

INTRODUCTION TO 2023 REGULATORY REQUIREMENTS





Contents

| | |
|----|---|
| 3 | Introduction Letter |
| 4 | 2023 Regulatory Changes |
| 6 | Efficiency Changes - Current vs. 2023 |
| 8 | Test Procedure Ratings Comparisons |
| 9 | Tempstar Readiness Plan |
| 10 | New Technologies |
| 11 | New Refrigerant |
| 12 | DOE Enforcement |
| 13 | We Are Here To Help |
| 14 | Where To Go For More Information |

May 2021

Dear Tempstar Customer:

**We are getting ready for the 2023 regulatory requirements
and we want you to be ready too!**

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. These changes will present new complexities, but the Tempstar team is prepared, and we are here to support you through this transition.

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. Tempstar is committed to leading our industry in compliance and we have developed this comprehensive launch kit to help you fully understand and be prepared for these changes.

The 2023 Regulatory Launch Kit provides information to help you get up to speed with the new requirements, including:

- Minimum efficiency changes with maps/charts
- New SEER2, EER2 and HSPF2 test procedures
- Regulatory-ready product updates
- Non-compliance consequences
- How to protect your business and maintain critical records

We are all in this together. As your trusted manufacturer, we will continue to make resources available to you leading up to January 1, 2023. Be sure to visit Tempstar's 2023 Regulatory Launch Kit site on HVACpartners for the most current marketing resources.

Thank you for your support!



Braden Cook
Director, Product Management, Heating & Cooling

2023 Regulatory Changes

New Minimum Efficiency

TIME FOR A NEW CHANGE

Tempstar has thrived by continuously looking for the next advancement in comfort technology. That's why we are always prepared when it's time to meet new, federally mandated minimum efficiency standards.*



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.

