ASHRAE HANDBOOK

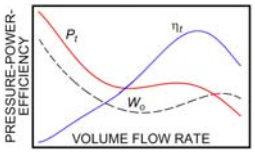
Additions and Corrections

The following presents additional information and technical errors found between June 15, 2016, and October 11, 2019, in the I-P editions of the 2016, 2017, 2018, and 2019 *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 hkennedy@ashrae.org.

2016 HVAC Systems and Equipment

p. 21.3, Table 1. The performance curve for propeller fans should be as follows:



p. 38.3. In the text preceding Equation 4, the term given as w_{io} should be w_{oi}.

p. 38.37, Eq. (24). Remove "x" from end of equation.

2017 Fundamentals

p. 1.13, Eq. (23). Following the equation, add the following text: "where μ is degree of saturation *W*/*Ws*, dimensionless."

p. 4.3, Table 2, 1st equation for hollow sphere. In the denominator, change the + to a –.

p. 4.20, Table 9. For Eq. (T9.10) for horizontal cylinder, the range should be $10^{-6} < Ra < 10^{13}$.

p. 4.21, Example 11. In list item number 1, the equation should be $t_f = (t_s + t_\infty)/2$.

p. 11.13, 2nd col. Change "*Guideline* 27" to "proposed *Guideline* 27P."

p. 14.12, Examples 7 and 8. In Example 7, in the equation for $E_{t,r}$, change "+ cos(68.62°)" to "– cos(90°)" and the result to 29 Btu/h·ft^2. In Example 8, in the equation for $E_{t,r}$, change "cos(68.64°)" to "cos(30°)" and the result to 4 Btu/h·ft^2.

p. 18.21, Eqs. (24) and (25). In Eq. (24), change $Z_{i,0}$ to $X_{i,0}$. The following paragraph should read "Equation (24) shows the need to separate $X_{i,0}$ because the contribution of current surface temperature to conductive flux cannot be collected with the other historical terms involving that temperature." In Eq. (25), change $T_{si_{i,j}}$ to $T_{so_{i,j}}$.

p. 18.39, 1st col, definitions. The mention of Figure 18 of Chapter 34 of the 2011 *ASHRAE Handbook—HVAC Applications* should refer to that figure in the 2015 edition.

p. 19.6, Example 1. In the last equation, change "14,000" to "14,400." The result remains the same.

p. 24.4, Eq. (2). Change "/2.152" to "× 2.151."

2019 HVAC Applications

First page of Contributors. Charles Gulledge's employer should be listed as Environmental Air Systems, LLC.

p. 11.14, Figure 13. Source year should be 2000, rather than 2007.

p. 19.2, Table 1. Source note should be "©ISO. This material is reproduced from ISO 14644-1:2015, with permission of the American National Standards Institute (ANSI) on behalf of the International Organization for Standardization. All rights reserved."

p. 35.11, Fig. 10. SI version of Figure 10 was included in both the I-P and SI versions of the chapter. Correct I-P graphic is as seen at the top of page A.2.

p. 59.15, Fig. 25. Figure caption should read "Velocity Vectors and Contours at Central Cross Section with 675k Grid."

p. 61.3, Fig. 2. Bottom line of figure cut off. The figure in its entirety is below.

Consultant(s)
- None
- In-house security management
- Outside security consultant
- Government security (at time of design; confidential)
- Government security (at time of construction; highly confidential)

Risk Evaluation Status (see risk evaluation document for more detail)
- Baseline: No specialized operations, tenants may be relocated, long-term nonoccupancy presents minimal challenge
- Enhanced: Specialized or unique operations, larger facilities with high populations, long-term nonoccupancy undesirable
- Critical: Highly specialized or unique operations, high importance or visibility, long-term nonoccupancy unacceptable

Design Features: HVAC Security
- List Features

Design Features: Environmental Health and Safety
- List systems with enhanced air filtration and MERV rating
- List systems with enhanced safeties and alarms and types of devices used
- List zoning application
- List air intake minimum height above grade requirements
- List equipment to be located above exterior historical flood level data
- List systems to be on emergency power

Commissioning, Operation, Maintenance, and Recommissioning
- Commission beginning in design phase through construction phase
- Continuous commissioning in warranty phase
- Operation training and documentation beginning in design phase
- Preventive maintenance work order ready to implement in construction/commissioning phase
- Predictive maintenance features
- Mode of operation: evacuation, shelter-in-place, uninterrupted operation (list systems by one of these three categories)
- Recommissioning every (X) years by _____

