Additions and Corrections

This report includes additional information, and technical errors found between June 15, 2005, and April 1, 2008, in the inch-pound (I-P) editions of the 2005, 2006, and 2007 *ASHRAE Handbook* volumes. Occasional typographical errors and nonstandard symbol labels will be corrected in future volumes. The most current list of Handbook additions and corrections is on the ASHRAE Web site (www.ashrae.org).

The authors and editor encourage you to notify them if you find other technical errors. Please send corrections to: Handbook Editor, ASHRAE, 1791 Tullie Circle NE, Atlanta, GA 30329, or e-mail mowen@ashrae.org.

2005 Fundamentals

p. 1.17, Eq. (63). $\dot{Q}_{evap}$ should be $\dot{Q}_{cond}$.

p. 1.20, Symbols. Units for V should be ft/s.

p. 2.7, Table 2. Values for ε (right column) should be 60, 1800, 6000, and 10,200 μin.

p. 2.11, definitions for Eq. (38). In the definition for Δh, there should be parentheses around $p_1 - p_2$.

p. 3.1, definitions for Eq. (1a). Units for thermal conductivity k should be Btu/h·ft·°F.

p. 3.2, Thermal Conduction, 2nd line from bottom. Change "steady" to "steady-state."

p. 3.5, Eq. (10). The equation should be as follows:

$$c_1 = \frac{2\,\mathrm{Bi}}{(\mu_1^2 + \mathrm{Bi}^2)\,J_0(\mu_1)}$$

p. 3.13, 1st col. Delete first repeated paragraph after Equation (30).

p. 3.21, 2nd col., last full sentence. Change to, "Depending on frequency and amplitude of vibration, forced convection from a wire to air is enhanced by up to 300% (Nesis et al. 1994)."

p. 3.28, Eq. (44). Delete second equals sign and second fraction.

p. 7.11, definitions for Eq. (42). Add "loss" to definition for TL.

p. 7.20, Eqs. (52) and (53). Revise the equations as follows:

$$\mathrm{TL} \approx 10 \log\left(1 + \frac{Z_f}{Z_I}\right) = 10 \log\left(1 + \frac{2\pi f Z_f}{k}\right) \quad (52)$$

$$\mathrm{TL} \approx 10 \log\left(1 + \frac{d_I}{d_f}\right) \quad (53)$$

p. 7.20, 1st col., last full paragraph. Change third sentence to read, "the resonance frequency of the system is maintained at 3.13 Hz, and the force transmitted to the structure remains at 12.5 $\mathrm{lb_f}$." Change sixth sentence to read, "where a is acceleration, the maximum dynamic displacement of the mounted equipment is reduced by a factor of (M_1/M_2), where M_1 and M_2 are the masses before and after mass is added, respectively."

p. 15.3, Eq. (3) and following text. Change K_a to K_d in the equation, definitions, and following paragraph (three places total).

p. 16.11, Symbols. Add the following definitions:

h_s = exhaust stack height (typically above roof unless otherwise specified), ft (see Figure 3, and Chapter 44 in the 2003 *ASHRAE Handbook—HVAC Applications*)

S = stretched-string distance; shortest distance from exhaust to intake over obstacles and along building surface, ft [see Figure 3, and Equation (22) in the 2003 *ASHRAE Handbook—HVAC Applications*)

p. 19.8, Table 7. Replace the table with the one supplied on p. A.2.

p. 23.6, Fig. 1. Change caption from "Adsorption Isotherms" to "Typical Adsorption."

p. 26.3, Eq. (2). The correct equation is

$$R_T = 12 \ln(D_3/D_2)/(2\pi k)$$

p. 27.21, Tables 4 and 5. Reverse the order of these two tables.

p. 27.14, Fig. 9. Air leakage should be at 0.2 in. of water.

