

**Heating and Cooling Efficiencies Based on Manufactured Date**  
*March 20, 2015*

Manufactured Date	Cooling Efficiency				Heat Pump Heating Efficiency (HSPF)
	Central Air Conditioner or Heat Pump (SEER)	Room or Window Air Conditioner			
		(EER)	(SEER) <sup>1</sup>	(SEER) <sup>2</sup>	
<1970	6.0	6.0	5.5	6.5	5.0
1970	6.0	6.0	5.5	6.5	5.0
1971	6.1	6.0	5.5	6.5	5.2
1972	6.3	6.0	5.5	6.5	5.2
1973	6.5	6.1	5.6	6.7	5.3
1974	6.6	6.3	5.7	6.8	5.4
1975	6.8	6.4	5.9	7.0	5.4
1976	7.0	6.5	6.0	7.1	5.5
1977	7.2	6.7	6.1	7.3	5.6
1978	7.4	6.8	6.2	7.4	5.6
1979	7.5	6.9	6.3	7.6	5.7
1980	7.7	7.0	6.4	7.8	5.8
1981	7.9	7.2	6.6	7.9	5.8
1982	8.1	7.3	6.7	8.1	5.9
1983	8.2	7.4	6.8	8.2	6.0
1984	8.4	7.6	6.9	8.4	6.1
1985	8.6	7.7	7.0	8.5	6.1
1986	8.8	7.8	7.1	8.7	6.2
1987	9.0	8.0	7.3	8.8	6.3
1988	9.1	8.1	7.4	9.0	6.3
1989	9.3	8.2	7.5	9.2	6.4
1990	9.5	8.3	7.6	9.3	6.5
1991	9.7	8.5	7.7	9.5	6.5
1992	9.9	8.6	7.8	9.6	6.6
1993	10.0	8.7	8.0	9.8	6.7
1994	10.2	8.9	8.1	9.9	6.7
1995	10.4	9.0	8.2	10.1	6.8
1996	10.6	9.0	8.2	10.1	6.9
1997	10.7	9.0	8.2	10.1	6.9
1998	10.8	9.0	8.2	10.1	7.0
1999	10.9	9.0	8.2	10.1	7.1
2000	11.0	9.25	8.4	10.4	7.2
2001	11.1	9.5	8.7	12.1	7.2
2002	11.1	9.75	8.9	11.0	7.3
2003	11.2	9.75	8.9	11.0	7.3
2004	11.6	9.75	8.9	11.0	7.4
2005	11.9	9.75	8.9	11.0	7.5
2006	12.3	9.75	8.9	11.0	7.6
2007	12.7	9.75	8.9	11.0	7.6
2008	13.0	9.75	8.9	11.0	7.7
>2008	13.0	9.75	8.9	11.0	7.7

<sup>1</sup>Fan runs continuously (assumed in Version 8.3)

<sup>2</sup>Fan runs only when cooling

Below are the equations used in the Weatherization Assistant's National Energy Audit Tool (NEAT) on the Heating and Cooling forms to convert a manufactured date for a heat pump or air conditioner into an efficiency. These equations were used to develop the values in the preceding table.

### **Central Air Conditioner or Heat Pump Cooling Efficiency (SEER)**

1970 and earlier	SEER = 6.0
1971 – 1996	SEER = [(year manufactured - 1990) x 0.1786] + 9.5
1997 - 2002	SEER = [(year manufactured - 1997) x 0.075] + 10.75
2003 - 2007	SEER = [(year manufactured - 2003) x 0.36] + 11.2
2008 and later	SEER = 13.0

### **Heat Pump Heating Efficiency (HSPF)**

1970 and earlier	HSPF = 5.0
1971 - 2007	HSPF = [(year manufactured - 1976) x 0.06875] + 5.5
2008 and later	HSPF = 7.7

### **Room (Window) Air Conditioner Cooling Efficiency (EER)**

1972 and earlier	EER = 6.0
1973 - 1994	EER = [(year manufactured - 1972) x 0.1304] + 6.0
1995 - 1998	EER = 9.0
1999 - 2001	EER = [(year manufactured - 1999) x 0.25] + 9.0
2002 and later	EER = 9.75

### **Conversion of Room Air Conditioner EER to SEER**

SEER = (EER x 0.9) + 0.1	Fan runs continuously (assumed in Version 8.3)
SEER = (EER x 1.2) - 0.7	Fan runs only when cooling

# Home Energy Saver Equipment Efficiencies

Lawrence Berkeley National Laboratory  
<http://hes-documentation.lbl.gov/calculation-methodology>

## Heating and Cooling Equipment Efficiencies - Legacy System

In the detailed inputs level of the model, users can select the purchase year for their heating and cooling systems as an alternative to entering an efficiency value for the equipment. In these cases, we derive a shipment-weighted efficiency based on the purchase year of the equipment. A shipment-weighted efficiency is the average efficiency for all units sold within a particular year weighted by the number of units in each efficiency bin (AHAM 1996). Efficiencies for furnaces are measured as AFUE, or Annual Fuel Utilization Efficiency rating, which represents the seasonal or annual efficiency of the furnace. Heat pumps efficiency is shown as HSPF, Heating Seasonal Performance Factor.

