

**Errata to
ASHRAE Pocket Guide, 8th edition
SI Edition (2013)**

December 6, 2017

Shaded items have been added since the previously published errata sheet dated July 21, 2015.

- Page viii:** Add the following sentence to the end of the preface: “**Complete entries for all references cited in tables and figures are available in the original source publications.**”
- Page 11:** The I-P version of the final equation on this page was inadvertently included in the SI edition. Please use the correct equation below.
- $$\text{fan power, kW} = \frac{\text{L/s} \times \text{pressure difference, kPa}}{40350 \times \text{fan efficiency} \times \text{motor efficiency}}$$
- Page 18:** The title for Table 1.12 reads “Thermodynamic Properties of Moist Air at Standard Atmospheric Pressure” but should read “**Specific Enthalpy** of Moist Air at Standard Atmospheric Pressure.”
- Page 19:** Table 1.14 is a repeat of Table 1.13; it should be deleted and the remaining tables in Chapter 1 should be renumbered.
- Page 29** The I-P version of Figure 1.10 was included in the SI edition. Please use the corrected figure below instead.

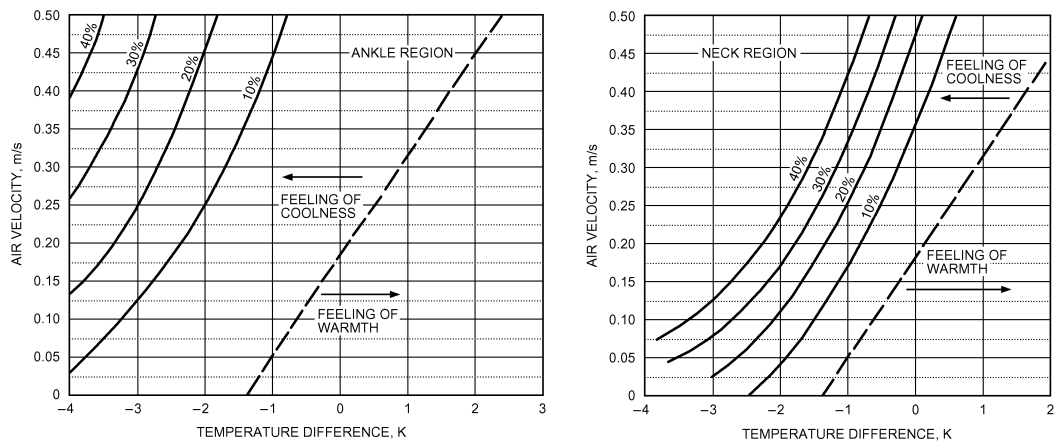


Figure 1.10 Percentage of Occupants Objecting to Drafts in Air-Conditioned Rooms
2013F Ch 20 Fig 111

- Page 37:** In the paragraph under “Filter Installation,” the last line begins with “...least 20 in. access...” but should read “...least **500 mm** access...”

- Page 40:** Table 2.4, in the row for “Organic Vapors” and the column for “Typical Outdoor Concentration,” reads “See Table 11” but should read “**See 2013F, Ch 11, Tbl 11.**”
- Page 46:** The right side of Figure 2.2 shows “7 ft” but should show “**2.13 m**”.
- Page 50:** The nomenclature after the first equation reads “ Δp_e = hood entry loss, in. of water” and “ p_v = appropriate velocity pressure, in. of water,” but in both instances “in. of water” should read “**Pa**”.
- Page 51:** In the first paragraph of the third bullet on the page, three lines from the bottom, a closing parenthesis needs to be deleted. The third line from the bottom should read “**consumption varies from 0.1 to 0.3 L/s per linear metre of hood, depending....**”
- Page 60:** Figures 3.3, 3.4, and 3.5 are all labeled with “Head” on the left side but should all be labeled with “**Pressure.**”
- Page 68:** Figure 3.10 included an image for Schedule 80 plastic pipe instead of for Schedule 40 steel pipe. Please use the corrected figure below instead.

