

Table 8 Recommended Rate of Heat Gain from Restaurant Equipment Located in Air-Conditioned Areas

Appliance	Size	Energy Rate, Btu/h		Recommended Rate of Heat Gain, ^a Btu/h			
		Rated	Standby	Without Hood		With Hood	
				Sensible	Latent	Total	Sensible
Electric, No Hood Required							
Barbeque (pit), per pound of food capacity	80 to 300 lb	136	—	86	50	136	42
Barbeque (pressurized), per pound of food capacity	44 lb	327	—	109	54	163	50
Blender, per quart of capacity	1 to 4 qt	1550	—	1000	520	1520	480
Braising pan, per quart of capacity	108 to 140 qt	360	—	180	95	275	132
Cabinet (large hot holding)	16.2 to 17.3 ft ³	7100	—	610	340	960	290
Cabinet (large hot serving)	37.4 to 406 ft ³	6820	—	610	310	920	280
Cabinet (large proofing)	16 to 17 ft ³	693	—	610	310	920	280
Cabinet (small hot holding)	3.2 to 6.4 ft ³	3070	—	270	140	410	130
Cabinet (very hot holding)	17.3 ft ³	21000	—	1880	960	2830	850
Can opener		580	—	580	—	580	0
Coffee brewer	12 cup/2 brnrs	5660	—	3750	1910	5660	1810
Coffee heater, per boiling burner	1 to 2 brnrs	2290	—	1500	790	2290	720
Coffee heater, per warming burner	1 to 2 brnrs	340	—	230	110	340	110
Coffee/hot water boiling urn, per quart of capacity	11.6 qt	390	—	256	132	388	123
Coffee brewing urn (large), per quart of capacity	23 to 40 qt	2130	—	1420	710	2130	680
Coffee brewing urn (small), per quart of capacity	10.6 qt	1350	—	908	445	1353	416
Cutter (large)	18 in. bowl	2560	—	2560	—	2560	0
Cutter (small)	14 in. bowl	1260	—	1260	—	1260	0
Cutter and mixer (large)	30 to 48 qt	12730	—	12730	—	12730	0
Dishwasher (hood type, chemical sanitizing), per 100 dishes/h	950 to 2000 dishes/h	1300	—	170	370	540	170
Dishwasher (hood type, water sanitizing), per 100 dishes/h	950 to 2000 dishes/h	1300	—	190	420	610	190
Dishwasher (conveyor type, chemical sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1160	—	140	330	470	150
Dishwasher (conveyor type, water sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1160	—	150	370	520	170
Display case (refrigerated), per 10 ft ³ of interior	6 to 67 ft ³	1540	—	617	0	617	0
Dough roller (large)	2 rollers	5490	—	5490	—	5490	0
Dough roller (small)	1 roller	1570	—	140	—	140	0
Egg cooker	12 eggs	6140	—	2900	1940	4850	1570
Food processor	2.4 qt	1770	—	1770	—	1770	0
Food warmer (infrared bulb), per lamp	1 to 6 bulbs	850	—	850	—	850	850
Food warmer (shelf type), per square foot of surface	3 to 9 ft ²	930	—	740	190	930	260
Food warmer (infrared tube), per foot of length	39 to 53 in.	990	—	990	—	990	990
Food warmer (well type), per cubic foot of well	0.7 to 2.5 ft ³	3620	—	1200	610	1810	580
Freezer (large)	73	4570	—	1840	—	1840	0
Freezer (small)	18	2760	—	1090	—	1090	0
Griddle/grill (large), per square foot of cooking surface	4.6 to 11.8 ft ²	9200	—	615	343	958	343
Griddle/grill (small), per square foot of cooking surface	2.2 to 4.5 ft ²	8300	—	545	308	853	298
Hot dog broiler	48 to 56 hot dogs	3960	—	340	170	510	160
Hot plate (double burner, high speed)		16720	—	7810	5430	13240	6240
Hot plate (double burner, stockpot)		13650	—	6380	4440	10820	5080
Hot plate (single burner, high speed)		9550	—	4470	3110	7580	3550
Hot water urn (large), per quart of capacity	56 qt	416	—	161	52	213	68
Hot water urn (small), per quart of capacity	8 qt	738	—	285	95	380	123
Ice maker (large)	220 lb/day	3720	—	9320	—	9320	0
Ice maker (small)	110 lb/day	2560	—	6410	—	6410	0
Microwave oven (heavy duty, commercial)	0.7 ft ³	8970	—	8970	—	8970	0
Microwave oven (residential type)	1 ft ³	2050 to 4780	—	2050 to 4780	—	2050 to 4780	0
Mixer (large), per quart of capacity	81 qt	94	—	94	—	94	0
Mixer (small), per quart of capacity	12 to 76 qt	48	—	48	—	48	0
Press cooker (hamburger)	300 patties/h	7510	—	4950	2560	7510	2390
Refrigerator (large), per 10 ft ³ of interior space	25 to 74 ft ³	753	—	300	—	300	0
Refrigerator (small), per 10 ft ³ of interior space	6 to 25 ft ³	1670	—	665	—	665	0
Rotisserie	300 hamburgers/h	10920	—	7200	3720	10920	3480
Serving cart (hot), per cubic foot of well	1.8 to 3.2 ft ³	2050	—	680	340	1020	328
Serving drawer (large)	252 to 336 dinner rolls	3750	—	480	34	510	150
Serving drawer (small)	84 to 168 dinner rolls	2730	—	340	34	380	110
Skillet (tilting), per quart of capacity	48 to 132 qt	580	—	293	161	454	218
Slicer, per square foot of slicing carriage	0.65 to 0.97 ft ²	680	—	682	—	682	216
Soup cooker, per quart of well	7.4 to 11.6 qt	416	—	142	78	220	68
Steam cooker, per cubic foot of compartment	32 to 64 qt	20700	—	1640	1050	2690	784
Steam kettle (large), per quart of capacity	80 to 320 qt	300	—	23	16	39	13
Steam kettle (small), per quart of capacity	24 to 48 qt	840	—	68	45	113	32
Syrup warmer, per quart of capacity	11.6 qt	284	—	94	52	146	45

