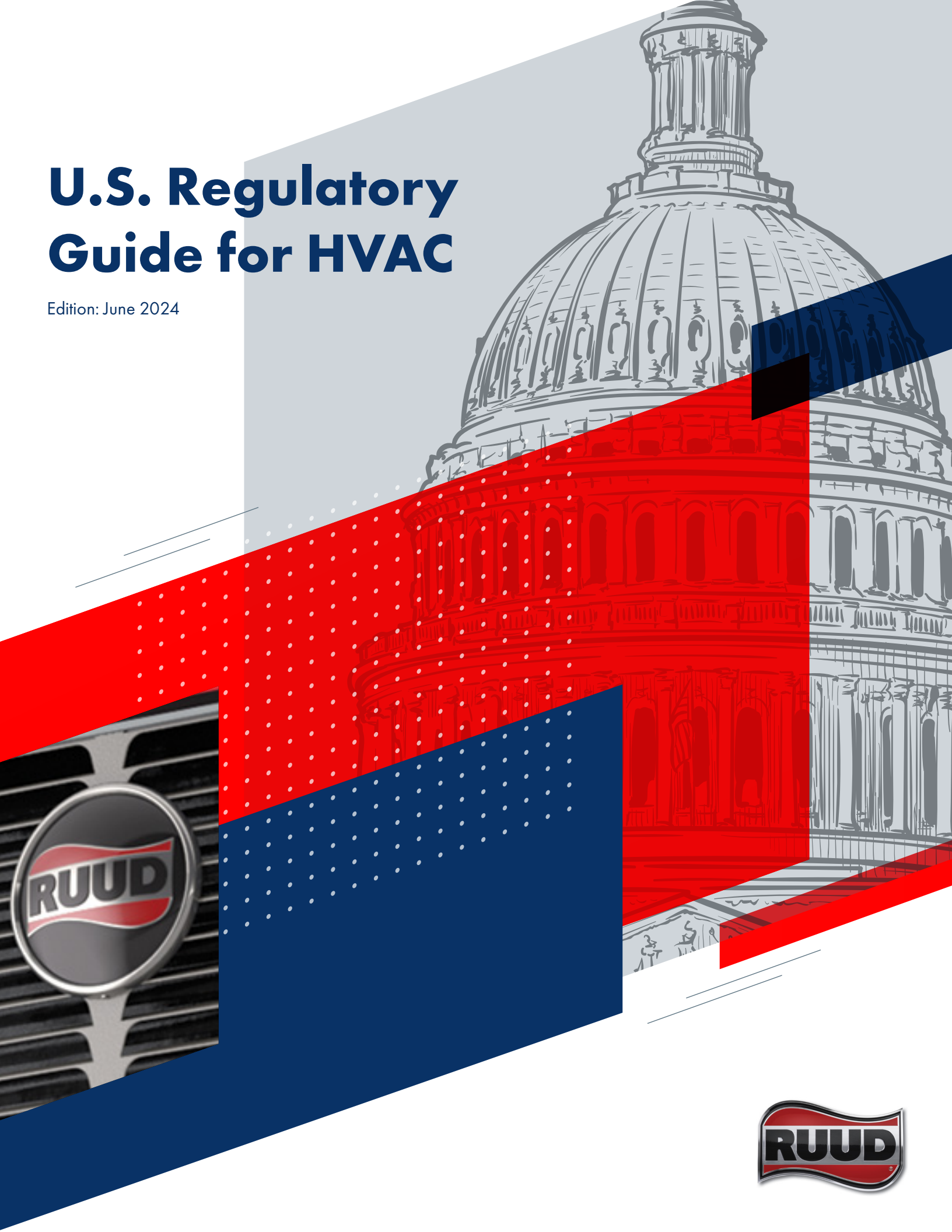


U.S. Regulatory Guide for HVAC

Edition: June 2024



KEEPING YOU READY FOR WHAT'S NEXT

The regulation of energy efficiency and emissions continues to spur change in the HVAC industry. In 2023, we saw significant changes in energy efficiency criteria and ratings that affected residential and commercial equipment throughout the U.S. Next on the horizon is the national phasedown of hydrofluorocarbon (HFC) refrigerants, which will mean a transition to lower global warming potential (GWP) refrigerants for air conditioning.

