ERRATA for

PE Mechanical HVAC and Refrigeration Questions and Solutions

ISBN: 978-1-932613-76-6

Errata posted 03/26/2018

Revisions are shown in red.

p. 41, Question 508:

The options should read as follows:

(A) 21.6
(B) 20.0
(C) 19.4
(D) 18.2

p. 91, Solution 508:

Item	R Value (hr-ft^2-°F/Btu)
Outside air	0.25
Built-up roof	0.33
Roof insulation	To be determined
Galvanized deck	Negligible
Air space (3.5")	3.41
Acoustical tile (3/4")	1.89 (lots of choices)
Inside air	0.92
	6.8

To achieve an overall U value of 0.04 requires a total R value of 25 (R = 1/U). The required R value of the roof deck insulation = 25 – 6.8 = 18.2 hr-ft^2-°F/Btu

THE CORRECT ANSWER IS: (D)

Previously posted errata continued on next page

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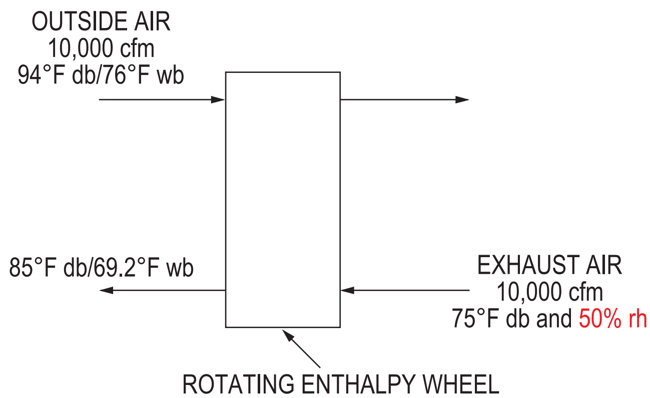
Errata posted 11/30/2017

Revisions are shown in red.

Question 136, p. 30:

A building air-conditioning system requires 10,000 cfm of outside air for ventilation. An enthalpy wheel, as shown, exchanges both sensible and latent heat energy to reduce the design load on the building refrigeration system. If the enthalpy wheel has 2% losses, the reduction in design load (tons) on the refrigeration system is most nearly:

(A) 8.4
(B) 19.1
(C) 24.4
(D) 54.2



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Errata posted 11/30/2017

Solution 136, p. 84:

Using sea level psychrometric chart:

$Q_{in(EXH)} = 4.5 \times \text{cfm} \times \Delta h$;

h of 85°F db/69.2°F wb = 33.4 Btu/lb;

h of 75°F db and 50% rh = 28.2 Btu/lb

$Q_{in(EXH)} = 4.5 \times 10{,}000(33.4 - 28.2) = 234{,}000$ Btu/hr

$$= \frac{234{,}000 \text{ Btu/hr}}{12{,}000 \text{ Btu}/(\text{hr-ton})} = 19.5 \text{ tons}$$

$Q_{out(OA)} = 0.98 \times 19.5 = 19.1$ tons

Alternate solution:

$$\dot{m} = \frac{V}{v} = \frac{10{,}000 \text{ cfm}}{13.68 \text{ ft}^3/\text{lb} \ (75°\text{F db}/50\% \text{ rh})} = 750 \text{ lb/min}$$

$$= 750 \text{ lb/min} \times 60 \text{ min/hr} = 45{,}000 \text{ lb/hr}$$

$$Q_{in(EXH)} = 45{,}000 \text{ lb/hr} \ (33.4 - 28.2) \text{ Btu/lb}$$

$$= 234{,}000 \text{ Btu/hr} = 19.5 \text{ tons}$$

$$Q_{out(OA)} = 0.98 \times 19.5 = 19.1 \text{ tons}$$

THE CORRECT ANSWER IS: (B)

