

ASHRAE HANDBOOK

Additions and Corrections

This report includes additional information, and technical errors found between June 15, 2012, and April 1, 2015, in the inch-pound (I-P) editions of the 2012, 2013, and 2014 *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.

2012 HVAC Systems and Equipment

p. 25.1, Fig. 1. Point E was omitted. The correct figure appears below.

p. 26.2, Eq. (2a). In the rightmost fraction, change m_s to m_e .

p. 26.12, Example 2. Flow rate for ethylene glycol should be in gpm.

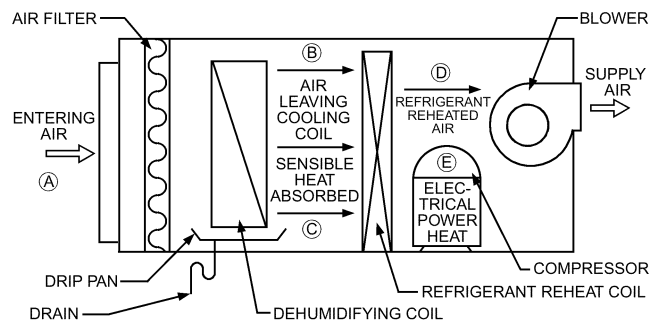


Fig. 1 Dehumidification Process Points
(2012 HVAC Systems and Equipment, Ch. 25, p. 1)

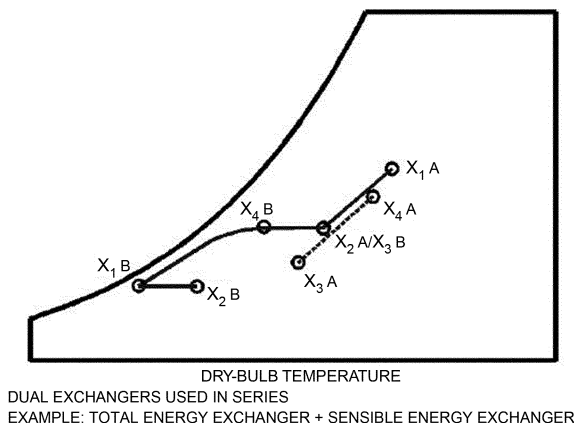


Fig. 13 The Psychrometric Processes of Exchangers in Series Mode
(Moffitt 2011)

(2012 HVAC Systems and Equipment, Ch. 26, p. 12)

p. 26.12, Fig. 13. The corrected figure is given below.

p. 41.3, Fig. 3. Replace parts B and C of the graphic with the horizontal polymer tube shown on p. A.2.

p. 44.8, Table 1. In both equations for flow and head, change the minuses to equals signs.

p. 51.24, Fig. 25. The bottom right line should have the discharge arrow pointing to the left, and the charge arrow pointing to the right. The corrected figure is shown on p. A.2.

2013 Fundamentals

p. 1.13, 2nd col. Above Eq. (38), change " $t_d(p, w)$ " to " $t_d(p, W)$."

p. 1.14, 1st col. In the table for Situation 2, 3rd line, Comments column, change " t_d " to " t ."

p. 4.21, Solution for Example 10, starting in 3rd para. Compute h_i using Eq. (T8.5a). Delete f_s and its value. Nu_d should be 248.3, and h_i should be 1248 Btu/h·ft²·°F. Compute h_o using Eq. (T9.10a). Change Ra to 74 574, Nu to 7.223, h_o to 3.643 Btu/h·ft²·°F, and the equation for h_{ot} to $0.643 + 0.757 = 1.400$ Btu/h·ft²·°F. Change the last paragraph in the example as follows:

Solving for d_o makes the left side of Equation (42) equal to the right side, and gives $d_o = 1.576$ in. Now, using the new value of 1.576 in. for the outer diameter, the new values of h_o and h_{ot} are 0.680 Btu/h·ft²·°F and 1.437 Btu/h·ft²·°F, respectively. The updated value of d_o is 1.857 in. Repeating the process several times results in a final value of $d_o = 1.733$ in. Thus, an outer diameter of 1.7874 in. (corresponding to an insulation radial thickness of 0.5 in.) keeps the outer surface temperature at 75.4°F, higher than the dew point. [Another method is to use Equation (42) to solve for t_o for values of d_o corresponding to available insulation thicknesses and using the insulation thickness that keeps t_o above the dew-point temperature.]

p. 9.19, 1st col. For Eq. (71), remove the minus sign before " $(t_{sk} - 93.2)$." In the following definitions, add that t_{bset} should be

