SCHOTT
glass made of ideas

Product Catalog & Specification Guide KIMAX®

Glass Drain and Vent Systems

Where others say no, we say yes. Because at SCHOTT we believe that shared responsibility can release the energy to achieve the impossible. As a global material technology group, we are constantly exploring unique and innovative ways to make a difference for businesses and people. Being a foundation company, SCHOTT has anchored responsibility, scientific research, society and the environment deeply in its DNA. Represented in over 30 countries by 17,200 employees, we are a highly skilled partner for many high-tech industries. Whatever challenges the future might hold, we can't wait to come up with innovative solutions and turn visions into reality.

With a production capacity of round about 230,000 tons and production sites in Europe, South America and Asia, SCHOTT Tubing is one of the world's leading manufacturers of glass tubes, rods and profiles. More than 60 different glass types are produced in a large variety of dimensional and cosmetic specifications based on a standardized production process and a global quality assurance system. SCHOTT Tubing provides customized products and services for international growth markets such as pharmaceuticals and electronics as well as industrial and environmental engineering.

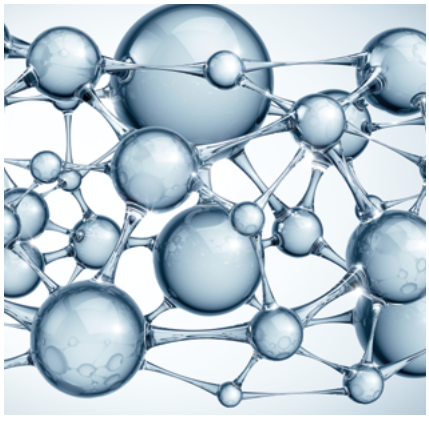
Contents

Otto Schott

The inventor of borosilicate glass, scientist and company founder.

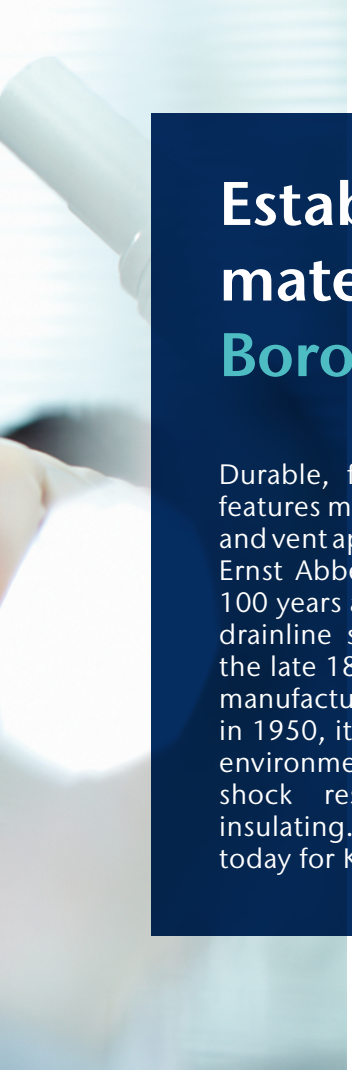
1888

Borosilicate glass invented at the Schott Associates & Glass Laboratory in Jena, Germany.



1891

Thermometers made from borosilicate glass.



Established and trusted material for over 130 years

Borosilicate glass

Durable, flexible, sustainable, easily installed – its many features make KIMAX® glass piping the ideal solution for drain and vent applications. The three german pioneers Otto Schott, Ernst Abbe, and Carl Zeiss invented borosilicate glass over 100 years ago and laid the foundation for our KIMAX® glass drainline systems. Their invention of borosilicate glass in the late 1880s paved the way for the company's success as a manufacturer of laboratory equipment. Patented as DURAN® in 1950, it had properties that made it ideal for a laboratory environment: chemical resistance, temperature resistance, shock resistance, light transparency and electrically insulating. These properties make it the ideal material even today for KIMAX® drainline system.

1893

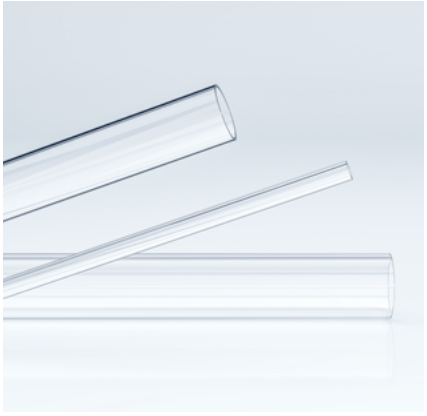
Borosilicate glass tubing used to make laboratory glassware.

1950

DURAN® borosilicate glass becomes the standard material in the production of laboratory glass.

1970s

KIMAX® borosilicate glass tubing for laboratory drain and vent systems comes to market.



Advantages of Glass as a Material

Borosilicate Glass: The Ideal Lab Glass

With its high resistance to chemicals and thermal changes, and versatility in sizes and lengths, **borosilicate glass 3.3** is ideal for laboratory and medical applications. High chemical durability and low thermal expansion – the lowest of all commercial glasses for large-scale technical applications – make it a versatile glass material.

Borosilicate glass vs. polymers
The average lab can use more than 100 chemicals. When they are all mixed together in the drain line they generate heat – creating new, reactive compounds. This can cause problems in the drain line if the material is not thermal resistant.

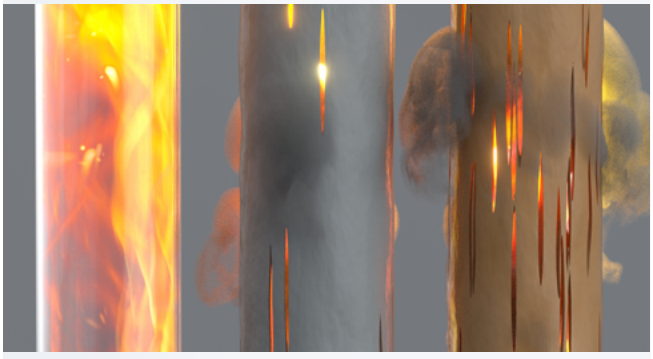
Not only is borosilicate glass used to create the vessels and containers that lab chemicals are stored in, it also is used for lab drain lines because of its superior thermal expansion, chemical-resistance, and fire-resistance qualities.

1. Thermal expansion
One of the most significant attributes of borosilicate glass is its low coefficient of linear thermal expansion (CLTE) – (3.3 × 10–6 K–1 at 20° C). CLTE illustrates how the size of an object changes with a change in temperature – how much it expands and contracts, or how much the material remains stable under temperature variations. Borosilicate's low CLTE makes it more resistant to thermal shock. The glass allows high maximum temperatures of typically about 932° F (500° C). It is also more resistant to thermal stress, which also is created by a change in temperature and can cause fracturing. Plastic polymers, on the other hand, have higher CLTEs – making them extremely sensitive to temperature changes.

2. Chemical resistance
Because borosilicate glass has high chemical resistance in corrosive environments, it does not react to those chemicals being poured down the drain. While most plastic piping is chemical-resistant, the combination of high temperatures and corrosive chemicals often damages plastic piping systems, resulting in downtime and expensive repairs.

3. Fire-resistance
No burning or toxic fumes with borosilicate glass! It meets the 25/50 plenum rating of UL-723/ASTM 84 Standard Test Method for Surface Burning Characteristics of Building Materials – the basic fire-resistant characteristic of building materials installed in a building's plenum space. However, most polymer piping systems are not plenum-rated; plastic piping can emit toxic fumes when burned.

Fire Protection & Safety



Requirements
- Fire stopping must meet UL 1479 (ASTM E814).
- Piping in return air plenums must meet 25/50 smoke rating (UL 723 / ATSM E84).

Infographic: Comparison of the Fire Protection of Various Materials

Advantages of KIMAX® Drainline Systems

Let's create today's lab that meets tomorrow's needs

KIMAX® acid waste and vent systems set the standard for borosilicate glass piping systems, offering the highest chemical resistance for acid waste while remaining sustainable, durable, user-friendly, and easy to assemble. For special handling of corrosive waste in a non-process system, KIMAX® is your trusted partner. Widely utilized in laboratories, dialysis systems, nuclear medicine, and other scientific applications with stringent waste handling requirements, KIMAX® systems also find application in educational, medical, and industrial institutions aiming to neutralize their waste before discharge.

Durable

KIMAX® borosilicate glass piping boasts unparalleled chemical resistance in non-process systems and highest thermal resistance, making it ideal for acid waste management. It is extremely resistant to water, neutral and acid solutions, strong acids, and their compounds, as well as against chlorine, bromine, iodine, esters, keytones, salts and other organic substances. It meets all applicable standards for technical glassware, such as DIN ISO 3585 and ASTM E438 Type I, and corresponds to acid class 1 for maximum acid resistance — making it an extremely durable choice for laboratory applications.

→ **Online Infographic:** Comparison of the Chemical Resistance of Various Materials

→ **Online Infographic:** Comparison of the Coefficient of Thermal Expansion of Various Materials

Sustainable

KIMAX® sets the benchmark for borosilicate glass piping systems, offering high chemical resistance for acid waste, and emphasizing sustainability. There is no off-gassing, no use of hazardous materials, and no volatile organic compounds (VOCs). KIMAX® is an entirely inorganic, mineral product. With theoretically unlimited lifespan, KIMAX® components can be safely cleaned and reused, reducing landfill waste and saving energy. Unlike polymers, glass remains stable with prolonged chemical exposure, ensuring a long service life potentially lasting for hundreds of years.

→ **Online Infographic:** Reasons why KIMAX® glass ist the most environmentally friendly material

Dependable

Unparalleled in its resistance to virtually every corrosive substance and reagent, KIMAX® stands strong. With an impressive ability to withstand acids that could compromise most plastics, our glass drainlines guarantee exceptional performance and unwavering reliability. Day in and day out, KIMAX® delivers continuous operation without downtime, showcasing its reliability in action. Durable and designed as a long-term solution for drain and vent lines, KIMAX® stands as a reliable choice for enduring quality and longevity.

➜ **Online Infographic:** Comparison of the Longevity of Various Materials

Flexible

KIMAX® glass drainlines are designed for adaptability. Its modular design allows easy reconfiguration during lab renovations, modifications, or reuse, providing a versatile and efficient solution for changing needs. It is a system that effortlessly adapts to changes, offering a truly flexible and modular approach to enhance the functionality.

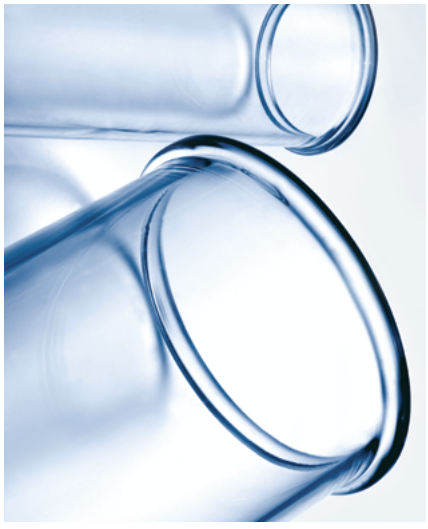
Economical

KIMAX® glass drainline systems ensure a long-term return on investment with the lowest life-cycle cost available in the market. The installation process is both safe and straightforward, and the maintenance-free operation guarantees continuous efficiency throughout the building's life.

BIM

The entire KIMAX® product line can be easily downloaded as BIM Objects. Once you've checked the technical specifications to make sure it is right for your design application, select your desired format and download the file.

➜ **Video:** How to use BIM Object®



For more information, refer to the test summary on page 52.

Sample Acid Waste Specification
Section 226600 – Chemical Waste for Laboratory Facilities

PART 1 - GENERAL

1.1 WORK INCLUDED

A. SCHOTT KIMAX® Acid Waste & Acid vent glass pipe, joints & fittings
Contractor shall furnish and install a complete acid waste drain and vent system as indicated. This system shall be made of U.L. Classified borosilicate glass conforming to ASTM Specification C 1053-90, Federal Specification DD-G-541 B and Military Specification MIL-P-22561 B (YD) as manufactured under the trade name "KIMAX®" by SCHOTT.

B. This system shall include all glass straight lengths, fittings, and traps, compression type tetra-fluoroethylene lined couplings, and padded hanger supports. It shall also include protected pipe for underground burial and recommended adapter couplings to connect other piping material, where applicable.

C. All pipes shall be installed free of strain, in a manner to permit limited movement. Padded pipe hangers shall be used on horizontal runs 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers of 1.'' And 2'' may be supported at every other floor level. 3'', 4'' and 6'' shall be supported at every floor level.

1.2 SUMMARY

A. Related Requirements:
1. Section _____
(please fill in the appropriate section)

1.3 REFERENCES

A. Reference Standards:
1. ASTM International (ASTM):
a. ASTM C1053 Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications.
b. ASTM E438 Standard Specification for Glasses in Laboratory Apparatus.
2. Military Standards (MIL):
a. MIL MIL-P-22561 Standard for Pipe and Pipe Fittings, Acid Resistant.
3. Underwriters Laboratories Inc. (UL):
a. UL 723 Tests for Surface Burning Characteristics of Building Materials

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate work of this section with work of other trades for proper time and sequence to avoid construction delays. Comply with section _____
(please fill in the appropriate section)

B. Sequencing work of this section in accordance with manufacturer's written recommendations.

C. Schedule work of this section in accordance with section _____
(please fill in the appropriate section)

1.5 ACTION SUBMITTALS

A. General: Submit listed submittals in accordance with Contract Conditions and Section _____
(please fill in the appropriate section)

B. Product Data: Submit specified products as follows.
1. Manufacturer's product data, including confirmation that the product conforms to specified regulatory requirements.
2. Manufacturer's installation instructions.
3. Catalog pages illustrating products to be incorporated into project.
4. Material Safety Data Sheets (MSDS).

C. Shop Drawings: Indicate information on shop drawings as follows.
1. Layout of drain and vent system showing pipe sizes, fittings, traps, neutralization sump and locations of cleanouts and accessories. Indicate slopes of horizontal piping.
2. Details of couplings, hangers, and riser clamps.
3. Details of connections to other types of piping materials and sump.
4. Details of underground installation.

1.6 INFORMATION SUBMITTALS

Specifier Note: Specify submittal of test reports or evaluation service reports intended to document required tests without repeating test requirements specified in Division _____

(please fill in the appropriate section)

A. General: Submit listed submittals in accordance with Contract Conditions and Section _____

(please fill in the appropriate section)

- Submittal Procedures.

B. Test and Evaluation Reports:

1. Certified test reports showing compliance with specified performance characteristics and physical properties.

Specifier Note: Specify submittals intended to document manufacturer installation, storage, and other instructions.

C. Manufacturer's Instructions: Submit manufacturer's storage and installation instructions.

D. Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer. E. Qualification Statements:

1. Submit letter of verification for Manufacturer's Qualifications.
2. Submit letter of verification for Installer's Qualifications.

1.7 CLOSEOUT SUBMITTALS

A. General: Submit listed submittals in accordance with Contract Conditions and section _____

(please fill in the appropriate section)

B. Operation and Maintenance Data:

1. Submit operation and maintenance data for installed products in accordance with section_____.

(please fill in the appropriate section)

Include:

a. Manufacturer's instructions detailing maintenance requirements.
b. Parts catalog showing complete list of available parts.
c. Replacement parts with cuts and identifying numbers.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer:
   a. Having experience manufacturing components similar to or exceeding requirements of project.
   b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
   c. Capable of providing field service representation during construction.
2. Installer:
   a. Acceptable to the manufacturer, experienced in performing work of this section and having specialized in installation of work similar to that required for this project.

1.9 DELIVERY, STORAGE & HANDLING

A. Delivery and Acceptance Requirements:

1. Deliver material in accordance with section _____

(please fill in the appropriate section)

and in accordance with manufacturer's written instructions.
2. Deliver materials in manufacturer's original packaging, with identification labels intact and in sizes to suit project.

B. Storage and Handling Requirements:

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, and packaging material in appropriate onsite bins for recycling.
4. Fold metal and plastic banding, flatten and place in designated area for recycling.
5. Remove:
   a. Pallets from site and return to supplier or manufacturer.

