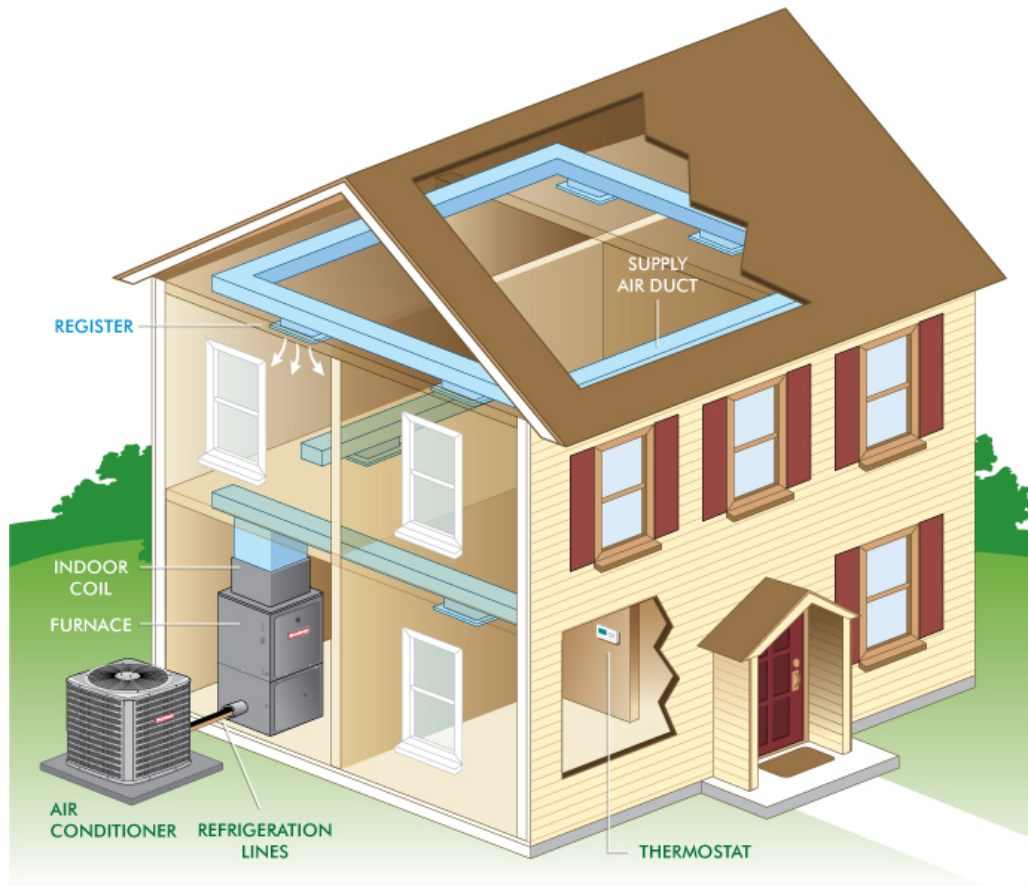


Central Air Conditioner



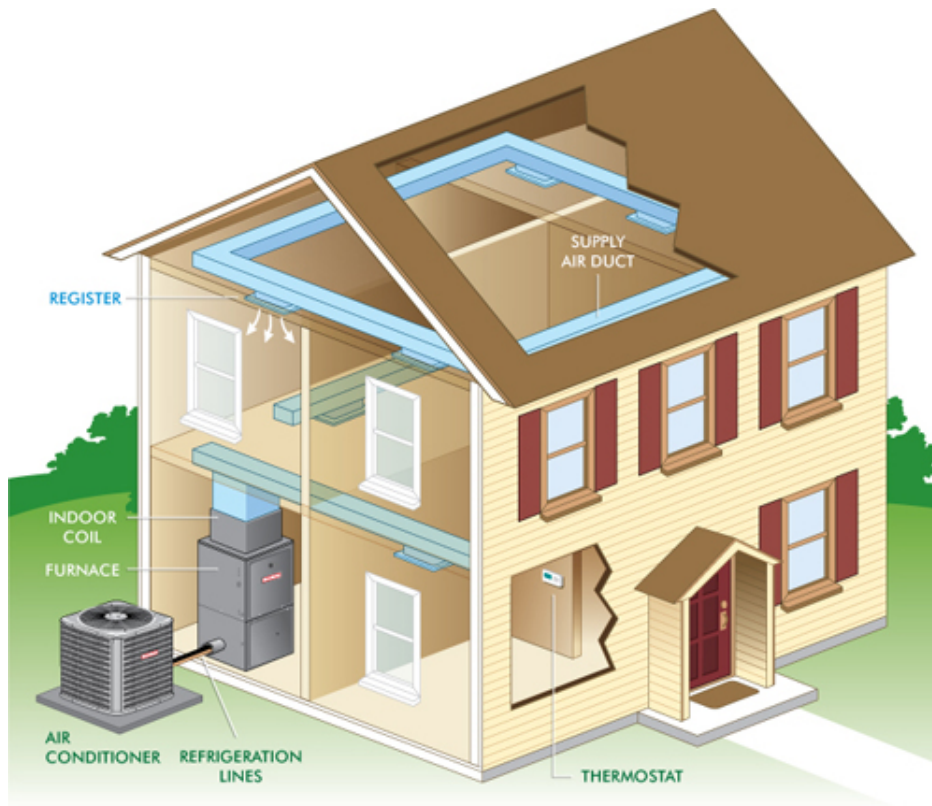
Facts:

- The typical central air conditioning system is a split system, with an outdoor air conditioning, or "compressor bearing unit" and an indoor coil, which is usually installed on top of the furnace in the home.
- Using electricity as its power source, the compressor pumps refrigerant through the system to gather heat and moisture from indoors and remove it from the home.
- Heat and moisture are removed from the home when warm air from inside the home is blown over the cooled indoor coil. The heat in the air transfers to the coil, thereby "cooling" the air.
- The heat that has transferred to the coil is then "pumped" to the exterior of the home, while the cooled air is pumped back inside, helping to maintain a comfortable indoor temperature.
- Central air conditioning can also be provided through a package unit or a heat pump

Benefits:

- **Indoor comfort during warm weather** - Central air conditioning helps keep your home cool and reduces humidity levels.
- **Cleaner air** - As your central air conditioning system draws air out of various rooms in the house through return air ducts, the air is pulled through an air filter, which removes airborne particles such as dust and lint. Sophisticated filters may remove microscopic pollutants, as well. The filtered air is then routed to air supply duct work that carries it back to rooms.
- **Quieter operation** - Because the compressor bearing unit is located outside the home, the indoor noise level from its operation is much lower than that of a free-standing air conditioning unit.