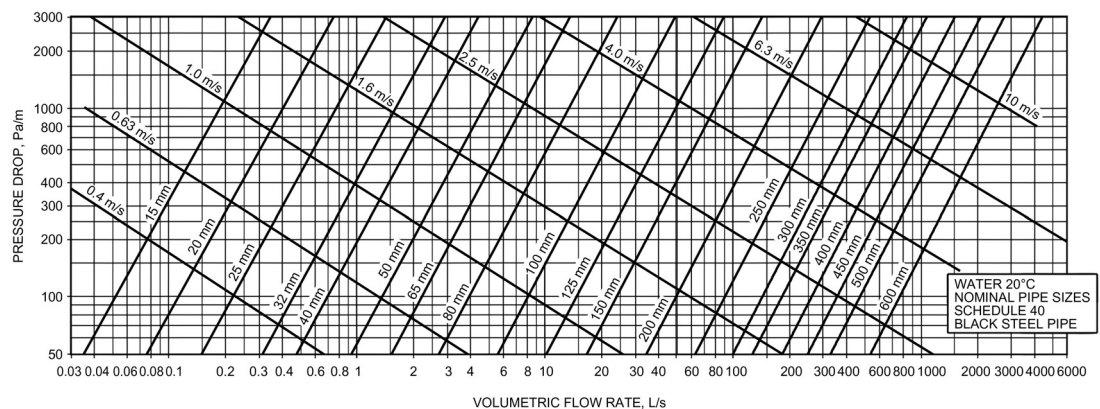


Figure 3.10 Friction Loss for Water in Commercial Steel Pipe (Schedule 40)
2013F, Ch 22, Fig. 41

- Page 69:** Twice after the equation on this page the text reads “following tables” but should read “**Tables 3.9 to 3.14.**”
- Page 72:** The title of Table 3.11 reads “Summary of K Values for Reducers and Expansions” but should read “Summary of K **Factors** for Reducers and Expansions,” and the title of Table 3.12 reads “Summary of Test Data for Pipe Tees” but should read “Summary of K **Factors** for Pipe Tees.”
- Original page 78:** The I-P table for flow rates of steam was included in the SI edition. Please delete Table 4.2 and renumber the remaining tables in Chapter 4.
- Original pp. 95–98 (reprint pp. 94–97):** The I-P versions of Tables 6.1–6.5 were included in the SI edition. Please use the included correct tables instead.

Original page 105 (reprint page 104):	Figures 7.4 and 7.5 are incorrectly cited. For Figure 7.4, “2012A, Ch 33, Fig 27” should read “ 2011A, Ch 35, Fig 27 ”, and for Figure 7.5, “2012A, Ch 33, Fig 28” should read “ 2011A, Ch 35, Fig 28 ”.
Original page 106 (reprint page 105):	Figures 7.6 and 7.7 are incorrectly cited. For Figure 7.6, “2012A, Ch 33, Fig 25” should read “ 2011A, Ch 35, Fig 25 ”, and for Figure 7.7, “2012A, Ch 33, Fig 26” should read “ 2011A, Ch 35, Fig 26 ”.
Original page 108 (reprint page 107)	The first line under the figures reads “Heat into evaporator ${}_4Q_1 = m(h_1 - h_4) - m(h_1 - h_2)kW$ ” but should read “Heat into evaporator ${}_4Q_1 = m(h_1 - h_4)$ ”.
Original page 117 (reprint page 116):	Table 9.4 has incorrect data for Refrigerant 123 in the final column, c_p/c_v Vapor. Please use the included correct table instead.
Original page 119:	One table, for the superheated vapor thermodynamic properties of R-134a, is missing from the SI edition of the Pocket Guide. Please insert the included table as the new Table 9.6 and renumber the remaining tables in Chapter 9.
Page 124:	Figure 9.6 should have the following caption: “ Pressure-Enthalpy Diagram for Refrigerant 407C [2013F, Ch 30, Fig 15]. ”
Page 165:	The nomenclature under the first equation reads “ x = wall thickness, in.” but should read “ x = wall thickness, m ”.
Page 166	The equation $q = \frac{Q_1 + Q_2 + Q_3}{n}$ should be $q = \frac{Q_1 + Q_2 + Q_3}{3600n}$
Page 167:	Under the heading “Infiltration Air Load,” the second equation is missing a definition for H . Please add the following after the definition for W : “ H = doorway height, m ”.
Page 170:	In the sixth paragraph, the first sentence reads “For preliminary estimation of the cooling load, the figures herein are a very rough guide” but should read “For preliminary estimation of the cooling load, the check values in Table 12-1 are a very rough guide.”
Page 172:	The title of Table 12.1 reads “Cooling Load Figures” but should read “Cooling Load Check Values .”
Page 175:	In footnote e to Table 12.3, the first sentence ends with “(see Table 2)” but should state “(see 2013F, Ch 26, Tbl 2).”
Page 176:	In footnote 5 to Table 12.4, the first sentence ends with “(see Table 2)” but should state “(see 2013F, Ch 26, Tbl 2).”
Page 184:	In footnote c of Table 12.8, the second sentence reads “...see Tables 2 and 3 for insulating value of airspace...” but should read “...see 2013F, Ch 26, Tbls 2 and 3 for insulating value of airspace....”

