

TABLE 1. COLUMN-TYPE CAST-IRON RADIATOR

| HEIGHT<br>Inches | GENERALLY ACCEPTED RATING PER SECTION <sup>a</sup> |        |             |        |              |        |
|------------------|----------------------------------------------------|--------|-------------|--------|--------------|--------|
|                  | One Column                                         |        | Two Column  |        | Three Column |        |
|                  | Sq Ft                                              | Btu/hr | Sq Ft       | Btu/hr | Sq Ft        | Btu/hr |
| 15               |                                                    |        | 1½          | 360    |              |        |
| 18               |                                                    |        | 2           | 480    | 2¼           | 540    |
| 20               | 1½                                                 | 360    | 2½          | 540    |              |        |
| 22               |                                                    |        | 2½          | 560    | 3            | 720    |
| 23               | 1½                                                 | 400    |             |        |              |        |
| 26               | 2                                                  | 480    | 2¾          | 640    | 3¾           | 900    |
| 32               | 2½                                                 | 600    | 3½          | 800    | 4½           | 1080   |
| 38               | 3                                                  | 720    | 4           | 960    | 5            | 1200   |
| 45               |                                                    |        | 5           | 1200   | 6            | 1440   |
|                  | Four Column                                        |        | Five Column |        | Six Column   |        |
|                  | Sq Ft                                              | Btu/hr | Sq Ft       | Btu/hr | Sq Ft        | Btu/hr |
|                  |                                                    |        |             |        |              |        |
| 13               |                                                    |        |             |        | 3            | 720    |
| 16               |                                                    |        |             |        | 3¾           | 900    |
| 18               | 3                                                  | 720    | 4¾          | 1120   | 4½           | 1080   |
| 20               |                                                    |        |             |        | 5            | 1200   |
| 22               | 4                                                  | 960    |             |        |              |        |
| 26               | 5                                                  | 1200   | 7           | 1680   |              |        |
| 32               | 6½                                                 | 1560   |             |        |              |        |
| 38               | 8                                                  | 1920   | 10          | 2400   |              |        |
| 45               | 10                                                 | 2400   |             |        |              |        |

<sup>a</sup> These ratings are based on steam at 215 F and air at 70 F. They apply only to installed radiators exposed in a normal manner; not to radiators installed behind enclosures, grilles, or under shelves. For Btu per hour ratings at other temperatures, divide table values by factors found in Table 6.

TABLE 2. LARGE-TUBE CAST-IRON RADIATORS

Sectional, cast-iron, tubular-type radiators of the large-tube pattern, that is, having tubes approximately 1½ in. in diameter, 2½ in. on centers.

| NUMBER OF<br>TUBES PER<br>SECTION | CATALOG RATING<br>PER SECTION <sup>a</sup> |        | HEIGHT<br>In. | WIDTH<br>In. | SECTION<br>CENTER<br>SPACING<br>In. | LEG HEIGHT <sup>b</sup><br>TO TAPPING<br>In. |
|-----------------------------------|--------------------------------------------|--------|---------------|--------------|-------------------------------------|----------------------------------------------|
|                                   | Sq Ft                                      | Btu/hr |               |              |                                     |                                              |
| 3                                 | 1¾                                         | 420    | 20            |              | 2½                                  | 4½                                           |
|                                   | 2                                          | 480    | 23            |              | 2½                                  | 4½                                           |
|                                   | 2½                                         | 560    | 26            | 4¾           | 2½                                  | 4½                                           |
|                                   | 3                                          | 720    | 32            |              | 2½                                  | 4½                                           |
| 4                                 | 3½                                         | 840    | 38            |              | 2½                                  | 4½                                           |
|                                   | 2¼                                         | 540    | 20            |              | 2½                                  | 4½                                           |
|                                   | 2½                                         | 600    | 23            |              | 2½                                  | 4½                                           |
|                                   | 2¾                                         | 660    | 26            | 6¼-6½        | 2½                                  | 4½                                           |
| 5                                 | 3½                                         | 840    | 32            |              | 2½                                  | 4½                                           |
|                                   | 4¼                                         | 1020   | 38            |              | 2½                                  | 4½                                           |
|                                   | 2¾                                         | 640    | 20            |              | 2½ <sup>d</sup>                     | 4½                                           |
|                                   | 3                                          | 720    | 23            |              | 2½ <sup>d</sup>                     | 4½                                           |
| 6                                 | 3½                                         | 840    | 26            |              | 2½ <sup>d</sup>                     | 4½                                           |
|                                   | 4¼                                         | 1040   | 32            | 8-8½         | 2½ <sup>d</sup>                     | 4½                                           |
|                                   | 5                                          | 1200   | 38            |              | 2½ <sup>d</sup>                     | 4½                                           |
|                                   | 6                                          | 1440   |               |              | 2½ <sup>d</sup>                     | 4½                                           |
| 7                                 | 3                                          | 720    | 20            |              | 2½                                  | 4½                                           |
|                                   | 3½                                         | 840    | 23            |              | 2½                                  | 4½                                           |
|                                   | 4                                          | 960    | 26            | 9-10¾        | 2½                                  | 4½                                           |
|                                   | 5                                          | 1200   | 32            |              | 2½                                  | 4½                                           |
| 8                                 | 6                                          | 1440   | 38            |              | 2½                                  | 4½                                           |
|                                   | 2½                                         | 600    | 14            |              | 2½                                  | 3                                            |
|                                   | 3                                          | 720    | 17            | 11½-12½      | 2½                                  | 3                                            |
| 9                                 | 3¾                                         | 880    | 20            |              | 2½                                  | 3 or 4½                                      |

<sup>a</sup> These ratings are based on steam at 215 F and air at 70 F. They apply only to installed radiators exposed in a normal manner; not to radiators installed behind enclosures, grilles, or under shelves. For Btu per hour ratings at other temperatures, divide table values by factors found in Table 6.

