



# ADDENDA

**ANSI/ASHRAE Addendum a to  
ANSI/ASHRAE Standard 90.4-2016**

# Energy Standard for Data Centers

Approved by the ASHRAE Standards Committee on January 20, 2018; by the ASHRAE Technology Council on January 24, 2018; and by the American National Standards Institute on January 25, 2018.

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. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or in paper form from the Senior Manager of Standards.

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

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- b. participation in the next review of the Standard,
- c. offering constructive criticism for improving the Standard, or
- d. permission to reprint portions of the Standard.

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## FOREWORD

*Addendum a deletes the definition of “alteration” from Section 3 of Standard 90.4 and defaults to the definition used in Standard 90.1 (which is reproduced in Standard 90.4, Annex 1). This change aligns Standard 90.4’s use of “alteration” with how the word is defined in codes.*

*Specific requirements for alterations to data centers are addressed through existing language in Section 4.2.1.3 on a general basis and in Section 6.1.1.3 for mechanical systems. These requirements remain unchanged and are included here to provide context.*

*Criteria for alterations to electrical systems in existing data centers are added through Section 8.1.4.*

*Criteria for additions to electrical systems in existing data centers will be added by addendum b to Standard 90.4. A new Section 8.1.3 is created here as a placeholder for that content.*

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

## Addendum a to Standard 90.4-2016

*Modify the standard as follows (I-P and SI units).*

## 3. DEFINITIONS

**3.1 General.** Certain terms, abbreviations, and acronyms are defined in this section for the purposes of this standard. These definitions are applicable to all sections of this standard.

**3.1.1 Coordination.** Where terms are not defined in this standard but are defined in ASHRAE/IES Standard 90.1, those terms shall have the meanings as assigned to them in ANSI/ASHRAE/IES Standard 90.1. Where terms are not defined in either document, they shall have their ordinary accepted meanings within the context in which they are used. Ordinarily accepted meanings shall be based on standard American English language usage as documented in an unabridged dictionary accepted by the adopting authority.

### **Informative Notes:**

1. See Annex 1 for ASHRAE/IES Standard 90.1 definitions.
2. Only terms that appear in Section 3 of this standard are italicized throughout the document. Terms that appear Annex 1 are not italicized.

## 3.2 Definitions

[ . . . ]

**alteration:** a replacement not in kind or addition to a building or its *systems* and *equipment*. Routine maintenance, repair, replacement in kind, and service, or a change in the building’s use classification or category shall not constitute an *alteration*. *Alterations* exclude *ITE adds, moves, and changes*.

[ . . . ]

## 4. ADMINISTRATION AND ENFORCEMENT

### 4.1 General

[ . . . ]

### 4.2 Compliance

#### 4.2.1 Compliance Paths

##### 4.2.1.1 New *Data Centers*. [ . . . ]

##### 4.2.1.2 Additions to Existing *Data Centers*. [ . . . ]

**4.2.1.3 Alterations to Existing *Data Centers*.** Alterations to existing *data centers* shall comply with the provisions of Sections 5, 7, 8 2, and 10 and with either Sections 6 and 8 or Section 11, provided such compliance will not result in the increase of energy consumption of the building.

#### **Exceptions:**

1. *ITE adds, moves, and changes* are excluded.
2. *ITE enclosures* are excluded.
3. A *data center* that has been specifically designated as historically significant by the adopting authority, is listed in The National Register of Historic Places, or has been determined to be eligible for listing by the U.S. Secretary of the Interior, need not comply with these requirements.
4. Where one or more components or portions of an existing *data center* mechanical, electrical, or lighting *system* is being replaced without changing capacities, the annual energy consumption of the *system* in which replacements are made shall not be greater than the annual energy consumption of the existing *system*. Compliance can be demonstrated using manufacturer’s published *efficiency* data for the new and existing devices or by comparative calculations of the annual energy consumptions of the existing and revised *systems* performed by a design professional using calculation methods commonly accepted in the industry.

Component or *system* replacements or modifications that result in changes in either capacity or type of technology require compliance with the applicable sections and versions of this standard in accordance with Section 4.2.2.4.

**Informative Note:** Refer to Figures C-3, C-4, and C-5 for guidance on applicability.

[ . . . ]

## 6. HEATING, VENTILATING, AND AIR CONDITIONING

### 6.1 General

### 6.1.1 Scope

[...]

#### 6.1.1.3 Alterations to Heating, Ventilating, Air Conditioning, and Refrigeration (HVACR) in Existing Data Centers

**6.1.1.3.1** Replacing existing HVAC *equipment* with new HVAC *equipment* shall comply with the specific minimum *efficiency* requirements applicable to that *equipment* in ASHRAE/IES Standard 90.1.

##### Exceptions:

1. For *equipment* that is being modified or repaired but not replaced, provided that such modifications and/or repairs will not result in an increase in the annual energy consumption of the *equipment* using the same energy type.
2. Where a replacement or alteration of equipment requires extensive revisions to other *systems, equipment,* or elements of a building, and such replaced or altered *equipment* is a like-for-like replacement.
3. For a refrigerant change of existing *equipment*.
4. For the relocation of existing *equipment*.

**6.1.1.3.2** New cooling *systems* installed to serve previously uncooled spaces shall comply with this section as described in Section 6.2.

[...]

## 8. ELECTRICAL

### 8.1 General

**8.1.1 Scope.** This section applies to the building electrical *systems* delivering power to the *data center* IT load, and to *equipment* described below.

**8.1.2 New Buildings.** *Equipment* installed in new *buildings* shall comply with the requirements of Section 8.

#### **8.1.3 Additions to Existing Buildings.**

#### **8.1.4 Alterations to Existing Buildings**

**8.1.4.1** Alterations to building service equipment or systems shall comply with the requirements of Section 8 applicable to those specific portions of the building and its systems that are being altered.

##### **Exceptions to 8.1.4.1:**

1. Compliance shall not be required for the relocation or reuse of *existing equipment* at the same site.
2. Where a replacement or alteration of equipment requires extensive revisions to other *systems, equipment,* or elements of a building, and such replaced or altered *equipment* is a like-for-like replacement.

**8.1.4.2** Any new equipment, subject to the requirements of Section 8, that is installed in conjunction with the alterations as a direct replacement of existing equipment shall comply with the specific requirements applicable to that equipment.

##### **Exceptions to 8.1.4.2:**

1. Compliance shall not be required for the relocation or reuse of *existing equipment* at the same site.
2. Where a replacement or alteration of equipment requires extensive revisions to other *systems, equipment,* or elements of a building, and such replaced or altered *equipment* is a like-for-like replacement.

## **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.

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