

Note: Where specifications are in italics, please select desired alternative.

I. General

- A. All laboratory service fixtures and safety equipment shall have the construction and meet the performance requirements set forth in this section. Fixture types shall be as indicated in the fixture schedule or fixture details.
- B. Laboratory fixtures and safety equipment shall be furnished and delivered to point of use by the laboratory casework contractor, for installation and plumbing by the mechanical contractor under Division 22 of the specifications.
- C. All laboratory service fixtures and safety equipment shall be the product of one service fixture manufacturer to assure uniform appearance and ease of maintenance of the laboratory facility. Remote control valves and fittings furnished with fume hoods shall be the product of the same fixture manufacturer.
- D. All service fixtures shall be factory assembled (including the assembly of valves and shanks to turrets, flanges and other mounting accessories), and each fixture shall be individually factory tested in the manner and at the pressures set forth below.
- E. All service fixtures shall be designed to minimize exposed surfaces on which dust, dirt and airborne contaminants may collect, and to facilitate cleaning and maintenance of the service fixture. Faucet and valve handles shall be hooded to cover the valve stem and top surface of the packing nut or bonnet. The valve stem shall not be exposed to view as the faucet or valve is opened and closed.
- F. Faucet and valve handles shall be **[molded nylon hooded type]** **[diecast aluminum hooded type]** and shall be **[color-coded per service index color]** **[black]**. Color code requirements shall be as follows:

Service	Color	Symbol
Cold Water	Green	CW
Hot Water	Red	HW
Gas	Blue	GAS
Air	Orange	AIR
Vacuum	Yellow	VAC
Nitrogen	Brown	NIT
Steam	Black	STM
Deionized Water	White	DI

(Add additional services as required)

- G. All laboratory service fixtures and safety equipment shall be ColorTech fixtures manufactured by WaterSaver Faucet Co.

II. Finish

A. Finish For Laboratory Service Fixtures and Safety Equipment:

All laboratory service fixtures (except fittings inside fume hoods) and safety equipment shall have the finish described below:

Select desired alternative:

Colored Epoxy Finish

All laboratory service fixtures (except fittings inside fume hoods) and safety equipment shall be furnished with ColorTech powder coated finish in [white] [tan] [gray]*. Coating material shall be electrostatically applied to all exposed surfaces. After application, coating shall be fully baked to permit curing.

Polished Chrome Plated with Clear Epoxy Coating

All laboratory service fixtures (except fittings inside fume hoods) and safety equipment shall be furnished with a polished chrome plated finish with clear epoxy coating. Clear epoxy coating shall be applied to all exposed surfaces and fully baked to permit curing.

Satin Nickel with Clear Epoxy

All laboratory service fixtures (except fittings inside fume hoods) and safety equipment shall be furnished with a satin nickel finish with clear epoxy coating. Clear epoxy coating shall be applied to all exposed surfaces and fully baked to permit curing.

Satin Chrome Plated with Clear Epoxy Coating

All laboratory service fixtures (except fittings inside fume hoods) and safety equipment shall be furnished with a satin chrome plated finish with clear epoxy coating. Clear epoxy coating shall be applied to all exposed surfaces and fully baked to permit curing.

B. Finish for Fume Hood Fittings:

Fittings inside fume hoods shall have a powder coated finish color-coded to match the service fitting index color.

C. Performance Requirements For Finishes:

Powder coated finishes shall meet the following performance tests and requirements:

1. Chemical Resistance

- a. Fume Test. Suspend coated samples in a container at least 6 cu. ft. capacity, approximately 12” above open beakers, each containing 100 cc of 70% nitric acid, 94% sulfuric acid and 35% hydrochloric acid, respectively. After exposure to these fumes for 150 hours, the finish on the samples shall show no discoloration, disintegration or other defects.
- b. Direct Application Test. Subject coated samples to the direct action of the reagents and solvents listed below at a temperature of 25 degrees C dropping from a burette at the rate of 60 drops per minute for ten minutes:

- Acetone
- Carbon Tetrachloride
- Ethyl Alcohol
- Glacial Acetic Acid (99.5%)
- Hydrochloric Acid (38%)
- Mineral Oil
- Nitric Acid (70%)
- Sodium Hydroxide (50%)
- Sulfuric Acid (92%)
- Toluene
- Zinc Chloride-Saturated

Finish on the samples shall not rupture, though slight discoloration or possible softening is permissible.

