

**ERRATA SHEET FOR THE FIRST PRINTING OF
ANSI/ASHRAE/IESNA STANDARD 90.1-2004 (SI edition)
Energy Standard for Buildings Except Low-Rise Residential Buildings**

August 27, 2009

The corrections listed in this errata sheet apply to the first printing of ANSI/ASHRAE/IESNA Standard 90.1-2004, SI edition, identified as “86248 PC 1/05” on the outside back cover of the standard. **Shaded** item has been added since the previously published errata sheet dated March 25, 2009 was distributed.

More than one errata sheet may be required for a specific document. Please review the entire list on the ASHRAE website related to the applicable document and download all that apply.

NOTICE: ASHRAE now has a list server for Standing Standards Project Committee 90.1 (SSPC 90.1). Interested parties can now subscribe and unsubscribe to the list server and be automatically notified via e-mail when activities and information related to the Standard and the User’s Manual is available. To sign up for the list server please visit **Project Committee List Servers for Standard** on the Technology / Standards section of the ASHRAE website at <http://www.ashrae.org/publications/detail/15620>.

Page(s) Erratum

- 6 **Section 3.2 Definitions.** Change (a) and (b) in the definition for *degree-day* to read as follows:

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

degree-day: the difference in temperature between the outdoor mean temperature over a 24-hour period and a given base temperature. For the purposes of determining building envelope requirements, the classifications are defined as follows:

- (a) ***cooling degree-day base 10°C, CDD10:*** for any one day, when the mean temperature is more than 10°C, there are as many degree-days as degrees Celsius~~Fahrenheit~~ temperature difference between the mean temperature for the day and 10°C. Annual cooling degree-days (CDDs) are the sum of the degree-days over a calendar year.
- (b) ***heating degree-day base 18°C, HDD18:*** for any one day, when the mean temperature is less than 18°C, there are as many degree-days as degrees Celsius~~Fahrenheit~~ temperature difference between the mean temperature for the day and 18°C. Annual heating degree-days (HDDs) are the sum of the degree-days over a calendar year.

- 11 **Section 3.2 Definitions.** On page 11 delete the following definition:

rated lamp wattage: see *lamp wattage, rated*.

Note: the standard does not include a definition for *lamp wattage, rated* and this term is not used in the standard.

- 15 **Section 3.3 Abbreviations and Acronyms.** Change CTI from “Cooling Tower Institute” to “Cooling Technology Institute”.

17 **Section 5. Building Envelope.** In the compliance path figure at the beginning of Section 5 correct the spelling of prescriptive so it reads “5.5 – Prescriptive Path”.

19 **Table 5.5.3.1.** Change the title of Table 5.5.3.1 as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Roof U-Factor Multipliers for Exception to ~~5.5.1.1~~ 5.5.3.1

19 **5.5.3.3 Below-Grade Wall Insulation.** Change the first sentence in Section 5.5.3.3 as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

5.5.3.3 Below-Grade Wall Insulation. *Below-grade walls shall have a rated R-value of insulation not less than ~~that~~ the insulation values specified in Tables 5.5-1 through 5.5-8.*

22 **TABLES 5.5-1 through 5.5-8 Building Envelope Requirements.** Add a footnote to
through the bottom of Tables 5.5-1 through 5.5-8 as follows:
30 “The following definitions apply: ci = continuous insulation (see Section 3.2), NR = no
(insulation) requirement.”

24 **TABLE 5.5-3 Building Envelope Requirements for Climate Zone 3 (A, B, C).** In
footnote “b” of Table 5.5-3 change “non-residential” to “nonresidential”.

34 & 35 **Section 6.4.3.2 (a) Off-Hour Controls.** Change **Section 6.4.3.2 (a) Off-Hour
Controls** to **Section 6.4.3.3 Off-Hour Controls** and renumber the remainder of
Section 6.4.3 as follows:
*Text not shown will remain the same except as shown below in underline(addition) and
~~strikethrough~~ (deletion)*

6.4.3.2 Setpoint Overlap Restriction.

~~(a)~~**6.4.3.3 Off-Hour Controls.** HVAC systems shall have the offhour controls required
by Sections 6.4.3.23.1 through 6.4.3.23.4.

Exceptions to 6.4.3.23:

6.4.3.23.1 Automatic Shutdown.

Exception to 6.4.3.23.1:

6.4.3.23.2 Setback Controls.

Exception to 6.4.3.23.2:

6.4.3.23.3 Optimum Start Controls.

6.4.3.23.4 Zone Isolation. ...Each isolation area shall be controlled independently by a
device meeting the requirements of 6.4.3.23.1 (Automatic Shutdown)....