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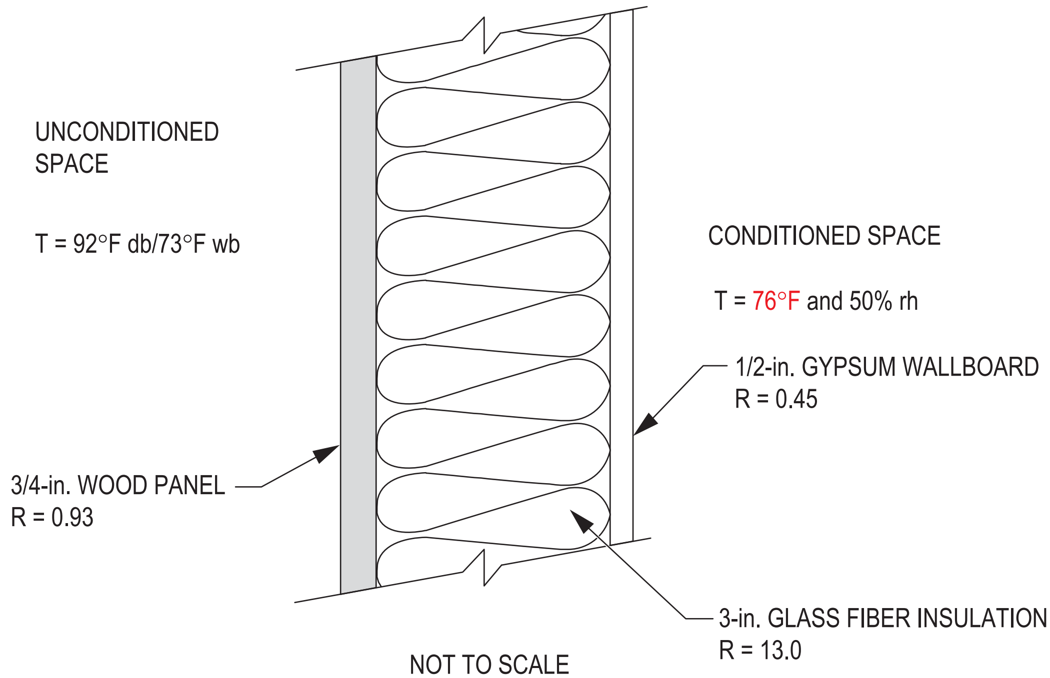
Errata posted 3/31/2017

Revisions are shown in red.

Question 506, p. 40:

The figure should be shown as follows:



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Errata posted 3/31/2017

Solution 110, p. 75:

The solution should read as follows:

Reference: 2013 *ASHRAE Handbook—Fundamentals*, Chapter 18

The sensible heat equation at standard air conditions (sea level and 59°F) is given by:

$$Q_s = \text{cfm} \times 1.10 \times \Delta T$$

This needs to be adjusted to allow for the change in air density from standard conditions (0.075 lb/ft^3) to the 5,000-ft elevation. On a psychrometric chart for 5,000 ft at a 55°F saturated supply air temperature, the specific volume of air is 15.8 ft^3/lb, which gives a density of 0.063 lb/ft^3.

The revised sensible heat equation becomes:

$$Q_s = \text{cfm} \times 1.10 \times (0.063/0.075) \times \Delta T$$

This becomes: $Q_s = \text{cfm} \times 0.92 \times \Delta T$

$$\text{cfm} = Q_s/(0.92 \times \Delta T)$$

$$\text{cfm} = \frac{23 \text{ tons} \times 12{,}000 \text{ Btu/hr/ton}}{0.92 \times (75 - 55)} = 15{,}000 \text{ cfm}$$

THE CORRECT ANSWER IS: (C)

Solution 509, p. 91:

Line 6 of the solution should read as follows:

$Q = 4.5 \times 112{,}250 \times (43.6 - 34.8) = 4{,}445{,}100$ Btu/hr

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Solution 529, p. 97:

The solution should read as follows:

$$Q_{evap} = \dot{m}\left(h_{out} - h_{in}\right)_{evap} = 23.2\,\text{tons}$$

Suction saturated vapor, h_{out} = 106.2 Btu/lb

Saturated liquid at discharge pressure, h_{in} = 47.03 Btu/lb

$$\therefore \dot{m} = \frac{23.2\,\text{tons}\left(200\,\frac{\text{Btu}}{\text{min-ton}}\right)}{\left(106.2 - 47.03\right)\text{Btu/lb}} = 78.4\ \text{lb/min}$$

THE CORRECT ANSWER IS: (B)

Revisions are shown in red.

Solution 530, p. 98:

Line 1 of the solution should read as follows:

$$\text{Refrigerant flow} = \frac{\text{tons} \times 12{,}000\ \text{Btu/hr/ton}}{(60\ \text{min/hr})(\Delta h,\ \text{Btu/lb})}$$

Previously posted errata continued on next page

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Errata posted 2/17/2017

p. 102:

The correct psychrometric chart is shown on the next page.

ASHRAE PSYCHROMETRIC CHART NO.1

NORMAL TEMPERATURE

BAROMETRIC PRESSURE: 29.921 INCHES OF MERCURY

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

SEA LEVEL