

STATE OF NEW YORK
DEPARTMENT OF STATE

ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001
HTTPS://DOS.NY.GOV

KATHY HOCHUL
GOVERNOR

WALTER T. MOSLEY
SECRETARY OF STATE

FINAL DRAFT

Proposed Changes to the 2020 New York State Energy Conservation Construction Code Part 2 of 3 | ASHRAE 90.1 Commercial Provisions July 26, 2024

This document is being developed for the purpose of posting a notice of rule in development for the New York State Fire Prevention and Building Code Council and the New York State Department of State. The purpose is to show the DRAFT proposed changes to the current version of the **New York State Energy Conservation Construction Code** (The State Energy Code). Separate parts of this documents are being issued on the same date: Part 1 contains the proposed changes to the Commercial provisions of the document *Energy Conservation Construction Code of New York State* (ECCCNYS); this Part 2 of 3 contains the proposed changes to the document *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings* published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., also known as ASHRAE 90.1-2022; and Part 3 contains the proposed changes to the Residential provisions of the ECCCNYS, all part of the State Energy Code.

This document **is not intended to include** all of the proposed code language; it only contains those sections of code that are proposed to be new or modified. Unaltered portions of the 2020 code books are not included within this document and should be considered to remain the same for this code update.

Separate incremental versions of this document have been issued for the Residential and Commercial provisions of the State Energy Code. Proposals numbered EC 07-8001 and higher, as summarized in the Quick Reference Guide, are new content since Version 2.0, presented to the Code Council at the meeting of June 2023. The changes are based on the following:

1. Because the State Energy Code is based, in part, on ASHRAE 90.1-2016, coordination and inclusion of NY-specific changes to the ASHRAE 90.1-2022 update and technical errata issued to date.
2. Revisions made to Article 11 of the NYS Energy Law on July 5, 2022 by Chapter 374 of the Laws of 2022 - Advanced Building Codes Act (consistent with the parallel changes proposed for the International Energy Code, included in Version 1.0, and presented at the meeting of March 31, 2023) and other necessary statutory requirements and statutory amendments.
3. Incorporation of provisions of NYStretch 2020 that modify the State Energy Code.

Please note:

- This document may not include grammatical, punctuation, and simple word clarifications that do not change the intent or meaning of a provision.
- Where a change is made by NYS, rather than an ASHRAE level change, “[NY]” is added to the section number; however, purely editorial changes made by NYS that do not change the intent or meaning of a provision may not denoted by [NY].
- Changes to the existing text are denoted in the following manner:
 - Text insertions: **TEXT**
 - Text deletions: ~~TEXT~~
- Where multiple code changes deal with the same topic, they are listed together and consolidated into one proposal number.
- Some code changes involve complex tables, lists, or lengthy sections in which a small change was made to only a portion. In those instances, portions of the section, table, list, etc. that were unchanged may not be included.

Cover sheet - Quick reference guide

Proposal #	Code Section(s)	Section Title	Subject	Origin / Consistency*
EC 07-8001	3.2	Definition, new	Add definition for “ <i>approved</i> ” to align with the ECCCNY and a definition for “ <i>character-defining features</i> ” referenced in Section 4.2.1.3.1.1.	ECCCNY ABCA
EC 07-8003	3.2	Definitions, modified	Modify the definition for the terms: <i>authority having jurisdiction, building, building official, and historic (building)</i> .	ECCCNY ABCA
EC 07-8004	4.2.1.3	Alterations to historic buildings	Modify the exception for historic buildings. New subsection identifying historic building report requirements.	ABCA ECCCNY
EC 07-8005	5.1.4.1	Roof Replacement for Roofs with Insulation Entirely Above Deck	Modify to remove language allowing the building official to approve “an alternative design” in conflict with the variance provisions of the Energy Law.	Energy Law
EC 07-8006	5.5.3, 5.5.5.5, 5.6.1.1	Opaque Elements, Other Elements and Building Assembly Intersections, Building Envelope Trade-Off Compliance Path	New exception for mechanical equipment penetrations through building thermal envelope assemblies.	Strtch 20
EC 07-8007	6.2.1 Tables 6.8.1-1 to -6, 6.8.1-8, 6.8.1-9, & 6.8.1-11 6.9	Requirements for all Compliance Paths Minimum Efficiency Requirements Electric resistance space heating	Limits on the use of electric resistance space heating. Resolve HVAC equipment efficiency ratings and test procedure inconsistencies between the model codes and the DOE website. Updated efficiency values for equipment subject to federal preemption.	ECCCNY DOE
EC 07-8008	8.4.5	Electrification ready	Pointer to the Uniform Code for specific provisions to be met where required.	Energy Law
EC 07-8009	10.4.3.5	Power Conversion	New power conversion requirement for elevators with a rise of 75-ft or more.	Strtch 20
EC 07-8010	10.4.4	Escalators and Moving Walks	New exception for some variable voltage drive systems. New energy recovery requirement.	Strtch 20
EC 07-8011	12.2	Compliance	New envelope performance requirement for new buildings 10,000 sq. ft. and greater.	Strtch 20
EC 07-8012	Table 12.5.1	Modeling requirements for calculating design energy cost and energy cost budget	Corrected multiplier for automatic lighting controls. Errata date 02/15/2024	ASHRAE
EC 07-8013	Several	Summary of “notable” changes in ASHRAE 90.1-2019 & 90.1-2022		ASHRAE

(*) Key for “Origin [of] / Consistency [with]” Column

ABCA Modifications to Article 11 of the Energy Law made by the Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022

ECCCNY The proposed Commercial provisions for the 2024 Energy Conservation Construction Code of New York State

Strtch 20
ASHRAE

NYStretch 2020 – ASHRAE 90.1
Code updates post 2016 and modifications based on errata published after the publication of ASHRAE
90.1-2022

ASHRAE 90.1-2022 Provisions

Section 3. Definitions, abbreviations, and acronyms

EC 07 -8001

Add new:

[NY] approved: acceptable to the *building official*.

EC 07 -8002

Add new:

[NY] character-defining features: those visual aspects and physical elements and spaces that comprise the appearance of a *historic building* and that are significant to the historical, architectural, and cultural values, including the overall shape of the *historic building* or property, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

EC 07 -8003

Revise as follows:

[NY] authority having jurisdiction: the governmental unit or agency ~~or agent~~ responsible for administration and enforcing enforcement of this standard.

[NY] building: any *structure* used or intended for supporting or sheltering any use or occupancy, including any equipment therein.

[NY] building official: the officer or other designated authority ~~having jurisdiction~~ charged with the administration and enforcement of this standard, or a duly authorized representative.

[NY] historic: ~~a an existing building or space that has been specifically designated historically significant by the adopting authority or is listed in The National Register of Historic Places or has been determined to be eligible for such listing by the U.S. Secretary of the Interior; is~~ any of the following:

- a. listed, or certified as eligible for listing, in the National Register of Historic Places or in the New York State Register of Historic Places; or
- b. designated as historic under an applicable state or local law; or
- c. certified as a contributing resource within a National Register listed, State Register listed, or locally designated historic district.

Section 4. Administration and Enforcement

EC 07-8004

Revise as follows:

[NY] 4.2.1.3 Alterations of Existing Building Assemblies, Systems, and Equipment. ~~Alterations of existing buildings~~ building assemblies, systems, and equipment shall comply with the provisions of Section 4.2.2 through 4.2.5 and one of the following:

- a. Sections 5, “Building Envelope”; 6, “Heating, Ventilating, and Air Conditioning”; 7, “Service Water Heating”; 8, “Power”; 9, “Lighting”; and 10, “Other Equipment”; ~~or~~ and 11, “Additional Efficiency Requirements,” or
- b. Normative Appendix G, “Performance Rating Method,” in accordance with Section 4.2.1.1 with the following modifications:

1. Alterations that meet the criteria in Section G3.1.4(a) shall use the BPF from Table 4.2.1.1 multiplied by 1.05.
2. All other alterations modeled following Section G3.3 shall use BPF = 1.

Exception to 4.2.1.3: ~~A building that has been specifically designated as historically significant by the adopting authority or is listed in The National Register of Historic Places or has been determined to be eligible for listing by the U.S. Secretary of the Interior~~ Features of *historic buildings* need not comply with these requirements. When a historic building report, prepared in accordance with Section 4.2.1.3.1, has been submitted and approved by the authority having jurisdiction.

[NY] 4.2.1.3.1 Historic Building Report. Written *historic building* reports shall be signed by a *design professional* or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction. Such report shall identify each feature that is a character-defining feature of the historic form, fabric, or function of such historic building or historic district and shall demonstrate that compliance with a specific provision or provisions of this standard would threaten, degrade or destroy the historic form, fabric or function of the building or historic district.

