Table 27. Rate of Heat Gain From Appliances WITHOUT HOODS[a, b] (Concluded)

Appliance	Capacity	Over-all Dimensions (Less Legs and Handles; Last Dimension is Height) Inches	Control A—Automatic M—Manual	Miscellaneous Data	Manufacturer's Rating Watts	Btu/Hr	Maintaining Rate Btu per Hour	Recommended Rate of Heat Gain Btu per Hour		
								Sensible	Latent	Total
Miscellaneous Electrical Appliances										
Hair Dryer, Blower Type			M	Fan, 165 w; Low, 915 w; High, 1580 w	1580	5400		2300	400	2700
Hair Dryer, Helmet Type			M	Fan, 80 w; Low, 300 w; High, 710 w	705	2400		1870	330	2200
Permanent Wave Machine			M	60 heaters at 25 w each, 36 in normal use	1500	5000		850	150	1000
Neon Sign, per linear ft of tube				½ in. outside diam. ⅜ in. outside diam.				30 60		30 60
Sterilizer, Instrument			A	For physicians; thermostat cuts off 550 w before boiling	1100	3750		650	1200	1850
Miscellaneous Gas-Burning Appliances										
Burners, Laboratory Small Bunsen Small Bunsen Fishtail Fishtail Large Bunsen		 7/16 in. Barrel 7/16 in. Barrel 7/16 in. Barrel 7/16 in. Barrel 1½ in. Mouth	 M M M M M	 Manufactured Gas Natural Gas Manufactured Gas Natural Gas Adjustable orifice		 1800 3000 3500 5500 6000		 960 1680 1960 3080 3350	 240 420 490 770 850	 1200 2100 2450 3850 4200
Cigar Lighter			M	Continuous Flame		2500		900	100	1000
Hair Dryer, 5 helmets			A	Heater and fan blowing air to helmets		33000		15000	4000	19000
Stoves, Oven				Insulated, modern Not insulated		25000 25000	6000 8500	7200 9200	1800 2300	9000 11500

[a] For restaurant appliances, miscellaneous electrical and miscellaneous gas burning appliances.
[b] When these appliances are hooded and provided with adequate exhaust, use 50 percent of recommended rate of heat gain from unhooded appliances.

the conditioned space. If the motor is without the space, then *do not divide* by the motor efficiency in Equation 16. The *load factor* is merely the fraction of the rated load which is being delivered under the conditions of the cooling-load estimate. *Motor efficiencies* may be approximated as follows: about 50 to 60 percent at ⅛ hp rating, increasing to 80 percent at 1 hp, and to 88 percent at 10 hp and above.

Appliances. Care must be taken in a cooling-load estimate to take into account the heat gain from all appliances, electrical, gas, or steam. Table 27 presents recommended data.[27] Note that the *maintaining rate* in Table 27 is the heat input required to maintain the appliance at the normal operating temperature even though it is not being used, *i.e.*, no coffee is being made, no toast is being made, no food is being cooked in the fry kettle, etc. The maintaining rate is useful in setting up a lower limit to the heat gain to a room from the appliance when in operation.

Experienced judgment must be used in the application of data given in Table 27. Consideration must be given to the heat contributed by appliances which are in use at the time of peak load. The quantity of heat will depend upon whether products of combustion are vented to a flue, whether they escape into the space to be conditioned, or whether appliances are hooded allowing part of the heat to escape through a stack. There are no generally accepted data available on the effects of venting and shielding heating appliances, but it is believed that when they are properly hooded with a positive fan exhaust system through the hood, 50 percent of the heat will be carried away and 50 percent dissipated in the space to be conditioned. The same effectiveness of the hood should be figured for both latent and sensible heat.

LOAD FROM MOISTURE TRANSFER THROUGH PERMEABLE BUILDING MATERIALS

The diffusion of moisture through all common building materials is a natural phenomenon which is always present to a greater or lesser degree.

The permeability values for various building materials are given in Table 21 of Chapter 9, together with an explanation of moisture transmission through these materials.

In the usual comfort air-conditioning application, it is common practice to neglect moisture transfer through walls, for the actual rate is quite small and the corresponding latent-heat load is hardly significant. So-called *vapor barriers* are frequently employed in modern construction for the purpose of keeping moisture transfer to a minimum, and reducing the deteriorating and insulation-destroying effects of moisture.

Industrial jobs, on the other hand, frequently call for a low moisture content to be maintained in a conditioned space. Here the matter of moisture transfer cannot be neglected; indeed, it is quite possible to have the latent-heat load accompanying this transfer be of greater magnitude than any other latent-heat load. The equation for computing this load is:

$$\left(\frac{q_m}{A}\right) = \frac{\mu}{7000} \times \left(\begin{matrix}\text{Vapor Pressure}\\ \text{Difference, In. Hg}\end{matrix}\right) \times 1076, \text{ Btu per (hr) (sq ft)} \qquad (17)$$

where

μ = permeability grains per (sq ft) (hr) (in. Hg).

7000 = grains per pound.