

Effects of 2006 13 SEER Minimum and HCFC Refrigerant Phase Out



Turn to the Experts.™



The New Energy Code

Federal Register: January 22, 2001 [(Volume 66, Number 14)]

The Department of Energy (DOE or the Department) is directed by the Energy Policy and Conservation Act to consider establishing minimum efficiency standards for various consumer products, including central air conditioners and heat pumps. Today's final rule adopts standards that are consistent with these requirements of the law. **The Department is amending the almost ten year old minimum efficiency standards for new central air conditioners and heat pumps. These amended standards take into account a decade of technological advancements and will save consumers and the Nation money, significant amounts of energy, and have substantial environmental and economic benefits. When today's adopted standards go into effect, they will essentially raise the energy efficiency standards to 13 SEER for new central air conditioners and to 13 SEER/7.7 HSPF for new central air conditioning heat pumps (heat pumps).** SEER, Seasonal Energy Efficiency Ratio, is the Department's measure of energy efficiency for the seasonal cooling performance of central air conditioners and heat pumps. HSPF, Heating Seasonal Performance Factor, is the Department's measure of energy efficiency for the seasonal heating performance of heat pumps. **The standards will apply to products manufactured for sale in the United States, as of January 23, 2006. The standard for split-system air conditioners, the most common type of residential air conditioning equipment, represents a 30 percent improvement in energy efficiency. For split-system heat pumps, the new standard would represent a 30 percent improvement in cooling efficiency and a 13 percent improvement in heating efficiency. The standard will also increase the cooling efficiency of single-package air conditioners and single-package heat pumps by 34 percent and the heating efficiency of single-package heat pumps by 17 percent. Finally, the Department is not yet adopting new standards for some products to ensure that more efficient versions remain available for niche applications.** The Department has determined that the new standards are the highest efficiency levels that are technically feasible and economically justified as required by law. Therefore, the Department is amending the energy conservation standards for residential central air conditioners and heat pumps. Central Air Conditioners and Heat Pump Features: The amended efficiency levels can be met by central air conditioner and heat pump designs that are already available in the market. We fully expect variations of these models to exist under the new standards, offering all the features and utility that are found in currently available products.

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Introduction

What is it?

How did it come about?

What are the effects to me?

What are the effects to the industry?

It goes without saying, we operate in an industry facing significant regulatory change. In January 2004, the U.S. Court of Appeals for the 2nd Circuit reinstated 13 SEER as the minimum federal standard effective in 2006. Carrier immediately focused its attention toward readying its complete product line for the new 13 SEER minimum.

For you, the 13 SEER minimum will provide a number of new product offerings, including those which will enhance the homeowner's level of comfort, as well as enable you to more efficiently install and provide ongoing service to the homeowner. In addition, you will have the most complete Puron[®]-based line of products to provide to your customers in anticipation of the 2010 HCFC phase out.

As a provider of HVAC products and related services to the residential market, you will need to be prepared for the training needs of your installation and service technicians, as well as the features and benefits of the new products and services that will be introduced in and around the 2006 SEER change. You will also need to be prepared to help architects, engineers, builders, building inspectors and homeowners understand the refrigerant phase out schedule for 2010.

The purpose of this document is to provide you with a much better understanding of the 13 SEER minimum and the HCFC refrigerant phase out, which will be our industry's next regulatory change.



Section 1

DOE to enforce 13 SEER, effective January 23, 2006

The current 10 SEER minimum was mandated in 1987 and put into effect in 1992. By 1993, the U.S. Department of Energy (DOE) was already considering a revision of the 10 SEER mandate. After being halted by Congress in 1995, the DOE re-started the process of revising 10 SEER in 1999.

In January 2001, the DOE announced that the current 10 SEER minimum for central air conditioners and heat pumps was going to increase to 13 SEER on January 23, 2006. After the change of Administrations, the DOE suspended the 13 SEER standard in 2001 and promulgated 12 SEER in 2002, also effective on January 23, 2006.

In January 2004, the U.S. Court of Appeals for the 2nd Circuit ruled that the DOE had not followed proper procedures and reinstated the 13 SEER standard. As a result, Original Equipment Manufacturers (OEMs) can only manufacture 13 SEER units after January 23, 2006.