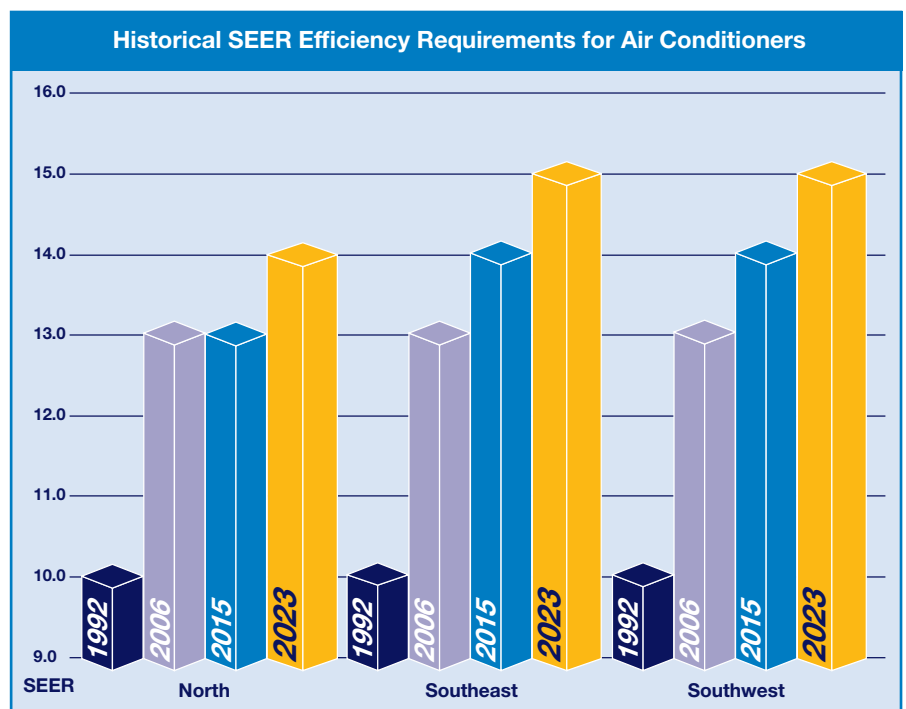
2023 MINIMUM EFFICIENCY CHANGE

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

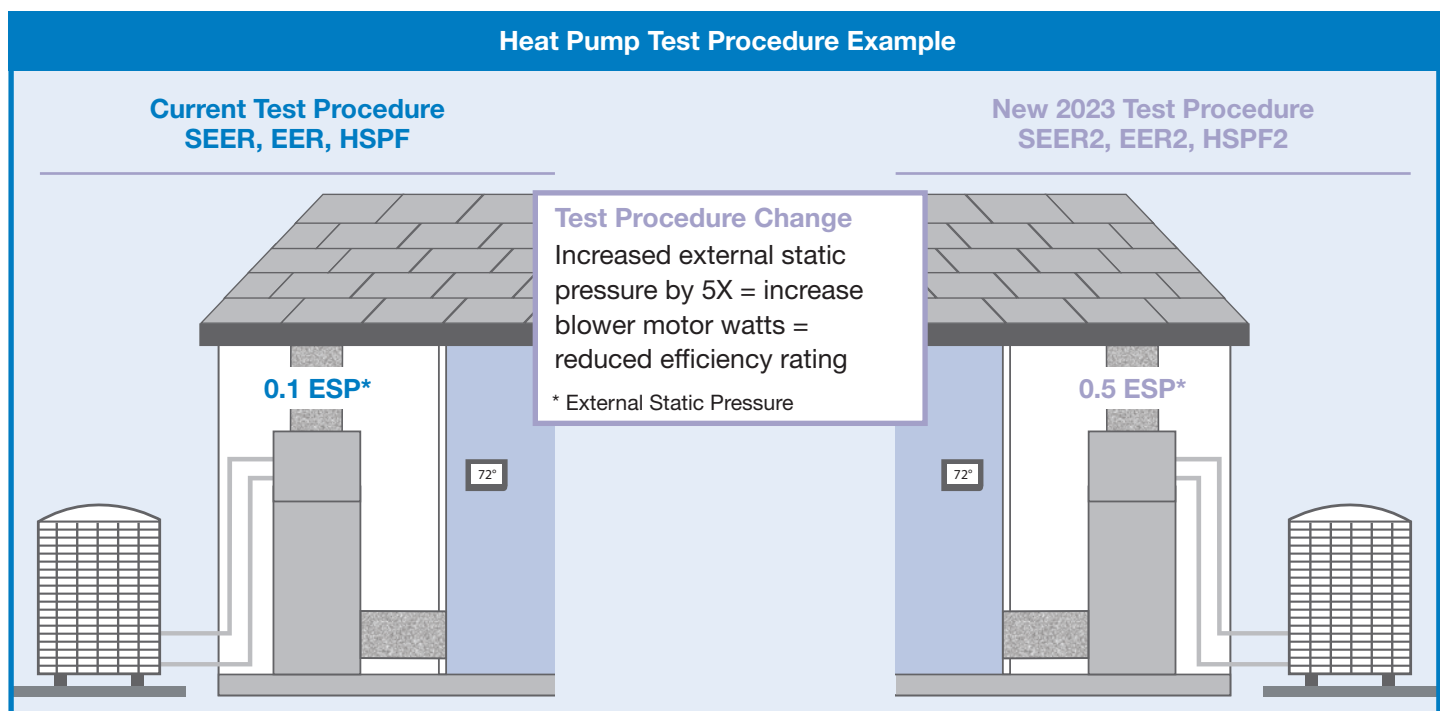
New Testing Procedure

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).

