

The recommended gages for sheet metal duct construction are given in Table 5. Weights of sheet metal per square foot of surface for different gages are given in Table 6. The weights of various gages and the areas for any length of run of rectangular sheet metal ducts may also be determined from Fig. 8. The bottom scale represents the sum of the two

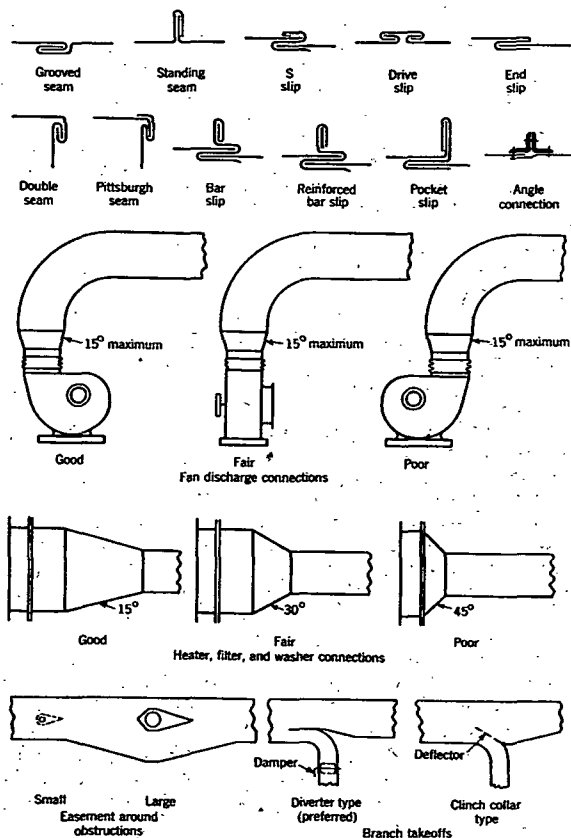


FIG. 7. SHEET METAL DUCT AND ARRANGEMENT DETAILS

sides of the duct and the oblique lines give the length of run in feet. Proceeding horizontally to the right from the intersection of vertical and oblique lines on the chart, the area of the duct may be determined in the first vertical scale. The scales to the right give the weights of the duct run for different gages of metal. In calculating the weights of duct, it is considered good practice to allow 20 per cent additional for weights of joints and bracings. Various weights and thicknesses of standard copper sheets will be found in Table 7.

TABLE 5. RECOMMENDED SHEET METAL GAGES FOR RECTANGULAR DUCT CONSTRUCTION^a

U. S. STD. GAGE	MAXIMUM SIDE, INCHES	TYPE OF TRANSVERSE JOINT CONNECTIONS ^b	BRACING
26	Up to 12	S, Drive, Pocket or Bar Slips, on 7 ft 10 in. centers	None
24	13 to 24	S, Drive, Pocket or Bar Slips, on 7 ft 10 in. centers	None
	25 to 30	S, Drive, 1 in. Pocket or 1 in. Bar Slips, on 7 ft 10 in. centers ^c	1 x 1 x 1/8 in. angles 4 ft from joint
22	31 to 40	Drive, 1 in. Pocket or 1 in. Bar Slips, on 7 ft 10 in. centers ^c	1 x 1 x 1/8 in. angles 4 ft from joint
	41 to 60	1 1/2 in. Angle Connections, or 1 1/2 in. Pocket or 1 1/2 in. Bar Slips with 1 3/8 in. x 1/8 in. bar reinforcing on 7 ft 10 in. centers ^c	1 1/2 x 1 1/2 x 1/8 in. angles 4 ft from joint
20	61 to 90	1 1/2 in. Angle Connections, or 1 1/2 in. Pocket or 1 1/2 in. Bar Slips 3 ft 9 in. maximum centers with 1 3/8 x 1/8 in. bar reinforcing	1 1/2 x 1 1/2 x 1/8 in. diagonal angles, or 1 1/2 x 1 1/2 x 1/8 in. angles 2 ft from joint
18	91 and up	2 in. Angle Connections or 1 1/2 in. Pocket or 1 1/2 in. Bar Slips 3 ft 9 in. maximum centers with 1 3/8 x 1/8 in. bar reinforcing ^d	1 1/2 x 1 1/2 x 1/8 in. diagonal angles, or 1 1/2 x 1 1/2 x 1/8 in. angles 2 ft from joint

^aFor normal pressures and velocities (see Table 3) utilized in typical ventilating and air conditioning systems. Where special rigidity or stiffness is required, ducts should be constructed of metal two gages heavier. All uninsulated ducts 18 in. and larger should be cross-braken. Cross-braking may be omitted on uninsulated ducts if two gages of heavier metal are used.

^bOther joint connections of equivalent mechanical strength and air tightness may be used.

^cDuct sections of 3 ft 9 in. may be used with bracing angles omitted, instead of 7 ft 10 in. lengths with joints indicated.

^dDucts 91 in. and larger require special field study for hanging and supporting methods.

HEAT LOSSES FROM DUCTS

The thermal transmittance U for ducts can be found as follows:

$$\text{For uninsulated metal duct, } U = \frac{1}{\frac{1}{f_i} + \frac{1}{f_o}} \quad (8)$$

$$\text{For uninsulated non-metallic ducts, } U = \frac{1}{\frac{1}{f_i} + \frac{x}{k} + \frac{1}{f_o}} \quad (9)$$

where U , f_i , f_o , x and k are as defined on page 759.

Where x is small and k is large, however, this factor $\frac{x}{k}$ is of little importance and may be neglected.

Film conductance f_i for air flowing in ducts apparently depends only on the velocity of the air and the diameter of the duct. A fairly reliable inside coefficient can be calculated from Schultz's modified equation:

$$f_i = \frac{0.32 V_a^{0.8}}{D^{0.25}} \quad (10)$$

where

V_a = velocity of air in duct, feet per second.

D = inside diameter of duct, feet.