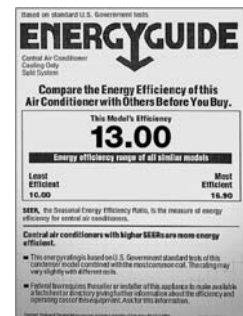
The 13 SEER mandate applies to new equipment production only. After the cut-off date, HVAC contractors may continue to sell existing inventory of equipment rated below 13 SEER and may continue to service those products as well.



Section 2

ARI drops challenge to 13 SEER

In March 2004, the Air Conditioning and Refrigeration Institute (ARI), which represents 90% of the U.S. air conditioning manufacturers, dropped its challenge of the DOE regulation affecting the minimum efficiency for central air conditioners and heat pumps following the ruling of the 2nd Circuit. This decision helped end a three-year battle over whether the minimum efficiency of air conditioners should be raised to 12 or 13 SEER and ensured certainty on the standard 13 SEER by the January 23, 2006 effective date.



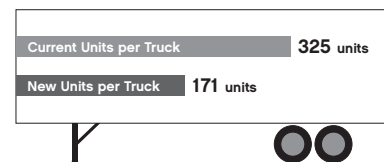
Section 3

Proper planning will reduce channel impact while delivering homeowner benefit

13 SEER is the right environmental choice. It provides significant energy savings for the country while reducing energy bills for homeowners. While this increase in efficiency represents a significant challenge for the industry, Carrier will be prepared to meet that challenge to support our customers. We encourage our channel partners to plan ahead to meet similar challenges detailed below.

Manufacturers

- **Material costs** — Achieving 13 SEER will require more efficient compression technologies, however, most of the efficiency increase will come from adding surface area to the condensing coil in the outdoor unit which increases the overall size of the unit.
- **Space issues** — To produce the same number of products that are physically bigger, more space will be needed for manufacturing, testing, warehousing, etc.
- **Shipping** — Because the trucks used to ship the bigger units will remain the same size, there will be fewer units per truckload and more deliveries per day. Looking at 2 1/2 ton cube units for example, we estimate that a truck will be able to carry roughly half as many 13 SEER cube units compared to the number of current 10 SEER cube units it could carry.
- **Labor costs** — Handling the larger equipment and larger volume of shipping activity will require increased manpower.



2 1/2 ton cube unit comparison per truck, current versus 2006

Dealers

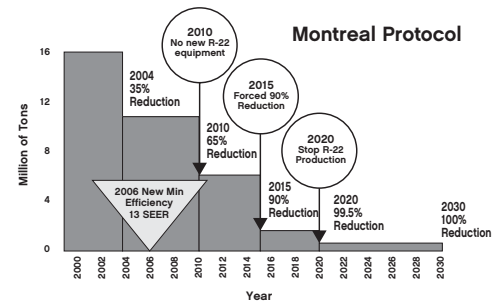
- **Space issues** — Dealer warehouses may have to grow larger to maintain current inventory levels or accept more frequent deliveries.
- **Labor costs** — As with manufacturing, dealers may see a need for increased manpower to handle the larger units, both in their warehouses and at jobsites.
- **Material costs** — Larger coils will require the use of more refrigerant - as much as 40% more per unit compared to 10 SEER models.

Proper planning will enable our industry to meet the challenges presented by the new standard while delivering the benefits of energy savings to homeowners.

Section 4

Other influencing factors

The United States ratified the United Nations Montreal Protocol on Substances that Depleted the Ozone Layer in 1988. This was followed by a passage of the Clean Air Act in 1990 that prescribed the U.S. refrigerant phase out schedule. The Environmental Protection Agency (EPA) is responsible for enforcing the phase out schedule of ozone depleting refrigerants. To the right is a chart on the HCFC phase out (R-22 is an HCFC), along with the 2006 DOE 13 SEER efficiency minimum. R-22 will be banned in new equipment starting in 2010.