Table 8 Recommended Rate of Heat Gain from Restaurant Equipment Located in Air-Conditioned Areas (Concluded)

Appliance	Size	Energy Rate, Btu/h		Recommended Rate of Heat Gain, ^a Btu/h			
		Rated	Standby	Without Hood			With Hood
				Sensible	Latent	Total	Sensible
Toaster (bun toasts on one side only)	1400 buns/h	5120	—	2730	2420	5150	1640
Toaster (large conveyor)	720 slices/h	10920	—	2900	2560	5460	1740
Toaster (small conveyor)	360 slices/h	7170	—	1910	1670	3580	1160
Toaster (large pop-up)	10 slice	18080	—	9590	8500	18080	5800
Toaster (small pop-up)	4 slice	8430	—	4470	3960	8430	2700
Waffle iron	75 in ²	5600	—	2390	3210	5600	1770
Electric, Exhaust Hood Required							
Broiler (conveyor infrared), per square foot of cooking area/minute	2 to 102 ft ²	19230	—	—	—	—	3840
Broiler (single deck infrared), per square foot of broiling area	2.6 to 9.8 ft ²	10870	—	—	—	—	2150
Charbroiler, per linear foot of cooking surface	2 to 8 linear ft	11,000	9300	—	—	—	2800
Fryer (deep fat)	35 - 50 lb oil	48,000	2900	—	—	—	1200
Fryer (pressurized), per pound of fat capacity	13 to 33 lb	1565	—	—	—	—	59
Oven (full-size convection)		41,000	4600	—	—	—	2900
Oven (large deck baking with 537 ft ³ decks), per cubic foot of oven space	15 to 46 ft ³	1670	—	—	—	—	69
Oven (roasting), per cubic foot of oven space	7.8 to 23 ft ³	27350	—	—	—	—	113
Oven (small convection), per cubic foot of oven space	1.4 to 5.3 ft ³	10340	—	—	—	—	147
Oven (small deck baking with 272 ft ³ decks), per cubic foot of oven space	7.8 to 23 ft ³	2760	—	—	—	—	113
Open range top, per 2 element section	2 to 6 elements	14,000	4600	—	—	—	2100
Range (hot top/fry top), per square foot of cooking surface	4 to 8 ft ²	7260	—	—	—	—	2690
Range (oven section), per cubic foot of oven space	4.2 to 11.3 ft ³	3940	—	—	—	—	160
Griddle, per linear foot of cooking surface	2 to 8 linear feet	19,500	3100	—	—	—	1400
Gas, No Hood Required							
Broiler, per square foot of broiling area	2.7 ft ²	14800	660 ^b	5310	2860	8170	1220
Cheese melter, per square foot of cooking surface	2.5 to 5.1 ft ²	10300	660 ^b	3690	1980	5670	850
Dishwasher (hood type, chemical sanitizing), per 100 dishes/h	950 to 2000 dishes/h	1740	660 ^b	510	200	710	230
Dishwasher (hood type, water sanitizing), per 100 dishes/h	950 to 2000 dishes/h	1740	660 ^b	570	220	790	250
Dishwasher (conveyor type, chemical sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1370	660 ^b	330	70	400	130
Dishwasher (conveyor type, water sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1370	660 ^b	370	80	450	140
