ANSI/ASHRAE/IESNA Addenda ac, an, and ao to
ANSI/ASHRAE/IESNA Standard 90.1-2004

ASHRAE STANDARD

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on January 27, 2007; by the ASHRAE Board of Directors on March 2, 2007; by IESNA on January 18, 2007; and by the American National Standards Institute on March 27, 2007.

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ISSN 1041-2336

IES The LIGHTING AUTHORITY

Approved American National Standard ANSI
www.ansi.org

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SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Consensus is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

The current version of Standard 90.1-2004 is inconsistent with regard to efficiency compliance levels. There are "steps" in efficiency compliance due to nominal motor hp size jumps. This results in cases where poor design practices comply while good design practices do not (a function of nominal motor hp steps). Additionally, the current standard does not adequately address complex exhaust systems associated with hospitals and laboratories—facilities typically associated with 24-hour operation and high airflow volume (relatively high hp or kW required). This results in such users taking exception to the fan power limitations entirely, citing "health and safety" compromise (high static pressure associated with exhaust of contaminated air volume) or submitting an interpretation request or change proposal to the 90.1 committee.

This change proposal (a) improves compliance consistency, (b) expands application coverage to properly address complex systems, and (c) strengthens stringency for simple systems with an easy-to-use format/structure.

a. Proposed compliance structure determines compliance based on a continuous curve and eliminates the nominal motor hp steps.

b. Proposed structure provides system static pressure allowances associated with specialized equipment required for hospitals, laboratories, vivariums, and other applications with filtration and other air quality control devices needed for health, safety, or specific environmental control and adding significant static pressure to the air distribution design.

c. Proposed structure offers an alternative compliance for simple (typically low static pressure systems) to comply by nameplate hp or kW measures. The stringency for this compliance has been slightly increased based on low static pressure associated with these systems and ease of compliance with the published standard.

The result is a more flexible standard with consistent compliance requirements (design fan system bhp or kW) while maintaining a nameplate hp or kW approach allowing simple demonstration of compliance (typical rooftop package applications).

***Note:** In this Independent Substantive Change, changes are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum ac to 90.1-2004 (I-P and SI Editions)

*Revise the following language in the **I-P edition**.*

3. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

Make the following changes to the definitions.

fan brake horsepower: the horsepower delivered to the fan's shaft. Brake horsepower does not include the mechanical drive losses (belts, gears, etc.).

fan system design conditions: operating conditions that can be expected to occur during normal system operation that result in the highest supply airflow rate to conditioned spaces served by the system.

fan system bhp: the sum of the fan brake horsepower of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors.

fan system motor nameplate hp: the sum of the motor nameplate horsepower of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors.

~~***fan system power:*** *the sum of the nominal power demand (nameplate horsepower) of motors of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors*.~~

nameplate horsepower: the nominal motor horsepower rating stamped on the motor nameplate.

6. HEATING, VENTILATING, AND AIR-CONDITIONING

Make the following changes to Section 6.5.3.

~~**6.5.3 Air System Design and Control.** HVAC systems having a total *fan system power* exceeding 5 hp shall meet the provisions of 6.5.3.1 through 6.5.3.2 unless otherwise noted.~~

~~**6.5.3.1 Fan Power Limitation.**~~

~~a. The ratio of the fan system power to the supply fan airflow rate (main fan) of each HVAC system at design conditions shall not exceed the allowable fan system power shown in Table 6.5.3.1.~~

~~b. Where air systems require air treatment or filtering systems with pressure drops over 1 in. w.c. when filters are clean, or heat recovery coils or devices, or direct evaporative humidifiers/coolers, or other devices to serve process loads in the airstream, the allowable fan system power may be adjusted using the pressure credit in the allowable fan system equation in Table 6.5.3.1.~~

~~c. If the temperature difference between design room temperature and supply air temperature at cooling design conditions that is used to calculate design zone supply airflow is larger than 20ºF, the allowable fan system power may be adjusted using the temperature ratio in the allowable fan system power equation in Table 6.5.3.1.~~

6.5.3 Air System Design and Control. Each HVAC system having a total *fan system motor nameplate hp* exceeding 5 hp shall meet the provisions of 6.5.3.1 through 6.5.3.2.