Regardless of the regulatory challenges, we continue to innovate and deliver Ruud® products that not only meet or exceed requirements, but offer the performance and ease of installation that the industry has come to expect from our trusted brands. We are a leading influencer on industry regulatory issues and are committed to keeping you continually informed and prepared.

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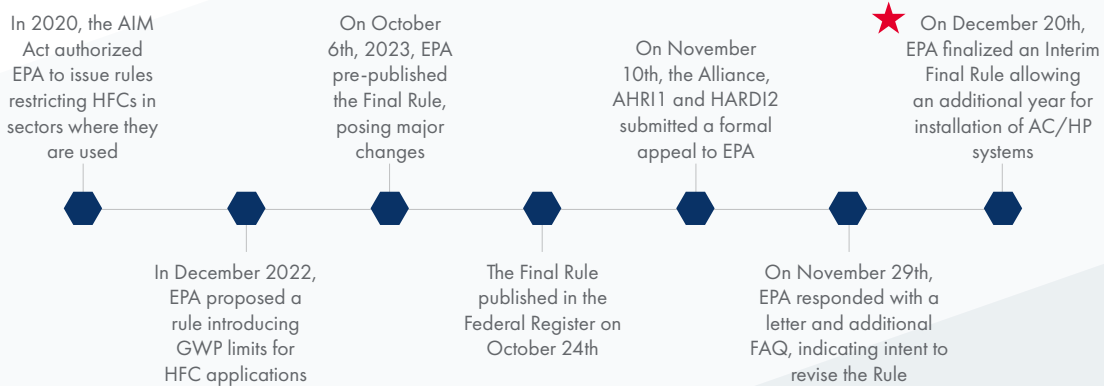
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2025: Technology Transition Rule on GWP Limits

In October 2023, the U.S. EPA finalized the Technology Transitions Restrictions on the Use of Certain Hydrofluorocarbons (HFCs) under Subsection (i) of the AIM Act, establishing GWP limits for the applications that use HFCs. The Technology Transitions Rule contains a 700 GWP limit for air conditioners and heat pumps by 2025, prohibiting the use of R-410A, which has a GWP of 2,088.

This rule has had quite the journey, going back to 2020 when the AIM legislation was enacted. Responding to recent concern by industry, EPA signed an interim final rule in December 2023, regarding the installation compliance date for residential heat pump and air conditioning systems. The amendment allows for installation of higher-GWP HFC equipment manufactured or imported before January 1, 2025, to be installed until January 1, 2026.



Designing for Sustainability with Low GWP

For 2025, the Environmental Protection Agency (EPA) has set a global warming potential (GWP) limit of 700 for refrigerant used in heating and cooling systems. This new requirement will result in a 78%³ lower GWP than previous-generation refrigerants—with only minimal changes to system installation. For us, this is another step toward our continued sustainability goal of reducing greenhouse gas emissions, while still delivering an exceptional level of energy efficient, dependable comfort.



¹Air Conditioning, Heating & Refrigeration Institute. ²Heating, Air Conditioning and Refrigeration Distributors International. ³When comparing the GWP of R-454B to R-410A refrigerant.

Compliance Based on Equipment Type

It is essential to get familiar with the regulation specifics. EPA delineates the equipment categories of Products, Systems and Components, and the rules are different for each.

Packaged equipment are considered “Products” and have a three-year sell-through of existing inventory. “Systems” are considered a grouping of components, such as a split ducted AC/HP or mini-split, and that compliance is based on system installation, but equipment made before 2025 can now be installed through 1/1/26. “Components” are the major elements such as an indoor coil, outdoor condensing unit or air handler, and can be manufactured for R-410A indefinitely as long as they are only used for the service of already-installed equipment and labeled as such.




IMPORTANT:
Compliance date is January 1, 2025, for AC and Heat Pumps, and January 1, 2026, for VRF.