PART 2 - PRODUCTS

2.1 DRAIN AND VENT PIPING

A. Manufacturer: SCHOTT North America, Inc.

1. Contact: 2 International Drive Ste. 105, Rye Brook, NY 10573; Telephone: 914-831-2200; Fax: 914-831-2201; E-mail: info@us.schott.com; website: www.schott.com.
2. Single Source Responsibility: Provide components and materials specified in this section from manufacturer listed under this section.
3. Substitution Limitations:
   a. Substitutions: In accordance with Contract.

4. Description:
5. Regulatory Requirements:
   a. Listed with UL 723 for use in fire-rated assemblies.
   b. Listed with International Association of Plumbing and Mechanical Officials.
6. Compatibility:
   a. Ensure components and materials are compatible with specified accessories and adjacent materials.

B. Design Criteria: Provide a complete acid waste drain and vent system, as indicated, including, but not limited to, straight lengths of glass pipe, fittings and traps, couplings, hanger supports and accessories. Provide protected pipe for underground burial and recommended adapter couplings to connect other piping materials.

C. Materials:
1. Glass Pipe: KIMAX® Glass Acid Waste Drainline.
   a. Above Ground:
      1) 5 Foot (1.5 m) Pipe Lengths: 6500 Series.
      2) 10 Foot (3 m) Pipe Lengths: 6501 Series.
   b. Underground: 6500 Series.
   c. Comply with the following standards:
      1) ASTM E438.
      2) ASTM C1053.
      3) MIL-P-22561-B.
2. Connectors: KIMAX® compression type bead-to-bead (#6650) and bead-to-plain end (#6661) couplings.
   a. Outer Shell: Encapsulating stainless steel band, 300-series stainless steel.
   b. Coupling Compression Liner: Buna-N-Rubber.
   c. Seal Ring Gasket: Tetra-fluoro ethylene (TFE).
   d. Nut, Bolt: Stainless steel.

2.2 ACCESSORIES

A. Pipe Fittings: Sweeps, bends, reducers, tees, cleanouts, wyes, cup sinks and traps, as provided by the piping manufacturer.

B. Hardware: Adapters, sink outlet assemblies, tailpiece assemblies, gaskets, couplings, and pipe hangers, as provided by the piping manufacturer.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to drain and vent piping system installation.
1. Inform Project Coordinator of unacceptable conditions immediately upon discovery.

3.2 PREPARATION

A. Ensure structure or substrate is adequate to support drain and vent piping system.

B. Demolition/Removal:

3.3 INSTALLATION

A. Coordinate installation of drain and vent piping system in accordance with applicable codes and with manufacturer's instructions.

B. Coordinate drain and vent piping system work with work of other trades for proper time and sequence to avoid construction delays.

C. Install drain and vent piping system plumb or sloped, as indicated.

D. Accurately fit, align, securely fasten and install free from distortion or defects.

E. Glass-to-glass connections shall be made with KIMAX® compression type bead-to-bead and bead-to-plain end couplings – article numbers 6650 and 6661 respectively. Coupling's outer shell, bolt and nut to be made from 300 series stainless steel. Bead-to-plain end coupling outer shell must encapsulate compression liner to prevent cold flow and ensure leak-free joint. Coupling compression liner to be made from Buna-N-Rubber. Seal ring gasket to be made of tetra-fluoro ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°

F. Joints between glass and other types of piping material shall be made with KIMAX® adapters, and/or according to manufacturer's recommendations.

G. Floor and wall penetrations
   a. Glass pipe passing through non-fire rated walls or floor slabs shall be fitted with pipe sleeves a minimum of 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or a non-hardening approved caulking material.
   b. Glass pipe passing through fire-rated walls or floor slabs shall be installed in accordance with Underwriters Laboratory fire penetration systems for KIMAX® Glass Pipe. System numbers listed in the U.L. Fire Resistance Directory include: C-AJ-2006, 2014, 2019, 2039, 2079, 2094, 2118, 2144, 8005, 8035; W-J-2032; W-L-2006, 2112, 2114
   c. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding shall be used to insulate between the two materials.
   d. Glass pipe shall be protected from weld spatter

H. Underground Pipe
   a) Excavation – shall conform to National Plumbing Code A 40.8 Section 2.7.
      1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
      2. A minimum of 4" of properly compacted rock free sand or soil shall be used directly under the pipe.
   b) Buried Pipe
      1. Pipe shall be 6500 series – 5-ft. lengths covered with expanded polystyrene.
      2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J.M. Trans-Tex or approved equal.
   c) Backfill
      Pipe trench shall be back-filled and tamped with rock-free sand or soil to 12" above top of pipe.
      Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

I. Laboratory Sink Connection
   a. Sink outlets, tailpieces, traps, and cup sinks shall be KIMAX® borosilicate glass.

3.4 FIELD QUALITY CONTROL

A. Field, Site Tests an Inspection: Coordinate test with section

_____

(please fill in the appropriate section)

1. Test installation in accordance with the manufacturer's recommendations and the requirements of State, City and local code authorities.

3.5 CLEANING

A. Perform cleanup in accordance with section

_____

(please fill in the appropriate section)

B. Upon completion, remove surplus materials, rubbish, tools, and equipment.
C. Waste Management:
   1. Coordinate recycling of waste materials.
   2. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction, or final cleaning.
   3. Remove recycling containers and bins from site.

3.6 PROTECTION

A. Protect installed product from damage during construction in accordance with Manufacturers recommendations.
B. Repair damage to adjacent materials caused by demolition/installation.

END OF SECTION 226600

Print Form

Job Name:

Job Location:

Engineer:

Contractor:

Representative:

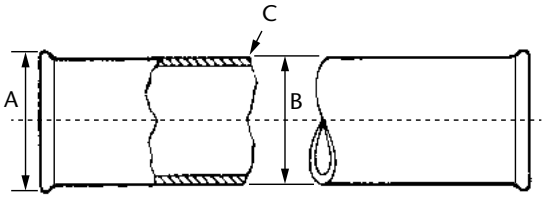
Short Form:
Acid Waste Drain and Vent Piping System
System shall be made of KIMAX® U.L. Classified borosilicate glass and conforming to ASTM Specification C 1053-90, Federal Specificaion DD-G-541-B and Military Specification MIL-P-22561-B (YD) as manufactured by SCHOTT. Glass-to-glass connections shall be made with KIMAX® compression type bead-to-bead and bead-to-plain end couplings – article numbers 6650 and 6661 respectively. Coupling's outer shell, bolt and nut to be made from 300 series stainless steel. Bead-to-plain end coupling outer shell must encapsulate compression liner to prevent cold flow and ensure leak-free joint. Inner seal ring is made of tetra-fluoroethylene. System shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

KIMAX® Product Portfolio
Drawings and Dimensions

Pipe and Fittings

Standard lengths of KIMAX® Drainline Pipe are 5 feet and 10 feet.
Special lengths (both ends beaded) are available on request.

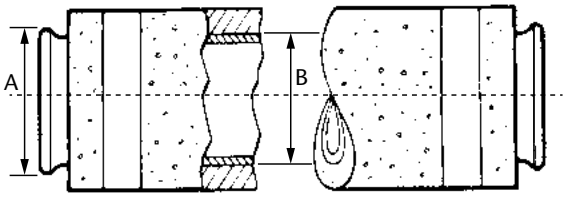
6500 **5-ft. lengths**
6501 **10-ft. lengths**



Size	Weight lbs./ft.	A	B (O.D.)	C (Wall)	5-ft. lengths Art. No.	10-ft. lengths Art. No.	Pcs.
1½	0.87	2.06	1.84	0.18	6500-1500	6501-1500	
2	1.1	2.58	2.34	0.17	-2000	-2000	
3	2.0	3.69	3.41	0.20	-3000	-3000	
4	3.4	4.84	4.53	0.26	-4000	-4000	
6	6.3	7.12	6.66	0.33	-6000	-6000	

HW 7035 **EPS DRAINLINE COVERS**
(for underground use)

EPS covers are designed to surround the pipe – each piece is 2.5' long and covers 180 of the pipe. To completely cover a 5' length of pipe, please use four (4) pieces of EPS. HW 7035 EPS drainline covers are designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.



EPS Covers Art. No.	Pcs.
HW 7035 D-1500	
-2000	
-3000	
-4000	
-6000	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

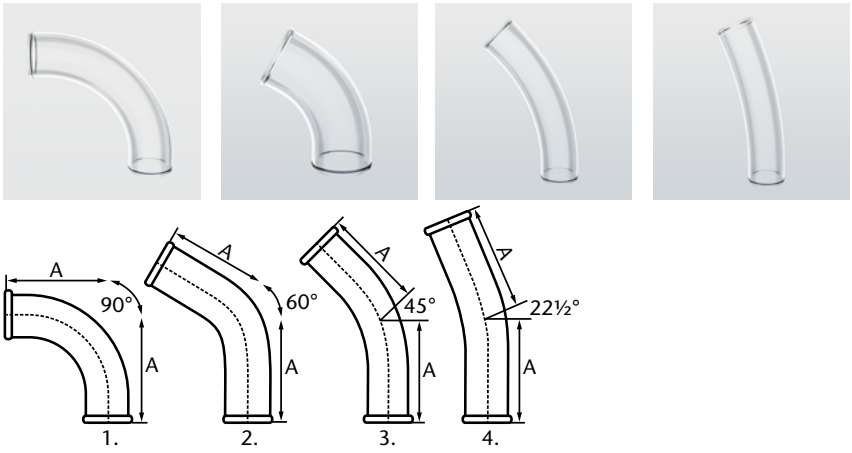
Engineer:

Contractor:

Representative:

6511 SWEEPS

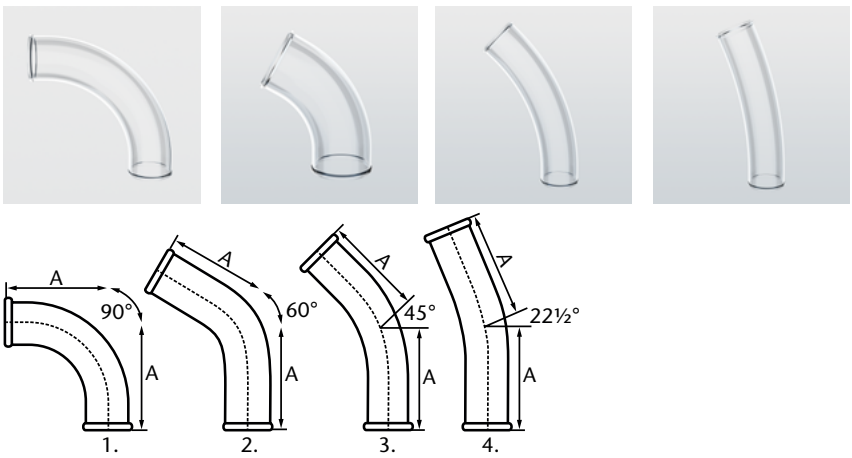
1. ¼ bend (90°)
2. ⅛ bend (60°)
3. ⅛ bend (45°)
4. 1/16 bend (22½°)



Size	A	90° Art. No.	60° Art. No.	45° Art. No.	22½° Art. No.	Pcs.
1½	4½	6511-1590	6511-1560	6511-1545	6511-1522	
2	5	-2090	-2060	-2045	-2022*	
3	6½	-3090	-3060*	-3045	-3022*	
4	9	-4090	-4060*	-4045	-4022*	
6	12	-6090	-6060*	-6045	-6022*	

6513 BENDS

1. ¼ bend (90°)
2. ⅛ bend (60°)
3. ⅛ bend (45°)
4. 1/16 bend (22½°)



Size	A 90°	A 60°	A 45°	A 22½°	90° Art. No.	60° Art. No.	45° Art. No.	22½° Art. No.	Pcs.
1½	3	2½	2	2	6513-1590	6513-1560	6513-1545	6513-1522	
2	3¼	2¾	2¼	2¼	-2090	-2060	-2045	-2022	
3	5	3½	2¾	2¾	-3090	-3060*	-3045	-3022*	
4	7	4½	3¼	3¼	-4090	-4060*	-4045	-4022*	
6	–	–	7	–			-6045		

Offsets made using Standard Sweeps and Bends

Offsets to satisfy differing angles and slopes can be created by using varying combinations of 6511 Sweeps & 6513 Bends. To do so please order the bend/sweeps necessary as well as the appropriate coupling – a 6650 Bead x Bead coupling to construct the offset.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

Job Location:

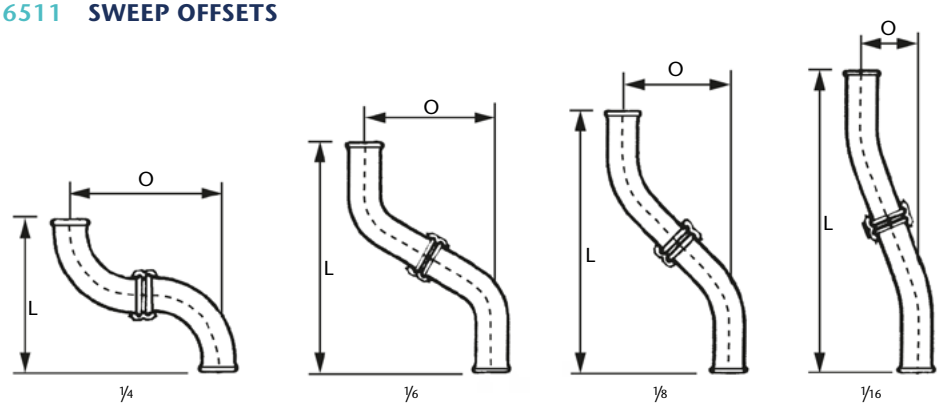
Engineer:

Contractor:

Representative:

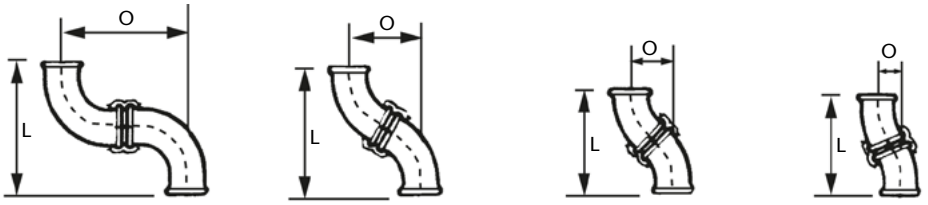
Sweep Offsets and Bend offsets are constructed by using items 6511 and 6513 to meet your particular needs

6511 SWEEP OFFSETS



Size	1/4		1/6		1/8		1/16	
	Length	Offset	Length	Offset	Length	Offset	Length	Offset
1½	9	9	13½	7⅞	15⅜	6⅜	17⅜	3⅜
2	10	10	15	8¾	17⅛	7⅛	19¼	3⅞
3	13	13	19½	11¼	22¼	9¼	25	5
4	18	18	27	15⅝	30¾	12¾	34⅝	6⅞
6	24	24	36	20¾	41	17	46¼	9¼

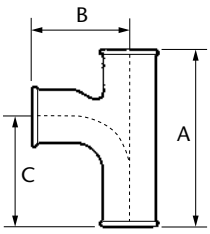
6513 BEND OFFSETS



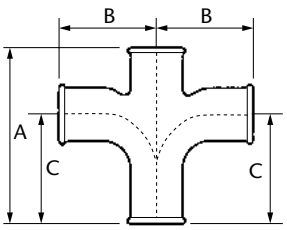
Size	1/4		1/6		1/8		1/16	
	Length	Offset	Length	Offset	Length	Offset	Length	Offset
1½	6	6	7½	4⅜	6⅞	2⅞	7¾	1½
2	6½	6½	8¼	4¾	7¾	3¼	8⅝	1¾
3	10	10	10½	6⅛	9⅜	3⅞	10½	2⅛
4	14	14	13½	7⅞	11⅛	4⅝	10¾	2½

Use catalog dimensions for piping layout as gasket thickness allowance is included.

