

**INTERPRETATION IC 90.1-2004-5 OF  
ANSI/ASHRAE/IESNA STANDARD 90.1-2004  
Energy Standard for Buildings Except Low-Rise Residential Buildings**

**Date Approved January 23, 2006**

**Request from:** Richard Lord (E-mail: [richard.lord@carrier.utc.com](mailto:richard.lord@carrier.utc.com)), United Technologies, Carrier, One Carrier Place, Farmington CT, 06034.

**Reference:** This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2004, Table 6.8.1A and Table 6.8.1B requiring a 12.0 SEER and 7.4 HSPF for less than 65,000 Btu/h cooling capacity machines.

**Background:** As per note “c” these are for **3 phase** products with a cooling capacity less than 65,000 Btu/h. **Single phase** products are covered by the NAECA federal standard. The 12.0 SEER and 7.4 HSPF levels in Table 6.8.1A and Table 6.8.1B were implemented when the NAECA levels were to be set at the 12.0 SEER and 7.4 HSPF. Since that time the federal levels have been further increased to 13.0 SEER and 7.7 HSPF. Because of NAECA change to 13 SEER a new ASHRAE 90.1 change proposal (CM 90.1-05-12-0002/001) was submitted by Karim Amrane. This change proposal has been approved by the Mechanical Subcommittee and the ASHRAE SSPC 90.1 and was approved by the ASHRAE Standards Committee on 1/21/2006. The final change is referred to as Addendum f to ANSI/ASHRAE/IESNA Standard 90.1-2004. The effective date shown in Addendum f is 1/23/2006.

There is considerable confusion in the industry about the various effective dates for the single and 3 phase 13 SEER requirement and this request is being submitted to request clarification of the implantation dates for 13 SEER.

**Interpretation:**

It is my understanding that the following is the correct interpretation of the requirements and effective date.

**Single Phase Products**

For single phase products with a capacity less than 65,000 Btu/h the requirements are defined by the NAECA standard and will go into effect on 1/23/2006 for replacement and new construction. The levels are;

Air Conditioners, Air Cooled Split Systems -	13.0 SEER
Air Conditioners, Air Cooled Single Package -	13.0 SEER
Heat Pumps, Air Cooled Split Systems (cooling) -	13.0 SEER
Heat Pumps, Air Cooled Single Packaged (cooling) -	13.0 SEER
Heat Pumps, Air Cooled, Split Systems (heating) -	7.7 HSPF
Heat Pumps, Air Cooled, Single Package (heating) -	7.7 HSPF

### 3 Phase Products

For 3 phase products with a capacity less than 65,000 Btu/h the new requirements are;

Air Conditioners, Air Cooled Split Systems -	13.0 SEER
Air Conditioners, Air Cooled Single Package -	13.0 SEER
Heat Pumps, Air Cooled Split Systems (cooling) -	13.0 SEER
Heat Pumps, Air Cooled Single Packaged (cooling) -	13.0 SEER
Heat Pumps, Air Cooled, Split Systems (heating) -	7.7 HSPF
Heat Pumps, Air Cooled, Single Package (heating) -	7.7 HSPF

The ASHRAE 90.1-2004 effective date as defined by Addendum f is 1/23/2006 but this does not mean the federal effective date will be 1/23/2006.

For the ASHRAE 90.1 requirements to be implemented as the federal minimum efficiency for 3 phase products Addendum f must be approved by the Department of Energy (DOE) as defined in the Energy Policy Act of 1992 (see attachment). If DOE approves the ASHRAE levels then the requirements would become the federal minimum 2 years after the 1/23/2006 effective date in the ASHRAE standard. In this case the federal date would then be 1/23/2008.

Also defined by the Energy Policy Act of 1992, once ASHRAE has approved the new levels a state has the option to require the new levels for new construction, but not on replacement equipment, during the period between the ASHRAE effective date of 1/23/2006 and the anticipated federal effective date of 1/23/2008.

