contact us by phone, email or FAX, to detail your specific requirements.

PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.0140	36	0.3556	914.40
0.0146	36	0.3708	914.40
0.0148	36	0.3759	914.40
0.0150	36	0.3810	914.40
0.0161	36	0.4089	914.40
0.0168	36	0.4267	914.40
0.0178	36	0.4521	914.40
0.0180	36	0.4572	914.40
0.0190	36	0.4826	914.40
0.0202	36	0.5131	914.40
0.0211	36	0.5359	914.40
0.0220	36	0.5588	914.40
0.0227	36	0.5766	914.40
0.0230	36	0.5842	914.40
0.0240	36	0.6096	914.40
0.0252	36	0.6401	914.40
0.0260	36	0.6604	914.40
0.0270	36	0.6858	914.40
0.0282	36	0.7163	914.40
0.0290	36	0.7366	914.40
0.0302	36	0.7671	914.40
0.0312	44	0.7925	1117.60
0.0320	44	0.8128	1117.60
0.0340	44	0.8636	1117.60
0.0342	44	0.8687	1117.60
0.0348	44	0.8839	1117.60
0.0351	22	0.8915	558.80
0.0360	44	0.9144	1117.60
0.0370	36	0.9398	914.40
0.0380	44	0.9652	1117.60
0.0390	36	0.9906	914.40
0.0391	44	0.9931	1117.60
0.0398	44	1.0109	1117.60
0.0400	36	1.0160	914.40
0.0401	21	1.0185	533.40
0.0407	44	1.0338	1117.60
0.0410	36	1.0414	914.40
0.0413	44	1.0490	1117.60
0.0420	40	1.0668	1016.00
0.0430	40	1.0922	1016.00
0.0438	44	1.1125	1117.60
0.0441	44	1.1201	1117.60
0.0444	42	1.1278	1066.80
0.0450	40	1.1430	1016.00
0.0452	44	1.1481	1117.60
0.0459	44	1.1659	1117.60
0.0460	40	1.1684	1016.00
0.0470	40	1.1938	1016.00
0.0484	44	1.2294	1117.60
0.0488	44	1.2395	1117.60
0.0492	44	1.2497	1117.60
0.0497	22	1.2624	558.80
0.0499	44	1.2675	1117.60
0.0500	40	1.2700	1016.00
0.0512	39	1.3005	990.60
0.0513	44	1.3030	1117.60

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.0516	43	1.3106	1092.20
0.0518	44	1.3157	1117.60
0.0520	40	1.3208	1016.00
0.0522	12	1.3259	304.80
0.0523	44	1.3284	1117.60
0.0524	43	1.3310	1092.20
0.0530	44	1.3462	1117.60
0.0536	44	1.3614	1117.60
0.0543	52	1.3792	1320.80
0.0544	44	1.3818	1117.60
0.0551	44	1.3995	1117.60
0.0553	41	1.4046	1041.40
0.0563	43	1.4300	1092.20
0.0575	44	1.4605	1117.60
0.0580	40	1.4732	1016.00
0.0590	40	1.4986	1016.00
0.0593	19	1.5062	482.60
0.0603	44	1.5316	1117.60
0.0604	22	1.5342	558.80
0.0613	44	1.5570	1117.60
0.0652	44	1.6561	1117.60
0.0670	40	1.7018	1016.00
0.0672	10	1.7069	254.00
0.0674	42	1.7120	1066.80
0.0701	8	1.7805	203.20
0.0709	44	1.8009	1117.60
0.0711	21	1.8059	533.40
0.0713	44	1.8110	1117.60
0.0722	44	1.8339	1117.60
0.0725	44	1.8415	1117.60
0.0733	8	1.8618	203.20
0.0736	45	1.8694	1143.00
0.0752	44	1.9101	1117.60
0.0759	44	1.9279	1117.60
0.0763	8	1.9380	203.20
0.0767	9	1.9482	228.60
0.0769	42	1.9533	1066.80
0.0770	10	1.9558	254.00
0.0782	8	1.9863	203.20
0.0791	8	2.0091	203.20
0.0792	8	2.0117	203.20
0.0802	8	2.0371	203.20
0.0807	43	2.0498	1092.20
0.0809	42	2.0549	1066.80
0.0813	8	2.0650	203.20
0.0822	42	2.0879	1066.80
0.0829	44	2.1057	1117.60
0.0834	8	2.1184	203.20
0.0842	11	2.1387	279.40
0.0850	44	2.1590	1117.60
0.0860	40	2.1844	1016.00
0.0863	8	2.1920	203.20
0.0871	8	2.2123	203.20
0.0880	40	2.2352	1016.00
0.0882	43	2.2403	1092.20
0.0884	21	2.2454	533.40

The dimensions above are for Pyrex Brand, Duran, or KG-33 glasses.

PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.0889	42	2.2581	1066.80
0.0895	44	2.2733	1117.60
0.0900	44	2.2860	1117.60
0.0903	19	2.2936	482.60
0.0904	17	2.2962	431.80
0.0907	19	2.3038	482.60
0.0909	25	2.3089	635.00
0.0910	43	2.3114	1092.20
0.0925	8	2.3495	203.20
0.0932	8	2.3673	203.20
0.0937	40	2.3800	1016.00
0.0942	8	2.3927	203.20
0.0957	42	2.4308	1066.80
0.0972	8	2.4689	203.20
0.0990	52	2.5146	1320.80
0.1003	42	2.5476	1066.80
0.1023	42	2.5984	1066.80
0.1033	52	2.6238	1320.80
0.1042	44	2.6467	1117.60
0.1052	44	2.6721	1117.60
0.1058	8	2.6873	203.20
0.1073	20	2.7254	508.00
0.1079	8	2.7407	203.20
0.1088	20	2.7635	508.00
0.1094	43	2.7788	1092.20
0.1108	8	2.8143	203.20
0.1110	44	2.8194	1117.60
0.1125	7	2.8575	177.80
0.1129	8	2.8677	203.20
0.1131	8	2.8727	203.20
0.1148	13	2.9159	330.20
0.1155	12	2.9337	304.80
0.1166	19	2.9616	482.60
0.1173	44	2.9794	1117.60
0.1183	13	3.0048	330.20
0.1190	43	3.0226	1092.20
0.1193	8	3.0302	203.20
0.1203	42	3.0556	1066.80
0.1213	38	3.0810	965.20
0.1247	13	3.1674	330.20
0.1248	43	3.1699	1092.20
0.1249	43	3.1725	1092.20
0.1264	43	3.2106	1092.20
0.1277	44	3.2436	1117.60
0.1281	17	3.2537	431.80
0.1282	12	3.2563	304.80
0.1285	19	3.2639	482.60
0.1294	31	3.2868	787.40
0.1297	20	3.2944	508.00
0.1300	12	3.3020	304.80
0.1308	8	3.3223	203.20
0.1313	19	3.3350	482.60
0.1326	19	3.3680	482.60
0.1336	44	3.3934	1117.60
0.1341	42	3.4061	1066.80
0.1351	44	3.4315	1117.60

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.1359	42	3.4519	1066.80
0.1370	20	3.4798	508.00
0.1371	44	3.4823	1117.60
0.1376	44	3.4950	1117.60
0.1377	12	3.4976	304.80
0.1386	44	3.5204	1117.60
0.1392	19	3.5357	482.60
0.1398	45	3.5509	1143.00
0.1402	43	3.5611	1092.20
0.1405	43	3.5687	1092.20
0.1412	44	3.5865	1117.60
0.1417	34	3.5992	863.60
0.1425	18	3.6195	457.20
0.1430	12	3.6322	304.80
0.1439	25	3.6551	635.00
0.1447	12	3.6754	304.80
0.1462	18	3.7135	457.20
0.1463	12	3.7160	304.80
0.1476	12	3.7490	304.80
0.1479	18	3.7567	457.20
0.1487	22	3.7770	558.80
0.1507	44	3.8278	1117.60
0.1516	13	3.8506	330.20
0.1525	10	3.8735	254.00
0.1529	13	3.8837	330.20
0.1553	19	3.9446	482.60
0.1562	36	3.9675	914.40
0.1563	11	3.9700	279.40
0.1568	11	3.9827	279.40
0.1574	44	3.9980	1117.60
0.1580	40	4.0132	1016.00
0.1593	19	4.0462	482.60
0.1601	17	4.0665	431.80
0.1606	23	4.0792	584.20
0.1613	23	4.0970	584.20
0.1621	42	4.1173	1066.80
0.1623	42	4.1224	1066.80
0.1625	9	4.1275	228.60
0.1630	43	4.1402	1092.20
0.1632	18	4.1453	457.20
0.1643	15	4.1732	381.00
0.1647	19	4.1834	482.60
0.1649	12	4.1885	304.80
0.1652	12	4.1961	304.80
0.1655	9	4.2037	228.60
0.1656	52	4.2062	1320.80
0.1658	12	4.2113	304.80
0.1661	19	4.2189	482.60
0.1672	34	4.2469	863.60
0.1681	43	4.2697	1092.20
0.1693	44	4.3002	1117.60
0.1706	12	4.3332	304.80
0.1708	13	4.3383	330.20
0.1717	18	4.3612	457.20
0.1721	19	4.3713	482.60
0.1725	19	4.3815	482.60

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PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.1731	19	4.3967	482.60
0.1737	34	4.4120	863.60
0.1741	19	4.4221	482.60
0.1746	19	4.4348	482.60
0.1762	13	4.4755	330.20
0.1765	34	4.4831	863.60
0.1771	44	4.4983	1117.60
0.1776	12	4.5110	304.80
0.1778	16	4.5161	406.40
0.1781	19	4.5237	482.60
0.1787	24	4.5390	609.60
0.1788	12	4.5415	304.80
0.1792	16	4.5517	406.40
0.1795	16	4.5593	406.40
0.1797	34	4.5644	863.60
0.1798	44	4.5669	1117.60
0.1807	18	4.5898	457.20
0.1809	20	4.5949	508.00
0.1811	16	4.5999	406.40
0.1812	10	4.6025	254.00
0.1814	19	4.6076	482.60
0.1818	15	4.6177	381.00
0.1827	11	4.6406	279.40
0.1829	11	4.6457	279.40
0.1838	8	4.6685	203.20
0.1843	19	4.6812	482.60
0.1847	11	4.6914	279.40
0.1849	19	4.6965	482.60
0.1856	13	4.7142	330.20
0.1871	43	4.7523	1092.20
0.1872	22	4.7549	558.80
0.1881	16	4.7777	406.40
0.1888	43	4.7955	1092.20
0.1891	14	4.8031	355.60
0.1893	43	4.8082	1092.20
0.1895	12	4.8133	304.80
0.1897	13	4.8184	330.20
0.1900	13	4.8260	330.20
0.1905	20	4.8387	508.00
0.1913	19	4.8590	482.60
0.1921	19	4.8793	482.60
0.1925	19	4.8895	482.60
0.1930	19	4.9022	482.60
0.1939	13	4.9251	330.20
0.1941	9	4.9301	228.60
0.1955	34	4.9657	863.60
0.1958	13	4.9733	330.20
0.1969	43	5.0013	1092.20
0.1976	34	5.0190	863.60
0.1983	34	5.0368	863.60
0.1987	20	5.0470	508.00
0.2003	36	5.0876	914.40
0.2008	12	5.1003	304.80
0.2015	13	5.1181	330.20
0.2026	39	5.1460	990.60
0.2028	18	5.1511	457.20

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.2043	20	5.1892	508.00
0.2045	12	5.1943	304.80
0.2047	18	5.1994	457.20
0.2050	18	5.2070	457.20
0.2052	34	5.2121	863.60
0.2054	18	5.2172	457.20
0.2059	34	5.2299	863.60
0.2063	12	5.2400	304.80
0.2069	12	5.2553	304.80
0.2074	36	5.2680	914.40
0.2076	13	5.2730	330.20
0.2091	14	5.3111	355.60
0.2098	19	5.3289	482.60
0.2099	19	5.3315	482.60
0.2100	19	5.3340	482.60
0.2111	34	5.3619	863.60
0.2114	12	5.3696	304.80
0.2119	12	5.3823	304.80
0.2129	13	5.4077	330.20
0.2131	13	5.4127	330.20
0.2134	12	5.4204	304.80
0.2136	39	5.4254	990.60
0.2142	13	5.4407	330.20
0.2149	36	5.4585	914.40
0.2154	12	5.4712	304.80
0.2165	10	5.4991	254.00
0.2171	13	5.5143	330.20
0.2175	12	5.5245	304.80
0.2179	10	5.5347	254.00
0.2195	28	5.5753	711.20
0.2197	10	5.5804	254.00
0.2199	29	5.5855	736.60
0.2201	18	5.5905	457.20
0.2205	19	5.6007	482.60
0.2207	38	5.6058	965.20
0.2213	12	5.6210	304.80
0.2217	9	5.6312	228.60
0.2226	42	5.6540	1066.80
0.2232	18	5.6693	457.20
0.2245	19	5.7023	482.60
0.2253	12	5.7226	304.80
0.2281	19	5.7937	482.60
0.2292	44	5.8217	1117.60
0.2297	15	5.8344	381.00
0.2298	36	5.8369	914.40
0.2304	14	5.8522	355.60
0.2320	34	5.8928	863.60
0.2336	14	5.9334	355.60
0.2341	11	5.9461	279.40
0.2343	52	5.9512	1320.80
0.2347	12	5.9614	304.80
0.2360	36	5.9944	914.40
0.2361	52	5.9969	1320.80
0.2369	18	6.0173	457.20
0.2375	42	6.0325	1066.80
0.2385	19	6.0579	482.60

The dimensions above are for Pyrex Brand, Duran, or KG-33 glasses.

PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.2398	18	6.0909	457.20
0.2415	18	6.1341	457.20
0.2426	14	6.1620	355.60
0.2433	18	6.1798	457.20
0.2436	43	6.1874	1092.20
0.2454	13	6.2332	330.20
0.2459	12	6.2459	304.80
0.2471	13	6.2763	330.20
0.2486	12	6.3144	304.80
0.2488	36	6.3195	914.40
0.2490	28	6.3246	711.20
0.2493	15	6.3322	381.00
0.2494	36	6.3348	914.40
0.2496	19	6.3398	482.60
0.2497	19	6.3424	482.60
0.2498	14	6.3449	355.60
0.2499	10	6.3475	254.00
0.2501	19	6.3525	482.60
0.2503	14	6.3576	355.60
0.2509	20	6.3729	508.00
0.2512	20	6.3805	508.00
0.2516	34	6.3906	863.60
0.2520	12	6.4008	304.80
0.2534	19	6.4364	482.60
0.2542	19	6.4567	482.60
0.2550	20	6.4770	508.00
0.2552	19	6.4821	482.60
0.2556	18	6.4922	457.20
0.2559	43	6.4999	1092.20
0.2565	12	6.5151	304.80
0.2570	19	6.5278	482.60
0.2573	19	6.5354	482.60
0.2589	20	6.5761	508.00
0.2599	43	6.6015	1092.20
0.2605	19	6.6167	482.60
0.2612	21	6.6345	533.40
0.2623	14	6.6624	355.60
0.2640	18	6.7056	457.20
0.2660	12	6.7564	304.80
0.2674	18	6.7920	457.20
0.2680	18	6.8072	457.20
0.2708	13	6.8783	330.20
0.2711	13	6.8859	330.20
0.2724	14	6.9190	355.60
0.2739	43	6.9571	1092.20
0.2750	43	6.9850	1092.20
0.2756	44	7.0002	1117.60
0.2757	14	7.0028	355.60
0.2760	19	7.0104	482.60
0.2767	43	7.0282	1092.20
0.2801	13	7.1145	330.20
0.2805	13	7.1247	330.20
0.2848	19	7.2339	482.60
0.2850	12	7.2390	304.80
0.2858	44	7.2593	1117.60
0.2859	34	7.2619	863.60

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.2862	28	7.2695	711.20
0.2863	13	7.2720	330.20
0.2870	42	7.2898	1066.80
0.2876	17	7.3050	431.80
0.2893	12	7.3482	304.80
0.2908	13	7.3863	330.20
0.2911	18	7.3939	457.20
0.2927	34	7.4346	863.60
0.2950	44	7.4930	1117.60
0.2986	36	7.5844	914.40
0.3024	32	7.6810	812.80
0.3040	19	7.7216	482.60
0.3069	24	7.7953	609.60
0.3082	19	7.8283	482.60
0.3102	42	7.8791	1066.80
0.3111	13	7.9019	330.20
0.3117	18	7.9172	457.20
0.3126	44	7.9400	1117.60
0.3143	19	7.9832	482.60
0.3148	44	7.9959	1117.60
0.3149	34	7.9985	863.60
0.3150	43	8.0010	1092.20
0.3166	18	8.0416	457.20
0.3168	31	8.0467	787.40
0.3187	12	8.0950	304.80
0.3234	12	8.2144	304.80
0.3239	12	8.2271	304.80
0.3255	20	8.2677	508.00
0.3271	13	8.3083	330.20
0.3274	18	8.3160	457.20
0.3310	23	8.4074	584.20
0.3312	24	8.4125	609.60
0.3314	12	8.4176	304.80
0.3315	19	8.4201	482.60
0.3410	12	8.6614	304.80
0.3434	19	8.7224	482.60
0.3450	21	8.7630	533.40
0.3466	21	8.8036	533.40
0.3476	18	8.8290	457.20
0.3482	44	8.8443	1117.60
0.3487	15	8.8570	381.00
0.3506	12	8.9052	304.80
0.3510	20	8.9154	508.00
0.3517	19	8.9332	482.60
0.3527	19	8.9586	482.60
0.3534	20	8.9764	508.00
0.3541	30	8.9941	762.00
0.3542	44	8.9967	1117.60
0.3553	31	9.0246	787.40
0.3557	42	9.0348	1066.80
0.3565	38	9.0551	965.20
0.3570	38	9.0678	965.20
0.3591	19	9.1211	482.60
0.3600	44	9.1440	1117.60
0.3636	44	9.2354	1117.60
0.3660	44	9.2964	1117.60

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PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.3674	26	9.3320	660.40
0.3675	18	9.3345	457.20
0.3688	19	9.3675	482.60
0.3699	19	9.3955	482.60
0.3722	9	9.4539	228.60
0.3747	37	9.5174	939.80
0.3751	52	9.5275	1320.80
0.3756	43	9.5402	1092.20
0.3810	52	9.6774	1320.80
0.3819	28	9.7003	711.20
0.3881	43	9.8577	1092.20
0.3892	19	9.8857	482.60
0.3904	19	9.9162	482.60
0.3906	44	9.9212	1117.60
0.3909	16	9.9289	406.40
0.3914	20	9.9416	508.00
0.3934	40	9.9924	1016.00
0.3935	44	9.9949	1117.60
0.3937	43	10.0000	1092.20
0.3954	18	10.0432	457.20
0.3965	24	10.0711	609.60
0.3967	18	10.0762	457.20
0.4000	13	10.1600	330.20
0.4002	33	10.1651	838.20
0.4004	25	10.1702	635.00
0.4022	26	10.2159	660.40
0.4027	44	10.2286	1117.60
0.4086	25	10.3784	635.00
0.4091	18	10.3911	457.20
0.4093	24	10.3962	609.60
0.4094	18	10.3988	457.20
0.4096	18	10.4038	457.20
0.4097	18	10.4064	457.20
0.4182	10	10.6223	254.00
0.4201	12	10.6705	304.80
0.4212	40	10.6985	1016.00
0.4218	12	10.7137	304.80
0.4223	18	10.7264	457.20
0.4232	11	10.7493	279.40
0.4249	30	10.7925	762.00
0.4305	42	10.9347	1066.80
0.4321	42	10.9753	1066.80
0.4322	18	10.9779	457.20
0.4323	18	10.9804	457.20
0.4325	21	10.9855	533.40
0.4328	18	10.9931	457.20
0.4329	43	10.9957	1092.20
0.4336	18	11.0134	457.20
0.4341	17	11.0261	431.80
0.4342	17	11.0287	431.80
0.4343	17	11.0312	431.80
0.4345	17	11.0363	431.80
0.4349	18	11.0465	457.20
0.4350	18	11.0490	457.20
0.4353	12	11.0566	304.80
0.4370	19	11.0998	482.60

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.4388	43	11.1455	1092.20
0.4391	19	11.1531	482.60
0.4394	18	11.1608	457.20
0.4400	18	11.1760	457.20
0.4416	18	11.2166	457.20
0.4427	18	11.2446	457.20
0.4444	43	11.2878	1092.20
0.4458	19	11.3233	482.60
0.4501	18	11.4325	457.20
0.4519	20	11.4783	508.00
0.4522	39	11.4859	990.60
0.4539	21	11.5291	533.40
0.4547	52	11.5494	1320.80
0.4552	29	11.5621	736.60
0.4565	33	11.5951	838.20
0.4595	19	11.6713	482.60
0.4603	18	11.6916	457.20
0.4606	18	11.6992	457.20
0.4642	19	11.7907	482.60
0.4659	43	11.8339	1092.20
0.4725	43	12.0015	1092.20
0.4744	18	12.0498	457.20
0.4746	18	12.0548	457.20
0.4768	18	12.1107	457.20
0.4815	17	12.2301	431.80
0.4823	18	12.2504	457.20
0.4841	18	12.2961	457.20
0.4852	17	12.3241	431.80
0.4855	18	12.3317	457.20
0.4894	19	12.4308	482.60
0.4958	14	12.5933	355.60
0.4972	32	12.6289	812.80
0.5001	18	12.7025	457.20
0.5004	18	12.7102	457.20
0.5010	18	12.7254	457.20
0.5025	18	12.7635	457.20
0.5033	17	12.7838	431.80
0.5034	17	12.7864	431.80
0.5042	41	12.8067	1041.40
0.5117	17	12.9972	431.80
0.5123	42	13.0124	1066.80
0.5144	17	13.0658	431.80
0.5165	42	13.1191	1066.80
0.5170	19	13.1318	482.60
0.5207	36	13.2258	914.40
0.5242	42	13.3147	1066.80
0.5278	18	13.4061	457.20
0.5281	41	13.4137	1041.40
0.5298	18	13.4569	457.20
0.5306	33	13.4772	838.20
0.5315	41	13.5001	1041.40
0.5353	17	13.5966	431.80
0.5394	28	13.7008	711.20
0.5453	41	13.8506	1041.40
0.5507	19	13.9878	482.60
0.5509	43	13.9929	1092.20

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PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.5561	18	14.1249	457.20
0.5566	21	14.1376	533.40
0.5621	41	14.2773	1041.40
0.5706	43	14.4932	1092.20
0.5746	23	14.5948	584.20
0.5748	19	14.5999	482.60
0.5757	18	14.6228	457.20
0.5765	23	14.6431	584.20
0.5783	17	14.6888	431.80
0.5788	18	14.7015	457.20
0.5792	17	14.7117	431.80
0.5800	18	14.7320	457.20
0.5829	23	14.8057	584.20
0.5854	18	14.8692	457.20
0.5903	18	14.9936	457.20
0.5912	21	15.0165	533.40
0.5936	28	15.0774	711.20
0.6097	21	15.4864	533.40
0.6114	43	15.5296	1092.20
0.6119	17	15.5423	431.80
0.6136	18	15.5854	457.20
0.6145	39	15.6083	990.60
0.6158	17	15.6413	431.80
0.6191	39	15.7251	990.60
0.6192	18	15.7277	457.20
0.6234	18	15.8344	457.20
0.6248	43	15.8801	1092.20
0.6252	27	15.8699	685.80
0.6261	18	15.9029	457.20
0.6270	42	15.9258	1066.80
0.6273	17	15.9334	431.80
0.6284	16	15.9614	406.40
0.6371	17	16.1823	431.80
0.6378	17	16.2001	431.80
0.6400	24	16.2560	609.60
0.6410	42	16.2814	1066.80
0.6433	43	16.3398	1092.20
0.6562	28	16.6675	711.20
0.6565	11	16.6751	279.40
0.6626	12	16.8300	304.80
0.6688	18	16.9875	457.20
0.6704	18	17.0282	457.20
0.6718	17	17.0637	431.80
0.6797	42	17.2644	1066.80
0.6813	17	17.3050	431.80
0.6819	17	17.3203	431.80
0.6829	18	17.3457	457.20
0.6874	31	17.4600	787.40
0.6875	35	17.4625	889.00
0.6888	19	17.4955	482.60
0.6889	41	17.4981	1041.40
0.6890	18	17.5006	457.20
0.7078	18	17.9781	457.20
0.7109	17	18.0569	431.80
0.7116	17	18.0746	431.80
0.7154	42	18.1712	1066.80

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.7199	18	18.2855	457.20
0.7220	18	18.3388	457.20
0.7251	18	18.4175	457.20
0.7415	18	18.8341	457.20
0.7442	33	18.9027	838.20
0.7445	17	18.9103	431.80
0.7488	43	19.0195	1092.20
0.7490	19	19.0246	482.60
0.7500	34	19.0500	863.60
0.7533	18	19.1338	457.20
0.7544	17	19.1618	431.80
0.7591	17	19.2811	431.80
0.7645	17	19.4183	431.80
0.7703	16	19.5656	406.40
0.7712	26	19.5885	660.40
0.7715	18	19.5961	457.20
0.7720	16	19.6088	406.40
0.7725	22	19.6215	558.80
0.7740	16	19.6596	406.40
0.7742	19	19.6647	482.60
0.7755	36	19.6977	914.40
0.7782	29	19.7663	736.60
0.7874	41	20.0000	1041.40
0.7875	19	20.0025	482.60
0.7890	25	20.0406	635.00
0.8044	17	20.4318	431.80
0.8090	23	20.5486	584.20
0.8110	23	20.5994	584.20
0.8120	49	20.6248	1244.60
0.8133	17	20.6578	431.80
0.8143	18	20.6832	457.20
0.8150	23	20.7010	584.20
0.8201	17	20.8305	431.80
0.8218	35	20.8737	889.00
0.8245	23	20.9423	584.20
0.8249	19	20.9525	482.60
0.8266	17	20.9956	431.80
0.8279	33	21.0287	838.20
0.8282	19	21.0363	482.60
0.8290	18	21.0566	457.20
0.8302	21	21.0871	533.40
0.8393	15	21.3182	381.00
0.8405	17	21.3487	431.80
0.8436	15	21.4274	381.00
0.8440	15	21.4376	381.00
0.8463	18	21.4960	457.20
0.8468	18	21.5087	457.20
0.8470	18	21.5138	457.20
0.8496	23	21.5798	584.20
0.8541	17	21.6941	431.80
0.8590	33	21.8186	838.20
0.8643	15	21.9532	381.00
0.8650	42	21.9710	1066.80
0.8703	18	22.1056	457.20
0.8741	42	22.2021	1066.80
0.8745	17	22.2123	431.80

If you require an I.D. or length not listed, please contact us detailing your specific requirements.

PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
0.8750	17	22.2250	431.80
0.8760	32	22.2504	812.80
0.8775	20	22.2885	508.00
0.8905	11	22.6187	279.40
0.8940	19	22.7076	482.60
0.8948	23	22.7279	584.20
0.8980	17	22.8092	431.80
0.9030	31	22.9362	787.40
0.9054	17	22.9972	431.80
0.9058	18	23.0073	457.20
0.9061	43	23.0149	1092.20
0.9090	20	23.0886	508.00
0.9105	17	23.1267	431.80
0.9183	18	23.3248	457.20
0.9208	20	23.3883	508.00
0.9226	20	23.4340	508.00
0.9245	10	23.4823	254.00
0.9269	18	23.5433	457.20
0.9331	19	23.7007	482.60
0.9470	23	24.0538	584.20
0.9528	20	24.2011	508.00
0.9683	40	24.5948	1016.00
0.9702	18	24.6431	457.20
0.9731	19	24.7167	482.60
0.9745	10	24.7523	254.00
0.9822	11	24.9479	279.40
0.9845	42	25.0063	1066.80
0.9856	23	25.0342	584.20
0.9940	42	25.2476	1066.80
0.9943	36	25.2552	914.40
0.9994	37	25.3848	939.80
1.0000	42	25.4000	1066.80
1.0002	17	25.4051	431.80
1.0015	18	25.4381	457.20
1.0027	10	25.4686	254.00
1.0034	14	25.4864	355.60
1.0060	17	25.5524	431.80
1.0100	42	25.6540	1066.80
1.0110	28	25.6794	711.20
1.0125	17	25.7175	431.80
1.0135	14	25.7429	355.60
1.0150	18	25.7810	457.20
1.0160	18	25.8064	457.20
1.0197	18	25.9004	457.20
1.0205	17	25.9207	431.80
1.0230	17	25.9842	431.80
1.0231	10	25.9867	254.00
1.0233	19	25.9918	482.60
1.0236	21	25.9994	533.40
1.0237	13	26.0020	330.20
1.0310	18	26.1874	457.20
1.0320	21	26.2128	533.40
1.0325	21	26.2255	533.40
1.0328	21	26.2331	533.40
1.0330	14	26.2382	355.60
1.0390	42	26.3906	1066.80

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
1.0465	17	26.5811	431.80
1.0478	17	26.6141	431.80
1.0500	15	26.6700	381.00
1.0530	17	26.7462	431.80
1.0610	11	26.9494	279.40
1.0618	23	26.9697	584.20
1.0620	42	26.9748	1066.80
1.0650	17	27.0510	431.80
1.0670	22	27.1018	558.80
1.0710	17	27.2034	431.80
1.0780	11	27.3812	279.40
1.0814	11	27.4676	279.40
1.0920	17	27.7368	431.80
1.1000	14	27.9400	355.60
1.1020	17	27.9908	431.80
1.1040	17	28.0416	431.80
1.1050	11	28.0670	279.40
1.1060	22	28.0924	558.80
1.1081	17	28.1457	431.80
1.1140	17	28.2956	431.80
1.1170	17	28.3718	431.80
1.1205	17	28.4607	431.80
1.1220	29	28.4988	736.60
1.1240	34	28.5496	863.60
1.1250	17	28.5750	431.80
1.1265	17	28.6131	431.80
1.1270	36	28.6258	914.40
1.1336	38	28.7934	965.20
1.1360	17	28.8544	431.80
1.1400	10	28.9560	254.00
1.1415	17	28.9941	431.80
1.1450	17	29.0830	431.80
1.1475	17	29.1465	431.80
1.1500	17	29.2100	431.80
1.1515	17	29.2481	431.80
1.1565	17	29.3751	431.80
1.1810	12	29.9974	304.80
1.1830	18	30.0482	457.20
1.1850	18	30.0990	457.20
1.1860	11	30.1244	279.40
1.1870	37	30.1498	939.80
1.1889	17	30.1981	431.80
1.2000	11	30.4800	279.40
1.2040	12	30.5816	304.80
1.2041	17	30.5841	431.80
1.2050	17	30.6070	431.80
1.2070	12	30.6578	304.80
1.2075	12	30.6705	304.80
1.2088	22	30.7035	558.80
1.2095	17	30.7213	431.80
1.2097	17	30.7264	431.80
1.2287	32	31.2090	812.80
1.2318	15	31.2877	381.00
1.2325	15	31.3055	381.00
1.2335	17	31.3309	431.80
1.2410	17	31.5214	431.80

The dimensions above are for Pyrex Brand, Duran, or KG-33 glasses.

PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
1.2440	22	31.5976	558.80
1.2450	17	31.6230	431.80
1.2490	17	31.7246	431.80
1.2495	34	31.7373	863.60
1.2500	22	31.7500	558.80
1.2505	8	31.7627	203.20
1.2525	17	31.8135	431.80
1.2630	17	32.0802	431.80
1.2710	18	32.2834	457.20
1.2835	17	32.6009	431.80
1.2854	14	32.6492	355.60
1.2900	16	32.7660	406.40
1.3015	17	33.0581	431.80
1.3021	19	33.0733	482.60
1.3072	19	33.2029	482.60
1.3123	19	33.3324	482.60
1.3130	13	33.3502	330.20
1.3158	17	33.4213	431.80
1.3182	18	33.4823	457.20
1.3352	42	33.9141	1066.80
1.3430	17	34.1122	431.80
1.3465	12	34.2011	304.80
1.3490	19	34.2646	482.60
1.3590	11	34.5186	279.40
1.3659	18	34.6939	457.20
1.3700	12	34.7980	304.80
1.3750	36	34.9250	914.40
1.3760	17	34.9504	431.80
1.3770	10	34.9758	254.00
1.3780	17	35.0012	431.80
1.3830	38	35.1282	965.20
1.3845	9	35.1663	228.60
1.3930	17	35.3822	431.80
1.3970	17	35.4838	431.80
1.3985	17	35.5219	431.80
1.4035	17	35.6489	431.80
1.4055	40	35.6997	1016.00
1.4195	12	36.0553	304.80
1.4200	42	36.0680	1066.80
1.4270	17	36.2458	431.80
1.4480	18	36.7792	457.20
1.4685	18	37.2999	457.20
1.4692	39	37.3177	990.60
1.4825	13	37.6555	330.20
1.4840	17	37.6936	431.80
1.4970	23	38.0238	584.20
1.5000	17	38.1000	431.80
1.5005	42	38.1127	1066.80
1.5030	17	38.1762	431.80
1.5055	14	38.2397	355.60
1.5056	14	38.2422	355.60
1.5235	17	38.6969	431.80
1.5240	12	38.7096	304.80
1.5270	18	38.7858	457.20
1.5290	17	38.8366	431.80
1.5520	9	39.4208	228.60

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
1.5639	18	39.7231	457.20
1.5740	44	39.9796	1117.60
1.5770	17	40.0558	431.80
1.5795	17	40.1193	431.80
1.5935	38	40.4749	965.20
1.5985	14	40.6019	355.60
1.6035	17	40.7289	431.80
1.6135	18	40.9829	457.20
1.6185	17	41.1099	431.80
1.6279	45	41.3487	1143.00
1.6305	12	41.4147	304.80
1.6330	11	41.4782	279.40
1.6335	19	41.4909	482.60
1.6380	17	41.6052	431.80
1.6420	17	41.7068	431.80
1.6610	17	42.1894	431.80
1.6805	17	42.6847	431.80
1.7405	12	44.2087	304.80
1.7440	17	44.2976	431.80
1.7500	39	44.4500	990.60
1.7510	18	44.4754	457.20
1.7547	18	44.5694	457.20
1.7880	19	45.4152	482.60
1.7985	17	45.6819	431.80
1.8040	16	45.8216	406.40
1.8096	17	45.9638	431.80
1.8435	38	46.8249	965.20
1.8440	39	46.8376	990.60
1.8455	14	46.8757	355.60
1.8555	11	47.1297	279.40
1.8760	17	47.6504	431.80
1.8785	9	47.7139	228.60
1.8800	17	47.7520	431.80
1.8805	32	47.7647	812.80
1.8815	26	47.7901	660.40
1.8885	11	47.9679	279.40
1.9045	14	48.3743	355.60
1.9150	8	48.6410	203.20
1.9295	17	49.0093	431.80
1.9597	18	49.7764	457.20
1.9686	48	50.0024	1219.20
1.9706	14	50.0532	355.60
1.9880	18	50.4952	457.20
2.0000	43	50.8000	1092.20
2.0010	9	50.8254	228.60
2.0040	17	50.9016	431.80
2.0060	14	50.9524	355.60
2.0070	17	50.9778	431.80
2.0090	12	51.0286	304.80
2.0140	17	51.1556	431.80
2.0160	17	51.2064	431.80
2.0230	17	51.3842	431.80
2.0480	17	52.0192	431.80
2.0600	9	52.3240	228.60
2.0680	17	52.5272	431.80
2.0740	39	52.6796	990.60

If you require an I.D. or length not listed, please contact us detailing your specific requirements.

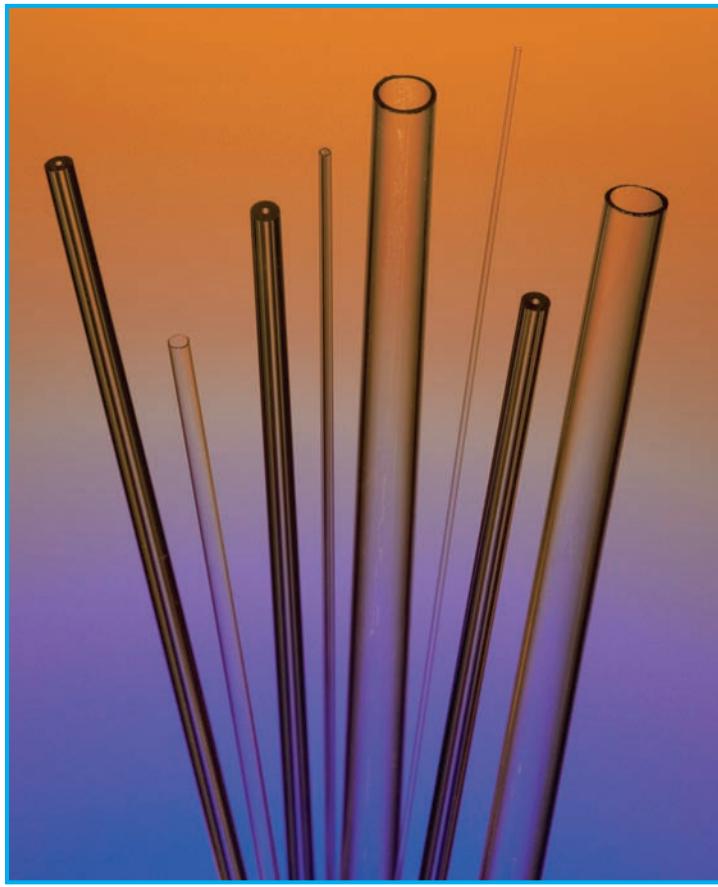
PRECISION BORE PYREX TUBING

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
2.1000	17	53.3400	431.80
2.1060	13	53.4924	330.20
2.1070	13	53.5178	330.20
2.1090	11	53.5686	279.40
2.1250	17	53.9750	431.80
2.1420	39	54.4068	990.60
2.1660	13	55.0164	330.20
2.1780	13	55.3212	330.20
2.2060	9	56.0324	228.60
2.2210	18	56.4134	457.20
2.2560	17	57.3024	431.80
2.2960	42	58.3184	1066.80
2.3120	17	58.7248	431.80
2.3200	9	58.9280	228.60
2.3360	17	59.3344	431.80
2.3850	11	60.5790	279.40
2.4100	17	61.2140	431.80
2.4280	17	61.6712	431.80
2.4770	17	62.9158	431.80
2.4780	17	62.9412	431.80
2.5000	18	63.5000	457.20
2.5740	10	65.3796	254.00
2.5920	17	65.8368	431.80
2.6240	29	66.6496	736.60
2.6680	17	67.7672	431.80
2.6880	17	68.2752	431.80
2.7000	32	68.5800	812.80
2.7060	17	68.7324	431.80
2.7420	17	69.6468	431.80
2.7500	17	69.8500	431.80
2.7910	13	70.8914	330.20
2.8090	17	71.3486	431.80
2.8800	17	73.1520	431.80
2.8990	17	73.6346	431.80
3.0000	37	76.2000	939.80
3.0230	17	76.7842	431.80
3.0410	9	77.2414	228.60
3.0770	13	78.1558	330.20
3.0880	13	78.4352	330.20
3.1040	44	78.8416	1117.60
3.1250	13	79.3750	330.20
3.1330	13	79.5782	330.20

