

Water Connections

Hot and cold water connections to sinks are $\frac{3}{4}$ in.; hot water only is provided for dish washer from $\frac{1}{2}$ to $1\frac{1}{4}$ in. according to size; $\frac{1}{2}$ in. hot and cold water to "bain marie;" and $\frac{1}{2}$ in. cold and hot water to coffee urns. Stock kettles, soup kettles, vegetable steamers, roasting steamers and potato peeler sink are frequently provided with a $\frac{1}{2}$ in. faucet over each of them, supported independent of the fixture. Generally hot water only is so connected. These are not an absolute necessity but often a great convenience. Drinking fountains and water coolers require $\frac{1}{2}$ in. cold water.

In sizing mains to care for two or more items make the mains about one half the sum of the areas of the branches.

Steam Supply Connections

Steam connections to jacketed kettles, soup kettles, vegetable steamers, steam tables, coffee urns, plate warmers and roll warmers are $\frac{1}{2}$ in. for smaller sizes and $\frac{3}{4}$ in. for larger sizes and in cases where runs are long. Steam connections to dish washing machines are $\frac{1}{2}$ to $1\frac{1}{4}$ in. according to size.

In sizing mains to take care of two or more items make the area of same about one half the sum of the branch areas, keeping the sizes well up, toward the ends of the runs.

Return Connections

Return connections are uniformly $\frac{1}{2}$ in. size and are made to all equipment having steam connections except the spray to dishwashing machine. However the coil in this machine requires a return connection. Each unit or separate coil should be provided with a $\frac{1}{2}$ in. thermostatic trap. If more than one unit or coil is connected to the same trap air binding will result. Connections of the same size are made to return mains.

Gas Connections

The proper manner is to obtain from the manufacturer, the gas consumption per hour of the different fixtures, to be used and size the gas pipes accordingly. Excellent tables for this purpose, when the gas consumption and length of run are known, are given by the *American Gas Association*.

As an approximation the following is given as sizes of connections commonly found in equipment of average size. Bake shop oven $1\frac{1}{4}$ in.; pastry oven $\frac{3}{4}$ in.; dish washing machines $\frac{3}{4}$ to $1\frac{1}{2}$ in.; broilers 1 to $1\frac{1}{4}$ in.; ranges 1 to 2 in.; small ranges in diet kitchens 1 in.; salamanders and warmers $\frac{3}{4}$ in. and steam tables 1 in.

Grease Traps

The dish washing machine, all pot sinks, pan sinks and any sinks into which grease may find its way should be provided with grease traps. When grease traps on the individual fixtures are used the cold water supply to the fixture is connected to pass through the jacket of the grease trap.

HOSPITAL EQUIPMENT

Every modern hospital must sterilize all instruments and utensils used in operations and treatments, all dressings before being used, all bed pans from wards and rooms, the baby's milk and the bottle in which it is served. Provision should also be made to sterilize mattresses, bedding and similar articles and also dishes when occasion arises. A plentiful supply of sterilized water and distilled water must also be provided. Hospitals for mental and nervous diseases must include hydro-therapy and electro-therapy treatment. The equipment with which this chapter deals is largely, but not altogether, sterilizers.

Instrument, dressing, utensil, dish and mattress sterilizers are usually rated by their internal dimensions in inches; water sterilizers by the gallons capacity of each of the two reservoirs, water stills by their capacity in gallons and pasteurizers and bottle sterilizers by their capacity in 8 oz. bottles. The method of rating other hospital equipment will be referred to later.

Selection of Type of Sterilizers

Sterilizers and water stills may be had heated either by steam, electricity, gas, kerosene or gasoline; the preference being in the order named. Steam is the only method, however, for which the entire line of sterilizers are ordinarily made. They are simpler, contain less equipment liable to derangement, quicker in operation and cheaper both to install and operate than those heated by any other method. Electrically heated sterilizers, in practice, are confined to the smaller sizes, and such as for dentists' and doctors' treatment rooms outside of hospitals.

Electricity is superior to any other method only in one case, *i.e.*, the solution warmer, where due to its adaptability to automatic control it is preferred to any other method.

Cost of Operation

The cost of operation of steam sterilizer equipment is very little more than the cost of keeping steam constantly available and the amount of use has little effect on the total cost of operation. The cost of operation of electric sterilizers may be considerable, depending upon how much they are used and the cost of *standby* service for them. This will be seen when it is noted that the smallest instrument sterilizer is rated at 2200 watts and the largest dressing sterilizer at 12,000 watts.

The cost of operation of gas, kerosene and gasoline heated sterilizers is much more than for steam heated ones but usually less than for electric heated ones, depending entirely on the amount of use.

Open and Closed Sterilizers

There are two general classes of sterilizer, *i.e.*, the open type in which the articles to be sterilized are immersed in a water bath heated by steam coils, the limiting temperature obviously being 212 deg. Fahr., and the closed type in which there is no water bath and the articles to be sterilized are brought into temperatures corresponding to steam at 40 to 60 lb. pressure per square inch.

The former is the older type and has the disadvantage of depositing