ASHRAE HANDBOOK

Additions and Corrections

This report includes additional information, and technical errors found between June 15, 2012, and April 1, 2015, in the SI 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. 6.6, Table 1. Units for r_s should be (m·K)/W.

pp. 7.26-27, Figs. 36 and 38. The SI versions of these figures are provided below and at right.

p. 19.2, Table 1. For the rightmost four columns, the headings should be +1500, –1500, +2500, and –2500 Pa.

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

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

p. 26.4, 1st col., top. Units for the results for w_2 and w_4 should be kg/kg of dry air.

p. 40.19, Table 1. In fifth column, change value in row 6 to 0.0345, and in row 7 to 0.0334.

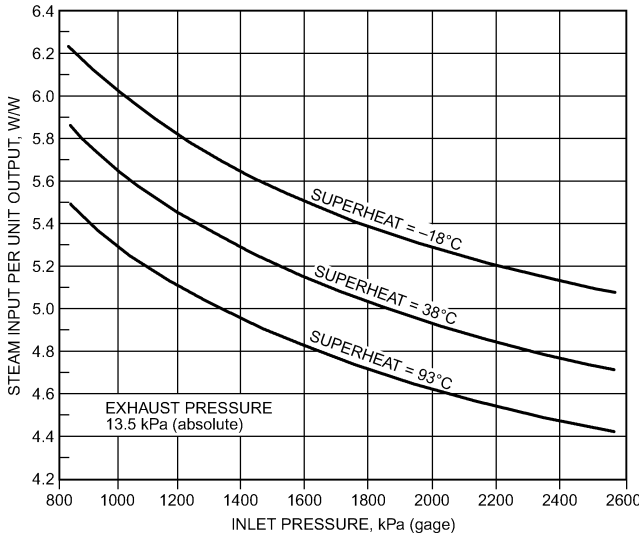

Fig. 36 Effect of Inlet Pressure and Superheat on Condensing Turbine
(2012 HVAC Systems and Equipment, Ch. 7, p. 26)

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 pressure, change the minuses to equals signs.

p. 51.8. In the first column, change "44 153 kWh" to "44 513 kWh" in two places: the first line, and in the paragraph before Eq. (4). In the second column, second paragraph, equation for TES tank volume, change "44 153" to "44 513" and add "× 0.9" after "998 kg/m^3." The result remains 4738 m^3.

p. 51.13, Table 4. For hour 6, Storage should be 1400 kW.

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.

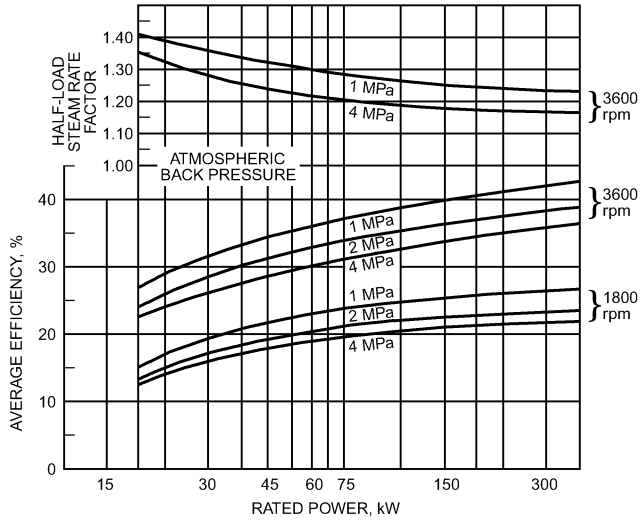

Fig. 38 Single-Stage Noncondensing Turbine Efficiency
(2012 HVAC Systems and Equipment, Ch. 7, p. 27)

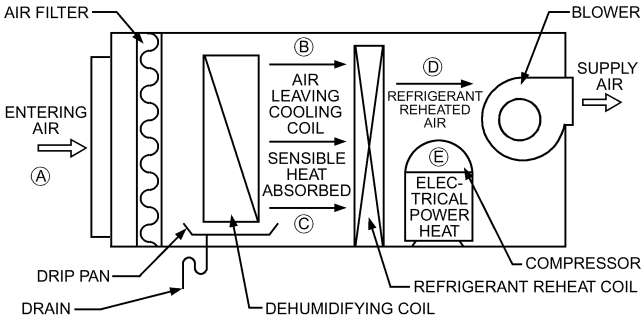

Fig. 1 Dehumidification Process Points
(2012 HVAC Systems and Equipment, Ch. 25, p. 1)

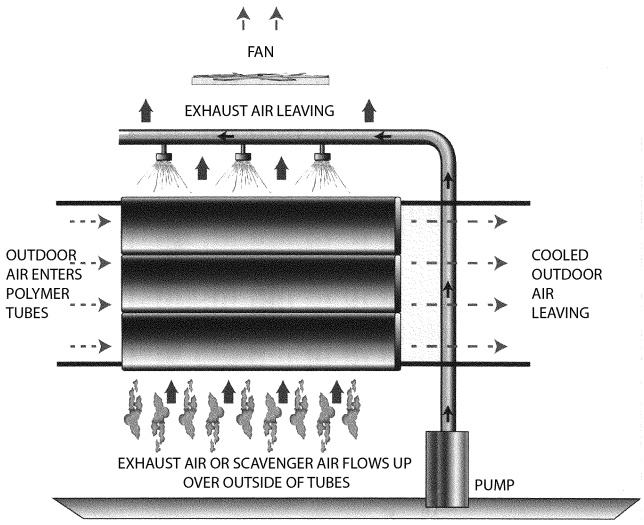

Fig. 3 Indirect Evaporative Cooling (IEC) Heat Exchanger
(Courtesy Munters/Des Champs)
(2012 HVAC Systems and Equipment, Ch. 41, p. 3. Replaces only parts B and C of Fig. 3.)