Fig. 2 HVAC Security and Environmental Health and Safety Basis of Design Segment
(from 2019 Applications, p. 61.3)

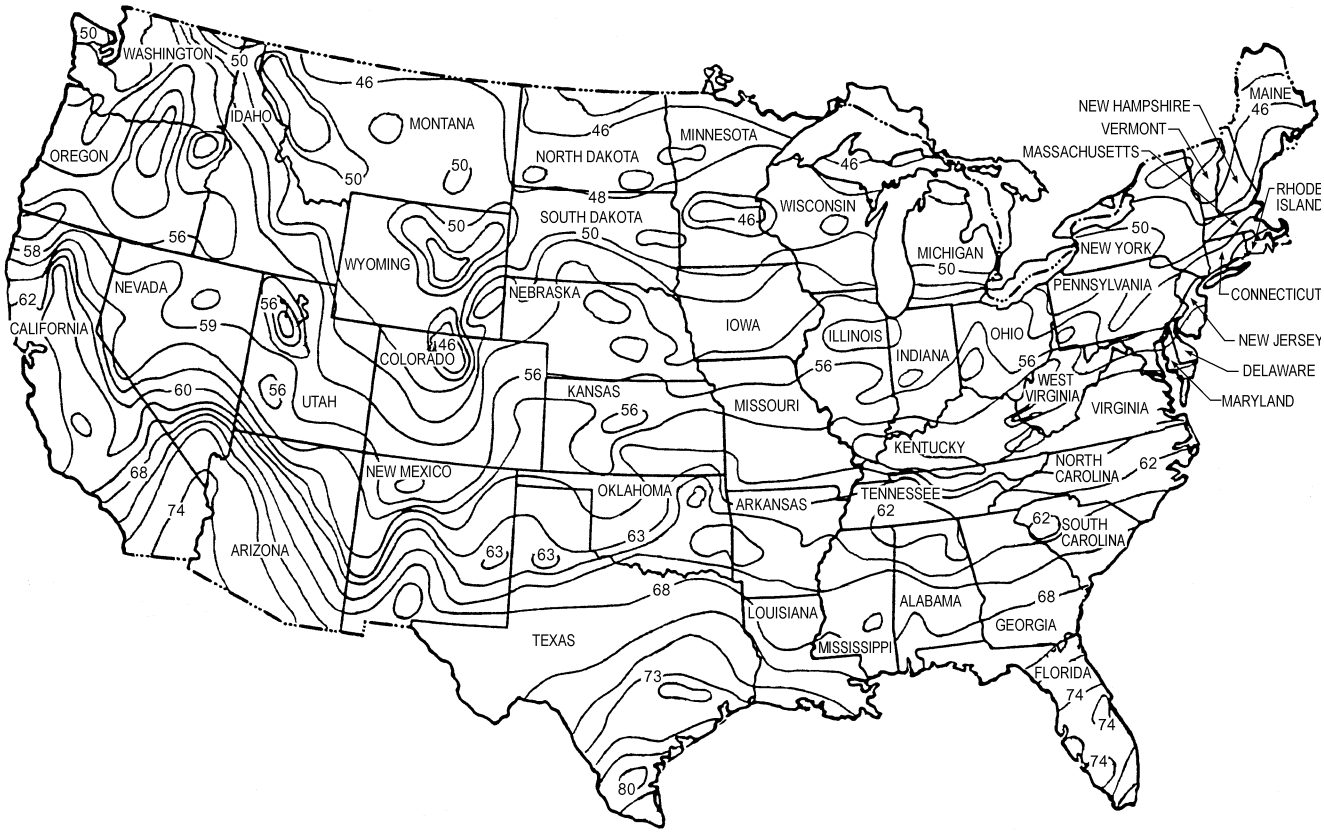


Fig. 10 Approximate Groundwater Temperature (°F) in the Continental United States
(from 2019 Applications, p. 35.11)

Chapters 46 and 47. These were erroneously published in SI format; replacement chapters are available on www.ashrae.org/technical-resources/ashrae-handbook.

End papers. Title for Chapter 59 should be listed as "Indoor Airflow Modeling," and Chapter 60 should be "Integrated Project Delivery and Building Design."