6521 SINGLE SANITARY T



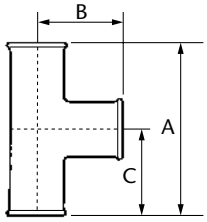
6522 DOUBLE SANITARY T



Special Purpose Bends

Size	A	B	C	Single Art. No.	Double Art. No.	Pcs.
1½ x 1½	6	3½	3¾	6521-1515	6522-1515	
2 x 1½	8	3¾	5	-2015	-2015	
2 x 2	8	4½	5	-2020	-2020	
3 x 1½	12	4¼	7⁷⁄₁₆	-3015	-3015*	
3 x 2	12	5	7⁷⁄₁₆	-3020	-3020	
3 x 3	12	6⅜	7⁷⁄₁₆	-3030	-3030	
4 x 1½	14	4⅞	8¾	-4015	-4015*	
4 x 2	14	5⅝	8¾	-4020	-4020*	
4 x 3	14	7	8¾	-4030	-4030*	
4 x 4	14	8¼	8¾	-4040	-4040*	
6 x 2	20	6¾	12⅜	-6020*	-6020*	
6 x 3	20	8	12⅜	-6030*	-6030*	
6 x 4	20	9⁵⁄₁₆	12⅜	-6040*	-6040*	
6 x 6	20	12	12⅜	-6060*	-6060*	

6523 STRAIGHT T



Size	A	B	C	Art. No.	Pcs.
1½ x 1½	6	3	3	6523-1515	
2 x 1½	8	3¼	4	-2015	
2 x 2	8	4	4	-2020	
3 x 1½	12	4½	6	-3015*	
3 x 2	12	4½	6	-3020	
3 x 3	12	6	6	-3030	
4 x 1½	14	5	7	-4015*	
4 x 2	14	5	7	-4020	
4 x 3	14	6½	7	-4030*	
4 x 4	14	8	7	-4040	
6 x 3	20	7¾	10	-6030*	
6 x 4	20	9	10	-6040*	
6 x 6	20	10	10	-6060*	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

*Manufactured per order/non-returnable.

Print Form

Job Name:

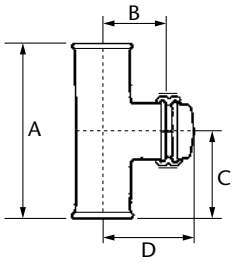
Job Location:

Engineer:

Contractor:

Representative:

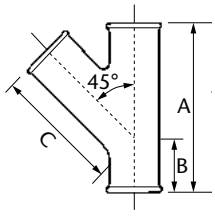
6524 TEST T WITH CLEANOUT



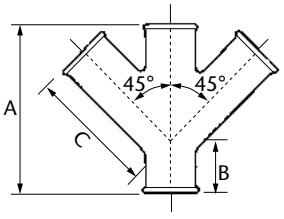
Size	A	B	C	D	Art. No.	Pcs.
1½ x 1½	6	2 3/16	3	3 1/16	6524-1515	
2 x 2	8	2 11/16	4	3 11/16	-2020	
3 x 3	12	3 9/16	6	4 11/16	-3030	
4 x 4	14	4 5/8	7	5 7/8	-4040	

Test T and cleanout comes as complete assembly including cap and coupling.

6526 DRAINLINE Y SINGLE



6527 DRAINLINE Y DOUBLE



Size	A	B	C	Single Y Art. No.	Double Y Art. No.	Pcs.
1½ x 1½	6	1 7/8	4½	6526-1515	6527-1515*	
2 x 1½	8	2½	4¾	-2015	-2015*	
2 x 2	8	2½	6	-2020	-2020*	
3 x 1½	12	3¾	5½	-3015	-3015*	
3 x 2	12	3¾	6¾	-3020	-3020*	
3 x 3	12	3¾	8	-3030	-3030*	
4 x 1½	14	4½	6⅜	-4015*	-4015*	
4 x 2	14	4½	7½	-4020	-4020*	
4 x 3	14	4½	8¾	-4030	-4030*	
4 x 4	14	4½	10	-4040	-4040*	
6 x 2	20	5¾	9	-6020*	-6020*	
6 x 3	20	5¾	10⅜	-6030*	-6030*	
6 x 4	20	5¾	11½	-6040*	-6040*	
6 x 6	20	5¾	14	-6060*	-6060*	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

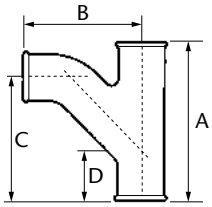
Job Location:

Engineer:

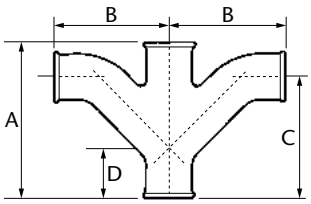
Contractor:

Representative:

6528 COMBINATION Y AND ⅛ BEND – SINGLE

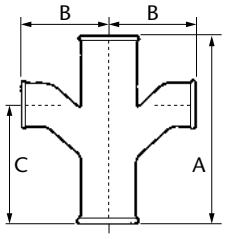


6529 COMBINATION Y AND ⅛ BEND – DOUBLE



Size	A	B	C	D	Single Art. No.	Double Art. No.	Pcs.
1½ x 1½	6	4½	4⅝	1⅞	6528-1515	6529-1515	
2 x 1½	8	4¾	5½	2½	-2015	-2015	
2 x 2	8	6	6¼	2½	-2020	-2020	
3 x 1½	12	5⅜	7¼	3¾	-3015	-3015*	
3 x 2	12	6½	8	3¾	-3020	-3020*	
3 x 3	12	8½	9	3¾	-3030	-3030*	
4 x 1½	14	6	8½	4½	-4015	-4015*	
4 x 2	14	7	9¼	4½	-4020	-4020*	
4 x 3	14	9	10¼	4½	-4030	-4030*	
4 x 4	14	11	11	4½	-4040	-4040*	
6 x 2	20	8¼	11⅝	5¾	-6020*	-6020*	
6 x 3	20	10	12½	5¾	-6030*	-6030*	
6 x 4	20	12	13½	5¾	-6040*	-6040*	
6 x 6	20	15	14½	5¾	-6060*	-6060*	

6531 PARTITION CROSS (compact)



Size	A	B	C	Art. No.	Pcs.
2 x 1½	8	3¾	5	6531-2015*	
2 x 2	8	4½	5	-2020*	
2 x 1½ x 1½ x 1½	8	3¾	5	-2151*	

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

Use catalog dimensions for piping layout as gasket thickness allowance is included.
***Manufactured per order/non-returnable.**

Print Form

Job Name:

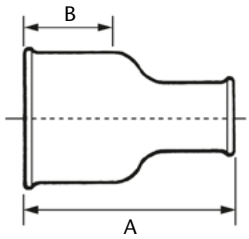
Job Location:

Engineer:

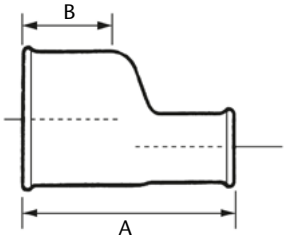
Contractor:

Representative:

6536 STRAIGHT REDUCERS OR INCREASERS



6537 ECCENTRIC REDUCERS OR INCREASERS



Size	A	B (min.)	Straight Art. No.	Eccentric Art. No.	Pcs.
2 x 1½	4	1¾	6536-2015	6537-2015	
3 x 1½	5	2¼	-3015	-3015*	
3 x 2	5	2¼	-3020	-3020*	
4 x 1½	7	3	-4015*	-4015*	
4 x 2	7	3	-4020	-4020*	
4 x 3	7	3	-4030	-4030*	
6 x 1½	9	4	-6015*	-6015*	
6 x 2	9	4	-6020*	-6020*	
6 x 3	9	4	-6030	-6030*	
6 x 4	9	4	-6040	-z6040*	

6544 CLEANOUT PLUG

Size	A	Art.No.	Pcs.
1½	1	6544-1500	
2	1	-2000	
3	1⅛	-3000	
4	1¼	-4000	
6	1½	-6000	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

*Manufactured per order/non-returnable.

Print Form

Job Name:

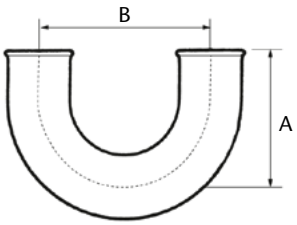
Job Location:

Engineer:

Contractor:

Representative:

6550 **U BEND** (vent loop)



Size	A	B	Art. No.	Pcs.
1½	4	5	6550-1500	
2	4½	5½	-2000	
3	5½	6½	-3000	
4	6½	7½	-4000*	

Note: U bends are often used for vent loops. No. 6705 outlets on Swivel "S" traps are also able to be used as vent loops.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

Job Location:

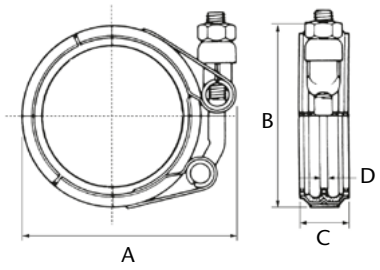
Engineer:

Contractor:

Representative:

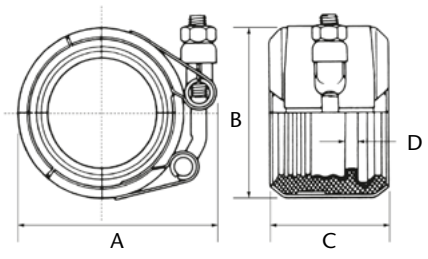
Couplings

6650 DRAINLINE COUPLING (bead to bead)



Size	A	B	C	D	Bolt Size	Art. No.	Pcs.
1½	3	2⅝	1⁵⁄₁₆	³⁄₁₆	¼ – 28 x 2¾	6650-1500	
2	3½	3⅛	1⁵⁄₁₆	³⁄₁₆	¼ – 28 x 2¾	-2000	
3	4¾	4¼	1⁷⁄₁₆	³⁄₁₆	¼ – 28 x 2¾	-3000	
4	6	5½	1½	³⁄₁₆	¼ – 28 x 3¼	-4000	
6	8¼	7¾	1⅞	¼	⁵⁄₁₆ – 24 x 4	-6000	

6661 B/P DRAINLINE COUPLING (bead-to-plain end)



Size	A	B	C	D	Bolt Size	Art. No.	Pcs.
1½	3	2¾	1¾	³⁄₁₆	¼ – 28	6661-1500	
2	3⅜	3¼	1¾	³⁄₁₆	¼ – 28	-2000	
3	4¹¹⁄₁₆	4¼	2⁹⁄₁₆	³⁄₁₆	⁵⁄₁₆ – 24	-3000	
4	6	5⅝	2⁹⁄₁₆	³⁄₁₆	⁵⁄₁₆ – 24 (2)	-4000	
6	8⅝	7⅞	4	¼	⁵⁄₁₆ – 24 (2)	-6000	

No. 6661 B/P drainline coupling is used for joining 1½”, 2”, 3”, 4” or 6” KIMAX® Beaded Glass Drainline to plain end (cut) glass pipe; lead, I.P.S. metal, or plastic pipe.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

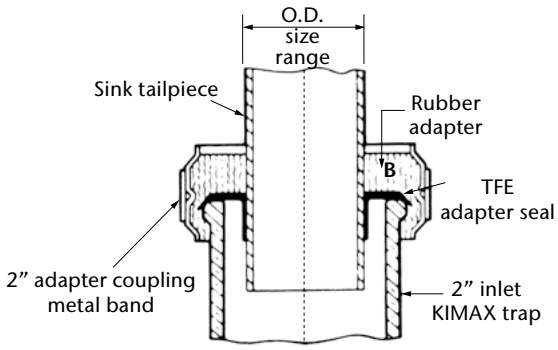
Engineer:

Contractor:

Representative:

6655 ADAPTER COUPLING FOR UNTHREADED PIPE

No. 6655 adapter assembly is used to join KIMAX® Drainline Pipe and/or fittings to plain end sink tailpieces.

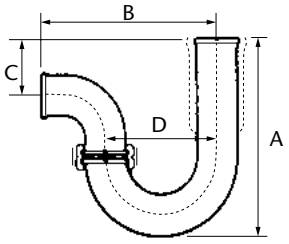


Size	Tailpiece Style	O.D. Size Range	Art. No.	Pcs.
2 x 1½	KIMAX® glass tail pipe extension No. 6728, metal tubing, and lead tailpiece extensions	1.48 to 1.53	6655-2015	
2 x 1¾	Lead, Class D or XL tailpiece PYREX tailpiece and cup sink	1.70 to 1.78	-2017	
2 x 1⅞	Plain end KIMAX® 1½ glass pipe or fittings Durcon = SO-2 Duriron = 11713 Lead-Class C or L, B or M Plastic or Steel (1½ IPS)	1.82 to 1.90	-2018	

Drainline Traps

6700 SWIVEL TRAP-P STYLE

No. 6700 (short outlet) swivel "P" trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX® Coupling at the swivel joint.



Size Inlet x Outlet	A	B	C	D	Art. No.	Pcs.
1½ x 1½	8¾	8	2	5	6700-1515	
2 x 1½	8¾	8	2	5	-2015	
2 x 2	9¹¹⁄₁₆	8¾	1⅝	5½	-2020	

Expanded inlets of traps have 4" minimum depth to permit adjustment.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

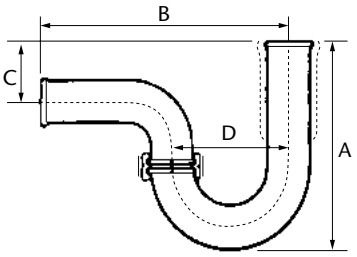
Engineer:

Contractor:

Representative:

6701 SWIVEL TRAP-P STYLE

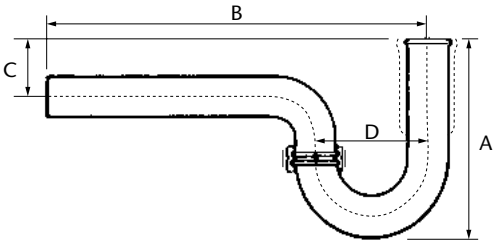
No. 6701 (long outlet) swivel "P" trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX® Coupling at the swivel joint.



Size Inlet x Outlet	A	B	C	D	Art. No.	Pcs.
1½ x 1½	9 11/16	11	1⅝	5	6701-1515	
2 x 1½	8¾	11	1⅝	5	-2015	
2 x 2	8¾	13	1¼	5½	-2020	

6704 SWIVEL TRAP-P STYLE (Plain end outlet[1])

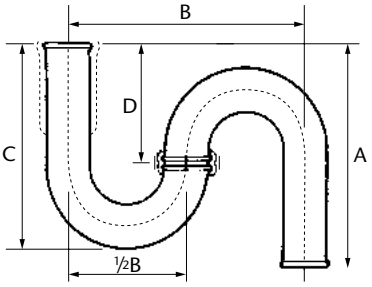
No. 6704 (plain end outlet) swivel "P" trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX® Coupling at the swivel joint.



Size Inlet x Outlet	A	B	C	D	Art. No.	Pcs.
1½ x 1½	8¾	17	1⅝	5	6704-1515	
2 x 1½	8¾	17	1⅝	5	-2015	
2 x 2	9 11/16	17½	1¼	5½	-2020	

[1] Plain end outlet, can be field cut.