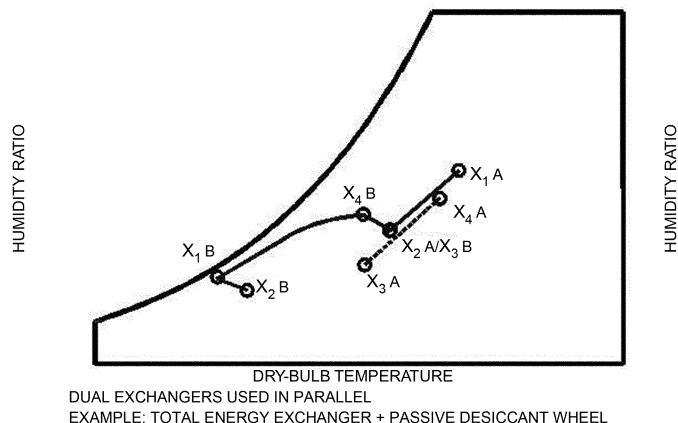
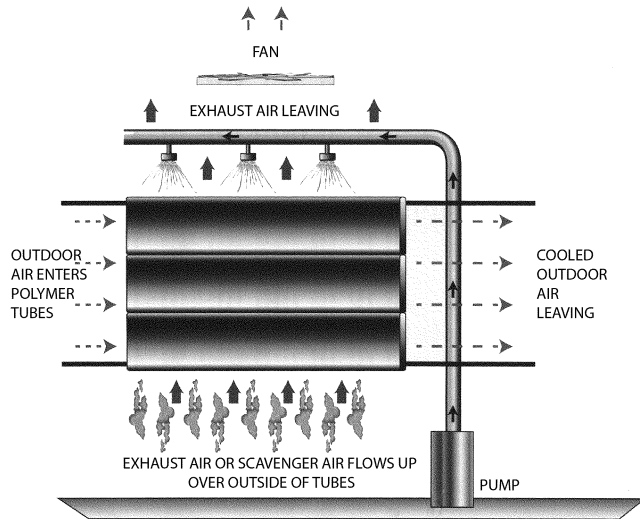


Table 8 Enhanced Model Stack and Wind Coefficients

(2013 Fundamentals, Ch. 16, p. 24)

	One-Story		Two-Story		Three-Story	
	No Flue	With Flue	No Flue	With Flue	No Flue	With Flue
C_s	0.000891	0.001144	0.001308	0.001478	0.001641	0.001791
C_w for basement slab	0.001313	0.001194	0.001432	0.001313	0.001432	0.001402
C_w for crawlspace	0.001074	0.001074	0.001194	0.001194	0.001271	0.001295

**Fig. 3 Indirect Evaporative Cooling (IEC) Heat Exchanger**

(Courtesy Munters/Des Champs)
 (2012 HVAC Systems and Equipment, Ch. 41, p. 3.
 Replaces only parts B and C of Fig. 3.)

97.68°F. In Eq. (72), change the minus in the denominator to a plus.

Ch. 14, climate data table for Esbjerg, Denmark. Please use the 2009 data for this location.

p. 15.17, Eq. (13). The equals sign belongs after “SHGC(θ).”

p. 15.29, Example 6, Solution. The first equation should read $q_s = q_b + q_d$.

p. 15.32, Eq. (40). Change “ $\min(1, 0.02 \times \Omega)$ ” to “ $\min(1.2\Omega, 60)/60$.” Add Barnaby et al. (2009) to the list of sources cited below.

p. 16.24, Table 8. The corrected table appears above.

p. 16.24, Example 5. The house’s flow coefficient c should be 4370 cfm/(in. of water)ⁿ. In the Solution, C_s should be 0.001478 [(in. of water)/°F]ⁿ and C_w should be 0.001313 [(in. of water)/mph]ⁿ. Consequently, the second and third equations should be as follows:

$$Q_s = 4370(0.001478)[68 - (-2)]^{0.67} = 110 \text{ cfm}$$

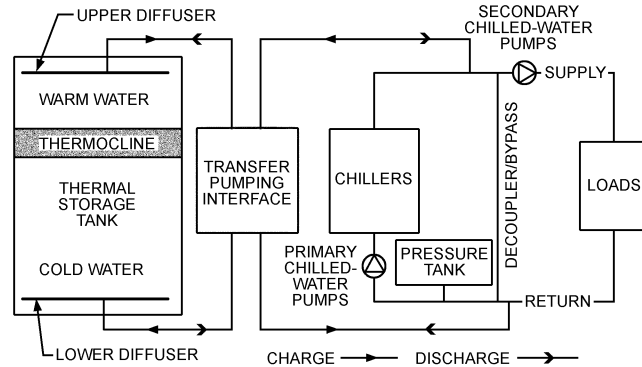
$$Q_w = 4370(0.001313)(0.64 \times 8.9)^{1.34} = 59 \text{ cfm}$$