Section 5. Building Envelope

EC 07 -8005

Revise as follows:

[NY] 5.1.4.1 Roof Replacement for Roofs with Insulation Entirely Above Deck. *Roof replacement for roofs with insulation entirely above deck* shall comply with Section 5.5.3.1, shall not be required to comply with the requirements of Section 5.4.3, and shall not increase the *energy use* of the *building*.

EC 07-8006

Revise as follows:

[NY] 5.5.3 Opaque Areas Elements.

For all *opaque surfaces, except doors, elements*, compliance with Tables 5.5-0 through 5.5-8 for each class of construction as described in Normative Appendix A, Sections A2 through A8 shall be demonstrated by one of the following two methods:

- a. Providing a minimum rated R-value of insulation for the thermal resistance of the added insulation in framing cavities and continuous insulation only. Specifications listed in Normative Appendix A for each class of construction shall be used to determine compliance. added to the assembly equal to or greater than the insulation minimum R-value required of each insulation component.
- b. Providing insulation such that the maximum U-factor, C-factor, or F-factor for the entire assembly. The values for typical construction assemblies listed in Normative Appendix A shall be used to determine compliance. is not exceeded as determined by one of the following:
 1. Precalculated values in accordance with Normative Appendix A, Section A1.1.
 2. Applicant-determined values in accordance with Normative Appendix A, Section A1.2 where such values are approved by the code official.

Exceptions to 5.5.3

1. For *opaque* assemblies ~~significantly different than those in~~ not complying with the classes of construction as described in Normative Appendix A, Sections A2 through A8, calculations shall be performed in accordance with the procedures required in Appendix A. compliance with the maximum U-factors for the “attic and other” or “wood frame and other” opaque element conditions in Tables 5.5-0 through 5.5-8 shall be demonstrated by testing or calculations representative of the designed assembly in accordance with Normative Appendix A, Section A9.1 where approved by the code official.
2. For multiple assemblies within a single *class of construction* for a single *space conditioning category*, compliance shall be shown for either (a) the most restrictive requirement or (b) an area-weighted average *U-factor, C-factor, or F-factor*.
3. When the total area of penetrations from mechanical equipment listed in Table 6.8.1-4 exceeds 1 percent of the opaque above-grade wall area, the mechanical equipment penetration area shall be calculated as a

separate wall assembly using a published and approved U-factor for that equipment or a default U-factor of 0.5 and compliance shall be shown in accordance with method b of this section.

[NY] 5.5.5.5 Other Elements and Building Assembly Intersections. Individual *point thermal bridges* and *linear thermal bridges* not addressed in Sections 5.5.5.1 through 5.5.5.4 shall comply with Equation 5.5.5.5.

$$347 \text{ Btu}\cdot\text{in.}/(\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}) \times 0.003\% \times \text{Above grade area of the building envelope} \geq (k1 \times A1) + (k2 \times A2) + (k3 \times A3) \dots \quad (5.5.5.5)$$

where

$k1, k2, k3 \dots$ = thermal conductivity of material 1, material 2, material 3, etc., expressed in Btu·in./
(ft²·h·°F) for *point thermal bridge* material 1, material 2, material 3, etc. (e.g., concrete, carbon steel, stainless steel, wood)

$A1, A2, A3, \dots$ = the total cross-sectional area of *point thermal bridges* and *linear thermal bridges* of material 1, material 2, material 3, etc., expressed in ft²

Exceptions to 5.5.5.5

1. Service penetrations, including mechanical, electrical, plumbing, telecommunications, and fire services, that pass through the *opaque building envelope*.
2. Insulated *roof curbs* and blocking.
3. Individual *point thermal bridges* that are less than the allowances in Table 5.5.5.5.
4. Penetrations from mechanical equipment listed in Table 6.8.1-4.

5.6 Building Envelope Trade-Off Option

[NY] 5.6.1.1 All components of the *building envelope* shown on architectural drawings or installed in *existing buildings* shall be modeled in the *proposed design*. The *simulation program* model *fenestration* and *opaque building envelope* types and area shall be consistent with the *construction documents*. Any *building envelope* assembly that covers less than 5 percent of the total area of that assembly type (e.g., *exterior walls*) need not be separately described, provided it is similar to an assembly being modeled. If not separately described, the area of a *building envelope* assembly shall be added to the area of an assembly of that same type with the same *orientation* and thermal properties.

Exception to 5.6.1.1: When the total area of penetrations from mechanical equipment listed in Table 6.8.1-4 exceeds 1 percent of the *opaque above-grade wall* area, the mechanical equipment penetration area shall be calculated as a separate wall assembly using a published and approved U-factor for that equipment or a default U-factor of 0.5.

Section 6. Heating, Ventilating, and Air Conditioning

EC 07 -8007

Revise as follows:

[NY] 6.2.1 Requirements for all Compliance Paths. Mechanical equipment and systems shall comply with all of the following:

- a. Section 6.1, “General”
- b. Section 6.4, “Mandatory Provisions”
 - Exception to 6.2.1(b):** When compliance is shown using Section 6.2.2(a), compliance with Section 6.4 is not required unless required in Section 6.3.2.
- c. Section 6.7, “Submittals”
- d. Section 6.8, “Minimum Equipment Efficiency Tables”
- e. [Section 6.9, “Electric Resistance Space Heating”](#)

[NY] Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements^{c,d}
 (This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency ^e	Test Procedure ^a
Air conditioners, air cooled	<65,000 Btu/h ^b	All	Split system, three ^b	13.0 SEER before 1/1/2025 13.4 SEER2 after 1/1/2025	AHRI210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single-package, three phase ^b	14.0 SEER before 1/1/2025 13.4 SEER2 after 1/1/2025	
Space constrained, air cooled Through the wall, air-cooled	≤30,000 Btu/h ^b	All	Split system, three phase ^b	12.0 SEER before 1/1/2025 11.7 SEER2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single package, three phase ^b	12.0 SEER before 1/1/2025 11.7 SEER2 after 1/1/2025	
Small duct, high velocity, air cooled	<65,000 Btu/h ^b	All	Split system, three phase ^b	11.0 SEER 12.0 SEER before 1/1/2025 12.0 SEER2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
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 12.9 IEER 14.8 IEER	AHRI 340/360
		All other		11.0 EER 12.7 IEER 14.6 IEER	

≥135,000 Btu/h and <240,000 Btu/h	<i>Electric resistance</i> (or none)	11.0 EER 12.4 IEER 14.2 IEER
	All other	10.8 EER 12.2 IEER 14.0 IEER

[NY] Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements (Continued) ^{c,d}

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency ^e	Test Procedure ^a			
Air conditioners, air cooled (continued)	≥240,000 Btu/h and <760,000 Btu/h	Electric resistance (or none)	Split system and single package	10.0 EER 11.6 IEER 13.2 IEER	AHRI 340/360			
		All other		9.8 EER 11.4 IEER 13.0 IEER				
	≥760,000 Btu/h	Electric resistance (or none)		9.7 EER 11.2 IEER 12.5 IEER				
		All other		9.5 EER 11.0 IEER 12.3 IEER				
	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)			12.1 EER 13.9 IEER	AHRI 340/360
All other			11.9 EER 13.7 IEER					
≥135,000 Btu/h and <240,000 Btu/h		Electric resistance (or none)	12.5 EER 13.9 IEER					
		All other	12.3 EER 13.7 IEER					
≥240,000 Btu/h and <760,000 Btu/h		Electric resistance (or none)	12.4 EER 13.6 IEER					
		All other	12.2 EER 13.4 IEER					
≥760,000 Btu/h		Electric resistance (or none)	12.2 EER 13.5 IEER					
		All other	12.0 EER 13.3 IEER					

[NY] Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units— Minimum Efficiency Requirements (Continued) ^{c,d}

[\(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code\)](#)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency ^e	Test Procedure ^a		
Air conditioners, evaporatively cooled	<65,000 Btu/h ^b	All	Split system and single package	12.1 <i>EER</i> 12.3 <i>IEER</i>	AHRI 210/240		
		≥65,000 Btu/h and <135,000 Btu/h		<i>Electric resistance</i> (or none)	12.1 <i>EER</i> 12.3 <i>IEER</i>	AHRI 340/360	
	All other			11.9 <i>EER</i> 12.1 <i>IEER</i>			
	≥135,000 Btu/h and <240,000 Btu/h	<i>Electric resistance</i> (or none)		12.0 <i>EER</i> 12.2 <i>IEER</i>	11.8 <i>EER</i> 12.0 <i>IEER</i>		
		All other		11.9 <i>EER</i> 12.1 <i>IEER</i>			
	≥240,000 Btu/h and <760,000 Btu/h	<i>Electric resistance</i> (or none)		11.7 <i>EER</i> 11.9 <i>IEER</i>	11.7 <i>EER</i> 11.9 <i>IEER</i>		
		All other		11.5 <i>EER</i> 11.7 <i>IEER</i>			
	≥760,000 Btu/h	<i>Electric resistance</i> (or none)		11.5 <i>EER</i> 11.7 <i>IEER</i>	11.5 <i>EER</i> 11.7 <i>IEER</i>		
		All other		11.5 <i>EER</i> 11.7 <i>IEER</i>			
	Condensing units, air cooled	≥135,000 Btu/h				10.5 <i>EER</i> 11.8 <i>IEER</i>	AHRI 365
	Condensing units, water cooled	≥135,000 Btu/h				13.5 <i>EER</i> 14.0 <i>IEER</i>	AHRI 365
	Condensing units, evaporatively cooled	≥135,000 Btu/h				13.5 <i>EER</i> 14.0 <i>IEER</i>	AHRI 365

a. Section 42.13 contains a ~~complete specification of the referenced test procedure~~ [list of the referenced standards, which include test procedures](#), including the referenced year version of the test procedure.