6706 SWIVEL TRAP-S STYLE



Size Inlet x Outlet	A	B	C	D	Body I.D.	Art. No.	Pcs.
1½ x 1½	9	8	1	4¾	3	6706-1515*	
2 x 1½	9	8	1½	4¾	3	-2015*	
2 x 2	9¾	9¼	2	5½	4	-2020*	

No. 6706 swivel "S" trap consists of two No. 6705 inlets and a No. 6650 KIMAX® Coupling at the swivel joint. Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

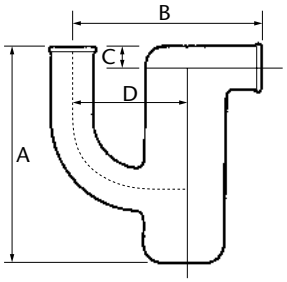
Job Location:

Engineer:

Contractor:

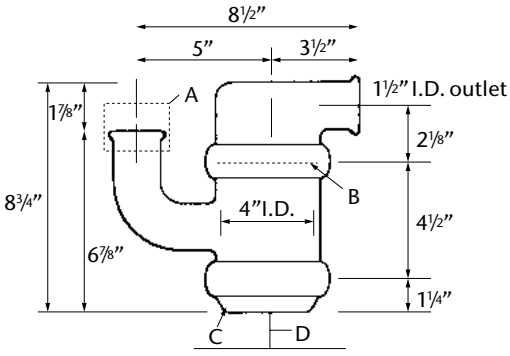
Representative:

6707 DRUM TRAP-P STYLE



Size Inlet x Outlet	A	B	C	D	Art. No.	Pcs.
1½ x 1½	10	10	8¾	5	6707-1515	
2 x 1½	10	10	8¾	5	-2015	
2 x 2	9¾	11	9 11/16	4⅞	-2020	

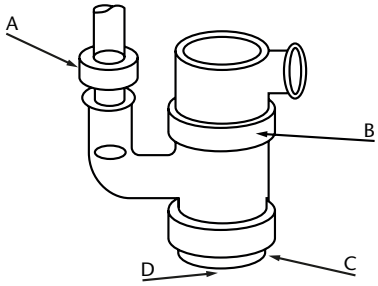
6708 INTERCEPTOR TRAP



Size	Description	Art. No.	Pcs.
1½ x 1½	Interceptor Trap	6708-4015	
1¼ O.D. Inlet	Adapter Seal	6665-1512	
1½ O.D. Inlet	Adapter Seal	6665-1515	

Specifications:
KIMAX® borosilicate glass interceptor trap with 1½" I.D. inlet, 1½" I.D. outlet and 4" I.D. body. Perforated S.S. screen interceptor 4" dia. with 1/16" holes and effective 6 sq. in. free area opening. Bottom C.O. coupling with end cap for cleaning.

Connections:
1. For DWV Service use KIMAX® Adapter Coupling 6665-1515 for 1½" O.D. tubing or 6665-1512 for 1¼" O.D. tubing. Rubber seal only.
2. To connect to 1½" IPS metal or rigid plastic plain end pipe, use KIMAX® B/P Coupling 6661-1500.
3. To connect to 1½" I.D. glass drainline, use KIMAX® Couplings 6650-1500 or 6661-1500.



A. Adapter seal No. 6665-1512 (to connect to ¼" O.D. tubing) (rubber seal)
No. 6665-1515
(to connect to 1½" O.D. tubing)
B. Perforated S.S. screen 1/16" dia. holes 6 sq. in. free area opening
C. Removable coupling/end cap for cleanout
D. Min. 3" clearance required under trap for removal of end cap

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

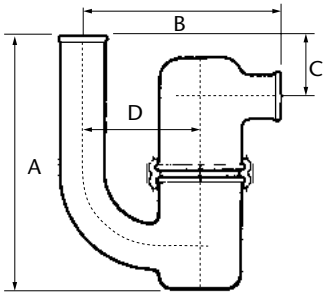
Job Location:

Engineer:

Contractor:

Representative:

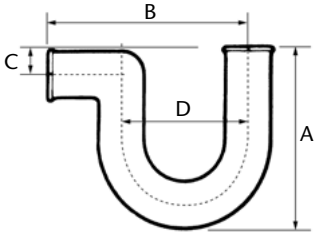
6710 SWIVEL DRUM TRAP-P STYLE



Size Inlet x Outlet	A	B	C	D	Body I.D.	Art. No.	Pcs.
1½ x 1½	10¼	8	2½	4¾	3	6710-1515	
2 x 1½	10¼	8	2½	4¾	3	-2015	
2 x 2	11	9¼	3	5½	4	-2020	

6718 TRAP-P STYLE

Has expanded inlet.



Size Inlet x Outlet	A	B	C	D	Art. No.	Pcs.
1½ x 1½	7	8	1	5	6718-1515*	
[1)]2 x 1½	8	8	1½	5	-2015*	
[1)]2 x 2	8 3/16	8¾	1½	5½	-2020*	
3 x 3	10¼	10½	2	6½	-3030*	
4 x 4	12¼	12½	2½	7½	-4040*	
6 x 6	18⅜	31	3⅜	24	-6060*[1]	

[1] Use No. 6655 adapter coupling for inlet joint.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

Job Location:

Engineer:

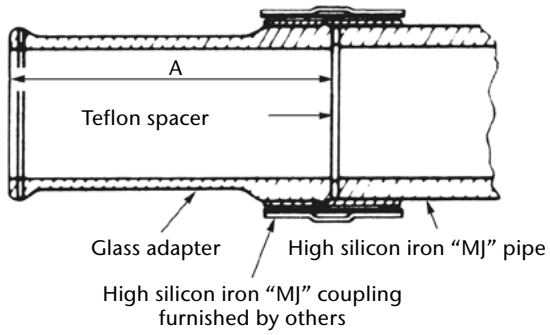
Contractor:

Representative:

Accessories and Hardware

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX® glass drainlines with No. 6650 coupling. All TFE construction.

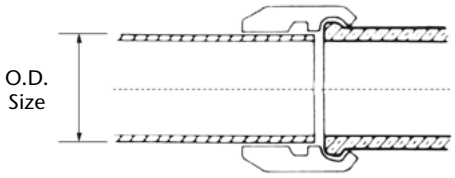
6566 "MJ" PIPE ADAPTER[1)]



Pipe Size	A	Art.No.	Pcs.
1½	3½	6566-1500	
2	4	-2000	
3	5	-3000	
4	6	-4000	

Glass Adapter to High Silicon Iron "MJ" Pipe.
[1)]6566 "MJ" Pipe Adapter consists of glass adapter and 6740 teflon spacer.

6665 ADAPTER SEALS



Size	Tailpiece Style	Art. No.	Pcs.
1½ x 1¼	1¼ O.D. tubing	6665-1512*	
1½ x 1½	1½ O.D. tubing	-1515	

Used to join 11/2" beaded KIMAX® Drainline Pipe to 11/4" or 11/2" O.D. tubing.
Note: Rubber seal only – not recommended where solvents will come in contact with the coupling seal.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

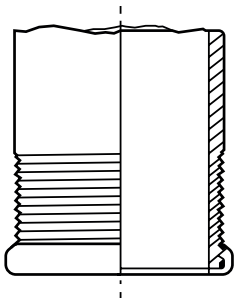
Engineer:

Contractor:

Representative:

6680 THREAD ADAPTERS (threaded to beaded pipe)

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX® glass drainlines with No. 6650 coupling. All TFE construction.

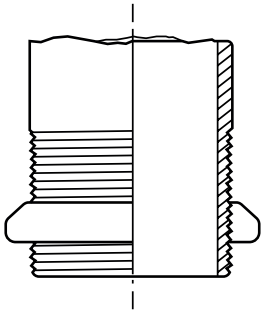


Size	Art. No.	Pcs.
1½	6680-1500	
2	-2000	
3	-3000	
4	-4000	

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 11/2" metal to 11/2" glass). Ideal for floor drain connections. In 11/2", 2", 3", and 4" sizes.

6685 ADJUSTABLE THREAD ADAPTER

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX® Glass Drainlines with No. 6650 coupling. All TFE construction.



Size	Art. No.	Pcs.
2 x 1½	6685-2015	

Adapter No. 6685 is designed to mate 11/2" threaded tailpieces to 2" expanded inlets for KIMAX® Traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 11/2" size only.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

***Manufactured per order/non-returnable.**

Print Form

Job Name:

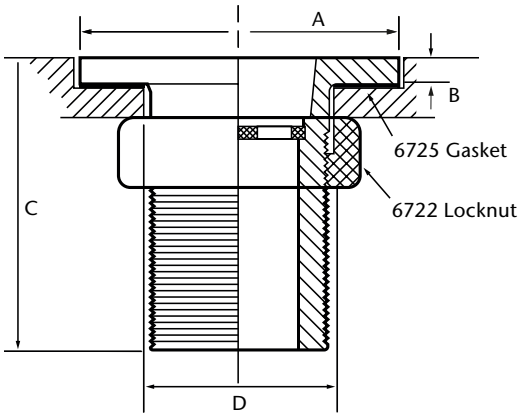
Job Location:

Engineer:

Contractor:

Representative:

6720 SINK OUTLET ASSEMBLY (1½" and 2" sizes)

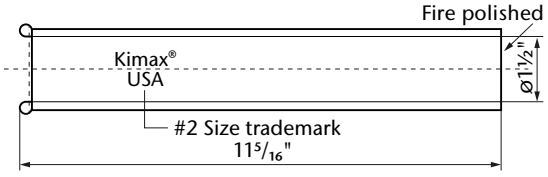


Size	A	B	C	D	Art. No.	Pcs.
1½	3⅜	¼	2¾	2	6720-1500	
2	3¹⁵⁄₁₆	¼	3	2⅝	-2000*	

Consists of: 6724 sink strainer (black fluorocarbon plastic) 1½" or 2"
6721 and 6721D sink outlet (black fluorocarbon plastic)
6725 gasket-neoprene
6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. 1½" and 2" size sink outlets are designed to accept standard overflows.

6500 S 264 TAILPIECE



Size	Art. No.	Pcs.
11⁵⁄₁₆ x 1½	6500 S 264	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

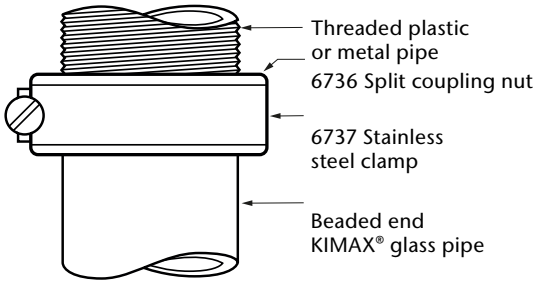
Job Location:

Engineer:

Contractor:

Representative:

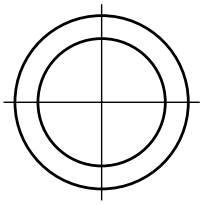
6735 1½" SPLIT COUPLING (threaded to beaded pipe)



Size	Art. No.	Pcs.
1½	6735-1500	

No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" I.P.S. pipe.
The assembly consists of: No. 6736 split coupling nut, No. 6737 stainless steel clamp.
To install, remove clamp from split nut. Place split nut over beaded glass end.
Replace clamp and tighten with screw driver.
Use gasket No. 6739 when connecting KIMAX® glass pipe to threaded metal pipe, using No. 6735 split coupling.

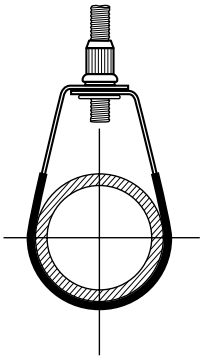
6739 GASKET



Size	Art.No.	Pcs.
1½	6739-1500	

To ensure proper application of our split coupling (No. 6735) be sure to also accompany it with our gasket (No. 6739).

7290 (1½", 2", 3", 4", 6" SIZES) PIPE HANGERS (padded)



Size	Thread Diameter	Art. No.	Pcs.
1½"	⅜ – 16	7290-1500	
2"	⅜ – 16	-2000	
3"	⅜ – 16	-3000	
4"	⅜ – 16	-4000	
6"	½ – 13	-6000	

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. zinc coating.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

Engineer:

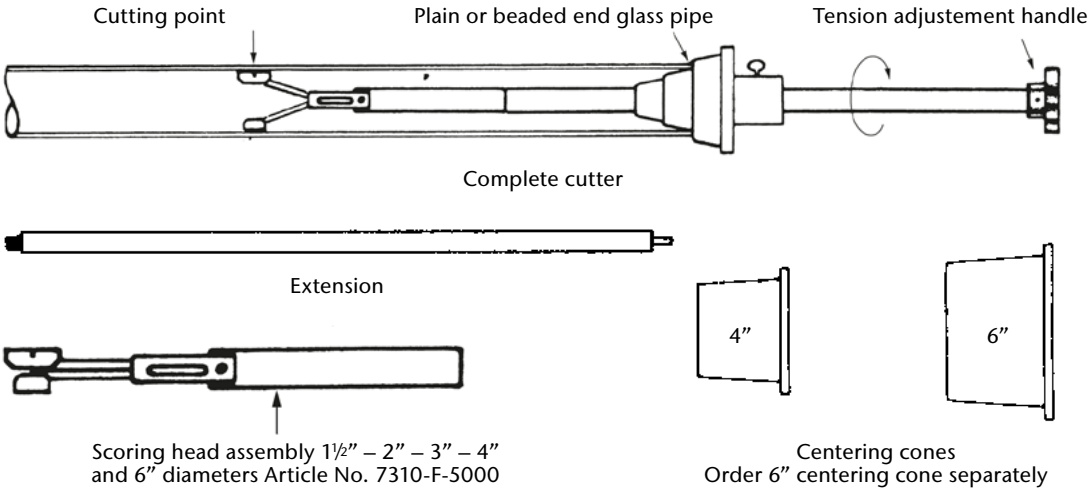
Contractor:

Representative:

Portable Field Cutting Tools

With the KIMAX® portable glass pipe cutter you can cut 11/2” – 6” glass drainline pipe anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm sub-assembly and 11/2” – 4” centering cones and ring stop as shown. Order 6” centering cone separately.

7310-56802 KIMAX® PORTABLE GLASS PIPE CUTTER



Cutter & Spare Parts 570

1. Portable cutter for 1½", 2", 3", 4", and 6" KIMAX® glass pipe A cone for cutting 6" pipe must be ordered separately.	Article No. 7310-56802
2. Six (6") inch pipe centering cone	Article No. 7310-J-4179
3. Scoring head sub-assembly for 7310-56802 cutter	Article No. 7310-F-5000
4. Replacement cutter/roller assembly Includes the housing with two roller guides and a cutter wheel mounted in place. Sold as assembly only.	Article No. 7310-F-4122
5. Replacement roller assembly Includes the housing with two roller guides mounted in place. Sold as assembly only.	Article No. 7310-F-6000
6. Tail piece cutter	Article No. 7310-1079
7. Thirty (30") inch extension rod	Article No. 1083440

	Art.No.	Pcs.
	7310-56802	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

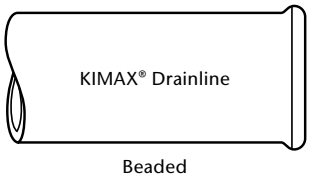
Engineer:

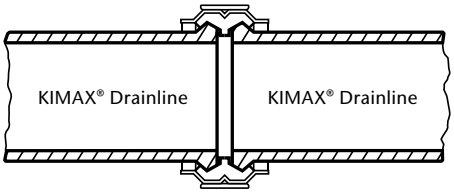
Contractor:

Representative:

Typical Joint Reference Chart

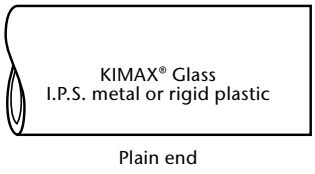
Type of Pipe	Type of Joint	Material needed

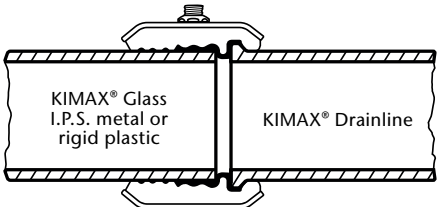




KIMAX® 6650 Bead to Bead Drainline Coupling

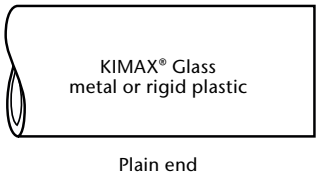
Size	Art. No.	Pcs.
1½	6650-1500	
2	-2000	
3	-3000	
4	-4000	
6	-6000	