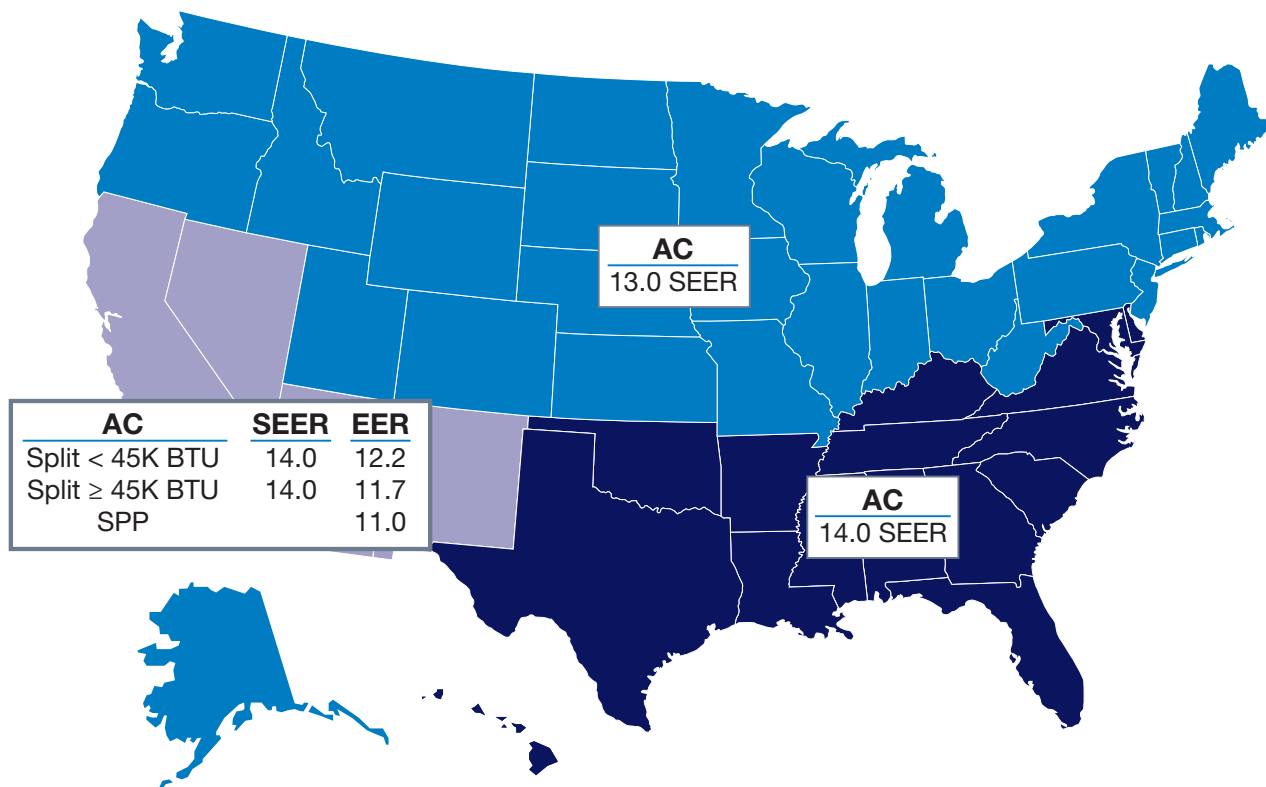
SEER2 • EER2 • HSPF2



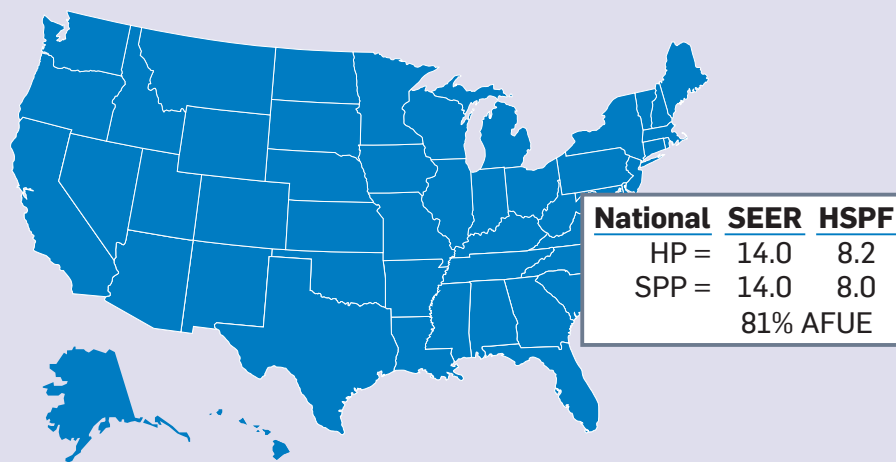
Current Standards (Effective January 2015)

