

# Additions and Corrections

This report includes additional information and technical errors found between June 15, 2000, and July 31, 2003, in the SI edition of the 2000, 2001, and 2002 *ASHRAE Handbooks*. 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](http://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](mailto:mowen@ashrae.org).

## 2000 HVAC Systems and Equipment

**p. 1.3, 2nd column.** In the Space requirements paragraph the first sentence should read:

“A decentralized system may or may not have an equipment room.”

**p. 7.3, 2nd column, 3rd full paragraph, 5th line down.** Number should be:

$$4090 \text{ kJ/kWh} (3.133 \text{ kJ/kJ}) (1.136)$$

two lines lower:

$$11\,640 \text{ kJ/kWh} (3.233)$$

$$2490 \text{ kJ/kWh} (0.692)$$

**p. 7.11, 2nd column, 4th paragraph.** Change last sentence to read:

“The exhaust of a gas turbine has about 1.5 to 3 kW of available heat per kilowatt of power output.”

**p. 7.11, 2nd column, 5th paragraph.** Change “40 MJ” to read “12 kW.”

**p. 7.20, 2nd column, 3rd full paragraph.** Change “1.4 to 4 MJ per kilowatt” to read “0.3 to 0.9 kW steam per kilowatt.”

**p. 7.20, 2nd column, 4th paragraph.** Change “5.5 to 15 MJ/kW per kilowatt” to read “1 to 3 kW steam per kilowatt.”

**p. 7.20, 2nd column, 5th paragraph.** Change “11 to 55 MJ/kW” to read “2.3 to 11.4 kW.”

**p. 7.28, 1st column, 3rd paragraph.** Change “600V” to “600 V.”

**p. 7.28, 1st column, 3rd paragraph.** Change “5 Hz” to read “5 cycles.”

**p. 7.33, 1st column, last paragraph.** Change “32 kg/h” to read “3200 kg,” and change “3.2 kg/h” to read “3.2 kg.”

**p. 7.33, 1st column, last paragraph.** Change “Thus, the total energy requirement...” to read “Thus, the total power requirement...”

**p. 7.33, 2nd column, 1st full paragraph.** Change “energy” to read “power.”

**p. 7.33, 2nd column, last sentence in Example 1.** Change “energy” to read “power.”

**p. 7.44, 2nd column, last full paragraph.** Change “0.012” to “0.04” and “0.024” to “0.07.” Change “\$/MJ” to “\$/10<sup>3</sup> MJ.”

**p. 9.4, 2nd column, 1st full paragraph.** Delete “by more than 25% of the sensible load.”

**p. 11.27, Fig. 22.** Replace Fig. 22 with the following figure, in which the primary and secondary systems are not shown to be connected.

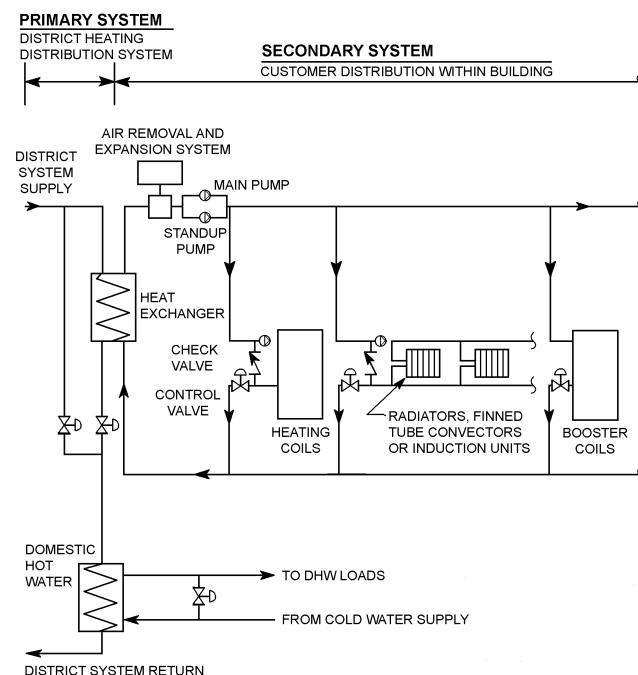


Fig. 22 Basic Heating System Schematic

**p. 11.30, 2nd column, 1st bulleted paragraph.** Change “thermal capacity” to read “thermal power.”

**p. 12.2, 2nd column, Eq. (7).** Add to definitions:

$$1000 = \text{constant to change kJ in } c_p \text{ to J}$$

**p. 15.6, 1st column, 4th line.** Change “12000 K” to “1200 K.”

**p. 18.7, 2nd column, Fig. 13.** Should read:

“Curve shows performance of a fixed fan size running at a fixed speed.”

