



SCHAEFER NEWS

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2006 Air Conditioning Regulations Seasonal Energy Efficiency Ratio (SEER)

We are still in mid-winter and thoughts of hot weather and air conditioners are tucked away into the recesses of our minds. Even so, before you know it, the snow will melt, trees and flowers will bud and the season will allow home inspectors to evaluate the cooling systems again. Therefore, we thought we would pass on some information that may eventually effect homes requiring new central air conditioning systems and heat pumps. The US Dept. of Energy has mandated improvements to the minimum efficiency of central air conditioning systems, which went into effect on Jan. 23, 2006. Before we address what impact this will have on those purchasing or replacing central air conditioners and heat pumps, it might be best to review the main components of a central air conditioning system.

More often than not, when the general public thinks of central air conditioners, they think of the condensing unit they see on the exterior of the home. This however, is only half the system. There is also the air handler and evaporating unit that will be found somewhere within the home. In most cases when a home has forced warm air heat, these two components are part of or attached to the furnace. In this case the blower that circulates the heat through the house also circulates the cool air from the air conditioner; a separate air-handler is not needed. The evaporator unit of the air conditioner is mounted above the furnace within the duct-work. The evaporator unit consists of a copper coil which is cooled by the refrigerant flowing through it. Air is blown over the coil, cooled and circulated through the home. A separate air-handler (blower) and evaporator unit independent of a furnace is typically required when the house does not have a forced warm air heat or there is inadequate space above the furnace to fit the evaporator unit (see diagram below). This will be important to understand as this article explains the potential affects of the new regulation.

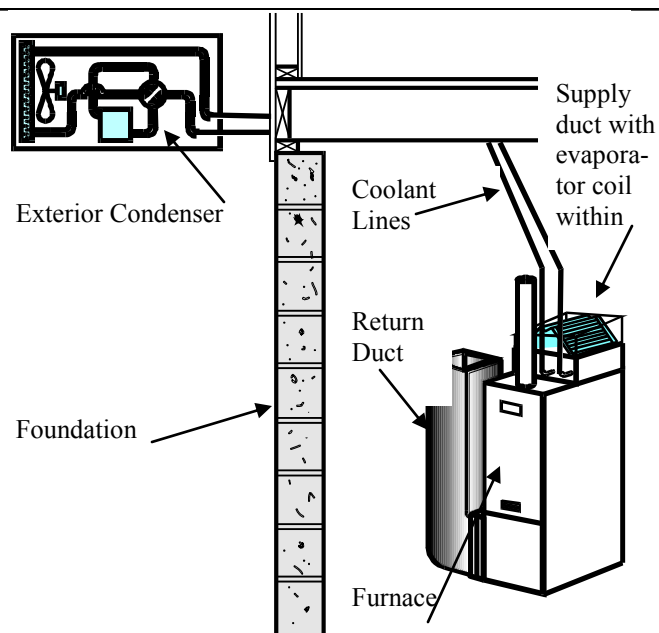
WHAT IS THE NEW REGULATION?

As of Jan. 23, 2006 all central air conditioners produced must be rated SEER 13 (Seasonal Energy Efficiency Ratio). All current stock less than SEER 13 can be installed until supplies run out. Some manufactures have stopped producing systems less than SEER 13 as early as June of 2005. The exception to this rule is for those apartments or condos with through-wall condenser units. Apartments and condos may continue to have SEER 10 units produced for them until 2010. Time is being granted to resolve the difficulty that the size of the new units will have where space may be very limited.

Another issue to consider when replacing Air conditioning systems is that in 2010 the regulations for refrigerant will change also. It may be of benefit when purchasing a unit with a SEER 13 rating to find one that already meets the 2010 refrigerant requirements.

The good news is that the new SEER 13 is about 30% more efficient than the SEER 10 it is replacing. Therefore, it should cost less to cool your home. Of course, there are air conditioning systems with even higher SEER ratings but they are optional. The not so good news is that it is likely to cost more to install and retrofit when replacing older units.

Basic Central Air-Conditioning System With Forced Warm air Heat



COST AND INSTALLATION ISSUES:

There are two major factors that determine cost and installation issues for SEER 13 air conditioners.