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

2015 Regional Efficiencies for AC Units



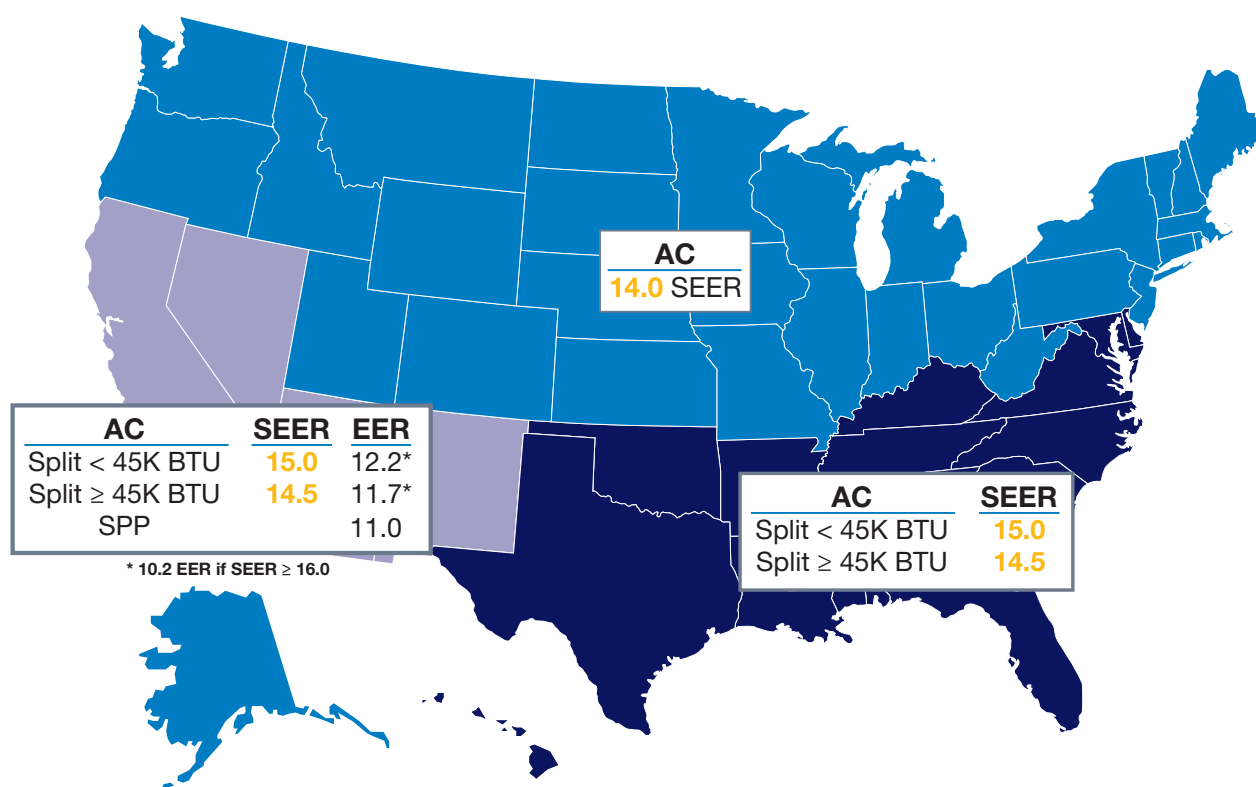
2015 National Standards for HP and SPP Units



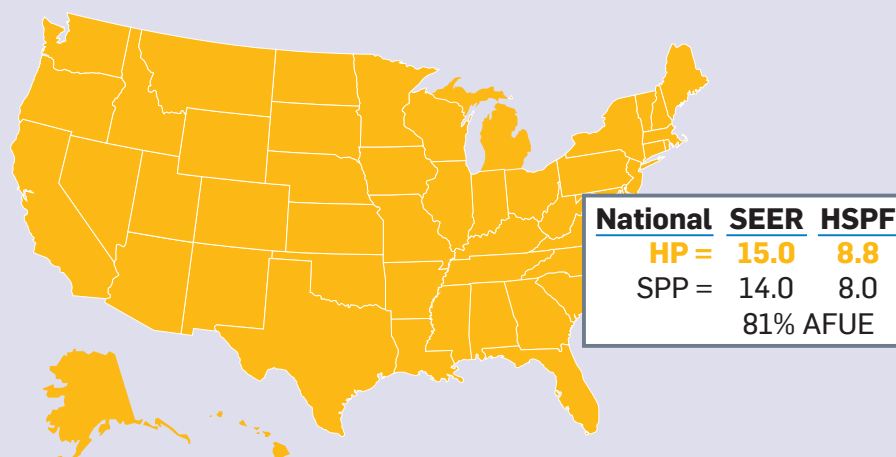
2023 Standards (Effective January 2023)

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 |



Tempstar Readiness

BREAKING DOWN THE NUMBERS

The 2023 efficiency standards represent a 7-8% SEER increase from current minimums, across the board. Under the new program, roughly 70% of our current products will NOT meet the minimum efficiency standards, and 100% of current products will need to be retested using the new procedures. The good news is, we have been working for several years in anticipation of these changes, and will be more than ready before the 2023 standards take effect on January 1, 2023.