**p. 20.2, 1st column, last paragraph.** Delete second sentence.

**p. 24.11, Table 3.** The second column heading should read “Dust Spot Efficiency.”

**p. 25.22, 2nd column, Eq. (11).** Change “g·mol/s” to read “mol/s.”

**p. 25.22, 2nd column, Eq. (13).** Change “m<sup>3</sup>/g·mol” to read “m<sup>3</sup>/mol.”

**p. 25.23, 2nd column, Figures 33 and 34.** Change “g·mol” to read “mol” in the equation between 85-90% on the lower right.



**p. 25.24, 1st column, Table 10.** Change “g·mol” to read “mol” in the third column heading.

**p. 25.26, 2nd column, 1st full paragraph.** Change “140 J/g·mol” to read “140 J/mol.”

**p. 26.9, Fuel Oil Preparation System section, 3rd paragraph.** Change “156 m<sup>2</sup>/s” to “156 mm<sup>2</sup>/s.”

**p. 32.3, 2nd column.** In the definition for  $n$ , replace the last two definitions with “1.0 for ceiling heating and floor cooling panels, and 1.1 for floor heating and ceiling cooling panels.”

**p. 37.1, 1st column, last paragraph, 2nd to last sentence.** Delete “the volume of the.”

**p. 41.11, 1st column.** In the section on L Bends, change references from Equation (4) to Equation (5). Change references from Equation (5) to Equation (6). Change the reference from Equation (6) to Equation (7).

**p. 42.14, 2nd column, last reference.** The year should be 1998 and the edition should be 3rd.

**p. 44.4, Eqs. (3) and (4).** The equations should read as follows:

$$x_2 = x_1 + \varepsilon \left( \frac{w_{min}}{w_s} \right) (x_3 - x_1) \quad (3)$$

$$x_4 = x_3 - \varepsilon \left( \frac{w_{min}}{w_e} \right) (x_3 - x_1) \quad (4)$$

## 2001 Fundamentals

**p. 1.8, Example 2, Solution (1), 5th line.** Change “Chapter 20” to read “Chapter 19 of the 1997 ASHRAE Handbook—Fundamentals.”

**p. 1.11, Example 4, Solution, 2nd line.** Change “Chapter 20” to read “Chapter 19 of the 1997 ASHRAE Handbook—Fundamentals.”

**p. 1.14, Fig. 16.** Change “Heat Amplifier” to read “Temperature Amplifier.”

**p. 2.1, 2nd column, last equation.** The kinematic viscosity of dry air ( $\nu_{air}$ ) should be

$$16 \times 10^{-6} \text{ m}^2/\text{s}$$

**p. 2.10, Table 2.** The units for  $\varepsilon$  should be  $\mu\text{m}$ , not feet.

**Table 2 Effective Roughness of Conduit Surfaces**

Material	$\varepsilon$ , $\mu\text{m}$
Commercially smooth brass, lead, copper, or plastic pipe	1.52
Steel and wrought iron	46
Galvanized iron or steel	152
Cast iron	259

**p. 3.24, Symbols.** Delete “mechanical equivalent of heat; or” from the definition for  $J$ .

**p. 8.21, 2nd column, Wind Chill Index section.** Replace Equation (80) with the following equation, and delete the text “and WCI units are kcal/(h·m<sup>2</sup>). Multiply WCI by 1.162 to convert to SI units of W/m<sup>2</sup>.”

$$\text{WCI} = \frac{(10.45 + 10\sqrt{V} - V)(33 - t_z)}{1.162} \text{ in W/m}^2 \quad (80)$$

**p. 8.27, 1st column.** For SKBF, replace “lb/h·ft<sup>2</sup>” with “g/(m<sup>2</sup>·s).” For WCI, replace “kcal/(h·m<sup>2</sup>)” with “W/m<sup>2</sup>.”

**p. 9.13, Table 6.** Replace Table 6 with the following table:

**Table 6 Approximate Surface Temperature Limits to Avoid Pain and Injury**

Material	Contact Time				
	1 s	10 s	1 min	10 min	8 h
Metal, water	65°C	56°C	51°C	48°C	43°C
Glass, concrete	80°C	66°C	54°C	48°C	43°C
Wood	120°C	88°C	60°C	48°C	43°C

**p. 10.5, 1st column, 3rd paragraph.** Replace the “ppm (mg/kg)” with “mg/kg” throughout [e.g., “25 ppm (18 mg/kg)” should be “25 mg/kg”].

**p. 17.3, 1st column, 9th line.** Change “970 MJ/m<sup>2</sup>·yr” to read “580 MJ/m<sup>2</sup>·yr.”

**p. 23.2, Thermal Insulation section, 1st sentence.** Delete “transfer” from “radiative transfer modes” and add “transfer” after “heat.”