6.5.3.1 Fan System Power Limitation.

6.5.3.1.1 Each HVAC system at fan system design conditions shall not exceed the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) as shown in Table 6.5.3.1.1A. This includes supply fans, return/relief fans, exhaust fans, and fan-powered terminal units associated with systems providing heating or cooling capability.

Exceptions to 6.5.3.1.1:

a. Hospital and laboratory systems that utilize flow control devices on exhaust and/or return to maintain space pressure relationships necessary for occupant health and safety or environmental control may use variable volume fan power Limitation.

b. Individual exhaust fans with motor nameplate horsepower of 1 hp or less.

c. Fans exhausting air from fume hoods. (**Note:** If this exception is taken, no related exhaust side credits shall be taken from Table 6.5.3.1.1B and the Fume Hood Exhaust Exception Deduction must be taken from Table 6.5.3.1.1B).

~~**TABLE 6.5.3.1 Fan Power Limitation**~~

	~~Allowable Nameplate Motor Power~~	
~~Supply Air Volume~~	~~Constant Volume~~	~~Variable Volume~~
~~< 20,000 cfm~~	~~1.2 hp/1000 cfm~~	~~1.7 hp/1000 cfm~~
~~TM 20,000 cfm~~	~~1.1 hp/1000 cfm~~	~~1.5 hp/1000 cfm~~

~~Allowable Fan System Power = [Table 6.5.3.1 Fan Power Limitation x (Temperature Ratio) + Pressure Credit + Relief Fan Credit]~~
~~where~~
~~Table 6.5.3.1 Fan Power Limitation = Table Value × CFM_n/1000~~
~~Temperature Ratio = $(T_{t\text{-}stat} - T_S)$ / 20~~
~~Pressure Credit (hp) = Sum of [$CFM_n \times (SP_n - 1.0)$ / 3718] + Sum of [$CFM_{HR} \times SP_{HR}$/3718]~~
~~Relief Fan Credit HP (kW) = F_R *HP* (kW) × [1 – (CFM_{RL} / CFM_n)]~~
~~CFM_n = supply air volume of the unit with the filtering system (cfm)~~
~~CFM_{HR} = supply air volume of heat recovery coils or direct evaporative humidified/cooler (cfm)~~
~~CFM_{RL} = relief fan air volume at normal cooling design operation~~
~~SP_n = air pressure drop of the filtering system when filters are clean (in. w.g.)~~
~~SP_{HR} = air pressure drop of heat recovery coils or direct evaporative humidifier/cooler (in. w.g.).~~
~~$T_{t\text{-}stat}$ = room thermostat set point~~
~~T_S = design supply air temperature for the zone in which the thermostat is located~~
~~F_R = name plate rating of the relief fan in hp~~

TABLE 6.5.3.1.1A Fan Power Limitation*

	Limit	Constant Volume	Variable Volume
Option 1: Fan System Motor Nameplate hp	Allowable Nameplate Motor hp	$hp \le CFM_S \cdot 0.0011$	$hp \le CFM_S \cdot 0.0015$
Option 2: Fan System bhp	Allowable Fan System bhp	$bhp \le CFM_S \cdot 0.00094 + A$	$bhp \le CFM_S \cdot 0.0013 + A$

* where:
CFM_S = the maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute
hp = the maximum combined motor nameplate horsepower
bhp = the maximum combined fan brake horsepower
A = sum of ($PD \times CFM_D$/4131)
where:
PD = each applicable pressure drop adjustment from Table 6.5.3.1.1B in in. w.c.
CFM_D = the design airflow through each applicable device from Table 6.5.3.1.1B in cubic feet per minute