b. Single-phase, U.S. air-cooled air conditioners <65,000 Btu/h are regulated as consumer products by the U.S. *Code of Federal Regulations* 10 CFR 430. *SEER* and *SEER2* values for single-phase products are set by the U.S. Department of Energy.

c. [DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 that are documented in AHRI 210/240—2023.](#)

d. [This table is a restatement of information found in 10 CFR 430, 10 CFR 431, and ASHRAE 90.1 Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units— Minimum Efficiency Requirements.](#)

e. [Where more than one efficiency requirement, test procedure and date are provided, it pertains to the date of equipment manufacture.](#)

Informative Note: See Informative Appendix F for the U.S. Department of Energy minimum *efficiency* requirements of single-phase air conditioners for U.S. applications.

[NY] Table 6.8.1-2 Electrically Operated Air-Cooled Unitary Heat Pumps—Minimum Efficiency Requirements^{c,d}

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency ^e	Test Procedure ^a
Air cooled (cooling mode)	<65,000 Btu/h ^b	All	Split system, three phase ^b	14.0 SEER before 1/1/2025 14.3 SEER2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single package, three phase ^b	14.0 SEER before 1/1/2025 13.4 SEER2 after 1/1/2025	
Space constrained, air cooled through the wall, air cooled (cooling mode)	≤30,000 Btu/h ^b	All	Split system, three phase ^b	12.0 SEER before 1/1/2025 11.7 SEER2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single package, three phase ^b	12.0 SEER before 1/1/2025 11.7 SEER2 after 1/1/2025	
Small duct, high velocity, air cooled (cooling mode)	<65,000 Btu/h ^b	All	Split System, three phase ^b	11.0 SEER 12.0 SEER before 1/1/2025 12.0 SEER2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
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 12.2 IEER 14.1 IEER	AHRI 340/360
		All other		10.8 EER 12.0 IEER 13.9 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)		10.6 EER 11.6 IEER 13.5 IEER	
		All other		10.4 EER 11.4 IEER 13.3 IEER	
	≥240,000 Btu/h	Electric resistance (or none)		9.5 EER 10.6 IEER 12.5 IEER	
		All other		9.3 EER 10.4 IEER 12.3 IEER	

[NY] Table 6.8.1-2 Electrically Operated Air-Cooled Unitary Heat Pumps—Minimum Efficiency Requirements (Continued)^{c,d}

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency ^e	Test Procedure ^a
Water to air, water loop (cooling mode)	<17,000 Btu/h ≥17,000 Btu/h and <65,000 Btu/h ≥65,000 Btu/h and <135,000 Btu/h	All	86°F entering water	12.2 EER 13.0 EER 13.0 EER	ISO-13256-1
Water to air, groundwater (cooling mode)	<135,000 Btu/h	All	59°F entering water	18.0 EER	ISO-13256-1
Brine to air, ground loop (cooling mode)	<135,000 Btu/h	All	77°F entering water	14.1 EER	ISO-13256-1
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	ISO-13256-2
Brine to water, ground loop (cooling mode)	<135,000 Btu/h	All	77°F entering water	12.4 EER	ISO-13256-2
Air cooled (heating mode)	<65,000 Btu/h ^b (cooling capacity)		Split system, three phase ^b	8.2 HSPF before 1/1/2025 7.5 HSPF2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single package, three phase ^b	8.0 HSPF before 1/1/2025 6.7 HSPF2 after 1/1/2025	
Through the wall, Space constrained, air cooled (heating mode)	≤30,000 Btu/h (cooling capacity)		Split system, three phase ^b	7.4 HSPF before 1/1/2025 7.0 HSPF2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
			Single package, three phase ^b	7.4 HSPF before 1/1/2025 6.7 HSPF2 after 1/1/2025	
Small duct high velocity, air cooled (heating mode)	<65,000 Btu/h ^b		Split system, three phase ^b	6.8 7.2 HSPF before 1/1/2025 6.9 HSPF2 after 1/1/2025	AHRI 210/240-2017 before 1/1/2025 AHRI 210/240-2023 after 1/1/2025
Air cooled (heating mode)	≥65,000 Btu/h and <135,000 Btu/h (cooling capacity)		47°F db/43°F wb outdoor air	3.30 COP _H 3.40 COP _H	AHRI 340/360
			17°F db/15°F wb outdoor air	2.25 COP _H	
	47°F db/43°F wb outdoor air		3.20 COP _H 3.30 COP _H		
	17°F db/15°F wb outdoor air		2.05 COP _H		
	≥135,000 Btu/h and <240,000 Btu/h (cooling capacity)				

	<u>≥240,000 Btu/h (cooling capacity)</u>		<u>47°F db/43°F wb outdoor air</u>	<u>3.20 COP_H</u>	
			<u>17°F db/15°F wb outdoor air</u>	<u>2.05 COP_H</u>	
Water to air, water loop (heating mode)	<135,000 Btu/h (cooling capacity)		68°F entering water	4.3 COP_H	ISO 13256-1
Water to air, groundwater (heating mode)	<135,000 Btu/h (cooling capacity)		50°F entering water	3.7 COP_H	ISO 13256-1
Brine to air, ground loop (heating mode)	<135,000 Btu/h (cooling capacity)		32°F entering water	3.2 COP_H	ISO 13256-1
Water to water, water loop (heating mode)	<135,000 Btu/h (cooling capacity)		68°F entering water	3.7 COP_H	ISO 13256-2
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	ISO 13256-2

a. Section [4213](#) contains a [complete specification of the referenced test procedure](#) list of the referenced standards, which include test procedures, including the referenced year version of the test procedure.

b. Single-phase, U.S. air-cooled air conditioners <65,000 Btu/h are regulated as consumer products by the U.S. *Code of Federal Regulations* 10 CFR 430. *SEER* and *SEER2* values for single-phase products are set by the U.S. Department of Energy.

c. [DOE 10 CFR 430 Subpart B Appendix M1](#) includes the test procedure updates effective 1/1/2023 that are documented in [AHRI 210/240—2023](#).

d. [This table is a restatement of information found in 10 CFR 430, 10 CFR 431, and ASHRAE 90.1 Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements.](#)

e. [Where more than one efficiency requirement, test procedure and date are provided, it pertains to the date of equipment manufacture.](#)

Informative Note: See Informative Appendix F for the U.S. Department of Energy minimum.

NY Table 6.8.1-3 Water-Liquid-Chilling Packages—Minimum Efficiency Requirements^{a,b,e}