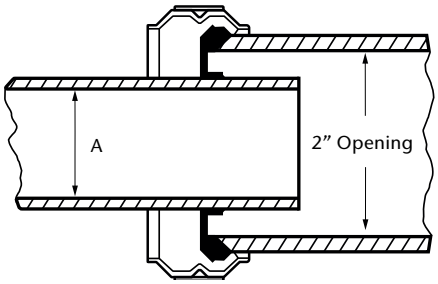




KIMAX® 6661 Bead to Plain Drainline Coupling

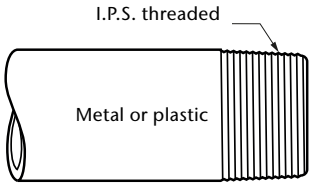
Pipe Size	Art. No.	Pcs.
1½	6661-1500	
2	-2000	
3	-3000	
4	-4000	
6	-6000	

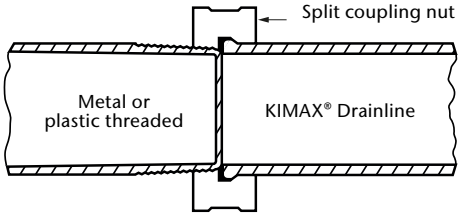




KIMAX® 6655 Drainline Adapter Coupling

“A” Dimension Pipe O.D.	Coupling Size	Art. No.	Pcs.
1.48–1.53	2 x 1½	6655-2015	
1.70–1.78	2 x 1¾	-2017	
1.82–1.90	2 x 1⅞	-2018	





KIMAX® 6735 1 1/2" Split Coupling (Threaded to Beaded)

Pipe Size	Coupling Art. No.	Gasket Art. No.	Pcs.
1½	6735-1500	6739-1500	

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

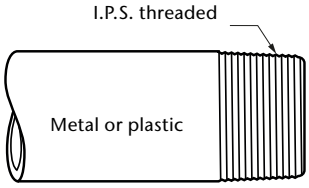
Job Location:

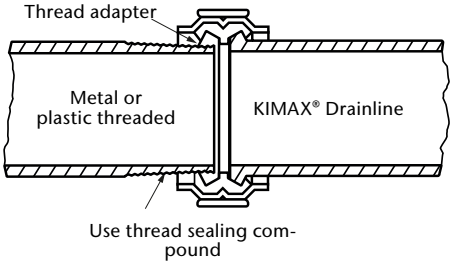
Engineer:

Contractor:

Representative:

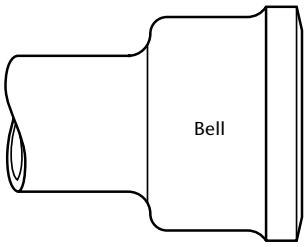
Type of Pipe	Type of Joint	Material needed

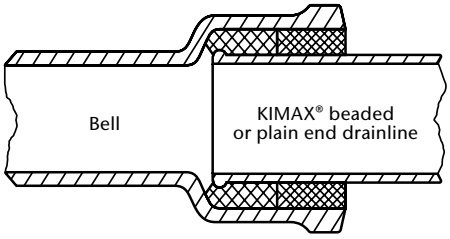




KIMAX® Thread Adapter and Drainline Coupling

Pipe Size	Adapter Art. No.	Coupling Art. No.	Pcs.
1½	6680-1500	6650-1500	
2	-2000	-2000	
3	-3000	-3000	
4	-4000	-4000	

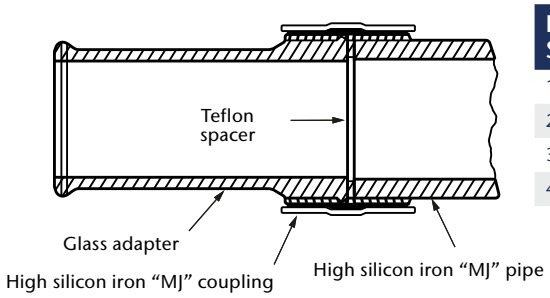




KIMAX® Glass-to-Bell End Pipe

1. Pack hub half full with non-asbestos rope.
2. Caulk with hot lead, lead wool or acid-proof cement.
   Please see Drainline Installation section on pg 36.

Glass Adapter to High Silicon Iron "MJ" Pipe



Pipe Size	Adapter Art. No.	MJ Coupling	Pcs.
1½	6566-1500	furnished	
2	-2000	by others	
3	-3000		
4	-4000		

Use catalog dimensions for piping layout as gasket thickness allowance is included.

Print Form

Job Name:

Job Location:

Engineer:

Contractor:

Representative:

Installation Guide and Videos

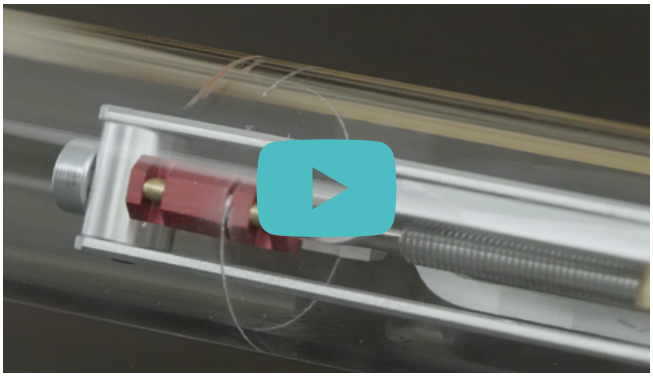
Complete System, Reliable, Easy to Install

These four instructional videos provide you an overview of how easy it is to install, hang, field cut and work with the KIMAX® borosilicate glass system. Once you have watched them you can find more in-depth installation information on the following pages. As always, if you have any questions contact your local distributor or the KIMAX® experts at SCHOTT North America.

ASSEMBLING KIMAX® DRAINLINES

Borosilicate glass is more rigid than most materials, requiring fewer hangers and joints. Padded tear- or pear-shaped hangers protect the glass from metal contact, while riser clamps are needed for vertical installation.

CUTTING KIMAX® DRAINLINES



Tools needed to cut borosilicate glass pipe that are not on a standard jobsite include a map gas torch and a tubular glass cutter. The cutter scores the glass pipe from the inside, while the torch is used to help separate the glass sections.

JOINING KIMAX® GLASS PIPES

KIMAX® uses two types of couplings: one that connects standard beaded pipes (B-B) together and another that connects beaded pipe to pipe cut on the jobsite (B-P). Because force is applied uniformly around the pipe, there are no special tools required when tightening the couplings.

INSTALLING KIMAX® DRAINLINES UNDERGROUND

The toughness and durability of KIMAX® glass drainline is demonstrated by its superior performance in thousands of underground installations. Underground drains have more exacting performance criteria than above-ground drains.

KIMAX® Glass Drainline Installation
Simple, Rugged and Reliable

Easy to install
With few exceptions, KIMAX® glass drainline installs in much the same manner as you would install any drainline system. It is fast and inexpensive – even faster and less costly than less effective materials like polypropylene pipe. Here's why:

- Glass pipe is lightweight and doesn't sag, even when it's hot. So, it requires fewer hangers than high silicon iron or plastic pipes. The recommended hanger spacing for all sizes of KIMAX® glass drainlines is every 8–10'. Polypropylene pipe manufacturers recommend hangers every 4–6' depending on the pipe diameter.

- Since glass pipe has a low coefficient of expansion, no expansion loops or joints are needed. Its coefficient of expansion – 0.2"/100 ft/100°F – is lower than any other drainline material. Polypropylene pipe needs expansion joints and/or loops.

- The UL classified firewall penetration system is simple, easy to install and effective.

- Couplings for KIMAX® glass drainlines require no field beading, welding, or fusion. To assemble a drain or vent system with the KIMAX® bead-to-plain coupling, the pipe is merely cut, inserted into the coupling, and a bolt is tightened. The two pieces of pipe can even be up to 4° out of line.

KIMAX® pipe and fittings possess good mechanical strength, so you don't need to handle the system with kid gloves.

There is no limit to the length or height to which KIMAX® glass drainline can be installed. It can be enclosed within a wall, if permitted by code. It can be buried in the ground, underneath concrete, or inside a trough or sleeve.

For above ground installation, drainline pipe is available in 5' and 10' lengths in diameters from 1.5" through 6". For underground use, 5' lengths should be protected with an expanded polystyrene casing. The system also includes a complete line of glass fittings and traps, plus the accessories and hardware to meet virtually any laboratory drain and vent system requirements.

KIMAX® drainline weighs less than conventional drainline materials, so it's easy to handle, fewer hangers and joints are required, and sections can be preassembled and carried to the point of installation. Expansion is negligible, therefore expansion joints are not needed or recommended.

Simple, leak-proof joints
Conventional glass-to-glass connections are made quickly and simply using #6650 KIMAX® couplings. Just as easily, you can join 1.5", 2", 3", 4" and 6" glass (beaded end) drainline to plain end glass, metal or rigid plastic pipe using #6661 KIMAX® B/P (Bead-to-Plain End) couplings. See opposite page for details.
When properly installed both couplings will provide leak-free joints – even with line deflections of up to four degrees. With B/P couplings and the KIMAX® portable glass cutter, you can cut and join 1.5" through 6" glass drainline anywhere on the jobsite.

Caution: Suitable safeguards for equipment and personnel must be provided when glass pipe is used under gas pressure, due to the potential energy of gases under pressure or vacuum.

KIMAX® Glass Drainline Couplings
Easy, Quick and Secure

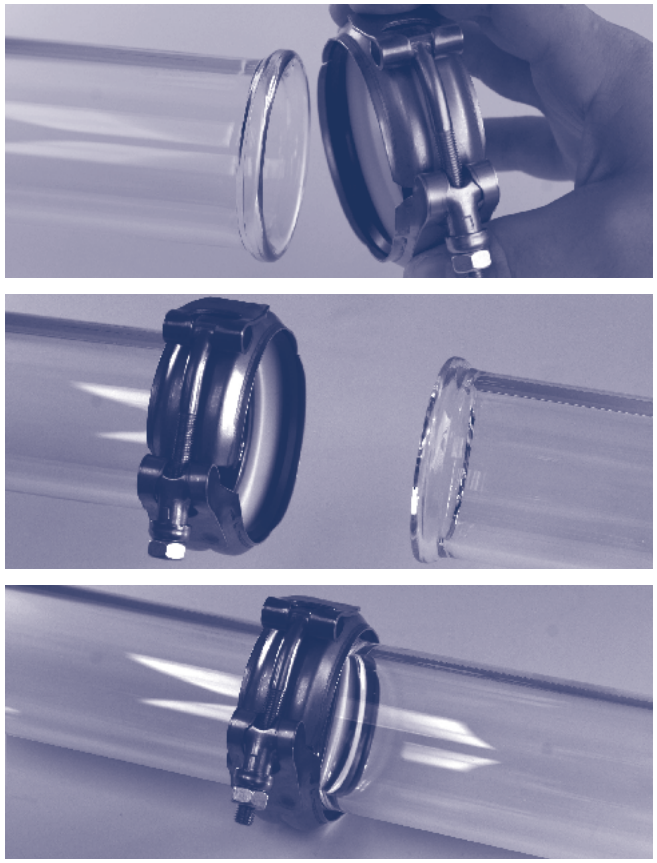
Two types of couplings are used to join KIMAX® glass drainline pipes and fittings – bead-to-bead and bead-to-plain end. Both types have a 300-series stainless steel outer shell, a Buna-N compression liner, and a TFE seal ring. With a KIMAX® coupling, only glass and TFE contact the fluid.

#6650 KIMAX® Bead-to-bead (B/B) coupling

Bead-to-bead (B/B) couplings are formed by placing the two beaded drainline ends into a coupling and tightening the bolt. This type of coupling is normally used when installing long runs of pipe that require no cutting. KIMAX® glass drainline comes from the factory with a bead on each end. When the pipe must be cut in the field, use the KIMAX® Bead-to-Plain end coupling.

- Dip coupling in water or wet inside with damp cloth.
- Snap coupling over one end of pipe and then stab other section of pipe into opposite side of the coupling. Start coupling from side opposite bolt as shown in top photo. Push and apply rotational pressure to snap coupling over bead.
- Tighten coupling bolt with 6“ ratchet wrench.

Bead-to-Bead End

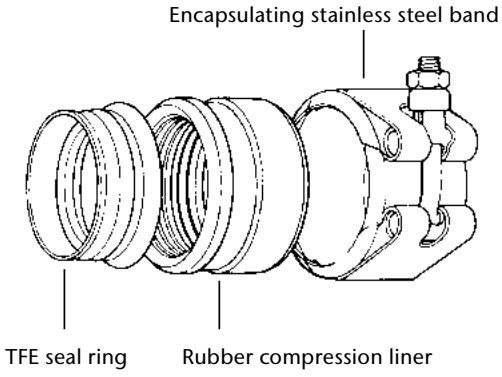


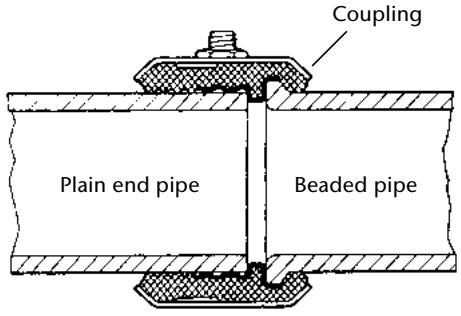
#6661 KIMAX® Bead-to-Plain (B/P) coupling

Bead-to-plain end (B/P) couplings eliminate field beading and are applied when pipe needs to be field cut. Only one pipe or fitting end requires a bead. The other pipe end needs only to be cut. To form a B/P joint, the outside edge of the cut pipe is wiped with an emery cloth to eliminate the sharp edge. The beaded pipe end is wetted, the two pipe ends are placed into the coupling, and the bolt tightened. The KIMAX® B/P coupling has performed successfully in the field for more than 30 years, including underground installations. With KIMAX® B/P couplings, installation labor is minimized and the possibility of error in forming a bead in the field is eliminated.

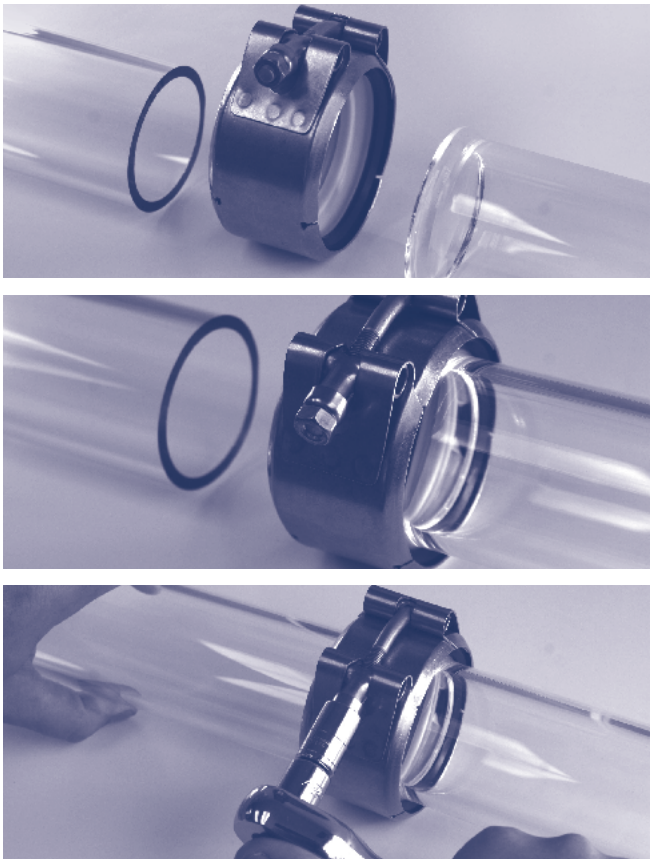
- Wipe beaded end of glass pipe with damp cloth.
- Snap coupling over beaded end of pipe as described for #6650 Drainline Coupling.
- Insert (do not force) plain end of pipe into opposite side of coupling, making certain that the plain end is fully seated in the white Teflon® liner.
- Tighten coupling bolt(s) with 6“ ratchet wrench.

With B/P couplings and the KIMAX® Portable Glass Pipe Cutter, you can cut and join 1.5“ thru 6“ beaded to plain end glass drainline anywhere on the jobsite.