Griddle/grill (large), per square foot of cooking surface	4.6 to 11.8 ft ²	17000	330	1140	610	1750	460
Griddle/grill (small), per square foot of cooking surface	2.5 to 4.5 ft ²	14400	330	970	510	1480	400
Hot plate	2 burners	19200	1325 ^b	11700	3470	15200	3410
Oven (pizza), per square foot of hearth	6.4 to 12.9 ft ²	4740	660 ^b	623	220	843	85
Gas, Exhaust Hood Required							
Braising pan, per quart of capacity	105 to 140 qt	9840	660 ^b	—	—	—	2430
Broiler, per square foot of broiling area	3.7 to 3.9 ft ²	21800	530	—	—	—	1800
Broiler (large conveyor, infrared), per square foot of cooking area/minute	2 to 102 ft ²	51300	1990	—	—	—	5340
Broiler (standard infrared), per square foot of broiling area	2.4 to 9.4 ft ²	1940	530	—	—	—	1600
Charbroiler (large), per linear foot of cooking area	2 to 8 linear feet	36,000	22,000	—	—	—	3800
Fryer (deep fat)	35 to 50 oil cap.	80,000	5600	—	—	—	1900
Oven (bake deck), per cubic foot of oven space	5.3 to 16.2 ft ³	7670	660 ^b	—	—	—	140
Oven (convection), full size		70,000	29,400	—	—	—	5700
Oven (pizza), per square foot of oven hearth	9.3 to 25.8 ft ²	7240	660 ^b	—	—	—	130
Oven (roasting), per cubic foot of oven space	9 to 28 ft ³	4300	660 ^b	—	—	—	77
Oven (twin bake deck), per cubic foot of oven space	11 to 22 ft ³	4390	660 ^b	—	—	—	78
Range (burners), per 2 burner section	2 to 10 burnrs	33600	1325	—	—	—	6590
Range (hot top or fry top), per square foot of cooking surface	3 to 8 ft ²	11800	330	—	—	—	3390
Range (large stock pot)	3 burners	100000	1990	—	—	—	19600
Range (small stock pot)	2 burners	40000	1330	—	—	—	7830
Griddle, per linear foot of cooking surface	2 to 8 linear feet	25,000	6300	—	—	—	1600
Range top, open burner (per 2 burner section)	2 to 6 elements	40,000	13,600	—	—	—	2200
Steam							
Compartment steamer, per pound of food capacity/h	46 to 450 lb	280	—	22	14	36	11
Dishwasher (hood type, chemical sanitizing), per 100 dishes/h	950 to 2000 dishes/h	3150	—	880	380	1260	410
Dishwasher (hood type, water sanitizing), per 100 dishes/h	950 to 2000 dishes/h	3150	—	980	420	1400	450
Dishwasher (conveyor, chemical sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1180	—	140	330	470	150
Dishwasher (conveyor, water sanitizing), per 100 dishes/h	5000 to 9000 dishes/h	1180	—	150	370	520	170
Steam kettle, per quart of capacity	13 to 32 qt	500	—	39	25	64	19

^aIn some cases, heat gain data are given per unit of capacity. In those cases, the heat gain is calculated by: $q = (\text{recommended heat gain per unit of capacity}) * (\text{capacity})$

^bStandby input rating is given for entire appliance regardless of size.