Equipment Type	Size Category	Units	Path A	Path B	Test Procedure ^c
Air-cooled	<150 tons	<i>EER</i> (Btu/Wh)	≥10.100 FL	≥9.700 FL	AHRI 550/590
			≥13.700 <i>IPLV</i> .IP	≥15.800 <i>IPLV</i> .IP	
	≥150 tons		≥10.100 FL	≥9.700 FL	
	≥14.000 <i>IPLV</i> .IP		≥16.100 <i>IPLV</i> .IP		
Air-cooled without condenser, electrically operated	All capacities	<i>EER</i> (Btu/Wh)	Air-cooled without condenser must be rated with matching condensers and comply with air-cooled chiller <i>efficiency</i> requirements.		AHRI 550/590
Liquid-Water -cooled, electrically operated positive displacement	<75 tons	<i>kW</i> /ton	≤0.750 FL	≤0.780 FL	AHRI 550/590
	≥75 tons and <150 tons		≤0.600 <i>IPLV</i> .IP	≤0.500 <i>IPLV</i> .IP	
			≤0.720 FL	≤0.750 FL	
	≥150 tons and <300 tons		≤0.560 <i>IPLV</i> .IP	≤0.490 <i>IPLV</i> .IP	
			≤0.660 FL	≤0.680 FL	
	≥300 tons and <600 tons		≤0.540 <i>IPLV</i> .IP	≤0.440 <i>IPLV</i> .IP	
			≤0.610 FL	≤0.625 FL	
	≥600 tons		≤0.520 <i>IPLV</i> .IP	≤0.410 <i>IPLV</i> .IP	
≤0.560 FL		≤0.585 FL			
Liquid-Water -cooled, electrically operated centrifugal	<150 tons	<i>kW</i> /ton	≤0.610 FL	≤0.695 FL	AHRI 550/590
	≥150 tons and <300 tons		≤0.550 <i>IPLV</i> .IP	≤0.440 <i>IPLV</i> .IP	
			≤0.610 FL	≤0.635 FL	
	≥300 tons and <400 tons		≤0.550 <i>IPLV</i> .IP	≤0.400 <i>IPLV</i> .IP	
			≤0.560 FL	≤0.595 FL	
	≥400 tons and <600 tons		≤0.520 <i>IPLV</i> .IP	≤0.390 <i>IPLV</i> .IP	
			≤0.560 FL	≤0.585 FL	
	≥600 tons		≤0.500 <i>IPLV</i> .IP	≤0.380 <i>IPLV</i> .IP	
≤0.560 FL		≤0.585 FL			
Air-cooled absorption, single effect	All capacities	<i>COP</i> (W/W)	≥0.600 FL	Na ^d	AHRI 560
Liquid-Water -cooled absorption, single effect	All capacities	<i>COP</i> (W/W)	≥0.700 FL	Na ^d	AHRI 560
Absorption double effect, indirect fired	All capacities	<i>COP</i> (W/W)	≥1.000 FL	Na ^d	AHRI 560
			≥1.050 <i>IPLV</i> .IP		
Absorption double effect, direct fired	All capacities	<i>COP</i> (W/W)	≥1.000 FL	Na ^d	AHRI 560
			≥1.000 <i>IPLV</i>		

a. The requirements for centrifugal chilling packages shall be adjusted for nonstandard rating conditions per Section 6.4.1.2.1 and are only applicable for the range of conditions listed there. The requirements for air-cooled, liquid-cooled positive displacement and absorption chilling packages are at standard rating conditions defined in the reference test procedure.

b. Both the full-load and *IPLV*.IP requirements must be met or exceeded to comply with this standard. When there is a Path B, compliance can be with either Path A or Path B for any application.

c. Section 4.2.3 contains a ~~complete specification of the referenced test procedure~~ [list of the referenced standards, which include test procedures](#), including the referenced year version of the test procedure.

d. NA means the requirements are not applicable for Path B, and only Path A can be used for compliance.

e. FL is the full-load performance requirements, and *IPLV*.IP is for the part-load performance requirements.

f. Electrically operated chilling packages employing a freeze-protection liquid in accordance with Section 6.4.1.2.2 shall be tested or rated with water for the purpose of compliance with the requirements of this table.

[NY] Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air-Conditioner Heat Pumps—Minimum Efficiency Requirements

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency ^d	Test Procedure ^a
PTAC (cooling mode) standard size	All capacities <7000 Btu/h	95°F db/75°F wb outdoor air ^c	13.8 – (0.300 × Cap/1000) ^e (before 1/1/2015)	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		14.0 – (0.300 × Cap/1000) ^e (as of 1/1/2015)	
	>15,000 Btu/h		11.9 EER	
PTAC (cooling mode) nonstandard size ^{ab}	All capacities <7000 Btu/h	95°F db/75°F wb outdoor air ^c	9.4 EER 10.9 – (0.213 × Cap/1000) ^e EER ^e	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		10.9 – (0.213 × Cap/1000) ^e EER ^e	
	>15,000 Btu/h		7.7 EER	
PTHP (cooling mode) standard size	All capacities <7000 Btu/h	95°F db/75°F wb outdoor air ^c	11.9 EER 14.0 – (0.300 × Cap/1000) ^e EER ^e	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		14.0 – (0.300 × Cap/1000) ^e EER ^e	
	>15,000 Btu/h		9.5 EER	
PTHP (cooling mode) nonstandard size ^b	All capacities <7000 Btu/h	95°F db/75°F wb outdoor air ^c	9.3 EER 10.8 – (0.213 × Cap/1000) ^e EER ^e	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		10.8 – (0.213 × Cap/1000) ^e EER ^e	
	>15,000 Btu/h		7.6 EER	
PTHP (heating mode) standard size	All capacities <7000 Btu/h	47°F db/43°F wb outdoor air	3.3 COP_H 3.7 – (0.052 × Cap/1000) ^e COP _H ^e	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		3.7 – (0.052 × Cap/1000) ^e COP _H ^e	
	>15,000 Btu/h		2.90 COP _H	
PTHP (heating mode) nonstandard size ^b	All capacities <7000 Btu/h	47°F db/43°F wb outdoor air	2.7 COP_H 2.9 – (0.026 × Cap/1000) ^e COP _H ^e	AHRI 310/380
	≥7000 Btu/h and ≤15,000 Btu/h		2.9 – (0.026 × Cap/1000) ^e COP _H ^e	
	>15,000 Btu/h		2.5 COP _H	
SPVAC (cooling mode) single and three phase	<65,000 Btu/h	95°F db/75°F wb outdoor air ^c	11.0 EER 10.0 EER	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 EER	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 EER	
SPVHP (cooling mode)	<65,000 Btu/h	95°F db/75°F wb outdoor air ^c	11.0 EER 10.0 EER	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		10.0 EER	
	≥135,000 Btu/h and <240,000 Btu/h		10.0 EER	
SPVHP (heating mode)	<65,000 Btu/h	47°F db/43°F wb outdoor air	3.3 3.0 COP _H	AHRI 390
	≥65,000 Btu/h and <135,000 Btu/h		3.0 COP _H	
	≥135,000 Btu/h and <240,000 Btu/h		3.0 COP _H	

[NY] Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air-Conditioner Heat Pumps—Minimum Efficiency Requirements (Continued)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency ^d	Test Procedure ^a			
Room air conditioners <u>without reverse cycle</u> with louvered sides <u>for applications outside U.S. d</u>	<6000 Btu/h		<u>11.0 CEER</u> 9.7 SEER	ANSI/AHAM RAC-1			
	≥6000 Btu/h and <8000 Btu/h		<u>11.0 CEER</u> 9.7 SEER				
	≥8000 Btu/h and <14,000 Btu/h		<u>10.9 CEER</u> 9.8 EER				
	≥14,000 Btu/h and <20,000 Btu/h		<u>10.7 CEER</u> 9.7 SEER				
	≥20,000 Btu/h <u>and <28,000 Btu/h</u>		<u>9.4 CEER</u> 8.5 EER				
	≥28,000 Btu/h		<u>9.0 CEER</u>				
<i>SPVAC</i> (cooling mode); nonweatherized space constrained	≤30,000 Btu/h	95°F db/75°F wb outdoor air	9.2 EER	AHRI 390			
	>30,000 Btu/h and ≤36,000 Btu/h		9.0 EER				
<i>SPVHP</i> (cooling mode); nonweatherized space constrained	≤30,000 Btu/h	95°F db/75°F wb outdoor air	9.2 EER	AHRI 390			
	>30,000 Btu/h and ≤36,000 Btu/h		9.0 EER				
<i>SPVHP</i> (heating mode); nonweatherized space constrained	≤30,000 Btu/h	47°F db/43°F wb outdoor air	3.0 COP_H	AHRI 390			
	>30,000 Btu/h and ≤36,000 Btu/h		3.0 COP_H				
Room air conditioners without louvered sides	<6000 Btu/h		<u>10.0 CEER</u>	ANSI/AHAM RAC-1			
	≥6000 Btu/h and <8000 Btu/h <8000 Btu/h		<u>10.0 CEER</u> 9.0 EER				
	≥8000 Btu/h and <11,000 Btu/h ≥8000 Btu/h and <20,000 Btu/h		<u>9.6 CEER</u> 8.5 EER				
	≥11,000 Btu/h and <14,000 Btu/h		<u>9.5 CEER</u>				
	≥14,000 Btu/h and <20,000 Btu/h		<u>9.3 CEER</u>				
	≥20,000 Btu/h		<u>9.4 CEER</u> 8.5 EER				
	Room air conditioners <u>with reverse heat pumps cycle</u> , with louvered sides <u>for applications outside U.S. d</u>		<20,000 Btu/h			<u>9.8 CEER</u> 9.0 EER	ANSI/AHAM RAC-1
	≥20,000 Btu/h		<u>9.3 CEER</u> 8.5 EER				
Room air conditioners <u>with reverse heat pumps cycle</u> , without louvered sides <u>for applications outside U.S. d</u>	<14,000 Btu/h		<u>9.3 CEER</u> 8.5 EER	ANSI/AHAM RAC-1			
	≥14,000 Btu/h		<u>8.7 CEER</u> 8.0 EER				