p. 28.2, Table 1 (and all data tables), cols. 13a, c, and e. Because of a data processing error, the enthalpy values in these columns are systematically low by 7.687 Btu/lb. Thus, all enthalpy values in Table 1 and in all design climatic condition tables on the accompanying CD-ROM should be increased by that amount.

p. 28.6, Eq. (1), definitions. The definition for F should have a plus, not a minus, within the brackets, as follows:

$$F = -\frac{\sqrt{6}}{\pi}\left\{0.5772 + \ln\left[\ln\left(\frac{n}{n-1}\right)\right]\right\}$$

p. 29.8, Table 7. Units for OF_b should be °F.

p. 29.9, Table 9. The correct numbers for the last line of the table are as follows:

E_t	326	325	321	314	305	293	279	262	243

p. 29.9, Eq. (23). Units for CF_{slab} should be Btu/h·ft^2; 0.51 is a constant with units of Btu/h·ft^2; and 2.5 is a factor with units of °F.

p. 30.2, 2nd col., 6th para., last line. Change "with" to "without."

p. 30.4, bottom of 2nd col. The reference to Equation (3) should be to Equation (4).

p. 30.12, 1st col., Infiltration. The cross reference to Table 3 in Chapter 27 should be to Table 1 in Chapter 27 of the 2001 *ASHRAE Handbook—Fundamentals*.

p. 30.27, Table 19. Footnote 7 should refer to Table 3 in Chapter 39.

p. 30.32, Central Plant, Piping. The cross reference should be to Chapter 26, not Chapter 23.

p. 30.34, Part 1, Solution. In the equations, change all "1500 W" to "440 W" (1500 is correct for the solutions for q_7 to q_{18}).

p. 31.6, Table 2. In the footnote for Winter Conditions, add the following: $h_i = h_{ic} + h_{iR} = 0.30(\Delta T/L)^{0.25} + \varepsilon\Gamma(T_i^4 - T_g^4)/\Delta T$, where $\Delta T = T_i - T_g$, °R; L = glazing height, ft; T_g = glass temperature, °R.

p. 31.13, after Eq. (10). The definition of LST should be "local standard time, decimal hours."

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Table 7 Comparative Refrigerant Performance per Ton of Refrigeration

(2005 Fundamentals, Ch. 19, p. 8)

Refrigerant No.	Chemical Name or Composition (% by mass)	Evaporator Pressure, psia	Condenser Pressure, psia	Compression Ratio	Net Refrigerating Effect, Btu/lb	Refrigerant Circulated, lb/min	Liquid Circulated, gal/min	Specific Volume of Suction Gas, ft^3/lb	Compressor Displacement, ft^3/min	Power Consumption, hp	Coefficient of Performance	Compressor Discharge Temp., °F
170	Ethane	233.2	672.8	2.88	69.5	2.85	1.22	0.541	1.54	1.72	2.70	121.73
744	Carbon dioxide	326.9	1041.4	3.19	57.3	1.79	0.36	0.269	0.48	0.91	2.69	157.73
1270	Propylene	51.9	189.1	3.64	123.0	1.62	0.39	2.081	3.37	1.04	4.50	107.33
290	Propane	41.5	155.9	3.76	119.5	1.65	0.41	2.502	4.13	1.03	4.50	96.53
502	R-22/115 (48.8/51.2)	49.7	190.3	3.83	45.6	4.40	0.44	0.814	3.58	1.08	4.38	100.13
507A	R-125/143a (50/50)	55.0	211.6	3.85	47.4	4.22	0.50	0.814	3.44	1.13	4.18	94.73
404A	R-125/143a/134a (44/52/4)	52.9	206.0	3.89	49.1	4.08	0.48	0.860	3.51	1.12	4.21	96.53
410A	R-32/125 (50/50)	69.3	271.5	3.92	72.2	2.71	0.31	0.873	2.37	1.05	4.41	123.53
125	Pentafluoroethane	58.5	226.4	3.87	36.7	5.31	0.55	0.631	3.35	1.15	3.99	87.53
22	Chlorodifluoromethane	42.8	172.2	4.02	69.9	2.85	0.29	1.248	3.56	1.01	4.66	127.13
12	Dichlorodifluoro-methane	26.3	107.5	4.09	50.3	3.94	0.37	1.479	5.83	1.00	4.70	100.13
500	R-12/152a (73.8/26.2)	31.0	127.1	4.09	60.1	3.31	0.35	1.504	4.98	1.00	4.66	105.53
407C	R-32/125/134a (23/25/52)	41.8	182.7	4.38	70.2	2.85	0.30	1.289	3.67	1.05	4.50	118.13
600a	Isobutane*	12.8	58.5	4.58	113.5	1.76	0.39	6.524	11.48	1.01	4.62	85.73
134a	Tetrafluoroethane	23.6	111.2	4.71	63.6	3.13	0.31	1.945	6.09	1.02	4.60	98.33
124	Chlorotetrafluoroethane*	12.8	64.3	5.03	50.7	3.90	0.35	2.741	10.69	1.01	4.62	85.73
717	Ammonia	34.1	168.5	4.94	474.3	0.42	0.08	8.197	3.44	1.00	4.76	209.93
600	Butane*	8.1	41.0	5.05	125.6	1.65	0.35	10.325	17.04	1.03	4.74	85.73
11	Trichlorofluoro-methane	2.9	18.1	6.25	67.0	2.95	0.24	12.317	36.34	0.93	5.02	109.13
123	Dichlorotrifluoro-ethane	2.3	15.8	6.81	61.2	3.27	0.27	14.279	46.69	0.96	4.90	91.13
113	Trichlorotrifluoroethane*	1.0	7.8	7.71	52.7	3.66	0.28	26.940	98.60	0.94	4.81	85.73