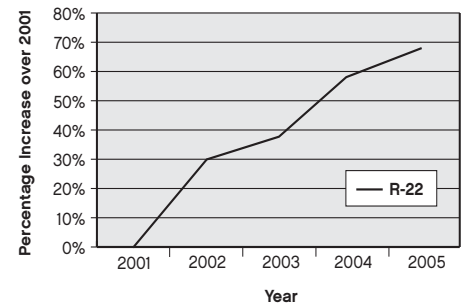
Section 5

The EPA announced a refrigerant allocation that went into effect in January 2003. Basically, this stopped most imports of R-22 from Asia and Eastern Europe into the United States, although many foreign manufacturers had anticipated this and filled the pipeline with excessive amounts of R-22 prior to the deadline. We expect that the decrease in inventories of imported R-22 will result in an increased price for R-22.

The European countries also adopted the Montreal Protocol but implemented a more aggressive phase out of ozone depleting refrigerants.

Since January 2003, there are fewer competing manufacturers to produce and sell R-22 in the United States. One major manufacturer has already closed down a plant that makes R-22. Fewer competitors and limited production capacity usually lead to higher prices. We expected the price of R-22 to rise and it has (see chart to right). While we cannot accurately project future cost increases, we can look at the precedent set by the phase out of R-12 in the automobile industry and foresee a dramatic increase in pricing as availability of R-22 diminishes.

R-22 Cost Increase %lb from 2001-2005



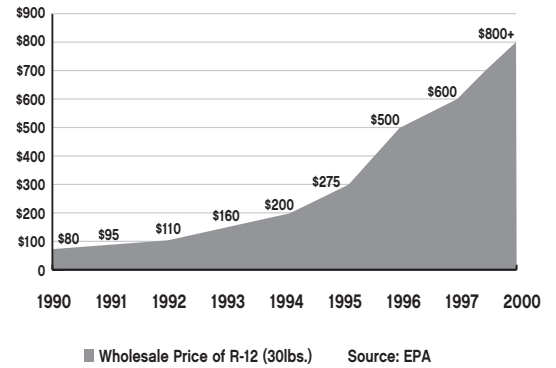
Source: E.I. Dupont de Nemours & Co.

Section 6

Historical Information: R-12 price increased as a result of its phase out as an ozone-depleting refrigerant in 1990. This took the refrigerator and automobile industry by storm. The chart to the right shows the increase in wholesale price over a period of 10 years when R-12 was phased out. In comparison to the R-12 pricing graphic on the right, the current situation for R-22 sits somewhere BEFORE the start of the 10-year period reported.

Section 7

In May of 2003, the United Nations Environmental Programme (UNEP) did a study on the impact the Montreal Protocol had globally. One scenario was that the UNEP discovered there could be a shortage of R-22 for servicing equipment starting as soon as 2014. Again, we expect R-22 refrigerant price increases due to higher demand and diminishing supply.



Section 8

Why prices increase; high demand low supply

- Reduction in supply of R-22 (government step phase out, see chart schedule on page 4)
- Refrigerant demand going up
 - Up to 40% more refrigerant per unit is required for DOE's 13 SEER minimum efficiency standard
 - Industry growing (5% per year on average)
- EPA allocation on refrigerants
 - Restrictions on foreign importers
 - Reduced number of U.S. manufacturers (less competition)
- Reduction of R-22 manufacturing facilities
 - Plant closings
 - Less demand worldwide for R-22 refrigerant

In conclusion, we fully expect the costs of manufacturing and servicing R-22 air conditioners and heat pumps to escalate as a result of the reduced availability of R-22 refrigerant.

Summary:

- DOE minimum is 13 SEER, with an effective date of January 23, 2006 for all heat pumps, air conditioners, small packaged products, and duct free split systems
- There are no outstanding court challenges to the above ruling
- Units will get larger, material and handling cost will increase for both R-22 and Puron® refrigerant products
- R-22 will be phased out in new equipment starting January 1, 2010 per the EPA's Clean Air Act of 1990
- Demand for air conditioners and heat pumps will continue to grow; average 5% per year
- Fewer refrigerant manufacturers to produce R-22, captive market
- There may be an R-22 shortage as early as 2014
- With high demand, limited supply; we can expect the price of R-22 to go up
- Service/repair cost for R-22 products will go up

Section 9

How will Carrier respond?