The cooling efficiency for Central Air Conditioners and Electric Heat Pumps are rated by the seasonal efficiency of the equipment or SEER. Room Air Conditioners are rated by EER or Energy Efficiency Ratio, the ratio of the cooling output (in BTU) divided by the electrical energy consumption (in watt-hours).

**Green** shaded values did not have data available so the last available year is copied forward.

**Yellow** shaded values did not have data available so the first available year is copied backward.

### Heating Equipment Efficiencies

Year	Gas Furnace (AFUE)	Electric Furnace (AFUE)	Oil Furnace (AFUE)	Propane Furnace (AFUE)	Gas Boiler (AFUE)	Oil Boiler (AFUE)	Heat Pump (HSPF)	Wall Furnace (AFUE)
1970	60.0	98	70.0	60.0	70.0	72.0	6.21	50.0
1971	61.4	98	71.8	61.4	71.2	73.6	6.21	54.8
1972	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1973	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1974	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1975	65.8	98	73.6	62.7	72.3	75.2	6.21	59.5
1976	66.1	98	74.1	63.0	72.3	75.2	6.21	59.5
1977	66.4	98	74.5	63.3	72.3	75.2	6.21	59.5
1978	66.7	98	75.0	63.6	72.3	75.2	6.21	59.5
1979	68.7	98	75.5	64.8	72.3	75.2	6.21	59.5
1980	70.6	98	76.0	65.9	72.3	75.2	6.21	59.5
1981	70.4	98	76.8	67.1	77.4	77.4	6.21	63.1
1982	70.3	98	77.5	68.4	77.4	77.4	6.21	63.1
1983	70.1	98	78.3	69.6	77.4	77.4	6.20	63.1
1984	72.6	98	78.6	73.0	77.4	77.4	6.36	63.1
1985	72.9	98	78.6	73.8	77.4	77.4	6.39	63.1
1986	73.7	98	79.6	74.3	78.2	81.6	6.55	64.2
1987	74.3	98	79.8	75.1	78.2	81.6	6.71	64.2
1988	74.9	98	80.4	75.8	78.2	81.6	6.88	64.2
1989	74.7	98	80.4	75.5	79.7	83.1	6.92	65.6
1990	76.7	98	80.3	75.7	79.7	83.1	7.03	65.6
1991	77.5	98	80.8	76.9	79.7	83.1	7.06	65.6
1992	82.1	98	80.8	83.2	79.7	83.1	7.10	65.6
1993	82.4	98	80.9	83.8	79.7	83.1	7.10	65.6
1994	82.4	98	80.9	83.9	79.7	83.1	7.10	65.6
1995	82.3	98	80.9	84.1	79.7	83.1	7.10	65.6
1996	82.7	98	80.9	84.1	79.7	83.1	7.40	65.6
1997	82.9	98	80.9	84.1	79.7	83.1	7.10	65.6
1998	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
1999	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2000	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2001	83.1	98	80.9	84.1	79.7	83.1	7.40	65.6
2002	83.1	98	80.9	84.1	79.7	83.1	7.40	65.6
2003	83.5	98	80.9	84.1	79.7	83.1	7.40	65.6
2004	83.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2005	83.9	98	80.9	84.1	79.7	83.1	7.40	65.6
2006	84.0	98	80.9	84.1	79.7	83.1	7.90	65.6
2007	84.1	98	80.9	84.1	79.7	83.1	7.90	65.6
2008	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6
2009	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6
2010	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6

### Cooling System Efficiencies

Year	Room AC (EER)	Central AC (SEER)	Heat Pump (SEER)
1970	5.80	6.50	5.50
1971	5.89	6.58	5.86
1972	5.98	6.66	6.21
1973	6.00	6.75	6.21
1974	6.10	6.85	6.21
1975	6.20	6.97	6.21
1976	6.40	7.03	6.87
1977	6.55	7.13	6.89
1978	6.72	7.34	7.24
1979	6.87	7.47	7.34
1980	7.02	7.55	7.51
1981	7.06	7.78	7.7
1982	7.14	8.31	7.79
1983	7.29	8.43	8.23
1984	7.48	8.66	8.45
1985	7.70	8.82	8.56
1986	7.80	8.87	8.70
1987	8.06	8.97	8.93
1988	8.23	9.11	9.13
1989	8.48	9.25	9.26
1990	8.73	9.31	9.46
1991	8.80	9.49	9.77
1992	8.88	10.46	10.60
1993	9.05	10.56	10.86
1994	8.97	10.61	10.94
1995	9.03	10.68	10.97
1996	9.08	10.68	11.00
1997	9.09	10.66	10.97
1998	9.08	10.92	11.29
1999	9.07	10.96	11.29
2000	9.30	10.95	11.21
2001	9.63	11.07	11.30
2002	9.75	11.07	11.31
2003	9.75	11.19	11.46
2004	9.71	11.29	11.56
2005	9.95	11.32	11.60
2006	10.02	13.17*	13.17*
2007	9.81	13.66	13.66
2008	9.93	13.76	13.76
2009	9.93	13.76	13.76
2010	9.93	13.76	13.76

\*New Federal CAC/HP standard took effect January 23, 2006. Standard level is 13 SEER. Because no SWEF data are available since 2003 that splits out CAC from HP, both products are set to the average for the combined product class (per AHRI data for DOE rulemaking).