- Page 190:** In Table 12.14, note 2 reads “Also see Table 4, Chapter 9” but should read “Also see **2013F, Ch 9, Tbl 4**” and footnote b reads “Values approximated from data in Table 6, Chapter 9...” but should read “Values approximated from data in **2013F, Ch 9, Tbl 6....**”
- Original page 193 (reprint page 192):** In the Building-Specific Space Type column of Table 12.15, the first entry under Retail is missing a bracket. It should read “Sales area [for accent lighting, see.....”
- Original page 194 (reprint page 193):** The paragraph under Table 12.16 begins with “Table 12.20 provides...” but should read “**Table 12.16 provides....**”
- Original page 199:** Two tables, Tables 5D and 5E from the 2013 *ASHRAE Handbook—Fundamentals*, are missing from the SI edition of the Pocket Guide. Please insert the included tables as the new Tables 12.20 and 12.21 and renumber the remaining tables in Chapter 12.
- Original page 242 (reprint page 241):** The caption for Figure 17.2 reads “Performance Curve for Typical 100 ton, Gas-Engine-Driven, Reciprocating Chiller” but should read “Performance Curve for Typical **350 kW**, Gas-Engine-Driven, Reciprocating Chiller.”
- Page 201:** The second sentence reads “In a laboratory, heat gain ranges from 15 to 70 Btuh/ft²” but should read “In a laboratory, heat gain ranges from **50 to 220 W/m²**”.
- Page 224:** The table that begins on this page is designated “Table 13.5” but should be “**Table 13.6**”.
- Page 226:** The table on this page is designated as “Table 13.6” but should be “**Table 13.7**”.
- Page 232:** The last line of the first paragraph reads “...based on the dv/dt of the drive...” and the caption for Figure 12.1 reads “Motor Voltage Peak and dv/dt Limits”; in both instances “ dv/dt ” should be changed to “ **dV/dt** ”.
- Page 273:** The first sentence of the notes to the table reads “in Table 47” but should read “in **2011A, Ch 48, Tbl 47.**”
- Page 301:** In Table 25.3, the second sentence of footnote a reads “See Figures 21 to 23” but should read “See **2011A, Ch 34, Figs 21 to 23.**”
- Page 300:** The figure at the top of the page is numbered “Figure 1.4” but should be numbered “**Figure 25.4**”.
- Page 304:** The I-P version of Table 26.1 was included in the SI edition. Please use the included corrected table instead.

In the Notes to General Design Criteria, note d has a typo and note e is out of order. Note e should obviously follow note d. Note d currently ends with “may be satisfactory for patrons” but should include the phrase following note d as well. Thus, the final sentence of note d should read “**Although space conditions of 80°F and 50% rh may be satisfactory for patrons when it is 95°F and 50% rh outside, inside conditions of 78°F and 40% rh are better.**”

Table 6.1 Typical Residential Use of Hot Water [2011A, Ch 50, Tbl 4]

Use	High Flow, Litres/Task	Low Flow (Water Savers Used), Litres/Task	Ultralow Flow, Litres/Task
Food preparation	19	11	11
Hand dish washing	15	15	11
Automatic dishwasher	57	57	11 to 38
Clothes washer	121	80	19 to 57
Shower or bath	76	57	38 to 57
Face and hand washing	15	8	4 to 8

Table 6.2 HUD-FHA Minimum Water Heater Capacities for One- and Two-Family Living Units [2011A, Ch 50, Tbl 5]

Number of Baths	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
Gas^a											
Storage, L	76	114	114	114	150	150	190	150	190	190	190
kW input	7.9	10.5	10.5	10.5	10.5	11.1	13.8	11.1	11.1	13.8	14.6
1 h draw, L	163	227	227	227	265	273	341	273	311	341	350
Recovery, mL/s	24	32	32	32	32	36	42	34	34	42	44
Electric^a											
Storage, L	76	114	150	150	190	190	250	190	250	250	300
kW input	2.5	3.5	4.5	4.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
1 h draw, L	114	167	220	220	273	273	334	273	334	334	387
Recovery, mL/s	10	15	19	19	23	23	23	23	23	23	23
Oil^a											
Storage, L	114	114	114	114	114	114	114	114	114	114	114
kW input	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
1 h draw, L	337	337	337	337	337	337	337	337	337	337	337
Recovery, mL/s	62	62	62	62	62	62	62	62	62	62	62
Tank-Type Indirect^{b,c}											
I-W-H-rated draw, L in 3 h, 55 K rise	150	150		250	250 ^e	250	250	250	250	250	250
Manufacturer-rated draw, L in 3 h, 55 K rise	186	186		284	284 ^e	284	284	284	284	284	284
Tank capacity, L	250	250		250	250 ^e	310	250	310	310	310	310
Tankless-Type Indirect^{c,d}											
I-W-H-rated draw, mL/s, 55 K rise	170	170		200	200 ^e	240	200	240	240	240	240
Manufacturer-rated draw, L in 5 min, 55 K rise	57	57		95	95 ^e	133	95	133	133	133	133

Note: Applies to tank-type water heaters only.

