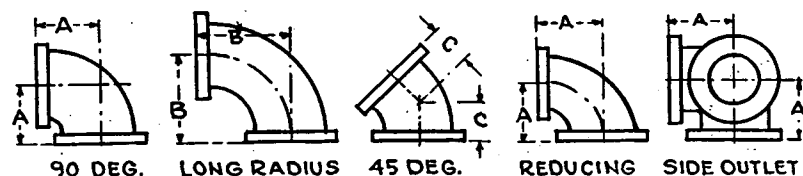


fittings are given in Table 7, whereas the dimensions for 125 lb cast-iron flanged fittings are given in Tables 8 and 9.

For low temperature service not to exceed about 220 F, a number of paper or vegetable fiber gasket materials will prove satisfactory; for plain

TABLE 9. AMERICAN STANDARD DIMENSIONS OF ELBOWS FOR 125 LB CAST-IRON FLANGED FITTINGS



NOMINAL PIPE SIZE ^a	A CENTER TO FACE ELBOW b-o-d	B CENTER TO FACE LONG RADIUS ELBOW b-o-d	C CENTER TO FACE 45 DEG ELBOW c	DIAMETER OF FLANGE	THICKNESS OF FLANGE, MIN.	METAL THICKNESS OF BODY, MIN.
1	3 1/2	5	1 3/4	4 1/4	7/16	7/16
1 1/2	3 3/4	5 1/2	1 7/8	4 5/8	1/2	7/16
2	4	6	2 1/4	5	9/16	7/16
2 1/2	4 1/2	6 1/2	2 1/2	6	5/8	7/16
3	5	7	3	7	1 1/16	7/16
3 1/2	5 1/2	7 3/4	3 1/2	7 1/2	3/4	7/16
4	6	8 1/2	4	8 1/2	13/16	7/16
5	6 1/2	9	4 1/2	9	1 1/16	1 1/2
6	7 1/2	10 1/4	5	10	1 1/8	1 1/2
8	8	11 1/2	5 1/2	11	1 1/8	1 1/2
10	9	14	6 1/2	13 1/2	1 1/8	5/8
12	11	16 1/2	7 1/2	16	1 3/8	3/4
14 O.D.	12	19	8 1/2	19	1 1/2	1 1/8
16 O.D.	14	21 1/2	9 1/2	21	1 3/8	1 1/8
18 O.D.	15	24	11	23 1/2	1 7/8	1 1/8
20 O.D.	16 1/2	26 1/2	15	25	1 7/8	1 1/8
24 O.D.	18	29	18	27 1/2	1 7/8	1 1/8
30 O.D.	22	34	21	32	1 7/8	1 1/8
36 O.D.	25	41 1/2	24	38 3/4	2 1/8	1 1/8
42 O.D.	28	49		46	2 3/8	1 1/8
48 O.D.	31	56 1/2		53	2 3/8	1 1/8
	34	64		59 1/2	2 3/4	2

All dimensions given in inches.

^aSize of all fittings listed indicates nominal inside diameter of port.

^bReducing elbows and side outlet elbows carry same dimensions center to face as straight size elbows corresponding to the size of the larger opening.

^cSpecial degree elbows, ranging from 1 to 45 deg, inclusive, have the same center to face dimensions as given for 45 deg elbows and those over 45 deg and up to 90 deg, inclusive, shall have the same center to face dimensions as given for 90 deg elbows. The angle designation of an elbow is its deflection from straight line flow and is the angle between the flange faces.

^dSide outlet elbows shall have all openings on intersection center-lines.

raised face flanges, rubber or rubber inserted gaskets are commonly employed. Asbestos composition gaskets are probably the most widely used, particularly where the temperature exceeds 250 F. Jacketed asbestos and metallic gaskets may be used for any pressure and tem-

perature conditions, but preferably only with a relatively narrow recessed facing.

WELDING

Erection of piping in heating and ventilating installations by means of fusion welding has been commonly accepted in the past few years as a competitive method to the screwed and flanged joint. Since the question of economy of welding as against the use of screwed and flanged fittings is dependent on the individual job, the use of welding is generally recommended on the basis of a greatly reduced cost of maintenance and repair, of less weight resulting from the use of a lighter-weight pipe, and of increased economy in pipe insulation, hangers, and supports rather than on the basis of any economy that might be effected in actual erection by welding.

Fusion welding, commonly used in erection of piping, is defined as the process of joining metal parts in the molten, or molten and vapor states, without the application of mechanical pressure or blows. Fusion welding embraces gas welding and electric arc welding, both of which are commonly used to produce acceptable welds.

Welding application requires the same basic knowledge of design as do the other types of assembly, but in addition, requires a generous knowledge of the sciences involved, particularly as to welding qualities of metal, their reaction to extremely high temperatures, and the ability to determine and use only the best quality welding rods. This requirement applies equally to employer and employee with the employer accepting all of the responsibility. Thus the employer should select his welding mechanics with good judgment, provide them with first-class equipment and tools, arrange for their training and use of acceptable workmanship standards, and at regular intervals subject their work to prescribed tests. Industry will not accept the employment of mechanics of undetermined ability nor on the basis of past experience. Neither does industry accept the statement that a weld is only as good as the workman who makes it. The control Codes now in process of adoption will be the law governing the use of the welding process. These Codes prohibit individual practices contrary to their specified procedure and rules of control, and this is predicated upon the sound requirement that the employer must assume full responsibility for the deposited weld.

It is advisable that this management responsibility be included in all welding specifications and that authoritative standards of workmanship also be specified. The standards of workmanship for this industry are as set forth in the *Standard Manual on Pipe Welding* of the Heating, Piping and Air Conditioning Contractors National Association.

A complete line of manufactured steel welding fittings is now available with plain ends machine beveled for welding and with radii similar to short and long radius flanged fittings. Some typical types of these fittings are shown in Fig. 3. They are made in pipe sizes 3/4 to 24 in., standard and extra heavy, in steel, wrought iron, brass, copper, and special alloys.

Socket welding fittings of forged steel are also commercially available. These fittings have a machined recess into which the pipe slips. A fillet weld between the pipe and socket edge provides a pressure-tight joint. A