Central Heating System



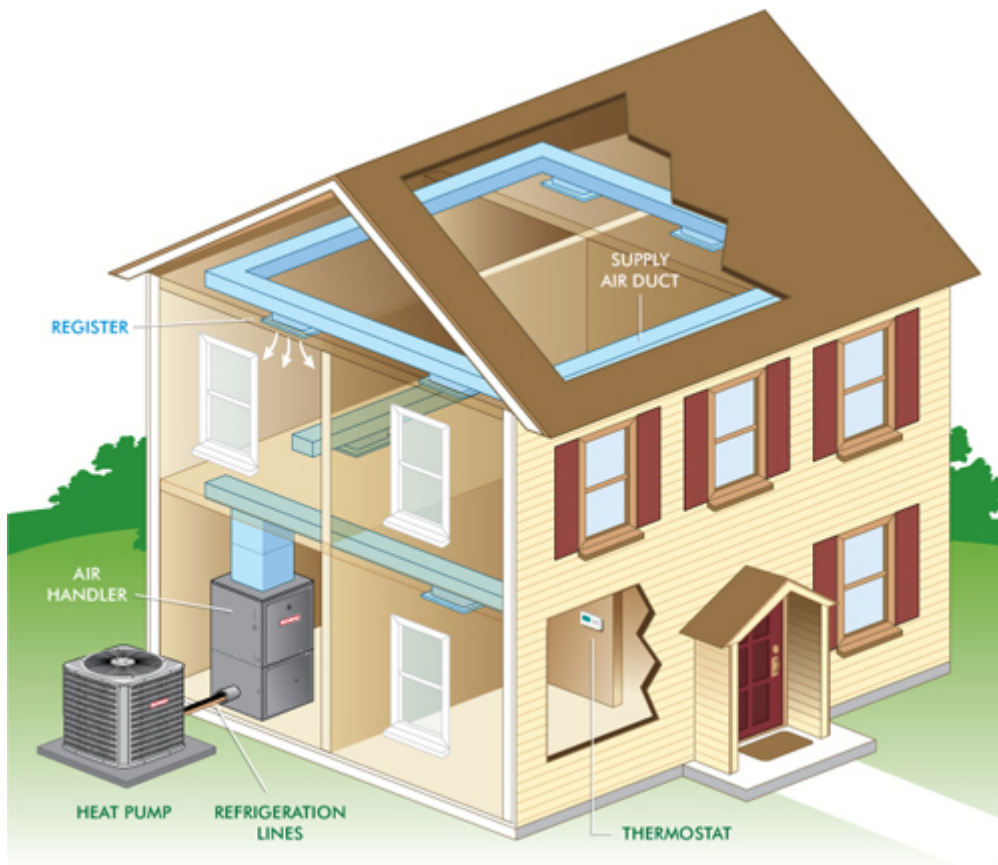
Facts:

- A furnace works to keep a home warm in the winter and plays a critical part in the operation of an air conditioning system.
- Furnaces produce heat through the combustion of natural gas in the furnace's burner. The heat produced from this process then passes through a heat exchanger. Air from your home's return air ducts is blown over the heat exchanger, thus warming the air.
- The furnace's blower then blows the warmed air into the duct work, which carries and disperses the warmed air throughout the home.
- During warmer months, the blower inside a furnace continues to circulate return air throughout the home—only this time, the return air has been cooled by being blown over the indoor coil portion of the home's split-system air conditioning system. The evaporator coil is typically installed downstream of the furnace.

Benefits:

- Indoor warmth any time it is required.
- **Energy efficiency** -The efficiency of a furnace can be determined by its AFUE—or Annual Fuel Utilization Efficiency. The minimum efficiency level for furnaces currently manufactured in the U.S. is 80% AFUE. A rating of "80% AFUE" means that for every dollar you spend heating your home; 80 cents are actually applied to the generation of warmth. Compared to many of the 60% AFUE furnaces in older homes, 80% AFUE furnaces are a significant improvement. However, for enhanced energy efficiency, you may wish to consider a 95% AFUE furnace.
- **Cleaner air** - As your HVAC system draws air out of various rooms in the house through return air ducts, the air is pulled through an air filter, which removes airborne particles such as dust and lint. Sophisticated filters may remove microscopic pollutants, as well. The filtered air is then routed to air supply duct work that carries it back to rooms. Whenever the HVAC system is running, this cycle repeats continually, constantly filtering and cleaning the air in your home.
 - This cleaning process improves with the installation of a variable-speed furnace. Variable-speed furnaces use variable-speed blowers, which shift between several speeds. These furnaces will run longer at a low speed, which causes them to filter the indoor air more frequently.
 - **And remember** - because the furnace plays an important role in the operation of the air conditioner, its variable-speed blower helps maintain both a consistent indoor temperature and improved air quality year-round.