- The size of both the condenser and the evaporator unit.
- What has to be replaced when part of an older system fails.

Lets deal with the second point first. It is most common that the exterior condenser unit fails before the interior air-handler and evaporator unit. In that case it was simple enough to just replace the condenser and continue to use the older evaporator. You can no longer do this as of Jan. 23, 2006 for two reasons: The regulations do not allow it and you may shorten the life span of the new condenser by using it in conjunction with an older evaporator. This means if the condenser fails, there will be the added cost of replacing the evaporator even if it is still functional. Bottom line, it will about double the cost of replacement.

Why does size factor into the cost of installing a new SEER 13 air conditioner?

Both the condenser and evaporators are bigger than older units. This means significantly more copper, steel and aluminum to manufacture them. More material equals greater cost.

The condenser unit will be twice the size or more than the older SEER 10's. This means a typical truck load of 342 SEER 10 condensers will be cut down to less than 110 SEER 13 units. Shipping, warehousing and handling cost will increase significantly.

The SEER 13 evaporator units will be about 5 inches greater in height than the older SEER 10. This means that there may not be adequate space above the furnace to install the newer units. In this case a separate air-handler may need to be installed. Because of the size there will be greater air resistance as the air-handler blows air over the coil to be cooled. This could create a problem with systems that already have a marginal air flow and therefore, a new furnace or air-handler may be needed.

It has been rumored that entire duct systems may need to be replaced in order to provide adequate air flow with the SEER 13. We have not been able to confirm this. HVAC contractors we have talked to have indicated that this would typically not be the case. With marginal air flow a secondary blower may be able to be installed to boost the flow if the evaporator fits above the furnace. The fact is, many duct systems are already technically inadequate for their present systems. Cooler air takes greater pressure to move than warm air and many older duct systems designed for older furnaces do not allow for proper air flow, which cuts down on the systems efficiency. It is likely that it was not mentioned to homeowners when they installed their air conditioning systems to older ducts designed for older furnaces because the loss in efficiency is less than the cost of duct replacement.

It is also likely that it goes unnoticed by the homeowner because although it is not technically ideal for air flow efficiency, it is still cooling the home to a comfortable level.

As with any thing else, cost is going to depend on each individual household need. One thing is sure, the initial cost of installation is going to be greater. The hope is, at 30% greater efficiency, energy cost to run them will make up for it.

How Might This Information Be Reflected In A Home Inspection Report?

The answer is, inadequate or marginal air flow, the cost of new units and possible improper mixing of new condenser units with old evaporator units may not show up in reports or be discussed by home inspectors at all.

The Connecticut Home Inspectors Standards of Practice outline only two requirements and one exclusion for the inspection of central air conditioning systems.

- The inspector shall inspect the installed central and through-wall cooling equipment
- The inspector shall describe the energy source and the cooling method by its distinguishing methods
- The inspector is not required to inspect electronic air filters or determine cooling supply adequacy or distribution balance

When "inspecting," the inspector is only required to report "significant deficiencies." Significant deficiencies mean unsafe or no longer functioning. Inadequate or marginal air flow, the cost of new units and possible improper mixing of new condenser units with old evaporator units do not meet the criteria being unsafe or non-functional. They may not be working to the ideal efficiency but they are still functional, nor does this present an unsafe condition. The third point of determining cooling supply and adequate distribution has to do with whether the ducts are properly sized for the air conditioning equipment.

All of this does not mean this information will not show up in the inspection report. The state standards clearly indicate that they are the minimal requirements for the inspector and that the home inspector is not limited or restricted from doing a better evaluation than the standards require.

Whether information provided in this newsletter will be presented to homebuyers by their home inspector will be determined by each home inspection company's level of knowledge on the subject and company policy regarding exceeding the required inspection standards. Most home inspectors are not qualified to determine adequacy of air flow distribution or balance based on the duct system in place (this is why it is not required). As this information becomes more common place, the issues more likely to be discussed by home inspectors will be the problems of mixing new condenser units with older evaporator units, since this was once common practice, which will no longer be acceptable.