^aStorage capacity, input, and recovery requirements indicated are typical and may vary with manufacturer. Any combination of requirements to produce stated 1 h draw is satisfactory.

^bBoiler-connected water heater capacities (82°C boiler water, internal or external connection).

^cHeater capacities and inputs are minimum allowable. Variations in tank size are permitted when recovery is based on 4.2 mL/(s kW) at 55 K rise for electrical, AGA recovery ratings for gas, and IBR ratings for steam and hot-water heaters.

^dBoiler-connected heater capacities (93°C boiler water, internal or external connection).

^eAlso for 1 to 1.5 baths and 4 bedrooms for indirect water heaters.

Table 6.3 Overall (OVL) and Peak Average Hot-Water Use [2011A, Ch 50, Tbl 6]

Group	Average Hot-Water Use, L							
	Hourly		Daily		Weekly		Monthly	
	OVL	Peak	OVL	Peak	OVL	Peak	OVL	Peak
All families	9.8	17.3	236	254	1652	1873	7178	7700
“Typical” families	9.9	21.9	239	252	1673	1981	7270	7866

Table 6.4 Hot-Water Demands and Use for Various Types of Buildings*
[2011A, Ch 50, Tbl 7]

Type of Building	Maximum Hourly	Maximum Daily	Average Daily
Men's dormitories	14.4 L/student	83.3 L/student	49.7 L/student
Women's dormitories	19 L/student	100 L/student	46.6 L/student
Motels: Number of units ^a			
20 or less	23 L/unit	132.6 L/unit	75.8 L/unit
60	20 L/unit	94.8 L/unit	53.1 L/unit
100 or more	15 L/unit	56.8 L/unit	37.9 L/unit
Nursing homes	17 L/bed	114 L/bed	69.7 L/bed
Office buildings	1.5 L/person	7.6 L/person	3.8 L/person
Food service establishments:			
Type A: Full-meal restaurants and cafeterias	5.7 L/max meals/h	41.7 L/max meals/day	9.1 L/average meals/day ^b
Type B: Drive-ins, grills, luncheonettes, sandwich and snack shops	2.6 L/max meals/h	22.7 L/max meals/day	2.6 L/average meals/day ^b
Apartment houses: Number of apartments			
20 or less	45.5 L/apartment	303.2 L/apartment	159.2 L/apartment
50	37.9 L/apartment	276.7 L/apartment	151.6 L/apartment
75	32.2 L/apartment	250 L/apartment	144 L/apartment
100	26.5 L/apartment	227.4 L/apartment	140.2 L/apartment
200 or more	19 L/apartment	195 L/apartment	132.7 L/apartment
Elementary schools	2.3 L/student	5.7 L/student	2.3 L/student ^b
Junior and senior high schools	3.8 L/student	13.6 L/student	6.8 L/student ^b

*Data predate modern low-flow fixtures and appliances.

^aInterpolate for intermediate values. ^bPer day of operation.

Table 6.5 Hot Water Demand per Fixture for Various Types of Buildings [2011A, Ch 50, Tbl 10]
(Litres of water per hour per fixture, calculated at a final temperature of 60°C)

	Apartment House	Club	Gymnasium	Hospital	Hotel	Industrial Plant	Office Building	Private Residence	School	YMCA
1. Basin, private lavatory	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
2. Basin, public lavatory	15	23	30	23	30	45.5	23	—	57	30
3. Bathtub ^c	76	76	114	76	76	—	—	76	—	114
4. Dishwasher ^d	57	190-570	—	190-570	190-760	76-380	—	57	76-380	76-380
5. Foot basin	11	11	46	11	11	46	—	11	11	46
6. Kitchen sink	38	76	—	76	114	76	76	38	76	76
7. Laundry, stationary tub	76	106	—	106	106	—	—	76	—	106
8. Pantry sink	19	38	—	38	38	—	38	19	38	38
9. Shower	114	568	850	284	284	850	114	114	850	850
10. Service sink	76	76	—	76	114	76	76	57	76	76
11. Hydrotherapeutic shower				1520						
12. Hubbard bath				2270						
13. Leg bath				380						
14. Arm bath				130						
15. Sitz bath				114						
16. Continuous-flow bath				625						
17. Circular wash sink				76	76	114	76		114	
18. Semicircular wash sink				38	38	57	38		57	
19. DEMAND FACTOR	0.30	0.30	0.40	0.25	0.25	0.40	0.30	0.30	0.40	0.40
20. STORAGE CAPACITY FACTOR ^e	1.25	0.90	1.00	0.60	0.80	1.00	2.00	0.70	1.00	1.00

Note: Data sources predate low-flow fixtures and appliances.