TABLE 6.5.3.1.1B Fan Power Limitation Pressure Drop Adjustment

Device	Adjustment
Credits	
Fully ducted return and/or exhaust air systems	0.5 in. w.c.
Return and/or exhaust airflow control devices	0.5 in. w.c
Exhaust filters, scrubbers, or other exhaust treatment	The pressure drop of device calculated at fan system design condition.
Particulate Filtration Credit: MERV 9 through 12	0.5 in. w.c.
Particulate Filtration Credit: MERV 13 through 15	0.9 in. w.c.
Particulate Filtration Credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2× clean filter pressure drop at fan system design condition
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition
Heat recovery device	Pressure drop of device at fan system design condition
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design condition
Sound Attenuation Section	0.15 in. w.c.
Deductions	
Fume Hood Exhaust Exception (required if 6.5.3.1.1 Exception (c) is taken)	–1.0 in. w.c.

6.5.3.1.2 Motor Nameplate Horsepower: For each fan, the selected fan motor shall be no larger than the first available motor size greater than the brake horsepower. The fan brake horsepower must be indicated on the design documents to allow for compliance verification by the code official.

Exceptions to 6.5.3.1.2:

a. For fans less than 6 bhp, where the first available motor larger than the brake horsepower has a nameplate rating within 50% of the brake horsepower, the next larger nameplate motor size may be selected.

b. For fans 6 bhp and larger, where the first available motor larger than the brake horsepower has a nameplate rating within 30% of the brake horsepower, the next larger nameplate motor size may be selected.

*Revise the language as follows in the **SI edition**.*

3. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

Make the following changes to the definitions.

fan brake horsepower: The horsepower delivered to the fan's shaft. Brake horsepower does not include the mechanical drive losses (belts, gears, etc.).

fan system design conditions: operating conditions that can be expected to occur during normal system operation that result in the highest supply airflow rate to conditioned spaces served by the system.

fan system bhp: the sum of the fan brake horsepower of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors.

fan system motor nameplate hp: the sum of the motor nameplate horsepower of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors.

~~***fan system power:*** *the sum of the nominal power demand (nameplate horsepower) of motors of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors.*~~

nameplate kW: the nominal motor kW rating stamped on the motor nameplate.

6. HEATING, VENTILATING, AND AIR-CONDITIONING

Make the following changes to Section 6.5.3.

~~**6.5.3 Air System Design and Control.** HVAC systems having a total *fan system power* exceeding 4 kW shall meet the provisions of 6.5.3.1 through 6.5.3.2 unless otherwise noted.~~

~~**6.5.3.1 Fan Power Limitation.**~~

~~a. The ratio of the fan system power to the supply fan airflow rate (main fan) of each HVAC system at design conditions shall not exceed the allowable fan system power shown in Table 6.5.3.1.~~

~~b. Where air systems require air treatment or filtering systems with pressure drops over 250 Pa when filters are clean, or heat recovery coils or devices, or direct evaporative humidifiers/coolers, or other devices to serve process loads in the airstream, the allowable fan system power may be adjusted using the pressure credit in the allowable fan system equation in Table 6.5.3.1.~~

c. ~~If the temperature difference between design room temperature and supply air temperature at cooling design conditions that is used to calculate design zone supply airflow is larger than 11.1œC, the allowable fan system power may be adjusted using the temperature ratio in the allowable fan system power equation in Table 6.5.3.1.~~

6.5.3 Air System Design and Control. Each HVAC system having a total *fan system motor nameplate kW* exceeding 3.8 kW shall meet the provisions of 6.5.3.1 through 6.5.3.2.

6.5.3.1.1 Fan System Power Limitation.

6.5.3.1.1 Each HVAC system at fan system design conditions shall not exceed the allowable fan system motor nameplate kW (Option 1) or fan system input kW (Option 2) as shown in Table 6.5.3.1.1A. This includes supply fans, return/

~~**TABLE 6.5.3.1 Fan Power Limitation**~~

	~~Allowable Nameplate Motor Power~~	
~~Supply Air Volume~~	~~Constant Volume~~	~~Variable Volume~~
~~< 9400 L/s~~	~~1.9 kW/1000 L/s~~	~~2.7 kW/1000 L/s~~
~~™ 9400 L/s~~	~~1.7 kW/1000 L/s~~	~~2.4 hp/1000 L/s~~