*Superheat required.

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p. 31.15. All references to Figure 9 should be to Figure 8, and references to Figure 10 should be to Figure 9.

p. 31.16, 1st col., 1st full paragraph. The reference to Figure 11 should be to Figure 10.

p. 31.16, Example 5, Solution. After "Eastern daylight time of 3:00 P.M.," add "(i.e., standard time of 2:00 P.M.)."

p. 31.26, Table 13. For ID 1b, change the following values:

T	0.77	0.75	0.73	0.68	0.58	0.35	0.69
R^f	0.07	0.08	0.09	0.13	0.24	0.48	0.13
R^b	0.07	0.08	0.09	0.13	0.24	0.48	0.13

p. 31.40, Table 16, last two rows, center column. Change "0.42" to "0.16," and "0.44" to "0.10."

p. 32.5, 1st col. Cross references to the following equations in Chapter 30 should be as follows (the chapter number should stay the same; only the equation numbers should be updated):

Equation (36)	Equation (27)
Equation (35)	Equation (26)
Equation (34)	Equation (25)

p. 33.3, below Eq. (6). The definition for C_o should be $A_c C_d R_{fa}$ = effective area of stream at discharge from an open-end duct or at a contracted section, ft^2

p. 35.6, Eq. (18), definition for D_h. The reference should be to Equation (22).

p. 35.9, above Eq. (23). The reference should be to Equation (23).

p. 38.1, 1st col. The definition of an acre should be 43,560 ft^2. The conversion factor for ft of water to Pa should be 2989.

p. 40.26. The URL for CSA America should be csa-america.org.

2006 Refrigeration

p. 2.22, Table 21. The data for R-22 and R-134a were transposed; please reverse the order of the data columns, as shown on p. A.3.

p. 47.4, Testing for Leaks, 2nd paragraph. Change the first sentence to read, "ASHRAE *Standard* 147 established. . . ."

p. 47.7, References. Add the following source:

ASHRAE. 2002. Reducing the release of halogenated refrigerants from refrigerating and air-conditioning equipment and systems. ANSI/ASHRAE *Standard* 147-2002.

