## PIPE SIZES FOR VAPOR SYSTEMS

Table 33 is computed for pressure loss of 2 oz. at the farthest radiator for length of main, allowing for average amount of elbows, tees, etc., and condensation in covered piping—steam and condensation flowing in same direction. Then to size a main for a gravity return vapor job using radiator return traps—measure length of piping from boiler to farthest radiator and use column for this length for sizing entire length.

*Example.*—Measured length from boiler to farthest radiator = 295 ft., then use Column F, for sizing main for entire length.

| | | |
|---|---|---|
| At end of main | = | 280 sq. ft. = 2½" Main |
| 50' from end of main | = | 450 sq. ft. |
| Total load to this point | = | 730 sq. ft. = 3½" Main |
| Near boiler | = | 400 sq. ft. |
| Total load to boiler | = | 1130 sq. ft. = 4" Main |

TABLE 33. CAPACITY OF SUPPLY MAINS IN SQ. FT.

| COL. A | MEASURED LENGTH OF PIPE IN FT. FROM BOILER TO FARTHEST RADIATION | | | | | |
|---|---|---|---|---|---|---|
| SIZE OF PIPE | Col. B | Col. C | Col. D | Col. E | Col. F | Col. G |
| | 100' | 150' | 200' | 250' | 300' | 400' |
| 2 | 325 | 260 | ..... | ..... | ..... | ..... |
| 2½ | 550 | 450 | 390 | 347 | 310 | 275 |
| 3 | 1,000 | 810 | 710 | 632 | 578 | 500 |
| 3½ | 1,500 | 1,215 | 1,065 | 948 | 860 | 750 |
| 4 | 2,100 | 1,700 | 1,500 | 1,325 | 1,200 | 1,050 |
| 4½ | 2,900 | 2,350 | 2,060 | 1,830 | 1,670 | 1,450 |
| 5 | 3,700 | 3,000 | 2,600 | 2,340 | 2,140 | 1,850 |
| 6 | 5,700 | 4,600 | 4,047 | 3,600 | 3,300 | 2,850 |
| 7 | 8,000 | 6,480 | 5,680 | 5,050 | 4,600 | 4,000 |
| 8 | 11,000 | 8,900 | 7,810 | 6,950 | 6,350 | 5,500 |
| 10 | 20,000 | 16,200 | 14,200 | 12,600 | 11,500 | 10,000 |
| 12 | 30,000 | 24,300 | 21,300 | 18,960 | 17,300 | 15,000 |

For steam and condensation flowing in opposite directions use pipe one size larger than given in table.

TABLE 34. CAPACITIES OF SUPPLY RISERS IN SQ. FT.

| COL. A | LENGTH IN FT. FROM BOILER TO END OF RISER | | | | | |
|---|---|---|---|---|---|---|
| Size of Pipe | Col. B | Col. C | Col. D | Col. E | Col. F. | Col. G |
| | 100' | 150' | 200' | 250' | 300' | 400' |
| 1" | 40 | 32 | 28 | 25 | 23 | 20 |
| 1¼" | 75 | 60 | 53 | 47 | 43 | 37 |
| 1½" | 150 | 120 | 105 | 95 | 86 | 75 |
| 2" | 300 | 240 | 210 | 190 | 173 | 150 |
| 2½" | 500 | 400 | 355 | 315 | 285 | 250 |
| 3" | 900 | 730 | 630 | 565 | 520 | 450 |

Horizontal branches to risers to be one size larger than riser.





TABLE 35. CAPACITY OF WET RETURN MAINS IN SQ. FT.

| SIZE OF PIPE | 1¼" | 1½" | 2" | 2½" | 3" | 3½" |
|---|---|---|---|---|---|---|
| Length 100' | 1,500 | 3,000 | 6,000 | 10,000 | 18,000 | 26,000 |
| Length 200' | 1,200 | 2,500 | 5,000 | 8,000 | 14,000 | 20,000 |
| Length 300' | 1,000 | 2,000 | 4,000 | 6,000 | 11,000 | 16,000 |

RETURN RISERS

| Size of Pipe | ¾" | 1" | 1¼" | 1½" |
|---|---|---|---|---|
| Capacity in Sq. Ft. | 300 | 630 | 1,300 | 2,200 |

TABLE 36. RADIATOR CONNECTIONS

| SUPPLY | | | RETURN | |
|---|---|---|---|---|
| Vertical Inlet Pipe to Valve | Horizontal Runout from Vertical Inlet Pipe to Riser or Main | | Stub to Valve | Horizontal Runout to Riser or Main |
| | Up to 5' Long | Over 5' Long | | |
| ½" | 24 sq. ft. = 1" | 16 sq. ft. = 1" | ½" | ¾" |
| ¾" | 70 sq. ft. = 1¼" | 60 sq. ft. = 1¼" | | |
| 1" | 150 sq. ft. = 1½" | 130 sq. ft. = 1½" | | |
| 1¼" | 200 sq. ft. = 2" | 175 sq. ft. = 2" | | |

Radiators to be water type of not over 200 sq. ft. capacity, tapped or bushed at the top for supply valve and at the bottom ⅛ in. eccentric turned down for return trap.
Supply and return connections can be made at same or opposite ends as desired.
All radiators to be washed clean of core sand before making valve connections.

## PIPE SIZES FOR VACUUM HEATING

Table 37 is computed for pressure loss of 16 oz. at the farthest radiator for length of main, allowing for average amount of elbows, tees, etc., and condensation in covered piping. Steam and condensation flowing in same direction.

To size a main—measure length of piping from boiler or pressure reducing valve to farthest radiator and use column for this length for sizing entire length.

TABLE 37. CAPACITY OF SUPPLY MAINS IN SQ. FT.

| COL. A | MEASURED LENGTH OF PIPE IN FT. FROM BOILER OR P. R. V. TO FARTHEST RADIATOR | | | | | | |
|---|---|---|---|---|---|---|---|
| Size of Pipe Inches | Col. B | Col. C | Col. D | Col. E | Col. F | Col. G | Col. H |
| | 100' | 200' | 300' | 400' | 500' | 750' | 1,000' |
| 2 | 940 | 667 | 543 | 470 | ..... | ..... | ..... |
| 2½ | 1,570 | 1,115 | 800 | 785 | ..... | ..... | ..... |
| 3 | 2,800 | 1,988 | 1,610 | 1,400 | 1,250 | 1,090 | 880 |
| 3½ | 4,200 | 2,982 | 2,427 | 2,100 | 1,877 | 1,638 | 1,320 |
| 4 | 6,000 | 4,260 | 3,480 | 3,000 | 2,680 | 2,340 | 1,895 |
| 4½ | 8,250 | 5,857 | 4,770 | 4,125 | 3,687 | 3,215 | 2,607 |
| 5 | 11,000 | 7,810 | 6,360 | 5,500 | 4,917 | 4,290 | 3,475 |
| 6 | 17,300 | 12,280 | 10,000 | 8,650 | 7,733 | 6,745 | 5,465 |
| 7 | 25,500 | 18,100 | 14,750 | 12,750 | 11,398 | 9,945 | 8,055 |
| 8 | 36,000 | 25,560 | 20,800 | 18,000 | 16,080 | 14,040 | 11,375 |
| 10 | 65,590 | 46,570 | 38,000 | 32,795 | 29,320 | 25,580 | 20,730 |
| 12 | 94,500 | 67,095 | 54,600 | 47,250 | 42,240 | 36,850 | 29,860 |