Heat Pumps



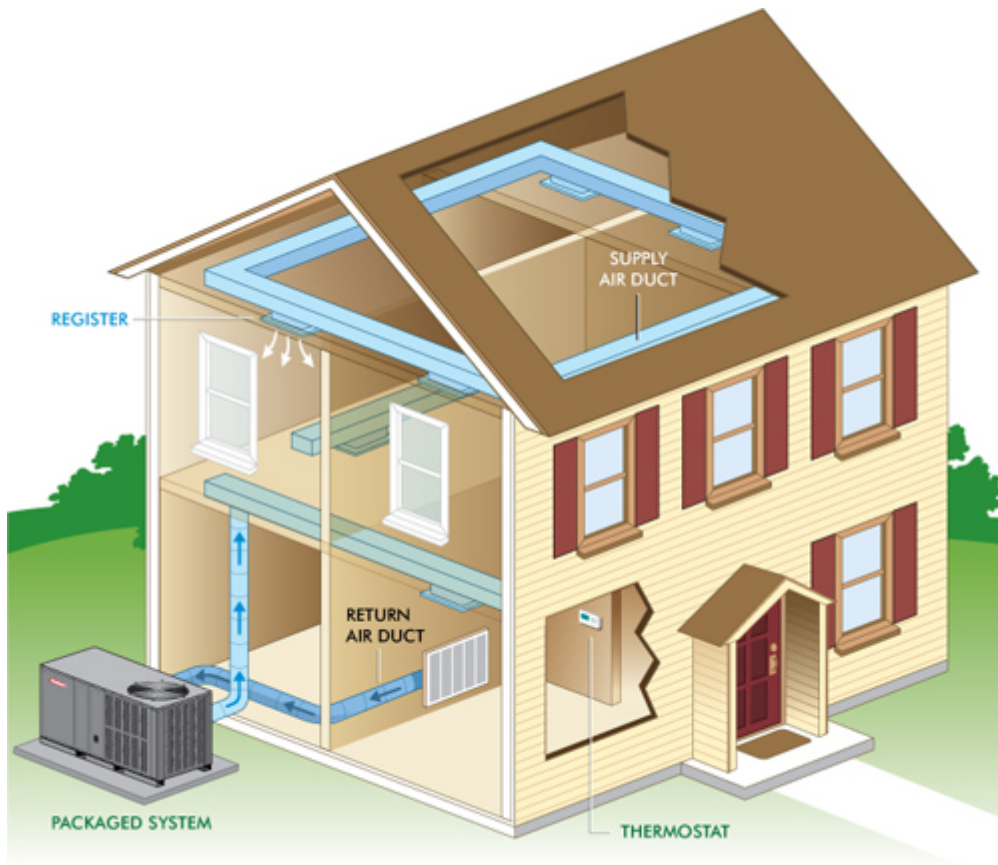
Facts:

- Using electricity as its energy source, heat pumps are used for either the heating or cooling of your home by transferring heat between two reservoirs.
- Air Handler distributes air properly.
- In the warmer months, the heat pump acts like an air conditioner, removing heat from the air inside your home and transferring it outside.
- During colder months, heat from outdoor air is extracted and transferred to the interior of your home. Believe it or not, even a 32° Fahrenheit day produces enough heat to warm a home via a heat pump.

Benefits:

- **Year-round, energy-efficient indoor comfort for moderate climates** - A central heat pump helps maintain comfortable temperatures inside your home and reduces humidity levels year-round. Homes located in regions with severely cold temperatures may either require supplemental heating or be better served with an air conditioner/furnace combination.
- **Cleaner air** - As your heat pump system draws air out of various rooms in the house through return air ducts, the air is pulled through an air filter, which removes airborne particles such as dust and lint. Sophisticated filters may remove microscopic pollutants, as well. The filtered air is then routed to air supply duct work that carries it back to rooms. Whenever the air conditioner is running, this cycle repeats continually, constantly filtering and cleaning the air in your home.
- **Quieter operation** - Because the compressor bearing unit of the typical central heat pump system is located outside the home, the indoor noise level from its operation is much lower than that of a free-standing air conditioning unit.