^aDishwasher requirements should be taken from this table or from manufacturers' data for model to be used, if known.

^bRatio of storage tank capacity to probable maximum demand/h. Storage capacity may be reduced where unlimited supply of steam is available from central street steam system or large boiler plant.

^cWhirlpool baths require specific consideration based on capacity. They are not included in the bathtub category.

Table 9.4 R-123 (2,2-Dichloro-1,1,1-Trifluoroethane)
Properties of Saturated Liquid and Saturated Vapor

Temp., °C	Pressure, MPa	Density, kg/m ³ Liquid	Volume, m ³ /kg Vapor	Enthalpy, kJ/kg		Entropy, kJ/(kg·K)		c _p /c _v Vapor
				Liquid	Vapor	Liquid	Vapor	
-80	0.00013	1709.6	83.6670	123.92	335.98	0.6712	1.7691	1.117
-70	0.00034	1687.4	32.8420	133.17	341.25	0.7179	1.7422	1.113
-60	0.00081	1665.1	14.3330	142.46	346.66	0.7625	1.7206	1.110
-50	0.00177	1642.6	6.84600	151.81	352.21	0.8054	1.7034	1.107
-40	0.00358	1620.0	3.53190	161.25	357.88	0.8468	1.6901	1.105
-30	0.00675	1597.0	1.94700	170.78	363.65	0.8868	1.6800	1.103
-20	0.01200	1573.8	1.13640	180.41	369.52	0.9256	1.6726	1.102
-10	0.02025	1550.1	0.69690	190.15	375.45	0.9633	1.6675	1.102
0	0.03265	1526.1	0.44609	200.00	381.44	1.0000	1.6642	1.102
2	0.03574	1521.3	0.40991	201.98	382.64	1.0072	1.6638	1.103
4	0.03907	1516.4	0.37720	203.97	383.84	1.0144	1.6634	1.103
6	0.04264	1511.5	0.34759	205.97	385.05	1.0216	1.6631	1.103
8	0.04647	1506.6	0.32075	207.96	386.25	1.0287	1.6628	1.103
10	0.05057	1501.6	0.29637	209.97	387.46	1.0358	1.6626	1.104
12	0.05495	1496.7	0.27420	211.97	388.66	1.0428	1.6625	1.104
14	0.05963	1491.7	0.25401	213.99	389.87	1.0499	1.6624	1.104
16	0.06463	1486.7	0.23559	216.00	391.08	1.0569	1.6623	1.105
18	0.06995	1481.7	0.21877	218.02	392.29	1.0638	1.6623	1.105
20	0.07561	1476.6	0.20338	220.05	393.49	1.0707	1.6624	1.106
22	0.08163	1471.5	0.18929	222.08	394.70	1.0776	1.6625	1.106
24	0.08802	1466.4	0.17637	224.12	395.91	1.0845	1.6626	1.107
26	0.09480	1461.3	0.16451	226.16	397.12	1.0913	1.6628	1.107
27.82 ^b	0.10133	1456.6	0.15453	228.03	398.22	1.0975	1.6630	1.108
28	0.10198	1456.2	0.15360	228.21	398.32	1.0981	1.6630	1.108
30	0.10958	1451.0	0.14356	230.26	399.53	1.1049	1.6633	1.109
32	0.11762	1445.8	0.13431	232.31	400.73	1.1116	1.6635	1.109
34	0.12611	1440.6	0.12577	234.38	401.93	1.1183	1.6639	1.110
36	0.13507	1435.4	0.11789	236.44	403.14	1.1250	1.6642	1.111
38	0.14452	1430.1	0.11060	238.51	404.34	1.1317	1.6646	1.112
