AHRI 1310-2019 (R2023) (I-P)

2019 (Reaffirmed 2023) Standard for

Wind Load Design of HVACR Equipment

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ICS Code: 17.808

Note:

This is a new AHRI Standard.
This standard was reaffirmed July 2023.

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Foreword

The codes and standards listed in Appendix A are used in conjunction with the requirements contained herein and together govern the wind load design, construction, and rating of Equipment within the scope of this standard. Evidence of compliance with this standard is deemed to satisfy the applicable provisions of the normative codes and standards.

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WIND LOAD DESIGN OF HVACR EQUIPMENT

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish for Heating, Ventilating, Air-conditioning, and Refrigeration (HVACR) Equipment the wind load design, construction, and rating requirements. This standard provides minimum requirements for the design, construction, and structural load rating of Equipment that must resist wind loads to maintain structural integrity and prevent separation of equipment Components that can become windborne debris.

1.1.1 *Intent.* This standard is intended to be used primarily by HVACR Equipment manufacturers and their agents. Other HVACR industry stakeholders that may use this standard include engineers, contractors, owners, insurers, and building officials.

1.1.2 *Review and Amendment.* This standard is subject to review and amendment as building codes change and as technology advances.

1.1.3 This standard does not address Equipment functionality. Compliance with this standard will not ensure Equipment will continue to function after a design wind event, though design for structural integrity can improve functional survivability. The design and construction requirements for HVACR Equipment that must function after a wind event shall be defined by the authority having jurisdiction. Alternatively, critical Equipment should be protected from the effects of winds.

Section 2. Scope

2.1 *Included Equipment and Components*.

2.1.1 This standard shall apply, but not be limited to, the following types of HVAC Equipment that are exposed to wind:

2.1.1.1 Air handling units as defined in AHRI Standards 430 (I-P).
2.1.1.2 Air-to-air heat exchangers as defined in AHRI Standards 1060 (I-P).
2.1.1.3 Dehumidifiers as defined in AHRI Standards 910 (I-P).
2.1.1.4 DX-dedicated outdoor air system units as defined in AHRI Standard 920.
2.1.1.5 Furnaces as defined in 10 CFR § 430.2.
2.1.1.6 Humidifiers as defined in AHRI Standards 640 (I-P).
2.1.1.7 Liquid chillers as defined in AHRI Standards 550/590 (I-P).
2.1.1.8 Packaged terminal equipment as defined in AHRI Standard 310/380.
2.1.1.9 Single packaged vertical air conditioners and heat pumps as defined in AHRI Standard 390.
2.1.1.10 Thermal storage equipment as defined in ANSI/AHRI Standards 900 (I-P).
2.1.1.11 Unitary air conditioners and heat pumps (including ductless equipment) as defined in AHRI Standard 210/240 and AHRI Standard 340/360.
2.1.1.12 Variable refrigerant flow air conditioners and heat pumps as defined in AHRI Standard 1230.
2.1.1.13 Water-source heat pumps as defined in ANSI/AHRI/ASHRAE/ISO Standard 13256-1 & 2.

2.1.2 This standard shall also apply to the following Structural Elements and connections of Equipment:

2.1.2.1 Equipment Attachment Points (EAP) that transfer loads to Supports and Attachments.

2.1.2.2 Equipment Force-Resisting System (EFRS) that provides a continuous load path for transmitting loads to the EAP.

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2.1.2.3 Equipment Components & Cladding (EC&C) parts that are directly exposed to wind loads. Components include items such as cowlings, exhaust or recovery sections, sound attenuators, and other appurtenances that are attached to Equipment and supplied by manufacturer of the Equipment. Cladding includes wall and roof panels forming the enclosure of Equipment. These parts also may be integral to the EFRS.

2.2 *Excluded Equipment and Components.* This standard shall not apply to Equipment that is indoors or fully shielded from wind by a wind load resistant enclosure independent of the Equipment. This standard also shall not apply to the following:

2.2.1 Nonstructural Elements including Components and parts that are internal to Equipment, are not directly exposed to wind loads, and are not a part of the EFRS.

2.2.2 Distribution system elements connecting Equipment, including piping, ducting, electrical wiring, and conduit.

2.2.3 Other appurtenances, including lightning, electrical boxes, and lightening protection that may be attached to Equipment but not supplied by the Equipment manufacturer.

2.2.4 Supports and Attachments, including hardware, stands, curbs, restrained isolators, and other structural members.

2.3 *Tornado Limitation.* The wind load effects of tornadoes are not within the scope of this standard.

2.4 *Missile Impact Resistance.* The design and test requirements for missile impact resistance of Equipment are not within the scope of this standard.

Section 3. Definitions

3.1 *General.* The definition of terms used in this standard shall be as provided in ASCE/SEI 7 and on *the ASHRAE Terminology* website (https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology) except as defined below.

3.1.1 *Attachments.* The devices or hardware, such as fasteners and welds, used to secure and restrain Equipment to Supports. Attachments also may be referred to as anchors.

3.1.2 *Building.* Any structure, other than Supports, on which Equipment is located or to which Equipment provides an HVACR service.

3.1.3 *Cladding.* The parts of Equipment that are directly exposed to wind loads including wall and roof panels forming the enclosure of Equipment. These parts also may be integral to the EFRS.

3.1.4 *Components.* Major parts or subassemblies of Equipment that are either directly exposed to wind loads or are internal to Equipment and not exposed.

3.1.5 *Equipment.* A product within the scope of this standard that provides a Heating, Ventilating, Air-conditioning, or Refrigeration (HVACR) function.

3.1.6 *Equipment Attachment Points (EAP).* The points on Equipment where it is attached to Supports and are designed in accordance with this standard to transfer loads from the EFRS to the Attachments and Supports.

3.1.7 *Equipment Force-Resisting System (EFRS).* A system of structural members, connections, and Components within Equipment that provides a continuous load path for transmitting loads to the EAP.

3.1.8 *Generic Design.* A procedure for wind load design of Equipment whereby the design wind pressures are determined based on the strength and deflection limit states of Structural Elements.

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