2. Mar and Abrasion Resistance

Finish shall have a pencil hardness of 2H-4H with adhesion substantial enough to withstand both direct and reverse impacts of 160 inch pounds. Finish shall have excellent mar resistance and be capable of withstanding scuffing, marring and other ordinary wear.

3. Repairability

Finish shall be capable of surface repair in the event that a fitting is scratched or a surface rupture occurs. The service fitting manufacturer shall have available an air-drying aerosol coating, specially formulated to match the existing finish color, which may be applied in the field to repair coated surfaces.

Compression Unit with Adjustable Volume Control

Renewable units shall be compression valve design with an integral adjustable volume control device. Units shall have a high durometer nitrile valve disc and replaceable stainless steel seat. The renewable unit shall be broached for position locking in the valve body. The unit shall have a molded TFE stem packing and adjustable packing nut. The unit shall be capable of being readily converted from compression to self-closing control, and vice versa, without disturbing the faucet body.

Ceramic Disc Unit

Renewable units shall have rotating self-lubricating ceramic discs to control the water flow. Units shall have a wear-resistant thrust washer and internal baffles for noise reduction. The renewable unit shall be broached for position locking in the valve body. Except where used with blade or lever handles, valve shall have 180 degree rotation from closed to open.

- 2. Goosenecks.** Goosenecks shall have a separate outlet coupling with a 3/8” IPS female thread securely brazed to the gooseneck for attachment of serrated hose ends, aerators and other outlet fittings. Rigid goosenecks shall have a 3/8” IPS male inlet thread and be threaded directly into the faucet body so as to be absolutely rigid. Swing goosenecks shall utilize a double O-ring union-type construction and be convertible from swing to rigid and vice versa.
- 3. Vacuum Breakers.** Vacuum breakers, where required and indicated by the fixture number, shall be integral with the gooseneck. Vacuum breakers shall have a forged brass body, a renewable seat and an ultralight float cup with silicone gasket for fine flow control. Vacuum breakers shall not spill over at low water volume. Vacuum breakers shall be certified by the American Society of Sanitary Engineers (ASSE) under Standard 1001.
- 4. Certification.** All fixtures for water service shall meet the requirements of ANSI/ASME A112.18.1M-1989 and be certified by the Canadian Standards Association (CSA) under Standard CAN/CSA B.125.M89.
- 5. Testing.** Water faucets and valves shall be fully assembled and individually tested at 80 pounds per square inch (PSI) water pressure.

B. Distilled, Deionized and Pure Water Fixtures

Faucets and valves for distilled, deionized and reverse osmosis water shall have the construction described below:

Select desired alternative:

Tin-Lined Brass

Fixtures shall be fabricated of brass with an interior lining of pure tin. Tin lining shall be applied by (i) prior to machining, dipping faucet bodies and goosenecks in liquid tin to coat thoroughly all interior surfaces, and (ii) after machining, tin plating faucet bodies, goosenecks and all other fixture components to cover all exposed surfaces. Tin-lined brass fixtures shall have the same internal construction as specified for water faucets and valves in paragraph III.A. above.

Polypropylene-Lined Brass

Fixtures shall be fabricated with a brass exterior and an interior lining of inert polypropylene. All components in contact with pure water shall be polypropylene. Valves shall be manual or self closing type (as indicated by the fixture number). Valves shall have a brass stem and valve bonnet, an elastomeric diaphragm and a removable serrated hose end.

III. Laboratory Service Fixtures

A. Water Faucets and Valves

- 1. Renewable Unit.** Faucets and valves for water service shall have a renewable unit or cartridge containing all working components subject to wear, with the construction features described below:

Select desired alternative:

Compression Unit

Renewable units shall be compression valve design with a high durometer nitrile valve disc and replaceable stainless steel seat. The renewable unit shall be broached for position locking in the valve body. The unit shall have a molded TFE stem packing and adjustable packing nut. The unit shall be capable of being readily converted from compression to self-closing control, and visa versa, without disturbing the faucet body.

PVDF-Lined Brass

Fixtures shall be fabricated with a brass exterior and an interior lining of inert polyvinylidene fluoride (PVDF). All components in contact with pure water shall be PVDF. Valves shall be manual or self-closing type (as indicated by the fixture number). Valves shall have a brass stem and valve bonnet, an elastomeric diaphragm and a removable serrated hose end.