40	0.15447	1424.8	0.10385	240.59	405.54	1.1383	1.6651	1.113
42	0.16495	1419.4	0.09759	242.67	406.73	1.1449	1.6655	1.114
44	0.17597	1414.1	0.09179	244.76	407.93	1.1515	1.6660	1.115
46	0.18755	1408.7	0.08641	246.86	409.12	1.1581	1.6665	1.116
48	0.19971	1403.3	0.08140	248.95	410.31	1.1646	1.6670	1.117
50	0.21246	1397.8	0.07674	251.06	411.50	1.1711	1.6676	1.119
52	0.22584	1392.3	0.07240	253.17	412.69	1.1776	1.6682	1.120
54	0.23985	1386.8	0.06836	255.28	413.87	1.1840	1.6688	1.121
56	0.25451	1381.2	0.06458	257.41	415.05	1.1905	1.6694	1.123
58	0.26985	1375.6	0.06106	259.53	416.23	1.1969	1.6701	1.124
60	0.28589	1370.0	0.05777	261.67	417.40	1.2033	1.6707	1.126
62	0.30264	1364.3	0.05469	263.81	418.57	1.2096	1.6714	1.127
64	0.32013	1358.6	0.05180	265.95	419.73	1.2160	1.6721	1.129
66	0.33838	1352.8	0.04910	268.10	420.89	1.2223	1.6728	1.131
68	0.35740	1347.0	0.04656	270.26	422.05	1.2286	1.6735	1.133
70	0.37722	1341.2	0.04418	272.42	423.20	1.2349	1.6743	1.135
72	0.39787	1335.3	0.04195	274.60	424.35	1.2411	1.6750	1.137
74	0.41936	1329.3	0.03985	276.77	425.50	1.2474	1.6758	1.139
76	0.44171	1323.4	0.03787	278.96	426.63	1.2536	1.6766	1.142
78	0.46494	1317.3	0.03601	281.15	427.77	1.2598	1.6774	1.144
80	0.48909	1311.2	0.03426	283.35	428.89	1.2660	1.6781	1.147
82	0.51416	1305.1	0.03261	285.55	430.01	1.2722	1.6789	1.150
84	0.54019	1298.9	0.03105	287.77	431.13	1.2783	1.6797	1.152
86	0.56720	1292.6	0.02958	289.99	432.23	1.2845	1.6806	1.156
88	0.59520	1286.3	0.02819	292.22	433.33	1.2906	1.6814	1.159
90	0.62423	1279.9	0.02687	294.45	434.43	1.2967	1.6822	1.162
92	0.65430	1273.5	0.02563	296.70	435.51	1.3028	1.6830	1.166
94	0.68544	1266.9	0.02445	298.95	436.59	1.3089	1.6838	1.169
96	0.71768	1260.3	0.02334	301.21	437.66	1.3150	1.6846	1.173
98	0.75103	1253.7	0.02228	303.49	438.72	1.3211	1.6854	1.177
100	0.78553	1246.9	0.02128	305.77	439.77	1.3271	1.6862	1.182
110	0.97603	1211.9	0.01697	317.32	444.88	1.3572	1.6902	1.208
120	1.19900	1174.4	0.01361	329.15	449.67	1.3872	1.6938	1.243
130	1.45780	1133.6	0.01094	341.32	454.07	1.4173	1.6969	1.294
140	1.75630	1088.3	0.00879	353.92	457.94	1.4475	1.6992	1.369
150	2.09870	1036.8	0.00703	367.10	461.05	1.4782	1.7003	1.493
160	2.49010	975.7	0.00555	381.13	463.01	1.5101	1.6991	1.726
170	2.93720	896.9	0.00425	396.61	462.89	1.5443	1.6939	2.309
180	3.45060	765.9	0.00292	416.22	456.82	1.5867	1.6763	6.158
183.68 ^c	3.66180	550.0	0.00182	437.39	437.39	1.6325	1.6325	∞