INNER DIAMETER	LENGTH INCHES	INSIDE DIAM mm	LENGTH mm
3.1830	13	80.8482	330.20
3.2220	13	81.8388	330.20
3.2640	13	82.9056	330.20
3.2800	27	83.3120	685.80
3.3310	23	84.6074	584.20
3.3750	17	85.7250	431.80
3.5000	16	88.9000	406.40
3.5000	13	88.9000	330.20
3.5670	10	90.6018	254.00
3.6770	16	93.3958	406.40
3.7390	17	94.9706	431.80
3.7870	9	96.1898	228.60
3.8180	17	96.9772	431.80
3.8850	10	98.6790	254.00
3.9830	44	101.1682	1117.60
4.0000	26	101.6000	660.40
4.1050	17	104.2670	431.80
4.2480	9	107.8992	228.60
4.4000	15	111.7600	381.00
4.6090	12	117.0686	304.80
4.6800	13	118.8720	330.20
4.7580	9	120.8532	228.60
5.3420	22	135.6868	558.80
5.4640	14	138.7856	355.60
5.5360	11	140.6144	279.40
6.0000	21	152.4000	533.40
6.1830	16	157.0482	406.40
7.6290	8	193.7766	203.20

The dimensions above are for Pyrex Brand, Duran, or KG-33 glasses.

PRECISION BORE QUARTZ TUBING



Wilmad also produces ultra-precision, uniform bore tubing in quartz including natural and synthetic. In most cases, we can hold the same tolerances as we do for Pyrex, Duran or KG-33 glass, particularly for I.D.s less than 1". O.D.s can be ground concentrically or can be centerless ground and polished. We can hold the wall tolerance to $\pm 0.001"$ or less in most sizes listed here. Precision quartz tubing is also available in square and rectangular shapes, and square tubing is produced in sizes ranging from 3mm x 6" long up to 1 1/2" x 12" long as specified in Section 8 of this catalog. Many other sizes and shapes of quartz tubing are also manufactured. Please refer to Section 9 of this catalog for specifics.

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.0170	.4318	3.5	88.90
.0200	.5080	15	381.00
.0210	.5334	12	304.80
.0239	.6070	12	304.80
.0245	.6223	12	304.80
.0250	.6350	10	254.00
.0262	.6654	6	152.40
.0271	.6883	12	304.80
.0285	.7239	6	152.40
.0300	.7620	12	304.80
.0321	.8153	12	304.80
.0353	.8966	12	304.80
.0370	.9398	13	330.20
.0392	.9957	12	304.80
.0393	.9982	23	584.20
.0397	1.0084	28	711.20
.0401	1.0185	13	330.20
.0423	1.0744	18	457.20
.0450	1.1430	18	457.20
.0473	1.2014	13	330.20
.0500	1.2700	12	304.80
.0515	1.3081	12	304.80
.0555	1.4097	13	330.20
.0578	1.4681	13	330.20
.0583	1.4808	13	330.20
.0592	1.5036	36	914.40
.0611	1.5519	12	304.80
.0621	1.5773	21	533.40

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.0632	1.6052	12	304.80
.0643	1.6332	18	457.20
.0648	1.6459	12	304.80
.0653	1.6586	18	457.20
.0661	1.6789	10	254.00
.0671	1.7043	42	1066.80
.0689	1.7500	10	254.00
.0703	1.7856	21	533.40
.0710	1.8034	20	508.00
.0715	1.8161	23	584.20
.0720	1.8288	18	457.20
.0722	1.8338	10	254.00
.0730	1.8542	23	584.20
.0754	1.9151	21	533.40
.0786	1.9964	39	990.60
.0791	2.0091	18	457.20
.0823	2.0904	18	457.20
.0853	2.1666	9	228.60
.0859	2.1818	14	355.60
.0867	2.2021	38	965.20
.0876	2.2250	18	457.20
.0891	2.2631	20	508.00
.0903	2.2936	18	457.20
.0913	2.3190	18	457.20
.0924	2.3470	18	457.20
.0926	2.3520	12	304.80
.0934	2.3724	18	457.20
.0940	2.3876	18	457.20

PRECISION BORE QUARTZ TUBING

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.0944	2.3978	44	1117.60
.0956	2.4282	9	228.60
.0985	2.5019	33	838.20
.0988	2.5095	22	558.80
.1003	2.5476	18	457.20
.1041	2.6441	12	304.80
.1050	2.6670	12	304.80
.1073	2.7254	40	1016.00
.1100	2.7940	18	457.20
.1117	2.8372	19	482.60
.1123	2.8524	18	457.20
.1134	2.8804	18	457.20
.1148	2.9159	11	279.40
.1183	3.0048	39	990.60
.1198	3.0429	19	482.60
.1219	3.0963	12	304.80
.1243	3.1572	18	457.20
.1250	3.1750	12	304.80
.1263	3.2080	44	1117.60
.1280	3.2512	12	304.80
.1298	3.2969	18	457.20
.1319	3.3517	18	457.20
.1340	3.4036	18	457.20
.1351	3.4315	18	457.20
.1354	3.4391	13	330.20
.1384	3.5153	33	838.20
.1407	3.5737	13	330.20
.1476	3.7490	12	304.80
.1495	3.7973	18	457.20
.1519	3.8582	18	457.20
.1551	3.9395	13	330.20
.1570	3.9878	13	330.20
.1575	4.0005	39	990.60
.1601	4.0665	18	457.20
.1640	4.1681	12	304.80
.1657	4.2087	18	457.20
.1695	4.3053	12	304.80
.1700	4.3180	12	304.80
.1737	4.4120	20	508.00
.1768	4.4907	21	533.40
.1777	4.5136	46	1168.40
.1780	4.5212	28	711.20
.1795	4.5593	14	355.60
.1804	4.5822	18	457.20
.1810	4.5974	12	304.80
.1816	4.6126	18	457.20
.1876	4.7650	12	304.80
.1882	4.7803	13	330.20
.1886	4.7904	18	457.20
.1903	4.8336	20	508.00
.1941	4.9301	13	330.20
.1958	4.9733	18	457.20
.1965	4.9911	18	457.20
.1968	4.9987	42	1066.80

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.1976	5.0190	18	457.20
.1985	5.0419	46	1168.40
.2011	5.1079	20	508.00
.2030	5.1562	42	1066.80
.2032	5.1612	16	406.40
.2042	5.1867	18	457.20
.2059	5.2298	18	457.20
.2089	5.3061	12	304.80
.2100	5.3340	18	457.20
.2120	5.3848	20	508.00
.2141	5.4381	16	406.40
.2177	5.5296	18	457.20
.2190	5.5626	18	457.20
.2193	5.5702	40	1016.00
.2201	5.5905	18	457.20
.2206	5.6032	13	330.20
.2210	5.6134	18	457.20
.2248	5.7099	12	304.80
.2283	5.7988	40	1016.00
.2284	5.8014	18	457.20
.2301	5.8445	12	304.80
.2314	5.8776	45	1143.00
.2334	5.9284	20	508.00
.2358	5.9893	28	711.20
.2365	6.0071	44	1117.60
.2397	6.0883	18	457.20
.2400	6.0960	18	457.20
.2430	6.1722	11	279.40
.2451	6.2255	18	457.20
.2489	6.3221	18	457.20
.2500	6.3500	18	457.20
.2505	6.3627	18	457.20
.2510	6.3754	39	990.60
.2515	6.3881	11	279.40
.2525	6.4135	12	304.80
.2530	6.4262	45	1143.00
.2558	6.4973	10	254.00
.2561	6.5049	39	990.60
.2626	6.6700	18	457.20
.2703	6.8656	13	330.20
.2704	6.8682	46	1168.40
.2719	6.9063	12	304.80
.2723	6.9164	46	1168.40
.2758	7.0053	40	1016.00
.2774	7.0460	12	304.80
.2779	7.0586	15	381.00
.2784	7.0714	42	1066.80
.2801	7.1145	18	457.20
.2826	7.1780	8	203.20
.2842	7.2187	13	330.20
.2873	7.2974	18	457.20
.2900	7.3660	18	457.20
.2914	7.4016	18	457.20
.2941	7.4701	12	304.80

PRECISION BORE QUARTZ TUBING

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.2948	7.4879	18	457.20
.3044	7.7318	20	508.00
.3073	7.8054	12	304.80
.3132	7.9552	11	279.40
.3141	7.9781	7	177.80
.3148	7.9959	18	457.20
.3156	8.0162	40	1016.00
.3188	8.0975	10	254.00
.3212	8.1585	12	304.80
.3255	8.2677	12	304.80
.3301	8.3845	12	304.80
.3342	8.4887	18	457.20
.3353	8.5166	20	508.00
.3398	8.6309	18	457.20
.3410	8.6614	12	304.80
.3422	8.6918	45	1143.00
.3435	8.7249	18	457.20
.3453	8.7706	12	304.80
.3480	8.8392	18	457.20
.3544	9.0017	16	406.40
.3545	9.0043	18	457.20
.3568	9.0627	18	457.20
.3600	9.1440	12	304.80
.3664	9.3065	18	457.20
.3672	9.3267	18	457.20
.3677	9.3396	18	457.20
.3701	9.4005	20	508.00
.3703	9.4056	12	304.80
.3710	9.4234	18	457.20
.3753	9.5326	12	304.80
.3756	9.5402	21	533.40
.3799	9.6494	18	457.20
.3852	9.7840	17	431.80
.3934	9.9923	42	1066.80
.3958	10.0533	21	533.40
.3972	10.0889	18	457.20
.4034	10.2464	18	457.20
.4056	10.3022	18	457.20
.4090	10.3886	11	279.40
.4100	10.4140	18	457.20
.4151	10.5435	18	457.20
.4173	10.5994	18	457.20
.4191	10.6451	18	457.20
.4196	10.6578	18	457.20
.4210	10.6934	18	457.20
.4284	10.8814	18	457.20
.4300	10.9220	18	457.20
.4330	10.9982	42	1066.80
.4350	11.0490	18	457.20
.4424	11.2369	11	279.40
.4562	11.5874	20	508.00
.4596	11.6738	18	457.20
.4620	11.7348	11	279.40
.4650	11.8110	12	304.80

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.4663	11.8440	18	457.20
.4671	11.8643	12	304.80
.4724	11.9900	42	1066.80
.4752	12.0700	18	457.20
.4789	12.1641	11	279.40
.4831	12.2707	12	304.80
.4850	12.3190	8	203.20
.4926	12.5120	18	457.20
.4960	12.5984	11	279.40
.4964	12.6085	42	1066.80
.4985	12.6619	12	304.80
.4993	12.6822	11	279.40
.5001	12.7025	18	457.20
.5005	12.7127	18	457.20
.5020	12.7508	20	508.00
.5103	12.9616	11	279.40
.5119	13.0022	28	711.20
.5203	13.2156	18	457.20
.5220	13.2588	12	304.80
.5226	13.2740	12	304.80
.5250	13.3350	18	457.20
.5293	13.4442	11	279.40
.5302	13.4670	18	457.20
.5314	13.4975	12	304.80
.5434	13.8024	12	304.80
.5494	13.9548	44	1117.60
.5515	14.0081	42	1066.80
.5524	14.0310	12	304.80
.5526	14.0360	18	457.20
.5634	14.3104	10	254.00
.5701	14.4805	12	304.80
.5703	14.4856	18	457.20
.5761	14.6329	12	304.80
.5805	14.7447	12	304.80
.5841	14.8361	18	457.20
.5904	14.9962	18	457.20
.5940	15.0876	18	457.20
.5972	15.1689	19	482.60
.6000	15.2400	18	457.20
.6042	15.3466	12	304.80
.6053	15.3746	18	457.20
.6070	15.4178	18	457.20
.6097	15.4864	12	304.80
.6121	15.5473	21	533.40
.6143	15.6032	11	279.40
.6181	15.6997	18	457.20
.6224	15.8090	32	812.80
.6240	15.8496	17	431.80
.6259	15.8978	22	558.80
.6293	15.9842	18	457.20
.6301	16.0045	18	457.20
.6315	16.0401	18	457.20
.6378	16.2001	13	330.20
.6405	16.2687	12	304.80