Category	Description	Compliance (JANUARY 1, 2025)	Sell-through	Example
Products	Equipment that is completed or otherwise functional upon leaving the <u>factory</u>	Date of factory manufacture	3 years post compliance date	Packaged products:
Systems	Assemblage of components that are connected and charged in the <u>field</u>	New rule change: 1-yr sell-through (install until end of 2025)		Installed at same time:
Components	Major mechanical elements of AC/HP systems	Date of field installation	(see note)	Installed individually, over time:

California and Washington HFC Rules Overlap With EPA

There is no federal preemption of state authority in the American Innovation and Manufacturing (AIM) Act. Both California and Washington have finalized state HFC rules, and other states are also considering doing the same. It's important to note any differences between local and federal rules for your state, as **the more stringent requirement prevails**.

Residential & Light Commercial AC/HP (excluding VRF)	 U.S. EPA	 CA	 WA
GWP limit	700	750	750
Compliance date	Jan. 1, 2025	Jan. 1, 2025	Jan. 1, 2026 ¹
Compliance basis for packaged and self-contained 'Products'	Date of manufacture	Date of manufacture	Date of manufacture
Sell-through deadline for 'Products'	Jan. 1, 2028	None	None
Compliance basis for split 'Systems'	Date of installation	Date of manufacture	Date of manufacture
Install-through deadline for 'Systems'	Jan. 1, 2026, for equipment made prior to Jan. 1, 2025	None	None
Outdoor condensing unit treatment for 'Systems'	Considered a component replacement of an existing system	Considered a new system installation²	Considered a new system installation²

¹Compliance is due by Jan. 1, 2026, if UL 60335-2-40 Edition 4 is adopted by the WA State Building Code Council by Dec. 31, 2023; otherwise 24 months following the adoption of the updated code. ²R-410A condensing units manufactured prior to 1/1/2025 can continue to be offered for service repair only.

NOTE: In CA, R-410A condensing units manufactured prior to 1/1/25 can continue to be sold for service after the compliance date.

Basics of A2Ls

The most common low-GWP alternatives to R-410A are classified by ASHRAE as mildly flammable, or A2L. Due to their mildly flammable characteristics, A2L refrigerants require updates to standards and building codes to allow for their safe installation.

ASHRAE Standard 34 Safety Groups

Higher Flammability	A3 Propane, Butane	B3
	A2	B2
Lower Flammability	A2L R-454B R-32	B2L Ammonia
	A1 R-410A	B1 R-123, SO ₂
No Flame Propagation	A1 R-410A	B1 R-123, SO ₂
	Lower Toxicity	Higher Toxicity

↑
Increasing Flammability

→
Increasing Toxicity

Building Code & Legislation Updates

In order to install appliances containing flammables in buildings, codes must be modified to allow it. Updated standards and model codes need to be adopted by the states on an individual basis, and there's been a tremendous amount of progress on this as we prepare for 2025. To view where state and local building codes have been updated, or where legislation has passed to allow equipment using A2L, visit [AHRI's A2L Refrigerant Building Code Map](#).



On the Horizon

Furnace Efficiency Rule

On December 18, 2023, the DOE published the final rule for energy conservation standards of consumer furnaces, making official the new minimum annual fuel utilization efficiency (AFUE) of 95% in the Federal Register.

Compliance with the amended standards will be required on December 18, 2028.

NOTE: *The gas industry has launched a lawsuit against DOE, challenging the final rule. The result of the legal challenge will likely take some time to resolve, but stakeholders should continue to prepare for the 2028 compliance date as stated in the rule.*

Commercial HVAC Efficiency Changes

DOE is preparing regulations that will bring new metrics and a 28–35% expected increase in minimum efficiency for large commercial air conditioners and heat pumps. The traditional efficiency rating metrics of IEER and COP will be replaced by IVEC and IVHE, reflecting changes in the DOE test procedure that incorporate additional sources of energy consumption. The anticipated rules will be required for all new large commercial equipment by January 1, 2029.



FAQs

Q. Does the EPA AIM rule require existing equipment to be replaced with low-GWP equipment?

ANSWER:

No, the prohibitions in the AIM low-GWP rule apply only to new equipment.

Q. Will existing R-410A systems be able to be repaired?

ANSWER:

Yes, R-410A systems can be serviced and repaired with replacement components offered by manufacturers.

Q. Can A2L refrigerants be put into an A1 system?

ANSWER:

No. Retrofitting from one refrigerant safety classification to another is a violation of EPA SNAP rules as well as the safety standards.

