ADDENDA

ANSI/ASHRAE/IES Addendum cl to
ANSI/ASHRAE/IES Standard 90.1-2013

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on June 25, 2016; by the ASHRAE Board of Directors on June 29, 2016; by the IES Board of Directors on June 27, 2016; and by the American National Standards Institute on July 26, 2016.

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FOREWORD

Addendum cl revises Tables 6.8.1-1 and 6.8.1-2 and Table 7.8 to relocate the minimum efficiency requirements for residential air conditioners and heat pumps and water heaters and pool heaters, respectively, which are established by the U.S. Department of Energy in an informative appendix. A footnote is added to identify products covered by these regulations and to refer to the new Informative Appendix H. The change does not alter the requirements of the standard.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes. Only these changes are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed substantive changes.

Addendum cl to 90.1-2013

Revise the Standard as follows. ***Note:*** *The only changes in these I-P versions of Tables 6.8.1-1 and 6.8.1-2 are to delete efficiencies for dates that have expired. The out-of-date efficiencies will also be deleted from the SI tables. Those tables are not shown here to conserve space but the same changes apply.*

TABLE 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure[a]
Air conditioners, air cooled	<65,000 Btu/h[b]	All	Split system, Three phase	13.0 SEER	AHRI 210/240
			Single package, Three phase	~~13.0 SEER (before 1/20/15)~~ 14 SEER ~~(as of 1/1/2015)~~	
Through the wall, air cooled	≤30,000 Btu/h[b]	All	Split system, Three phase	12.0 SEER	
			Single package, Three phase	12.0 SEER	
Small duct high velocity, air cooled	<65,000 Btu/h[b]	All	Split System, Three phase	11.0 SEER	
Air conditioners, air cooled	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.2 EER ~~11.4 IEER (before 1/1/2016)~~ 12.9 IEER ~~(as of 1/1/2016)~~	AHRI 340/360
		All other	Split system and single package	11.0 EER ~~11.2 IEER (before 1/1/2016)~~ 12.7 IEER ~~(as of 1/1/2016)~~	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)	Split system and single package	11.0 EER ~~11.2 IEER (before 1/1/2016)~~	

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				12.4 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	10.8 EER ~~11.0 IEER~~ ~~(before 1/1/2016)~~ 12.2 IEER ~~(as of 1/1/2016)~~	
	≥240,000 Btu/h and <760,000 Btu/h	Electric resistance (or none)	Split system and single package	10.0 EER ~~10.1 IEER~~ ~~(before 1/1/2016)~~ 11.6 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	9.8 EER ~~9.9 IEER~~ ~~(before 1/1/2016)~~ 11.4 IEER ~~(as of 1/1/2016)~~	
	≥760,000 Btu/h	Electric resistance (or none)	Split system and single package	9.7 EER ~~9.8 IEER~~ ~~(before 1/1/2016)~~ 11.2 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	9.5 EER ~~9.6 IEER~~ ~~(before 1/1/2016)~~ 11.0 IEER ~~(as of 1/1/2016)~~	
Air conditioners, water cooled	<65,000 Btu/h	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)	Split system and single package	12.1 EER ~~12.3 IEER~~ ~~(before 1/1/2016)~~ 13.9 IEER ~~(as of 1/1/2016)~~	AHRI 340/360
		All other	Split system and single package	11.9 EER ~~12.1 IEER~~ ~~(before 1/1/2016)~~ 13.7 IEER ~~(as of 1/1/2016)~~	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)	Split system and single package	12.5 EER ~~12.5 IEER~~ ~~(before 1/1/2016)~~ 13.9 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	12.3 EER ~~12.5 IEER~~ ~~(before 1/1/2016)~~ 13.7 IEER ~~(as of 1/1/2016)~~	
	≥240,000 Btu/h and <760,000 Btu/h	Electric resistance (or none)	Split system and single package	12.4 EER ~~12.6 IEER~~ ~~(before 1/1/2016)~~ 13.6 IEER	AHRI 340/360

