

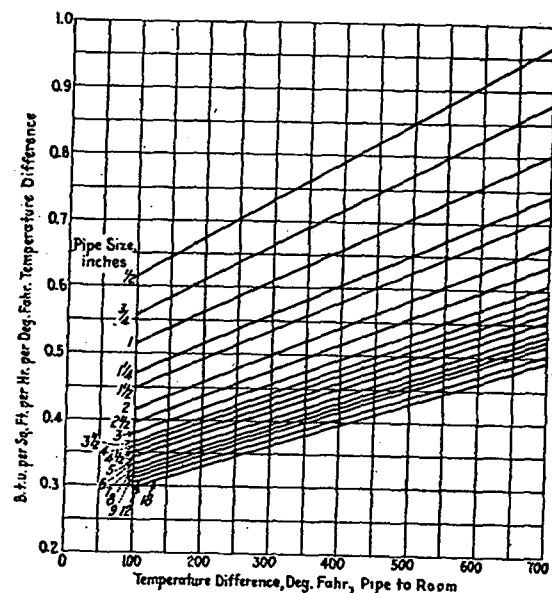


FIG. 3. HEAT LOSS THROUGH 1 IN. THICK COVERING

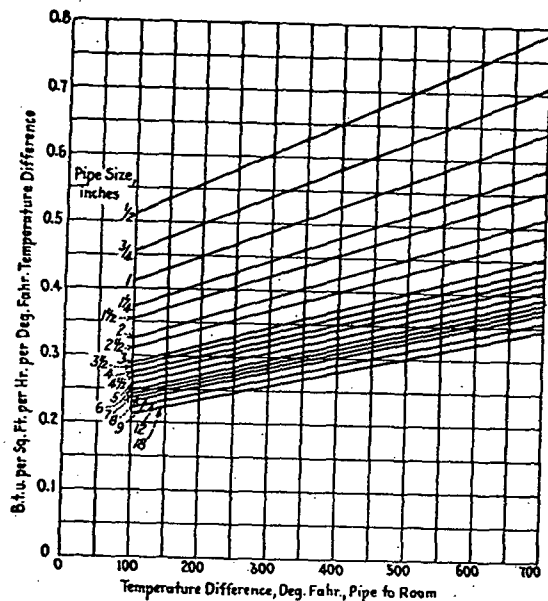


FIG. 4. HEAT LOSS THROUGH 1 1/2 IN. THICK COVERING

practically the same as for canvas surfaces so that the curves given may be followed with no alteration on account of the surfaces commonly used. (See discussion of surface transfer of heat in Chapter 2, page 18).

To determine the thickness of insulation necessary to prevent sweating for coverings having conductivity values differing from the value of 0.3 used in computing the curves, increase or decrease the values taken from

TABLE 4. VALUES OF k CORRESPONDING TO COMMONLY USED COVERINGS

	k	PER CENT VARIATION FROM $k = 0.3$
Hair Felt.....	0.246	-18%
Keystone Hair.....	0.27	-10%
Wood Felt.....	0.36	+20%
Cork, 6.9 lb. per cubic foot.....	0.27	-10%
Cork, 9.7 lb. per cubic foot.....	0.30	0%
Cork, 16 lb. per cubic foot.....	0.35	+17%

TABLE 5. PIPE-COVERING FACTORS

TYPE OF COVERING	TEMPERATURE DIFFERENCE, PIPE TO AIR, DEG. FAHR.						
	100	200	300	400	500	600	700
85% Magnesia.....	1.234	1.184	1.148	1.111	1.082	1.051	1.025
Laminated Asbestos Type. Approx. 20 laminations per inch.....	1.515	1.474	1.441	1.409	1.383	1.360	1.345
Laminated Asbestos Type. Approx. 30 to 40 laminations per inch.....	1.022	1.019	1.016	1.013	1.010	1.007	1.005
High Temperature.....	1.438	1.358	1.292	1.233	1.190	1.147	1.109
Felted Brown Asbestos Fibre.....	1.665	1.577	1.505	1.436	1.387	1.340	1.300
Rock Wool.....	1.058	1.045	1.035	1.022	1.020	1.014	1.010
Corrugated Asbestos, 8 plies per inch.....	1.349	1.340	1.333	1.323			
Corrugated Asbestos, 4 plies per inch.....	1.520	1.550	1.580	1.605			

TABLE 6. THICKNESSES OF INSULATION ORDINARILY USED

STEAM PRESSURES (LB. GAGE)	STEAM TEMPERATURES (DEG. FAHR.)	THICKNESS OF INSULATION		
		Pipe larger than 4 in.	Pipes 2 in. to 4 in.	Pipes 1 1/4 in. to 2 in.
0 to 25	212 to 267	1 in.	1 in.	1 in.
25 to 100	267 to 338	1 1/2 in.	1 in.	1 in.
100 to 200	338 to 388	2 in.	1 1/2 in.	1 in.
Higher Pressure or Superheat	388 to 500	2 1/2 in.	2 in.	1 1/2 in.
Higher Pressure or Superheat	500 to 600	3 in.	2 1/2 in.	2 in.

Example: Determine the heat flow in B.t.u. per hour per square foot of pipe surface through a magnesia covering 1 in. thick on a 4 in. pipe.

Solution: The temperature of the pipe is 270 deg. Fahr. and the room temperature, 70 deg. Fahr. The loss through a covering 1 in. thick on a 4 in. pipe at 200 deg. temperature difference from Fig. 5 = 0.395; the factor for magnesia at 200 deg. temperature difference from Table 5 = 1.184; then the heat loss through the magnesia covering = $0.395 \times 1.184 \times 200 = 93.5$ B.t.u. per square foot of pipe surface per hour.