*Temperatures on ITS-90 scale

^bNormal boiling point

^cCritical point

Table 9.6 Superheated Vapor Thermodynamic Properties of R-134a

Temp, °C	Pressure = 0.101325 MPa			Pressure = 0.200 MPa		
	Sat. temp. = -26.07°C			Sat. temp. = -10.07°C		
	<i>V</i>	<i>h</i>	<i>s</i>	<i>V</i>	<i>h</i>	<i>s</i>
-20.00	5.11	387.68	1.7667	-10.00	10.01	392.77
-10.00	4.89	395.65	1.7976	0.00	9.54	401.21
0.00	4.69	403.74	1.8278	10.00	9.13	409.73
10.00	4.50	411.97	1.8574	20.00	8.76	418.35
20.00	4.34	420.34	1.8864	30.00	8.42	427.07
30.00	4.18	428.85	1.9150	40.00	8.12	435.90
40.00	4.04	437.52	1.9431	50.00	7.83	444.87
50.00	3.91	446.33	1.9708	60.00	7.57	453.97
60.00	3.78	455.30	1.9981			
Temp, °C	Pressure = 0.400 MPa			Pressure = 1.000 MPa		
	Sat. temp. = 8.94°C			Sat. temp. = 39.39°C		
	<i>V</i>	<i>h</i>	<i>s</i>	<i>V</i>	<i>h</i>	<i>s</i>
10.00	19.41	404.78	1.7263	70.00	41.21	452.05
20.00	18.45	414.00	1.7583	80.00	39.36	462.47
30.00	17.61	423.21	1.7892	90.00	37.74	472.86
40.00	16.87	432.46	1.8192	100.00	36.29	483.26
50.00	16.20	441.76	1.8485	110.00	34.99	493.69
60.00	15.60	451.15	1.8771	120.00	33.80	504.19
				130.00	32.71	514.75
Temp, °C	Pressure = 1.400 MPa			Pressure = 1.600 MPa		
	Sat. temp. = 52.43°C			Sat. temp. = 57.91°C		
	<i>V</i>	<i>h</i>	<i>s</i>	<i>V</i>	<i>h</i>	<i>s</i>
60.00	66.61	433.69	1.7347	60.00	80.74	428.99
70.00	62.25	445.31	1.7691	70.00	74.43	441.47
80.00	58.74	456.56	1.8014	80.00	69.61	453.30
90.00	55.79	467.60	1.8322	90.00	65.71	464.76
100.00	53.24	478.53	1.8619	100.00	62.43	476.01
110.00	51.03	489.39	1.8906	110.00	59.62	487.13
120.00	49.05	500.25	1.9186	120.00	57.14	498.19
130.00	47.28	511.11	1.9459	130.00	54.95	509.23
Temp, °C	Pressure = 2.000 MPa					
	Sat. temp. = 67.49°C					
	<i>V</i>	<i>h</i>	<i>s</i>			
70.00	104.37	432.22	1.7091			
80.00	94.85	445.86	1.7483			
90.00	87.97	458.49	1.7835			
100.00	82.58	470.57	1.8164			
110.00	78.17	482.32	1.8474			
120.00	74.44	493.86	1.8772			
130.00	71.18	505.30	1.9059			
140.00	68.33	516.68	1.9338			

V = vapor volume, kg/m³
h = enthalpy, kJ/kg
s = entropy, kJ/kg·K

Table 12.20 Recommended Rates of Radiant Heat Gain from Hooded Solid Fuel Appliances During Idle (Ready-to-Cook) Conditions [2013F, Ch 18, Tbl 5D]

Appliance	Energy Rate, W		Rate of Heat Gain, W		Usage Factor <i>F_U</i>	Radiation Factor <i>F_R</i>
	Rated	Standby	Sensible			
Broiler: solid fuel: charcoal	18 kg	12 309	1817		N/A	0.15
Broiler: solid fuel: wood (mesquite)*	18 kg	14 536	2051		N/A	0.14

*Items with an asterisk appear only in Swierczyna et al. (2009); all others appear in both Swierczyna et al. (2008) and (2009).

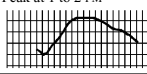
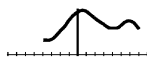
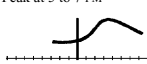
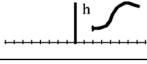
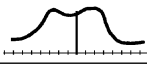
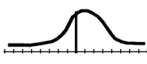
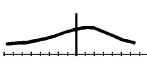
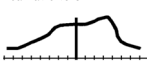
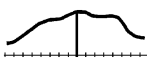
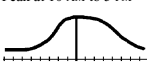
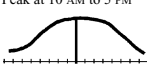
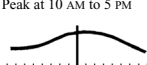
Table 12.21 Recommended Rates of Radiant and Convective Heat Gain from Warewashing Equipment During Idle (Standby) or Washing Conditions [2013F, Ch 18, Tbl 5E]

Appliance	Energy Rate, W		Rate of Heat Gain, W					Usage Factor <i>F_U</i>	Radiation Factor <i>F_R</i>
	Rated	Standby/ Washing	Unhooded				Hooded		
			Sensible Radiant	Sensible Convective	Latent	Total	Sensible Radiant		
Dishwasher (conveyor type, chemical sanitizing)	13 716	1671/12 778	0	1304	3954	5258	0	0.36	0
Dishwasher (conveyor type, hot-water sanitizing) standby	13 716	1671/N/A	0	1392	4973	6366	0	N/A	0
Dishwasher (door-type, chemical sanitizing) washing	5393	352/3898	0	580	818	1398	0	0.26	0
Dishwasher (door-type, hot-water sanitizing) washing	5393	352/3898	0	580	818	1398	0	0.26	0
Dishwasher* (under-counter type, chemical sanitizing) standby	7796	352/5480	0	668	1222	1890	0	0.35	0.00
Dishwasher* (under-counter type, hot-water sanitizing) standby	7796	498/5774	234	305	882	1421	234	0.27	0.34
Booster heater*	38 099	0	147	0	0	0	147	0	N/A

*Items with an asterisk appear only in Swierczyna et al. (2009); all others appear in both Swierczyna et al. (2008) and (2009).

Note: Heat load values are prorated for 30% washing and 70% standby.

