

2023 U.S. Energy Efficiency Standards for Residential AC's and Heat Pumps

East Coast

METAL DISTRIBUTORS

“The HVAC Supplier of Choice”

History of Efficiency Standards

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- » The Energy Policy and Conservation Act (ECPA) of 1975 first gave the U.S. Department of Energy (DOE) authority to develop, revise, and implement minimum energy conservation standards for HVAC equipment.
- » The National Appliance Energy Conservation Act of 1987 established the first minimum efficiency requirements for central air-conditioning and heat pump equipment sold in the United States.
 - » These first became effective September 1st, 1990

History of Efficiency Standards

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MINIMUM US FEDERAL EFFICIENCY STANDARDS ENACTED BY NAECA OF 1987

Equipment Type	Minimum Efficiency	Effective Date
Residential Central Air Conditioners (Split Systems)	10 SEER	1/1/1992
Residential Heat Pumps (Split Systems)	10 SEER / 6.8 HSPF	1/1/1992
Residential Central Air Conditioners (Packaged Systems)	9.7 SEER	1/1/1993
Residential Heat Pumps (Packaged Systems)	9.7 SEER / 6.6 HSPF	1/1/1993
Residential Furnaces	78% AFUE	1/1/1992
Mobile Home Furnaces	75% AFUE	9/1/1990

History of Efficiency Standards

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- » The U.S. Department of Energy (DOE) is tasked with reviewing efficiency and testing standards every 6 years. They must then provide guidance on adjusting standards or maintaining them.
- » The next major milestone took place in 2000 when the efficiency standard was raised from 10-SEER to 13-SEER
 - » This became effective on January 1st, 2006

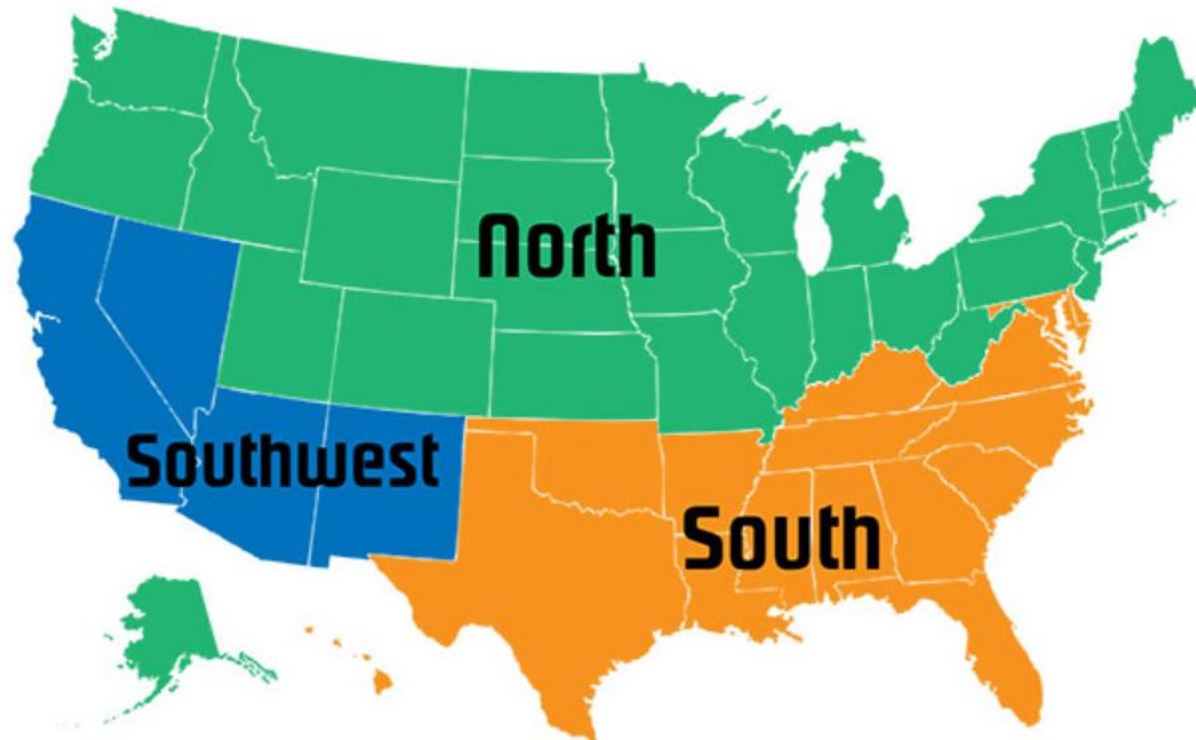
History of Efficiency Standards

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- » Starting not long after 2010 the U.S. Department of Energy (DOE) began to look at the United States from a more regional viewpoint. This allowed for them to factor in different climate zones within the United States.
- » The country was split into 3 “Regions”
 - » North
 - » South
 - » Southwest

History of Efficiency Standards

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History of Efficiency Standards

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» The Regional Efficiency Standards became effective January 1st, 2015