Bead-to-Plain End



KIMAX® B/P couplings Passed the Following Tests

- **Simulated 20-year underground corrosion test:** Immersion in hydrochloric, nitric and sulfuric acid (pH of 2.6) or sodium hydroxide (pH of 8.0) for 15 days at 186°F, KIMAX® B/P couplings still did not leak and retained their strength. They will not pull apart, even with a 375-pound pull force.
- **Thermocycle test:** With the two pipes deflected 4°, the KIMAX® B/P coupling was subjected to thermocycles from 0°F to 200°F. A 25 psi pressure check showed no leakage after any of the temperature cycles, and a 375-pound pull would not pull the coupling apart.
- **Deflection testing:** While under 25 psi internal pressure, the coupling was flexed over its 4° deflection range 15,000 times. No leakage occurred and the coupling still would not pull apart with a 375-pound pull.

(Details of the B/P coupling tests, performed by Pittsburgh Testing Laboratories, are available upon request.)

KIMAX® Glass Drainline for Underground Installation

The long-lasting and durable solution

The toughness and durability of KIMAX® glass drainline is demonstrated by its superior performance in thousands of underground installations. Underground drains have more exacting performance criteria than above-ground drains.

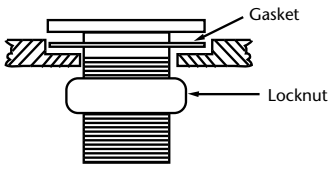
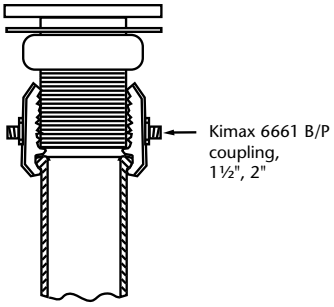
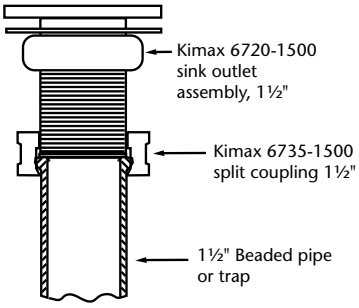
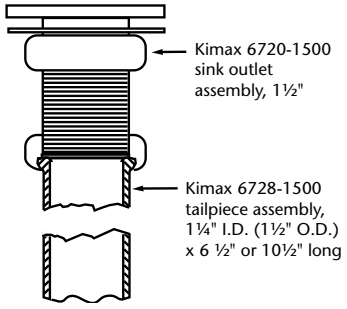
KIMAX® glass pipe is corrosion resistant; it can handle future anticipated requirements. And glass pipe is not affected by external corrosion either. KIMAX® glass drainlines are unaffected by lime, moisture, and other materials in the soil. The smooth, non-porous surface of a KIMAX® glass drainline minimizes plugging and scale build-up – an important feature for buried pipe.

KIMAX® Glass Drainlines are also tough enough to withstand the rigors of underground installation methods. EPS*-covered KIMAX® glass drainlines meet or exceed ASTM requirements for buried heavy schedule cast iron pipe. EPS-covered KIMAX® glass drainline passes the ASTM three edge bearing test, the impact test, and the earth loading test. (Testing report from Pittsburgh Testing Laboratory available upon request.)

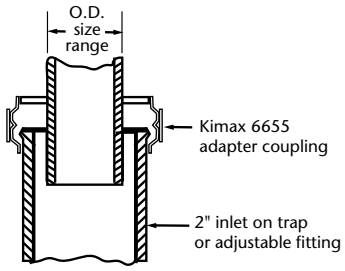
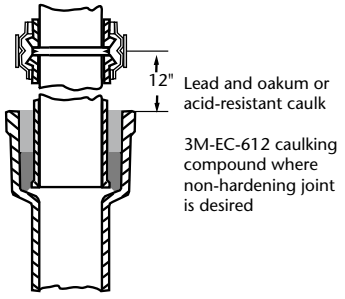
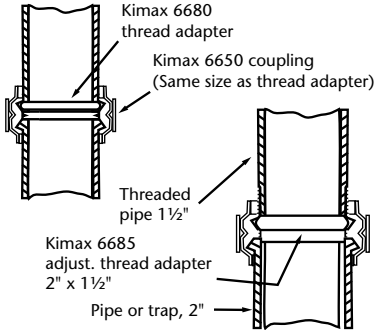
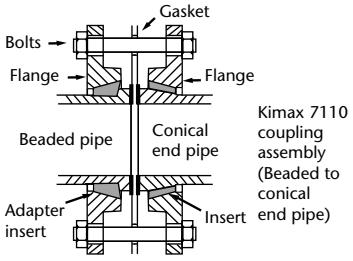
KIMAX® B/P couplings not only resist internal and external corrosion, but their ability to deflect up to 4° without leaking allows buried KIMAX® glass drainlines to flex with shifting ground conditions.

*EPS is Expanded Polystyrene

Typical Joint Reference Chart

Type of Joint	Materials Needed	Steps to be Taken
Installing KIMAX® Sink Outlet		1. Drill hole in sink bottom as indicated for size outlet being installed. 2. Drill counter bore to proper diameter and depth. 3. Smooth bottom of counter bore and insert gasket. 4. Remove locknut and insert outlet through sink hole 5. Screw locknut tight against sink bottom 6. Seal gap between outlet lip and counter bore with acid-resistant 3M-EC-612 caulking compound or equivalent. **Note:** Install stainless steel in same manner as above.
1.5“, 2“ KIMAX Sink Outlet to KIMAX Beaded Pipe or Trap (same size)		1. Snap coupling over beaded end of pipe or trap. 2. Slide opposite (grooved) side of coupling onto threaded outlet. Do not force but make certain that outlet end is fully seated in coupling. 3. Tighten coupling bolt with 6“ ratchet wrench.
1.5“ KIMAX (or plastic or metal I.P.S. threaded) Sink Outlets to 1.5“ KIMAX Beaded Pipe or Trap		1. Remove clamp from split coupling. 2. Position coupling halves over glass bead. 3. Replace and tighten clamp. 4. Screw coupling onto threaded outlet. **Note:** Use 6739 Gasket when connecting KIMAX beaded pipe or trap to metal threaded sink outlet.
1.5“ KIMAX (or plastic or metal I.P.S. threaded) Sink Outlets to 1.5“ KIMAX Tailpiece Assembly		• Slide plastic nut up to top (beaded end) of tailpiece. • Screw nut onto threaded outlet. **Note:** Use 6738 Gasket when connecting glass tailpiece to metal threaded sink outlet.

Size Outlet	Hole	Counter-bore
1½"	2"	3½" x 5/16"
2"	2½"	4 1/16" x 5/16"

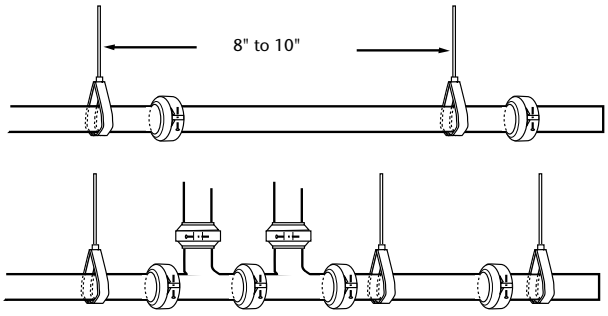
Type of Joint	Materials Needed	Steps to be Taken
1.5“ KIMAX® (or other glass, metal or plastic) Plain End Tailpiece or Plain End Cupsink to 2“ KIMAX Trap Inlet Or Adjustable Fitting	 1½" x 1¼" O.D. #6665-1512 1½" x 1½" O.D. #6665-1515 with rubber seal only	1. Snap coupling over beaded end of trap inlet. 2. Slide coupling up over plain and tail-piece or cup sink to desired height. 3. Tighten coupling bolt with 6 inch ratchet wrench. **Note:** Use KIMAX adapter coupling 2“ x 1½“ to connect to Pyrex sink outlet or plain end cupsink.
KIMAX Beaded Or Plain End Pipe to Metal Bell and Spigot Type		1. For line flexibility, place coupling within 12 inches of caulked joint. 2. If using plain-end glass pipt, smooth external rough edges with fine carborundum stone or 150-grit emery cloth. 3. Insert glass into hub using care so as not to scratch glass. Pack space between glass and hub firmly with non-combustible packing material – then back off glass ½“ to ½“ from base of hub. 4. If using lead pour in lead* at lowest temperature and caulk lightly with an acid-resistant caulk. **Note:** If lead is used, preheat glass first until water drop sizzles. *Pack with lead wool if joining glass to vitreous tile hub.
Metal or Plastic I.P.S Threaded Pipe (straight or tapered, 1.5“, 2“ 3“, 4“ or 6“ to KIMAX Beaded Pipe or Trap (same size)		1. Screw thread adapter onto threaded pipe until it “bottoms“. With adjustable adapter, screw into threaded pipe until desired height adjustment is reached. 2. Snap coupling over adapter. 3. Stab beaded pipe or trap into opposite side of coupling. 4. Tighten coupling bolt with 6 inch ratchet wrench. **Note:** Use 6685 Adjust. Adapter to join 1½“ threaded pipe to 2“ KIMAX beaded trap or pipe.
KIMAX (conical end) Process Pipe, 1.5“, 2“, 3“, 4“ or 6“ to KIMAX Beaded Pipe or Trap (same Size)		1. Disassemble coupling and remove inserts 2. Slide proper flange over conical end pipe and snap in flange insert. 3. Slide other flange over beaded end pipe and snap in flange adapter insert. 4. Slide both flanges firmly against pipe ends. 5. Insert gasket between pipe ends. 6. Replace bolts and tighten nuts evenly.

Coupling Size	Tailpiece Style	O.D Size Range
2 x 1½	KIMAX Glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions.	1.48 to 1.53
2 x 1¾	Lead, Class D or XL tailpiece PYREX tailpiece and cup sink	1.70 to 1.78
2 x 1⅞	Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon # SO-2 Duriron #11713 Lead – Class C or L, B or M Plastic or Steel (1½ IPS)	1.82 to 1.90

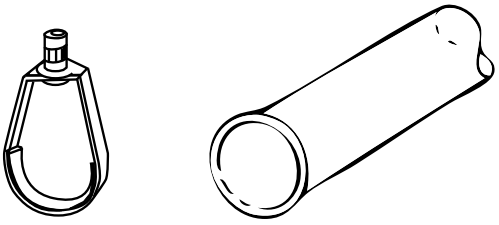
Hanging KIMAX® Drainline – Horizontally

- Use padded hangers (to prevent glass to metal contact) to support lines every 8 feet to 10 feet.
- Use extra hanger when three or more couplings fall within 8 foot to 10 foot span.

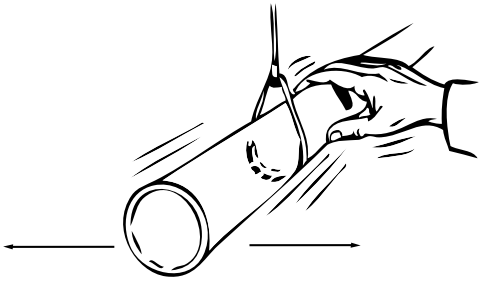
Note: Appropriate padded hangers are available from Schott North America Inc.



- Do not pull or spring pipe into place. Move hanger to pipe, not pipe to hanger.
- Completely tighten coupling as each joint is made.

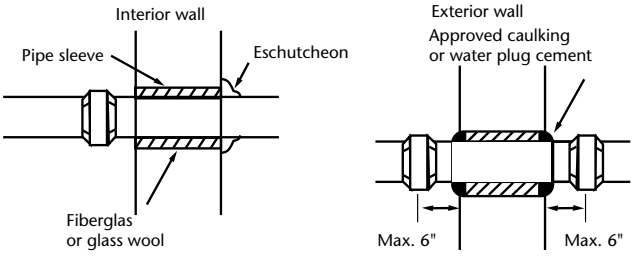


- Keep lines loose. When horizontal lines are hung they should be free to move sideways.

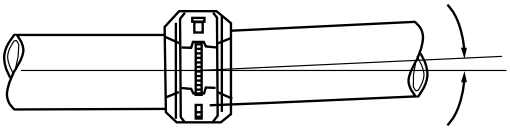


- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: KIMAX pipe is U.L. Classified as a fire penetrant, for penetrating fire rated floors. System Numbers for KIMAX pipe are listed in the U.L. Fire Resistance Directory under the file number R11306.

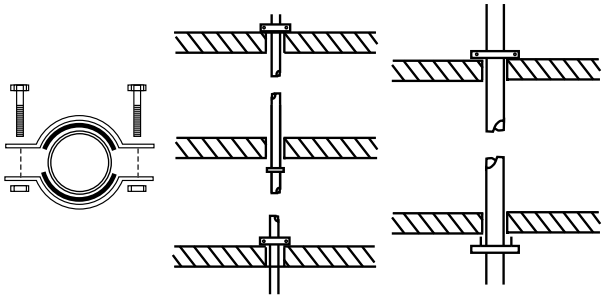


- To pitch a line, snug coupling, cock joint as required to a maximum 4° deflection.

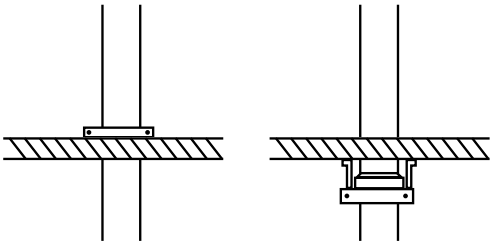


Hanging KIMAX® Drainline – Vertically

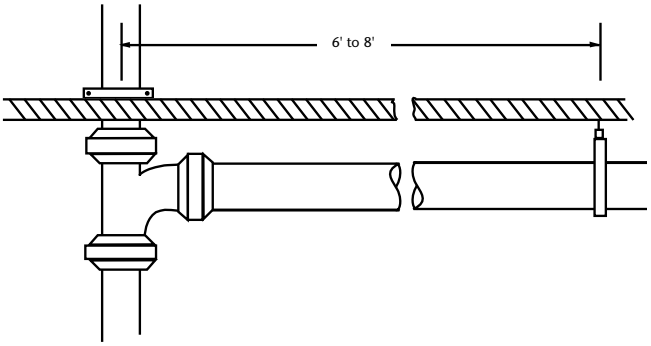
- Use coated riser clamps.
- Support 1.5“ and 2“ stacks at every other floor.
- Support 3“, 4“ and 6“ stacks at every floor.
- Where possible riser clamp should be placed underneath a coupling.



- Place riser clamps either above or below floor.
- Clamp should be below bottom coupling in stack and where possible, below coupling on every third floor.

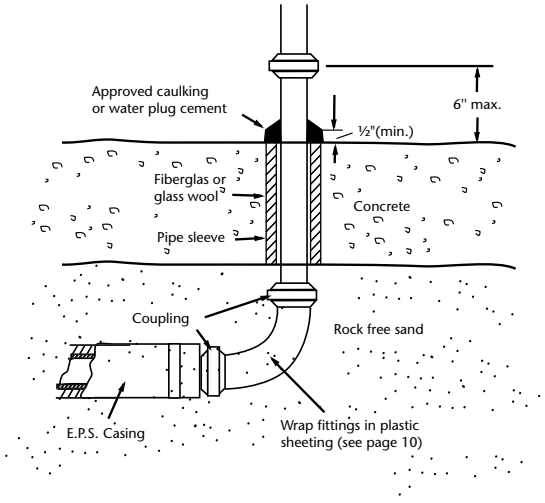


- Do not support vertical stacks with horizontal lines. First hanger should be placed from 6 feet to 8 feet from stack.



- Pipe passing through floors or slabs should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.
- Install coupling within 6“ of floor or slab to give flexibility.

Note: KIMAX pipe is U.L. Classified as a fire penetrant, for penetrating fire rated floors. System Numbers for KIMAX pipe are listed in the U.L. Fire Resistance Directory under the file number R11306.