PRECISION BORE QUARTZ TUBING

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
.6469	16.4312	18	457.20
.6540	16.6116	42	1066.80
.6558	16.6573	13	330.20
.6560	16.6624	19	482.60
.6625	16.8275	18	457.20
.6680	16.9672	18	457.20
.6692	16.9977	18	457.20
.6700	17.0180	18	457.20
.6708	17.0383	18	457.20
.6848	17.3939	14	355.60
.6902	17.5311	18	457.20
.6915	17.5641	18	457.20
.6975	17.7165	42	1066.80
.7086	17.9984	18	457.20
.7106	18.0492	42	1066.80
.7203	18.2956	22	558.80
.7205	18.3007	12	304.80
.7265	18.4531	18	457.20
.7272	18.4709	11	279.40
.7330	18.6182	11	279.40
.7454	18.9332	18	457.20
.7489	19.0220	20	508.00
.7500	19.0500	38	965.20
.7502	19.0551	18	457.20
.0751	19.0652	18	457.20
.7674	19.4919	18	457.20
.7809	19.8349	18	457.20
.7868	19.9847	18	457.20
.7874	19.9999	18	457.20
.7910	20.0914	18	457.20
.7915	20.1041	18	457.20
.8002	20.3250	18	457.20
.8073	20.5054	18	457.20
.8151	20.7035	18	457.20
.8162	20.7315	18	457.20
.8304	21.0922	27	685.80
.8403	21.3436	28	711.20
.8415	21.3741	18	457.20
.8428	21.4071	52	1320.80
.8504	21.6001	18	457.20
.8658	21.9913	22	558.80
.8661	21.9989	22	558.80
.8673	22.0294	22	558.80
.8753	22.2326	18	457.20
.8846	22.4688	18	457.20
.8900	22.6060	13	330.20
.9068	23.0327	14	355.60
.9082	23.0682	22	558.80
.9111	23.1419	18	457.20
.9223	23.4264	18	457.20
.9289	23.5941	16	406.40
.9360	23.7744	18	457.20
.9451	24.0055	35	889.00
.9592	24.3637	18	457.20

INNER DIAMETER inches	INNER DIAMETER mm	LENGTH inches	LENGTH mm
0.9745	24.7523	18	457.20
0.9852	25.0241	40	1016.00
1.0004	25.4102	40	1016.00
1.0040	25.5016	18	457.20
1.0080	25.6032	37	939.80
1.0083	25.6108	48	1219.20
1.0089	25.6261	40	1016.00
1.0226	25.9740	40	1016.00
1.0240	26.0096	40	1016.00
1.0325	26.2255	18	457.20
1.0393	26.3982	18	457.20
1.0788	27.4015	42	1066.80
1.0856	27.5742	18	457.20
1.1020	27.9908	20	508.00
1.1122	28.2499	17	431.80
1.1201	28.4505	18	457.20
1.1605	29.4767	18	457.20
1.1762	29.8755	18	457.20
1.1845	30.0863	18	457.20
1.1886	30.1904	18	457.20
1.2500	31.7500	18	457.20
1.2597	31.9964	17	431.80
1.2633	32.0878	17	431.80
1.2994	33.0047	18	457.20
1.3140	33.3760	18	457.20
1.3400	34.0360	18	457.20
1.3758	34.9453	17	431.80
1.3974	35.4940	17	431.80
1.4385	36.5379	8	203.20
1.4568	37.0027	17	431.80
1.4885	37.8079	17	431.80
1.4982	38.0543	17	431.80
1.6145	41.0083	24	609.60
1.7323	44.0004	18	457.20
1.7480	44.3992	18	457.20
1.7503	44.4576	18	457.20
1.8425	46.7995	16	406.40
1.8708	47.5183	8	203.20
1.9406	49.2912	18	457.20
2.0994	53.3248	12	304.80
2.6085	66.2559	24	609.60

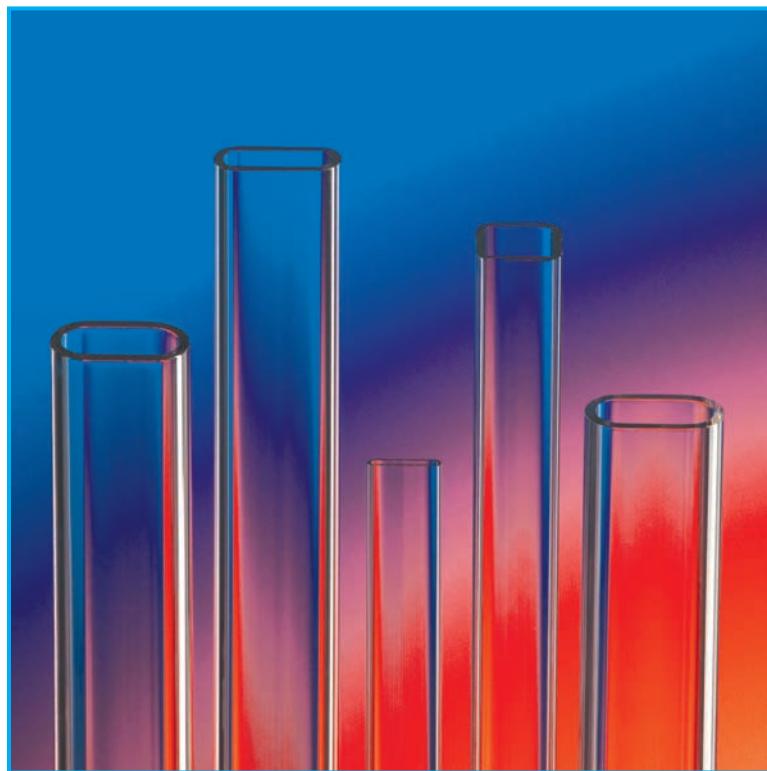
PRECISION BORE SQUARE TUBING

Wilmad square precision bore tubing is characterized by the same accuracy and uniformity that marks all Wilmad products. The sizes listed are available from tooling on hand in our plant.

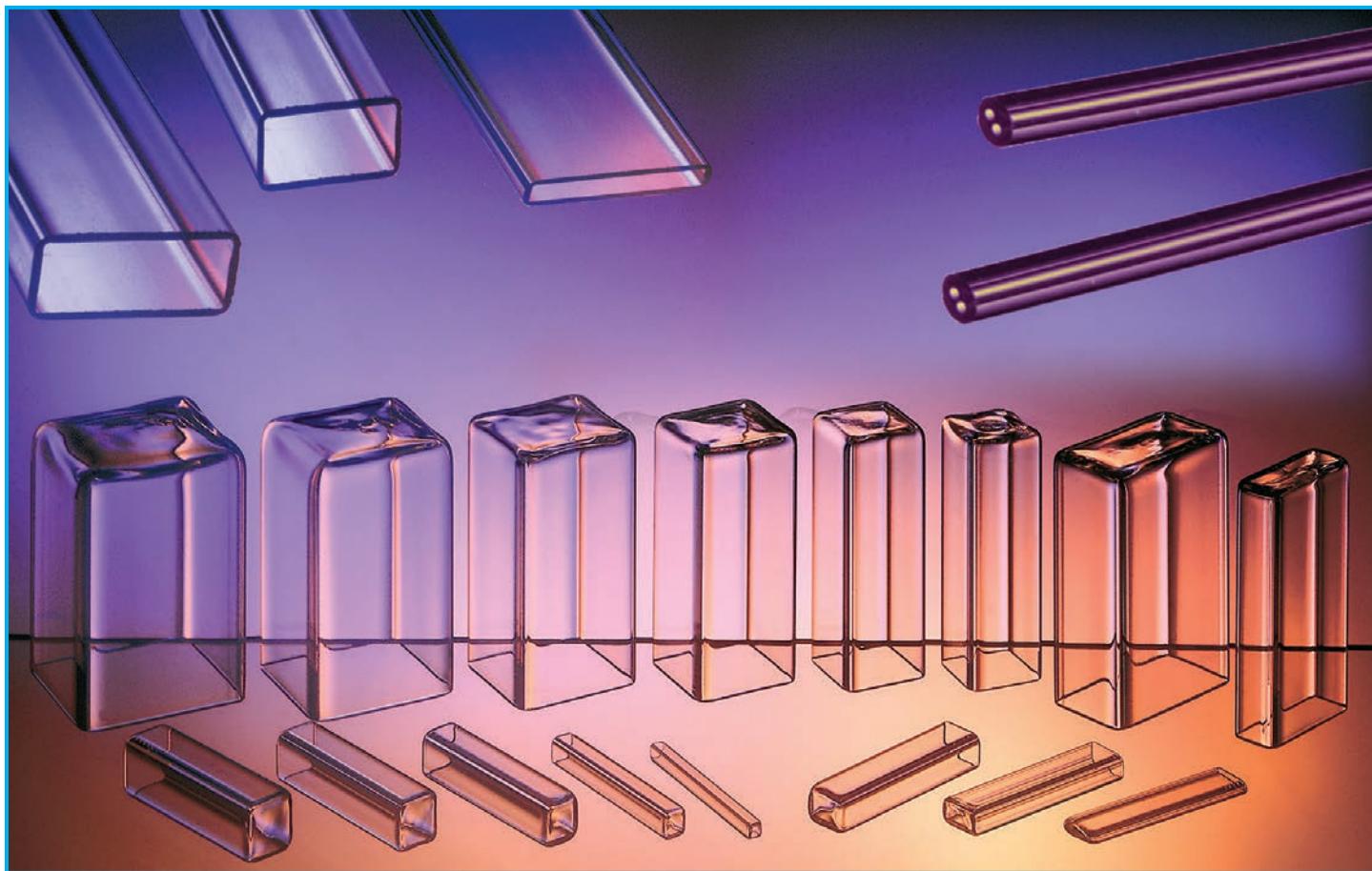
The dimensions shown in the tables are for Pyrex Brand, Duran or KG-33 Glass. The same tooling can be used to produce tubes from different types of glass but there will be a slight change in dimensions.

SQUARE PB TUBING

DIMENSIONS	LENGTH inches	LENGTH mm
8mm x 8mm	11	279.40
10mm x 10mm	10	254.00
13mm x 13mm	12	304.80
16mm x 16mm	12	304.80
20mm x 20mm	12	304.80
1 inch x 1 inch	14	355.60
1 1/8 in. x 1 1/8 in.	12	304.80
1 1/4 in. x 1 1/4 in.	12	304.80
1 1/2 in. x 1 1/2 in.	12	304.80



We can also produce tubing in shapes other than square to precision bore tolerances. Such shapes include rectangular, triangular and other geometric configurations. For your special requirements, call, email or Fax our Engineering Department with details.

SPECIALTY BOROSILICATE & QUARTZ PRODUCTS

The items listed in this section of our catalog are available from stock or can be manufactured to your specifications in a relatively short time. These items generally are not precision bore products. The quality and craftsmanship of these specialty pieces, however, may be sufficient for many design needs. Be sure to check tolerances carefully to determine suitability to your needs.

**INNER DIAMETER TOLERANCES
FOR RECTANGLE & SQUARE TUBING**

1mm +/- 10%

1-3mm +/- 6%

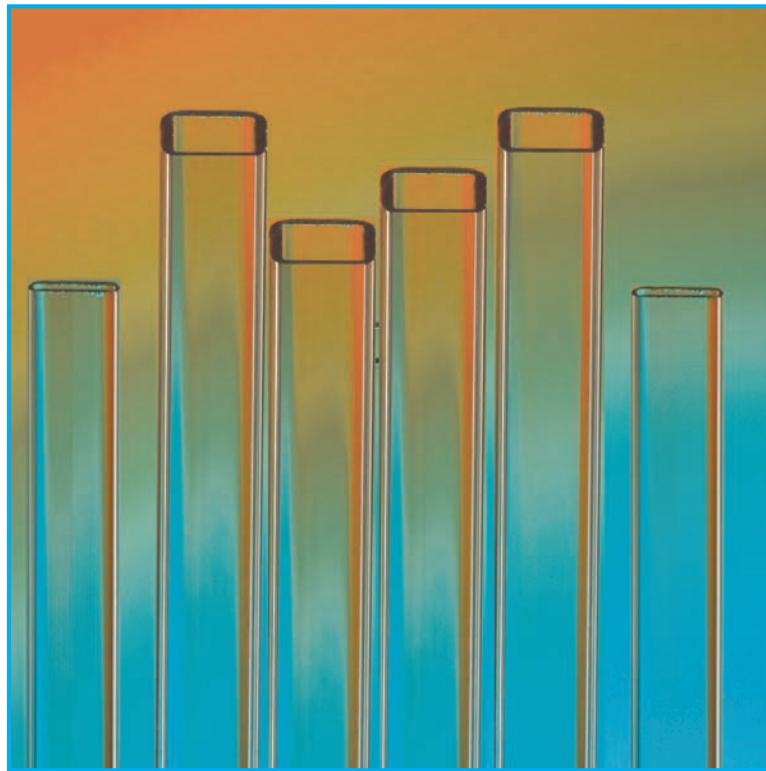
4-5mm +/- 4%

6-20mm +/- 2%

21mm +/- 1%

Specialty products listed include:

- Square Borosilicate Tubing
- Square Quartz Tubing
- Rectangular Borosilicate Tubing
- Large Ratio Rectangular Tubing
- Rectangular Quartz Tubing
- Multi-bore Tubing
(Call for sizes and specifications)
- Micro cells
(Square Capillary Tubes)
- Cells - Square or Rectangular; Glass or Quartz

SPECIALTY BOROSILICATE & QUARTZ PRODUCTS**BOROSILICATE GLASS SQUARE TUBING**

This square tubing is stocked in 1,2,3 and 4 foot lengths. If you need a size not listed in the table, or a special wall thickness not shown in the table, please contact us. On special orders, we can also supply tubing made of glass other than Pyrex brand.