Room air conditioners, casement only for applications outside U.S. d	All	9.5 CEER 8.7 EER	ANSI/AHAM RAC-1
Room air conditioners, casement slider for applications outside U.S. d	All	10.4 CEER 9.5 EER	ANSI/AHAM RAC-1

- a. Section ~~4213~~ contains a ~~complete specification of the referenced test procedure~~ [list of the referenced standards, which include test procedures](#), including the referenced year version of the test procedure.
- b. Nonstandard size units must be factory *labeled* as follows: “MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS.” Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external *wall* opening of less than 16 in. high or less than 42 in. wide and having a cross-sectional area less than 670 in.².
- c. The cooling-mode wet bulb temperature requirement only applies for units that reject condensate to the condenser coil.
- d. *Room air conditioners* are regulated as consumer products by 10 CFR 430. For U.S. applications of *room air conditioners*, refer to Informative Appendix F, Table F-3, for the U.S. DOE minimum efficiency requirements for U.S. applications.
- e. “Cap” in *EER* and *COP_H* equations for *PTACs* and *PTHPs* means cooling capacity in Btu/h at 95°F outdoor dry-bulb temperature. *Cap*² means the rated cooling capacity of the product in Btu/h. If the unit’s capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit’s capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.

Replace in its entirety:

~~Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements~~

[\[NY\] Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements](#)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

<u>Equipment Type</u>							<u>Minimum Efficiency^b</u>	<u>Test Procedure^a</u>
<u>Description</u>	<u>Fuel</u>	<u>Electric Power Phase</u>	<u>Application Location</u>	<u>Heating Capacity (input), Btu/h^b</u>	<u>Combo-Unit Cooling Capacity, Btu/h</u>	<u>Subtype</u>		
Warm-air furnace	Gas	1	Inside U.S.	<225,000	≥65,000	Nonweatherized	80% <i>AFUE</i>	Appendix N^g
						Weatherized	81% <i>AFUE</i> or 80% <i>E_L^c</i>	Appendix N^g ANSI Z21.47
Warm-air furnace	Gas	3	All	<225,000	All	Nonweatherized	80% <i>AFUE</i>	Appendix N^g
						Weatherized	81% <i>AFUE</i> or 80% <i>E_L^c</i>	Appendix N^g ANSI Z21.47
Warm-air furnace	Gas	All	All	≥ 225,000 and < 400,000	All	All	81% <i>E_L^c</i>	ANSI Z21.47 before 5/8/2023 10 CFR 431.76 after 5/8/2023
Warm-air furnace	Gas	All	Inside U.S.	> 400,000	All	All	81% <i>E_L^c</i>	ANSI Z21.47 before 5/8/2023 10 CFR 431.76 after 5/8/2023
Warm-air furnace	Oil	1	Inside U.S.	<225,000	≥65,000	Nonweatherized	83% <i>AFUE</i> <i>P_{W,SB}</i> < 11 W <i>P_{W,OFF}</i> ≤ 11 W	Appendix N^g
						Weatherized	78% <i>AFUE</i>	Appendix N^g

[NY] Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements (Continued)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type							Minimum Efficiency ^b	Test Procedure ^a
Description	Fuel	Electric Power Phase	Application Location	Heating Capacity (input), Btu/h ^b	Combo-Unit Cooling Capacity, Btu/h	Subtype		
Warm-air furnace	Oil	3	All	<225,000	All	Nonweatherized	83% AFUE	Appendix N ^g
						Weatherized	78% AFUE	Appendix N ^g
Warm-air furnace	Oil	All	All	>225,000	All	All	82% E_t ^d	Section 42 UL 727 before 5/8/2023 10 CFR 431.76 after 5/8/2023
Warm-air furnace	Electric	1	Inside U.S.	<225,000	>65,000	All	78% AFUE $P_{W,SB} \leq 10$ W $P_{W,OFF} \leq 10$ W	Appendix N ^g
Warm-air furnace	Electric	3	All	<225,000	All	All	78% AFUE	Appendix N ^g
Warm-air duct furnaces	Gas	All	All	All	All	All	80% E_c ^d	ANSI Z83.8
Warm-air unit heaters	Gas	All	All	All	All	All	80% E_c ^{d,e}	ANSI Z83.8
Warm-air unit heaters	Oil	All	All	All	All	All	80% E_c ^{d,e}	Section 40 UL 731

a. Section 13 contains a list of the referenced standards, which include test procedures. For this table, the following applies:

- Appendix N = 10 CFR 430 Appendix N
- ANSI Z21.47 = Section 2.39, Thermal Efficiency, ANSI Z21.47
- ANSI Z83.3 = Section 2.10, Efficiency, ANSI Z83.3
- UL 727 = Section 42, Combustion, UL 727
- UL 731 = Section 40, Combustion, UL 731

b. Compliance of multiple firing rate units shall be at the maximum firing rate.

c. E_t = thermal efficiency. Units must also include an interrupted or intermittent ignition device (IID), have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

d. E_c = combustion efficiency (100% less flue losses). See test procedure for detailed discussion.

e. Units must also include an interrupted or intermittent ignition device (IID) and have either power venting or an automatic flue damper.

f. Includes combination units with cooling capacity <65,000 Btu/h. For U.S. applications of federally covered <225,000 Btu/h products, see Informative Appendix F, Table F-4.

g. 10 CFR 430 is limited to single phase equipment that is not contained within the same cabinet with a central air conditioner whose rated cooling capacity is above 65,000 Btu/h but for the test and rating procedures are not impacted for three-phase and can be used for AFUE ratings for ASHRAE/IES Standard 90.1 three-phase products and single-phase products with a cooling capacity greater than 65,000 Btu/h.

[NY] Table 6.8.1-6 Gas- and Oil-Fired Boilers—Minimum Efficiency Requirements

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type ^a	Subcategory or Rating Condition	Size Category (Input)	Minimum Efficiency ⁱ	Efficiency as of 3/2/2020	Test Procedure
Boilers, hot water	Gas fired ^h	<300,000 Btu/h ^{f,g} for applications outside U.S. ⁱ	82% AFUE	82% AFUE	10 CFR Part 430 Appendix N
		≥300,000 Btu/h and ≤2,500,000 Btu/h ^d	80% E_t ^c	80% E_t ^e	10 CFR 431.86
		>2,500,000 Btu/h ^d and < 10,000,000 Btu/h ^b	82% E_c ^b	82% E_c ^b	
		>10,000,000 Btu/h ^b	82% E_c ^b		
	Oil fired ^e	<300,000 Btu/h ^{f,g} for applications outside U.S. ⁱ	84% AFUE	84% AFUE	10 CFR Part 430 Appendix N
		≥300,000 Btu/h and ≤2,500,000 Btu/h ^d	82% E_t ^c	82% E_t ^e	10 CFR 431.86
		>2,500,000 Btu/h ^d and < 10,000,000 Btu/h ^b	84% E_c ^b	84% E_c ^b	
		>10,000,000 Btu/h ^b	84% E_c ^b		
Boilers, steam	Gas-fired	<300,000 Btu/h ^f for applications outside U.S. ⁱ	80% AFUE	80% AFUE	10 CFR Part 430 Appendix N
	Gas fired— all, except natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h ^d	79% E_t ^c	79% E_t ^e	10 CFR 431.86
		>2,500,000 Btu/h ^d and < 10,000,000 Btu/h ^b	79% E_t ^c	79% E_t ^e	
		>10,000,000 Btu/h ^b	79% E_t ^c		
	Gas fired— natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h ^d	77% E_t ^c	79% E_t ^e	
		>2,500,000 Btu/h ^d	77% E_t ^c	79% E_t ^e	
	Oil fired ^e	<300,000 Btu/h ^f for applications outside U.S. ⁱ	82% AFUE	82% AFUE	10 CFR 430 Appendix N
		≥300,000 Btu/h and ≤2,500,000 Btu/h ^d	81% E_t ^c	81% E_t ^e	10 CFR 431.86
		>2,500,000 Btu/h ^d and < 10,000,000 Btu/h ^b	81% E_t ^c	81% E_t ^e	
		>10,000,000 Btu/h ^b	81% E_t ^c		

a. These requirements apply to *boilers* with rated input of 8,000,000 Btu/h or less that are not packaged *boilers* and to all packaged *boilers*. Minimum *efficiency* requirements for *boilers* cover all capacities of packaged *boilers*.

b. E_c = combustion *efficiency* (100% less flue losses). See reference document for detailed information.

c. E_t = thermal *efficiency*. See reference document for detailed information.

d. Maximum capacity—minimum and maximum ratings as provided for and allowed by the unit's controls.

e. Includes oil-fired (residual).

f. *Boilers* shall not be equipped with a constant burning pilot light.

g. A *boiler* not equipped with a tankless domestic water-heating coil shall be equipped with an *automatic* means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.

h. For new construction, refer to Section 6.4.1.1 for additional system compliance requirements.

i. See Informative Appendix F, Table F-4, for U.S. minimum *efficiencies* for residential products covered by U.S. DOE requirements for U.S. applications.

