TABLE 4. INTERNAL CONDUCTIVITIES OF BUILDING MATERIALS AND INSULATIONS[1]—Continued

B. Insulations—(Continued)

MATERIAL	DESCRIPTION	DENSITY (LB. PER CU. FT.)	MEAN TEMP. OF SAMPLE (DEG. FAHR.)	INTERNAL CONDUCTIVITY (C OR C_u)	AUTHORITY[14]
Corkboard	Pure; no added binder.	7.0	90	0.27	Bureau of Standards
Corkboard	Pure; no added binder.	9.7		0.32	Willard, Lichty & Harding
Dry zero[10]	Kapok between burlap or paper.	2.0	90	0.25	Bureau of Standards
Fibrofelt[10]	Flax and rye fiber.	13.6	90	0.32	Bureau of Standards
Flaxlinum[10]	Flax fiber	13.0	90	0.31	Bureau of Standards
Flaxlinum[10]	Flax fiber	14.0	70	0.32	Peebles, Armour Institute
Hairinsul[10]	75 per cent hair, 25 per cent jute	6.3	90	0.27	Bureau of Standards
Hairinsul[10]	50 per cent hair, 50 per cent jute	6.1	90	0.26	Bureau of Standards
Hair felt[10]	Felted Cattle Hair	13.0	90	0.26	Bureau of Standards
Hair felt[10]	Felted Cattle Hair	11.0	90	0.26	Bureau of Standards
Insulex or Pyrocell	Cellular Gyspum	30.0	90	1.00	Bureau of Standards
Insulex or Pyrocell	Cellular Gypsum	30.0	75	0.92	Peebles, Armour Institute
Insulex or Pyrocell	Cellular Gypsum	24.0	90	0.77	Bureau of Standards
Insulex or Pyrocell	Cellular Gypsum	24.0	75	0.737	Peebles, Armour Institute
Insulex or Pyrocell	Cellular Gypsum	18.0	90	0.59	Bureau of Standards
Insulex or Pyrocell	Cellular Gypsum	18.0	75	0.566	Peebles, Armour Institute
Insulex or Pyrocell	Cellular Gypsum	12.0	90	0.44	Bureau of Standards
Insulex or Pyrocell	Cellular Gypsum	12.0	75	0.400	Peebles, Armour Institute
Insulite	Board form insulation made from wood pulp.	16.9	90	0.34	Bureau of Standards
Insulite	Board form insulation made from wood pulp.	16.5	70	0.34	Peebles, Armour Institute
Keystone Hair[10]		11.0	75	0.25	Peebles, Armour Institute
Linofelt[10]	Flax fibers between paper.	4.9	90	0.28	Bureau of Standards
Lith	Rock wool, flax and straw pulp with binder.	14.3	90	0.40	Bureau of Standards
Lith	Rock wool, flax and straw pulp with binder.	14.5	75	0.38	Peebles, Armour Institute
Masonite	Board form insulation made from exploded wood fiber.	18.0	75	0.33	Peebles, Armour Institute
Maftex	Board form of insulation made from roots of licorice.	16.1	81	0.337	Peebles, Armour Institute
Regranulated Cork	About ⅜ in. particles.	8.1	90	0.31	Bureau of Standards
Rock Wool[10]	Fibrous material, made from rock. Also made in sheet form, felted and confined with netting.	10.0	90	0.27	Bureau of Standards
Ten Test	Board form insulation made from wood pulp.	20.0	75	0.46	Peebles, Armour Institute
Thermofelt[10]	Jute and asbestos fibers, felted.	10.0	90	0.37	Bureau of Standards
Thermofelt[10]	Hair and asbestos fibers, felted.	7.8	90	0.28	Bureau of Standards
Thermofill	Powdered Gypsum.	34.0	90	0.60	Bureau of Standards
Thermofill	Powdered Gypsum.	26.0	90	0.52	Bureau of Standards
Thermofill	Powdered Gypsum.	24.0	75	0.475	Peebles, Armour Institute
Thermofill	Powdered Gypsum.	18.0	75	0.34	Peebles, Armour Institute

TABLE 5. FACTORS TO BE USED IN DETERMINING VALUES OF OUTSIDE SURFACE COEFFICIENTS (K_2) UNDER MOVING AIR CONDITIONS

In each case, the moving air factor is based on still air coefficient (K_1) for *same* material. For conditions where wind velocity is not known use the factor (3) or take K_2 as $3K_1$ for same material.

Wind Velocity in Miles per Hour	Multipliers of K_1* Brickwork	Wood	Average
5	2.38	2.19	2.28
10	3.20	2.71	2.96
15	3.76	2.95	3.36**
20	4.22	3.02	3.62
Additional Values—Smooth Surface			
10	.....	2.20	.....
20	.....	2.60	.....
Above 20	.....	3.00	.....

*Taken from Engineering Experiment Station Bulletin No. 102, of the University of Illinois. Additional values from Engineering Experiment Station, Pennsylvania State College, reported by Professor Wood. Tests at Pennsylvania State College indicate character of surface, rough or smooth, more important than material of surface.

**This is usually taken as 3 even.

Heat Transmission Data

Heat transmission coefficients of many common types of building construction are given in Tables 6 to 12, inclusive, each construction being identified by a serial number. For example, in Table 6-A, the coefficient of transmission (U) of a 13-in. brick wall, furring strips, and ¾ in. of gypsum plaster on metal lath, is 0.185, and the number assigned to a wall of this construction is 3-b.

The coefficients in these tables were determined by computations similar to those shown in Fig. 3, using the value of C (or C_u[1]) indicated. The authorities for the conductivities used for computing these coefficients are given in Table 4. As in the case of the examples in Fig. 3, the average value of 1.34 given in Table 3 for K_1 was used for all surfaces in still air. The value of K_2 for outside wall and roof surfaces was taken as $3 \times K_1$, or 4.02, corresponding to a wind velocity of approximately 15 miles per hour.

A value of $C = 8.3$ for stone concrete (1- 2- 4 mix) was used for computing the values of U for all constructions involving this material. It is quite probable that the true conductivity of stone concrete approaches the value of 6.3 obtained from tests conducted by Professor Peebles of Armour Institute, when the concrete is thoroughly dry and well cured. If, for a certain concrete construction, it appears that the value of 6.3 is more nearly correct, the engineer may at his discretion compute the value of U on the basis of this figure. This of course is true of other constructions.

The Research Laboratory of the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS has developed an apparatus known as the Nicholls heat meter for the determination of the heat loss through any type of construction, and by means of which the value of U for any construction may be ascertained by actual test. The Nicholls heat meter consists essentially of a plate of bakelite, 2 ft. square and ⅛ in. thick. This plate is equipped with thermocouples which are so constructed as to the two surfaces of the plate produces a difference in electrical potential between the thermocouples. The plate is calibrated so that this difference in potential, when measured, can be converted into terms of heat trans-

[1] C_u is the conductivity (or conductance) for construction or thickness stated.