TABLE 12. HEAT EMISSION OF DIRECT PIPE COIL RADIATION FOR STEAM

Steam Temperature at 240 deg. fahr.—Pressure 10 lb. per sq. in.—Room Temperature at 60 deg. fahr.

WALL COILS—Coils Placed Vertical—Pipes Horizontal

B.t.u. per Lineal Ft. of Coil per Hour. (Not Lineal Ft. of Pipe.)

Size of Coil	1"	1¼"	1½"
Single Row	175	215	245
Two	335	413	462
Four	584	724	816
Six	752	930	1050
Eight	864	1064	1200
Ten	970	1200	1350
Twelve	1075	1330	1500

WALL COILS—Coils Placed Vertical—Pipes Vertical

Emission varies in inverse ratio of the height of the coil. Use 133 B.t.u. per lineal ft. of pipe as an average for 1¼ in. coil, 10 ft. high.

CEILING COILS—Coils Placed Horizontal—Pipes Horizontal

Emission is equal to that of a single row coil.

Allowance must be made however, if the coil is at the ceiling in a higher temperature.

In this case use 167 B.t.u. per lineal ft. of pipe for 1 in. coils.
206 " " " " " " 1¼ in. coils.
231 " " " " " " 1½ in. coils.

Note.—This Table has been developed by a method of deduction from the available data on such experimental work on pipe coils as has been recorded, and does not represent definite results of tests as in Tables 17 to 30. The values are therefore approximate only but can be used with assurance that they are more accurate than those obtained by the usual method for calculating pipe coil surface.

TABLE 13. HEAT EMISSION OF DIRECT PIPE COIL RADIATION FOR HOT-WATER

Water Temperature at 180 deg. fahr. Room Temperature at 60 deg. fahr.

WALL COILS—Coils Placed Vertical—Pipes Horizontal

B.t.u. per Lineal Ft. of Coil per Hour. (Not Lineal Ft. of Pipe.)

Size of Coil	1"	1¼"	1½"
Single Row	105	131	147
Two	198	248	276
Four	352	432	488
Six	456	558	630
Eight	520	640	720
Ten	583	720	810
Twelve	645	800	900

WALL COILS—Coils Placed Vertical—Pipes Vertical

Emission varies in inverse ratio to the height of coil. Use 80 B.t.u. per lineal ft. of pipe as an average for 1¼ in. Coil 10 ft. high.

CEILING COILS—Coils Placed Horizontal—Pipes Horizontal

Emission is equal to that of a single row coil.

Allowance must be made however, if the coil is at the ceiling where the temperature is higher.

In this case use 100 B.t.u. per lineal ft. of pipe for 1 in. coils.
125 " " " " " " 1¼ in. coils.
138 " " " " " " 1½ in. coils.

Note.—See note under Ceiling Coils for Steam.

SELECTION OF RADIATION

It is usually necessary to select the type and location of radiation to conform to the conditions and space available in the room. It is usually most convenient and practical to locate the radiation on the exposed side of the room. The size of the radiator to take care of any particular heat loss can be best selected from Tables 1 and 13. As the heat emitted per square foot of radiation varies in radiators of different heights, widths and lengths, and also with the steam pressure and the temperature of the room, errors will occur if the same factor is used for all radiators.

To determine the amount of radiation required for heating a given room, calculate first the total heat loss from the room as outlined in Chapter I, making proper allowance for exposure, wind velocity, height of ceiling, etc. Next decide upon the type (design, height, width, etc.) and number of radiators to be used. Then find in Tables 1 to 11 or from manufacturers' data the number of sections necessary in each radiator.

Example.—The heat loss from a given room calculated in accordance with Chapter I is estimated to be 14,216 B.t.u. per hour. How many sections are required in a three-column 38 in. radiator for heating this room?

Solution.—Table 3, column for 38 in. indicates that 12 sections will emit 13,530 B.t.u. and that 13 sections will emit 14,587 B.t.u. Therefore a 13-section radiator is required.

Example.—How many sections are required in a three-column 38 in. radiator to heat a room having a heat loss of 24,986 B.t.u. per hour?

Solution.—From Table 3, column for 38 in. find 21,990 B.t.u. as the heat loss for a 20-section radiator and 1057 as the heat loss per additional intermediate section.

$20 + \frac{24{,}986 - 21{,}990}{1057}$ or 23 are the required number of sections.

Example.—How many sections of 22 in. wall radiation are required to heat a room to 50 deg. with hot water at a mean temperature of 160 deg. fahr. The calculated heat loss from the room is 10,400.

Solution.—Conversion factor for water at 160 deg. and air at 50 deg. is 1.412. $10{,}400 \times 1.412 = 14{,}685$. Table 6, column for 22 in. indicates 8 as the number of sections necessary.

To determine the amount of semi-indirect radiation to heat a room, calculate the heat loss as in Chapter I, adding the proper amount for exposure, etc. Then add the required 40 per cent as shown in Cases *1* to *6* (on p. 77) and refer to Tables 1 to 13 to find the proper size radiator.

Example.—How many sections are required in a 45 in. three-column semi-indirect radiator installed according to Case *5* (p. 77) to heat a room whose heat loss is calculated to be 17,200 B.t.u.?