HSPF: What it is and Why It's Important

Carrier®
turn to the experts℠

greenspeed™ INTELLIGENCE

INFINITY™ SERIES

Superior heating efficiency can drive higher savings on monthly utility bills

INTRODUCTION

When making comparisons between heat pumps, traditional emphasis for HVAC dealers and home owners has been on SEER, the cooling efficiency. However, because heat pumps provide both cooling AND heating, it's important to look at heating efficiency – HSPF – as well. HSPF is a concept that many have overlooked or perhaps not really understood. And now, understanding HSPF is more important than ever. With its new Infinity® Heat Pump with Greenspeed™ intelligence, Carrier has significantly raised the bar for HSPF ratings. This breakthrough has created a new point of emphasis for dealers and consumers when split system heat pumps are concerned – HSPF.

WHAT IS HSPF?

HSPF is an acronym for Heating Seasonal Performance Factor. It is the U.S. Department of Energy's (DOE) standard measurement for the energy efficiency of a heat pump during heating operation. Every HVAC manufacturer must follow DOE guidelines for testing and rating the efficiency of its products.

$$HSPF = h_S / P_{WS}\ 3413$$

where

h_S ***= heat produced during the season (Btu)***

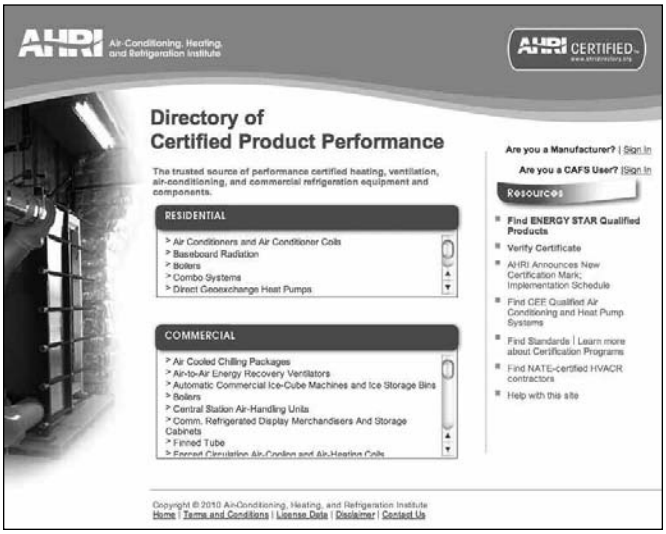
P_{WS} ***= electrical power consumed during the season (kWh)***

HSPF is calculated by taking the total heat created by the heat pump during the heating season and dividing by the total amount of electricity it used during the heating season.

HOW IS HSPF USED?

Here's a simple trick to remember the value of HSPF: If you eliminate the "H" you get SPF… and most people know that when you buy sunscreen, the higher the SPF the better the protection. Buy a low SPF sunscreen and you can easily get burned! With heat pumps, a lower HSPF product can burn you with higher electricity bills.

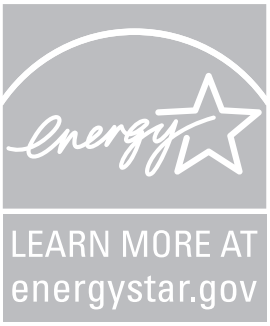
Simply stated, a higher HSPF number means higher energy efficiency and greater savings. Home-owners interested in energy savings can use the published HSPF ratings to compare different heat pump models from different manufacturers to help make their purchasing decisions. These ratings can be found on the AHRI web site ***(http://www.ahridirectory.org/ahridirectory/pages/home.aspx)*** and on the manufacturers' web sites.



AVAILABLE HEAT PUMP EFFICIENCIES

When looking at HSPF ratings of a new residential split-system heat pump, it's important to understand the efficiencies currently available. At the time of this publication, there are three significant levels of HSPF ratings to keep in mind:

- **7.7 HSPF** - DOE minimum allowed efficiency. In many cases, a 7.7 HSPF heat pump may be much more energy efficient than an older heat pump you may be replacing. This is the lowest allowed efficiency for new equipment.
- **8.2 HSPF** - DOE ENERGY STAR® qualified product meeting the U.S. Government's minimum standard for higher efficiency, energy saving products.
- **13 HSPF** – Unprecedented in the industry, this efficiency is currently achieved only by the Carrier Infinity® Heat Pump with Greenspeed™ intelligence for significant savings over other ENERGY STAR® qualified heat pumps.