Exceptions to 6.4.3.23.4:

6.4.3.23.4 Ventilation System Controls.

6.4.3.23.4.1 Stair and Shaft Vents.

6.4.3.23.4.2 Gravity Hoods, Vents, and Ventilators.

Exceptions to 6.4.3.34.1 and 6.4.3.34.2:

6.4.3.34.3 Shutoff Damper Controls.

Exceptions to 6.4.3.34.3:

6.4.3.34.4 Dampers. Where *outdoor air* supply and exhaust air dampers are required by Section 6.4.3.34, they shall have a maximum leakage rate when tested in accordance with AMCA Standard 500 as indicated in Table 6.4.3.34.4.

TABLE 6.4.3.34.4 Maximum Damper Leakage

6.4.3.34.5 Ventilation Fan Controls. Fans with motors greater than $\frac{3}{4}$ hp (0.5 kW) shall have automatic controls complying with Section 6.4.3.231 that are capable of shutting off fans when not required.

Exception to 6.4.3.34.5:

6.4.3.45 Heat Pump Auxiliary Heat Control.

Exception to 6.4.3.45:

6.4.3.56 Humidifier Preheat.

6.4.3.67 Humidification and Dehumidification.

Exceptions to 6.4.3.67:

6.4.3.78 Freeze Protection and Snow/Ice Melting Systems.

6.4.3.89 Ventilation Controls for High-Occupancy Areas.

Exception to 6.4.3.89:

43 & 44 **TABLE 6.8.1A Air Conditioners and Condensing Units.** Change the title of Table 6.8.1A from “Air Conditioners and Condensing Units” to “Electronically Operated Unitary Air Conditioners and Condensing Units – Minimum Efficiency Requirements”.

45 **TABLE 6.8.1B Electrically Operated Unitary and Applied Heat Pumps – Minimum Efficiency Requirements.** In Table 6.8.1B for equipment type “Air Cooled (Cooling Mode)”, under size category “ ≥ 70 kW”, change the minimum efficiency from “2.78 COP_c” to “2.64 COP_c” for “Electric Resistance (or None)” and from “2.72 COP_c” to “2.58 COP_c” for “All other” heating section type.

58 **TABLE 7.8 Performance Requirements for Water Heating Equipment.** The 2004 SI edition of Standard 90.1 incorrectly included the I-P version of Table 7.8. See Table 7.8 for changes (attached). Table changed to reflect SI units.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

65 **Table 9.6.1 Lighting Power Densities Using the Space-by-Space Method.** In the second column, for the Building Specific Space Type “Retail”, change the referenced section as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Retail [For accent lighting, see ~~9.3.1.2.1(e)~~ 9.6.3(c)]

- 78 **Section 12 Normative References.** Change the address for the Cooling Technology Institute as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

**Cooling Technology Institute,
~~530 Wells Fargo, Suite 218, Houston, TX 77090-2611~~ **FM 1960 West, Suite A-101,
Houston, TX 77068-3730; P.O. Box 73383, Houston, TX 77273-3383****

- 92 **A3.3.1 General. (Steel-Framed Walls)** In the fourth sentence of Section A3.3.1 change “Table A-21” to “Table A9.2B”.

- 118 **Table B-3 International Climate Zones.** Inadvertent omission of the climate zones for New Zealand. Insert the following climate zone numbers as published in Addendum “am” to 90.1-2001:

Country	City (Providence or Region)	Zone
New Zealand	Auckland Airport	4
	Christchurch	4
	Wellington	4

- 130 **Normative Appendix D Climatic Data.** At the top of the page delete the second sentence that reads “Table numbers corresponding to the envelope criteria tables in Normative Appendix B are also included.”

- 153 **Table D-2 Canadian Climatic Data.** The SI edition of Standard 90.1 incorrectly included I-P climatic data in Table D-2. See Table D-2 for changes (attached). Table changed to reflect SI units.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

- 168 **Table F-2 Addenda to ANSI/ASHRAE/IESNA Standard 90.1-2001, Approval Dates.** In the third and fourth columns for Addenda q, t, u, y, z, aa, ab, ac, ae, ag, ah, ai, al, and am change the July 1, 2001 date to July 1, 2004 (14 places in each of the two columns).