[NY] Table 6.8.1-9 6.8.1-8 Electrically Operated Variable-Refrigerant-Flow Air Conditioners—Minimum Efficiency Requirements

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type ^a	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF air conditioners, air cooled	<65,000 Btu/h	All	VRF multisplit system	<u>13.0 SEER</u> Before 1/1/25 <i>SEER2 = 13.4</i> On or after 1/1/25	AHRI 1230- <u>AHRI 210/240-2023</u>
	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.2 EER Before 1/1/2024 13.1 IEER (before 1/1/2017) 15.5 IEER On or after 1/1/24 (as of 1/1/2017)	<u>AHRI 1230-2021</u>
		<u>All other</u>		<u>7 EER before 1/1/2024</u> <u>15.5 IEER after 1/1/2024</u>	
	≥135,000 Btu/h and <240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.0 EER Before 1/1/2024 12.9 IEER (before 1/1/2017) 14.9 IEER On or after 1/1/24 (as of 1/1/2017)	
<u>All other</u>		<u>10.8 EER before 1/1/2024</u> <u>14.9 IEER after 1/1/2024</u>			
≥240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	10.0 EER Before 1/1/2024 11.6 IEER (before 1/1/2017) 13.9 IEER On or after 1/1/24 (as of 1/1/2017)		
	<u>All other</u>		<u>9.8 EER before 1/1/2024</u> <u>13.9 IEER after 1/1/2024</u>		

a. VRF outdoor units can be combined with innumerable indoor unit combinations, which will vary by application, building type, building size, operating conditions, and comfort level goals. Selection of indoor units tested during the test is considered to be representative of commonly sold applications and is detailed in AHRI 1230.

Informative Note: For single-phase VRF air conditioners, air-cooled systems less than 65,000 Btu/h see Informative Appendix F, Table F-1 for the U.S. Department of Energy minimum.

**[NY] Table 6.8.1-10 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps—
Minimum Efficiency Requirements**

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF air cooled (cooling mode)	<65,000 Btu/h	All	VRF multisplit system	13.0 SEER <u>Before 1/1/2025</u> SEER2 = 13.4 <u>On or after 1/1/2025</u>	AHRI 1230- <u>AHRI 210/240-2023</u>
	≥65,000 Btu/h and <135,000 Btu/h	Electric resistance (or none)		11.0 EER <u>Before 1/1/2024</u> 12.9 IEER (before 1/1/2017) 14.6 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	AHRI 1230- <u>AHRI 1230-2021</u>
			VRF multisplit system with heat recovery	10.8 EER <u>Before 1/1/2024</u> 12.7 IEER (before 1/1/2017) 14.4 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	
	≥135,000 Btu/h and <240,000 Btu/h		VRF multisplit system	10.6 EER <u>Before 1/1/2024</u> 12.3 IEER (before 1/1/2017) 13.9 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	
			VRF multisplit system with heat recovery	10.4 EER <u>Before 1/1/2024</u> 12.1 IEER (before 1/1/2017) 13.7 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	
	≥240,000 Btu/h and <760,000 Btu/h after 1/1/2024 ≥ 240,000 Btu/h after 1/1/2024		VRF multisplit system	9.5 EER <u>Before 1/1/2024</u> 11.0 IEER (before 1/1/2017) 12.7 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	
			VRF multisplit system with heat recovery	9.3 EER <u>Before 1/1/2024</u> 10.8 IEER (before 1/1/2017) 12.5 IEER <u>On or after 1/1/24 (as of 1/1/2017)</u>	

[NY] Table 6.8.1-10 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps—Minimum Efficiency Requirements (Continued)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF water source (cooling mode)	<17,000 Btu/h	All	VRF multisplit systems 86°F entering water	12.0 EER before 1/1/2024	ISO 13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h		VRF multisplit systems with heat recovery 86°F entering water	11.8 EER before 1/1/2024	
	<65,000 Btu/h		VRF multisplit systems 86°F entering water	12.0 EER before 1/1/2024	ISO 13256-1
	<65,000 Btu/h		VRF multisplit systems 86°F entering water	12.0 EER 16.0 IEER after 1/1/2024 (as of 1/1/2018)	AHRI 1230-2021 Before 11/29/2024
			VRF multisplit systems with heat recovery 86°F entering water	11.8 EER 15.8 IEER after 1/1/2024 (as of 1/1/2018)	
	≥65,000 Btu/h and <135,000 Btu/h		VRF multisplit system 86°F entering water	12.0 EER before 1/1/2024 (as of 1/1/2018) 16.0 IEER after 1/1/2024 (as of 1/1/2018)	AHRI 600–2023 after 11/29/2024
			VRF multisplit system with heat recovery 86°F entering water	11.8 EER before 1/1/2024 (as of 1/1/2018) 15.8 IEER before 1/1/2024 (as of 1/1/2018)	
	≥135,000 Btu/h and <240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER before 1/1/2024 (as of 1/1/2018) 14.0 IEER before 1/1/2024 (as of 1/1/2018)	
			VRF multisplit system with heat recovery 86°F entering water	9.8 EER before 1/1/2024 (as of 1/1/2018) 13.8 IEER before 1/1/2024 (as of 1/1/2017)	
	≥240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER before 1/1/2024 (as of 1/1/2017) 12.0 IEER before 1/1/2024 (as of 1/1/2018)	
VRF multisplit system with heat recovery 86°F entering water			9.8 EER before 1/1/2024 (as of 1/1/2018) 11.8 IEER before 1/1/2024 (as of 1/1/2018)		
VRF groundwater source (cooling mode)	<135,000 Btu/h	All	VRF multisplit system 59°F entering water	16.2 EER	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
			VRF multisplit system with heat recovery 59°F entering water	16.0 EER	
	≥135,000 Btu/h		VRF multisplit system 59°F entering water	13.8 EER	
			VRF multisplit system with heat recovery 59°F entering water	13.6 EER	

[NY] Table 6.8.4-10 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps— Minimum Efficiency Requirements (Continued)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF ground source (cooling mode)	<135,000 Btu/h	All	VRF multisplit system 77° F entering water	13.4 EER	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
			VRF multisplit system with heat recovery 77° F entering water	13.2 EER	
	≥135,000 Btu/h		VRF multisplit system 77° F entering water	11.0 EER	
	VRF multisplit system With heat recovery 77° F entering water		10.8 EER		
VRF air cooled (heating mode)	<65,000 Btu/h (cooling capacity)		VRF multisplit system	7.7 HSPF HSPF2 = 7.5	AHRI 1230- AHRI 210/240-2023
	≥65,000 Btu/h and <135,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.3 COP _H	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
			17°F db/15°F wb outdoor air	2.25 COP _H	
	≥135,000 Btu/h and < 760,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.2 COP _H	
			17°F db/15°F wb outdoor air	2.05 COP _H	
VRF water source (heating mode)	<65,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.3 COP _H 4.2 COP_H (before 1/1/2018)	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
	≥65,000 Btu/h and <135,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.3 COP _H 4.2 COP_H (before 1/1/2018)	
	≥135,000 Btu/h and <240,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.0 COP _H 3.9 COP_H (before 1/1/2018)	
	≥240,000 Btu/h and < 760,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	3.9 COP _H	
VRF groundwater source (heating mode)	<135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.6 COP _H	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
	≥135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.3 COP _H	
VRF ground source (heating mode)	<135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	3.1 COP _H	AHRI 1230-2014 with Addendum 1 before 1/1/2024 AHRI 1230-2021 on or after 1/1/2024
	≥135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	2.8 COP _H	

a. VRF outdoor units can be combined with innumerable indoor unit combinations, which will vary by application, building type, building size, operating conditions, and comfort level goals. Selection of indoor units tested during the test is considered to be representative of commonly sold applications and is detailed in AHRI 1230.

Informative Note: For single-phase VRF multisplit system less than 65,000 Btu/h, see Informative Appendix F, Table F-1 for the U.S. Department of Energy minimum.