**Question:** Is this interpretation correct?

**Answer:** Yes

TITLE 42--THE PUBLIC HEALTH AND WELFARE

CHAPTER 77--ENERGY CONSERVATION

SUBCHAPTER III--IMPROVING ENERGY EFFICIENCY

Part A-1--Certain Industrial Equipment

Sec. 6313. Standards

- (a) Small and large commercial package air conditioning and heating equipment, packaged terminal air conditioners and heat pumps, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, and unfired hot water storage tanks

(1) Each small commercial package air conditioning and heating equipment manufactured on or after January 1, 1994, shall meet the following standard levels:

(A) The minimum seasonal energy efficiency ratio of air-cooled three-phase electric central air conditioners and central air conditioning heat pumps less than 65,000 Btu per hour (cooling capacity), split systems, shall be 10.0.

(B) The minimum seasonal energy efficiency ratio of air-cooled three-phase electric central air conditioners and central air conditioning heat pumps less than 65,000 Btu per hour (cooling capacity), single package, shall be 9.7.

(C) The minimum energy efficiency ratio of air-cooled central air conditioners and central air conditioning heat pumps at or above 65,000 Btu per hour (cooling capacity) and less than 135,000 Btu per hour (cooling capacity) shall be 8.9 (at a standard rating of 95 degrees F db).

(D) The minimum heating seasonal performance factor of air-cooled three-phase electric central air conditioning heat pumps less than 65,000 Btu per hour (cooling capacity), split systems, shall be 6.8.

(E) The minimum heating seasonal performance factor of air-cooled three-phase electric central air conditioning heat pumps less than 65,000 Btu per hour (cooling capacity), single package, shall be 6.6.

(F) The minimum coefficient of performance in the heating mode of air-cooled central air conditioning heat pumps at or above 65,000 Btu per hour (cooling capacity) and less than 135,000 Btu per hour (cooling capacity) shall be 3.0 (at a high temperature rating of 47 degrees F db).

(G) The minimum energy efficiency ratio of water-cooled, evaporatively-cooled and water-source central air conditioners and central air conditioning heat pumps less than 65,000 Btu per hour (cooling capacity) shall be 9.3 (at a standard rating of 95 degrees F db, outdoor temperature for evaporatively cooled equipment, and 85 degrees Fahrenheit entering water temperature for water-source and water-cooled equipment).

(H) The minimum energy efficiency ratio of water-cooled, evaporatively-cooled and water-source central air conditioners and central air conditioning heat pumps at or above 65,000 Btu per hour (cooling capacity) and less than 135,000 Btu per hour (cooling capacity) shall be 10.5 (at a standard rating of 95 degrees F db, outdoor temperature for evaporatively cooled equipment, and 85 degrees Fahrenheit entering water temperature for water source and water-cooled equipment).

(I) The minimum coefficient of performance in the heating mode

of water-source heat pumps less than 135,000 Btu per hour (cooling capacity) shall be 3.8 (at a standard rating of 70 degrees Fahrenheit entering water).

(2) Each large commercial package air conditioning and heating equipment manufactured on or after January 1, 1995, shall meet the following standard levels:

(A) The minimum energy efficiency ratio of air-cooled central air conditioners and central air conditioning heat pumps at or above 135,000 Btu per hour (cooling capacity) and less than 240,000 Btu per hour (cooling capacity) shall be 8.5 (at a standard rating of 95 degrees F db).

(B) The minimum coefficient of performance in the heating mode of air-cooled central air conditioning heat pumps at or above 135,000 Btu per hour (cooling capacity) and less than 240,000 Btu per hour (cooling capacity) shall be 2.9.

(C) The minimum energy efficiency ratio of water- and evaporatively-cooled central air conditioners and central air conditioning heat pumps at or above 135,000 Btu per hour (cooling capacity) and less than 240,000 Btu per hour (cooling capacity) shall be 9.6 (according to ARI Standard 360-86).

(3) Each packaged terminal air conditioner and packaged terminal heat pump manufactured on or after January 1, 1994, shall meet the following standard levels:

(A) The minimum energy efficiency ratio (EER) of packaged terminal air conditioners and packaged terminal heat pumps in the cooling mode shall be  $10.0 - (0.16 \times \text{Capacity [in thousands of Btu per hour at a standard rating of 95 degrees F db, outdoor temperature]})$ . If a unit has a capacity of less than 7,000 Btu per hour, then 7,000 Btu per hour shall be used in the calculation. If a unit has a capacity of greater than 15,000 Btu per hour, then 15,000 Btu per hour shall be used in the calculation.