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				~~(as of 1/1/2016)~~	
		All other	Split system and single package	12.2 EER ~~12.4 IEER~~ ~~(before 1/1/2016)~~ 13.4 IEER ~~(as of 1/1/2016)~~	
	≥760,000 Btu/h	Electric resistance (or none)	Split system and single package	12.2 EER ~~12.4 IEER~~ ~~(before 1/1/2016)~~ 13.5 IEER ~~(as of 1/1/2016)~~	AHRI 340/360
		All other	Split system and single package	12.0 EER ~~12.2 IEER~~ ~~(before 1/1/2016)~~ 13.3 IEER ~~(as of 1/1/2016)~~	
Air conditioners, evaporatively cooled	<65,000 Btu/h[b]	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)	Split system and single package	12.1 EER 12.3 IEER	AHRI 340/360
		All other	Split system and single package	11.9 EER 12.1 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)	Split system and single package	12.0 EER 12.2 IERR	
		All other	Split system and single package	11.8 EER 12.0 IEER	
	≥240,000 Btu/h and <760,000 Btu/h	Electric resistance (or none)	Split system and single package	11.9 EER 12.1 IEER	
		All other	Split system and single package	11.7 EER 11.9 IEER	
	≥760,000 Btu/h	Electric resistance (or none)	Split system and single package	11.7 EER 11.9 IEER	
		All other	Split system and single package	11.5 EER 11.7 IEER	
Condensing units, air cooled	≥135,000 Btu/h			10.5 EER 11.8 IEER	AHRI 365
Condensing units, water cooled	≥135,000 Btu/h			13.5 EER 14.0 IEER	
Condensing units, evaporatively cooled	≥135,000 Btu/h			13.5 EER 14.0 IEER	

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

b. Single-phase, air conditioners < 65,000 Btu/h are regulated by the US Department of Energy Code of Federal Regulations 10 CFR 430. SEER values for single-phase products are set by the US Department of Energy. Informative Note: See Informative Appendix H for the U.S. Department of Energy minimum efficiency requirements of single-phase air conditioners.

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TABLE 6.8.1-2 Electrically Operated Unitary and Applied Heat Pumps—Minimum Efficiency Requirements

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure[a]
Air cooled (cooling mode)	<65,000 Btu/h[b]	All	Split system, Three phase	~~13.0 SEER (before 1/1/2015)~~ 14 SEER ~~(as of 1/1/2015)~~	AHRI 210/240
			Single package, Three phase	~~13.0 SEER (before 1/1/2015)~~ 14 SEER ~~(as of 1/1/2015)~~	
Through the wall, air cooled (cooling mode)	≤30,000 Btu/h[b]	All	Split system, Three phase	12.0 SEER	
			Single package, Three phase	12.0 SEER	
Small duct high velocity, air cooled	<65,000 Btu/h[b]	All	Split System, Three phase	11.0 SEER	
Air cooled (cooling mode)	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.0 EER ~~11.2 IEER (before 1/1/2016)~~ 12.2 IEER ~~(as of 1/1/2016)~~	AHRI 340/360
		All other	Split system and single package	10.8 EER ~~11.0 IEER (before 1/1/2016)~~ 12.0 IEER ~~(as of 1/1/2016)~~	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)	Split system and single package	10.6 EER ~~10.7 IEER (before 1/1/2016)~~ 11.6 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	10.4 EER ~~10.5 IEER (before 1/1/2016)~~ 11.4 IEER ~~(as of 1/1/2016)~~	
	≥240,000 Btu/h	Electric resistance (or none)	Split system and single package	9.5 EER ~~9.6 IEER (before 1/1/2016)~~ 10.6 IEER ~~(as of 1/1/2016)~~	
		All other	Split system and single package	9.3 EER ~~9.4 IEER (before 1/1/2016)~~ 10.4 IEER ~~(as of 1/1/2016)~~	
	<17,000 Btu/h	All	86°F entering water	12.2 EER	