Zones	Split A/C	Packaged A/C	Split Heat Pumps	Packaged Heat Pumps	Gas Furnaces (Weatherized)	Gas Furnaces (Non-Weatherized)	Oil Furnaces (Non-Weatherized)
North	13 SEER	14 SEER	14 SEER 8.2 HSPF	14 SEER 8 HSPF	14 SEER 81% AFUE	90% AFUE	83% AFUE
Southern	14 SEER	14 SEER	14 SEER 8.2 HSPF	14 SEER 8 HSPF	14 SEER 81% AFUE	80% AFUE	83% AFUE
Southwestern	14 SEER / 12.2 EER < 45,000 BTU/H 14 SEER / 11.7 EER ≥ 45,000 BTU/H	14 SEER / 11 EER	14 SEER 8.2 HSPF	14 SEER 8 HSPF	14 SEER 81% AFUE	80% AFUE	83% AFUE

2023 Energy Efficiency Standards

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- » The most recent change to the minimum efficiency standards for Air-Conditioners and Heat Pumps will focus on two key areas:
 - » Energy Efficiency
 - » Testing Procedures
- » The regions throughout the United States will stay the same.

2023 Split AC Standards

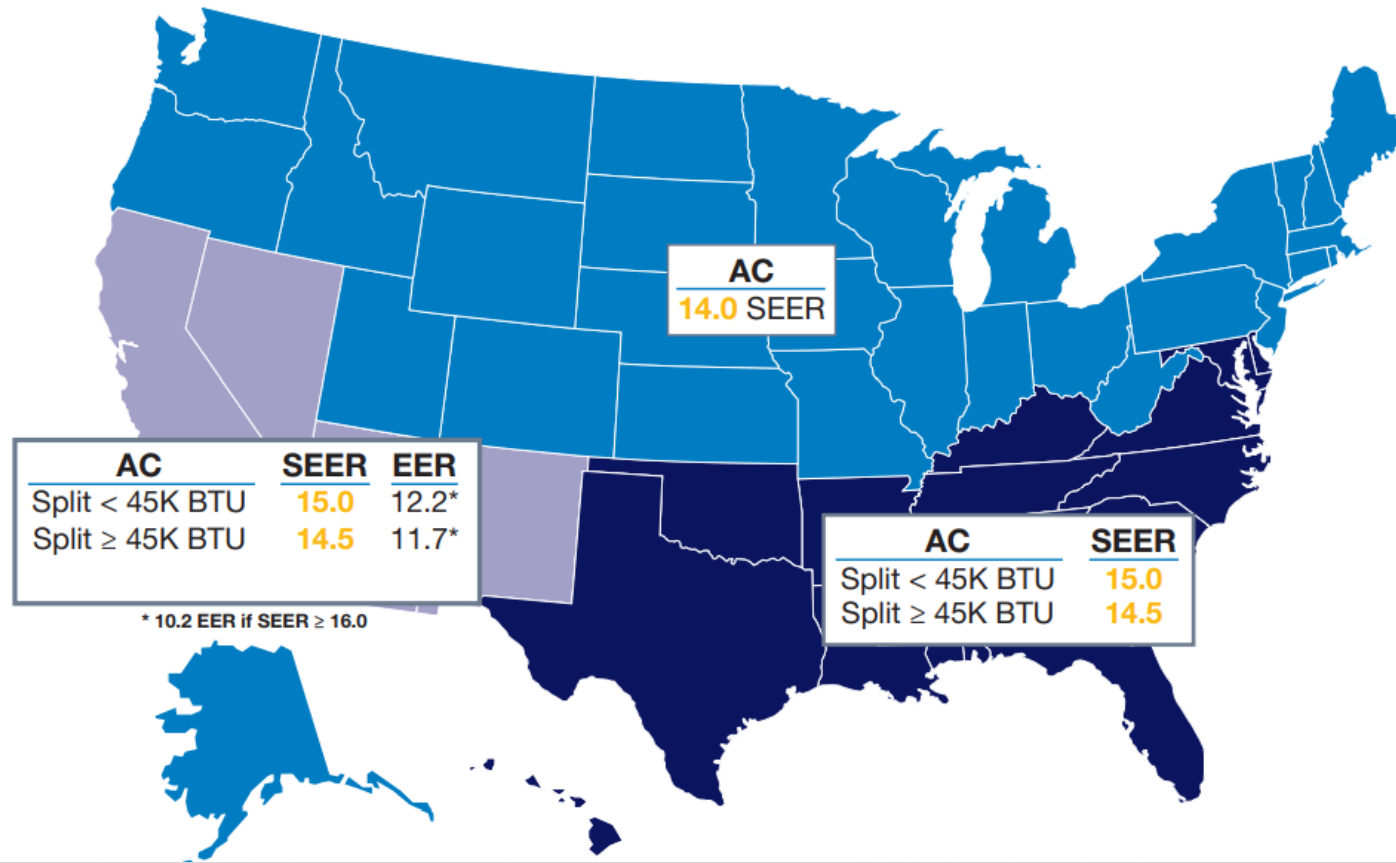
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- » Based on 2022 testing standards split air-conditioners will have the following minimum efficiency requirements
- » North Region – 14.0 SEER
- » South Region – 15.0 SEER < 45,000-BTUH
14.5 SEER ≥ 45,000-BTUH
- » Southwest Region – 15.0 SEER | 12.2 EER* < 45,000-BTUH
14.5 SEER | 11.7 EER* ≥ 45,000-BTUH