Q. How are the efficiency standards enforced?

ANSWER:

The DOE relies on reporting of suspected violations by distributors, dealers and contractors. The DOE investigates credible complaints and may assess penalties for violators.

Q. Can I still access ratings information for products made prior to January 1, 2024?

ANSWER:

Yes. Even if a product was moved to "production stopped" or "discontinued" in the AHRI directory, ratings are still available for a period of time after the status change.

Q. How does the DOE define system installation?

ANSWER:

According to the definition in the Code of Federal Regulations, "Installation of a central air conditioner" means the connection of the refrigerant lines and/or electrical systems to make the center air conditioner operational.

Recap: 2023 Minimum Efficiency Standards

(Effective January 1, 2023)

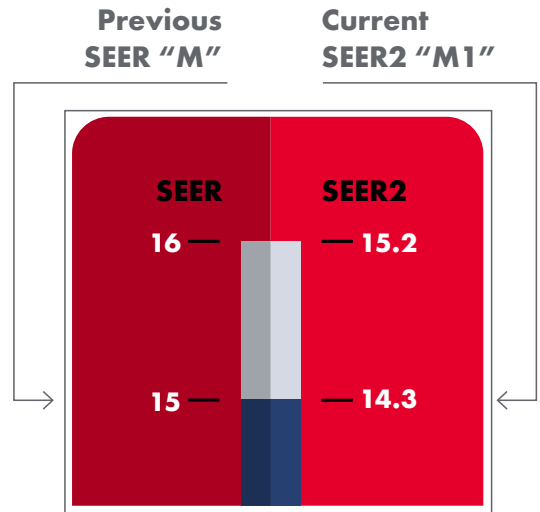
As of 2023, newly manufactured residential and commercial equipment sold in the U.S. must meet minimum efficiency standards set by the DOE. For single-phase residential and light commercial central air conditioning systems, the 2023 minimum efficiency requirements vary by region.

Appendix M1: A System of Measurement

The new test method is commonly referred to as Appendix M1 and replaced Appendix M in the Code of Federal Regulations. For decades, we used the classic metrics of SEER, EER and HSPF. Now, these metrics are referred to as SEER2, EER2 and HSPF2.

What about commercial?

Commercial single-phase air conditioners and heat pumps <65k BTU/HR (typically those in the 3-, 4- and 5-ton range) follow the residential standards. Commercial systems ≥65k BTU/HR also had new minimum efficiency levels go into effect in 2023 on a national basis, with compliance based on date of manufacture. Note that while the metrics of IEER and COP did not change, IEER and COP minimum efficiency levels did increase from the DOE 2018 standard. EER requirements remain unchanged. See the table below for the 2023 requirements. The M1 requirements will apply to small 3-phase systems 5 tons and below starting January 1, 2025.



Navigating Regional Standards

PHASE IN, PHASE OUT

It is important to note that the 2023 requirements apply nationally—*unless* superseded by a regional standard. The regional standards apply in the Southeast and Southwest, and there is a key difference between the national and regional standards when it comes to enforcement. While both had a compliance deadline of January 1, 2023, the national deadline is based on equipment **date of manufacture**, while compliance to the regional standards is based on **date of installation**. Heat pumps do not have regional efficiency criteria, so the national criteria apply in all states.

DOE 2023 6 to 30 tons (≥ 65,000 BTU/HR)

NATIONAL REQUIREMENTS				
Equipment	Rated Capacity (BTU/HR)	Gas/Elec (IEER)	AC (IEER)	HP (IEER/COP)
Commercial Packaged & Splits	≥ 65,000 < 135,000	14.6	14.8	14.1/3.4
	≥ 135,000 < 240,000	14.0	14.2	13.5/3.3
	≥ 240,000	13.0	13.2	12.5/3.2

Compliance for Existing Inventory

AFTER JANUARY 1, 2023:

Outdoor AC units manufactured prior to January 1, 2023, rated using Appendix M, can be installed in the Southeast and Southwest Regions, if the lowest FTC label rating (coil-only) is at or above the new minimum efficiency requirements on a conversion basis. Ratings based on Appendix M will need to be cross-referenced with the corresponding Appendix M1 values.



