

TABLE 1. VARIATION IN DIMENSIONS AND CATALOG RATING OF 10-SECTION TUBULAR RADIATORS MADE BY SIX MANUFACTURERS

No. of Tubes.....	3	4	5	6	7
Width of Radiator.....Inches	4.6-5.1	6.0-7.0	8.0-8.9	9.1-10.4	11.4-12.8
Length per Section.....Inches	2.5	2.5	2.5	2.5	2.5-3.0
HEIGHT WITH LEGS—INCHES	HEAT EMISSION—EQUIVALENT SQUARE FEET				
13-14			28.5	20	25.0-32.5
16-18					30.0-38.3
20-21	15.0-17.5	20.0-22.5	25.0-31.2	30	36.7-45.0
22-23	20.0-21.3	25	30.0-33.9	35	40.0-45.2
25-26	20.0-26.7	25.0-27.5	32.5-39.8	37.5-40.0	50.0-53.5
30-32	25.0-30.9	33.3-35.0	40.0-48.6	50	63.3-62.5
36-38	30.0-36.7	40.0-42.5	50.0-56.5	60	70.0-75.4

the equivalent heating surface made up of 1¼-in. pipe coils. Wall radiators are particularly adapted for direct heating of industrial buildings, for heating small rooms such as baths or toilets, or for use at the ceilings of basement rooms or just below the skylights.

These radiators are assembled at the factory in stacks of from 3 to 5 sections, and these stacks may be connected later by right and left hexagon nut shoulder nipples to obtain large units. The method of hanging or supporting wall radiators is of great importance as the tendency of these radiators to tear loose the brackets or hangers is very marked, due to the expansion and contraction strains produced by the piping system as well as by weight of the radiators themselves. Wall sections are always installed with bars vertical in order to obtain the greatest efficiency.

Window Radiators

Low window radiators are usually of the flue type or of the tubular type and are designed to be placed below the stools or seats of very low windows. In construction, the flue type differs from the column and tubular radiators only in that the sections are usually flat hollow slabs with vertical ribs so cast upon them as to form flues of the interior surfaces of the radiator. This type is not made in heights above 20 in.

TABLE 2. HEAT EMISSION OF PIPE COILS PLACED VERTICALLY ON A WALL (PIPES HORIZONTAL) CONTAINING STEAM AT 215 F AND SURROUNDED WITH AIR AT 70 F.

Btu per linear foot of coil per hour (not linear feet of pipe)

SIZE OF PIPE	1"	1¼"	1½"
Single Row.....	132	162	185
Two.....	252	312	348
Four.....	440	545	616
Six.....	567	702	793
Eight.....	651	796	907
Ten.....	732	907	1020
Twelve.....	812	1005	1135

Pipe-Coil Radiators

Pipe-coil radiators are in more or less general use in factory and industrial plants and are usually made up of 1 or 1¼-in. standard black pipe screwed into manifolds. These coils may be of the miter type, or of the return or box-coil type using manifold tees or headers of cast-iron in each case. A coil made up of return bends and straight pipe is sometimes used, and is called a trombone coil. Its use is questionable since the long, continuous coil offers excessive friction to the steam or water. Pipe coils are intended to be hung on the side walls or from the ceiling, and suitable provision must be made for expansion. Vertical pipe radiators have also been used extensively in the past, and are made up by screwing short pieces of capped pipe into a cast-iron base forming a portable radiator very similar to the ordinary cast-iron column radiator.

Special Radiators

The *circular* radiator is often placed around columns in entrance lobbies and can be obtained in the one-, two-, and three-tube patterns, in all regular heights, but usually only on special order.

The *corner* radiator is also often used in entrance lobbies where the wall space is limited. It can be obtained in practically all patterns and heights except in the four-tube and in the ventilating flue style. As from 3 to 5 sections are required to make the corner, depending on the style of radiator, it is necessary to specify the number of sections in each arm as well as in the corner. The supply and return ends must be indicated also to provide the proper hub for each end.

OUTPUT OF RADIATORS

In the past the unit of measure recognized in computing heat emission of radiators was the square foot of actual surface. The use of this unit is gradually being discarded, however, for the reason that heat emission depends upon the design of the heating unit as well as upon its surface area. The engineer is interested primarily in the amount of heat emitted by, rather than the amount of surface in a heat-transferring agent. As a result, radiators are now rated on the heat given off either in Btu per hour or in equivalent square feet, based on 240 Btu per hour.

Output of Tubular Radiators

Table 1 illustrates the difficulty in tabulating tubular radiator outputs since there is so much variation between the products of the different manufacturers. Only on the four-tube and six-tube sizes is there any practical agreement in output value. The heat emission values appear as square feet but are entirely artificial, being based on the heat emission of the radiator and not on the measured surface.

Output of Pipe Coils

The heat emission of vertical pipe coils placed on a wall (pipes horizontal) is given in Table 2. 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 experimental results of tests. For vertical wall coils (pipes vertical) the heat emission