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Water to air, water loop (cooling mode)	≥17,000 Btu/h and <65,000 Btu/h	All	86°F entering water	13.0 EER	ISO 13256-1
	≥65,000 Btu/h and <135,000 Btu/h	All	86°F entering water	13.0 EER	
Water to air, groundwater (cooling mode)	<135,000 Btu/h	All	59°F entering water	18.0 EER	
Brine to air, ground loop (cooling mode)	<135,000 Btu/h	All	77°F entering water	14.1 EER	
Water to water, water loop (cooling mode)	<135,000 Btu/h	All	86°F entering water	10.6 EER	ISO 13256-2
Water to water, groundwater (cooling mode)	<135,000 Btu/h	All	59°F entering water	16.3 EER	
Brine to water, ground loop (cooling mode)	<135,000 Btu/h	All	77°F entering water	12.1 EER	
Air cooled (heating mode)	<65,000 Btu/h[b] (cooling capacity)	—	Split system, Three phase	~~7.7 HSPF (before 1/1/2015)~~ 8.2 HSPF ~~(as of1/1/2015)~~	AHRI 210/240
			Single package, Three phase	~~7.7 HSPF (before 1/1/2015)~~ 8.0 HSPF ~~(as of1/1/2015)~~	
Through the wall, air cooled (heating mode)	≤30,000 Btu/h[b] (cooling capacity)	—	Split system, Three phase	7.4 HSPF	
			Single package, Three phase	7.4 HSPF	
Small duct high velocity, air cooled (heating mode)	<65,000 Btu/h[b]	—	Split System, Three phase	6.8 HSPF	
Air cooled (heating mode)	≥65,000 Btu/h[c] and <135,000 Btu/h (cooling capacity)	—	47°F db/43°F wb outdoor air	3.3 COP_H	AHRI 340/360
			17°F db/15°F wb outdoor air	2.25 COP_H	
	≥135,000 Btu/h[c] (cooling capacity)	—	47°F db/43°F wb outdoor air	3.2 COP_H	
			17°F db/15°F wb outdoor air	2.05 COP_H	
Water to air, water loop (heating mode)	<135,000 Btu/h (cooling capacity)	—	68°F entering water	4.3 COP_H	ISO 13256-1

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Water to air, groundwater (heating mode)	<135,000 Btu/h (cooling capacity)	—	50°F entering water	3.7 COP_H	
Brine to air, ground loop (heating mode)	<135,000 Btu/h (cooling capacity)	—	32°F entering water	3.2 COP_H	
Water to water, water loop (heating mode)	<135,000 Btu/h (cooling capacity)	—	68°F entering water	3.7 COP_H	
Water to water, groundwater (heating mode)	<135,000 Btu/h (cooling capacity)	—	50°F entering water	3.1 COP_H	ISO 13256-2
Brine to water, ground loop (heating mode)	<135,000 Btu/h (cooling capacity)	—	32°F entering water	2.5 COP_H	

a. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
b. Single-phase, heat pumps < 65,000 Btu/h are regulated by the US Department of Energy Code of Federal Regulations 10 CFR 430. SEER and HSPF values for single-phase products are set by the US Department of Energy. Informative Note: See Informative Appendix H for the US Department of Energy minimum efficiency requirements of single-phase heat pumps.

TABLE 7.8 Performance Requirements for Water-Heating Equipment (I-P)

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Performance Required [a]	Test Procedure[b,c]
Electric table-top water heaters	≤12 kW	Resistance ≥20 gal	~~0.93–0.00132V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
Electric water heaters	≤12 kW	Resistance ≥20 gal	~~0.97–0.00132V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
	>12 kW[e]	Resistance ≥20 gal	0.3 + 27/Vm %/h	Section G.2 of ANSI Z21.10.3
	≤24 Amps and ≤250 Volts	Heat Pump	~~0.93–0.00132V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
Gas storage water heaters	≤75,000 Btu/h	≥20 gal	~~0.67–0.0019V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	>75,000 Btu/h	<4000 (Btu/h)/gal	80% E_t (Q/800 + 110 $\sqrt{V}$) SL, Btu/h	Sections G.1 and G.2 of ANSI Z21.10.3
Gas instantaneous water heaters	>50,000 Btu/h and <200,000 Btu/h	≥4000 (Btu/h)/gal and <2 gal	~~0.62–0.0019V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
	≥200,000 Btu/h[d]	≥4000 (Btu/h)/gal and <10 gal	80% E_t	Sections G.1 and G.2 of ANSI Z21.10.3
	≥200,000 Btu/h	≥4000 (Btu/h)/gal and	80% E_t (Q/800 + 110 $\sqrt{V}$)	

