

take the wall having the most crack; and with three or four exposed walls, take the wall having the most crack, but in no case take less than half the total crack.

Methods for Determining Infiltration

The determination of Q , the amount of air leaking in per hour, may be arrived at in either of two ways: (1) by assuming a certain number of air changes per hour for each room, the number of changes assumed (Table 38) being dependent upon the type, use, and location of room, or (2) by computing the infiltration taking place through the cracks around windows and doors in that side of the room which has the greatest number of feet of such crack.

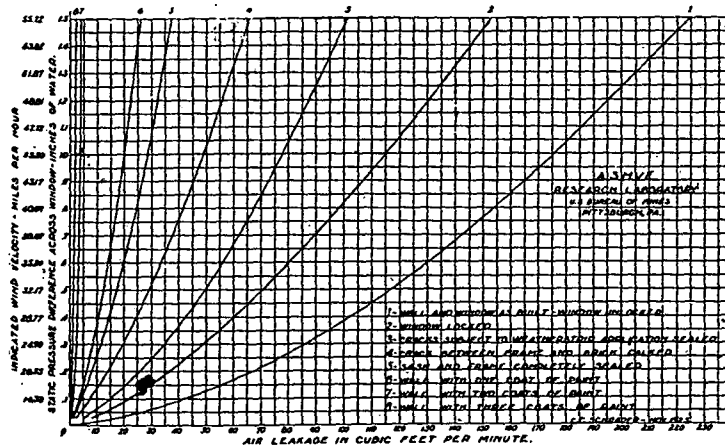


FIG. 5. RESULTS OF TESTS OF LEAKAGE THROUGH VARIOUS PARTS OF WINDOW AND FRAME

Neither of these methods for estimating the infiltration is entirely satisfactory in view of the limited amount of data available, but for the purposes of calculation the second (infiltration) method is to be preferred and then checked against the first (air changes per hour) method. In no case use less than one-half an air change where outside doors and windows exist.

Leakage through Various Parts of Window and Frame: The results of tests of leakage through various parts of a window and frame are shown in Fig. 5.

The principal facts brought out in these tests were that increasing the crack around the perimeter of a plain sash does not materially increase the leakage, and that weatherstripped sash, while permitting much less leakage, shows a small increase in leakage with increase in crack. These facts were established by making several hundred tests.

Double-Hung Wood Sash Windows: Table 39, pertaining to double-hung wood sash windows, shows the amount of leakage for various wind

TABLE 37. INFILTRATION THROUGH VARIOUS TYPES OF WALL CONSTRUCTION

Wind Velocity Miles Per Hour	8 1/2 IN. BRICK WALL				8 1/2 IN. BRICK WALL PLASTERED				13 IN. BRICK WALL				13 IN. BRICK WALL PLASTERED				FRAME WALL WITHOUT LATH AND PLASTER				FRAME WALL WITH LATH AND PLASTER			
	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area	Leak- age Cu. Ft. per Hour	B.t.u. per Sq. Ft. of Wall Area	Equiv. Steam Radia- tion per 100 Sq. Ft. of Wall Area			
5.0	2.18	2.75	1.15	0.021	0.026	0.011	1.80	2.27	0.945	0.006	0.008	0.003	5.50	6.93	2.88	0.102	0.138	0.057						
10.0	5.24	6.60	2.75	0.046	0.058	0.024	4.90	6.19	2.58	0.16	0.020	0.008	16.00	20.20	8.40	0.270	0.340	0.141						
15.0	9.81	12.30	5.13	0.083	0.105	0.044	9.35	11.90	4.90	0.31	0.039	0.016	28.70	36.20	15.10	0.521	0.656	0.272						
20.0	15.30	19.30	8.04	0.134	0.169	0.070	14.50	18.30	7.63	0.54	0.068	0.028	45.00	56.70	23.60	0.796	1.000	0.416						
25.0	23.20	29.20	12.20	0.201	0.253	0.105	20.30	25.60	10.70	0.84	0.103	0.044	60.00	75.60	31.40	1.070	1.350	0.562						
30.0	28.60	36.10	15.10	0.295	0.372	0.155	26.50	33.40	13.90	1.21	0.153	0.064	76.90	96.90	40.30	1.330	1.670	0.695						
40.0	43.50	54.80	22.80	0.543	0.685	0.285	39.80	50.20	20.90				108.00	136.00	56.60	1.860	2.340	0.975						
PART I Values actually determined by Laboratory tests.																								
5.0	1.75	2.21	0.92	0.017	0.021	0.009	1.44	1.82	0.77	0.005	0.006	0.003	4.40	5.55	2.31	0.082	0.103	0.043						
10.0	4.20	5.29	2.20	0.037	0.047	0.020	3.92	4.95	2.06	0.013	0.016	0.007	12.80	16.10	6.71	0.216	0.272	0.113						
15.0	7.85	9.90	4.12	0.066	0.083	0.035	7.48	9.45	3.93	0.025	0.032	0.013	23.00	29.00	12.10	0.417	0.525	0.219						
20.0	12.20	15.40	6.41	0.107	0.135	0.056	11.60	14.60	6.10	0.043	0.054	0.022	36.00	45.40	18.90	0.637	0.802	0.334						
25.0	18.60	23.40	9.75	0.161	0.203	0.085	16.30	20.60	8.55	0.067	0.085	0.035	48.00	60.50	25.20	0.856	1.080	0.450						
30.0	22.90	28.90	12.10	0.236	0.297	0.124	21.20	26.70	11.10	0.097	0.122	0.051	61.50	77.50	32.30	1.060	1.340	0.557						
40.0	34.80	43.80	18.30	0.435	0.548	0.228	31.80	40.10	16.70				86.40	109.00	45.30	1.490	1.880	0.783						
PART II Values for practical use; average test values reduced by 20 per cent to allow for building up of pressure in room, etc.																								

The values given in the above table were derived from experiments conducted at the Research Laboratory on only a few samples of both brick and frame walls, and while they may be used to represent average walls or average conditions there might be a wide difference in the value between well built walls of both constructions, and those not so built. Further tests are now being conducted to verify this.

It will be noted that the loss through plastered walls can be neglected.

Published in the JOURNAL, A. S. H. V. E., Vol. 33, No. 4, April, 1927.