WE'LL BE READY, AND YOU SHOULD BE TOO

We have been working on our 2023 product redesign and development for many years now. With millions of dollars invested in engineering, testing, tooling and manufacturing, we will be ready for 2023.

| | |
|-------------------------------|---|
| 2023 Product Readiness | <ul style="list-style-type: none">• Majority of product tiers and tonnages will be available on or before January 1, 2023• Industry-leading technology within our 2023 product line will have been tested and validated to meet the new requirements• Instituting a phased rollout, with products launching ahead of deadline, starting early 2022• Regulatory-ready products are being redesigned with an expected change in refrigerant targeted for 2025, to minimize future product transition |
| 2023 Product Launch Readiness | <ul style="list-style-type: none">• Phase II 2023 Regulatory Launch Kit - new product introduction (Fall 2021)• New consumer product literature• New SEER2 consumer flyer• Phase III 2023 Regulatory Launch Kit – recap of complete product offering and detailed product road maps (Fall 2022)• Comprehensive e-communications efforts from now through January 1, 2023 |
| 2023 Training Readiness | <ul style="list-style-type: none">• Comprehensive training, including:<ul style="list-style-type: none">- 2023 Regulatory video overview- 2023 Regulatory overview and new technology eLearning course- 2023 Regulatory overview and new technology course material for distributor hosted training- Model number nomenclature training- Product specific training with product rollout- R-454B video overview |

New Technologies

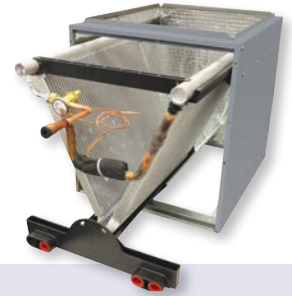
INDOOR V-COIL WITH POWER-V™ TECHNOLOGY

As we continue to look for measured improvements in the energy efficiency and performance of our cooling systems leading up to 2023, we will launch our new indoor V-coil with Power-V technology in 2022. This vertical application coil for use with Tempstar air conditioners, will reshape the future of indoor comfort.



The new coil is constructed of flat, aluminum refrigerant channels brazed to ridged aluminum fins and configured in a “V” shape with the header tubes positioned at top. The resulting coil geometry provides improved heat transfer, more even and controlled airflow over the coil, improved system efficiency* and a lighter, corrosion-resistant coil. Additional benefits include:

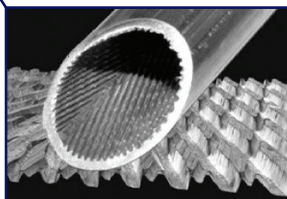
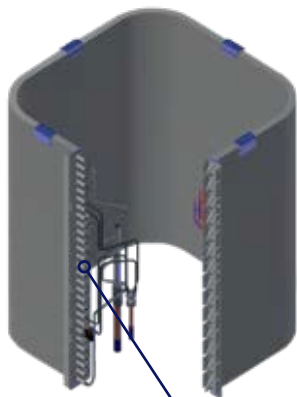
POWER-V™
TECHNOLOGY



- Achieves targeted SEER ratings while avoiding the increased pressure drop and larger coil size we would have seen using current, 3/8” coil technology.
- Maintains current coil footprints while adding condensate drain options on both left and right sides for easy and flexible coil replacement/ installation.
- Minimizes pressure through the system through less drain pan interference, thus allowing us to maintain SEER ratings at new DOE required static pressures.
- Easily slides out on rails for improved serviceability and coil cleaning.

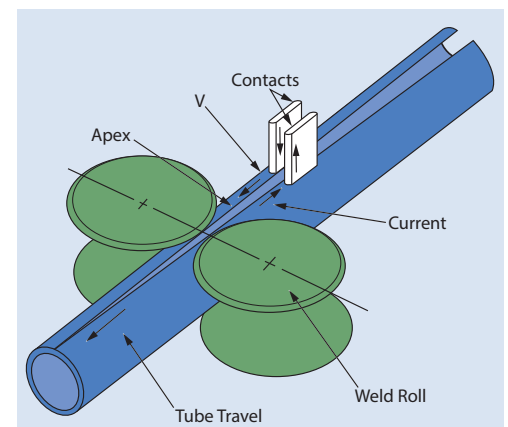
WELDED ALUMINUM OUTDOOR COIL TECHNOLOGY

Another exciting product improvement rolling out by 2023 will be our unique and innovative welded aluminum outdoor coils. By 2023, all outdoor units will feature welded aluminum tubes, replacing the current copper tubes for improved corrosion resistance. Tempstar is the only manufacturer to currently offer this new coil technology. Some key features include:



Interior view of welded AL coil

- High-strength aluminum with a zinc cladding layer for improved corrosion resistance
- Internal grooves for greater heat transfer efficiency
- Same footprint on our current 13.0/14.0 SEER design – but with an 8% weight reduction on average
- Same installation practices
 - Aluminum joints brazed at the factory – and treated with a protective heat shrink wrap
 - Only copper to copper brazing in the field
- Some competitors use extruded tube with axial enhancements – which will not accept zinc cladding



The welding process

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.