**p. 25.5, Table 4.** The conductivity for waferboard should be 0.091.

**p. 25.24, 1st column, after 3rd entry.** Add the following reference:

Lotz, W.A. 1964. Vapor barrier design, neglected key to freezer insulation effectiveness. *Quick Frozen Foods* (November):122.

**p. 26.8, Fig. 6A.** The label  $P_{outside}$  should indicate the more diagonal line.

**p. 26.18, 2nd column, Particulates section.** Change “3 mm” to “3  $\mu\text{m}$ .”

**p. 26.28, Symbols.** Change the definition for  $g$  to read “gravitational constant,” and add “ $G$  = wind speed multiplier (Table 10).”

**p. 26.30, References.** Add the following source below Klauss et al.:

Klote, J.H. and J.A. Milke. 1992. *Design of smoke management systems*. ASHRAE.

**p. 27.1.** The second paragraph under the Climatic Design Conditions should read, “Information on station location, period analyzed, heating design conditions, mean annual extreme, and standard deviation of minimum and maximum dry-bulb temperature are listed in Tables 1A, 2A, and 3A. Information on the design conditions for cooling and humidity control, along with the mean daily temperature range for the warmest month, is provided in Tables 1B, 2B, and 3B.”

**p. 28.7, Table 12.** The first row should refer to Chapter 25, Tables 1, 2, and 4.

**p. 29.14, Eq. (13).** Should read:

$$q_b = AE_D \text{ SHGC}(\theta) \text{ IAC} \quad (13)$$

**pp. 29.28-29, Table 20.** Replace the table with one shown on pages 6 and 7.

**p. 29.37, Table 29.** Change the units for Conditional Heat Gain and Total Diffusion and Conduction from “Btu/h” to “W.”

**p. 30.14, 1st column.** Change “2130 W/(m<sup>2</sup>·K)” to “2130 W/(m<sup>2</sup>· $\mu\text{m}$ ).”

**p. 30.21, 1st column, ASHRAE “Standard” Glass section.** Change “eighth-inch” to “3.2 mm”

**p. 30.33, Table 13.** In the footnote, change the reference for ID numbers from “Table 5” to “Table 4.”

**p. 30.38, 2nd column, 2nd paragraph.** The reference to Tables 16 through 22 should be to Tables 15 through 22.

**p. 31.20, Eq. (52).** Replace the superscripted  $\theta$  with  $\phi$  in two places.

**p. 31.22, Example 4.** The reference should be to Table 7, not Table 8.



**p. 31.30, 2nd column, last paragraph.** The reference to Table 10 should be to Table 9.

**p. 33.1, Eq. (1).** In the third term on the right side, replace  $v$  with  $v$ .

**p. 33.1, Eq. (2).** In the first term on the right side, replace  $X$  with  $Y$ .

**p. 33.1, Example.** At the end of the 1st paragraph, add, “Note: For this example, buoyancy and pressure are not considered.”

**p. 33.2, Eq. (13).** In the denominators,  $v_{i,j}$  should be  $v_{t,i,j}$ . The correct equation is presented here for clarity:

$$\omega_{i,j} = \frac{\left(1 - \frac{\Delta x u_{i+1,j}}{2v_{t,i,j}} + \frac{\Delta x^2 u_{i+1,j}^2}{8v_{t,i,j}^2}\right) \omega_{i+1,j} + \left(1 + \frac{\Delta x u_{i-1,j}}{2v_{t,i,j}} + \frac{\Delta x^2 u_{i-1,j}^2}{8v_{t,i,j}^2}\right) \omega_{i-1,j} + \dots + \left(1 - \frac{\Delta x v_{i,j+1}}{2v_{t,i,j}} + \frac{\Delta x^2 v_{i,j+1}^2}{8v_{t,i,j}^2}\right) \omega_{i,j+1} + \left(1 + \frac{\Delta x v_{i,j-1}}{2v_{t,i,j}} + \frac{\Delta x^2 v_{i,j-1}^2}{8v_{t,i,j}^2}\right) \omega_{i,j-1}}{\left(4 + \frac{\Delta x^2 (u_{i,j}^2 + v_{i,j}^2)}{4v_{t,i,j}^2}\right)}$$

**p. 33.4, Symbols.** Replace  $P$  with  $p$ . Correct the units for the following symbols:

$c = \text{kJ}/(\text{kg}\cdot\text{K})$	$k = \text{W}/(\text{m}\cdot\text{K})$	$K = \text{m}^2/\text{s}^2$
$L = \text{m}$	$P = \text{Pa}$	$s = \text{m}$
$T = \text{K}$	$u, u_\tau, v, V, V' = \text{m/s}$	$x, \delta x, y = \text{m}$