~~Allowable Fan System Power = [Table 6.5.3.1 Fan Power Limitation × (Temperature Ratio) + Pressure Credit + Relief Fan Credit]~~
~~where~~
~~Table 6.5.3.1 Fan Power Limitation = Table Value × L/S_n/1000~~
~~Temperature Ratio = $(T_{t\text{-}stat} - T_S)$ / 11.1 š~~
~~Pressure Credit (kW) = Sum of [L/S_n × (SP_n – 250) / 486000] + Sum of [L/SR_E / L/S_n]~~
~~Relief Fan Credit HP (kW) = F_R (kW) × [1 – (L/SR_E / L/S_n)]~~
~~L/S_n = supply air volume of the unit with the filtering system (L/s)~~
~~*L/SHR* = supply air volume of heat recovery coils or direct evaporative humidified/cooler (L/s)~~
~~*L*/SRF = relief fan air volume at normal cooling design operation~~
~~SP_n = air pressure drop of the filtering system when filters are clean (Pa)~~
~~SP_{HR} = air pressure drop of heat recovery coils or direct evaporative humidifier/cooler (Pa).~~
~~$T_{t\text{-}stat}$ = room thermostat set point~~
~~T_S = design supply air temperature for the zone in which the thermostat is located~~
~~F_R = name plate rating of the relief fan in kW~~

relief fans, exhaust fans, and fan-powered terminal units associated with systems providing heating or cooling capability.

Exceptions to 6.5.3.1.1:

a. Hospital and laboratory systems that utilize flow control devices on exhaust and/or return to maintain space pressure relationships necessary for occupant health and safety or environmental control may use variable volume fan power limitation.

b. Individual exhaust fans with motor nameplate kW of 0.75 kW or less.

c. Fans exhausting air from fume hoods. (**Note:** If this exception is taken, no related exhaust side credits shall be taken from Table 6.5.3.1.1B and the Fume Hood Exhaust Exception Deduction must be taken from Table 6.5.3.1.1B).

6.5.3.1.2 Motor Nameplate kW: For each fan, the selected fan motor shall be no larger than the first available motor size greater than the kW. The fan kW must be indicated on the design documents to allow for compliance verification by the code official.

Exceptions to 6.5.3.1.2:

a. For fans less than 4.5 kW, where the first available motor larger than the kW has a nameplate rating within 50% of the kW, the next larger nameplate motor size may be selected.

b. For fans 4.5 kW and larger, where the first available motor larger than the kW has a nameplate rating within 30% of the kW, the next larger nameplate motor size may be selected.

TABLE 6.5.3.1.1A Fan Power Limitation*

	Limit	Constant Volume	Variable Volume
Option 1: Fan System Motor Nameplate kW	Allowable Nameplate Motor kW	$kW \le L/S_S \cdot 0.0017$	$kW \le L/S_S \cdot 0.0024$
Option 2: Fan System kW	Allowable Fan System kW	$kW \le L/S_S \cdot 0.0015 + A$	$kW \le L/S_S \cdot 0.0021 + A$

* where:

L/S_S = the maximum design supply airflow rate to conditioned spaces served by the system in liters per second

kW = the maximum combined motor nameplate kW

kW = the maximum combined fan required kW

A = sum of $(PD \times L/S_D/4131)$

where:

PD = each applicable pressure drop adjustment from Table 6.5.3.1.1B in in. w.c.

L/S_D = the design airflow through each applicable device from Table 6.5.3.1.1B in liters per second

TABLE 6.5.3.1.1B Fan Power Limitation Pressure Drop Adjustment

Device	Adjustment
Credits	
Fully ducted return and/or exhaust air systems	125 Pa
Return and/or exhaust airflow control devices	125 Pa
Exhaust filters, scrubbers, or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate Filtration Credit: MERV 9 through 12	125 in. w.c.
Particulate Filtration Credit: MERV 13 through 15	225 in. Pa
Particulate Filtration Credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2× clean filter pressure drop at fan system design condition
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition
Heat recovery device	Pressure drop of device calculated at fan system design condition
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design condition
Sound attenuation section	38 Pa
Deductions	
Fume Hood Exhaust Exception (required if 6.5.3.1.1 Exception (c) is taken)	–250 Pa

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FOREWORD

The efficiency requirements for commercial boilers in Standard 90.1 have not been changed in a significant way since 90.1-1989. Over the years the number of models available at higher efficiencies has increased. Recently, boiler manufacturers and energy efficiency supporters met and developed a joint proposal to raise the boiler efficiency requirements in 90.1. This addendum involves deleting the current Table 6.2.1F and replacing it with the new table provided.