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		≥10 gal	SL, Btu/h	
Oil storage water heaters	≤105,000 Btu/h	≥20 gal	~~0.59–0.0019V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
	>105,000 Btu/h	<4000 (Btu/h)/gal	80% E_t (Q/800 + 110 $\sqrt{V}$) SL, Btu/h	Sections G.1 and G.2 of ANSI Z21.10.3
Oil instantaneous water heaters	≤210,000 Btu/h	≥4000 (Btu/h)/gal and <2 gal	~~0.59–0.0019V EF~~ See footnote g	~~DOE 10 CFR Part 430~~
	>210,000 Btu/h	≥4000 (Btu/h)/gal and <10 gal	80% E_t	Sections G.1 and G.2 of ANSI Z21.10.3
	>210,000 Btu/h	≥4000 (Btu/h)/gal and ≥10 gal	78% E_t (Q/800 + 110 $\sqrt{V}$) SL, Btu/h	
Hot-water supply boilers, gas and oil	≥300,000 Btu/h and <12,500,000 Btu/h	≥4000 (Btu/h)/gal and <10 gal	80% E_t	Sections G.1 and G.2 of ANSI Z21.10.3
Hot-water supply boilers, gas		≥4000 (Btu/h)/gal and ≥10 gal	80% E_t (Q/800 + 110 $\sqrt{V}$) SL, Btu/h	
Hot-water supply boilers, oil		≥4000 (Btu/h)/gal and ≥10 gal	78% E_t (Q/800 + 110 $\sqrt{V}$) SL, Btu/h	
Pool heaters, gas	All		~~78% E_t~~ See footnote g	~~ASHRAE 146~~
Pool heaters, oil	All		78% E_t	ASHRAE 146
Heat-pump pool heaters	All	50ºF db 44.2ºF wb outdoor air 80.0ºF entering water	4.0 COP	AHRI 1160
Unfired storage tanks	All		R-12.5	(none)

a. ~~Energy factor (EF) and t~~Thermal efficiency (E_t) ~~are~~ is a minimum requirements, while standby loss (SL) is maximum Btu/h based on a 70°F temperature difference between stored water and ambient requirements. ~~In the EF equation, V is the rated volume in gallons.~~ In the SL equation, V is the rated volume in gallons and Q is the nameplate input rate in Btu/h. V_m is the measured volume in the tank

b. Section 12 contains a complete specification, including the year version, of the referenced test procedure.

c. Section G.1 is titled "Test Method for Measuring Thermal Efficiency" and Section G.2 is titled "Test Method for Measuring Standby Loss."

d. Instantaneous water heaters with input rates below 200,000 Btu/h must comply with these requirements if the water heater is designed to heat water to temperatures of 180°F or higher.

e. Electric water heaters with input rates below 12 kW must comply with these requirements if the water heater is designed to heat water to temperatures of 180°F or higher.

f. Refer to Section 7.5.3 for additional requirements for gas storage and instantaneous water heaters and gas hot-water supply boilers.

g. In the U.S., the efficiency requirements for water heaters or gas pool heaters in this category or subcategory are specified by the U.S. Department of Energy. Those requirements and applicable test procedures are found in the Code of Federal Regulations 10 CFR Part 430. Informative Note: See Informative Appendix H for the US Department of Energy efficiency requirements applicable to these water heaters and pool heaters.

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Table 7.8 Performance Requirements for Water Heating Equipment (SI)