Add the following definitions to the list of symbols:

$g$  = acceleration of gravity  
 $X = \rho g_x = 0$ , body force (buoyancy) horizontal component  
 $Y = \rho g_y$ , body force (buoyancy) vertical component

**p. 34.5, 2nd column, Example 5.** Delete “(–2.7 mm of water).”

**p. 34.9, Fig. 9.** Replace I-P value chart with SI value chart (page A.5).

**p. 34.17, 2nd column, 1st paragraph.** AMCA *Standard 500-L* should be AMCA *Standard 500*.

**p. 34.23, Example 9, 2nd paragraph, 2nd line.** Change “Figure 13 in Chapter 16” to read “Figure 2 in Chapter 43 of the 1999 ASHRAE Handbook—HVAC Applications.” Figure 2 is presented at right for convenience.

**p. 34.57, table for CR-6 Screen (Only).** In the cell for  $n = 0.65$  and  $A_1/A_o = 1.2$ , replace “0.36” with “0.52.”

**p. 35.7, Example 6.** The solution for  $\Delta h$  should be “0.126 m loss.”

**p. 35.8, 1st column, 3rd full paragraph.** Delete “in gallons per minute.”

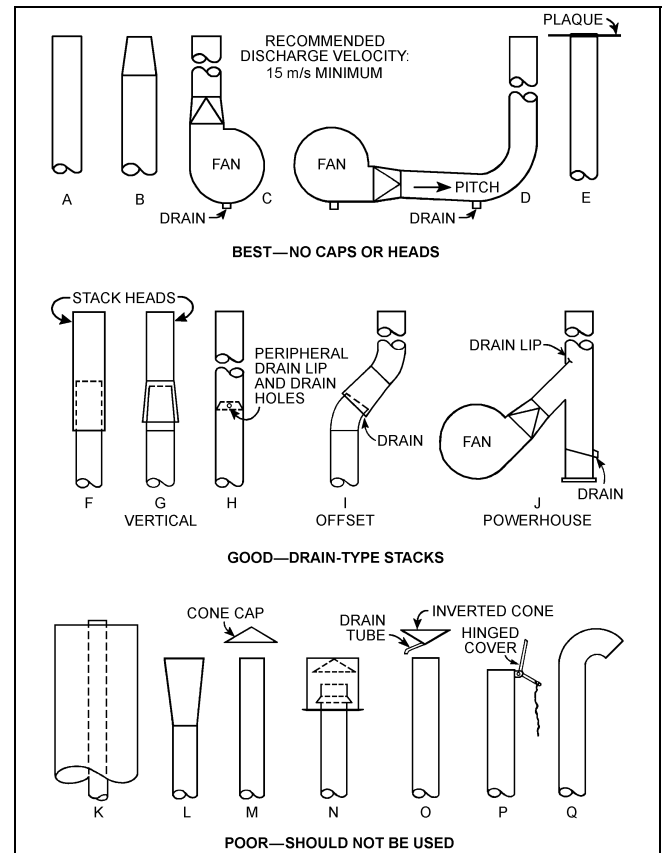
**p. 35.9, Fig. 9.** Add “(12.7 mm)” after “1/2 in.” throughout.

**p. 35.12, Fig. 10.** Replace “0 to 200 psig” with “101 to 1500 kPa.”

**p. 35.17, 1st column, last paragraph.** Add the following sentence to the end of the paragraph:

“Typical pressures in the return line are given in Table 23.”

**p. 35.17, 1st column, Eq. (17).** Relocate Equation (17) to 2nd column, following the 4th paragraph, preceding “where.”



**Fig. 2 Stack Designs Providing Vertical Discharge and Rain Protection**

(ref. in 2001 Fundamentals, Chapter 34, p. 23)

**p. 35.17, 2nd column.** In the second paragraph, replace “specific gravity” with “density.” In the third paragraph, delete “Btu.” In the fourth paragraph replace “specific gravity of 0.60” with “gas density of 0.735 kg/m<sup>3</sup>.”