Packaged Systems



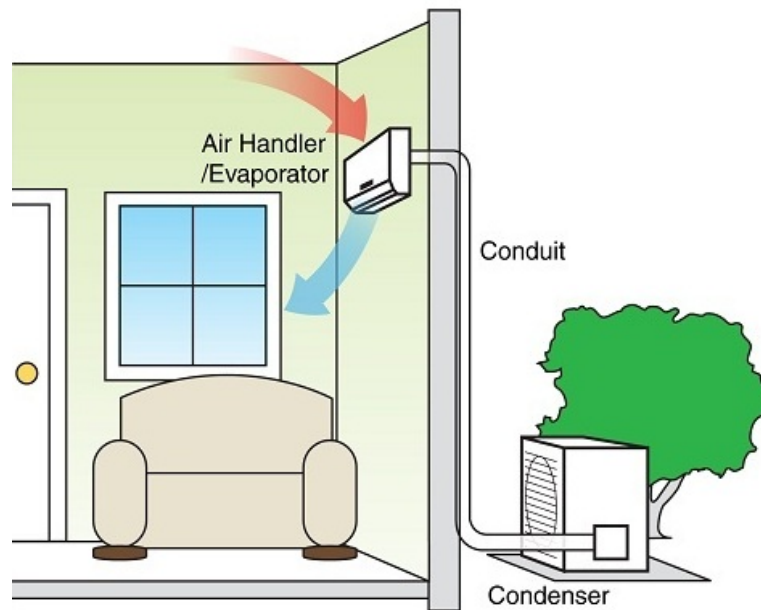
Facts:

- Package units are unique, all-in-one systems that supply both cooling and heating equipment in one "package." These units sit on the ground or rooftop outside of your home or business.
Rooftop units can be side draft (Supply and return from side of unit) or down draft (Supply and return from bottom of unit).
Roof top units need a curb (mount) to be properly placed and secured
- Package units come in three forms:
 - Packaged heat pumps offer heating and cooling using heat pump technology.
 - Packaged air conditioners cool your home and can heat it as well, using electrical strip heat.
 - Packaged gas-electric units offer all-in-one air conditioning and natural gas-powered furnace performance.

Benefits:

- **Space efficiency** - Unlike split-system units, all components of a complete heating and cooling system are contained in one location, making package units ideal for situations in which indoor space is at a premium.
- **Energy-efficient heating and cooling performance** - All package units offer 13 SEER or higher cooling performance. Our package gas/electric units offer 80% AFUE heating performance, as well.

Mini Split Systems



Facts:

- A ductless mini split system is an indoor fan, referred to as the head, and an outdoor compressor unit. The head measures about 11 inches high, 34 inches long and 12 inches deep and connects with the compressor by copper tubing and electrical wiring that's passed through a 3-inch hole. The compressor looks like a small central air condenser and can cool and heat one or more rooms.
- Can come in heat pump or ACr only option

Benefits:

More control. With central air, you must cool an entire house even if you want only one room cooled. Offering room-by-room control, ductless mini split systems cool (or heat) only the areas you want. Room-by-room temperature control alone produces savings for many homeowners.

Ease of use. Most homes either lack zones or have complex zoning systems that make them expensive or confusing to operate. With a ductless mini split system, multiple heads make zoning as simple as setting a TV remote control.

Less energy waste. Ductless mini splits use inverter technology which allows the system to continuously adjust its speed to match the heating and cooling demand of the home. Additionally, the ducts in conventional systems can lose up to 25 percent of the energy produced; ductless mini split systems conserve 95 percent, because the energy is transported through insulated lines.