WHY HSPF CAN BE BEST MEASURE OF EFFICIENCY & SAVINGS

HSPF vs. SEER

Homeowners and dealers often use SEER ratings as the best measure of heat pump efficiency and savings. One explanation for this is a wider range of SEER levels available provides a perceived benefit of a wider range of savings. However, now that Carrier can achieve up to 13 HSPF with Greenspeed™ intelligence, dealers and homeowners alike should look at the higher savings that can be achieved during the heating season. When you compare the potential savings between today's minimum and maximum heating and cooling efficiencies, you'll find that a home owner can save significantly more during the heating season with the Infinity Heat Pump with Greenspeed intelligence. Combine the heating savings with the impressive cooling ratings of up to 20 SEER, and the new Greenspeed intelligence units provide a compelling payback story.

Annual savings comparison vs. 7.7 HSPF and 13 SEER on a 3-ton unit:

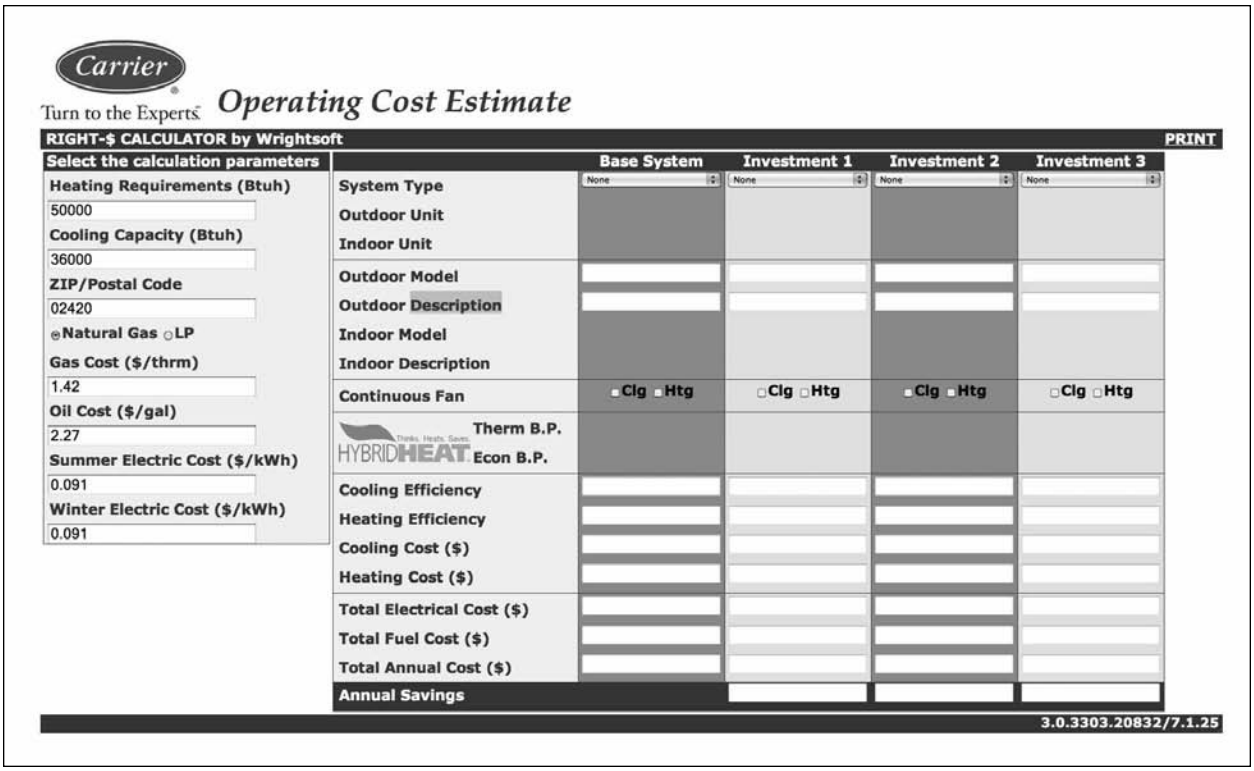
- 13 HSPF – up to $352/year
- 20 SEER – up to $111/year

Of course, actual savings will vary according to a number of factors, including area climate, size and condition of home, homeowner comfort preferences and more. Our savings comparisons have been made using AHRI standards for estimated operating costs using average US heating and cooling hours. AHRI is a national trade associate that represents 90% of HVAC equipment manufactured in the U.S., and is widely recognized as a reliable and unbiased resource for HVAC standards and practices.

HSPF vs. AFUE

Traditionally, heat pumps have not been considered a practical solution in areas where natural gas or heating oil are inexpensive, or areas where a supplemental heat source is needed due to lower winter temperatures. However, the Carrier Infinity Heat Pump with Greenspeed™ intelligence has changed the game. This heat pump can efficiently deliver comfortable indoor temperatures even as temperatures outside drop below twenty degrees – much better than standard heat pumps.