Table 7.8
Performance Requirements for Water Heating Equipment

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Performance Required ^a	Test Procedure^b
Electric Water Heaters	≤ 12 kW	Resistance ≥75.7 L	0.93- 0.00132 <u>0.00035</u> V EF	DOE 10 CFR Part 430
	>12 kW	Resistance≥75.7 L	20+355.9 + 5.3 √V SL, W	ANSI Z21.10.3
	≤ 24 Amps and ≤ 250 Volts	Heat Pump	0.93- 0.00132 <u>0.00035</u> V EF	DOE 10 CFR Part 430
Gas Storage Water Heaters	≤ 22.98 kW	≥75.7 L	0.62- 0.00190 <u>0.0005</u> V EF	DOE 10 CFR Part 430
	>22.98 kW	<309.75 W/L	80% E_t (Q/800+110799 + 16.6 √V) SL, W	ANSI Z21.10.3
Gas Instantaneous Water Heaters	>14.66 kW and <58.62 kW ^c	≥309.75 W/L and <7.57 L	0.62- 0.00190 <u>0.0005</u> V EF	DOE 10 CFR Part 430
	≥58.62 kW	≥309.75 W/L and <37.85	80% E_t	ANSI Z21.10.3
	≥58.62 kW	≥309.75 W/L and ≥37.85	80% E_t (Q/800+110799 + 16.6 √V) SL, W	
Oil Storage Water Heaters	≤ 30.78 kW	≥75.7 L	0.59- 0.00190 <u>0.0005</u> V EF	DOE 10 CFR Part 430
	>30.78 kW	<309.75 W/L	78% E_t (Q/800+110799 + 16.6 √V) SL, W	ANSI Z21.10.3
Oil Instantaneous Water Heaters	≤ 61.55 kW	≥309.75 W/L and <7.57 L	0.59- 0.00190 <u>0.0005</u> V EF	DOE 10 CFR Part 430
	>61.55 kW	≥309.75 W/L and <37.85	80% E_t	ANSI Z21.10.3
	>61.55 kW	≥309.75 W/L and ≥37.85	78% E_t (Q/800+110799 + 16.6 √V) SL, W	
Hot Water Supply Boilers, Gas and Oil	≥61.55 kW and <3663.8 kW	≥309.75 W/L and <37.85	80% E_t	ANSI Z21.10.3
Hot Water Supply Boilers, Gas		≥309.75 W/L and ≥37.85	80% E_t (Q/800+110799 + 16.6 √V) SL, W	
Hot Water Supply Boilers, Oil		≥309.75 W/L and ≥37.85	78% E_t (Q/800+110799 + 16.6 √V) SL,W	
Pool Heaters Oil and Gas	All		78% E_t	ASHRAE 146
Heat Pump Pool Heaters	All		4.0 COP	ASHRAE 146
Unfired Storage Tanks	All		R-2.2	(none)

- a Energy factor (EF) and thermal efficiency (Et) are minimum requirements, while standby loss (SL) is maximum W based on a 38.9°C temperature difference between stored water and ambient requirements. In the EF equation, V is the rated volume in ~~gallons~~ liters. In the SL equation, V is the rated volume in ~~gallons~~ liters and Q is the nameplate input rate in W.
- b Section 12 contains a complete specification, including the year version, of the referenced test procedure.
- c Instantaneous water heaters with input rates below 58.62 W must comply with these requirements if the water heater is designed to heat water to temperatures 82.2°C or higher.

**Table D-2
Canadian Climatic Data**

Province City	Latitude	Longitude	Elev. (m)	HDD18	CDD10	Heating Design Temperature	Cooling Design Temperature	
						99.6%	Dry- Bulb	Wet- Bulb
Alberta (AB)								
Calgary International A	51.12 N	114.02 W	3533 <u>1076</u>	9,885 <u>5,492</u>	1,167 <u>648</u>	-22 <u>-30</u>	80 <u>27</u>	59 <u>15</u>
Edmonton International A	53.30 N	113.58 W	2345 <u>714</u>	11,023 <u>6,124</u>	1,069 <u>594</u>	-28.4 <u>-33</u>	78 <u>26</u>	63 <u>17</u>
Grande Prairie A	55.18 N	118.88 W	2185 <u>665</u>	11,240 <u>6,244</u>	1,031 <u>573</u>	-32 <u>-36</u>	78 <u>26</u>	60 <u>16</u>
Lethbridge A	49.63 N	112.80 W	3047 <u>928</u>	8,783 <u>4,879</u>	1,730 <u>961</u>	-22 <u>-30</u>	84 <u>29</u>	64 <u>16</u>