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Performance Required [a]	Test Procedure[b]
Electric Table-top Water Heaters	≤ 12 kW	Resistance ≥75.7 L	~~0.93–0.00035V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
Electric Water Heaters	≤ 12 kW	Resistance ≥75.7 L	~~0.97–0.00035V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	>12 kW	Resistance≥75.7 L	0.3 + 102.2/Vm %/h	Section G.2 of ANSI Z21.10.3
	≤24 Amps and ≤250 Volts	Heat Pump	~~0.93–0.00035V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
Gas Storage Water Heaters	≤22.98 kW	≥75.7 L	~~0.67–0.0005V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	>22.98 kW	<309.75 W/L	80% E_t (Q/799 + 16.6 • V) SL, W	Section G.1 of 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–.0005V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	≥58.62 kW	≥309.75 W/L and <37.85	80% E_t	Section G.1 of ANSI Z21.10.3
	≥58.62 kW	≥309.75 W/L and ≥37.85	80% E_t (Q/799 + 16.6 • V) SL, W	
Oil Storage Water Heaters	≤30.78 kW	≥75.7 L	~~0.59–0.0005V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	>30.78 kW	<309.75 W/L	80% E_t (Q/799 + 16.6 • V) SL, W	Section G.1 of ANSI Z21.10.3
Oil Instantaneous Water Heaters	≤61.55 kW	≥309.75 W/L and <7.57 L	~~0.59–0.0005V EF~~ See footnote "g"	~~DOE 10 CFR Part 430~~
	>61.55 kW	≥309.75 W/L and <37.85	80% E_t	Section G.1 of ANSI Z21.10.3
	>61.55 kW	≥309.75 W/L and ≥37.85	78% E_t (Q/799 + 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	Section G.1 of ANSI Z21.10.3
Hot Water Supply Boilers, Gas		≥309.75 W/L and ≥37.85	80% E_t (Q/799 + 16.6 • V) SL, W	
Hot Water Supply Boilers, Oil		≥309.75 W/L and ≥37.85	78% E_t (Q/799 + 16.6 • V) SL,W	
Pool Heaters Ga	All		~~78% E_t~~ See footnote "g"	~~ASHRAE 146~~
Pool Heaters, oil	All		78% E_t	ASHRAE 146
Heat Pump Pool Heaters	All	10ºC db 6.8ºC wb Outdoor Air 26.7ºC Entering Water	4.0 COP	AHRI 1160
Unfired Storage Tanks	All		R-2.2	(none)

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a ~~Energy factor (EF) and t~~Thermal efficiency (*Et*) ~~are~~ is a 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 litres.~~ In the SL equation, *V* is the rated volume in liters and *Q* is the nameplate input rate in W. V_m is the measured volume in the tank.

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.

d Electric water heaters with input rates below 12kW must comply with these requirements if the water heater is designed to heat water to temperatures of 82.2°C or higher.

e Refer to Section 7.5.3 for additional requirements for gas storage and instantaneous water heaters and gas hot water supply boilers.

g. In the U.S. the efficiency requirements for water heaters or gas pool heaters in this category or subcategory are specified by the U.S. Department of Energy. Those requirements and applicable test procedures are found in the Code of Federal Regulations 10 CFR Part 430. Informative Note: See Informative Appendix H for the US Department of Energy efficiency requirements applicable to these water heaters and pool heaters.

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(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE APPENDIX H
U.S. DEPARTMENT OF ENERGY EFFICIENCY REQUIREMENTS

In the United States, the U.S. Department of Energy establishes efficiency standards for products which it defines as residential covered products. Since these products are used in buildings covered by this standard, the DOE efficiency requirements are shown here for ease of reference. All DOE efficiency for residential products are found in the U.S. *Code of Federal Regulations 10 CFR Part 430 Subpart C, Section 430.32.*

H1. DOE Minimum Energy Efficiency Requirements For Single-Phase Air Conditioners And Heat Pumps

These standards became effective on January 1, 2015. In the United States, some of the standards are regional in nature. The U.S. has been divided into 3 regions: (1) the "north", comprising states with a population weighted heating degree days (HDD) equal to or greater than 5000; (2) the "southeast", comprising states with a population weighted HDD less than 5000; and (3) the "southwest", comprising Arizona, California, Nevada, and New Mexico. The regions are shown in Figure H-1 (reprinted from the June 27, 2011 *Federal Register* 76 FR 37431).