Better aesthetics, easier installation. Retrofitting homes for central air conditioning requires cutting holes in walls, floors and ceilings or losing valuable closet space to make room for ducts. A ductless mini split system requires just a three-inch hole in an outside wall to connect the compressor and head.

Frequently Asked Questions

Why should the client consider purchasing a new heating or air conditioning system?

Efficiency and cost savings

- Purchasing a heating or air conditioning system is no small matter. However, if your existing system is old, in need of repair or simply inefficient, purchasing a new unit, one which can be as much as 60% more efficient than a system purchased just 10 years ago, can offer long-term benefits.
- Rather than continuing to pay for ongoing maintenance and costly monthly bills, invest in a new system today that will save you money for years to come.

How can the client find the system that's right for them?

Get the facts from an expert

- Consumers seeking to replace an existing system often choose a new unit with equal or higher efficiency ratings compared to their previous system. Replacing a unit that is 10- to 15-years-old may reduce natural gas or electricity costs by 30 to 50%.

How does the client determine the size, or capacity, of their HVAC system?

Schedule a Neel's Heating & Air visit

- Factors affecting the size of your new system include the climate in your region, humidity levels, the number of windows in your dwelling, total square footage of your home, the direction your home faces, the number of heat-producing appliances in your home, the type of insulation you have and the number of people that live in your residence.
- Rule of thumb 500 square feet = 1 ton unit
- Neel's Heating & Air can perform the proper calculations to determine the appropriate heating or cooling unit for your home and lifestyle.

What goes into installing a new system?

It's all about the ductwork.

- Putting a new system in a home that has not had central air and heat before will require the installation of ductwork, insulation, refrigerant piping, electrical service, wiring, thermostat, condensate piping, flue piping, flue terminations, chimney liner, slabs, filter, driers, registers, grills, drain pans and evaporator coil. Beyond equipment, the most important component installed with a new system, however, is the ductwork.
- Ductwork is composed of two parts, supply and return. Supply duct is attached to the outflow of the new system, delivering air to each zone in a home. The amount of air reaching each zone is determined by the size of supply ductwork connecting it to your system. Your dealer will help you determine the size of all the supply ductwork in your home.
- The second part of the ductwork, the return duct, attaches to the inlet of the new system and draws air out of the spaces to be heated or cooled. Attached to the return duct is the filter. The filter should be placed as near to the furnace or air handler as possible. Ductwork can be either fiberglass or metal and must be properly sized in order to evenly distribute the proper amount of air to each room.

What happens when the client replaces my old system?

Start with a detailed inspection

- To install the most efficient HVAC system in your household, a detailed inspection should first be performed.
- The inspection by your contractor should include, as a minimum, the inspection of your home's ductwork, insulation, refrigerant piping, electrical service, wiring, thermostat, condensate piping, flue piping, flue terminations, chimney liner, slabs, filter, driers, registers, grills, drain pans and evaporator coil.
- An estimate will be sent on the scope of work
 - Permit will be pulled upon approval
 - Work will begin on approved estimate
 - Third party duct pressure test will be performed after completion of install
 - Final inspection will be called to city/county to finalize permit

How long will the clients system last?

Proper maintenance is key

- Maintenance and service play a key role in the life-cycle of a heating or air conditioning system. If all recommended maintenance and service actions are taken, an air conditioner can last 12 to 15 years and a gas furnace 20 to 25 years.

Does the client need to change their indoor coil?

- It is generally a good idea to replace the indoor coil if you are also replacing your air conditioner or heat pump. There is a correlation between the efficiency of your heating or cooling system and the performance of the indoor coil and changing out the current indoor coil for a new one may be critical to optimizing the performance, the efficiency and the savings potential of your new system.

Where can the client locate their air handler or furnace system?

You may have options based on your home's design

- The system can actually be located in several different places. A system with up-flow application might be located in the basement, while a system with a horizontal application may be found in your attic. A self-contained, or single package unit, could be located outside on a slab or on the roof. Your garage could house an up-flow, down-flow or horizontal application system.