This new table contains three efficiency columns: the current standard, which will continue to apply for several years; a proposed new standard, which will go into effect three years from the date of ASHRAE Board approval; and an additional standard level for one product class, which will go into effect ten years after the previous column. The three-year period before the proposed new standard takes effect is provided to allow manufacturers sufficient time to upgrade models that do not meet the standards. In addition, a new product class is created for gas natural draft steam boilers in order to permit a more gradual transition to the proposed new standard level for this class, since space constraints in old existing boiler rooms provide extra challenges.

Available public data indicate that about half the boilers now being sold meet the new proposed requirements. Analysis conducted for the committee indicates that the proposed new efficiency levels will be cost-effective to boiler users using the economic tests generally employed in setting efficiency levels in 90.1. The proposed increases in efficiency will reduce commercial boiler energy use by an average of about 5%. A 5% decrease would save about 18 trillion Btu of gas and oil annually once the existing boiler stock turns over.

***Note:** In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum an to 90.1-2004 (I-P and SI Editions)

*Make the following changes to the **I-P edition**.*

Delete the current Table 6.8.1F and replace it with the table that follows.

TABLE 6.8.1F Gas- and Oil-Fired Boilers, Minimum Efficiency Requirements

Equipment Type[a]	Sub-Category or Rating Condition	Size Category (Input)	Minimum Efficiency[b,c]	Efficiency as of 6/29/2009 (Date 3 yrs after ASHRAE Board approval)	Efficiency as of 6/29/2019 (Date 13 yrs after ASHRAE Board approval)	Test Procedure
Boilers, Hot Water	Gas-Fired	< 300,000 Btu/h	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³300,000 Btu/h and £2,500,000 Btu/h[d]	75% E_t	80% E_t	80% E_t	10 CFR Part 431
		> 2,500,000 Btu/h[a]	80% E_c	82% E_c	82% E_c	
	Oil-Fired[e]	£ 300,000 Btu/h	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³300,000 Btu/h and £ 2,500,000 Btu/h[d]	78% E_t	82% E_t	82% E_t	10 CFR Part 431
		> 2,500,000 Btu/h[a]	83% E_c	84% E_c	84% E_c	
Boilers, Steam	Gas-Fired	< 300,000 Btu/h	75% AFUE	75% AFUE	75% AFUE	10 CFR Part 430
	Gas-Fired—All, except natural draft	³300,000 Btu/h and £ 2,500,000 Btu/h[d]	75% E_t	79% E_t	79% E_t	10 CFR Part 431
		> 2,500,000 Btu/h[a]	80% E_c	79% E_t	79% E_t	
	Gas-Fired—Natural Draft	³300,000 Btu/h and £ 2,500,000 Btu/h[d]	75% E_t	77% E_t	79% E_t	
		> 2,500,000 Btu/h[a]	80% E_c	77% E_t	79% E_t	
	Oil-Fired[e]	< 300,000 Btu/h	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³300,000 Btu/h and £ 2,500,000 Btu/h[d]	78% E_t	81% E_t	81% E_t	10 CFR Part 431
		> 2,500,000 Btu/h[a]	83% E_c	81% E_t	81% E_t	

[a] These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
[b] E_c = combustion efficiency (100% less flue losses). See reference document for detailed information.
[c] E_t = thermal efficiency. See reference document for detailed information.
[d] Maximum capacity – minimum and maximum ratings as provided for and allowed by the unit's controls.
[e] Includes oil-fired (residual).