In addition, as natural gas and heating oil prices have increased, it's time to re-think the idea of using a heat pump in traditional gas or oil furnace markets. The best way to decide whether a 13 HSPF heat pump is a good option is to use the Carrier OpCost Calculator which can be accessed on the internet at HVACpartners.com.



Carrier
Turn to the Experts.

Operating Cost Estimate

RIGHT-$ CALCULATOR by Wrightsoft — PRINT

Select the calculation parameters		Base System	Investment 1	Investment 2	Investment 3
Heating Requirements (Btuh) 50000	System Type	None	None	None	None
Cooling Capacity (Btuh) 36000	Outdoor Unit				
ZIP/Postal Code 02420	Indoor Unit				
⊕Natural Gas ○LP	Outdoor Model				
Gas Cost ($/thrm) 1.42	Outdoor Description				
Oil Cost ($/gal) 2.27	Indoor Model				
Summer Electric Cost ($/kWh) 0.091	Indoor Description				
Winter Electric Cost ($/kWh) 0.091	Continuous Fan	□Clg □Htg	□Clg □Htg	□Clg □Htg	□Clg □Htg
	HYBRIDHEAT Therm B.P. / Econ B.P.				
	Cooling Efficiency				
	Heating Efficiency				
	Cooling Cost ($)				
	Heating Cost ($)				
	Total Electrical Cost ($)				
	Total Fuel Cost ($)				
	Total Annual Cost ($)				
	Annual Savings				

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13 HSPF IS A CARRIER EXCLUSIVE

At the time of this publication, the Carrier Infinity Heat Pump with Greenspeed™ intelligence is the only air source split-system heat pump in the industry achieving 13 HSPF. This high HSPF rating is unprecedented and currently unchallenged. In the 3 ton size, it is 29% higher than the nearest competitior.

The keys to Carrier's superior performance include:

- Inverter-driven variable speed operation that precisely matches compressor speed to heating, cooling and humidity control requirements
- Infinity control which gives the dealer and homeowner enhanced levels of communications with the heat pump system
- Greenspeed intelligence with system monitoring of critical parameters including discharge pressure, compressor temperature, outdoor temperature and more, and the ability to adjust operation for optimized performance

Additional Benefits of the Infinity Heat Pump with Greenspeed Intelligence

COMFORT

Homeowners will appreciate the comfort this system can provide. True variable speed operation allows the system to operate a majority of the time on lower speeds to gently circulate heated or cooled air without the dramatic up and down temperature swings that can be associated with many single-speed systems. During heating, this product maintains a higher leaving air temperature (temperature of the air leaving the heat vents) than standard heat pumps as outdoor temperatures drop. During cooling, longer run cycles help contribute to greater indoor humidity control and comfort.

Additional Benefits continued...

DEALER INSTALLATION, SETUP & TROUBLESHOOTING

- Two wires to the outdoor unit - From a physical standpoint, the new Carrier Infinity Heat Pump with Greenspeed™ intelligence simplifies installation to the outdoor unit to just two control wires to the outdoor unit. This will make retrofit installations much simpler and faster when only two wires are available.
- New Infinity Control setup features – A number of new functions for heat pump setup include charge assist that calculates additional charge needed to account for lineset length as well as an optimum subcooling temperature display
- Enhanced zoning through a total of five airflow adjustments compared to three on older systems allowing the technician to better fine tune zoning systems
- Adjustable CFM settings allows dealer to change factory settings to resolve ducting issues as well as noisy airflow
- The inverter-driven variable speed technology gives this heat pump a wider range of operation for greater sizing flexibility, including sizing the system for optimum heating capacity
- The new communicating intelligence on this product will allow service technicians to hookup a second Infinity Control directly to the outdoor unit for checkout and troubleshooting the system without needing indoor access to the home.

Naturally, all performance data and potential savings will vary based on your area, physical limitations of the home, and current energy source pricing. However, now is the time for you to consider the benefits of a higher HSPF heat pump for efficiency, savings, potential tax rebates, easier installation and troubleshooting and overall performance. For more information about the Carrier Infinity® Heat Pump with Greenspeed™ intelligence, including availability and ordering information, contact your distributor representative.

REFERENCES:

AHRI Air-Conditioning, Heating, and Refrigeration Institute

http://www.ahrinet.org/about+us.aspx

U.S. Department of Energy: Energy Efficiency & Renewable Energy: Energy Savers:
Air-Source Heat Pumps

http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12620

ASHRAE

http://www.ashrae.org/education/page/1481

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