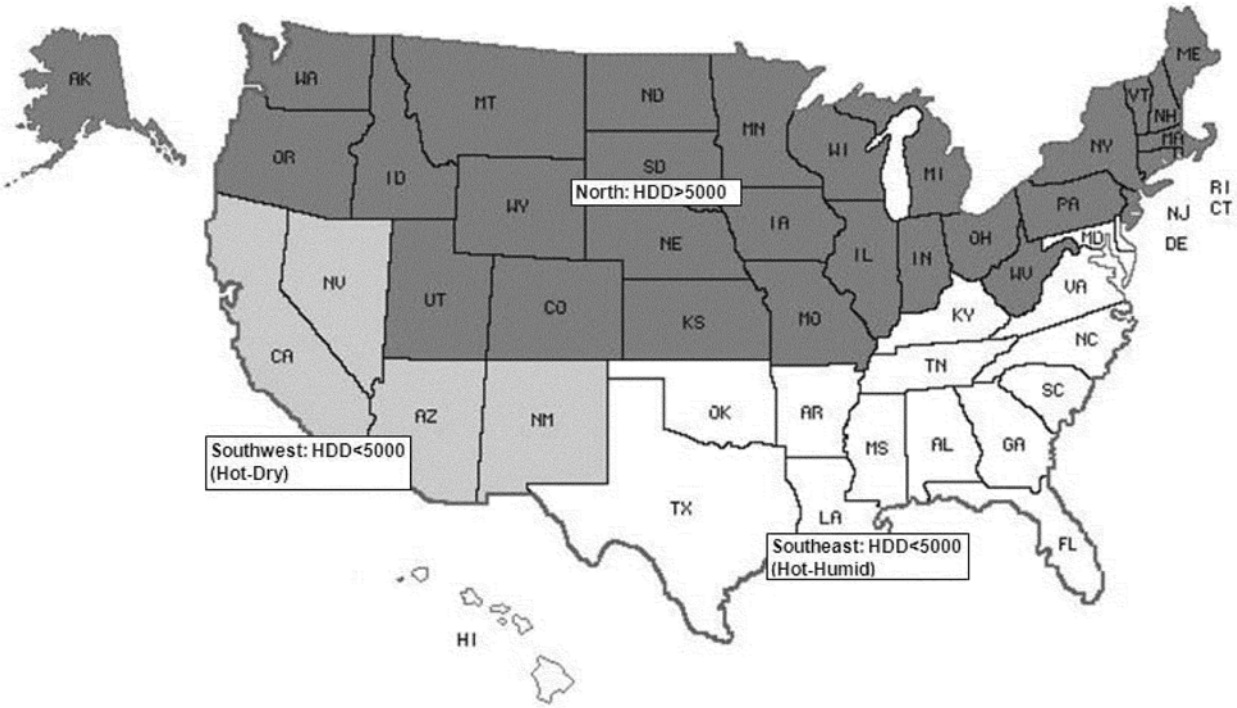

Figure III.3 Map of the Regions for the Analysis of Central Air Conditioners and Heat Pumps

The U.S. federal minimum energy efficiency standards for single-phase air conditioners and heat pumps are shown in Table H-1 below. The standards apply to residential single-phase air conditioners and heat pumps that are rated at less than 65,000 Btu/h (19 kW) of cooling capacity.

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Table H-1 – U.S. Minimum Efficiency Requirements for Single-Phase Air Conditioners and Heat Pumps that Have a Cooling Capacity < 65,000 Btu/h (19 kW)

Product Class	National Standards	Southeastern Region Standards[b]	Southwestern Region Standards[c]
Central Air Conditioners and Heat Pumps[d]			
Split-system air conditioners……..	SEER = 13……..	SEER = 14……..	SEER = 14. EER = 12.2 (for units with a rated cooling capacity less than 45,000 Btu/h (13 kW)). EER = 11.7 (for units with a rated cooling capacity equal to or greater than 45,000 (13 kW) Btu/h)
Split-system heat pumps……..	SEER = 14…….. HSPF = 8.2…….	SEER = 14…….. HSPF = 8.2…….	SEER = 14…….. HSPF = 8.2…….
Split-system air conditioners[a] …….	SEER = 14……..	SEER = 14……..	SEER = 14…….. EER = 11.0…….
Single-package heat pumps…….	SEER = 14…….. HSPF = 8.0…….	SEER = 14…….. HSPF = 8.0…….	SEER = 14…….. HSPF = 8.0…….
Small-duct high-velocity systems……..	SEER = 13…….. HSPF = 7.7…….	SEER = 13…….. HSPF = 7.7…….	SEER = 13…….. HSPF = 7.7…….
Space-constrained products – air conditioners[a]……..	SEER = 12……..	SEER = 12……..	SEER = 12……..
Space-constrained products – heat pumps[a]…….	SEER = 12…….. HSPF = 7.4…….	SEER = 12…….. HSPF = 7.4…….	SEER = 12…….. HSPF = 7.4…….