2007 HVAC Applications

Contributors List. Wayne Lawton of X-nth should be listed as contributor for Chapters 29 and 30.

Ch. 14, Laboratories. Revisions were inadvertently omitted from the 2007 volume; please go to http://www.ashrae.org/publications/page/158 to download the revised chapter.

p. 17.3, Table 1, Relative humidity control range. The maximum dew point for Class 1 should be 63°F.

p. 17.16, References. Please update the following two URLs:

For LBNL 2003,
http://hightech.lbl.gov/dc-benchmarking-results.html.

For NIOSH 1986,
http://www.cdc.gov/niosh/86-113.html.

p. 32.14, 2nd col., 1st paragraph. The reference to Table 5 should be to Table 4.

Table 21 Refrigerant Flow Capacity Data for Defrost Lines
(2006 Refrigeration, Ch. 2, p. 22, 1st two columns)

Pipe Size Copper[a]		R-22 Mass Flow Data, lb/h			R-134a Mass Flow Data, lb/h		
		Velocity, fpm			Velocity, fpm		
		1000	2000	3000	1000	2000	3000
1/2		110	220	330	150	300	450
5/8		170	350	520	240	480	720
3/4		260	510	770	350	710	1060
7/8		360	720	1090	500	1000	1500
1 1/8		620	1230	1850	850	1700	2550
1 3/8		940	1880	2820	1300	2590	3890
1 5/8		1330	2660	3990	1840	3670	5510
2 1/8		2310	4630	6940	3190	6390	9580
2 5/8		3570	7140	10,700	4930	9850	14,800
3 1/8		5100	10,200	15,300	7030	14,100	21,100
3 5/8		6900	13,800	20,700	9510	19,000	28,500
4 1/8		9000	17,900	26,900	12,400	24,700	37,100
5 1/8		14,000	27,900	41,900	19,300	38,500	57,800
6 1/8		20,100	40,100	60,200	27,700	55,400	83,100
8 1/8		35,100	70,100	105,200	48,400	96,700	145,100
Steel							
IPS	SCH						
3/8	80	110	210	320	150	290	440
1/2	80	180	350	530	240	480	720
3/4	80	320	650	970	450	890	1340
1	80	540	1080	1610	740	1480	2230
1 1/4	80	1120	2240	3360	1540	3090	4630
1 1/2	80	1520	3050	4570	2100	4200	6300
2	40	2510	5020	7530	3460	6930	10,400
2 1/2	40	3580	7160	10,700	4940	9870	14,800
3	40	5530	11,100	16,600	7620	15,200	22,900
4	40	9520	19,000	28,600	13,100	26,300	39,400
5	40	15,000	29,900	44,900	20,600	41,300	61,900
6	40	21,600	43,200	64,800	29,800	59,600	89,400
8	40	37,400	74,800	112,300	51,600	103,300	154,900
10	40	59,000	118,00	176,900	81,400	162,800	244,100
12	ID[b]	84,600	169,200	253,800	116,700	233,400	350,200
14	30	—	—	—	—	—	—
16	30	—	—	—	—	—	—

Note: Refrigerant flow data based on saturated condensing temperature of 70°F.[a]For brazed Type L copper tubing for defrost service, see Safety Requirements section.[b]Pipe inside diameter is same as nominal pipe size.

p. 32.15, Table 6. Units for "Bore Fill Conductivity" should be Btu/h·ft·°F.

p. 32.15, 1st col., 1st and 2nd lines, and following Eq. (4). Change "outside pipe" to "borehole." In the definitions for Eq. (4), units should be ft^2/day for α_g, days for τ, and ft for d, which is defined as borehole diameter.

p. 41.22, Example 3. The reference to Table 6 should be to Table 5. In the solution, change 0.8 to 0.85 in both equations.

p. 41.25, Eq. (26). The second term on the left side of the equation should be $\dot{Q}_{blr,i}$.

p. 41.30, Eq. (33). Change D to Δ.

