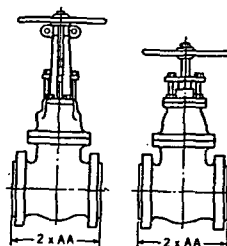


Use of socket welding fittings generally is restricted to nominal pipe size 3 in. and smaller in which range commercial fittings are available. For pipe sizes above 3 in., butt welding fittings of the type shown in Table 10 customarily are used. Proposed American Standard dimensions for socket-welding elbows, tees, crosses, 45-deg elbows, and couplings, which are being formulated under the procedure of the *American Standards Association*, are given in Table 13.

TABLE 14. AMERICAN STANDARD CONTACT SURFACE TO CONTACT SURFACE DIMENSIONS OF CAST-IRON AND STEEL FLANGED WEDGE GATE VALVES, A.S.A. B16.10-1939



| NOMINAL<br>PIPE<br>SIZE | CONTACT SURFACE TO CONTACT SURFACE DIMENSIONS, (2 X AA) |        |        |        |        |
|-------------------------|---------------------------------------------------------|--------|--------|--------|--------|
|                         | Cast-Iron <sup>a</sup>                                  |        |        | Steel  |        |
|                         | 125                                                     | 175bc  | 250b   | 150b   | 300b   |
| 1                       | -----                                                   | -----  | -----  | -----  | -----  |
| 1 1/4                   | -----                                                   | -----  | -----  | -----  | -----  |
| 1 1/2                   | -----                                                   | -----  | -----  | -----  | 7 1/2  |
| 2                       | 7                                                       | 7 1/4  | 8 1/2  | 7      | 8 1/2  |
| 2 1/2                   | 7 1/2                                                   | 8      | 9 1/2  | 7 1/2  | 9 1/2  |
| 3                       | 8                                                       | 9 1/4  | 11 1/8 | 8      | 11 1/8 |
| 3 1/2                   | 8 1/2                                                   | 10     | 11 7/8 | 8 1/2  | 11 7/8 |
| 4                       | 9                                                       | 10 1/2 | 12     | 9      | 12     |
| 5                       | 10                                                      | 11 1/2 | 15     | 10     | 15     |
| 6                       | 10 1/2                                                  | 13     | 15 7/8 | 10 1/2 | 15 7/8 |
| 8                       | 11 1/2                                                  | 14 1/4 | 16 1/2 | 11 1/2 | 16 1/2 |
| 10                      | 13                                                      | 16 3/4 | 18     | 13     | 18     |
| 12                      | 14                                                      | 17 1/2 | 19 3/4 | 14     | 19 3/4 |
| 14 O.D.                 | 15                                                      | -----  | 22 1/2 | 15     | 30     |
| 16 O.D.                 | 16                                                      | -----  | 24     | 16     | 33     |
| 18 O.D.                 | 17                                                      | -----  | 26     | 17     | 36     |
| 20 O.D.                 | 18                                                      | -----  | 28     | 18     | 39     |
| 24 O.D.                 | 20                                                      | -----  | 31     | 20     | 45     |

All dimensions given in inches.

<sup>a</sup>These dimensions are the same for Cast-Iron Double Disc Flanged Gate Valves.

<sup>b</sup>These are pressure designations which refer to the primary service ratings in pounds per square inch of the connecting end flanges.

<sup>c</sup>The connecting end flanges of 175 lb valves are the same as those on 250 lb valves.

NOTE 1:—Where dimensions are not given, the sizes either are not made or there is insufficient demand to warrant the expense of unification.

NOTE 2:—Female and groove joint facings have bottom of groove in same plane as flange edge, and center to contact surface dimensions for these facings are reduced by the amount of the raised face.

## VALVES

Valves are made with both threaded and flanged ends for screwed and bolted connections just as are pipe fittings.

The material used for valves of small size is generally brass or bronze for low pressures and forged steel for high pressures, while in the larger sizes either cast-iron, cast-steel or some of the steel alloys are employed. Practically all iron or steel valves intended for steam or water work are bronze-mounted or trimmed.

Brass, bronze, and iron valves are generally designed for standard or extra heavy service, the former being used up to 125 lb and the latter up to 250 lb saturated steam working pressure, although most manufacturers also make valves for medium pressure up to 175 lb steam working pressure. The more common types are gate valves or straightway valves, globe valves, angle valves, check valves and automatic valves, such as reducing and back-pressure valves.

Gate valves are the most frequently used of all valves since in their open position the resistance to flow is a minimum, but they should not be used where it is desired to throttle the flow; globe valves should be used for this purpose. These valves may be secured with either a rising or a non-rising stem, although in the smaller sizes the rising stem is more commonly used. The rising stem valve is desirable because the positions of the handle and stem indicate whether the valve is open or closed, although space limitations may prevent its use. The globe valve is less expensive to manufacture than the gate valve, but its peculiar construction offers a high resistance to flow and may prevent complete drainage of the pipe line. These objections are of particular importance in heating work.

An American Standard, A.S.A. B16.10-1939, has been prepared giving the face-to-face dimensions of ferrous flanged and welding end valves. The following types are covered: wedge gate, double disc gate, globe and angle, and swing check. One purpose of establishing these dimensions is to insure that gate valves of a given rating and flange dimension of either the wedge or double disc design will be interchangeable in a pipe line. Contact surface to contact surface dimensions of cast-iron and steel flanged wedge gate valves are given in Table 14. End-to-end dimensions for steel butt-welding valves in sizes up to 8 in., inclusive, are the same as those given in Table 14 for steel valves.

Check valves are automatic in operation and permit flow in only one direction, depending for operation on the difference in pressure between the two sides of the valve. The two principal kinds of check valves are the swing check in which a flapper is hinged to swing back and forth, and the lift check in which a dead weight disc moves vertically from its seat.

Valves commonly used for controlling steam or water supply to radiators constitute a special class since they are manufactured to meet heating system requirements. These valves are generally of the angle type and are usually made of brass. Graduations on the heads or lever handles are often supplied to indicate the relative opening of the valve in any position.

Automatic control of steam supply to individual radiators can be effected by use of direct-acting radiator valves having a thermostatic