**p. 36.1, 2nd column, Letter Symbols section.** Replace “ft for foot” with “m for metre.”

**p. 36.11, 1st column.** Change “1/2 in.” to “13 mm,” and “3/4 in.” to “20 mm.”

**p. 37.1.** The conversion values for Btu/lb·°F should be as follows (asterisks indicate that the conversion factor is exact):

Multiply	By	To Obtain
Btu/lb·°F (specific heat, $c_p$ )		
(International Table)	*4.1868	kJ/(kg·K)
(thermochemical)	*4.184	kJ/(kg·K)

**p. 38.4.** Under Specific Heat, the reference should be to Table 4 in Chapter 25.

**p. I.28, Index.** The page numbers for the **Louvers**, **sizing** entry should be 34.17-18.

## 2002 Refrigeration

**p. 2.2, Figures 1 and 2.** In the captions, replace “ton of refrigeration” with “kilowatt of refrigeration.”



**p. 2.10, 2nd column.** In the first sentence under Refrigerant Line Capacity Tables, replace “tons of refrigeration” with “kilowatts of refrigeration.”

**p. 2.16, Example 2.** In the Solution, the reference to Table 10 should be to Table 16.

**p. 8.8, Eq. (18).** The equation should read as follows:

$$H = (t - t_r) \left( 1.55 + 1.26x_s - \frac{(x_{wa} - x_b)L_o t_f}{t_r t} \right)$$

**p. 8.9, 2nd column, 3rd equation.** Delete the 3 directly to the right of the equals sign.

**p. 12.1, 1st column, 5th line from bottom.** Change “15 mph” to “25 km/h.”

**p. 12.1, 2nd column.** In the first full paragraph, change “These values decrease” to “These values increase.”

**p. 12.7, Infiltration Load values.** Delete “°C” from the definitions for  $h_f$ ,  $h_r$ , and  $\rho_r$ ; for  $\rho_i$ , the entire definition should read only “density incoming air, kg/m<sup>3</sup>.”

**p. 16.10, 2nd column.** The next to the last sentence under Fresh Pork Holding should read, “Care must be taken to maintain the ratio of kilograms of CO<sub>2</sub> to kilograms of meat for the retention period.”

**p. 22.7, Airflow Requirements.** The units for  $c_p$  should be J/(kg·K), and the symbol for mass flow rate of air should be  $\dot{m}$ .

**p. 25.2, 16th line.** Change “metre” to “cubic metre.”

**p. 30.2, Controls.** Change “several hundred feet” to “hundreds of metres.”

**p. 31.3, 2nd column, 4th line.** The text in parentheses should read “(i.e., a total area of 3.0 m<sup>2</sup> and a capacity of 0.33 m<sup>3</sup>).”

**p. 34.3, Example 2 values.** Change the unit for Ceiling radiating area from “mm<sup>2</sup>” to “m<sup>2</sup>.”

**p. 38.21, Figure 30.** Along the  $x$  axis, change “10<sup>0</sup>” to “10<sup>2</sup>.”

**p. I.30, Index.** Add the following index entry after **Load coefficients**:

Louvers, F30.45  
sizing, F34.17-18

## 2003 HVAC Applications

**p. 1.4, Evaporative Cooling.** The reference to Chapter 50 should be to Chapter 51.

**p. 16.13, Temperature and Humidity, 3rd paragraph.** If full-coverage smocks are not used, temperature set points can be higher, not lower.

**p. 31.5, Type II Hoods, Condensate hood list item.** The second and third sentences for this item should read, “The hood is designed to direct the condensate toward a perimeter gutter for collection and drainage, allowing none to drip onto the appliance below. Flow rates are typically based on 255 to 380 L/s per square metre of hood opening.”

**p. 36.3, Table 3.** Add the following footnote:

3. For updated information on heat pump life, see Lovvorn and Hiller (2002).

**p. 36.13, References.** Add the following source after Lovvorn and Hiller (1985):

Lovvorn, N.C. and C.C. Hiller. 2002. Heat pump life revisited. *ASHRAE Transactions* 108(2):107-112.



