BSR/ASHRAE/IES Addendum cd
to ANSI/ASHRAE/IES Standard 90.1-2022

Public Review Draft

Proposed Addendum cd to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

First Public Review (March 2025)
(Draft Shows Proposed Changes to Current Standard)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at www.ashrae.org/standards-research--technology/public-review-drafts and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at www.ashrae.org/bookstore or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

This standard is under continuous maintenance. To propose a change to the current standard, use the change submittal form available on the ASHRAE website, www.ashrae.org.
The appearance of any technical data or editorial material in this public review document does not constitute endorsement, warranty, or guaranty by ASHARE of any product, service, process, procedure, or design, and ASHRAE expressly disclaims such.

ASHRAE, 180 Technology Parkway NW, Peachtree Corners, GA 30092

(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

Prior to the next publication, the Format and Compliance team was asked to verify accuracy of the current Acronym list. This addendum represents our edits. Note, in the standard, if an Acronym only exists in formula and is described in the formula, we did not add that Acronym to the list unless the Acronym is used in more than one location in the standard.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum cd to 90.1-2022

Modify the standard as follows for IP (and SI) units:

3.3 Abbreviations and Acronyms

χ	*chi-factor*, *thermal transmittance* of a *point thermal bridge*	ASTM	ASTM International
Ψ	*psi-factor*, *thermal transmittance* per unit length of a *linear thermal bridge*	AVIXA	Audiovisual and Integrated Experience Association
AAMA	American Architectural Manufacturers Association	BAS	building automation system
ac	alternating current	BEP	best efficiency point
ACCA	Air Conditioning Contractors Association	(*fan*) *bhp*	(*fan*) *brake horsepower*
ach	air changes per hour	*BMS*	building management system
AFUE	annual fuel utilization efficiency	BSR	Board of Standards Review
AHAM	Association of Home Appliance Manufacturers ANSI	Btu	British thermal unit
AHRI	Air-Conditioning, Heating and Refrigeration Institute	Btu/h	British thermal unit per hour
AFUE	annual fuel utilization efficiency	Btu/h·ft·°F	British thermal unit per hour per linear foot per degree Fahrenheit
AISI	American Iron and Steel Institute	Btu/ft^2·°F	British thermal unit per square foot per degree Fahrenheit Btu/h·ft^2
AMCA	Air Movement Control Association	CAN	Canada
ANSI	American National Standards Institute	*CDD*	*cooling degree-day*
ASABE	American Society of Agricultural and Biological Engineers	*CDD*50	*cooling degree-days* base 50°F
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers	*CEER*	*combined energy efficiency ratio*

