ADDENDA

ANSI/ASHRAE/IES Addendum cz to
ANSI/ASHRAE/IES Standard 90.1-2022

Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and by the American National Standards Institute on November 28, 2025; and by the Illuminating Engineering Society on November 13, 2025.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (https://www.ashrae.org/continuous-maintenance).

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c. offering constructive criticism for improving the Standard, or
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In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

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FOREWORD

Addendum cz replaces the standard's reference to AMCA 208 for calculating fan energy index (FEI) to the Energy Conservation Program: Test Procedure for Fans and Blowers, published by the U.S. Department of Energy (DOE), on May 1, 2023.

The test procedure establishes separate methods of test for general fans and blowers as Appendix A and air-circulating fans (ACF) as Appendix B.

In January of 2025, the U.S. DOE withdrew the proposed minimum efficiency standards for both fans and blowers as well as air-circulating fans.

Compliance with the Code of Federal Regulations (CFR) test procedures is required within the U.S. and U.S. territories; however, Addendum cz continues the allowance of AMCA 208 to calculate FEI ratings for fans sold for use outside the U.S. No significant cost impact related to increased efficiency of fans and blowers is anticipated, as this addendum does not change the minimum FEI levels.

Addendum cz requires ACFs be tested and rated per the requirements of the CFR and in a manner consistent with fans and blowers and ceiling fans.

The addendum adds definitions established by the CFR test procedure as necessary and provides clarity and efficiency. For example, DOE established a statutory definition for "safety fan" that allows the list of exemptions for the fans and blowers provision to be shortened, and provides clarity for certain conditions, such as what is meant by "explosion proof."

Addendum cz requires that FEI values be indicated on the construction documents to allow for compliance verification by the authority having jurisdiction.

Informative 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 cz to Standard 90.1-2022

Modify Section 3.2 as shown (I-P and SI).

air-circulating fan: a *fan* that has no provision for connection to ducting or separation of the *fan* inlet from its outlet using a pressure boundary, operated against zero external pressure loss, and is not a *jet fan* or a *ceiling fan*.

ceiling fan: a nonportable ~~(permanently installed)~~ device that is suspended from a ceiling ~~or overhead structure~~ for circulating air via the rotation of fan blades. For the purpose of this definition, "circulating air" means the discharge of air in an upward or downward direction. A ceiling fan that has a ratio of fan blade span (in inches [millimeters]) to maximum rotation rate (in revolutions per minute) greater than 0.06 in./rpm (1.524 mm/rpm) provides circulating air.

fan: a rotary-bladed machine used to convert electrical or mechanical power to air power, with an energy output limited to 25 kJ/kg (10.75 Btu/lb_m) of air. It consists of an impeller, a shaft, and bearings and/or driver to support the impeller, as well as a structure or housing. A fan or blower can include a transmission, driver, and/or motor controller.

fan energy index (FEI): the ratio of the electric input power of a reference fan to the electric input power of the actual fan as calculated per ~~AMCA 208~~ 10 CFR Part 431 if required, otherwise, calculated per AMCA 208.

induced flow fan: a type of laboratory exhaust fan with nozzle and windband; the fan's outlet airflow is greater than the inlet airflow due to induced airflow. All airflow entering the inlet exits through the nozzle. Airflow exiting the windband includes the nozzle airflow as well as the induced airflow.

jet fan: a *fan* designed and marketed specifically for producing a high-velocity air jet in a space to increase its air momentum. Jet *fans* are rated using thrust. Inlets and outlets are not ducted but can include acoustic silencers.

radial housed fan: a *fan* with a radial impeller in which airflow exits into a housing that is generally scroll-shaped to direct the air through a single *fan* outlet. Inlets and outlets can optionally be ducted.

radial housed unshrouded fan: a *radial housed fan* for which the impeller blades are attached to a backplate and hub (i.e., open radial blade), or to a hub only (i.e., open paddle wheel), and with an open front at the impeller's inlet.

safety fan:

a. A reversible axial fan in cylindrical housing that is designed and marketed for use in ducted tunnel ventilation that will reverse operations under an emergency ventilation condition;
b. A fan for use in explosive atmospheres tested and marked according to ISO 80079-36;
c. An electric-motor-driven positive pressure ventilator, as defined AMCA 240;
d. Fans complying with ANSI/UL 705 and listed as power ventilators for smoke control systems; or
e. A laboratory exhaust fan designed and marketed specifically for exhausting contaminated air vertically away from a building using high-velocity discharge

Modify Section 6.4.7 as shown (I-P and SI).

6.4.7 Performance Rating Requirements for Equipment without Minimum Efficiency Requirements ~~System Components~~. The *equipment* listed in Table 6.4.7 shall be rated in accordance with the rating procedure listed.