* 10.2 EER is SEER ≥ 16.0

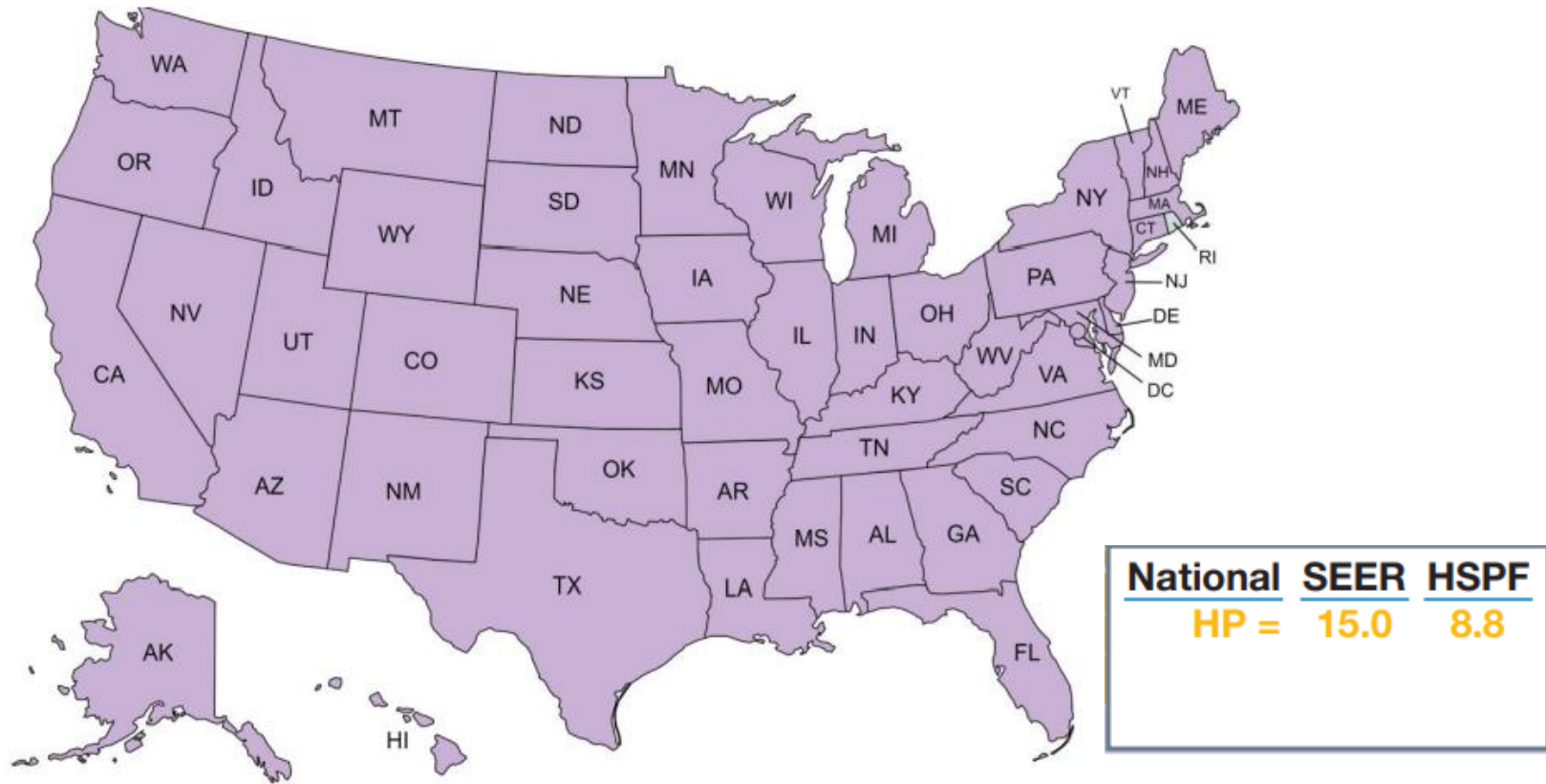
2023 Energy Efficiency Standards

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2023 Split Heat Pump Standards