CFEI	*ceiling fan energy index*	HW	heating water
cfm	cubic feet per minute	HWST	heating-water supply temperature
CHW	chilled water	~~HID~~	~~high-intensity discharge~~
CHWST	chilled-water supply temperature	hp	horsepower
c.i.	*continuous insulation*	*HSPF/HSPF2*	*heating seasonal performance factor*
CMU	concrete masonry unit	HVAC	heating, ventilating, and air conditioning
COP	*coefficient of performance*	HVACR	heating, ventilating, air conditioning, and refrigeration IEC
COP_H	*coefficient of performance, heat pump—heating*	IEC	International Electrotechnical Commission
COP_{HR}	*heat recovery coefficient of performance*	*IEER*	*integrated energy efficiency ratio*
COP_{SHC}	*simultaneous cooling and heating coefficient of performance*	IES	Illuminating Engineering Society
COPS	critical operations power systems	IID	intermittent ignition device
CRRC	Cool Roof Rating Council	IL	inline
CSA	Canadian Standards Organization	in.	inches
CTI	Cooling Technology Institute	I-P	inch-pound
CTI ATC	acceptance test code for water cooling towers	*IPLV*.IP	*integrated part-load value*
CTI STD	Cooling Technology Institute Standard	IR	infrared
CV	constant volume	*ISCOP*	integrated seasonal coefficient of performance
DASMA	Door and Access Systems Manufacturers Association	*ISMRE/ISMRE2*	*integrated seasonal moisture removal efficiency*
db	dry-bulb	ISO	International Standards Organization
DC	direct current	IT	information technology
DCV	*demand control ventilation*	J	joule
DDC	*direct digital control*	K	kelvin
DOAS	dedicated *outdoor air system*	kJ	kilojoule
DOE	U.S. Department of Energy	*kVA*	*kilovolt-ampere*
DX	direct expansion	*kW*	*kilowatt*
EAC	energy attribute certificate	L	length of a *linear thermal bridge*
E_c	combustion *efficiency*	lb	pound
ECM	electronically commutated motor	lin	linear
EER/EER2	*energy efficiency ratio*	lin ft	linear foot
EF	*energy factor*	*LPA*	*lighting power allowance*
EISA	Energy Independence and Security Act	*LPD*	*lighting power density*
EPCA	U.S. Energy Policy and Conservation Act	*Ls*	*liner system*
ER	*energy* recovery	*LSG*	*light-to-solar-gain ratio*
E_t	thermal *efficiency*	MERV	minimum efficiency reporting value
ESCC	*end-suction close-coupled*	MICA	Midwest Insulation Contractors Association
ESFM	*end-suction frame-mounted/own-bearings*	MIL	U.S. Military Specification
°F	Fahrenheit	min.	minimum
FC	filled cavity	MPF	mechanical performance factor
FDD	fault detection and diagnostics	*MRE*	*moisture removal efficiency*
FEI	*fan energy index*	MSH	monitor seal height
FL	full-load	*n*	number of occurrences a *point thermal bridge*
FPT	*functional performance testing*	NAECA	U.S. National Appliance Energy Conservation Act
FPTU	fan-powered *terminal* unit	NEMA	National Electric Manufacturers Association
ft	foot	NFPA	National Fire Protection Association
gr	grains of moisture per pound of dry air	NFRC	National Fenestration Rating Council
GPM	gallons per minute	*NPLV*.IP	nonstandard part-load value
h	hour	OAT	*outdoor air* temperature (dry-bulb unless wet-bulb is specified)
HC	*heat capacity*	*OA*	*outdoor air*
HDD	*heating degree-day*	PEI	*pump* energy index
*HDD*65	*heating degree-days* base 65°F	PER	*pump* energy rating
$h \cdot ft^2 \cdot °F/Btu$	hour per square foot per degree Fahrenheit per British thermal unit	*PF*	*projection factor*

PFP	parallel fan-powered	wb	wet-bulb
~~PPE~~	~~photosynthetic photon efficacy~~	WDMA	Window and Door Manufacturers Association
PRM	*performance rating method*	W/ft^2	watts per square foot
PRV	power roof/wall ventilator	WF	well factor
PSZ-AC	packaged single-zone air conditioner		
PSZ-HP	packaged single-zone heat pump		
PTAC	*packaged terminal air conditioner*		
PTHP	*packaged terminal heat pump*		
PV	photovoltaic		
$P_{W,off}$	off-mode power consumption		
$P_{W,SB}$	standby power mode consumption		
R	*R-value* (*thermal resistance*)		
RAC	room air conditioners		
RAT	return air temperature (dry-bulb unless wet-bulb is specified)		
R_c	*thermal resistance* of a material or *construction* from surface to surface		
RCR	*room cavity ratio*		
REC	renewable energy certificate		
rpm/RPM	revolutions per minute		
R_u	total *thermal resistance* of a material or *construction* including air film resistances rpm		
RSV	radially split, multistage, vertical, inline diffuser casing		
SAT	supply air temperature (dry-bulb unless wet-bulb is specified)		
SC	*shading coefficient*		
SEER/*SEER2*	*seasonal energy efficiency ratio SERR*		
SERR	*series energy recovery ratio*		
SHGC	*solar heat gain coefficient*		
SHW	service hot water		
SI	International System of Units		
SL	standby loss		
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association		
SPVAC	*single-package vertical air conditioner*		
SPVHP	*single-package vertical heat pump*		
ST	submersible turbine		
SWH	service water heating		
SZ	single zone		
T_{db}	dry-bulb temperature		
TDA	total display area		
TIA	Telecommunications Industry Association		
TSPR	*total system performance ratio*		
$TSPR_p$	*TSPR* of a *proposed design*		
$TSPR_r$	*TSPR* of a *TSPR reference building design*		
T_{wb}	wet-bulb temperature		
UEF	uniform energy factor		
UPS	uninterruptible power supply		
VAV	*variable air volume*		
VRF	*variable refrigerant flow*		
VSD	variable-speed drive		
VT	*visible transmittance* (also known as visible light transmittance [VLT])		
V&T	verification and testing		
W	watt		