Hanging KIMAX® Drainline – Vertically

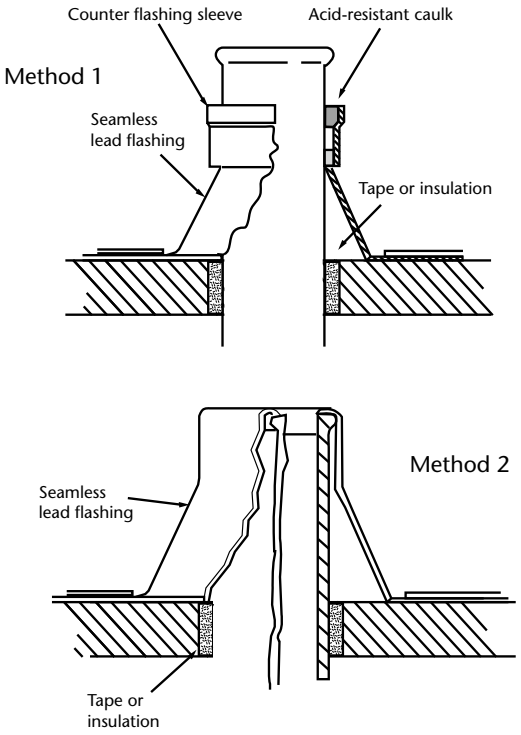
Flashing through roof

When flashing through a roof, wrap the vent pipe with tape or an insulating material and follow through using either of the methods indicated below:

Method 1: Seamless lead roof flashing with a caulked counter-flashing sleeve.

Method 2: Seamless lead or copper roof flashing.

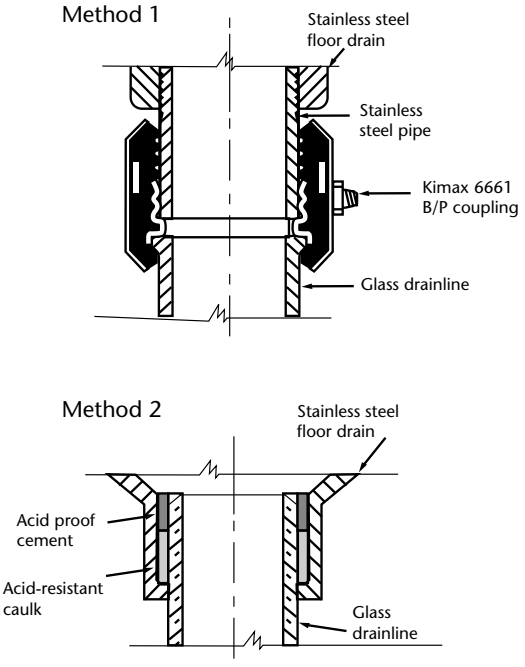
Note: The annular opening for the vent should be 2“ greater than the pipe O.D. being stubbed through the roof.



Connecting to floor drain

Method 1: Screw I.P.S. threaded metal nipple into outlet of floor drain and join the glass pipe or fitting to nipple using a KIMAX 6661 B/P Coupling.

Method 2: Cut glass pipe to desired length using KIMAX portable cutting tool. Smooth external sharp edges from cut end and insert into outlet of floor drain. Seal glass in place using non-combustible packing material, and acid-proof cement.



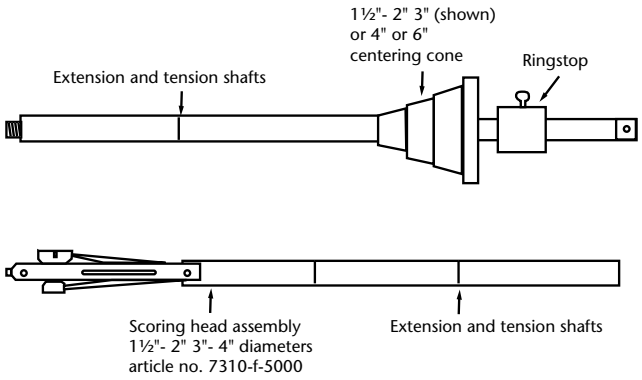
Cutting KIMAX® Drainline Pipe

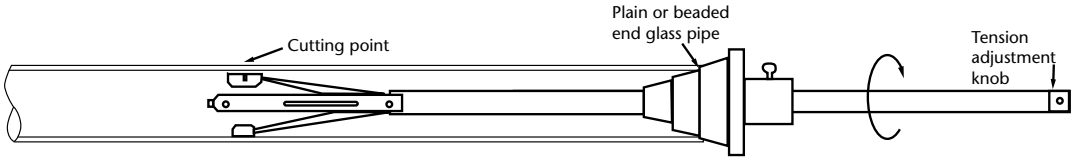
Tools needed
- Cutting Tool:
  7310-56802, 1.5“ and 2“, 3“- 4“ and 6“ Diameter Pipe.
- Safety Glasses
- Grease Pencil
- Measuring Tape
- Propane or Butane Hand Torch
- Emery Cloth or Carborundum Stone
- Work Bench with Backstop

To assemble cutter tools
1. Slide centering cone and ring stop onto extension* and tension shafts.
2. Firmly couple tension shaft and scoring head assembly. Use small cutter head, 7310-S-1000 for 1.5“ and 2“ pipe and large cutter head 7310-F-5000 for 3“-4“ and 6“ pipe. A cone for cutting 6“ pipe must be ordered separately.

*Use extension shaft if cutting pipe over 2½ feet long.

Video: Cutting KIMAX® Drainlines





Pipe storage
Protect pipe from scratches. Leave pipe in shipping cartons until immediately prior to installation. Used cartons provide protection
to glass pipe on floor prior to cutting or installation.

To cut pipe
Measure and mark – Measure length of pipe required and mark cutting point with grease pencil, making sure surface of glass is dry.
Note: do not attempt to cut within 8“ of a factory beaded pipe end.

Insert cutter – Insert scoring head into pipe with red cutter wheel up and cutter arms completely retracted. Do not scratch inside or outside of pipe as this can cause breakage.

Seat cone/lock ring stop – Slide centering cone into pipe until firmly seated against cut or beaded end. Align cutter wheel with cutting mark. Slide ring stop against centering cone and lock ring stop by tightening thumb screw.
Note: workbench must have backstop for opposite end of pipe.

Tension to score – Turn tension adjustment knob clockwise. Re-check alignment of cutter wheel with pencil mark. Continue turning tension adjustment handle clockwise to give cutter wheel sufficient pressure to score glass. A medium to light score is desirable on all sizes except 6“ which requires a heavier score.

Score the pipe – With the pipe against the backstop, centering cone pressed firmly into the pipe, and ring stop locked against centering cone, make a test score (about ½“ long) by turning the tension shaft clockwise. Make final adjustment if necessary.

Complete the score by turning tension shaft one full turn – making sure to close cutting circle, but not the score beyond the starting point. The tension adjustment handle may require adjustment while scoring to maintain
a uniform score as the cutter is turned.
Release tension/remove cutter – Turn tension adjustment knob completely counter-clockwise to draw cutter wheel away from glass. With red cutter head facing up, and cutter arms retracted, withdraw cutter from pipe. Do not drag scoring wheel against the pipe when removing the cutter.

Heat the score – Light crack off torch (propane or butane). Set light blue flame 1“ to 1.5“ in length. Apply point of flame to score, moving back and forth along score. As pipe begins to separate, follow score mark with flame. You may find it necessary to gently tap one end of the pipe on table top to complete crack off.

Smooth edge – Lightly wipe cut outside sharp edge at approximate 45 degree angle with corborundum stone or 150 grit emery cloth to remove sharp edges.

Cutter/roller assembly maintenance
During normal use the cutter wheel will eventually become dull, this becomes noticeable as the score becomes less sharp and/or increased tension is required to produce a sharp score.

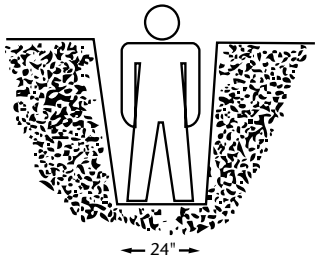
When cutter wheel becomes dull, replace with KIMAX Cutter/Roller Assembly – article number 7310-F-4122. Install per instructions included with the assembly. Also check the roller wheels on the roller assembly They must rotate freely and be free from embedded dirt or grit. If necessary, replace roller assembly – article number 7310-F-6000.

Installing KIMAX® Drainline – Underground

Video: Installing KIMAX® Drainlines Underground

Excavating trench

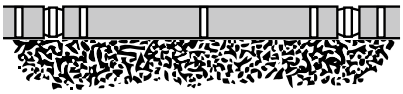
Excavate trench to workable width (24 inches at bottom) and 1 to 2 inches below final grade if clean dirt – 4 to 6 inches below grade if rocky or clay condition.

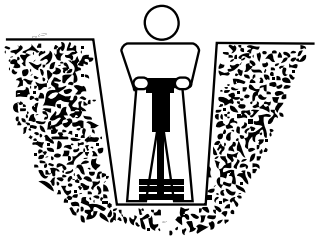


Trench bedding

Trench should have firm bed in order to support pipe uniformly along its full length.

Back-fill to final grade with rock-free sand or soil. Tamp back-fill to assure firm bed and level off mounds or fill depressions with tamped soil.





Installing pipe

Use 5-fool lengths of E.P.S. covered heavy schedule drainline pipe and fittings, couple pipe and/or fittings in usual manner.

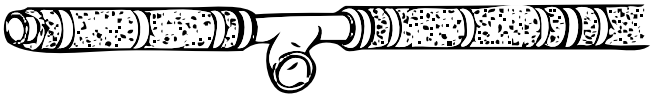
When convenient, assemble several joints to form a section, tighten couplings firmly and lower section into trench.

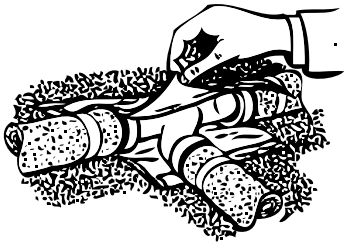
Protect fittings by wrapping them in polyvinyl film (5 mil), Scotch Wrap or J.M. Trans-Tex or equal.

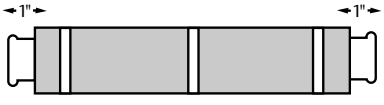
Compact sand under fittings for support.

Check all joints and water test.

Note: When odd lengths of pipe are required, remove E.P.S. casing and field fabricate pipe to required length. Cut casing 2 inches shorter than new length and replace on pipe leaving 1 inch of pipe exposed at both ends.







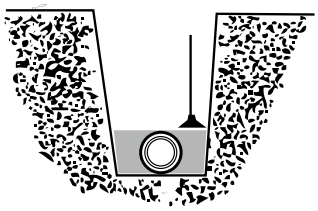
Backfilling trench

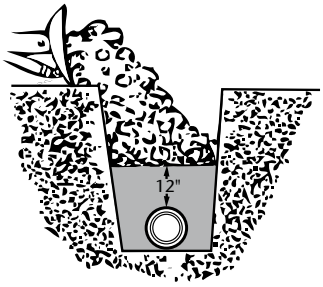
Backfill trench with thin layers of rock-free sand or soil to 12 inches above glass pipe.

Tamp sand firmly with hand tamper or spray it with water to make sure it's firm.

Rest of trench can be filled with available soil using mechanical means.

Note: Do not leave pipe in open trenches overnight. In the event of rain, KIMAX EPS covered pipe will float due to its buoyancy.





Testing and protecting glass drainline

Testing

Shake lines to make sure there is no strain. There should be some limited movement in both vertical and horizontal lines.

Test lines in accordance with local codes. Air testing should not exceed 5 psi; water testing should not exceed 22 psi.

In case of leak

Tighten coupling at leaking joint.

If joint continues to leak, remove coupling and make certain that rubber compression liner and TFE seal ring are free from dirt or other obstruction. Also, check that ends of pipe or fittings are properly seated in couplings.

Replace defective couplings and replace pipe or fittings if beaded ends are defective.

Check for good drainline alignment.

Protecting

Protect glass from scratches. Keep pipe and fittings in shipping cartons until ready to use.

Protect glass from weld spatter. Cover with protective material.

When exposed to heavy traffic, protect drainline with expanded metal, plywood enclosure, or channel iron.

Cleaning procedure

To clean drainline system, use cleaning agent to dissolve material causing stoppage. If necessary to mechanically dislodge blockage, remove pipe section if accessible. If not accessible, insert rubber hose or plastic covered snake. Do not insert objects hard enough to scratch glass.

Corrosion Resistance Chart

Corrosion Resistance of Acid Waste Drainline Piping and Vent Materials

Maximum Operating Temperature[1]

Materials:
A – Very Good Service to oper. limit of material. (see table)
B – Moderate Service
C – Limited or Variable Service
F – Unsatisfactory

Chemicals:
Solids assumed in solution.
Room temperatures assumed unless otherwise stated.
Data represented is to be used as a guide only. For specific information, test under actual operating conditions.

	250 °F KIMAX® Borosilicate Glass	250 °F High Silicon Iron	250 °F 304 Stainless Steel; Fe. 18 Cr, 8 Ni	250 °F Teflon®	150 °F Polyethylene	150 °F Polyvinyl Chloride rigid or unplasticized	180 °F Polypropylene
Acetaldehyde CH_3CHO	A	A	A	A	F	A	B
Acetic Acid, 100%, CH_3COOH	A	A	F	A	F	F	C
Acetic Acid, (Dilute) 50%	A	A	B	A	C	C	A
Acetic Anhydride, $(CH_3CO)_2O$	A	A	B	A	B	F	C
Acetone, CH_3COCH_3	A	A	A	A	F	F	B
Alcohol, Amyl $CH_3(CH_2)_4OH$	A	B	B	A	C	F	C
Alcohol, Butyl C_4H_9OH	A	A	A	A	B	F	B
Allyl Chloride CH_2CHCH_2CL	A	A	B	A	F	F	F
Aluminium Chloride, $AlCl_3$	A	B	F	A	A	A	A
Aluminium Hydroxide, $AL(OH)_3$	A	B	A	A	B	A	A
Aluminium Sulfate, $Al_2(SO_4)_3$	A	B	F	A	A	A	A
Alums, Conc., $Al_2(SO_4)_3 \cdot K_2SO_4$, etc.	A	A	F	A	A	F	A
Ammonium Carbonate, $(NH_4)_2CO_3$	A	B	B	A	A	A	A
Ammonium Chloride, NH_4Cl	A	B	F	A	A	A	A
Ammonium Fluoride NH_4F 25%	F	F	C	A	A	A	A
Ammonium Hydroxide, NH_4OH	A	B	A	A	A	A	A
Amyl Acetate, $C_5H_{11}COOCH_3$	A	A	A	A	F	F	F
Amyl Chloride, $C_5H_{11}Cl$	A	B	A	A	F	F	F
Antimony Trichloride, $SbCl_3$	A	B	F	A	A	A	B
Aniline $C_6H_5NH_2$	A	B	A	A	F	F	B
Aniline Hydrochloride $C_6H_5NH_2 \cdot HCl$	A	B	F	A	B	F	F
Ammonia (Gas), (Moist), NH_3	A	B	A	A	A	A	B
Arsenic Acid, $HAsO_3$	A	B	F	A	A	A	C
Barium Carbonate, $BaCO_3$	A	B	B	A	A	A	A
Barium Chloride, $BaCl_2$	A	B	C	A	A	A	A
Barium Hydroxide, $Ba(OH)_2$	A	B	B	A	A	A	A
Barium Sulfate, $BaSO_4$	A	B	B	A	A	A	A
Barium Sulfide, BaS	A	B	B	A	A	A	A
Benzaldehyde, C_6H_5CHO 100%	A	B	B	A	F	F	C
Benzene, C_6H_6	A	A	B	B	F	F	F
Benzoic Acid, C_6H_5COOH	A	B	B	A	A	A	B
Borax, $Na_2B_4O_7 \cdot IOH_2O$	A	B	B	A	A	A	A
Boric Acid, H_3BO_3	A	B	B	A	A	A	A
Bromine, (Wet), Br_2	A	F	F	A	F	F	F
Butane C_4H_{10}	A	A	A	A	F	F	F
Butyl Acetate, $C_4H_9COOCH_3$	A	B	B	A	F	F	F
Butyric Acid, C_3H_7COOH	A	A	F	A	F	F	A
Calcium Bisulfite, $Ca(HSO_3)_2$	A	F	B	A	A	A	A
Calcium Carbonate, $CaCO_3$	A	B	A	A	A	A	A
Calcium Chlorate, $CaClO_3$	A	B	B	A	A	A	A
Calcium Chloride, $CaCl_2$	A	B	F	A	A	A	A
Calcium Hydroxide, $Ca(OH)_2$	A	C	B	A	A	A	A
Calcium Hypochlorite, $Ca(OCl)_2$	A	B	F	A	A	C	B
Carbon Disulfide, CS_2	A	A	B	A	F	F	F
Carbon Tetrachloride (Moist) CCl_4	A	A	F	A	F	F	F
Chloracetic Acid, $ClCH_2CO_2H$	A	B	F	A	F	F	F
Chloralhydrate $CCl_3CH(OH)_2$	A	A	F	A	F	A	F
Chloric Acid, $HCLO_3$	A	B	F	A	C	A	F