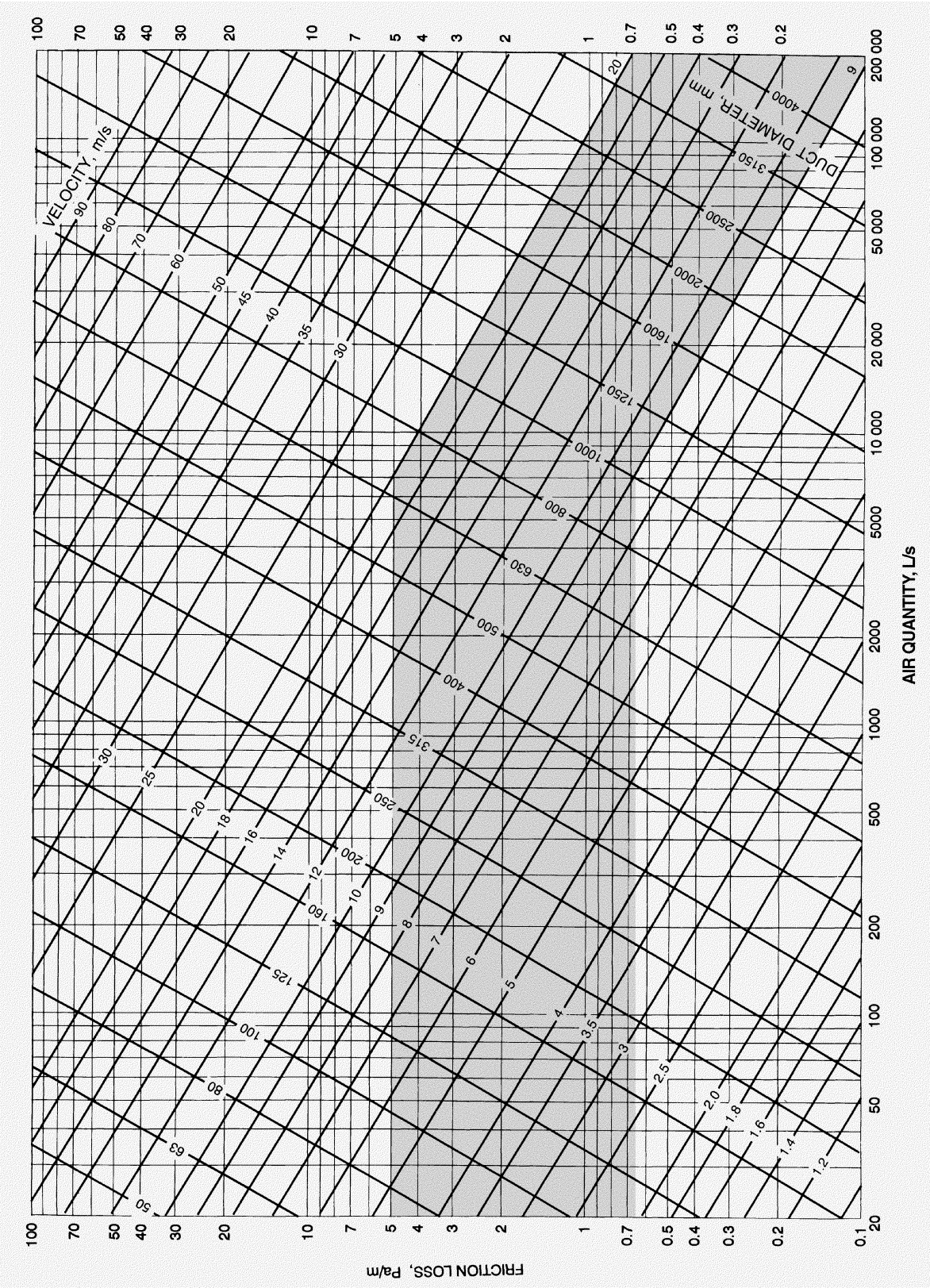


Fig. 9 Friction Chart for Round Duct ( $\rho = 1.20 \text{ kg/m}^3$  and  $\varepsilon = 0.09 \text{ mm}$ )