- I.D. RANGE: 0.05mm to 70mm
- LENGTHS: 1, 2, 3 and 4-foot or cut to length

CATALOG NUMBER	SQUARE I.D. mm	O.D. mm	WALL mm
WST8505	0.05	0.10	0.025
WST8508	0.08	0.16	0.040
WST8510	0.10	0.20	0.050
WST8320	0.20	0.40	0.100
WST8330	0.30	0.60	0.150
WST8240	0.40	0.80	0.200
WST8250	0.50	0.70	0.100
WST8260	0.60	0.84	0.120
WST8270	0.70	0.98	0.140
WST8280	0.80	1.12	0.160
WST8290	0.90	1.26	0.180
WST8100	1.00	1.40	0.200
WS102	2.00	2.80	0.400
WS103	3.00	4.00	0.500
WS105	5.00	6.40	0.700
WS106	6.00	7.60	0.800
WS108	8.00	9.60	0.800
WS108H	8.00	10.40	1.200
WS110	10.00	11.80	0.900
WS110H	10.00	13.00	1.500
WS112	12.00	14.00	1.000

- Stocked in 1,2,3 and 4 foot lengths
- Available in custom lengths

CATALOG NUMBER	SQUARE I.D. mm	O.D. mm	WALL mm
WS112H	12.00	13.00	1.500
WS113	13.00	15.00	1.000
WS113H	13.00	16.00	1.500
WS114	14.00	16.00	1.000
WS114H	14.00	17.20	1.600
WS116	16.00	18.20	1.100
WS116H	16.00	19.20	1.600
WS118	18.00	21.00	1.500
WS120	20.00	23.00	1.500
WS122	22.00	25.60	1.800
WS125	25.00	28.60	1.800
WS128	28.00	31.60	1.800
WS130	30.00	33.60	1.800
WS135	35.00	38.60	1.800
WS140	40.00	44.00	2.000
WS145	45.00	49.00	2.000
WS151	51.00	54.40	2.200
WS151H	51.00	56.60	2.800
WS160	60.00	65.00	2.500
WS170	70.00	75.00	2.500
WS170H	70.00	76.00	3.000

- Stocked in 1,2,3 and 4 foot lengths
- Available in custom lengths

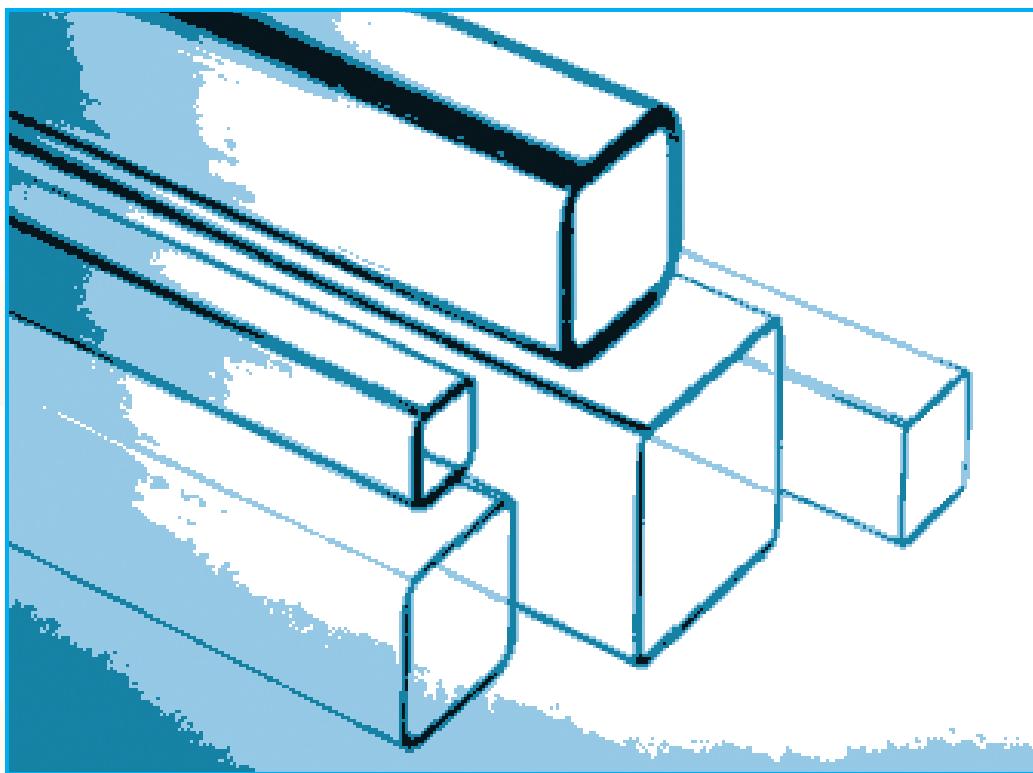
SPECIALTY QUARTZ PRODUCTS**CLEAR FUSED QUARTZ SQUARE TUBING**

CATALOG NUMBER	I.D. mm	O.D. mm	WALL mm
WQS1005	0.50	1.00	0.25
WQS101	1.00	2.00	0.50
WQS102	2.00	3.50	0.75
WQS103	3.00	4.50	0.75
WQS104	4.00	6.60	1.30
WQS105	5.00	7.60	1.30
WQS106	6.00	8.60	1.30
WQS107	7.00	9.60	1.30
WQS108	8.00	10.60	1.30
WQS109	9.00	11.60	1.30
WQS110	10.00	12.60	1.30
WQS112	12.00	14.60	1.30
WQS113	13.00	15.60	1.30
WQS114	14.00	16.60	1.30

- Non-Stock items; subject to material availability.

- **I.D. RANGE:** 0.5mm to 14mm
- **LENGTHS:** 1 to 2 ft.
- **WALL THICKNESS:** 0.25mm to 1.30mm

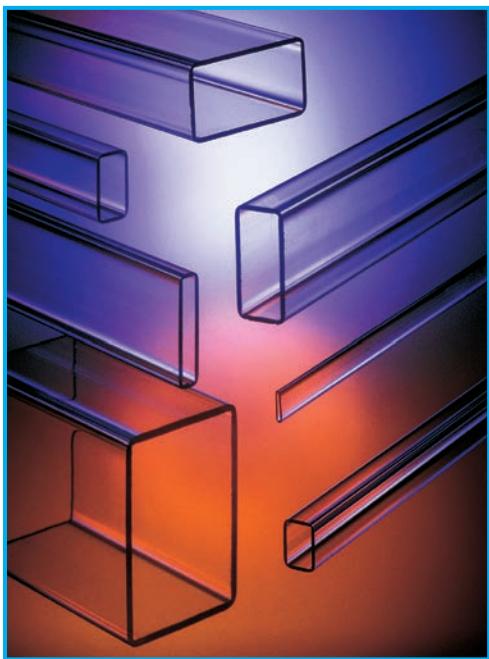
Precision, high-purity, square tubing manufactured of clear fused quartz is frequently available from stock. Should your application demand purity better than that offered by clear fused quartz or if it is to be used for transmission in the UV to 200 nanometers, we can supply it in non-fluorescent synthetic Suprasil. If you require any of the listed sizes finished as cells, boats, or trays, please call and discuss your needs.



The sizes listed are available in various wall weights in clear fused quartz; ranging from 0.9mm - 1.75mm. In Suprasil we normally supply one wall weight of 0.9mm.

SPECIALTY BOROSILICATE & QUARTZ PRODUCTS

CLEAR FUSED QUARTZ RECTANGULAR TUBING



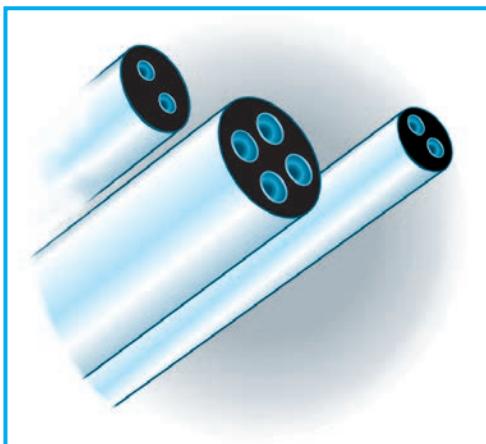
This precision, high purity, rectangular tubing can be used continuously at 1000° C.

CATALOG NUMBER	SQUARE I.D. mm	WALL mm
WQR0204	2.00x4.00	1.30
WQR0305	3.00x5.00	1.30
WQR0307	3.00x7.00	1.30
WQR0309	3.00x9.00	1.30
WQR0406	4.00x6.00	1.30
WQR0408	4.00x8.00	1.30
WQR0507	5.00x7.00	1.30
WQR0509	5.00x9.00	1.30
WQR0608	6.00x8.00	1.30
WQR0610	6.00x10.00	1.30
WQR0709	7.00x9.00	1.30
WQR0711	7.00x11.00	1.30
WQR0713	7.00x13.00	1.30
WQR0812	8.00x12.00	1.30

* Wall Tolerance +/- 30%

- **I.D. RANGE:** Up to 4 feet
- **LENGTHS:** From 2 x 4 to 8 x 12
- **WALL THICKNESS:** Clear Fused Quartz

MULTI-BORE TUBING



- **MATERIAL:** Fused Quartz or Borosilicate Glass
- .060" Bore Size Not Available in Quartz

MULTI-BORE TUBING

Glass tubing up to 1/4" O.D. has been produced with bores in sizes ranging from 5 to 100 micrometers. Hundreds or thousands of accurate holes can be incorporated in these small diameter rods. The rods can be wafered and the discs used for ultra-filtration of bacteria, microorganism counting or identification. Multi-bore tubing is made to customer specifications. Numerous precision bores can be placed in precise locations to meet your design requirements.

DOUBLE BORE AND FOUR BORE TUBING

For thermocouples, electrochemical probes and other insulating applications.

BORE SIZE inches	OUTSIDE DIAMETER inches
.005 ± .001	.020 ± .004
.005 ± .001	.031 ± .006
.010 ± .0015	.062 ± .009
.015 ± .002	.062 ± .009
.020 ± .002	.125 ± .012
.030 ± .003	.125 ± .012
.040 ± .003	.250 ± .015
.060 ± .0035	.250 ± .015

Double bore and four bore tubing may not always be transparent; it may exhibit some translucency due to microscopic air lines. However, this will not impair electrode or thermocouple positioning.

SPECIALTY PYREX GLASS PRODUCTS

RECTANGULAR AND LARGE RATIO RECTANGULAR GLASS TUBING

STANDARD RECTANGULAR TUBING



- LENGTHS: 1, 2, 3, and 4 feet

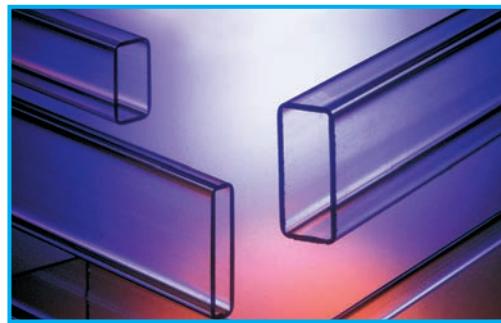
This high quality rectangular tubing has uniform walls, flat sides and a minimum of striation resulting from new manufacturing methods. Inside dimensions are held to close tolerances by the use of precision mandrels.