Table 6.4.7 Performance Rating Procedures for Equipment without Minimum Efficiency Requirements ~~System Components~~

Equipment	Rating Procedure
Plate-type liquid-to-liquid heat exchangers	AHRI 400
Fin-and-tube heating and cooling coils (hydronic and DX)	AHRI 410
Exhaust air energy recovery heat exchangers	AHRI 1060
Air-circulating fans with input power >200 W	Appendix B to Subpart J of 10 CFR Part 431, if required, otherwise use AMCA 230.

Modify Section 6.5.3.1.3 as shown (I-P and SI):

6.5.3.1.3 Fan Efficiency. Each fan and *fan array* shall have a *fan energy index* (*FEI*) of 1.00 or higher at its highest design airflow rate. Each fan and *fan array* used for a *variable-air-volume system* that meets the requirements of Section 6.5.3.2.1 shall have an *FEI* of 0.95 or higher at its highest design airflow rate.

~~The *FEI* for *fan arrays* shall be calculated in accordance with AMCA 208 Annex C.~~

6.5.3.1.3.1 The *FEI* for individual fans shall be determined in accordance with 10 CFR Part 431 if required, otherwise, calculated per AMCA 208. The fan *FEI* shall be indicated on the construction documents to allow for compliance verification by the *AHJ*.

6.5.3.1.3.2 Fan Array Efficiency. *Fan arrays* with a combined motor *nameplate horsepower* (*nameplate kilowatts*) greater than 5 hp (3.7 *kW*) or with a *fan system electrical input power* greater than 4.1 *kW* shall have an *FEI* of 1.00 or greater calculated in accordance with AMCA 208 Annex C. Any fan in the fan array with a shaft input power greater than or equal to 1 hp (0.75 *kW*) or with a fan electrical input power greater than or equal to 0.89 *kW* shall have an *FEI* of 1.00 or greater. Each fan array used for a variable-air-volume system that meets the requirements of Section 6.5.3.2.1 shall have an *FEI* of 0.95 or higher at its highest design airflow rate. All *fan array FEI* values shall be indicated on the *construction documents*.

Exceptions to 6.5.3.1.3:

1. Fans that are not *embedded fans* with a motor *nameplate horsepower* of less than 1.0 hp or with a *fan nameplate electrical input power* of less than 0.89 *kW* or where air power at the design airflow results in greater than 150 hp (111 *kW*).
2. *Embedded fans* and *fan arrays* with a combined motor *nameplate horsepower* of 5 hp or less or with a *fan system electrical input power* of 4.1 *kW* or less.
3. *Embedded fans* that are part of *equipment* listed under Section 6.4.1.1.
4. *Embedded fans* included in *equipment* bearing a third-party-certified seal for air performance or *energy* performance of the *equipment* package.
5. Ceiling fans.
6. Fans used for moving gases at temperatures above 482°F (250°C).
7. ~~Fans used for operation in explosive atmospheres.~~
8. ~~Reversible fans used for tunnel *ventilation*.~~

~~9~~7. Fans outside the scope of AMCA 208.
~~10~~8. Fans when operating during emergency conditions.
~~11~~9. *Radial housed unshrouded fans* with blade diameter at tip less than 30 in. (76 cm) or a blade width of less than 3 in. (76 mm).
~~11~~10. *Safety fans*.
~~12~~11. *Induced flow fans*.
12. *Jet fans*.

Modify Section 13 as shown (I-P and SI).

Reference		Section
[. . .]		
Air Movement and Control Association International (AMCA) 30 West University Drive, Arlington Heights, IL 60004-1806		
[. . .]		
ANSI/AMCA 230-~~15~~23 with errata	Laboratory Methods of Testing Air Circulating Fans for Rating and Certification	Table 6.8.1-21
ANSI/AMCA 240-15	Laboratory Methods of Testing Positive Pressure Ventilators for Aerodynamic Performance Rating.	3.2, 6.5.3.1.3
[. . .]		
International Organization for Standardization (ISO) ISO Central Secretariat BIBC II Chemin de Blandonnet 8, CP 401, 1214, Vernier, Geneva, Switzerland		
[. . .]		
ISO 80079-36:2016	Explosive atmospheres—Part 36: Non-electrical equipment for explosive atmospheres—Basic method and requirements	3.2, 6.5.3.1.3
[. . .]		
UL, LLC 333 Pfingsten Rd., Northbrook, IL 60062		
ANSI/UL 705	Standard for Safety for Power Ventilator	3.2, 6.5.3.1.3
[. . .]		

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.

ASHRAE · 180 Technology Parkway · Peachtree Corners, GA 30092 · www.ashrae.org

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