Stainless Steel

Fixtures shall be fabricated of Type 316 stainless steel. All components in contact with pure water shall be stainless steel. Valves shall be compression valve design with a renewable unit containing all working components subject to wear. Valves shall have a high durometer valve disc, stainless steel valve seat, molded TFE stem packing and adjustable packing nut.

C. Valves for Gas, Air, Vacuum and Special Gas Service

- 1. Fine Control Needle Valves.** Fine control needle valves shall have a forged brass valve body with a 3/8" IPS female outlet for attachment of serrated hose ends, quick connects or other outlet fittings. Valves shall have a self-centering replaceable stainless steel floating cone and a replaceable stainless steel valve seat with a .125" diameter orifice. The floating cone shall be tapered with a maximum diameter of .125". The valve shall have a molded TFE stem packing with an externally adjustable packing nut. The valve shall go from closed to fully open in 6 full revolutions of the handle. Fine control needle valves shall be fully assembled and individually tested at 375 PSI nitrogen pressure. Maximum working pressure shall be 250 PSI.
- 2. Needle Valves.** Needle valves shall have a forged brass valve body with a 3/8" IPS female outlet for attachment of serrated hose ends, quick connects or other outlet fittings. Valves shall have a self-centering replaceable stainless steel floating cone and a replaceable stainless steel valve seat. The valve shall have a molded TFE stem packing with an externally adjustable packing nut. The valve shall go from closed to fully open in two full revolutions of the handle. Needle valves shall be fully assembled and individually tested at 225 PSI nitrogen pressure. Maximum working pressure shall be 150 PSI air pressure.
- 3. Laboratory Ball Valves.** Laboratory ball valves shall have a forged brass valve body with a 3/8" IPS female outlet for attachment of serrated hose ends, quick connects or other outlet fittings. Valves shall have a chrome plated brass ball and molded TFE seals. Where used for gas service, valves shall be certified by the American Gas Association (AGA) under ANSI Z21.15 ("Manually Operated Gas Valves"). Ball valves shall be fully assembled and individually tested at 125 PSI nitrogen pressure. Maximum working pressure shall be 75 PSI. Where used for gas service, valves are CSA-certified to 0.50 PSI.

D. Remote Control Valves for Fume Hoods

Remote control valves shall be mounted on the front panel of the fume hood, with all components subject to wear accessible from the front exterior face of the hood. Valves shall have a forged brass body with a threaded collar to hold the valve in place. Valves for water shall have either compression valve or rotating ceramic disc construction (as indicated by the fitting number). Valves for laboratory gases shall be either fine control or standard needle-type design (as indicated by the fitting number), with a self-centering replaceable stainless steel floating cone and a replaceable stainless steel valve seat. Where indicated, valves for burning gases shall be push/turn type with rotating ceramic disc construction.

E. Electric Pedestal Boxes

Electric pedestal boxes shall be cast aluminum with an integral base, shall be machined for both standard and ground fault receptacles, and shall be furnished complete with grounding screws, mounting shank and locknut. Electric pedestal boxes shall be listed by Underwriters Laboratories (UL) under Standard UL514A. Receptacles shall be commercial or specification grade. Face plates shall be Type 304 stainless steel with formed and beveled edges.

IV. Laboratory Safety Equipment

- A. Emergency eye wash and shower equipment shall be ColorTech style with a powder coated finish to match the laboratory service fixtures. Finish shall meet the performance requirements set forth in paragraph II. C. above.**
- B. Emergency showers shall have a stainless steel shower head with a perforated face plate for complete dispersion of the water. Valves shall be cast or forged brass with stainless steel actuators.**
- C. Emergency eye wash, eye/face wash and drench hose units shall utilize spray-type outlet heads. Each spray head shall have a "flip top" dust cover, an internal flow control and a filter to remove impurities from the water.**
- D. All pipe and fittings shall be brass. Units with galvanized steel pipe and fittings shall not be acceptable.**
- E. All emergency eye wash and shower equipment shall be certified by a nationally-recognized testing laboratory to meet the requirements of ANSI Z358.1-2004 ("Emergency Eye Wash and Shower Equipment").**