Replace in its entirety and combine:

~~Table 6.8.1-12 Commercial Refrigerator and Freezers—Minimum Efficiency Requirements~~

~~Table 6.8.1-13 Commercial Refrigeration—Minimum Efficiency Requirements~~

[NY] Table 6.8.1-11 Commercial Refrigerators, Commercial Freezers, and Refrigeration—Minimum Efficiency Requirements^a

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

<u>Equipment Category</u>	<u>Condensing Unit Configuration</u>	<u>Equipment Family</u>	<u>Rating Temp., °F</u>	<u>Operating Temp., °F</u>	<u>Equipment Classification^c</u>	<u>Maximum Daily Energy Consumption, kWh/day^{d,e}</u>	<u>Test Procedure</u>			
<u>Remote condensing commercial refrigerators and commercial freezers</u>	Remote (RC)	<u>Vertical open (VOP)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>VOP.RC.M</u>	<u>0.64 × TDA + 4.07</u>	<u>AHRI 1200</u>			
			<u>0 (L)</u>	<u>≤32</u>	<u>VOP.RC.L</u>	<u>2.20 × TDA + 6.85</u>				
		<u>Semivertical open (SVO)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>SVO.RC.M</u>	<u>0.66 × TDA + 3.18</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>SVO.RC.L</u>	<u>2.20 × TDA + 6.85</u>				
		<u>Horizontal open (HZO)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>HZO.RC.M</u>	<u>0.35 × TDA + 2.88</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>HZO.RC.L</u>	<u>0.55 × TDA + 6.88</u>				
		<u>Vertical closed transparent (VCT)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>VCT.RC.M</u>	<u>0.15 × TDA + 1.95</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>VCT.RC.L</u>	<u>0.49 × TDA + 2.61</u>				
		<u>Horizontal closed transparent (HCT)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>HCT.RC.M</u>	<u>0.16 × TDA + 0.13</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>HCT.RC.L</u>	<u>0.34 × TDA + 0.26</u>				
		<u>Vertical closed solid (VCS)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>VCS.RC.M</u>	<u>0.10 × V + 0.26</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>VCS.RC.L</u>	<u>0.21 × V + 0.54</u>				
		<u>Horizontal closed solid (HCS)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>HCS.RC.M</u>	<u>0.10 × V + 0.26</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>HCS.RC.L</u>	<u>0.21 × V + 0.54</u>				
		<u>Service over counter (SOC)</u>	<u>38 (M)</u>	<u>≥32</u>	<u>SOC.RC.M</u>	<u>0.44 × TDA + 0.11</u>				
			<u>0 (L)</u>	<u>≤32</u>	<u>SOC.RC.L</u>	<u>0.93 × TDA + 0.22</u>				
		<u>Self-contained commercial refrigerators and commercial freezers with and without doors</u>	Self-contained (SC)	<u>Vertical open (VOP)</u>	<u>38 (M)</u>	<u>≥32</u>		<u>VOP.SC.M</u>	<u>1.69 × TDA + 4.71</u>	<u>AHRI 1200</u>
					<u>0 (L)</u>	<u>≤32</u>		<u>VOP.SC.L</u>	<u>4.25 × TDA + 11.82</u>	
<u>Semivertical open (SVO)</u>	<u>38 (M)</u>			<u>≥32</u>	<u>SVO.SC.M</u>	<u>1.70 × TDA + 4.59</u>				
	<u>0 (L)</u>			<u>≤32</u>	<u>SVO.SC.L</u>	<u>4.26 × TDA + 11.51</u>				
<u>Horizontal open (HZO)</u>	<u>38 (M)</u>			<u>≥32</u>	<u>HZO.SC.M</u>	<u>0.72 × TDA + 5.55</u>				
	<u>0 (L)</u>			<u>≤32</u>	<u>HZO.SC.L</u>	<u>1.90 × TDA + 7.08</u>				
<u>Vertical closed transparent (VCT)</u>	<u>38 (M)</u>			<u>≥32</u>	<u>VCT.SC.M</u>	<u>0.10 × V + 0.86</u>				
	<u>0 (L)</u>			<u>≤32</u>	<u>VCT.SC.L</u>	<u>0.29 × V + 2.95</u>				
<u>38 (M)</u>	<u>≥32</u>			<u>VCS.SC.M</u>	<u>0.05 × V + 1.36</u>					

	Vertical closed solid (VCS)	0 (L)	≤32	VCS.SC.L	0.22 × V + 1.38
	Horizontal closed transparent (HCT)	38 (M)	≥32	HCT.SC.M	0.06 × V + 0.37
		0 (L)	≤32	HCT.SC.L	0.08 × V + 1.23
	Horizontal closed solid (HCS)	38 (M)	≥32	HCS.SC.M	0.05 × V + 0.91
		0 (L)	≤32	HCS.SC.L	0.06 × V + 1.12
	Service over counter (SOC)	38 (M)	≥32	SOC.SC.M	0.52 × TDA + 1.00
		0 (L)	≤32	SOC.SC.L	1.10 × TDA + 2.10

[NY] Table 6.8.1-11 Commercial Refrigerators, Commercial Freezers, and Refrigeration— Minimum Efficiency Requirements^a (Continued)

(This table is intended to be a restatement of the legally binding provisions found in Title 10 CFR Part 431 included here as a convenience to the users of this code)

Equipment Category	Condensing Unit Configuration	Equipment Family	Rating Temp., °F	Operating Temp., °F	Equipment Classification^c	Maximum Daily Energy Consumption, kWh/day^{d,e}	Test Procedure
Self-contained commercial refrigerators with transparent doors for pull-down temperature applications	Self-contained (SC)	Pull-down (PD)	38 (M)	≥32	PD.SC.M	0.11 × V + 0.81	AHRI 1200
Commercial ice-cream freezers	Remote (RC)	Vertical open (VOP)	-15 (I)	≤-5^b	VOP.RC.I	2.79 × TDA + 8.70	AHRI 1200
		Semivertical open (SVO)			SVO.RC.I	2.79 × TDA + 8.70	
		Horizontal open (HZO)			HZO.RC.I	0.70 × TDA + 8.74	
		Vertical closed transparent (VCT)			VCT.RC.I	0.58 × TDA + 3.05	
		Horizontal closed transparent (HCT)			HCT.RC.I	0.40 × TDA + 0.31	
		Vertical closed solid (VCS)			VCS.RC.I	0.25 × V + 0.63	
		Horizontal closed solid (HCS)			HCS.RC.I	0.25 × V + 0.63	
		Service over counter (SOC)			SOC.RC.I	1.09 × TDA + 0.26	
	Self-contained (SC)	Vertical open (VOP)	VOP.SC.I	5.40 × TDA + 15.02	AHRI 1200		
		Semivertical open (SVO)	SVO.SC.I	5.41 × TDA + 14.63			
		Horizontal open (HZO)	HZO.SC.I	2.42 × TDA + 9.00			
		Vertical closed transparent (VCT)	VCT.SC.I	0.62 × TDA + 3.29			
		Horizontal closed transparent (HCT)	HCT.SC.I	0.56 × TDA + 0.43			
		Vertical closed solid (VCS)	VCS.SC.I	0.34 × V + 0.88			
Horizontal closed solid (HCS)	HCS.SC.I	0.34 × V + 0.88					

	Service over counter (SOC)		SOC.SCI	$1.53 \times TDA + 0.36$
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- The meaning of the letters in this column is indicated in the columns to the left.
- "Ice-cream freezer" is defined in 10 CFR 431.62 as a commercial freezer that is designed to operate at or below -5°F and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.
- Equipment class designations consist of a combination (in sequential order separated by periods (AAA).(BB).(C)) of the following:
(AAA) - An equipment family code (VOP = vertical open, SVO = semivertical open, HZO = horizontal open, VCT = vertical closed transparent doors, VCS = vertical closed solid doors, HCT = horizontal closed transparent doors, HCS = horizontal closed solid doors, and SOC = service over counter); (BB)—An operating mode code (RC = remote condensing and SC = self-contained); a(C)—A rating temperature code (M = medium temperature [38°F], L = low temperature [0°F], or I = ice cream temperature [-15°F]). For example, "VOP.RC.M" refers to the "vertical open, remote condensing, medium temperature" equipment class.
- V is the volume of the case (ft^3) as measured in AHRI Standard 1200, Appendix C.
- TDA is the total display area of the case (ft^2) as measured in AHRI Standard 1200, Appendix D.

Add new:

[NY] 6.9 Electric resistance space heating. *Dwelling units and sleeping units* using electric-resistance space heating shall limit the total installed heating capacity of all electric-resistance space heating to no more than 2.0 kW. All other *occupiable spaces* within the *building* using electric-resistance space heating shall limit the total installed heating capacity of all electric-resistance space heating to no more than 0.25 kW per square foot, 5 percent of the total building HVAC system heating capacity or serve less than 5 percent of the *conditioned floor area*, whichever is less.

Exceptions:

- Portions of *buildings* that require greater electric resistance space heating capacity for health care, research, or commercial and industrial processes subject to the *approval* of the building official.
- Redundant or emergency systems required by regulation in Groups I-2 and I-3 facilities.
- Temporary electric resistance heating systems with a maximum setpoint of 40°F (4°C) in unfinished and unoccupied tenant spaces.