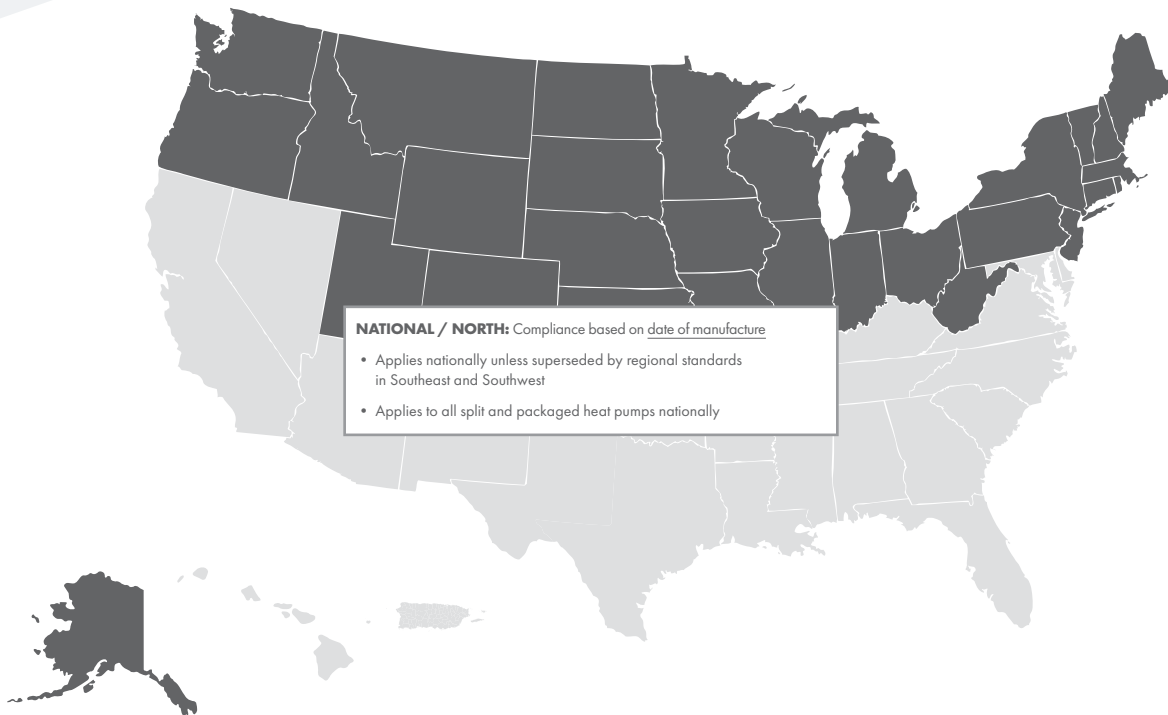
North Region

Understanding Compliance in Your Region

For the states in the North region, compliance is based on **date of manufacture**. Therefore, if a product, as part of an AHRI-rated matched system, was compliant on the day it was produced, it can continue to be sold and installed anywhere in the North region.

NORTH REGION		
PRODUCT CATEGORY	2023 Efficiency Requirements Using Appendix M1	
	SEER2	HSPF2
SPLIT AC < 45k BTU/HR	13.4	
SPLIT AC ≥ 45k BTU/HR	13.4	
SPLIT HP	14.3	7.5
SINGLE PACKAGED AC/GE	13.4	
SINGLE PACKAGED HP	13.4	6.7

NOTE: The above table applies to system matchups and not individual components. Consult the AHRI directory for the most current matchups.