BOROSILICATE RECTANGLE TUBING

CATALOG NUMBER	I.D. (mm)	WALL (mm)
WR0204	2.00 x 4.00	0.30
WR0206	2.00 x 6.00	0.80
WR0307	3.00 x 7.00	1.00
WR0309	3.00 x 9.00	1.00
WR0406	4.00 x 6.00	1.00
WR0410	4.00 x 10.00	1.00
WR0412	4.00 x 12.00	1.20
WR0610	6.00 x 10.00	1.20
WR0615	6.00 x 15.00	1.20
WR0714	7.00 x 14.00	1.20
WR0721	7.00 x 21.00	1.30
WR0816	8.00 x 16.00	1.30
WR0824	8.00 x 24.00	1.50
WR1015	10.00 x 15.00	1.30
WR1022	10.00 x 22.00	1.50
WR1030	10.00 x 30.00	1.50
WR1035	10.00 x 35.00	1.80
WR1040	10.00 x 40.00	1.80
WR1224	12.00 x 24.00	1.50
WR1326	13.00 x 26.00	1.50
WR1525	15.00 x 25.00	1.50
WR1535	15.00 x 35.00	1.80
WR1545	15.00 x 45.00	2.00
WR2030	20.00 x 30.00	1.80
WR2040	20.00 x 40.00	2.00
WR2050	20.00 x 50.00	2.00
WR2652	26.00 x 52.00	2.00
WR2675	26.00 x 75.00	2.20
WR2675H	26.00 x 75.00	2.80
WR3050	30.00 x 50.00	2.00
WR3050H	30.00 x 50.00	2.50
WR3575	35.00 x 75.00	2.50
WR3575H	35.00 x 75.00	3.00
WR4080	40.00 x 80.00	2.50
WR4080H	40.00 x 80.00	3.00
WR5075	50.00 x 75.00	2.50
WR5075H	50.00 x 75.00	3.00

Stocked in 1,2,3 and 4 Foot Lengths

LARGE RATIO RECTANGULAR TUBING



- I.D.s: 0.02mm to 10mm wide

Similar to tubing listed on left, but with a greater height-to-width ratio. Smaller sizes are ideal for microscopic work. Large sizes can be fabricated into specimen cells to suit your requirements.

LARGE RATIO BOROSILICATE RECTANGLE TUBING

CATALOG NUMBER	I.D. (mm)	WALL (mm)
WRT5002	0.02 x 0.20	0.02
WRT5003	0.03 x 0.30	0.03
WRT5004	0.04 x 0.40	0.04
WRT5005	0.05 x 0.50	0.05
WRT5015	0.05 x 1.00	0.05
WRT5010	0.10 x 1.00	0.10
WRT5012	0.10 x 2.00	0.10
WRT3520	0.20 x 2.00	0.15
WRT3524	0.20 x 4.00	0.20
WRT3530	0.30 x 3.00	0.23
WRT3536	0.30 x 6.00	0.30
WRT2540	0.40 x 4.00	0.30
WRT2548	0.40 x 8.00	0.40
WRT4905	0.50 x 5.00	0.30
WRT4806	0.60 x 6.00	0.40
WRT4707	0.70 x 7.00	0.46
WRT4608	0.80 x 8.00	0.54
WRT4509	0.90 x 9.00	0.60
WRT4410	1.00 x 10.00	0.67
WRT0115	1.00 x 15.00	1.10
WRT0212	2.00 x 12.00	1.20
WRT0220	2.00 x 20.00	1.30
WRT0330	3.00 x 30.00	1.50
WRT0350	3.00 x 50.00	2.00
WRT0440	4.00 x 40.00	1.70
WRT0550	5.00 x 50.00	2.00
WRT0575	5.00 x 75.00	2.50
WRT0640	6.00 x 40.00	2.00
WRT0660	6.00 x 60.00	2.20
WRT0770	7.00 x 70.00	2.50
WRT0860	8.00 x 60.00	2.30
WRT0880	8.00 x 80.00	2.50
WRT1075	10.00 x 75.00	2.50

Custom Lengths Available

SPECIALTY BOROSILICATE & QUARTZ PRODUCTS

SQUARE AND RECTANGULAR CELLS

RECTANGULAR CELLS

(BOROSILICATE GLASS)

I.D. mm	HEIGHT mm
1 x 10	48
2 x 20	48
2 x 4	48
2 x 6	48
3 x 7	48
3 x 9	48
4 x 6	48
4 x 10	48
4 x 12	48
6 x 10	48
7 x 14	48
7 x 21	48
10 x 22	60
10 x 30	60
10 x 40	60
13 x 26	60
20 x 40	60
26 x 52	60

Rectangular cells can be used as sample containers for research and development work or production instrumentation. These cells are produced from our uniform wall, mandrel-formed tubing. Rectangular glass cells are available in all stock tubing sizes shown in our rectangular tubing tables with no extra charge for tooling.

RECTANGULAR CELLS

(CLEAR FUSED QUARTZ)

I.D. mm	HEIGHT mm
3.00 x 7.00	48
6.00 x 10.00	48
7.00 x 13.00	48

- Wall Tolerance +/- 30%

Used for ultraviolet transmission and high purity work, these cells are available from stock in the clear fused quartz tubing sizes without special tooling charges. Any stock size will be produced to your height requirements.



SQUARE CELLS

(CLEAR FUSED QUARTZ)

I.D. mm	HEIGHT mm
3 x 3	48
5 x 5	48
8 x 8	48
10 x 10	48
12 x 12	48
14 x 14	60

- Wall Tolerance +/- 30%

These cells may be used as containers for high temperature applications or where high purity or UV transmission is needed. They are manufactured with all-fused construction, flat bottoms, and a fire polished open end to your specifications from stock size tubing. Non-fluorescent, synthetic Suprasil is used when the application requires purity better than clear fused quartz or for use in UV below 200 nanometers.

SQUARE CELLS

(BOROSILICATE GLASS)

I.D. mm	HEIGHT mm
3 x 3	48
5 x 5	48
8 x 8	48
10 x 10	48
12 x 12	48
18 x 18	60
20 x 20	60
25 x 25	60
30 x 30	60
35 x 35	60
40 x 40	60

Rectangular cells can be used as sample containers for research and development work or production instrumentation. These cells are produced from our uniform wall, mandrel-formed tubing. Rectangular glass cells are available in all stock tubing sizes shown in our rectangular tubing tables with no extra charge for tooling.

SPECIALTY BOROSILICATE & QUARTZ PRODUCTS

MICRO SLIDES, MICRO CELLS AND CAPILLARIES

Micro slides are precision rectangular glass capillary tubes with open ends and are used for microscopic inspection of liquid samples. Capillary action instantly collects the sample and the micro slide maintains a precision optical path length. Thin flat glass walls minimize evaporation. Cover glass is not required and issues associated with the hanging drop technique are eliminated.

BOROSILICATE STANDARD MICRO SLIDES

50mm and 100mm long (-50M OR -100M)

Packaged in screw cap vials.

CATALOG NUMBER	INSIDE DIMENSIONS (mm) Path length x Width	PIECES PER VIAL
W5002	.02 x .2	30
W5003	.03 x .3	33
W5004	.04 x .4	36
W5005	.05 x .5	44
W5010	.10 x 1.0	40
W3520	.20 x 2.0	36
W3530	.30 x 3.0	31
W2540	.40 x 4.0	28

BOROSILICATE 100MM LONG ONLY

Open ends flame polished. Collect sample by partially immersing into solution. Place finger over open end to remove sample.

CATALOG NUMBER	INSIDE DIMENSIONS (mm) Path length x Width	PIECES PER VIAL
W4905-100M	.50 x 5.0	14
W4806-100M	.60 x 6.0	12
W4707-100M	.70 x 7.0	9
W4608-100M	.80 x 8.0	7
W4509-100M	.90 x 9.0	6
W4410-100M	1.0 x 10.0	4

BOROSILICATE EXTRA WIDE MICRO SLIDES

50mm and 100mm long (-50M OR -100M)

Packaged in screw cap vials.

CATALOG NUMBER	INSIDE DIMENSIONS (mm) Path length x Width	PIECES PER VIAL
WW5005	.05 x 1.0	50
WW5010	.10 x 2.0	45
WW3520	.20 x 4.0	36
WW3530	.30 x 6.0	24
WW2540	.40 x 8.0	18

Micro cells are precision square glass capillary tubes for viewing microscopic objects in two optical planes at right angles. Micro slides and Micro cells are made from borosilicate glass. They may be heated to 500°C. Samples may be permanently retained for reference by fusing or cementing the open ends. All Micro slide and Micro cell tubing is stocked in 1, 2, 3 and 4 foot lengths.

BOROSILICATE STANDARD MICRO CELLS

50mm and 100mm long (-50M OR -100M)

Packaged in screw cap vials.

CATALOG NUMBER	SQUARE I.D. mm	WALL THICKNESS	QUANTITY PER VIAL
W8505	0.05	0.025	35
W8508	0.08	0.035	35
W8510	0.10	0.04	30
W8320	0.20	0.076	30
W8330	0.30	0.10	30
W8240	0.40	0.15	27
W8250	0.50	0.10	25
W8260	0.60	0.12	25
W8270	0.70	0.14	25
W8280	0.80	0.14	23
W8290	0.90	0.15	23
W8100	1.00	0.15	22

ROUND CAPILLARY TUBING BOROSILICATE GLASS (P) CLEAR FUSED QUARTZ (Q) SYNTHETIC FUSED SILICA (S)

*PN see below	I.D. mm	O.D. mm	PCS (per vial)
.05 x .08	0.05	0.08	100
.10 x .17	0.10	0.17	100
.15 x .25	0.15	0.25	100
.20 x .33	0.20	0.33	100
.3 x .40	0.30	0.40	75
.4 x .55	0.40	0.55	75
.5 x .70	0.50	0.70	75
.6 x .84	0.60	0.84	75
.7 x .87	0.70	0.87	50
.8 x 1.0	0.80	1.00	50
.9 x 1.1	0.90	1.10	50
1.0 x 1.2	1.00	1.20	25
1.5 x 1.8	1.50	1.80	25
2.0 x 2.4	2.00	2.40	25

- Length 100mm
- Add *P for Pyrex: ex P-.05x.08
- Add *Q for Quartz: ex Q-.05X.08
- Add *S for Synthetic: ex S-.05X.08
- Packed in plastic screw cap vials

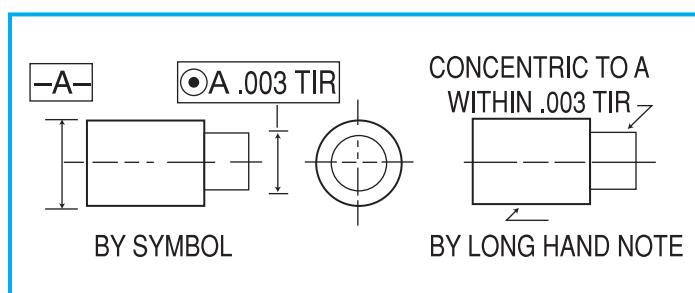
Both Ends open.

ENGINEERING DATA

DEFINITIONS

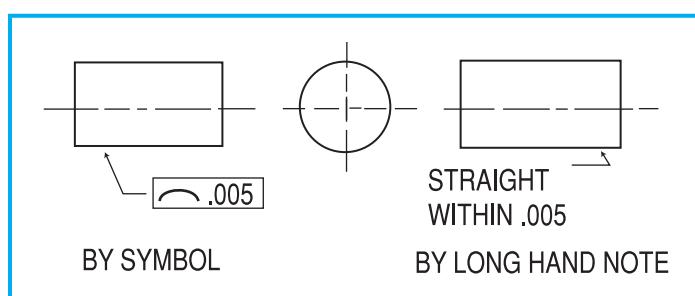
CONCENTRICITY . . . A measure of the lack of uniformity of the wall-thickness of the tube, this tolerance can be thought of as the degree to which the cylinders defined by the inner and outer surfaces of the tube parallel and overlap. Determined using an Indicating Gauge, this tolerance is reported as a deviation (w) or Total Indicator Reading (T.I.R.), i.e. the absolute variation in wall thickness at the ends of a tube rotated through 360°.

Method of specifying concentricity on drawings:



STRAIGHTNESS . . . Straightness of the elements of a precision bore tube is a condition which no element deviates from a straight line.

Method of specifying straightness of elements:



CAMBER . . . A measure of the lack of straightness of a tube, this tolerance is determined by gauging the deflection at the middle of a tube held at the ends and rotated through 360°. Recorded as a deviation (\pm) or Total Indicator Reading (T.I.R.).

TIR . . . This is the Total Indicator Reading...or the maximum dial variation from the datum or reference point when measurements of the I.D., O.D., wall thickness, camber, etc. of a precision bore tube are taken.

SPECIFICATIONS

TOLERANCES . . . Our guaranteed tolerance limits are your assurance that our precision bore glass tubing will perform satisfactorily in even the most demanding applications. I.D. tolerances vary somewhat depending on the I.D. of the tubing. However, depending on your particular requirements, we can supply PB tubing to the most demanding specifications. Nor is the I.D. the only tubing feature covered by our precise manufacturing procedure. We control straightness, length, I.D., O.D., concentricity, finish, etc. with the same precision.

NOTE: Should you require tolerances more stringent than those listed above, don't hesitate to call us.

WALL THICKNESS . . . The generally accepted method of referring to wall thickness in precision bore Tubing is by the terms Standard, Medium and Heavy. If it is important to your requirements that you know the actual dimensions of the wall thicknesses; our glass engineers will be happy to provide you with the necessary information.

LENGTHS . . . Although we have tooling for many lengths and sizes of PB tubing, it is important that we keep mentioning the need to order the shortest lengths available from the tooling on hand. The smaller lengths are easier to ship and we may be able to ship from stock.

MATERIALS . . . Generally our PB tubing is supplied in Pyrex Brand, Duran or KG-33 glass. However, we also work with various types of glasses. We also use synthetic or natural quartz, and can provide glass tubing for matched metal-to-glass seals.

ENGINEERING DATA

PRODUCT FINISH . . . Based on your requirements, we can modify our precision bore tubing in end finish or outside surface. We can cut the ends square or at any angle. End finished include simple crack-off, wet wheel cut, fine ground, fire polished, belt or felt polished. External finishes include both rough and fine ground and varying degrees of polish. A surface profilometer is available for accurately quantifying surface finishes.

CONFIGURATIONS . . . Wilmad PB tubing is available in round, square, or rectangular shapes in standard, medium, or heavy walls. However, we can make it in practically any shape . . . oval, hexagonal, tapered, and fluted . . . or other special shapes which meet your requirements.

TUBING CLASSIFICATIONS

STANDARD TUBING . . . Standard tubing, as received from major manufacturers such as Corning, Kimble, Schott, and Kavalier has dimensional tolerances of $\pm 0.3\%$ depending on O.D. size. This type of tubing material is usually unsuited for precision parts but is used as the starting material for other classifications of tubing detailed in the links listed below.

REDRAWN TUBING . . . Redrawn tubing is produced by reheating standard or select material and re-extruding the softened material to rework the O.D., I.D., or shape to tighter tolerances. In many engineering applications, this material is sufficient and typically tolerances are from 5 to 10 times better than standard tubing.

PRECISION BORE TUBING . . . Precision bore (or PB) tubing, as Wilmad's principal product, is manufactured to our industry's strictest tolerances. The process of creating a piece of PB tubing involves the heating and softening of a standard tube over a precision mandrel. The glass is heated to the proper temperature and a vacuum is applied to the annular space between the tube and the mandrel. The final product is formed as the glass is softened and pulled over the mandrel. Each mandrel is carefully machined and polished to exact O.D. based on the difference in coefficient of expansion and contraction of the mandrel and the glass or quartz tubing utilized. Our stock of mandrels is extensive as listed in this catalog, and custom sized mandrels can be produced for virtually any I.D., shape or length.

ORDERING INFORMATION

Wilmad PB Tubing is not priced in this catalog. Since every piece of Wilmad PB tubing and every assembly and subassembly made from it is custom manufactured to your specifications, it is not practical to prepare a price list in advance. Therefore, to receive a quotation, it is necessary to either write, e-mail, fax, or call customer service. Our glass engineers will review your needs and quote a price and delivery time. If your requirements are complex, please submit a drawing or sketch of the glassware you require showing all dimensions and tolerances.

ENGINEERING DATA

CONVERSION FACTORS

TO CONVERT	MULTIPLY BY	TO OBTAIN
Atmospheres	760	Mercury (mm)
Centigrade	(°C X 9/5) + 32	Fahrenheit (degrees)
Centimeters	0.3937	Inches
Cubic Centimeters	0.06102	Cubic Inches
Fahrenheit (degrees)	(°F-32) X 5/9	Centigrade (degrees)
Feet	0.3048	Meters
Grams	0.03527	Ounces
Hertz	1.0	CPS
Inches	25.40	Millimeters
Inches	2.540	Centimeters
Kilograms	2.205	Pounds
Meters	39.37	Inches
Ounces	28.349	Grams
Pounds	453.6	Grams
Square Centimeters	0.1550	Square Inches
Square Inches	6.452	Square Centimeters
Torr	1.0	Mercury (mm)

WAVELENGTH CONVERSIONS

1 Angstrom	(A°)	=	10 Millimicrons
1 Angstrom	(A°)	=	.1 Nanometer
1 Angstrom	(A°)	=	3.937 X 10 ⁻⁹ Inches
1 Angstrom	(A°)	=	10 ⁻¹⁰ Meters
1 Angstrom	(A°)	=	10 ⁻⁸ Centimeters
1 Angstrom	(A°)	=	10 ⁻⁴ Microns
1 Micron	(μ)	=	10 ⁻⁴ Centimeters
1 Millimicron	(mμ)	=	10 ⁻³ Microns
1 Micron	(μ)	=	0.001 Millimeters
1 Nanometer	(nm)	=	1 Millimicron
1 Nanometer	(nm)	=	10 Angstroms
1 Wavelength (at 5500 A)	(λ)	=	21.8 x 10 ⁻⁶ Inches

VOLUME

1 milliliter (ml.)	0.03382 ounce (U.S. Liquid)
1 ounce (U.S. Liquid)	29.573 milliliters
1 liter (L)	1.05671 quarts (U.S. Liquid)
1 quart (U.S. Liquid)	0.94633 liter
1 liter	0.26418 gallon (U.S. Liquid)
1 gallon (U.S. Liquid)	3.78533 liters
1 cubic centimeter (cc)	0.001 liter (L)
1 cubic centimeter	0.0610 cubic inch
1 cubic inch	16.3872 centimeters
1 cubic meter (M)	35.314 cubic feet
1 cubic foot	0.02832 cubic meter

LENGTH

INCHES	INCHES	MILLIMETERS (mm)
1/64	.015625	0.3969
1/32	.03125	0.7938
1/16	.0625	1.5875
1/8	.1250	3.1750
3/16	.1875	4.7625
1/4	.2500	6.3500
5/16	.3125	7.9375
3/8	.3750	9.5250
7/16	.4375	11.1125
1/2	.5000	12.7000
5/8	.6250	15.8750
3/4	.7500	19.0500
7/8	.8750	22.2250
1	1.0000	25.4000

1 millimeter (mm)	0.1 centimeter (cm)
1 centimeter	0.01 meter (M)
1 centimeter	0.394 inch
1 inch	2.540 centimeters
1 meter	3.2808 feet
1 foot	0.305 meter
1 millimeter (mm)	0.03937 inches
2 millimeters (mm)	0.07874 inches
3 millimeters (mm)	0.11811 inches
4 millimeters (mm)	0.15748 inches
5 millimeters (mm)	0.19685 inches
6 millimeters (mm)	0.23622 inches
7 millimeters (mm)	0.27559 inches
8 millimeters (mm)	0.41396 inches
9 millimeters (mm)	0.35433 inches
10 millimeters (mm)	0.39370 inches

TRANSMITTANCE VS. ABSORBANCE

TRANSMITTANCE	ABSORBANCE
(% T)	(A, Abs, AU)
100	0.0000
90	0.046
80	0.097
70	0.155
60	0.222
50	0.301
40	0.398
30	0.523
20	0.699
10	1.000
5	1.301
1	2.000
0.1	3.000
0	∞

The Best Way to Buy Materials and Supplies for Precision Bore Tubing and for NMR, EPR, and Laboratory Glassware... Use Your Wilmad-LabGlass Catalog!

Nuclear Magnetic Resonance Catalog



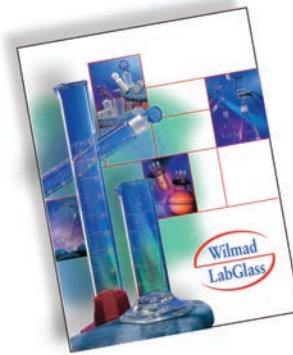
Wilmad-LabGlass's NMR catalog includes the most extensive line of NMR sample tubes and inserts anywhere. You can get all the supplies and accessories you need to keep your NMR spectrometer producing data from Wilmad-LabGlass. You can also get sample handling devices or plotter consumables. The NMR Catalog includes Doty Susceptibility Plugs for exceptional microsampling, Roto Tec Mass Rotors and Spinner Turbines, and a variety of tube washers you can use with all sizes of NMR tubes. You shouldn't do NMR without a Wilmad-LabGlass Catalog. Check our on-line NMR catalog (<http://www.Wilmad-LabGlass.com>) or request a printed copy today.

Electron Paramagnetic Resonance Catalog



Our unique manufacturing skills place Wilmad-LabGlass in an ideal position to offer high quality quartzware for EPR spectroscopy. Our EPR catalog contains an extensive collection of quartz products, including sample tubes, aqueous cells, tissue cells, dewar flasks and inserts and variable temperature accessories. The catalog also details TPX capillaries and other supplies. For both routine and exotic experiments, Wilmad-LabGlass's EPR catalog is essential.

Laboratory Glassware



Wilmad-LabGlass has been a leader in the manufacture of scientific and laboratory glassware that ranges from adapters to condensers to round bottom flasks to pilot plant reactors. Our corporate partnership with Corning Life Sciences has enabled us to provide one of the most complete product lines in the industry. The catalog also details chromatography, distilling and drying apparatus, impingers, joints, pipets, pumps, reactions apparatus, thermometers, and glassware made from Borosilicate, Quartz and Vycor.[®]



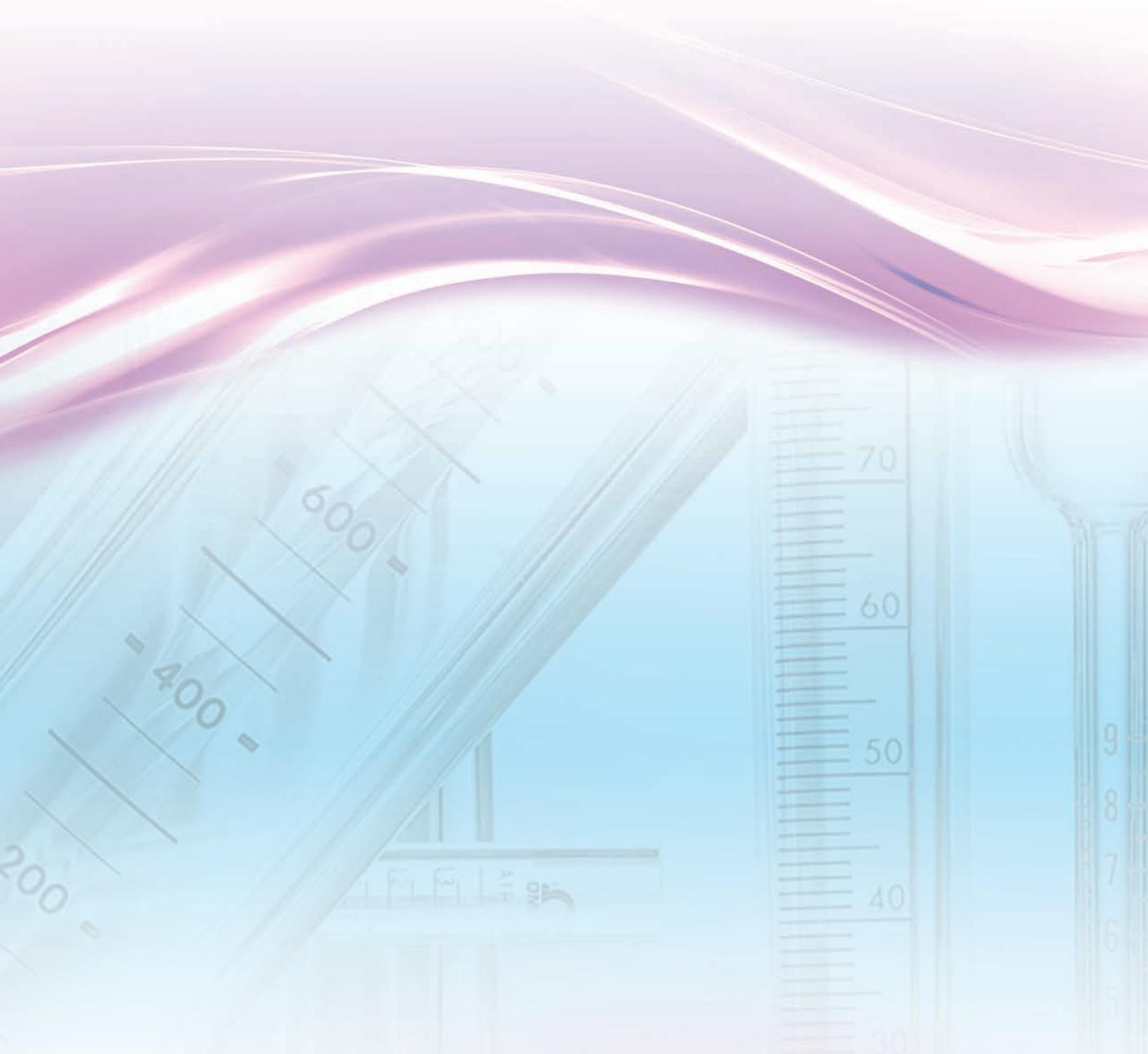
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