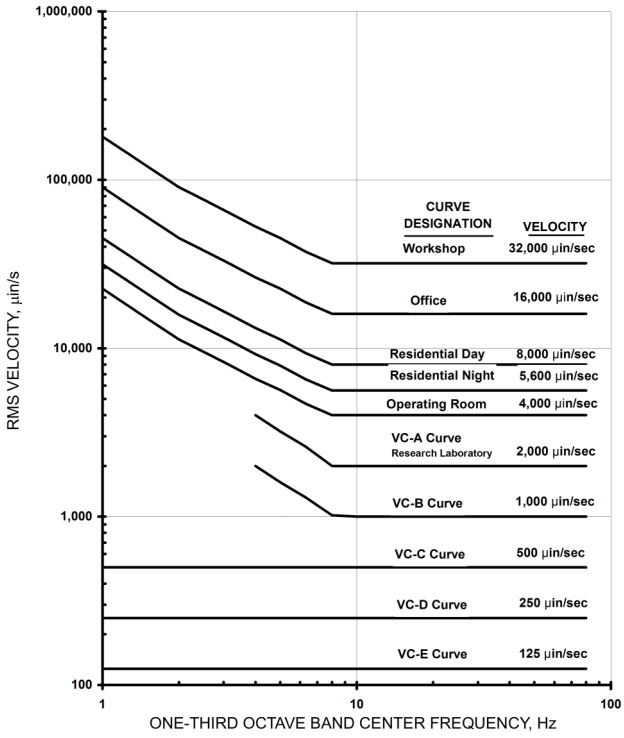

Fig. 37 Building Vibration Criteria for Vibration Measured on Building Structure
(2007 HVAC Applications, Chapter 47, p. 39)

p. 47.26, Eq. (26). The final number subtracted should be 0.5, not 11.

p. 47.37, Eq. (29). The final term should be $10^{L_{w2}/10}$.

p. 47.38, Vibration Criteria, 1st paragraph. ANSI *Standard* 3.29 is the former designation; update this to ANSI *Standard* S2.71-1983 (R2006).

p. 47.39, Fig. 37. The corrected figure is as shown at right.

p. 47.40, Table 48, Packaged AH, AC, H and V Units. In the Horsepower and Other column, change all ≤ to ≥ (i.e., should be ≥15, ≥4 in. SP).

p. 49.17, Fig. 21. Along the (horizontal) *x* axis, the labels should be 0, 12, 24, 36, and 48.

p. 49.24, Figs. 25 and 26. The current Figure 25 should be Figure 26; its caption should refer to Figure 25, not Figure 22. The current Figure 26 should be Figure 25.

p. 52.10, Example 7, 3rd paragraph. The equation for A_{bo} should be $6030(0.17 \times 10^{-3}) = 1.025$ ft^2. Consequently, the pressure difference Δp_{sbt} (third line from end of example) should be 0.331 in. of water, and the flow of pressurization air (last line of example) should be 5585 cfm.

p. 52.18, Symbols. The variable for floor-to-ceiling height should be *H*, and the variable for number of floors should be *N*.

p. 54.15, Example 1. For calculations using Eqs. (2) and (3), S_{DS} should be 0.623, not 0.85. The result using Eq. (2) should be 1495 lb, and the result using Eq. (3) should be 280 lb.

p. 54.17, Example 2. For calculations using Eqs. (2) and (3), S_{DS} should be 0.623, not 0.85. The result using Eq. (2) should be 1495 lb, and the result using Eq. (3) should be 280 lb.

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p. 54.18, Example 3. For calculations using Eqs. (2) and (3), S_{DS} should be 0.623, not 0.85. The result using Eq. (2) should be 3738 lb, and the result using Eq. (3) should be 701 lb.

p. 54.19, Example 4. For calculations using Eqs. (2) and (3), S_{DS} should be 0.623, not 0.85. The result using Eq. (2) should be 747 lb, and the result using Eq. (3) should be 140 lb.

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