Section 8. Power

EC 07 -8008

Add new:

[NY] 8.4.5 Electrification Ready. *Fossil fuel* equipment and *building* systems required to be electrification ready by 19 NYCRR Part 1240 shall comply with the requirements of Section E3707 of the *Residential Code of New York State*, or Section 2703 of the *Building Code of New York State*, as applicable.

Section 10. Other Equipment

EC 07 -8009

Add new:

[NY] 10.4.3.5 Power Conversion System. New traction elevators with a rise of 75 feet or more in new *buildings* shall have a power conversion system that complies with Sections 10.4.3.5.1 through 10.4.3.5.3.

[NY] 10.4.3.5.1 Motor. Induction motors with a Class IE2 efficiency rating, as defined by IEC EN 60034-30, or alternative technologies, such as permanent magnet synchronous motors that have equal or better efficiency, shall be used.

[NY] 10.4.3.5.2 Transmission. Transmissions shall not reduce the efficiency of the combined motor/transmission for the Class IE2 motor for elevators with capacities below 4,000 lbs. Gearless machines shall be assumed to have a 100 percent transmission efficiency.

[NY] 10.4.3.5.3 Drive. Potential energy released during motion shall be recovered with a regenerative drive that supplies electrical energy to the building electrical system.

EC 07 -8010

Add new:

[NY] 10.4.4 Escalators and Moving Walks. Escalators and moving walks shall *automatically* slow to the minimum permitted speed in accordance with ASME A17.1/CSA B44 when not conveying passengers.

Exception to 10.4.4: A variable voltage drive system that reduces operating voltage in response to light loading conditions is an alternative to the reduced speed function.

[NY] 10.4.4.1 Energy recovery. Escalators shall be designed to recover electrical energy when resisting overspeed in the down direction.

Section ~~11~~ 12. Energy Cost Budget Method

EC 07 -8011

Modify as follows:

[NY] 12.2 Compliance. ~~Compliance with Section 11 will be achieved if~~ The proposed building design shall comply with all of the following:

- a. ~~all requirements of Sections 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4 are met;~~ Sections 5.2.1, 6.2.1, 7.2.1, 8.2.1, 9.2.1, and 10.2.1.
- b. The *design energy cost*, ~~as calculated in Section 11.5, does not exceed the energy cost budget as calculated by the simulation program described in Section 11.4; and~~ shall comply with the following:

$$\text{Design Energy Cost} \leq \text{Energy Cost Budget} \times \left(1 - \frac{\text{EC}_{req}}{1000} \times A_{adj} \right)$$

where

EC_{req} = energy credits required for the building in accordance with Section 11.5.1

A_{adj} = where the project includes *additions* or *alterations* use an adjustment factor as follows; otherwise use 1.0:

$$A_{adj} = \frac{\text{Addition Gross Floor Area} + \text{Alteration Gross Floor Area}}{\text{Modeled gross floor area}}$$

Design energy cost = as calculated in Section 12.5

Energy cost budget = as calculated in Section 12.5

- c. The *energy efficiency* level of installed components ~~specified in the building design meet~~ and systems that meets or ~~exceed~~ exceeds the *efficiency* levels used to calculate the *design energy cost*.
- d. For new buildings, one of the following is met:
 1. The building envelope complies with Section 5.5, "Prescriptive Building Envelope Compliance Path."
 2. Using Section 5.6, "Building Envelope Trade-Off Compliance Option," the *proposed envelope performance factor* shall not exceed the *base envelope performance factor* by more than 15% in multifamily residential, hotel/motel, and dormitory building area types. For all other building area types, the limit shall be 7%. For buildings with both residential and nonresidential occupancies, the limit shall be based on the area-weighted average of the *gross conditioned floor area*.
- e. Verification, testing, and commissioning requirements of Section 4.2.5 shall be met.
- f. Proposed building systems, controls, or building envelope documented in Table 12.7.2(d) that do not have criteria in Sections 5 through 10 shall have verification or testing to document proper installation and operation in accordance with Section 4.2.5
- g. In new buildings 10,000 square feet and greater, an envelope performance factor shall be calculated in accordance with 90.1 Appendix C, and buildings shall comply with one of the following:
 - i. For compliance with this requirement, the base envelope performance factor shall be calculated using metal framing operable windows. In buildings with window area accounting for 40 percent or more of the wall area, the SHGC of the vertical fenestration on east and west oriented façade may be reduced by the following multiplier to account for the permanent site shading from existing buildings or infrastructure.
 - ii. For all other buildings area types, the margin by which the proposed envelope performance factor exceeds the base envelope performance factor shall be not greater than 7 percent. For compliance with this requirement, the base envelope performance factor shall be calculated using metal framing fixed windows.

- iii. For mixed-use buildings, the margin shall be calculated as the gross wall area-weighted average of options a and b.

Informative Note: The *energy cost budget* and the *design energy cost* calculations are applicable only for determining compliance with this standard. They are not predictions of actual *energy* consumption or costs of the *proposed design* after *construction*. Actual experience will differ from these calculations due to variations such as occupancy, *building* operation and maintenance, weather, *energy* use not covered by this standard, changes in *energy* rates between design of the *building* and occupancy, and precision of the calculation tool.

EC 07 -8012

Revise as follows:

Table 12.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget (partial)

Proposed Design (Column A) Design Energy Cost (DEC)	Budget Building Design (Column B) Energy Cost Budget (ECB)
[...]	
6. Lighting	
...	
g. <i>Automatic</i> lighting controls included in the <i>proposed design</i> but not required by Section 9.4.1 shall be modeled using the following methods for each luminaire under control: <ol style="list-style-type: none"> <i>Manual-ON</i> or partial-auto-ON <i>occupancy sensors</i> shall be modeled by reducing the lighting schedule each hour by the <i>occupancy sensor</i> reduction factors in Table G3.7-1 and G3.7-2 for the applicable <i>space</i> type multiplied by 0.25<u>1.25</u>. 	

EC 07 -8013

In addition to NYS-specific changes, ASHRAE has deemed the following updates from the 2016 edition to be “notable:”

General

- Commissioning requirements were added and Section 4.2.5 “Verification, Testing, and Commissioning” was expanded.
- A new energy credits requirement (new Section 11) has been added that enables approximately 4% to 5% cost-effective energy savings through 33 different energy-saving measures. The number of required credits varies by building type and climate zone.
- A minimum prescriptive requirement for on-site renewable energy has been added. This requirement includes exceptions for small buildings, buildings with limited roof space, and other situations where PV installations would be problematic.

Building Envelope

- Minimum criteria for SHGC and U-factors upgraded through all climate zones.
- A requirement was added to perform whole-building air-leakage testing and measurement on buildings less than 25,000 ft².
- Requirements were added that address the impacts of thermal bridges in building envelopes, with a new Informative Appendix K providing supplemental information on application.

Lighting and Power

- Updated installed interior lighting power allowances and minimum control requirements; added a power exception for the germicidal function in luminaires and sources; and removed exceptions for casinos and parking garage daylight transition zone lighting.
- Modified a number of lighting requirements to reflect greater use of higher efficiency LED products and revised lighting practices.
- Added requirements for indoor horticultural lighting in greenhouses and indoor grow buildings based on

a new metric, photosynthetic photon efficacy (PPE), developed in ANSI/ASABE S640.

Mechanical

- New requirements added for ceiling-mounted computer room units.
- New requirement for reporting fan power of ceiling fans.
- Energy recovery added for high-rise residential buildings.
- Introduced an optional Mechanical System Performance Path that allows HVAC system efficiency tradeoffs based on a new metric, total system performance ratio (TSPR).
- Required condensing boilers for new construction in order to achieve 90% or greater efficiency for large boilers (1 to 10 million Btuh. The thermal efficiency requirements for high-capacity gas-fired service water-heating equipment were also increased.
- Established a minimum enthalpy recovery ratio for energy recovery systems and specified operational requirements to ensure proper economized performance.
- Revised demand control ventilation requirements to be based on climate zone and Standard 62.1 airflow requirements.
- New efficiency metrics and minimum efficiency requirements for heat pump and heat reclaim chillers.
- Modified the minimum efficiency requirements for air-source heat pumps and introduced a new metric, COP_{HR}, for units that perform heat recovery during chiller operation.
- Added the minimum energy efficiency requirements (and new CFEI metric) for large-diameter ceiling fans from 10 CFR 430.

Energy Cost Budget Method

- Baseline set for on-site electricity generation systems.

Performance Rating Method (Appendix G)

- New requirements were added to limit trade-offs between the building envelope and other building systems.
- A relaxation in stringency was added when using Normative Appendix G for retrofit projects consisting of substantial alterations.

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