Table 26.1 General Design Criteria^{a, b} [2007A, Ch 3, Tbl 1]

General Category	Specific Category	Inside Design Conditions		Air Movement	Circulation, ach	Noise ^c	Filtering Efficiencies (ASHRAE Std. 52.1)	Load Profile	Comments
		Winter	Summer						
Dining and Entertainment Centers	Cafeterias and Luncheonettes	21 to 23°C 20 to 30% rh	26°C ^d 50% rh	0.25 m/s at 1.8 m above floor	12 to 15	NC 40 to 50 ^e	35% or better	Peak at 1 to 2 PM 	Prevent draft discomfort for patrons waiting in serving lines
	Restaurants	21 to 23°C 20 to 30% rh	23 to 26°C 55 to 60% rh	0.13 to 0.15 m/s	8 to 12	NC 35 to 40	35% or better	Peak at 1 to 2 PM 	
	Bars	21 to 23°C 20 to 30% rh	23 to 26°C 50 to 60% rh	0.15 m/s at 1.8 m above floor	15 to 20	NC 35 to 50	Use charcoal for odor control with manual purge control for 100% outside air to exhaust ±35% prefilters	Peak at 5 to 7 PM 	
	Nightclubs and Casinos	21 to 23°C 20 to 30% rh	23 to 26°C 50 to 60% rh	below 0.13 m/s at 1.5 m above floor	20 to 30	NC 35 to 45 ^f	Use charcoal for odor control with manual purge control for 100% outside air to exhaust ±35% prefilters	Nightclubs peak at 8 PM to 2 AM; Casinos peak at 4 PM to 2 AM; Equipment, 24 h/day	Provide good air movement but prevent cold draft discomfort for patrons
	Kitchens	21 to 23°C	29 to 31°C	0.15 to 0.25 m/s	12 to 15 ^g	NC 40 to 50	10 to 15% or better		Negative air pressure required for odor control (also see Chapter 31)
Office Buildings		21 to 23°C 20 to 30% rh	23 to 26°C 50 to 60% rh	0.13 to 0.23 m/s 4 to 10 L/(s·m ²)	4 to 10	NC 30 to 40	35 to 60% or better	Peak at 4 PM 	
Museums, Galleries, Libraries and Archives	Average		20 to 22°C 40 to 55% rh	below 0.13 m/s	8 to 12	NC 35 to 40	35 to 60% or better	Peak at 3 PM 	
	Archival		See Chapter 21	below 0.13 m/s	8 to 12	NC 35	35% prefilters plus charcoal filters 85 to 95% final ⁱ	Peak at 3 PM 	
Bowling Centers		21 to 23°C 20 to 30% rh	24 to 26°C 50 to 55% rh	0.25 m/s at 1.8 m above floor	10 to 15	NC 40 to 50	10 to 15%	Peak at 6 to 8 PM 	
Communication Centers	Telephone Terminal Rooms	22 to 26°C 40 to 50% rh	22 to 26°C 40 to 50% rh	0.13 to 0.15 m/s	8 to 20	to NC 60	85% or better	Varies with location and use	Constant temperature and humidity required
	Radio and Television Studios	21 to 23°C 40 to 50% rh	23 to 26°C 45 to 55% rh	0.13 to 0.15 m/s	15 to 40	NC 15 to 25	35% or better	Varies widely because of changes in lighting and people	Constant temperature and humidity required
Transportation Centers (also see Chapter 13)	Airport Terminals	23 to 26°C 30 to 40% rh	23 to 26°C 40 to 55% rh	below 0.13 m/s at 3.7 m above floor	8 to 12	NC 35 to 50	35% or better and charcoal filters	Peak at 10 AM to 9 PM 	Positive air pressure required in terminal
	Ship Docks	21 to 23°C 20 to 30% rh	23 to 26°C 50 to 60% rh	0.13 to 0.15 m/s at 1.8 m above floor	8 to 12	NC 35 to 50	10 to 15%	Peak at 10 AM to 5 PM 	Positive air pressure required in waiting area
	Bus Terminals	21 to 23°C 20 to 30% rh	23 to 26°C 50 to 60% rh	0.13 to 0.15 m/s at 1.8 m above floor	8 to 12	NC 35 to 50	35% with exfiltration	Peak at 10 AM to 5 PM 	Positive air pressure required in terminal
	Garages ^j	4 to 13°C	27 to 38°C	0.15 to 0.38 m/s	4 to 6	NC 35 to 50	10 to 15%	Peak at 10 AM to 5 PM 	Negative air pressure required to remove fumes; positive air in pressure adjacent occupied spaces
Warehouses		Inside design temperatures for warehouses often depend on the materials stored.			1 to 4	to NC 75	10 to 35%	Peak at 10 AM to 3 PM 