<sup>b</sup> Maximum assembly 60 sections. Length equals number of sections times 24 in.

<sup>c</sup> Where greater than standard leg heights are required, this dimension shall be 6 in., except for 7-tube sections, in heights from 13 to 20 in., inclusive, for which this dimension shall be 4½ in. Radiators may be furnished without legs.

<sup>d</sup> For 5-tube hospital-type radiation, this dimension is 3 in.

it emits and is generally expressed in units of: Btu per hr; *Mbh* (1000 Btu per hr); or in equivalent direct radiation (e.g., 240 Btu per hr for steam).

## RADIATORS

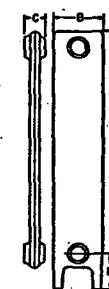
Column and large-tube radiators are no longer manufactured, but since many of these units are still in use, Tables 1 and 2 are included to provide principal dimensions and average ratings of them.

The small-tube type radiators, with a spacing of 1½ in. per section, are about the only available cast-iron radiating surface for homes and office buildings. Small-tube radiators occupy less space than the older column and large-tube radiators, and are particularly suited for installation in recesses.

After a study of the demand for various sizes of radiators, the *Institute of*

TABLE 3. SMALL-TUBE CAST-IRON RADIATORS

| NUMBER<br>OF<br>TUBES<br>PER<br>SECTION | CATALOG<br>RATING<br>PER<br>SECTION <sup>a</sup> |        | SECTION DIMENSIONS       |            |         |                           |                                 |
|-----------------------------------------|--------------------------------------------------|--------|--------------------------|------------|---------|---------------------------|---------------------------------|
|                                         |                                                  |        | A<br>Height <sup>c</sup> | B<br>Width |         | C<br>Spacing <sup>b</sup> | D<br>Leg<br>Height <sup>e</sup> |
|                                         |                                                  |        |                          | Minimum    | Maximum |                           |                                 |
|                                         | Sq Ft                                            | Btu/hr |                          | In.        | In.     |                           |                                 |
| 3 <sup>d</sup>                          | 1.6                                              | 384    | 25                       | 3¼         | 3¼      | 1¾                        | 2½                              |
| 4 <sup>d</sup>                          | 1.6                                              | 384    | 19                       | 4¾         | 4¾      | 1¾                        | 2½                              |
|                                         | 1.8                                              | 432    | 22                       | 4¾         | 4¾      | 1¾                        | 2½                              |
|                                         | 2.0                                              | 480    | 25                       | 4¾         | 4¾      | 1¾                        | 2½                              |
| 5 <sup>d</sup>                          | 2.1                                              | 504    | 22                       | 5½         | 5½      | 1¾                        | 2½                              |
|                                         | 2.4                                              | 576    | 25                       | 5½         | 5½      | 1¾                        | 2½                              |
| 6 <sup>d</sup>                          | 2.3                                              | 552    | 19                       | 6¼         | 6¼      | 1¾                        | 2½                              |
|                                         | 3.0                                              | 720    | 25                       | 6¼         | 6¼      | 1¾                        | 2½                              |
|                                         | 3.7                                              | 888    | 32                       | 6¼         | 6¼      | 1¾                        | 2½                              |



<sup>a</sup> These ratings are based on steam at 215 F and air at 70 F. They apply only to installed radiators exposed in a normal manner; not to radiators installed behind enclosures, grilles, or under shelves. For Btu per hour ratings at other temperatures, divide table values by factors found in Table 6.

<sup>b</sup> Length equals number of sections times 1½ in.

<sup>c</sup> Overall height and leg height, as produced by some manufacturers, are one inch greater than shown in Columns A and D. Radiators may be furnished without legs. Where greater than standard leg heights are required this dimension shall be 4½ in.

<sup>d</sup> Or equal.

Boiler and Radiator Manufacturers, in cooperation with the Division of Simplified Practice, *National Bureau of Standards*, established Simplified Practice Recommendation R174-47 for small-tube cast-iron radiators. Table 3 shows the size and dimensions now being manufactured.

Wall radiators are hung from wall brackets and are well adapted to use in factory buildings. Tests have shown that the heat emitted from a wall-type radiator may be reduced from 5 to 10 percent if the radiator is placed near the ceiling with the bars horizontal and in an air temperature exceeding 70 F. When radiators are placed near the ceiling, there is usually such a large difference in the temperature between the floor level and the ceiling that it becomes difficult to heat the living zone of the rooms satisfactorily. Dimensions and heat emission rates for wall radiators are given in Table 4.

## CONVECTORS

A typical recessed convector is shown in Fig. 1. The room air enters the convector enclosure near the floor line, below the heating element, is heated in passing through the element, and is delivered to the room through