Our 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. That is why we are in the process of developing new products that will use R-454B refrigerant. 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
- 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)
- 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
- 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

As an added precaution, Tempstar will add safety features in all systems containing R-454B which could include leak detection sensors and mitigation procedures.

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. As we move forward with implementing R-454B, Tempstar will support you all along the way making the transition as smooth as possible.

* <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.

We anticipate the DOE will allow easy and confidential reporting of suspected violations, and will make every effort to investigate credible complaints. In addition, manufacturers will be obligated to report any potential violations we identify or become aware of to the DOE within 15 days of discovery.



In 2015, the DOE cracked down with big fines for violators, including a \$1.2 million fine to HVAC manufacturers.

Protect Your Business

Training

So how can you prepare to safeguard your business? The first step is training. As 2023 draws nearer, the 2023 minimum efficiency standards will be easily accessible on the Internet, including the DOE web site. Tempstar will also be creating training materials and continually communicating with you as we get closer to the deadline. We will make every effort to ensure that you are being supplied with region-appropriate products that meet all efficiency requirements for your area. However, it is important for you to protect your business by learning the efficiency standards for your region and placing product orders accordingly.



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:

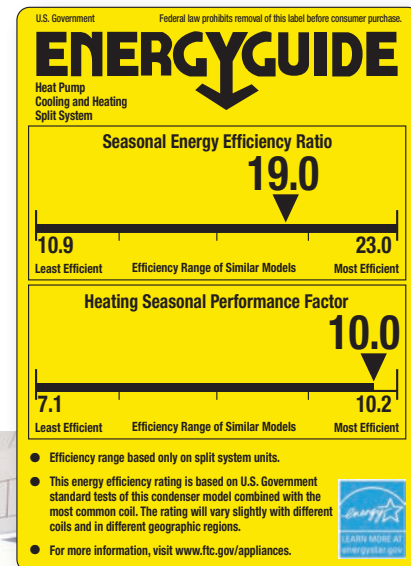
- 48 months for dealers / contractors
- 54 months for distributors
- 60 months for manufacturers

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

We Are Here To Help

At Tempstar, we are here to help you safeguard your business.

- We will provide detailed training.
- Our rating plates will continue to clearly identify regions in which installation of the equipment is prohibited.
- We will continue to include an EnergyGuide label on the exterior of the shipping packaging for all condensing units.
- We will publish EnergyGuide efficiency rating information for every product online so you can provide this information to your customer before every sale, as required.



MAKE THE COMMITMENT

Remember, we ALL have a stake in this. As your trusted supplier, we will invest the time and resources to make compliance as easy as possible. That includes training, updated product labeling, and continued communications about this topic.

In the end, we encourage you to make the commitment as well. Start preparing now by getting up to speed on the upcoming 2023 regulations and taking advantage of your resources. If you have any questions regarding the new 2023 regulations, reach out to your local distributor.

2023

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Where To Go For More Information

HVAC PARTNERS

HVAC PARTNERS

Visit HVACpartners.com for access to the 2023 Regulatory launch kit page. Visit often, as we will be adding new product information and regulatory details to the site as they become available.

Go to: [HVACpartners](#) > [Marketing Tools](#) > [Sales Tools](#) > [Marketing Launch Kits](#) > [2023 Regulatory](#)

CONTENT INCLUDES:

- 2023 Readiness Flyer
- 2023 Regulatory Resource Guide
- 2023 Regulatory Readiness Sales PPT
- Power-V™ Technology Technical Resource Guide
- Welded Aluminum Outdoor Coil Technical Resource Guide
- R-454B Technical Resource Guide
- R-454B Training Video

Learning Center

TRAINING

Visit MLCTraining.com to access the 2023 Regulatory video. Check back Q3 and Q4 of this year for 2023 Regulatory and product courses and classroom materials.



OTHER RESOURCES

U.S. Department of Energy –
[Energy.gov](https://www.energy.gov)

EPA and DOE Energy Efficiency –
[Energystar.gov](https://energystar.gov)

U.S. Environmental Protection Agency –
[Epa.gov](https://www.epa.gov)

U.S. Government's national archives –
[Federalregister.gov](https://www.federalregister.gov)

Notes

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Heating and Cooling Products

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