Before we reveal our solution to the 13 SEER mandate, please take a brief look at HVAC history:

- Carrier developed the first modern air conditioning system
- Carrier was the first to develop heat pump technology
- From our Nation's capital to the Sistine Chapel, Carrier has provided air conditioning in some of the world's most challenging installations
- Carrier has been manufacturing 13 SEER units since 1996

A history of firsts

When it became clear that R-22 was on its way to a world-wide phase out, Carrier responded by developing our Puron® family of products a full six years ahead of the competition. To date, there are more than one million Puron systems installed nationwide. Not only did this become our most reliable family of products, it led to a number of industry firsts:

- **1st to introduce Puron® refrigerant**
- **1st to develop a TXV for Puron**
- **1st to develop POE oils compatible with Puron**
- **1st to offer a two-speed Puron air conditioner and heat pump**

And, in 2004, Carrier introduced the revolutionary Infinity™ System, a system that delivers unprecedented control over indoor comfort for consumers combined with an unprecedented number of dealer benefits as well. So, how are we responding to the 13 SEER mandate? The only way we know how. We went back to the engineering lab and are coming to the market with the best product line completely designed around 13 SEER.

Introducing the new, 13 SEER platform

Carrier's new product line is not just a simple upgrade of the current designs to meet the new 13 SEER mandate. We are responding to this latest challenge by developing a completely new line of condensing products with industry-leading technology. Our new technology base is designed to optimize the advantages of meeting the 13 SEER minimum while maintaining the advantages we've gained using Puron® refrigerant.

In doing so, we've developed a product family that offers:

- **Superior heat transfer**
- **Superior air management**
- **Ultra-quiet operation**
- **Carrier reliability**
- **Easier installation**
- **A full range of product sizes and tiers**

Also, in anticipation of industry growth and the additional space needed to create physically larger products, Carrier is investing in more manufacturing space in Collierville, Tennessee. We will absolutely be able to deliver these new products as demand increases.



As a result of the 13 SEER mandate, we are coming to the market stronger than ever. With our new product line, Carrier will deliver:

- a stronger brand image
- best in class products for quality, reliability and durability
- improved system integration to create a “one-stop-shopping” scenario for customers who choose Carrier

Why? Because Carrier has the financial commitment combined with the historically validated success in research and development. No matter what the challenge, we will continue to respond by setting the curve with industry leading technology. As we move forward with this initiative, we enthusiastically invite all of our customers to join us in this endeavor.

Section 10

What are YOUR plans?

Now that you are better informed about what the future holds for your business, now is the time to take action. Furthermore, Carrier will be by your side every step of the way. Here are some suggestions that may be of use as you look ahead:

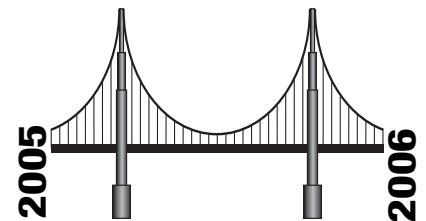
- **Determine your strategy** – You will have some tough decisions to make concerning costs, physical changes, manpower changes, etc. Be sure to involve your channel partners in helping plot the course that will work best for all involved.
- **Forecast production through second quarter of 2006** – Look at both existing and new developments that will affect the volume of business you can expect. Look at the mix of products you are currently offering, and see how that mix has changed – you might be surprised to see that you are already “ramping up” to higher SEER products.
- **Identify obstacles to success** – Construction issues, installation and labor challenges and other “obstacles” may get in the way of your goals. By identifying those obstacles now, you can plan around them.
- **Integrate 13 SEER into sales & marketing** – Through training and advertising, the sooner you can get word out about the mandated 13 SEER minimum, the sooner you can begin selling the advantages of the new product line, such as lower sound and money savings through higher efficiency products.

While there may be some growing pains, the mandated 13 SEER minimum has ultimately provided you with the opportunity to shift your approach with your customers from one of energy savings, payback and return on investment. Instead, you can turn your attention to the quality of life issues that make customers more satisfied and loyal in the long run: comfort, quality, convenience and peace of mind.

Reference Material:

1. www.energy.gov
2. www.epa.gov

Where will you be in 2005?



For many Carrier dealers, the 13 SEER minimum just supports the trend of selling more higher efficiency products and a slight decline in sales of 10 SEER units.



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