(B) The minimum coefficient of performance (COP) of packaged terminal heat pumps in the heating mode shall be  $1.3 + (0.16 \times \text{the minimum cooling EER as specified in subparagraph (A)})$  (at a standard rating of 47 degrees F db).

(4) Each warm air furnace and packaged boiler manufactured on or after January 1, 1994, shall meet the following standard levels:

(A) The minimum thermal efficiency at the maximum rated capacity of gas-fired warm-air furnaces with capacity of 225,000 Btu per hour or more shall be 80 percent.

(B) The minimum thermal efficiency at the maximum rated capacity of oil-fired warm-air furnaces with capacity of 225,000 Btu per hour or more shall be 81 percent.

(C) The minimum combustion efficiency at the maximum rated capacity of gas-fired packaged boilers with capacity of 300,000 Btu per hour or more shall be 80 percent.

(D) The minimum combustion efficiency at the maximum rated capacity of oil-fired packaged boilers with capacity of 300,000 Btu per hour or more shall be 83 percent.

(5) Each storage water heater, instantaneous water heater, and unfired water storage tank manufactured on or after January 1, 1994, shall meet the following standard levels:

(A) Except as provided in subparagraph (G), the maximum standby loss, in percent per hour, of electric storage water heaters shall be  $0.30 + (27/\text{Measured Storage Volume [in gallons]})$ .

(B) Except as provided in subparagraph (G), the maximum standby loss, in percent per hour, of gas- and oil-fired storage water heaters with input ratings of 155,000 Btu per hour or less shall be  $1.30 + (114/\text{Measured Storage Volume [in gallons]})$ . The minimum

thermal efficiency of such units shall be 78 percent.

(C) Except as provided in subparagraph (G), the maximum standby loss, in percent per hour, of gas- and oil-fired storage water heaters with input ratings of more than 155,000 Btu per hour shall be  $1.30 + (95/\text{Measured Storage Volume [in gallons]})$ . The minimum thermal efficiency of such units shall be 78 percent.

(D) The minimum thermal efficiency of instantaneous water heaters with a storage volume of less than 10 gallons shall be 80 percent.

(E) Except as provided in subparagraph (G), the minimum thermal efficiency of instantaneous water heaters with a storage volume of 10 gallons or more shall be 77 percent. The maximum standby loss, in percent/hour, of such units shall be  $2.30 + (67/\text{Measured Storage Volume [in gallons]})$ .

(F) Except as provided in subparagraph (G), the maximum heat loss of unfired hot water storage tanks shall be 6.5 Btu per hour per square foot of tank surface area.

(G) Storage water heaters and hot water storage tanks having more than 140 gallons of storage capacity need not meet the standby loss or heat loss requirements specified in subparagraphs (A) through (C) and subparagraphs (E) and (F) if the tank surface area is thermally insulated to R-12.5 and if a standing pilot light is not used.

(6)(A) If ASHRAE/IES Standard 90.1, as in effect on October 24, 1992, is amended with respect to any small commercial package air conditioning and heating equipment, large commercial package air conditioning and heating equipment, packaged terminal air conditioners, packaged terminal heat pumps, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, or unfired hot water storage tanks, the Secretary shall establish an amended uniform national standard for that product at the minimum level for each effective date specified in the amended ASHRAE/IES Standard 90.1, unless the Secretary determines, by rule published in the Federal Register and supported by clear and convincing evidence, that adoption of a uniform national standard more stringent than such amended ASHRAE/IES Standard 90.1 for such product would result in significant additional conservation of energy and is technologically feasible and economically justified.