Southeast Region

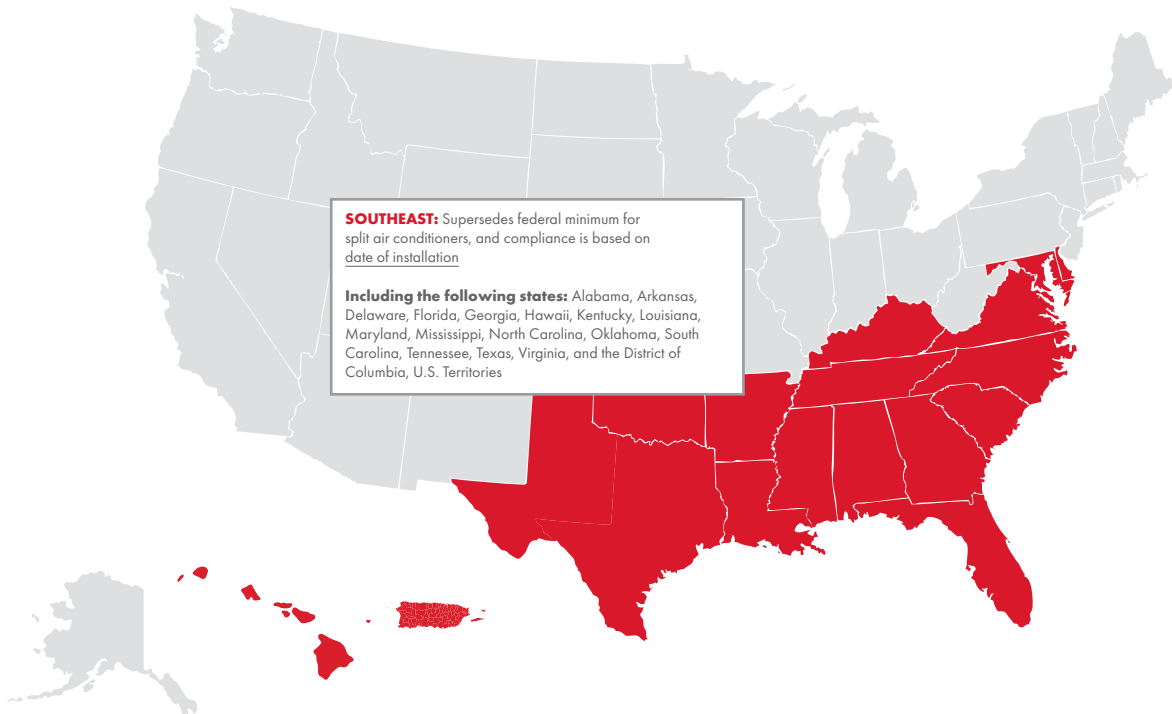
Understanding Compliance in Your Region

For split air conditioner systems in the Southeast states, a regional standard (as highlighted in red below) supersedes the national requirements. Therefore, compliance for that product type is based on **date of installation**. Compliance for all other product types is based on **date of manufacture**.

SOUTHEAST REGION		
PRODUCT CATEGORY	2023 Efficiency Requirements Using Appendix M1	
	SEER2	HSPF2
SPLIT AC < 45k BTU/HR	14.3	
SPLIT AC ≥ 45k BTU/HR	13.8	
SPLIT HP	14.3	7.5
SINGLE PACKAGED AC/GE	13.4	
SINGLE PACKAGED HP	13.4	6.7

Supersedes Split AC national standard of 13.4 SEER2

NOTE: The above table applies to system matchups and not individual components. Consult the AHRI directory for the most current matchups.



