

SEER

Explained...

What is SEER?

SEER is called the “Seasonal Energy Efficiency Ratio”. This is a misnomer.

SEER is not $\frac{\text{Total Cooling Output over the Season}}{\text{Total Electrical Input over the Season}}$

SEER is a rating of air conditioners that attempts to account for both continuous operation and cycling. The rating is based on three laboratory tests all at 82°F outside and 80°F inside. One test is at a reasonable indoor relative humidity (50%). The other two tests are at very low indoor relative humidity not experienced in real homes.

SEER ratings are helpful, but are over emphasized. They do not take into account the actual operating conditions in various climates (wet or dry, hot or mild). They do not take into account the higher temperatures where air conditioning efficiency is critical.

SEER ratings are useful when combined with the other ratings of an air conditioner – EER and SHR. Selecting an air conditioner with both a high SEER and EER will give you the best performance.

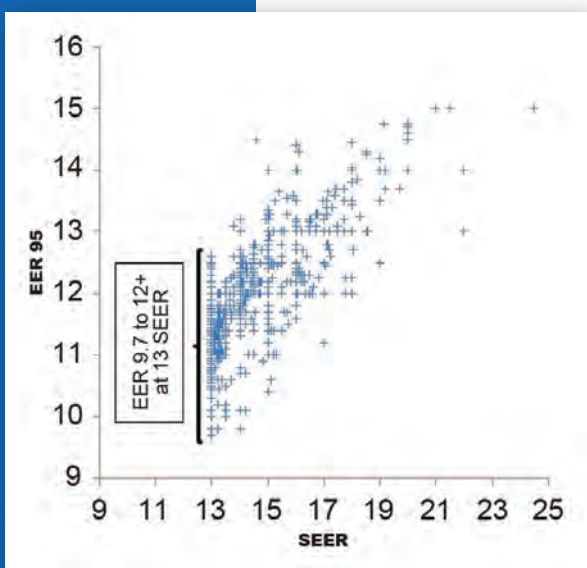


EER & SHR

What is EER?

EER₉₅ is a rating of air conditioners at 95°F outside and 80°F inside with 50% indoor relative humidity. It is a rating with the air conditioner running continuously. It does not take into account the normal cycling of the air conditioner or how much of the cooling is dehumidification (needed in wet climates but not in dry climates).

The SEERs and EERs of some currently available air conditioners are shown in Figure 1. Note that even at the mandatory minimum SEER 13 the actual EERs vary from 9.7 to over 12, an increase in efficiency of over 23%. IT IS CLEAR THAT LOOKING AT THE EER AS WELL AS THE SEER IS IMPORTANT!



The highest efficiency (SEER) conventional split system air conditioner available in the US as of October 2013 has a SEER of 26 and an EER of 14. They are made by Lennox and marketed under the brand name ADP. This unit (4BI024K in model number) has a true variable speed compressor. The second highest efficiency split ACs are made by Nordyne with an SEER of 25.5 and an EER of 15.

The highest EER conventional split system is a 16 EER Lennox. Two air conditioners with evaporatively cooled condensers are made by Beutler and have EERs of 17 and 18.

What is SHR?

SHR is the sensible heat ratio of an air conditioner. Air conditioners perform two types of cooling – dehumidification and temperature reduction. In dry climates all you need is temperature reduction, in wet climates you need a lot of dehumidification. In dry climates you want a SHR approaching 1. In wet climates you want substantially lower SHR (which indicate more dehumidification).

Unfortunately, the SEER test does not distinguish between dehumidification and temperature reduction (known as sensible cooling). Therefore the SEER rating is not much help for selecting for wet or dry climates.

One can obtain better performance in a dry climate with higher airflow across the indoor coil. The level should be 450 to 500 CFM per ton. In wet climates, the airflow should be lower, between 325 and 350 CFM per ton.