**Table 20 Wall Conduction Time Series (CTS)**  
(2001 Fundamentals, Chapter 29, page 28)

Wall Number =	CURTAIN WALLS			STUD WALLS				EIFS			BRICK WALLS									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
U-factor, W/(m <sup>2</sup> ·K)	0.428	0.429	0.428	0.419	0.417	0.406	0.413	0.668	0.305	0.524	0.571	0.377	0.283	0.581	0.348	0.628	0.702	0.514	0.581	0.389
Total R	2.3	2.3	2.3	2.4	2.4	2.5	2.4	1.5	3.3	1.9	1.7	2.7	3.5	1.7	2.9	1.6	1.4	1.9	1.7	2.6
Mass, kg/m <sup>2</sup>	31.0	20.9	80.0	25.5	84.6	25.6	66.7	36.6	38.3	130.9	214.1	214.7	215.8	290.6	304.0	371.7	391.5	469.3	892.2	665.1
Thermal Capacity, kJ/(m <sup>2</sup> ·K)	30.7	20.4	67.5	24.5	73.6	32.7	61.3	36.7	38.8	120.6	177.8	177.8	177.8	239.1	253.5	320.9	312.7	388.4	784.9	580.5
Hour	Conduction Time Factors, %																			
0	18	25	8	19	6	7	5	11	2	1	0	0	0	1	2	2	1	3	4	3
1	58	57	45	59	42	44	41	50	25	2	5	4	1	1	2	2	1	3	4	3
2	20	15	32	18	33	32	34	26	31	6	14	13	7	2	2	2	3	3	4	3
3	4	3	11	3	13	12	13	9	20	9	17	17	12	5	3	4	6	3	4	4
4	0	0	3	1	4	4	4	3	11	9	15	15	13	8	5	5	7	3	4	4
5	0	0	1	0	1	1	2	1	5	9	12	12	13	9	6	6	8	4	4	4
6	0	0	0	0	1	0	1	0	3	8	9	9	11	9	7	6	8	4	4	5
7	0	0	0	0	0	0	0	0	2	7	7	7	9	9	7	7	8	5	4	5
8	0	0	0	0	0	0	0	0	1	6	5	5	7	8	7	7	8	5	4	5
9	0	0	0	0	0	0	0	0	0	6	4	4	6	7	7	6	7	5	4	5
10	0	0	0	0	0	0	0	0	0	5	3	3	5	7	6	6	6	5	4	5
11	0	0	0	0	0	0	0	0	0	5	2	2	4	6	6	6	6	5	5	5
12	0	0	0	0	0	0	0	0	0	4	2	2	3	5	5	5	5	5	5	5
13	0	0	0	0	0	0	0	0	0	4	1	2	2	4	5	5	4	5	5	5
14	0	0	0	0	0	0	0	0	0	3	1	2	2	4	5	5	4	5	5	5
15	0	0	0	0	0	0	0	0	0	3	1	1	1	3	4	4	3	5	4	4
16	0	0	0	0	0	0	0	0	0	3	1	1	1	3	4	4	3	5	4	4
17	0	0	0	0	0	0	0	0	0	2	1	1	1	2	3	4	3	4	4	4
18	0	0	0	0	0	0	0	0	0	2	0	0	1	2	3	3	2	4	4	4
19	0	0	0	0	0	0	0	0	0	2	0	0	1	2	3	3	2	4	4	4
20	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	3	2	4	4	4
21	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	2	1	4	4	4
22	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	2	1	4	4	3
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3	4	3
Total Percentage	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Layer ID from outside to inside (see Table 22)	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01
	F09	F08	F10	F08	F10	F11	F07	F06	F06	F06	M01	M01	M01	M01	M01	M01	M01	M01	M01	M01
	F04	F04	F04	G03	G03	G02	G03	I01	I01	I01	F04	F04	F04	F04	F04	F04	F04	F04	F04	F04
	I02	I02	I02	I04	I04	I04	I04	G03	G03	G03	I01	G03	I01	I01	M03	I01	I01	I01	I01	M15
	F04	F04	F04	G01	G01	G04	G01	F04	I04	M03	G03	I04	G03	M03	I04	M05	M01	M13	M16	I04
	G01	G01	G01	F02	F02	F02	F02	G01	G01	F04	F04	G01	I04	F02	G01	G01	F02	F04	F04	G01
	F02	F02	F02	0	0	0	0	F02	F02	G01	G01	F02	G01	0	F02	F02	0	G01	G01	F02
	0	0	0	0	0	0	0	0	0	F02	F02	0	F02	0	0	0	0	F02	F02	0

## Wall Number Descriptions

- |   |  |
|---|--|
| 1. Spandrel glass, insulation board, gyp board                          | 11. Brick, insulation board, sheathing, gyp board                  |
| 2. Metal wall panel, insulation board, gyp board                        | 12. Brick, sheathing, batt insulation, gyp board                   |
| 3. 25 mm stone, insulation board, gyp board                             | 13. Brick, insulation board, sheathing, batt insulation, gyp board |
| 4. Metal wall panel, sheathing, batt insulation, gyp board              | 14. Brick, insulation board, 200 mm LW CMU                         |
| 5. 25 mm stone, sheathing, batt insulation, gyp board                   | 15. Brick, 200 mm LW CMU, batt insulation, gyp board               |
| 6. Wood siding, sheathing, batt insulation, 13 mm wood                  | 16. Brick, insulation board, 200 mm HW CMU, gyp board              |
| 7. 25 mm stucco, sheathing, batt insulation, gyp board                  | 17. Brick, insulation board, brick                                 |
| 8. EIFS finish, insulation board, sheathing, gyp board                  | 18. Brick, insulation board, 200 mm LW concrete, gyp board         |
| 9. EIFS finish, insulation board, sheathing, batt insulation, gyp board | 19. Brick, insulation board, 300 mm HW concrete, gyp board         |
| 10. EIFS finish, insulation board, sheathing, 200 mm LW CMU, gyp board  | 20. Brick, 200 mm HW concrete, batt insulation, gyp board          |



