TABLE 5. INTERNAL CONDUCTIVITIES OF BUILDING MATERIALS AND INSULATIONS[1]—Continued

B. Insulations (Dry)—(Continued)

MATERIAL	DESCRIPTION	DENSITY (LB. PER CU. FT.)	MEAN TEMP. OF SAMPLE (DEG. FAHR.)	INTERNAL CONDUCTIVITY (C OR C_u)	AUTHORITY[14]
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	Dry, Fluffy, Flaked Gypsum.	34.0	90	0.60	Bureau of Standards
Thermofill	Dry, Fluffy, Flaked Gypsum.	26.0	90	0.52	Bureau of Standards
Thermofill	Dry, Fluffy, Flaked Gypsum.	24.0*	75	0.475	Peebles, Armour Institute
Thermofill	Dry, Fluffy, Flaked Gypsum.	18.0†	75	0.34	Peebles, Armour Institute
Thermasote Insulating Board.	Board form Insulation made from wood pulp.	20.8	70	0.374	Peebles, Armour Institute

*Weight used in walls.
†Weight used in ceilings.

$$\text{or } U = \frac{1}{\Sigma\,[R_1 + R_2 + R_c]}$$

The internal resistance of a material is equal to the reciprocal of its so-called internal conductivity (C) multiplied by its thickness and is represented by the fraction $\frac{x}{C}$, or $\frac{1}{C_u}$, in the case of materials for which the conductivity (or conductance) is given in terms of the construction or thickness stated. For example, the internal resistance of 13 in. of brickwork on the basis of value of C of 5.0 is $\frac{13}{5}$ or 2.6. The internal resistance of 2 in. hollow clay tile based on the value of C_u of 1.14 is $\frac{1}{1.14}$ or 0.877.

In the resistance method, the sum of the internal resistances of all the materials entering into the construction, is added to the sum of the surface resistances, which are the reciprocals of the surface coefficients or $\frac{1}{K}$. The resistance of a surface in still air, based on the average value of K_1 or 1.34 is $\frac{1}{1.34}$ or 0.746. The resistance of an outside surface exposed to the wind, based on the average value of K_2 or 4.02 (3×1.34) is $\frac{1}{4.02}$ or 0.249. The computed value of U obtained by the resistance method is obtained by taking the reciprocal of the sum of the internal and surface resistances of the construction. The solution of Example V in Fig. 3, by means of the resistance method is given in the accompanying tabulation:

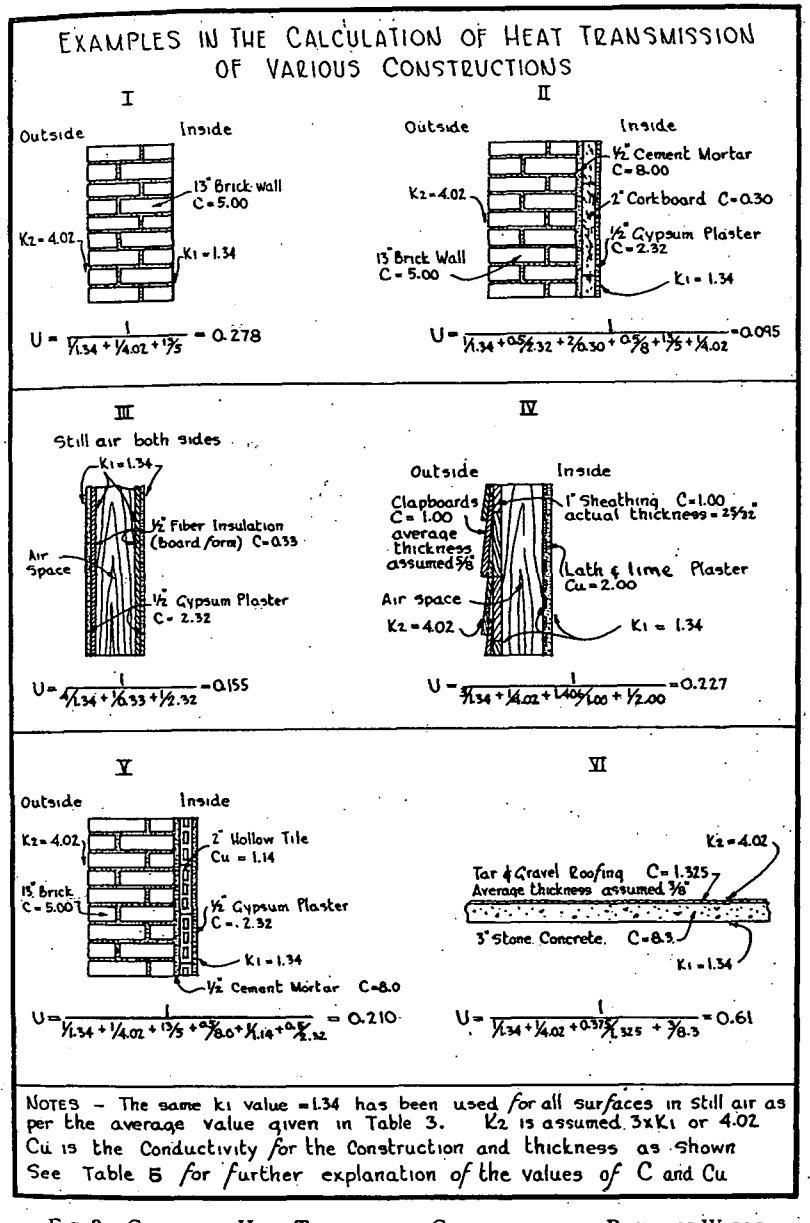

FIG. 3. COMPUTING HEAT TRANSMISSION COEFFICIENTS FOR BUILDING WALLS