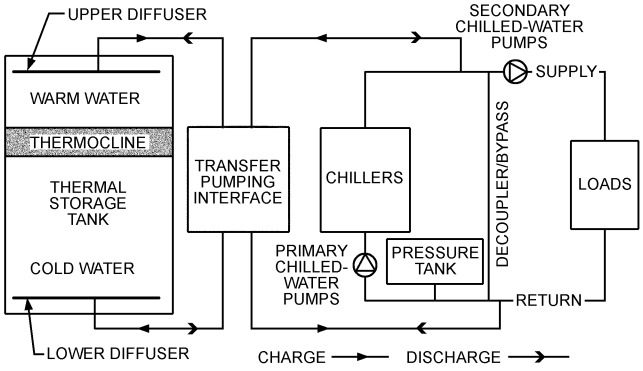

Fig. 25 Typical Sensible Storage Connection Scheme
(2012 HVAC Systems and Equipment, Ch. 51, p. 24)

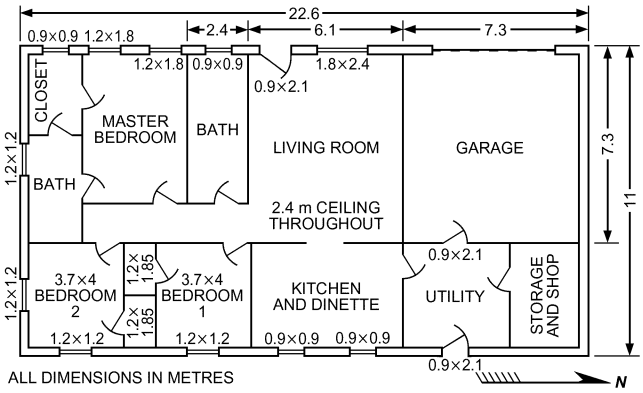

Fig. 1 Example House
(2013 Fundamentals, Ch. 17, p. 12)

2013 Fundamentals

p. 1.9, 2nd col. Above Eq. (38), change "$t_d(p, w)$" to "$t_d(p, W)$."

p. 1.10, 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). For c_{pw}, units should be J/(kg·K). Delete f_s and its value. Nu_d should be 248.3, and h_i should be 7087 W/(m^2·K). Compute h_o using Eq. (T9.10a). Change Ra to 74 574, Nu to 7.223, h_o to 3.65 W/(m^2·K), and the equation for h_{ot} to 3.65 + 4.3 = 7.95 W/(m^2·K). 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 = 0.040 03 m. Now, using the new value of 0.040 03 m for the outer diameter, the new values of h_o and h_{ot} are 3.86 W/(m^2·K) and 8.20 W/(m^2·K), respectively. The updated value of d_o is 0.044 03 m. Repeating the process several times results in a final value of d_o = 0.047 17 m. Thus, an outer diameter of 0.045 m (corresponding to an insulation radial thickness of 12.5 mm) keeps the outer surface temperature at 24.1°C, 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} – 34)." In the following definitions, add that t_{bset} should be 36.49°C. In Eq. (72), change the minus in the denominator to a plus. In the paragraph below Eq. (74), ρ_{bl} should be 1 kg/L.

p. 9.23, after Eq. (83). WCI should be multiplied by 1.163 to get W/m^2.

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

p. 14.3, Table 1A. Change "Hours 8/4 & 55/69" to "Hours 8/4 & 12.8/20.6."

p. 15.10, Example 1. Replace "m/s" with "km/h" (in six places).

p. 15.11, 2nd col. At the end of Example 3, change "R-20" to "R-3.5."

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 × Ω)" to "min(1.2Ω, 60)/60." Add Barnaby et al. (2009) to the list of sources cited below.

p. 16.11, definitions for Eq. (35). The unit for q_l should be watts.

p. 16.25, 1st col., bottom. The equation at the bottom of the column should be numbered (51), and all later numbered equations should increase by one. Text references to equations remain the same.

p. 17.12-13, Fig. 1 and Table 19. The corrected figure is shown above. In Table 19, floor area should be 195.3 m^2.

pp. 18.24-26, Tables 16 and 17. In the Layer ID row, the reference should be to Table 18.

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. 18.42, Table 29B. Under Heat Gain, Convective should be 54%, and Radiant should be 46%.

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 (CO_2) follows a similar pattern."

p. 21.20, 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.

p. 27.2, 2nd col. Data for elements 2 and 5 and the total should be as follows:

Element		R, (m²·K)/W
2. 100 mm concrete, 1920 kg/m³, k = 1.1		0.09
5. 10 mm built-up roof membrane		0.06
	Total	5.83

p. 27.3, 2nd col. For element 1, wind speed should be 6.7 m/s.

p. 27.4, 1st col., Example 3. In the elements table, wind speed for element 1 should be 6.7 m/s. After the equation for $U_{Assembly}$, change "300 mm" to "600 mm."

p. 27.4, 1st col., Example 4. On fourth line, face shell thickness should be 32 mm. In the Solution, wind speed for R_o should be 6.7 m/s.

p. 27.4, 1st col., 2nd full para. The steel member should be 90 mm deep.

2014 Refrigeration

p. 12.14, Fig. 13. Change "polyoxypropylene" to "polyalkylene."

p. 24.1, 1st paragraph under Eq. (2). Change 1.6 to 9.1, and 6 to 34.

p. 24.6, definitions for Eq. (16). In the definition for q_s/A, the reference should be to Figure 9.