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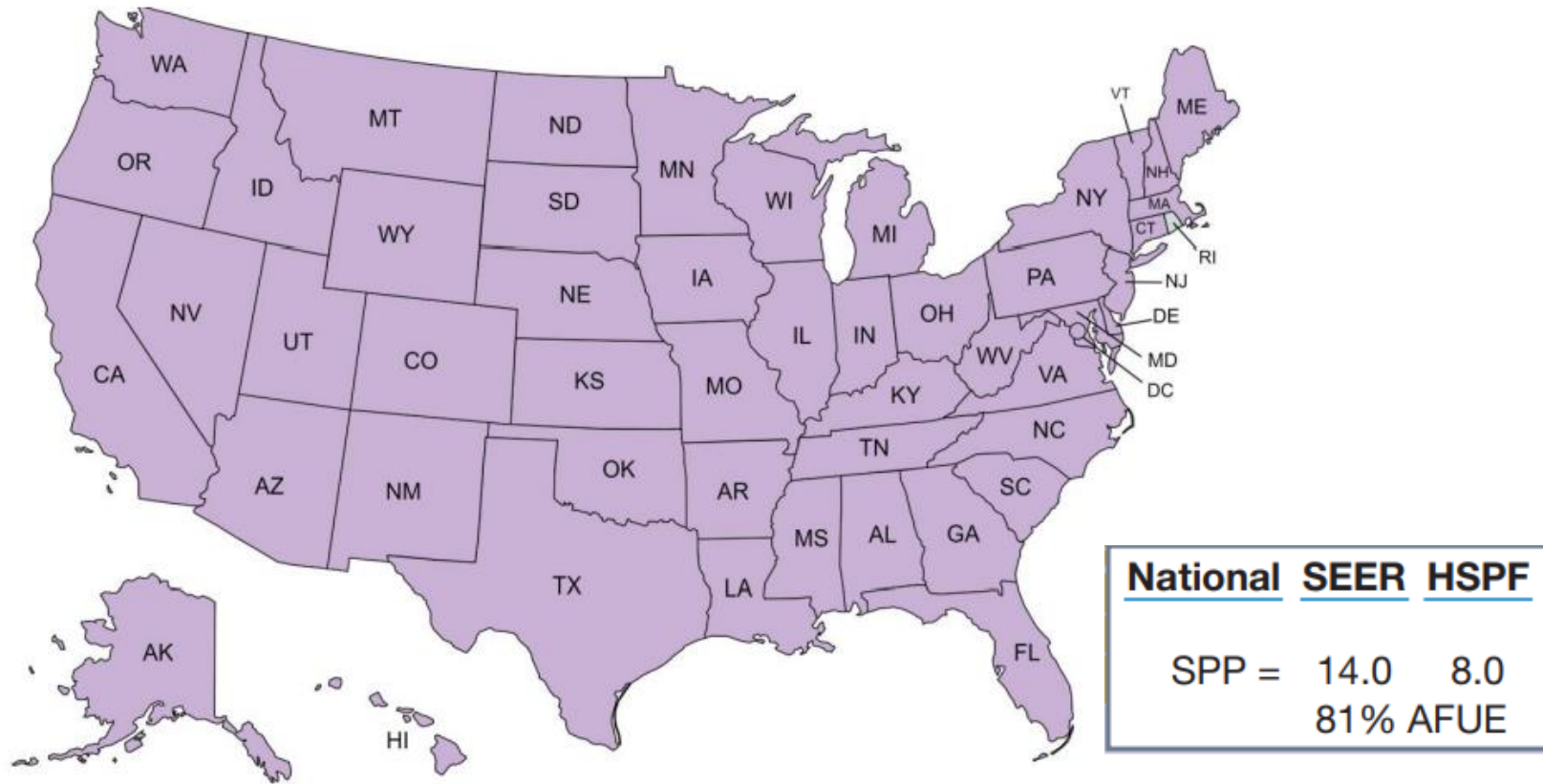
2023 Small Package Units

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- » Small Packaged Products (SPP) are single phase residential use packaged units.
 - » Straight Cooling
 - » Heat Pump
 - » Gas/Electric
- » There has been no change to the efficiency standards to these from previous standards.
- » Nationally – 14 SEER | 8.0 HSPF | 81 AFUE

2023 Small Package Units

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2023 New Testing Standards

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» Previously Energy Efficiency has been tested and certified using DOE's M testing method.

» SEER =
$$\frac{\text{Cooling Output Over a Typical Cooling Season}}{\text{Energy it Uses over the Season}}$$

» EER =
$$\frac{\text{Cooling Output}}{\text{Total Energy Usage}}$$

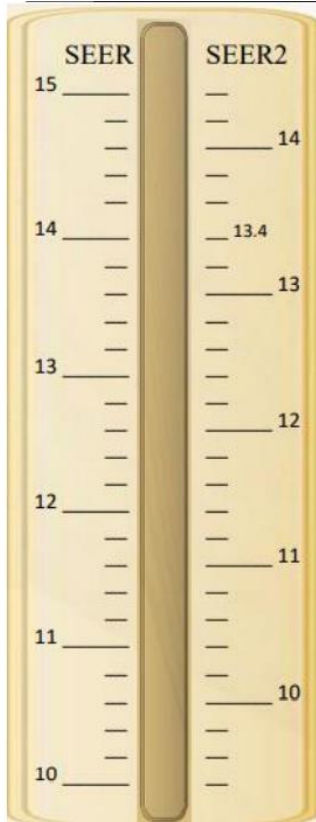
» HSPF =
$$\frac{\text{Heating Output Over a Typical Heating Season}}{\text{Energy it Uses over the Season}}$$

2023 New Testing Standards

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- » New for 2023 is the M1 testing method, developed to better represent actual field conditions.
- » SEER2 | EER2 | HSPF2
- » Major Changes
 - » Minimum Static Pressure has increased
 - » Increased Fan Power Input on AC/Coil-Only testing
 - » Increased HSPF testing conditions, lowering the zero-load testing temperature from 60°F to 55°F
 - » Increased consideration for Variable Capacity systems to reflect their enhanced capabilities

2023 New Testing Standards

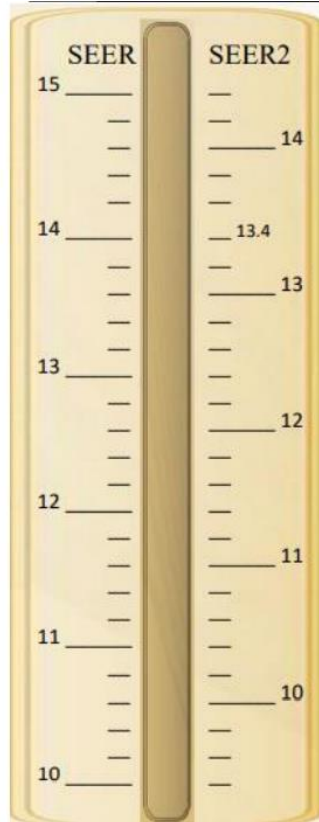


Split System Air Conditioners – 2023 Regional Standards†						
System Type	North Region		Southeast Region		Southwest Region	
	New SEER	New SEER2	New SEER	New SEER2	New SEER	New SEER2
Split System ACs (AC < 45K Btu/h)	14.0 SEER	13.4 SEER2	15.0 SEER	14.3 SEER2	15.0 SEER and 12.2 EER*	14.3 SEER2 and 11.7 EER2**
Split System ACs (AC ≥ 45K Btu/h)	14.0 SEER	13.4 SEER2	14.5 SEER	13.8 SEER2	14.5 SEER and 11.7 EER*	13.8 SEER2 and 11.2 EER2**

* 10.2 EER if SEER ≥ 16.0 SEER ** 9.8 EER2 if SEER2 ≥ 15.2 SEER2

2023 New Testing Standards

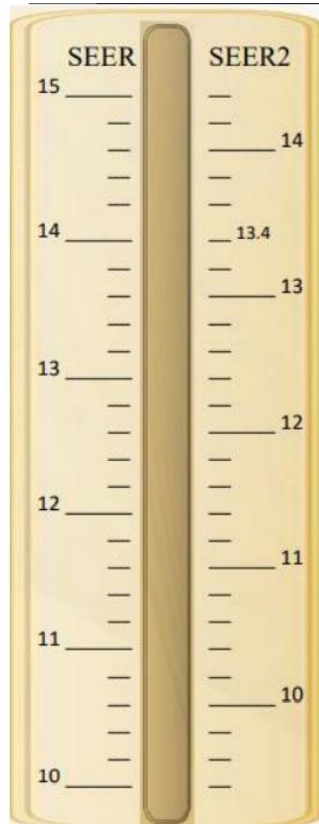
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Split System Heat Pump – 2023 National Standards†		
System Type	National Efficiency Standard	
	New SEER and HSPF	New SEER2 and HSPF2
Split System HPs	15.0 SEER and 8.8 HSPF	14.3 SEER2 and 7.5 HSPF2

2023 New Testing Standards

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Packaged Systems – 2023 National Standards		
System Type	National Efficiency Standard	
	New SEER and HSPF	New SEER2 and HSPF2
Packaged ACs, Heat Pumps, Gas Electrics and Dual-Fuel HPs	14.0 SEER and 8.0 HSPF	13.4 SEER2 and 6.7 HSPF2

Energy Savings

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7-8% increase
over previous
minimums



300 million KWH
saved over 30
years



Savings of \$38
billion in utility
costs

Manufacturer Compliance

20



* All products built on/after January 1, 2023, must adhere to new minimum efficiency standards.

What can we sell and where...?

21

- » Distributors | Contractors
 - » It is a violation to knowingly sell to and/or install for an end user a central air conditioner subject to regional standards with the knowledge that such product will be installed in violation of any regional standard applicable to the product (10 CFR 429.102(c) Violations of regional standards)
- » DOE enforces regional standards
 - » If in violation, installer should replace the non-compliant ACs at no cost to consumer
 - » Manufacturers/Distributors may be unable to do business with routine violators

What can we sell and where...?

22

- » In the North Region
 - » Air Conditioners manufactured prior to January 1, 2023, may continue to be sold and installed.
 - » Must be 13.0 SEER
 - » Heat Pumps manufactured prior to January 1, 2023, may continue to be sold and installed.
 - » Must be 14.0 SEER | 8.2 HSPF

What can we sell and where...?

23

- » In the South Region
 - » Air Conditioners manufactured prior to January 1, 2023, may continue to be sold and installed.
 - » If they meet the new 2023 M testing standards according to the coil-only indoor unit match. Use FTC label to verify compliance.

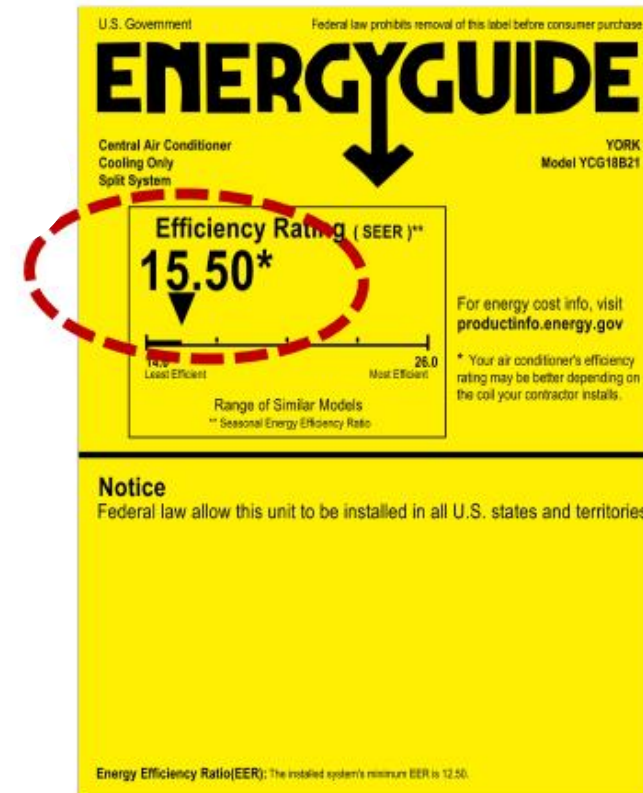


What can we sell and where...?

24

- » FTC labels must show the least efficient match-up which is generally the coil-only match-up to the outdoor unit.

AC Product Class	SEER
< 45,000 BTUH	15.0 SEER
≥ 45,000 BTUH	14.5 SEER



What can we sell and where...?

25

- » In the South Region
 - » Heat Pumps manufactured prior to January 1, 2023, may continue to be sold and installed.
 - » Must be 14.0 SEER | 8.2 HSPF



What can we sell and where...?

26

» In the Southwest Region

» Air Conditioners manufactured prior to January 1, 2023, may continue to be sold and installed.

» If they meet the new 2023 M testing standards according to the coil-only indoor unit match. Use FTC label to verify compliance.

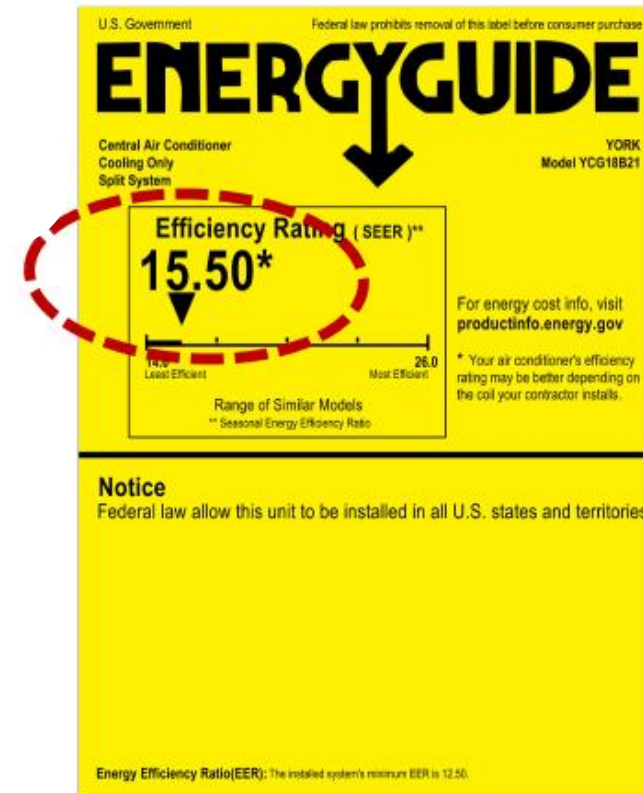


What can we sell and where...?

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- » FTC labels must show the least efficient match-up which is generally the coil-only match-up to the outdoor unit.

AC Product Class	SEER	EER
< 45,000 BTUH	15.0	12.2
≥ 45,000 BTUH	14.5	11.7



What can we sell and where...?

28

- » In the Southwest Region
 - » Heat Pumps manufactured prior to January 1, 2023, may continue to be sold and installed.
 - » Must be 14.0 SEER | 8.2 HSPF



The Future is Here

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- » Be prepared for what is coming quickly to our industry
- » Be capable of providing clear guidance to your customers
- » Know what can and cannot be sold and where
- » Get ready to learn new products



2023 Goodman Model Changes

2023 Product Nomenclature

	G	S	X	N	4	S	3	6	1	0	A	A
	1	2	3	4	5	6	7	8	9	10	11	12
Brand											Minor Rev	
G Goodman											A	
A Amana											Major Revision	
V GMC											A	
Product Category											Variation	
S Split System R-410A											International - K Kuwait	
L Split System R32											Sea Coast - C	
D Split System Dry Charge											Electrical	
Unit Type											1 208/230V, 1 Phase, 60 Hz	
X Condenser											2 220/240V, 1 Phase, 50 Hz	
Z Heat Pump											3 208/230V, 3 Phase, 60 Hz	
Feature											Nominal Capacity	
N or B Base											12 - 1.0Ton 36 - 3.0Tons	
H High Spec (Premium)											18 - 1.5Tons 42 - 3.5Tons	
C 2-Stage Communicating											24 - 2.0Tons 48 - 4.0Tons	
V Inverters											30 - 2.5Tons 60 - 5.0Tons	
SEER2											Sales Region	
13.4 - 13.7 = 3											N North	
13.8 - 14.5 = 4											S Southeast & North	
14.6 - 15.5 = 5											O All Regions	
15.6 - 16.5 = 6												
16.6 - 17.5 = 7												
17.6 - 18.5 = 8												
18.6 - 19.5 = 9												
19.6 - 20.5 = 0												

2023 Goodman Model Changes

2023 Product Nomenclature


New A **M** **S** T 3 6 B U 1 4 0 0 A A

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Product														Minor Rev
A Corporate Air Handler														A
D Daikin Air Handler														Major Revision
														A
Application														Electric Heat KW
C Ceiling Mounted														Refrigerant
M Multi-Positional														3 R32
W Wall Mounted														4 R410A
														6 R410A or R22
Motor														Electrical
R PSC														1 208/230 V, 1 Phase, 60 Hz
S MS-ECM														2 220/240 V, 1 Phase, 50 Hz
V VS-ECM Communicating														3 208/230 V, 3 Phase, 60 Hz
Expansion Device														Cabinet
E Electronic Expansion Valve														N Uncased
F Flowrator														P Painted
T Expansion Valve														U Unpainted
Nominal Capacity														Cabinet Width
12 - 1.0 Ton														HC* Series
18 - 1.5 Tons														S - 37.25"
24 - 2.0 Tons														HM* Series
30 - 2.5 Tons														B - 17.5"
														S - 20.2"
														M -
														L - 49.25"
														D - 24.5"
														L - 36.0"

Current	New
ARUF	AMRF36BU1400AA
ASPT	AMST36BU1400AA
AVPTC	AMVT36BP1400AA
AVPEC	AMVE36BP1400AA
AWUF	AWSF24MU1408AA
AWUT	AWST36LU1405AA
ACNF	ACST36MN1403AA

Current to New Model Comparison



GSXH5 Series AC

32

- » High Spec 15.2 SEER2 model
 - » Replacing the existing single stage 16 SEER
- » Will incorporate a new fan system for enhanced airflow
- » Mix of 5mm and 7mm condenser coils
- » New Copeland ZP**K7 scroll compressors

GSXH5 Series

Current Design			New 2023 Design			
16 SEER Model	16 SEER Coil Specs	16 SEER Compressor	New 15 SEER Model	Coil Specs	New Compressor	Other Changes
GSX160181	5mm 1R 48S	ZP14K5	GSXH501810	5mm 1R 38S	ZP14K7	New CFS
GSX160241	5mm 1R 48S	ZP20K5	GSXH502410	5mm 1R 48S	ZP20K7	New CFS
GSX160311	5mm 1R 60S	ZP24K5	GSXH503110	5mm 1R 60S	ZP24K7	New CFS
GSX160371	5mm 1R 54S	ZP31K6	GSXH503610	5mm 1R 60S	ZP29K7	New CFS
GSX160421	5mm 1R 54S	ZP34K5	GSXH504210	7mm 2R 40/40S	ZP34K7	New CFS
GSX160481	5mm 1R 60S	ZP36K5	GSXH504810	7mm 2R 40/40S	ZP40K7	New CFS
GSX160601	3/8" 2R 36/36S	ZP44K5	GSXH506010	7mm 2R 46/46S	ZPS51K7	New CFS, stud mount motor w/ swept fan blade

[GSXH506010 Two Stage Compressor](#)



GSZH5 Series Heat Pump

34

- » High Spec 15.2 SEER2 model
 - » Replacing the existing single stage 16 SEER
- » Will incorporate a new fan system for enhanced airflow
- » Mix of 5mm and 7mm condenser coils
- » New Copeland ZP**K7 scroll compressors

GSXH5 Series

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OD Model	Compressor	Chassis Size	Coil Diameter	Rows	Steps	Circuits	Coil Length [in]	Coil Height [in]	Hairpins
GSZH501810	ZP14K7	29"	5mm	1	60	8	82.5	37.8	30
GSZH502410	ZP20K7	35"	5mm	1	54	10	107.2	34	27
GSZH503010	ZP25K7	35"	5mm	1	60	10	107.2	37.8	30
GSZH503610	ZP31K7	35"	5mm	1	60	12	107.2	37.8	30
GSZH504210	ZP34K7	35"	5mm	2	54/54	12	107.2/103	34	54
GSZH504810	ZP40K7	35"	7mm	2	40/40	10	107.8/103.3	34.6	40
GSZH506010	ZP551K7	35"	7mm	2	46/46	10	107.8/103.3	39.8	46

GSZH506010 Two Stage Compressor

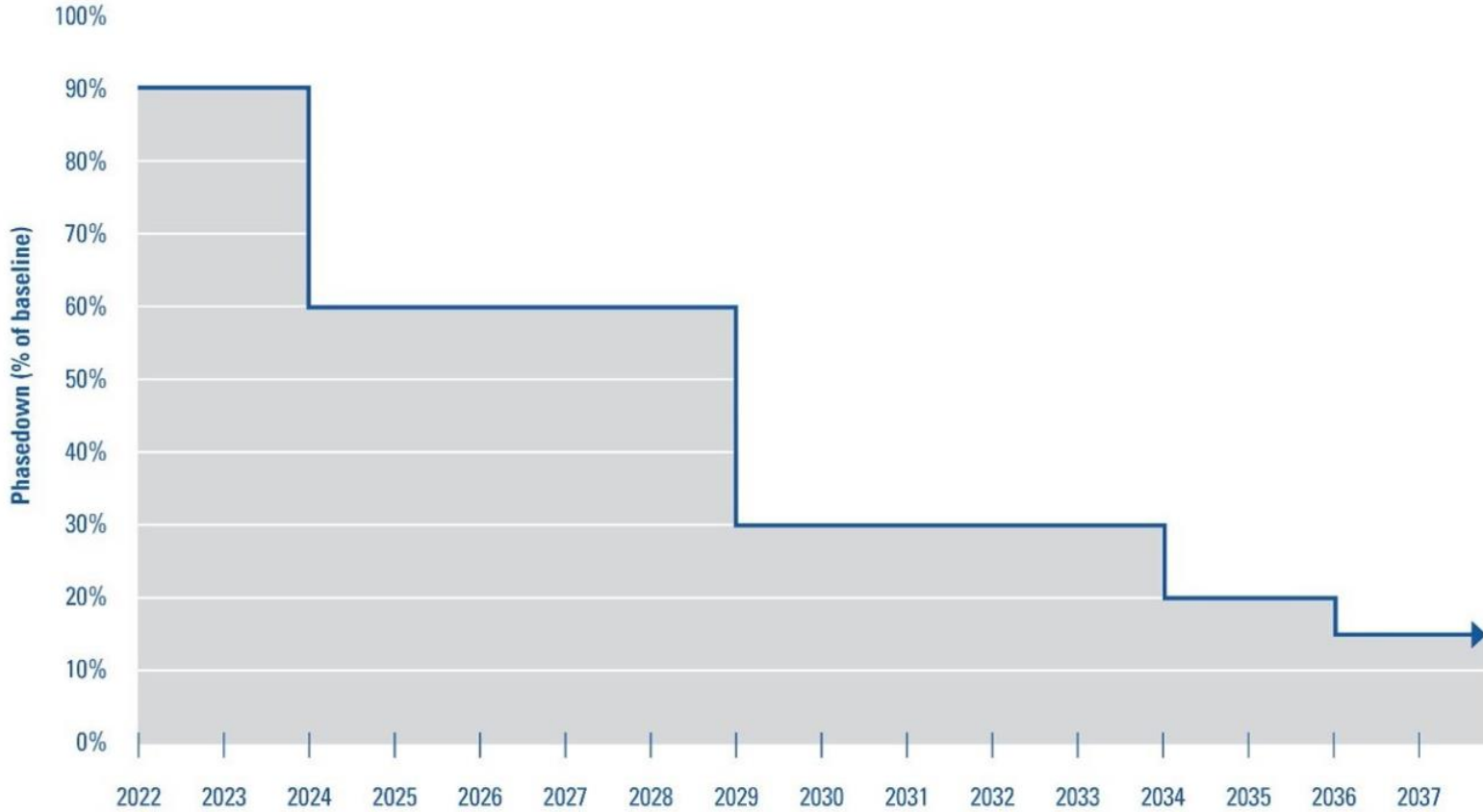


HFC Phase Down

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- » Under the AIM Act – included in the Consolidated Appropriations Act of 2021, the EPA has been directed to phase down production and consumption of HFC's by 85% over the next 15 years
- » This will most likely begin to result in the adoption of new, lower GWP refrigerants in the HVAC industry over the next few years.
- » While this is still very much “up in the air”, I would expect OEM equipment containing new refrigerants to begin hitting the market 2024 to 2025.

HFC Phase Down



Questions?