Q is thus 125 cfm = 7490 ft³/h, and the final equation should be

$$I = (7490 \text{ ft}^3/\text{h})/(12,000 \text{ ft}^3) = 0.62 \text{ ach}$$

pp. 16.24–25, Example 6. The house’s flow coefficient c should be 6890 cfm/(in. of water)ⁿ. In the Solution, C_s should be 0.00893 [(in. of water)/°F]ⁿ and C_w should be 0.001074 [(in. of water)/mph]ⁿ. Consequently, the second and third equations should be as follows:

$$Q_s = 6890(0.00893)(29)^{0.6} = 46 \text{ cfm}$$

**Fig. 25 Typical Sensible Storage Connection Scheme**

(2012 HVAC Systems and Equipment, Ch. 51, p. 24)

$$Q_w = 6890(0.001074)(0.50 \times 2.9)^{1.34} = 12 \text{ cfm}$$

Q is thus 48 cfm = 2880 ft³/h, and the final equation should be

$$I = (2880 \text{ ft}^3/\text{h})/(9000 \text{ ft}^3) = 0.32 \text{ ach}$$

p. 16.25, Example 7. The house’s flow coefficient c should be 8740 cfm/(in. of water)ⁿ. In the Solution, C_s should be 0.001791 [(in. of water)/°F]ⁿ and C_w should be 0.001295 [(in. of water)/mph]ⁿ. Consequently, the second and third equations should be as follows:

$$Q_s = 8740(0.001791)(9)^{0.67} = 68 \text{ cfm}$$

$$Q_w = 8740(0.001295)(0.43 \times 6.7)^{1.34} = 47 \text{ cfm}$$

Q is thus 83 cfm = 4960 ft³/h, and the final equation should be

$$I = (4960 \text{ ft}^3/\text{h})/(14,200 \text{ ft}^3) = 0.35 \text{ ach}$$

p. 17.12–13, Fig. 1. The corrected figure is shown on p. A.3.

p. 18.35, 2nd col. Just above the Plenums in Load Calculations heading, the citation for the *UFAD Design Guide* should be ASHRAE (2013).

p. 18.41, 1st col. In equation for q_{15} , the last term on the first line should be $c_{23}q_{i,16}$.

p. 18.49, References. Delete the Bauman and Daly 2013 source, and replace it with the following:

ASHRAE. 2013. *Underfloor air distribution (UFAD) design guide*, 2nd ed.

p. 20.1, 1st col. Immediately after the bulleted list, change the paragraph as follows: “As shown in Figure 1, local temperature concentration has a similar profile, although its rate usually differs. Carbon dioxide (CO₂) follows a similar pattern.”

pp. 21.7–8. Renumber Figure 10 (Diffuser Installation Suggestions) as Figure 9, and Figure 9 (Friction Chart) as Figure 10.

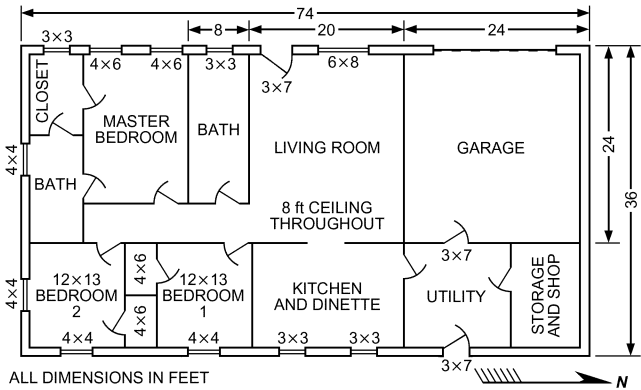


Fig. 1 Example House
(2013 Fundamentals, Ch. 17, p. 12)

- p. 21.21, 2nd col., 3rd para. from bottom.** The reference to Figure 16 should be to Figure 21, and the reference to Figure 10 should be to Figure 9.
- p. 21.22, step 9c.** The correct section in ASHRAE *Standard* 90.1 is 6.5.3.1.
- p. 22.2, 2nd col.** Change “(Table 8 and Figure 7)” to “(Tables 6 and 10).”
- p. 23.18, definitions for Eq. (8).** The symbol for outer radius should be r_2 ; for inner radius, it should be r_1 .

2014 Refrigeration

- p. 12.31, Fig. 68.** The source for this graphic should be Seeton et al. 2000.
- p. 24.6, definitions for Eq. (16).** In the definition for q_s/A , the reference should be to Figure 9.