What is a heat pump?

Air movement from point A to point B

- A heat pump is a device used for either the heating or cooling of a space by transferring hot and cold between two reservoirs.
- A heat pump can act like an air conditioner, transferring heat from inside to out, or like a heater as it transfers exterior heat to the interior. A winter day with a temperature of 32° Fahrenheit still produces enough heat to warm a space when the air is transferred by heat pump.

What can clients do to control the humidity levels in their home?

It's all about variability

- Humidity levels can be reduced by using a variable-speed furnace or air handler as part of your HVAC system. Variable speed units run longer, at lower speeds, allowing air to constantly circulate against the cooling coil and remove more moisture.
- Variable-speed motors also use less electricity than regular motors, reducing your energy costs.

What can Clients do before calling us to service my system?

HVAC systems are complicated networks of machinery that should be serviced by a certified professional. However, if your HVAC system seems to be malfunctioning, you can try a few basic steps, which *may* correct your problem, prior to calling a service professional. If you do not feel comfortable performing any of these tasks, however, do not hesitate to call an HVAC contractor.

- Disconnect and reconnect your indoor and outdoor switches.
- Make sure your circuit breakers are in the ON position.
- Make sure your filters are clean.
- Open supply and return vents and make sure they are unobstructed.
- Check the settings on your thermostat.
- Make sure the system switch is on the appropriate COOL or HEAT setting.

What is SEER?

- Seasonal Energy Efficiency Ratio. SEER indicates the relative amount of energy needed to provide a specific cooling output

What is AFUE?

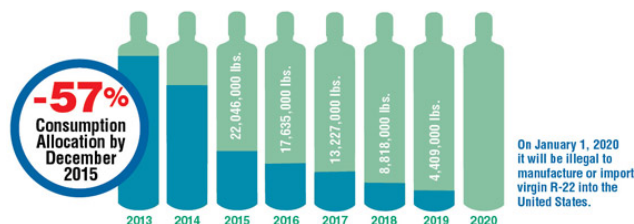
- AFUE is the abbreviation for Annual Fuel Utilization Efficiency ratio. AFUE is used to rate furnace efficiencies by dividing the ratio of heat output by heat input. This measurement describes how well fuel, gas or oil is consumed to produce heat by a furnace. As the AFUE rate increases, the efficiency of your furnace also increases, lowering your fuel costs. Furnaces manufactured in the United States are required to have at least an 80% AFUE.

What is HSPF?

- HSPF is the abbreviation for the Heating Seasonal Performance Factor, which is a rating of the efficiency level of the heating operation of a heat pump. The higher the HSPF, the more efficient the heating performance of a heat pump. New units in the United States have HSPF ratings from 7.0 to 9.4.

What is R-22?

- R-22 is the common name for hydro-chlorofluorocarbon (HCFC). R-22 has been used as a refrigerant by HVAC manufacturers for over 40 years, but studies in the past decade have shown that HCFCs contain chlorine, an ozone-depleting agent. For this reason, the United States Clean Air Act has set a target date for January 1, 2010, on which HVAC **manufacturers must cease the production of products that use R-22.**



What is R-410A?

- R-410A is the common name for an emerging hydro-fluorocarbon (HFC) that is being used as a refrigerant in the HVAC industry. R-410A is more environmentally friendly than R-22 and is being seen as the most likely replacement for R-22 by HVAC manufacturers. At the beginning of 2010, the use of alternate refrigerant will be required in HVAC manufacturing.

What is ENERGY STAR?

- ENERGY STAR is a program that was created by the US Environmental Protection Agency (EPA) to help businesses and individuals make energy efficient purchases.
- This program places the ENERGY STAR label, a small blue and white logo, on items that meet superior energy efficiency standards. This label provides an easy way for consumers to identify quality, high efficiency products.
- For more information about the Energy Star program, please view their website at www.energystar.gov.