Maximum Operating Temperature[1]

Materials:
A – Very Good Service to oper. limit of material. (see table)
B – Moderate Service
C – Limited or Variable Service
F – Unsatisfactory

Corrosion Rate Code:
A = < 2 mm Penetration / Yr.
B = < 20
C = < 50
F = > 50

	250 °F KIMAX® Borosilicate Glass	250 °F High Silicon Iron	250 °F 304 Stainless Steel; Fe. 18 Cr, 8 Ni	250 °F Teflon®	150 °F Polyethylene	150 °F Polyvinyl Chloride rigid or unplasticized	180 °F Polypropylene
Chlorine (Dry), Cl_2	A	B	B	A	F	F	F
Chlorine (Wet), Cl_2+H_2O	A	B	F	A	F	F	F
Chlorobenzene, C_6H_5Cl	A	B	B	A	F	F	F
Chloroform, $CHCl_3$	A	B	A	A	F	F	F
Chlorosulfonic Acid, 100% $ClSO_3OH$	A	A	B	A	F	F	F
Chlorox' Bleach, SOL, 5,5% Cl_2	A	A	A	A	F	F	F
Chromic Acid, CrO_3 sol'n	A	B	F	A	C	F	B
Copper Chloride, $CuCl_2$	A	B	F	A	A	A	B
Copper Nitrate $Cu(NO_3)_2$	A	A	A	A	A	A	B
Copper Sulfate $CuSO_4$	A	A	B	A	A	A	B
Cresol	A	B	A	A	F	F	B
Cyclohexanone	A	B	B	A	F	F	F
Dimethylamine $(CH_3)_2NH$	A	A	A	A	F	F	B
Dioctyl Phthalate	A	A	A	A	F	F	F
Dioxane	A	B	B	A	F	F	F
Ethers (Various)	A	A	B	A	F	F	F
Ethyl Acetate, $C_2H_5COOCH_3$	A	A	B	A	F	F	F
Ethylene Bromide, $C_2H_5Br_2$	A	B	A	A	F	F	F
Ethyl Chloride, C_2H_5Cl	A	A	A	A	F	F	F
Ethyl Ether $(C_2H_5)_2O$	A	A	B	A	F	F	F
Ethylene Chlorohydrin, $Cl(C_2H_4)OH$	A	B	B	A	F	F	C
Ethylene Dichloride, $C_2H_4Cl_2$	A	B	B	A	F	F	F
Ethylene Glycol, CH_2OHCH_2OH	A	B	B	A	A	A	A
Ethylene Oxide, CH_2OCH_2	A	A	B	A	F	F	F
Fatty Acids (Various)	A	A	B	A	F	A	B
Ferric Chloride, $FeCl_3$	A	C	F	A	A	A	A
Ferrous Chloride, $FeCl_2$	A	B	F	A	A	A	A
Ferrous Sulfate $FeSO_4$	A	B	B	A	A	A	A
Fluorine, F_2	F	F	A	A	F	B	F
Formaldehyde, CH_2O 37%	A	A	A	A	A	A	B
Formic Acid, HCOOH	A	A	C	A	C	F	B
Fuel Oil	A	A	A	A	F	A	F
Furfural, C_4H_3OCHO	A	B	B	A	F	F	F
Gallic Acid, $(OH)_3C_6H_2COOH$	A	A	B	A	A	A	A
Gasoline (Refined)	A	A	A	A	F	A	F
Glycerol, $CH_2OH.CHOHCH_2OH$	A	A	A	A	A	A	A
Heptane, $CH_3(CH_2)_5CH_3$	A	A	A	A	F	C	C
Hexane, C_6H_{14}	A	A	A	A	F	F	C
Hydrobromic Acid, HBr	A	F	F	A	A	A	C
Hydrocarbons (Aliphatic)	A	A	A	A	F	F	C
Hydrocarbons (Aromatic)	A	A	A	A	F	F	F
(Check individual listing)							
Hydrochloric Acid (Conc.), HCl	A	F	F	A	A	F	C
Hydrochloric Acid (Dilute)	A	F	F	A	A	A	B
Hydrofluoric Acid (Conc.), HF	F	F	F	A	B	C	C
Hydrofluoric Acid (Dilute)	F	F	F	A	A	C	B
Hydrofluosilicic Acid, H_2SIF_6	C	F	F	A	A	A	C
Hydrogen Peroxide (Conc.), H_2O_2	A	B	B	A	C	F	C

[1] For operating pressures see Drainline Catalog.
See back page for Physical and Chemical Data of KIMAX® Glass Drainline.

Teflon® is a registered trademark of DuPont.
KIMAX® is a registered trademark of DWK Life Sciences GmbH.

Corrosion Resistance of Acid Waste Drainline Piping and Vent Materials

Maximum Operating Temperature[1]

Materials:
A – Very Good Service to oper. limit of material. (see table)
B – Moderate Service
C – Limited or Variable Service
F – Unsatisfactory

Chemicals:
Solids assumed in solution.
Room temperatures assumed unless otherwise stated.
Data represented is to be used as a guide only. For specific information, test under actual operating conditions.

	250°F KIMAX® Borosilicate Glass	250°F High Silicon Iron	250°F 304 Stainless Steel; Fe. 18 Cr, 8 Ni	250°F Teflon®	150°F Polyethylene	150°F Polyvinyl Chloride rigid or unplasticized	180°F Polypropylene
Iodine, I_2 (Wet)	A	F	F	A	F	F	C
Isopropyl Ether $(Ch_3)_2$ $CHOCH(CH_3)_2$	A	A	A	A	F	F	C
Kerosene	A	A	A	A	F	A	F
Ketones (Various), RCOR'	A	A	A	A	F	F	C
Lauryl Chloride	A	A	A	A	F	A	C
Lead Acetate, $Pb(CH_3COO)_2$	A	B	B	A	A	A	A
Magnesium Chloride, $MgCl_2$	A	B	C	A	A	A	A
Magnesium Hydroxide, $Mg(OH)_2$	A	B	A	A	A	A	A
Magnesium Sulfate, $MgSO_4$	A	A	B	A	A	A	A
Mercury, Hg	A	A	A	A	A	A	A
Methanol (Conc.), CH_3OH	A	A	A	A	A	A	B
Methyl Chloride, CH_3Cl	A	A	A	A	F	F	F
Methylene Chloride, CH_2Cl_2	A	A	B	A	F	F	F
Methyl Ethyl Ketone, $CH_3COC_2H_5$	A	B	B	A	F	F	C
Methyl Isobutyl Ketone, $C_6H_{12}O$	A	B	B	A	F	F	C
Naphtha	A	B	A	A	F	A	C
Nickel Chloride, $NiCl_2$	A	B	C	A	A	A	A
Nickel Sulfate, $NiSO_4$	A	B	B	A	A	A	A
Nitric Acid (Conc.), HNO_3	A	A	F	A	F	F	F
Nitric Acid (Dilute)	A	A	A	A	A	C	B
Nitrobenzene, $C_6N_5NO_2$	A	A	B	A	F	F	C
Nitrous Oxide	A	B	B	A	F	A	C
Oleum	A	F	B	A	F	F	F
Oxalic Acid, CO_2HCO_2H	A	B	F	A	A	A	C
Perchloric Acid 70% $HClO_4$	A	A	F	A	A	F	C
Phenylhydrazine $C_6H_5NHNH_2$	A	A	A	A	F	F	C
Phosphoric Acid (100%), H_3PO_4	A	B	F	A	A	A	B
Phosphoric Acid (> 45% Cold) 80°F	A	B	F	A	A	A	A
Phosphoric Acid(< 45% Cold) 80°F	A	A	B	A	A	A	A
Phosphorus, Trichloride, PCl_3	A	A	B	A	B	F	C
Picric Acid, (Sol'n.), HO. C_6H_2 $(NO_2)_3$	A	B	B	A	C	F	C
Potassium Bromide, KBr	A	B	B	A	A	A	A
Potassium Carbonate, K_2CO_3	A	B	A	A	A	A	A
Potassium Chlorate, $KClO_3$	A	B	B	A	A	A	A
Potassium Chloride, KCl	A	A	B	A	A	A	A
Potassium Cyanide, KCN	A	B	B	A	A	A	A
Potassium Dichromate, $K_2Cr_2O_7$	A	A	A	A	A	A	A
Potassium Ferrocyanide, $K_4Fe(CN)_6$	A	A	A	A	A	A	A
Potassium Hydroxide, KOH	A	F	B	A	A	A	A
Potassium Nitrate, KNO_3	A	A	A	A	A	A	A
Potassium Permanangate, $KMnO_4$	A	B	B	A	B	B	C
Potassium Sulfate, K_2SO4	A	A	B	A	A	A	A
Potassium Sulfide, K_2S	A	A	B	A	A	A	A
Propylene Dichloride	A	A	A	A	F	F	F
Silver Nitrate, Ag NO_3	A	A	B	A	A	A	A
Sodium Acetate, CH_3COONa	A	B	B	A	A	A	A
Sodium Azide NaN_3	A	A	A	A	A	A	A
Sodium Bicarbonate, $NaHCO_3$	A	A	A	A	A	A	A

Maximum Operating Temperature[1]

Materials:
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Corrosion Rate Code:
A = < 2 mm Penetration / Yr.
B = < 20
C = < 50
F = > 50

	250°F KIMAX® Borosilicate Glass	250°F High Silicon Iron	250°F 304 Stainless Steel; Fe. 18 Cr, 8 Ni	250°F Teflon®	150°F Polyethylene	150°F Polyvinyl Chloride rigid or unplasticized	180°F Polypropylene
Sodium Bisulfate, $NaHSO_4$	A	A	F	A	A	A	A
Sodium Bisulfite, $NaHSO_3$	A	F	C	A	A	A	A
Sodium Bromide, NaBr	A	B	F	A	A	A	A
Sodium Carbonate, NA_2CO_3	A	B	B	A	A	A	A
Sodium Chlorate, $NaClO_3$	A	A	B	A	A	C	A
Sodium Chloride, NaCl	A	B	F	A	A	A	A
Sodium Cyanide, NaCN	A	A	A	A	A	A	A
Sodium Fluoride, NaF	B	F	F	A	A	A	A
Sodium Hydroxide, NaOH < 85°F	A	F	C	A	A	A	A
Sodium Hydroxide NaOH < 140°F	B	F	C	A	A	A	A
Sodium Hydroxide NaOH, > 160°F	F	F	A	A	A	A	A
Sodium Hypochlorite, NaOCl	A	B	F	A	C	A	B
Sodium Hyposulfate, $Na_2S_2O_4$	A	B	B	A	A	A	B
Sodium Nitrate, $NaNO_3$	A	A	A	A	A	A	A
Sodium Sulfate, Na_2SO_4	A	A	A	A	A	A	A
Sodium Sulfide, Na_2S	F	B	F	A	A	A	A
Sodium Sulfite, Na_2SO_3	A	F	B	A	A	A	A
Stannic Chloride, $SnCl_4$	A	A	F	A	A	A	A
Stannous Chloride, $SnCl_2$	A	B	F	A	A	A	A
Stearic Acid, $CH_3(CH_2)_{16}COOH$	A	B	B	A	F	A	B
Sulfur, (Molten), S	A	A	A	A	C	A	B
Sulfur Chloride (Wet), S_2Cl_2	A	F	F	A	F	F	F
Sulfur Dioxide (Wet), SO_2+H_2O	A	F	F	A	C	F	C
Sulfur Trioxide, SO_3	A	F	B	A	A	A	F
Sulfuric Acid (Fuming to 98%)	A	F	A	A	F	F	F
Sulfuric Acid (Hot Conc.) H_2SO_4	A	A	F	A	F	F	F
Sulfuric Acid (Cold Conc.)	A	A	F	A	F	F	C
Sulfuric Acid (75% – 95%)	A	A	F	A	F	F	F
Sulfuric Acid (10% – 75%)	A	A	F	A	C	A	C
Sulfuric Acid (> 10%)	A	A	F	A	A	A	C
Sulfurous Acid, H_2SO_3	A	F	F	A	A	A	B
Sulfuryl Chloride, SO_2Cl_2	A	B	B	A	F	F	F
Tetrahydrofuran (75%)	A	A	A	A	F	F	F
Tetralin	A	B	A	A	F	F	F
Thionyl Chloride, $SOCl_2$	A	B	B	A	F	F	C
Toluene, $CH_3C_6H_5$	A	A	A	A	F	F	F
Tributyl Phosphate $(C_4H_9)_3PO4$	A	B	A	A	F	C	F
Trichlorethylene, (Dry), $Cl_2C.CHCl$	A	A	B	A	F	F	F
Tricresylphosphate, $(CH_3C_6H_4O)_3PO$	A	A	A	A	F	F	C
Turpentine	A	B	B	A	F	F	F
Vinyl Acetate, $C_4H_6O_2$	A	B	B	A	F	F	F
Water, (Distilled Lab)	A	A	A	A	A	A	A
Xylene, C_8H_{10}	A	B	B	A	F	F	F
Zinc Phosphate, $Zn_3(PO_4)_2$	A	B	B	A	A	A	A
Zinc Sulfate, $ZnSO_4$	A	A	B	A	A	A	A

[1] For operating pressures see Drainline Catalog.
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Summary of Tests

	KIMAX®	Duriron	Polypropylene
A	179	81	72
B	2	81	27
C	1	2	35
F	6	24	54
Total Chem. Tested	188	188	188

References:
Corrosion Data Survey, 1969 edition, Nace
Corrosion Data Survey – Nonmetals, 1975, Nace
Chemical Engineering Handbook, Perry & Chilton, 5th edition, McGraw Hill, 1973
"Super Corrosion Control", The Carpenter Steel Company, 1965
"A Guide to the Selection of Durco Corrosion Resisting Materials for Process Industries Service", The Duriron Company, Inc., 1964
"Corrosion Resistant Lined Pipe and Fittings", Corrosion Resistance Rating, Resistoflex Corporation, 1975
"Chemical Resistance Guide", Asahi / America, 1977
"Chemical Resistance of Plastic Piping Materials", Cabot Corporation, 1971

Physical and Chemical Properties of KIMAX® Piping Systems Chemical Durability:
KIMAX® Glass Pipe is measureably affected by only one acid, hydrofluoric, or strong caustics such as sodium or potassium hydroxide.

Under continuous exposure of 1 % hydrofluoric acid at 70° F will require approximately 30 to 35 years to destroy one-half the wall thickness of KIMAX® pipe. Ten percent HF at 70° F will require approximately five years of continuous exposure to destroy one-half the wall thickness.

When KIMAX® Glass is exposed to NaOH or KOH in concentrations up to 50 % at room temperature, the pipe should last from 90 to 100 years. All other chemicals exhibit little or no effect on KIMAX® Piping Systems.

General Chemical Composition	Approximate Percentage
Silica (SiO_2)	80.5 %
Boric Acid (B_2O_3)	13.0 %
Sodium Oxide (Na_2O)	4.0 %
Aluminium Oxide (Al_2O_3)	2.0 %
Potassium Oxide (K_2O)	0.5 %

Chemical Properties	
Thermal Coefficient of Linear Expansion	18×10^{-7} in / in / ° F
Thermal Expansion	KIMAX® brand drainline will expand only 0.22" per 100 ft. of length when temperature increases 100 ° F
Thermal Shock (Instantaneous)	1½" to 3" pipe – 200 ° F 4" pipe – 175 ° F 6" pipe – 160 ° F

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