Table Notes:

a. The Northern region for central air conditioners and heat pumps contains the following States: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

b. The Southeastern region for central air conditioners and heat pumps contains the following States: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and the District of Columbia.

c. The Southwestern region for central air conditioners and heat pumps contains the States of Arizona, California, Nevada, and New Mexico.

d. SEER is Seasonal Energy Efficiency Ratio; EER is Energy Efficiency Ratio; HSPF is Heating Seasonal Performance Factor; and Btu/h is British thermal units per hour.

H2 DOE Minimum Energy Efficiency Requirements For Water Heaters

These standards became effective on April 16, 2015, and apply to products manufactured on or after that dates.

Table H-2 – Minimum Energy Efficiency Requirements for Water Heaters (Source: 10 CFR Part 430, Energy Conservation Program: Energy Conservation Standards for Water Heating Pumps) (I-P)

Product class	Minimum Energy Factor (EF)
Gas-fired Water Heater	For tanks with a Rated Storage Volume at or below 55 gallons: EF = 0.675 − (0.0015 × Rated Storage Volume in gallons). For tanks with a Rated Storage Volume above 55 gallons: EF = 0.8012 − (0.00078 × Rated Storage Volume in gallons).
Oil-fired Water Heater	EF = 0.68 − (0.0019 × Rated Storage Volume in gallons).

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Electric Water Heater	For tanks with a Rated Storage Volume at or below 55 gallons: EF = 0.960 − (0.0003 × Rated Storage Volume in gallons). For tanks with a Rated Storage Volume above 55 gallons: EF = 2.057 − (0.00113 × Rated Storage Volume in gallons).
Tabletop Water Heater	EF = 0.93 − (0.00132 × Rated Storage Volume in gallons).
Instantaneous Gas-fired Water Heater	EF = 0.82 − (0.0019 × Rated Storage Volume in gallons).
Instantaneous Electric Water Heater	EF = 0.93 − (0.00132 × Rated Storage Volume in gallons).

Note: The Rated Storage Volume equals the water storage capacity of a water heater, in gallons, as specified by the manufacturer.

Table H-2 – Minimum Energy Efficiency Requirements for Water Heaters (Source: 10 CFR Part 430, Energy Conservation Program: Energy Conservation Standards for Water Heating Pumps) (SI)

Product class	**Minimum Energy Factor (EF)**
Gas-fired Water Heater	For tanks with a Rated Storage Volume at or below 208.2 liters: EF = 0.675 − (0.0004 × Rated Storage Volume in liters). For tanks with a Rated Storage Volume above 208.2 liters: EF = 0.8012 − (0.0002× Rated Storage Volume in liters).
Oil-fired Water Heater	EF = 0.68 − (0.0005 × Rated Storage Volume in liters).
Electric Water Heater	For tanks with a Rated Storage Volume at or below 208.2 liters: EF = 0.960 − (0.00008 × Rated Storage Volume in liters). For tanks with a Rated Storage Volume above 208.2 liters: EF = 2.057 − (0.0003 × Rated Storage Volume in liters).
Tabletop Water Heater	EF = 0.93 − (0.00035 × Rated Storage Volume in liters).
Instantaneous Gas-fired Water Heater	EF = 0.82 − (0.0005 × Rated Storage Volume in liters).
Instantaneous Electric Water Heater	EF = 0.93 − (0.00035 × Rated Storage Volume in liters).

Note: The Rated Storage Volume equals the water storage capacity of a water heater, in liters, as specified by the manufacturer.

H3. DOE Minimum Energy Efficiency Requirements For Pool Heaters

Gas-fired pool heaters manufactured on or after April 16, 2013, shall have a thermal efficiency not less than 82%.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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