(B)(i) If the Secretary issues a rule containing such a determination, the rule shall establish such amended standard. In determining whether a standard is economically justified for the purposes of subparagraph (A), the Secretary shall, after receiving views and comments furnished with respect to the proposed standard, determine whether the benefits of the standard exceed its burdens by, to the greatest extent practicable, considering--

(I) the economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;

(II) the savings in operating costs throughout the estimated average life of the product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the products which are likely to result from the imposition of the standard;

(III) the total projected amount of energy savings likely to result directly from the imposition of the standard;

(IV) any lessening of the utility or the performance of the products likely to result from the imposition of the standard;

(V) the impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard;

(VI) the need for national energy conservation; and

(VII) other factors the Secretary considers relevant.

(ii) The Secretary may not prescribe any amended standard under this

paragraph which increases the maximum allowable energy use, or decreases the minimum required energy efficiency, of a covered product. The Secretary may not prescribe an amended standard under this subparagraph if the Secretary finds (and publishes such finding) that interested persons have established by a preponderance of the evidence that a standard is likely to result in the unavailability in the United States in any product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United States at the time of the Secretary's finding. The failure of some types (or classes) to meet this criterion shall not affect the Secretary's determination of whether to prescribe a standard for other types or classes.

(C) A standard amended by the Secretary under this paragraph shall become effective for products manufactured--

(i) with respect to small commercial package air conditioning and heating equipment, packaged terminal air conditioners, packaged terminal heat pumps, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, and unfired hot water storage tanks, on or after a date which is two years after the effective date of the applicable minimum energy efficiency requirement in the amended ASHRAE/IES standard referred to in subparagraph (A); and

(ii) with respect to large commercial package air conditioning and heating equipment, on or after a date which is three years after the effective date of the applicable minimum energy efficiency requirement in the amended ASHRAE/IES standard referred to in subparagraph (A);

except that an energy conservation standard amended by the Secretary pursuant to a rule under subparagraph (B) shall become effective for products manufactured on or after a date which is four years after the date such rule is published in the Federal Register.

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TITLE 42--THE PUBLIC HEALTH AND WELFARE

CHAPTER 77--ENERGY CONSERVATION

SUBCHAPTER III--IMPROVING ENERGY EFFICIENCY

Part A-1--Certain Industrial Equipment

Sec. 6316. Administration, penalties, enforcement, and  
preemption

(a) The provisions of section 6296(a), (b), and (d) of this title, the provisions of subsections (l) through (s) of section 6295 of this title, and section \1\ 6297 through 6306 of this title shall apply with respect to this part (other than the equipment specified in subparagraphs (B), (C), (D), (E), and (F) of section 6311(1) of this title) to the same extent and in the same manner as they apply in part A of this subchapter. In applying such provisions for the purposes of this part--

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\1\ So in original. Probably should be ``sections''.  
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(1) references to sections 6293, 6294, and 6295 of this title shall be considered as references to sections 6314, 6315, and 6313 of this title, respectively;

(2) references to ``this part'' shall be treated as referring to part A-1 of this subchapter;

(3) the term ``equipment'' shall be substituted for the term ``product'';

(4) the term ``Secretary'' shall be substituted for ``Commission'' each place it appears (other than in section 6303(c) of title);

(5) section 6297(a) of this title shall be applied, in the case of electric motors, as if the National Appliance Energy Conservation Act of 1987 was the Energy Policy Act of 1992;

(6) section 6297(b)(1) of this title shall be applied as if electric motors were fluorescent lamp ballasts and as if the National Appliance Energy Conservation Amendments of 1988 were the Energy Policy Act of 1992;

(7) section 6297(b)(4) of this title shall be applied as if electric motors were fluorescent lamp ballasts and as if paragraph (5) of section 6295(g) of this title were section 6313 of this title; and

(8) notwithstanding any other provision of law, a regulation or other requirement adopted by a State or subdivision of a State contained in a State or local building code for new construction concerning the energy efficiency or energy use of an electric motor covered under this part is not superseded by the standards for such electric motor established or prescribed under section 6313(b) of this title if such regulation or requirement is identical to the standards established or prescribed under such section.

(b)(1) The provisions of section 6296(a), (b), and (d) of this title, section 6297(a) of this title, and sections 6298 through 6306 of

this title shall apply with respect to the equipment specified in subparagraphs (B), (C), (D), (E), and (F) of section 6311(1) of this title to the same extent and in the same manner as they apply in part B of this subchapter. In applying such provisions for the purposes of such equipment, paragraphs (1), (2), (3), and (4) of subsection (a) of this section shall apply.