*Make the following changes to the **SI edition**.*

Delete the current Table 6.8.1F and replace it with the table that follows.

TABLE 6.8.1F Gas- and Oil-Fired Boilers, Minimum Efficiency Requirements

Equipment Type[a]	Sub-Category or Rating Condition	Size Category (Input)	Minimum Efficiency[b,c]	Efficiency as of 6/29/2009 (Date 3 yrs after ASHRAE Board approval)	Efficiency as of 6/29/2019 (Date 13 yrs after ASHRAE Board approval)	Test Procedure
Boilers, Hot Water	Gas-Fired	< 88 kW	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³ 88 kW and £ 733 kW	75% E_t	80% E_t	80% E_t	10 CFR Part 431
		> 733 kW[a]	80% E_c	82% E_c	82% E_c	
	Oil-Fired[e]	< 88 kW	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³ 88 kW and £ 733 kW	78% E_t	82% E_t	82% E_t	10 CFR Part 431
		> 733 kW[a]	83% E_c	84% E_c	84% E_c	
Boilers, Steam	Gas-Fired	< 88 kW	75% AFUE	75% AFUE	75% AFUE	10 CFR Part 430
	Gas-Fired—All, except natural draft	³ 88 kW and £ 733 kW	75% E_t	79% E_t	79% E_t	10 CFR Part 431
		> 733 kW[a]	80% E_c	79% E_t	79% E_t	
	Gas-Fired—Natural Draft	³ 88 kW and £ 733 kW	75% E_t	77% E_t	79% E_t	
		> 733 kW[a]	80% E_c	77% E_t	79% E_t	
	Oil-Fired[e]	< 88 kW	80% AFUE	80% AFUE	80% AFUE	10 CFR Part 430
		³ 88 kW and £ 733 kW	78% E_t	81% E_t	81% E_t	10 CFR Part 431
		> 733 kW[a]	83% E_c	81% E_t	81% E_t	

[a] These requirements apply to boilers with rated input of 2346 kW or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
[b] E_c = combustion efficiency (100% less flue losses). See reference document for detailed information.
[c] E_t = thermal efficiency. See reference document for detailed information.
[d] Maximum capacity – minimum and maximum ratings as provided for and allowed by the unit's controls.
[e] Includes oil-fired (residual).

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Under the Energy Policy Act of 2005, Section 135 (aa), all unit heaters manufactured on and after August 8, 2008, for use in the United States must be equipped with an intermittent ignition device and have power venting or an automatic flue damper. This footnote would help to update the ASHRAE standard so that users are aware of the new federal law. Also, as is done for other products in Standard 90.1, the acceptability of vent dampers on units installed in the conditioned space should be recognized.

Also, there is a precedent for this type of footnote in the standard. In footnotes c and f for Table 6.8.1E in 90.1-2004, the wording is "units must also include an interrupted or intermittent ignition device (IID) ... and have either power venting or a flue damper." In addition, footnotes c and f state "A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space."

Note: *In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum ao to 90.1-2004 (I-P and SI Editions)

Make the following changes to the ***I-P and SI editions****.*

Add footnote h to Table 6.8.1E as follows:

TABLE 6.8.1E Warm Air Furnaces and Combination Warm Air Furnaces/Air-Conditioning Units, Warm Air Duct Furnaces and Unit Heaters

Warm Air Unit Heaters, Gas-Fired	All Capacities	Maximum Capacity[e]	80% E_c[g,h]	ANSI Z83.8
Warm Air Unit Heaters, Oil-Fired	All Capacities	Maximum Capacity[e]	80% E_c[g,h]	UL 731

h. As of August 8, 2008, per the Energy Policy Act of 2005, units must also include an interrupted or intermittent ignition device (IID) and have either power venting or an automatic flue damper. A vent damper is an acceptable alternative to a flue damper for those unit heaters where combustion air is drawn from the conditioned space.

The remainder of the table and footnotes remain unchanged.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the standards and guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive technical committee structure, continue to generate up-to-date standards and guidelines where appropriate and adopt, recommend, and promote those new and revised standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating standards and guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.