Southwest Region

Understanding Compliance in Your Region

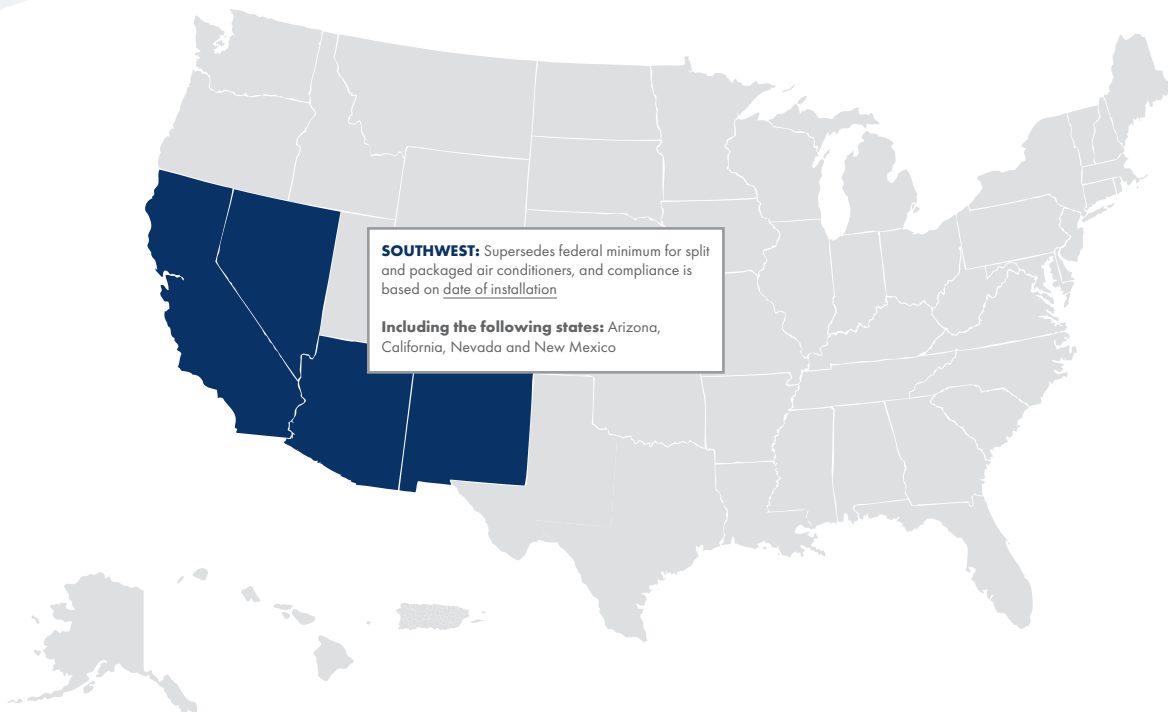
For split and packaged AC and gas/electric (GE) in the Southwest states, a regional standard (as highlighted in blue below) supersedes the national requirements. Therefore, compliance for that product type is based on **date of installation**. Compliance for the other product types is based on **date of manufacture**.

SOUTHWEST REGION			
PRODUCT CATEGORY	2023 Efficiency Requirements Using Appendix M1		
	SEER2	EER2	HSPF2
SPLIT AC < 45k BTU/HR	14.3	11.7/9.8 ¹	
SPLIT AC ≥ 45k BTU/HR	13.8	11.2/9.8 ¹	
SPLIT HP	14.3		7.5
SINGLE PACKAGED AC/GE	13.4	10.6	
SINGLE PACKAGED HP	13.4		6.7

Supersedes Split AC national standard of 13.4 and includes EER2 requirements

¹The lower EER2 requirements are for equipment at or above 15.2 SEER2.

NOTE: The above table applies to system matchups and not individual components. Consult the AHRI directory for the most current matchups.



Enforcement

HOW THE U.S. GOVERNMENT WILL ENSURE COMPLIANCE

The DOE may impose stiff penalties for violators of these regulations. For both contractors and distributors, it is unlawful to knowingly sell or install non-compliant equipment. Ultimately, it's the seller's responsibility to check and ensure that the equipment for sale complies with the regulations in the region in which the equipment will be installed.

- CONTRACTORS
 - › If contractors install equipment that doesn't meet the new standards, they are required to cover all costs associated with replacing the equipment, and they may be subject to additional DOE penalties
 - › Repeat offenders may be placed on a national do-not-sell registry
- DISTRIBUTORS
 - › If distributors knowingly supply non-compliant equipment to contractors, including those who intend to cross regional lines, they may be subject to the same enforcement, plus a per-unit monetary penalty
- If either contractors or distributors are found to be routinely selling or installing non-compliant equipment, they may be prohibited from purchasing any of the covered classes of equipment:
 - › Split-system air conditioners
 - › Split-system heat pumps
 - › Single-packaged air conditioners
 - › Single-packaged heat pumps
 - › Small-duct, high-velocity systems
 - › Space-constrained air conditioners
 - › Space-constrained heat pumps
- DISTRIBUTORS
 - › If a customer believes their contractor has installed an illegal air conditioner, they may report it to DOE at energyefficiencyenforcement@doe.gov or [202-287-6997](tel:202-287-6997)

Learn more <https://www.energy.gov/gc/office-assistant-general-counsel-enforcement>.

NOTE: The information provided does not, and is not intended to, constitute legal advice; instead, all information and content are for general informational purposes only.

Why choose Ruud?

Rather than viewing the regulatory changes as a problem to be solved, we are embracing them as an opportunity to innovate new coil technology, compressor technology, electronics and connected solutions to create an even better Ruud® line for the contractor and the consumer.



[Ruud.com/HVACKnowZone](https://www.ruud.com/HVACKnowZone)

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