

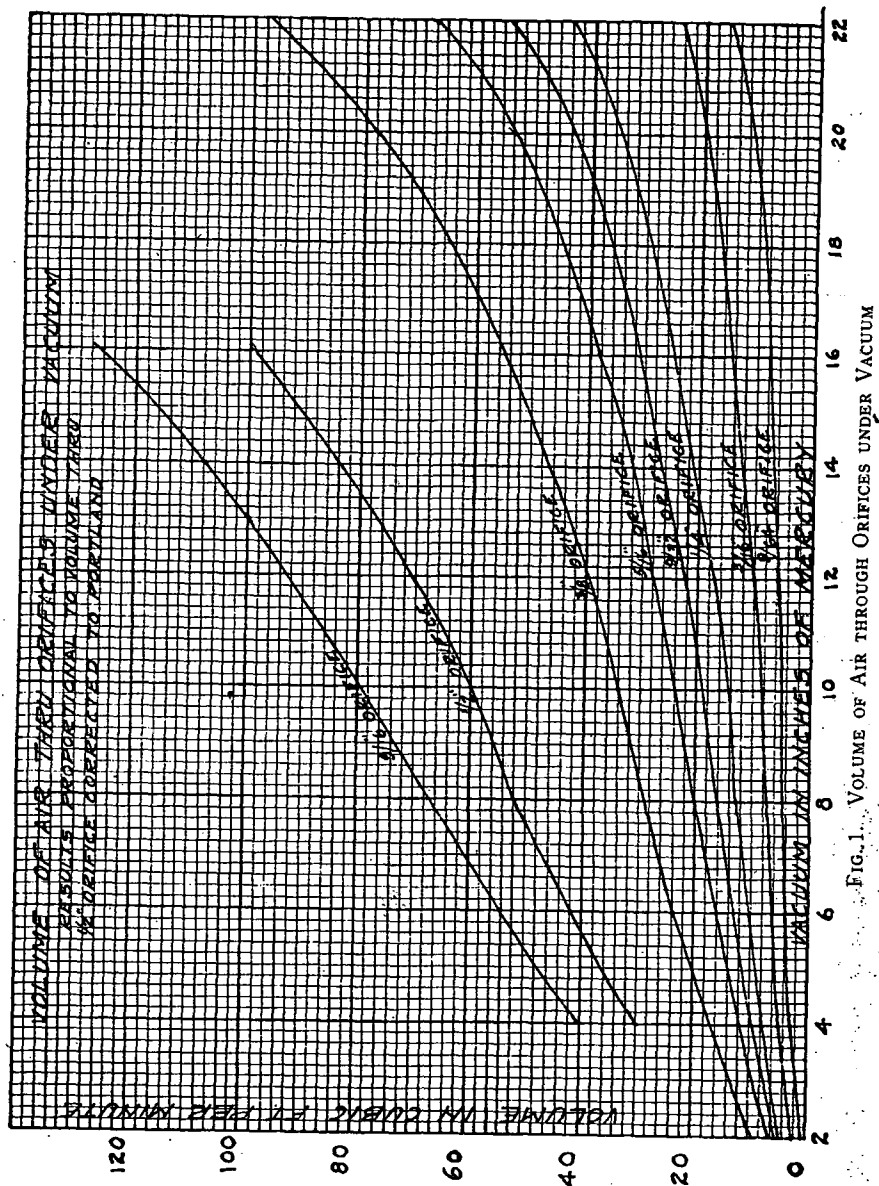


FIG. 1. VOLUME OF AIR THROUGH ORIFICES UNDER VACUUM

Air capacities of vacuum heating pumps are in general referred to as equivalent cast iron direct radiation, and may be assumed on a decreasing ratio as the system increases in capacity, in accordance with Table 11. It should be noted that while water capacities of pumps for fan blast heaters are to be based upon their equivalent in direct radiation the air capacities for this class of radiation may be considerably less than that corresponding to this equivalent.

The air capacity measurement of a vacuum heating pump should be made at a point in the main vacuum return line close to and before it enters the pump strainer, while the pump is in operation, under the

TABLE 11. AIR CAPACITIES FOR VACUUM HEATING PUMPS

SQUARE FEET DIRECT EQUIVALENT RADIATION SURFACE	DIAMETER ORIFICE VACUUM 10 IN.	AIR CAPACITY CUBIC FEET PER MINUTE
2,500	3/8"	3
5,000	1/2"	3
8,000	5/8"	5
16,000	3/4"	9
26,000	7/8"	15
40,000	1"	19
65,000	1 1/8"	34
100,000	1 1/4"	44
150,000	1 1/2"	80
300,000	1 3/4"	132

vacuum specified at the pump suction and while handling the quantity of condensate specified at a temperature not exceeding 180 deg. fahr.

Air test in general may be made with water at lower temperatures; these determinations shall be made by means of a standard test orifice located in an inlet connection to the pump suction, consisting of a plate 1/8 in. thick with a reamed hole having sharp edges and of a diameter corresponding to the capacity of the pump.

Fig. 1 may be used to give the quantity of air handled, corresponding to several sizes of orifices and different degrees of vacuum to be met.

The water capacity of vacuum heating pumps, when operating against 8 in. of mercury vacuum, should be not less than 3/8 lb. of water per hour per square foot of equivalent cast iron direct radiation, based upon condensate at a temperature of not over 180 deg. fahr. when the pump is delivering water against a specified gage pressure at the water discharge of the pump. For pumps handling both air and water the above water capacity must be delivered when the pump is maintaining a vacuum of 8 in. of mercury and handling air through a standard orifice corresponding to the air capacity of the pump as herein specified.

In estimating the water capacity no additional allowance need be made for covered mains or risers, but exposed mains or risers used as heating surfaces should be included in computing the equivalent square foot of direct radiation.

Steam-driven vacuum pump size determination should take into consideration the following variables: