

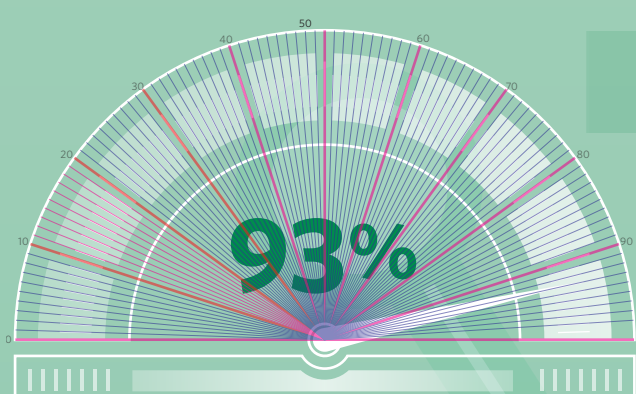


2023 DOE EFFICIENCY REQUIREMENTS

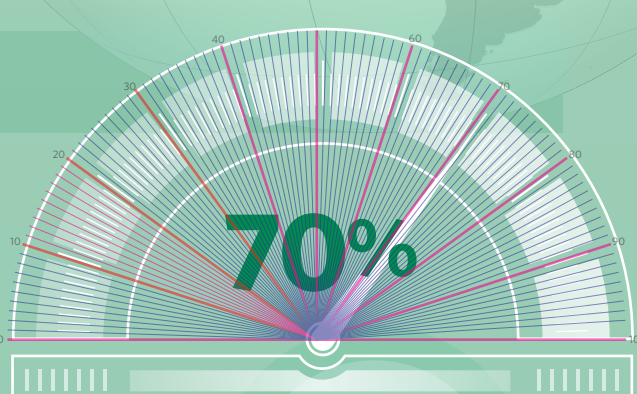
Are you regulation ready?

With the Department of Energy increased minimum efficiency for residential air conditioning taking effect in January 2023, the HVACR industry is challenged with preparing now.

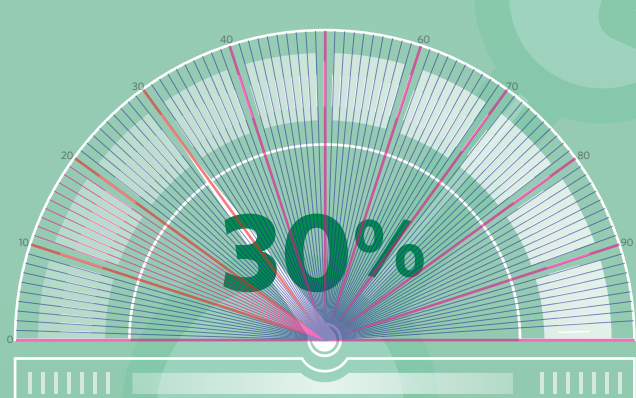
How prepared are contractors and wholesalers?



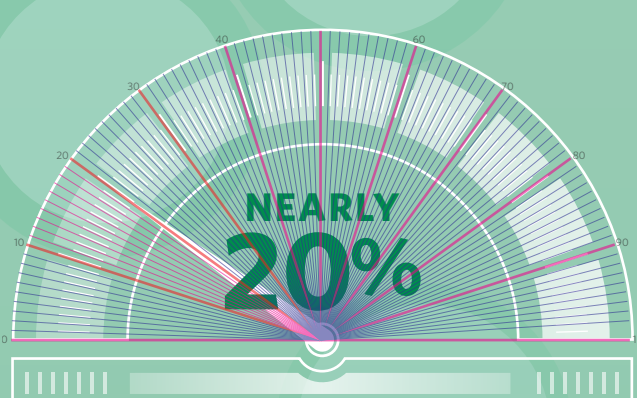
Lack extensive understanding of the business requirements



Have not taken action in response to the regulations



Have trained service people or technicians

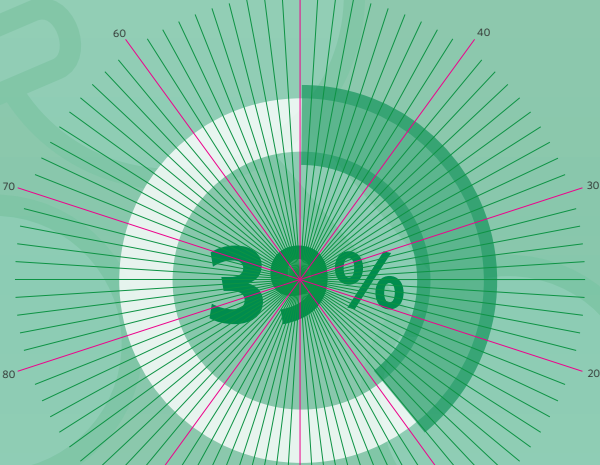


Have developed a new marketing plan

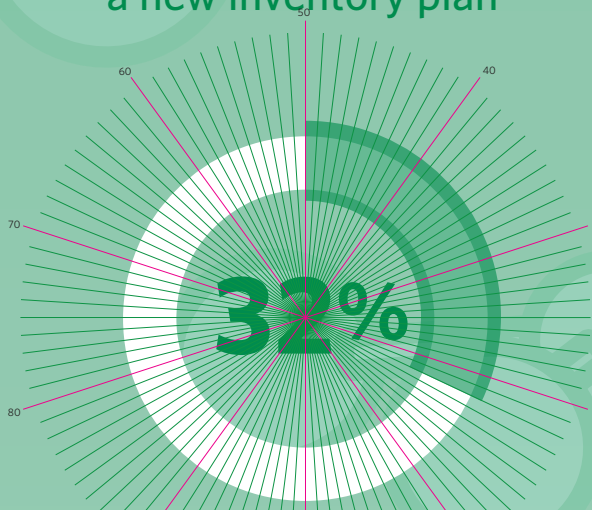
To prepare for efficiency requirements, considerations include:



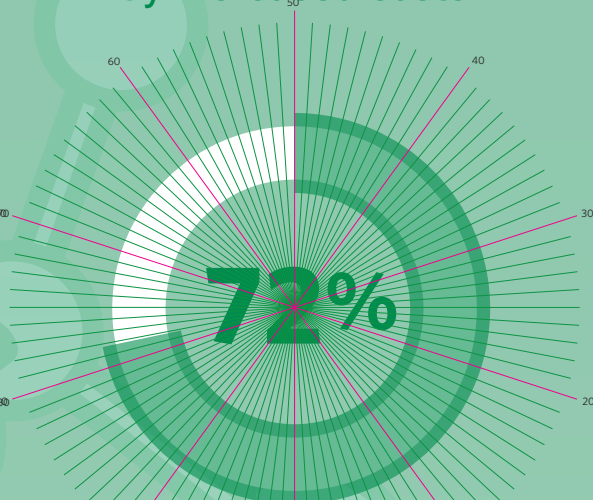
Are concerned with creating a new inventory plan



Feel they will be affected by increased costs



believe they will be impacted by changes in equipment



expressed concerns around attending product information meetings

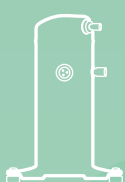
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2023 Regulatory Changes

New Minimum Efficiency

On January 1, 2023, the Department of Energy's (DOE) new minimum efficiency standards for split system air conditioners (ACs) and split system heat pumps (HPs) will go into effect. These new regulations are part of the DOE's ongoing initiative to reduce overall energy consumption in the United States.

The minimum efficiency increases for 2023 will once again vary not only by product type but by geographic region as well. In addition, HVAC manufacturers will be required to comply with a new testing procedure for developing efficiency ratings.

WHY THE CHANGE

Every six years the Department of Energy (DOE) reanalyzes the effects of energy usage, sets minimum efficiency requirements and manages the testing standards by which those efficiencies are measured. For 2023, the DOE is increasing the minimum efficiencies for central air conditioners and heat pumps. The testing procedures for determining those efficiencies will change as well.

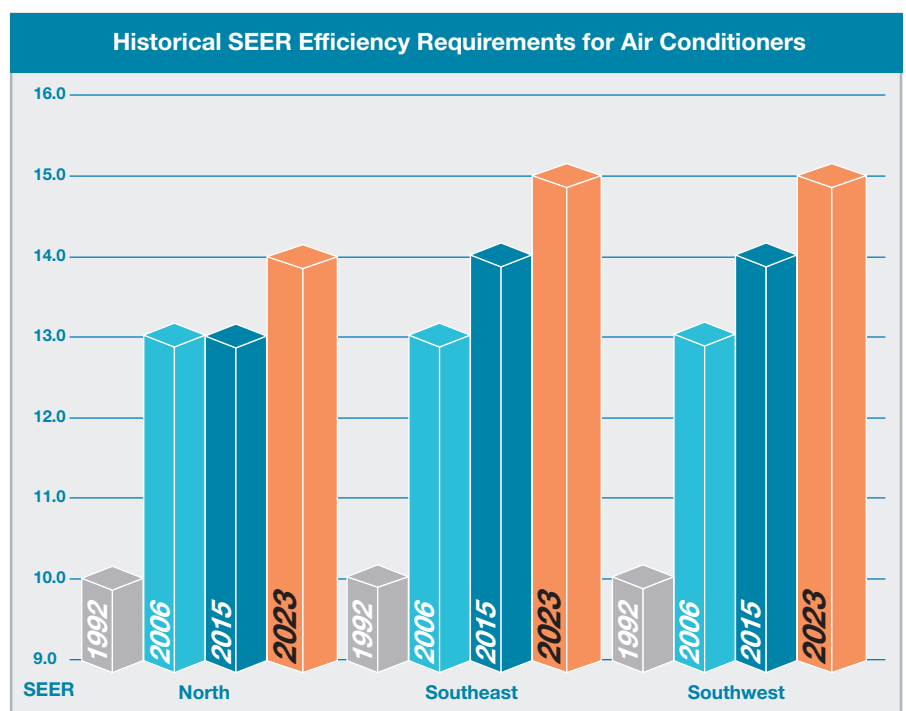
2023 MINIMUM EFFICIENCY CHANGE

For 2023, the DOE has reanalyzed and adjusted minimums accordingly.

- For air conditioners in the North, the minimum efficiency will increase from 13.0 to 14.0 SEER and in the South from 14.0 to 15.0 SEER[†] under today's test procedure.

[†]15.0 SEER up to 45k BTU, 14.5 SEER at/above 45k BTU

- The national heat pump minimum efficiency will increase from 14.0 to 15.0 SEER.



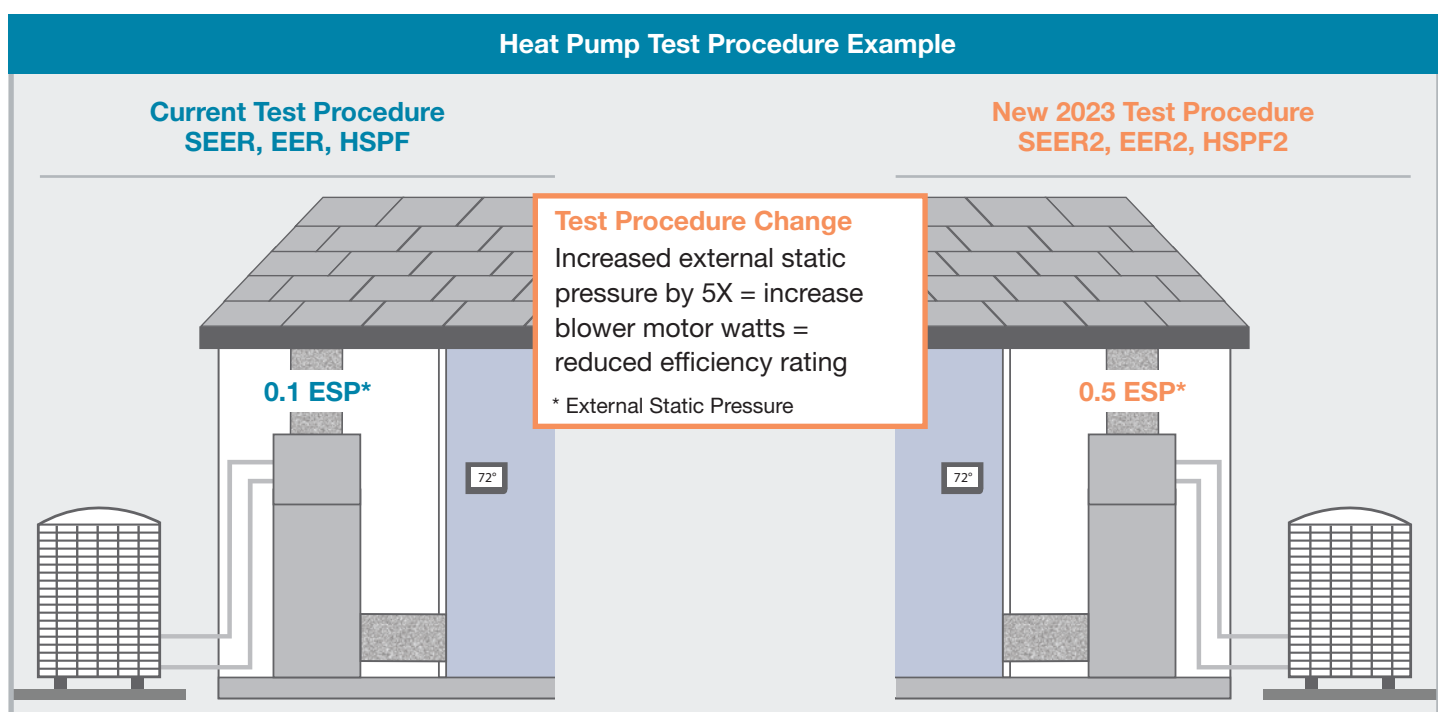
2023 Regulatory Changes

New Testing Procedure

A NEW NORMAL IS COMING FOR 2023 – SEER2, EER2 AND HSPF2

In addition to increasing the minimum efficiency in 2023, HVAC manufacturers will also be required to comply with a new testing procedure for developing efficiency ratings. Compared to today's test procedure, the external static pressure used when testing will be increased by up to 5X to better reflect field conditions (see graphic below). Since the new testing requirements are more stringent and reduce the resulting efficiency rating, in 2023, there will be new metrics and nomenclature – SEER2, EER2 and HSPF2. Specifically, you will note the following:

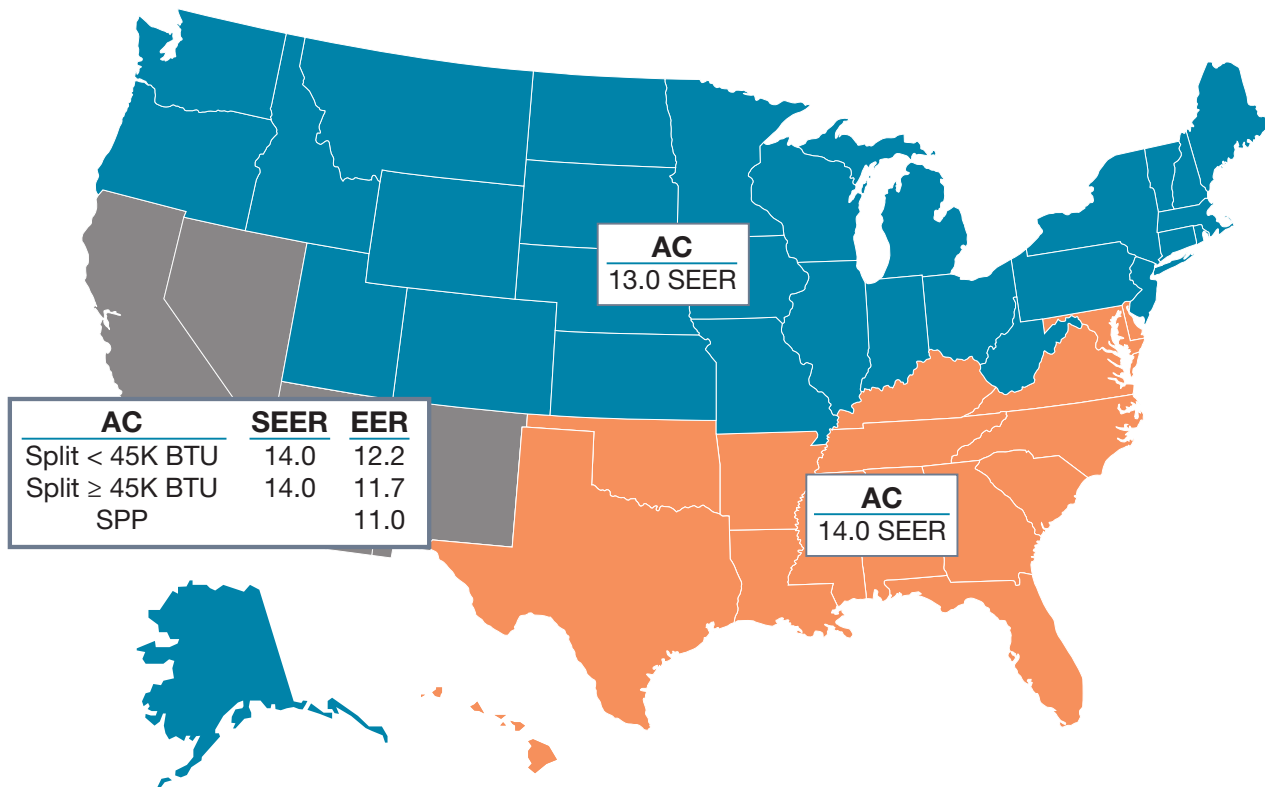
- The new SEER2 ratings will be lower and the minimum efficiencies will be reduced to account for the more difficult test procedures, compared to the SEER ratings on the same system – e.g. the North region's 14.0 SEER minimum efficiency under the current test procedure will become a 13.4 SEER2 under the new test procedure.
- All tiers of products will need to be retested, optimized, and relaunched in accordance with the new test procedure - resulting in a much larger scale project for manufacturers compared to prior minimum efficiency changes.
- The new test procedure will also drive changes to the airflow set point on indoor blowers (fan coils and furnaces).



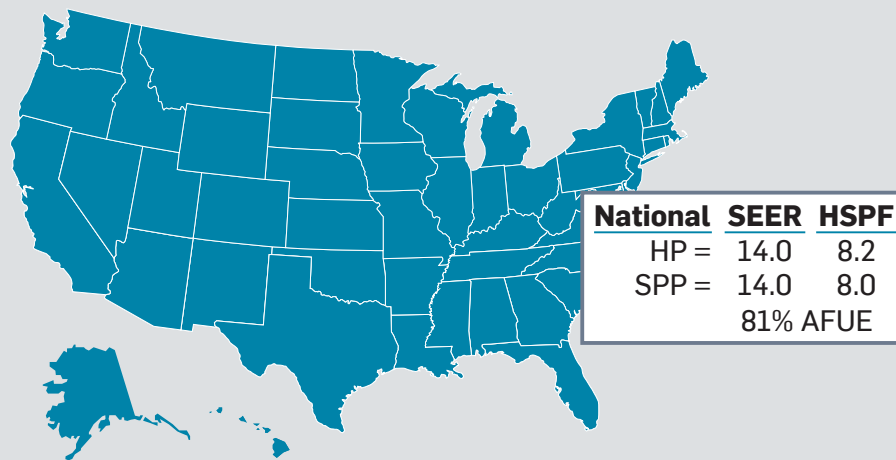
Current Standards (Effective January 2015)

The maps below show the DOE minimum efficiency standards that went into effect January 2015.

2015 Regional Efficiencies for AC Units



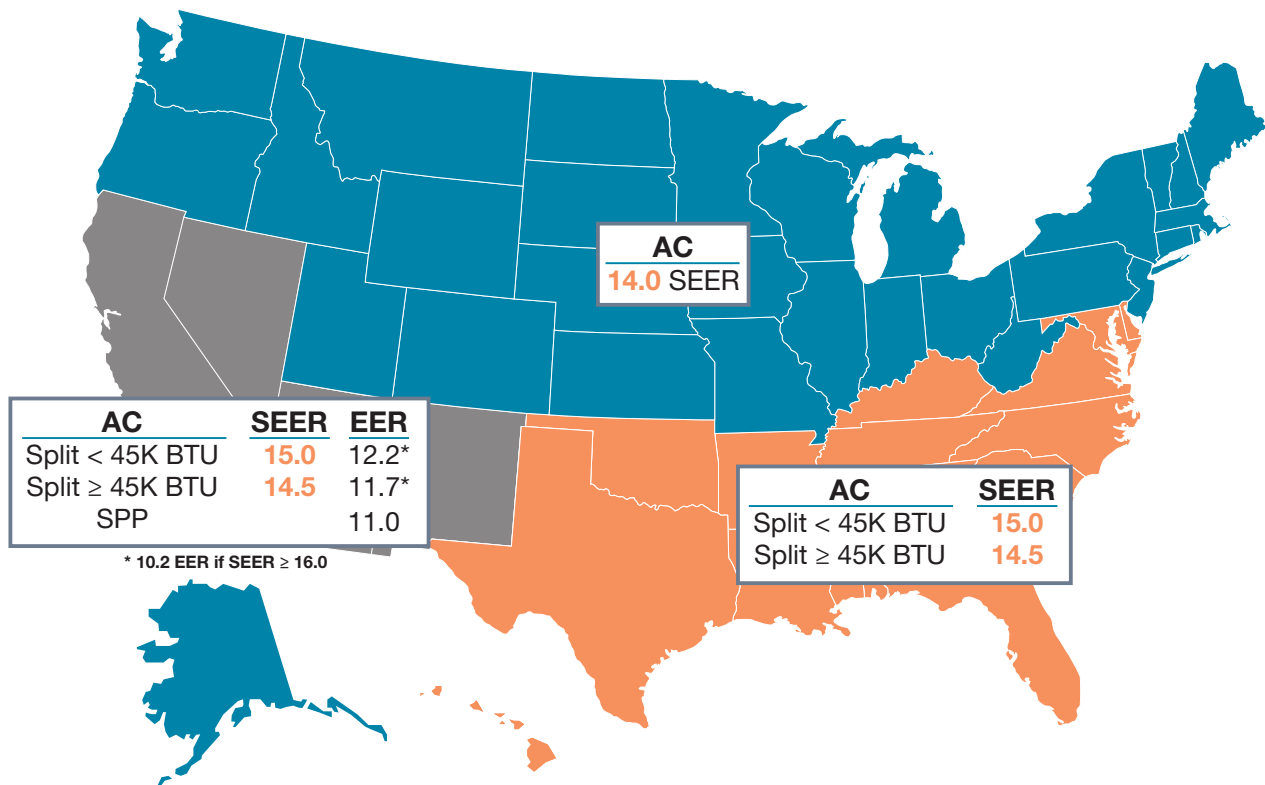
2015 National Standards for HP and SPP Units



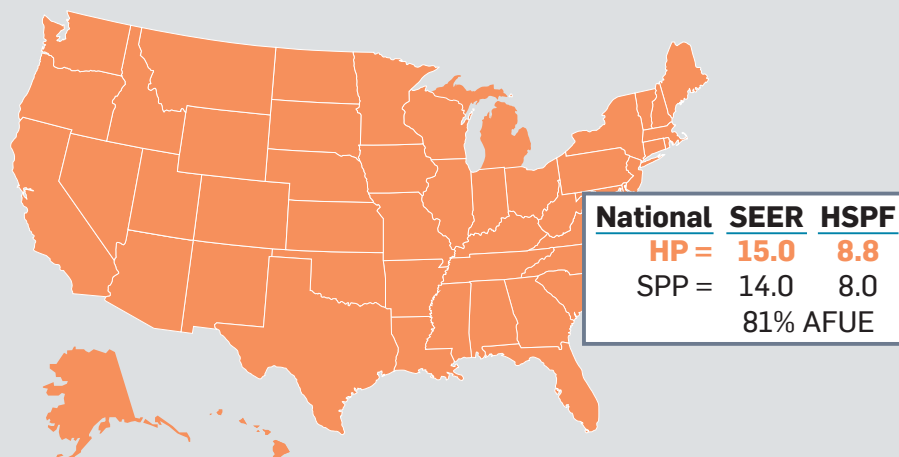
2023 Standards (Effective January 2023)

The maps below show the DOE minimum efficiency standards that will go into effect January 2023 based on current (pre-2023) test procedure.

2023 Regional Efficiencies for AC Units



2023 National Standards for HP and SPP Units



Test Procedure Ratings Comparisons

AIR CONDITIONER RATINGS

The new 2023 minimum efficiency standards for air conditioners continue to follow the regional borders established in 2015: North, Southeast and Southwest. Additionally, the Southwest includes an EER/EER2 requirement. SEER and EER are ratings tested under the pre-2023 test procedure while SEER2 and EER2 are tested under the 2023 test procedure with higher external static pressures as detailed below.

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 EER if SEER2 ≥ 15.2 SEER

Sell-Through Deadlines

For the North Region, any 13.0 SEER AC built before January 1, 2023, **can still be installed** on or after January 1, 2023. For the Southeast and Southwest Regions, any AC that does not meet the above requirements **cannot be installed** on or after January 1, 2023.

HEAT PUMP RATINGS

Heat pump minimum efficiency requirements follow national standards. In 2023, the new minimum efficiency standards for heat pumps will increase by 1.0 SEER to 15.0 SEER. Split-system heat pumps must also achieve a minimum of 8.8 HSPF.

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

Sell-Through Deadline

Any 14.0 SEER heat pump built before January 1, 2023, **can still be installed** on or after January 1, 2023.

SMALL PACKAGED PRODUCT RATINGS

Small Packaged Products will not increase in minimum efficiency from 14.0 SEER and 8.0 HSPF, but will be required to comply with the new test procedure.

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

New Refrigerant

A NEW REFRIGERANT FOR A NEW STANDARD

In a worldwide effort to address climate change concerns, global leaders have proposed a phase down of high Global Warming Potential (GWP) refrigerants as a part of the Kigali Amendment to the United Nations' Montreal Protocol. Although the United States as a whole has not yet ratified this agreement, states involved in the U.S. Climate Alliance* are embracing the reductions. Based on proposed California regulations, it is anticipated that many U.S. states will be limiting the GWP for refrigerants used in HVAC applications at a maximum of 750, possibly as early as 2025.

The current R-410A refrigerant, while excellent at providing a non-ozone-depleting alternative to R-22, has a GWP of 2088, well above the anticipated future limit. The new R-454B is composed of a blend of R-32 and R-1234yf. It has a much lower GWP – 465 – which easily surpasses the proposed 2023 requirement. And, it will continue to meet the anticipated future Kigali phase down requirements well into the 2030s.

WHAT'S THE BIG DIFFERENCE?

R-454B falls into a new classification on the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 34 flammability and toxicity matrix – A2L. A2L refrigerants are classified by ASHRAE as having lower toxicity and lower flammability. Our current R-410A refrigerant falls into the A1 category for refrigerants with no ignition at or below 60° C. And while that makes A2Ls more flammable than A1s, such as R-410A, they are still much less flammable than natural gas or propane. According to AHRI research studies, the risk of fire remains low. Here's why:

- A2Ls, like R-454B, are hard to ignite (they require significant ignition energy) so they will not be ignited by static electricity or a water heater pilot
- Concentrations of A2Ls, like R-454B, below the LFL will only burn while passing through a flame and will not ignite and sustain a flame
- A significant leak of an A2L, such as R-454B, would be required to reach a flammable concentration of 11.8% lower flame limit (LFL)
- If an unlikely ignition does occur, the resulting energy is very low with a burning velocity of about 2.0 inches per second

ASHRAE Standard 34 Safety Classes

Higher Flammability	A3 Propane, Butane	B3
Flammable	A2 Methylene Fluoride	B2 Methyl Chloride
Lower Flammability	A2L R-454B	B2L Ammonia
No Flame Propagation at 60° C	A1 R-410A	B1 Sulfur Dioxide
	Lower Toxicity (OEL of 400 ppm or greater)	Higher Toxicity (OEL of less than 400 ppm)

↑ Increasing Flammability

→ Increasing Toxicity

The change to R-454B is just that – a change. But since it will meet regulatory requirements far into the future, it should be a change that lasts quite a while.

* <https://www.usclimatealliance.org>

DOE Enforcement

THE COSTS – AND CONSEQUENCES – OF NON-COMPLIANCE

As with the 2015 standards, we anticipate penalties for non-compliance in 2023 as well. The DOE has been aggressively enforcing efficiency standards in a number of industries, including HVAC and violations can be costly.

- Dealers and contractors caught installing non-compliant equipment will be forced to replace the equipment at their cost. Repeat violators can be put on a national do-not-sell list.
- Distributors are subject to the same do-not-sell penalty if they knowingly and repeatedly supply non-compliant equipment to contractors who install that equipment in violation of the regional minimum.
- Any distributor or contractor identified as a routine violator will be prohibited from purchasing any of the seven classes of products identified in the Code of Federal Regulations, 10-CFR-430.32.
- Manufacturers knowingly selling non-compliant equipment will also face stiff fines.

Protect Your Business

Future Record Keeping

Beginning in 2023, be prepared for record keeping. Dealer/contractors, distributors, and manufacturers will all be required to track the model and serial numbers of equipment sold, delivered and installed, as well as delivery addresses and installation locations. This includes cash sales. These records will protect you in the event of a DOE investigation. If 2015 is any indication for 2023, they will need to be kept for up to 60 months, depending on the type of business:

- 48 months for dealers / contractors
- 54 months for distributors
- 60 months for manufacturers

In summary, treat this information like you would treat your tax records, just to be safe.

For more information contact your GA Larson Territory Manager.