**Table 20 Wall Conduction Time Series (CTS) (Concluded)**  
(2001 Fundamentals, Chapter 29, page 29)

Wall Number =	CONCRETE BLOCK WALL						PRECAST AND CAST-IN-PLACE CONCRETE WALLS									
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
U-factor, W/(m <sup>2</sup> ·K)	0.383	0.335	0.414	1.056	0.834	0.689	0.673	0.418	0.434	0.650	0.387	0.467	0.434	0.266	3.122	
Total R	2.6	3.0	2.4	0.9	1.2	1.5	1.5	2.4	2.3	1.5	2.6	2.1	2.3	3.8	0.3	
Mass, kg/m <sup>2</sup>	108.8	108.8	224.3	94.3	107.1	168.9	143.9	144.6	262.5	291.8	274.7	488.1	469.9	698.9	683.2	
Thermal Capacity, kJ/(m <sup>2</sup> ·K)	98.1	98.1	204.4	83.8	96.1	151.3	124.7	124.7	220.8	247.3	233.0	441.5	425.2	631.6	615.2	
Hour	Conduction Time Factors, %															
0	0	1	0	1	0	1	1	0	1	2	1	3	1	2	1	
1	4	1	2	11	3	1	10	8	1	2	2	3	2	2	2	
2	13	5	8	21	12	2	20	18	3	3	3	4	5	3	4	
3	16	9	12	20	16	5	18	18	6	5	6	5	8	3	7	
4	14	11	12	15	15	7	14	14	8	6	7	6	9	5	8	
5	11	10	11	10	12	9	10	11	9	6	8	6	9	5	8	
6	9	9	9	7	10	9	7	8	9	6	8	6	8	6	8	
7	7	8	8	5	8	8	5	6	9	6	7	5	7	6	8	
8	6	7	7	3	6	8	4	4	8	6	7	5	6	6	7	
9	4	6	6	2	4	7	3	3	7	6	6	5	6	6	6	
10	3	5	5	2	3	6	2	2	7	5	6	5	5	6	6	
11	3	4	4	1	3	6	2	2	6	5	5	5	5	5	5	
12	2	4	3	1	2	5	1	2	5	5	5	4	4	5	4	
13	2	3	2	1	2	4	1	1	4	5	4	4	4	5	4	
14	2	3	2	0	1	4	1	1	4	4	4	4	3	4	4	
15	1	3	2	0	1	3	1	1	3	4	3	4	3	4	3	
16	1	2	1	0	1	3	0	1	2	4	3	4	3	4	3	
17	1	2	1	0	1	2	0	0	2	3	3	4	2	4	3	
18	1	2	1	0	0	2	0	0	1	3	2	4	2	4	2	
19	0	1	1	0	0	2	0	0	1	3	2	3	2	3	2	
20	0	1	1	0	0	2	0	0	1	3	2	3	2	3	2	
21	0	1	1	0	0	2	0	0	1	3	2	3	2	3	1	
22	0	1	1	0	0	1	0	0	1	3	2	3	1	3	1	
23	0	1	0	0	0	1	0	0	1	2	2	2	1	3	1	
Total Percentage	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Layer ID from outside to inside (see Table 22)	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	F01	
	M03	M08	F07	M08	M08	M09	M11	M11	M11	F06	M13	F06	M15	M16	M16	
	I04	I04	M05	F02	F04	F04	I01	I04	I02	I01	I04	I02	I04	I05	F02	
	G01	G01	I04	—	G01	G01	F04	G01	M11	M13	G01	M15	G01	G01	—	
	F02	F02	G01	—	F02	F02	G01	F02	F02	G01	F02	G01	F02	F02	—	
	—	—	F02	—	—	—	F02	—	—	F02	—	F02	—	—	—	

**Wall Number Descriptions**

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| 21. 200 mm LW CMU, batt insulation, gyp board                      | 29. 100 mm LW concrete, board insulation, 100 mm LW concrete     |
| 22. 200 mm LW CMU with fill insulation, batt insulation, gyp board | 30. EIFS finish, insulation board, 200 mm LW concrete, gyp board |
| 23. 25 mm stucco, 200 mm HW CMU, batt insulation, gyp board        | 31. 200 mm LW concrete, batt insulation, gyp board               |
| 24. 200 mm LW CMU with fill insulation                             | 32. EIFS finish, insulation board, 200 mm HW concrete, gyp board |
| 25. 200 mm LW CMU with fill insulation, gyp board                  | 33. 200 mm HW concrete, batt insulation, gyp board               |
| 26. 300 mm LW CMU with fill insulation, gyp board                  | 34. 300 mm HW concrete, batt insulation, gyp board               |
| 27. 100 mm LW concrete, board insulation, gyp board                | 35. 300 mm HW concrete   |
| 28. 100 mm LW concrete, batt insulation, gyp board                 |  |