(2)(A) A standard prescribed or established under section 6313(a) of this title shall, beginning on the effective date of such standard, supersede any State or local regulation concerning the energy efficiency or energy use of a product for which a standard is prescribed or established pursuant to such section.

(B) Notwithstanding subparagraph (A), a standard prescribed or established under section 6313(a) of this title shall not supersede a standard for such a product contained in a State or local building code for new construction if--

(i) the standard in the building code does not require that the energy efficiency of such product exceed the applicable minimum energy efficiency requirement in amended ASHRAE/IES Standard 90.1; and

(ii) the standard in the building code does not take effect prior to the effective date of the applicable minimum energy efficiency requirement in amended ASHRAE/IES Standard 90.1.

(C) Notwithstanding subparagraph (A), a standard prescribed or established under section 6313(a) of this title shall not supersede the standards established by the State of California set forth in Table C-6, California Code of Regulations, Title 24, Part 2, Chapter 2-53, for water-source heat pumps below 135,000 Btu per hour (cooling capacity) that become effective on January 1, 1993.

(D) Notwithstanding subparagraph (A), a standard prescribed or established under section 6313(a) of this title shall not supersede a State regulation which has been granted a waiver by the Secretary. The Secretary may grant a waiver pursuant to the terms, conditions, criteria, procedures, and other requirements specified in section 6297(d) of this title.

(c) With respect to any electric motor to which standards are applicable under section 6313(b) of this title, the Secretary shall require manufacturers to certify, through an independent testing or certification program nationally recognized in the United States, that such motor meets the applicable standard.

(Pub. L. 94-163, title III, Sec. 345, as added Pub. L. 95-619, title IV, Sec. 441(a), Nov. 9, 1978, 92 Stat. 3272; amended Pub. L. 102-486, title I, Sec. 122(e), Oct. 24, 1992, 106 Stat. 2815; Pub. L. 105-388, Sec. 5(a)(7), Nov. 13, 1998, 112 Stat. 3478.)

#### References in Text

The National Appliance Energy Conservation Act of 1987, referred to in subsec. (a)(5), is Pub. L. 100-12, Mar. 17, 1987, 101 Stat. 103. For complete classification of this Act to the Code, see Short Title of 1987 Amendment note set out under section 6201 of this title and Tables.

The Energy Policy Act of 1992, referred to in subsec. (a)(5), (6), is Pub. L. 102-486, Oct. 24, 1992, 106 Stat. 2776. For complete classification of this Act to the Code, see Short Title note set out under section 13201 of this title and Tables.

The National Appliance Energy Conservation Amendments of 1988, referred to in subsec. (a)(6), is Pub. L. 100-357, June 28, 1988, 102 Stat. 671. For complete classification of this Act to the Code, see Short Title of 1988 Amendments note set out under section 6201 of this title and Tables.



## Amendments

1998--Subsec. (c). Pub. L. 105-388 inserted ``standard'' after ``meets the applicable''.

1992--Pub. L. 102-486, Sec. 122(e)(3), substituted ``enforcement, and preemption'' for ``and enforcement'' in section catchline.

Subsec. (a). Pub. L. 102-486, Sec. 122(e)(1)(A), inserted ``(other than the equipment specified in subparagraphs (B), (C), (D), (E), and (F) of section 6311(1) of this title)'' after ``to this part'' and substituted ``, the provisions of subsections (l) through (s) of section 6295 of this title, and section 6297'' for ``and sections 6298''.

Subsec. (a)(1). Pub. L. 102-486, Sec. 122(e)(1)(B), substituted ``, 6294, and 6295 of this title'' for ``and 6294 of this title'' and ``6314, 6315, and 6313 of this title, respectively'' for ``6314 and 6315 of this title, respectively''.

Subsec. (a)(5) to (8). Pub. L. 102-486, Sec. 122(e)(1)(C)-(E), added pars. (5) to (8).

Subsecs. (b), (c). Pub. L. 102-486, Sec. 122(e)(2), added subsecs. (b) and (c).