Table 9A Rate of Heat Gain from Selected Office Equipment

Appliance	Size	Maximum Input Rating, Btu/h	Standby Input Rating, Btu/h	Recommended Rate of Heat Gain, Btu/h
Check processing workstation	12 pockets	16400	8410	8410
Computer devices				
Card puncher	—	2730 to 6140	2200 to 4800	2200 to 4800
Card reader	—	7510	5200	5200
Communication/transmission	—	6140 to 15700	5600 to 9600	5600 to 9600
Disk drives/mass storage	—	3410 to 34100	3412 to 22420	3412 to 22420
Magnetic ink reader	—	3280 to 16000	2600 to 14400	2600 to 14400
Microcomputer	16 to 640 Kbyte ^a	340 to 2050	300 to 1800	300 to 1800
Minicomputer	—	7500 to 15000	7500 to 15000	7500 to 15000
Optical reader	—	10240 to 20470	8000 to 17000	8000 to 17000
Plotters	—	256	128	214
Printers				
Letter quality	30 to 45 char/min	1200	600	1000
Line, high speed	5000 or more lines/min	4300 to 18100	2160 to 9040	2500 to 13000
Line, low speed	300 to 600 lines/min	1540	770	1280
Tape drives	—	4090 to 22200	3500 to 15000	3500 to 15000
Terminal	—	310 to 680	270 to 600	270 to 600
Copiers/Duplicators				
Blue print	—	3930 to 42700	1710 to 17100	3930 to 42700
Copiers (large)	30 to 67 ^a copies/min	5800 to 22500	3070	5800 to 22500
Copiers (small)	6 to 30 ^a copies/min	1570 to 5800	1020 to 3070	1570 to 5800
Feeder	—	100	—	100
Microfilm printer	—	1540	—	1540
Sorter/collator	—	200 to 2050	—	200 to 2050
Electronic equipment				
Cassette recorders/players	—	200	—	200
Receiver/tuner	—	340	—	340
Signal analyzer	—	90 to 2220	—	90 to 2220
Mailprocessing				
Folding machine	—	430	—	270
Inserting machine	3600 to 6800 pieces/h	2050 to 11300	—	1330 to 7340
Labeling machine	1500 to 30000 pieces/h	2050 to 22500	—	1330 to 14700
Postage meter	—	780	—	510
Wordprocessors/Typewriters				
Letter quality printer	30 to 45 char/min	1200	600	1000
Phototypesetter	—	5890	—	5180
Typewriter	—	270	—	230
Wordprocessor	—	340 to 2050	—	300 to 1800
Vending machines				
Cigarette	—	250	51 to 85	250
Cold food/beverage	—	3920 to 6550	—	1960 to 3280
Hot beverage	—	5890	—	2940
Snack	—	820 to 940	—	820 to 940
Miscellaneous				
Barcode printer	—	1500	—	1260
Cash registers	—	200	—	160
Coffee maker	10 cups	5120	—	3580 sens., 1540 latent
Microfiche reader	—	290	—	290
Microfilm reader	—	1770	—	1770
Microfilm reader/printer	—	3920	—	3920
Microwave oven	1 ft ³	2050	—	1360
Paper shredder	—	850 to 10240	—	680 to 8250
Water cooler	32 qt/h	2390	—	5970

^aInput is not proportional to capacity.

Table 9B Heat Gain Versus Nameplate Rating From Electrical Office Equipment

Equipment Tested	Nameplate Rating, W	Measured Total		Radiant Power, W	Radiant Power, %	Convective Power, %
		Power Consumption, W	Power, W			
15 in. monitor energy saver (white screen)	220	78	28.8	37.1	62.9	
Laser printer	836	248	26.6	10.7	89.3	
Desktop copier	1320	181	25.9	14.3	85.7	
Personal computer (Brand 1) and 17 in. monitor (white screen)	575	133	29.7	22.3	77.7	
Personal computer (Brand 2) and 17 in. monitor (white screen)	420	125	35.7	28.6	71.4	