



**BSR/ASHRAE/IES Addendum b  
to ANSI/ASHRAE/IES Standard 90.1-2019**

**Public Review Draft**

# **Proposed Addendum b to Standard 90.1-2019, Energy Standard for Buildings Except Low-Rise Residential Buildings**

**Second Public Review (June 2020)  
(Draft Shows Proposed Independent Substantive  
Changes to Previous Public Review Draft)**

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](http://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](http://www.ashrae.org/bookstore) or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

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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**

*Demand Controlled Ventilation (DCV) should be required when cost-effective for occupied spaces considering the required outside air for ventilation required based on number of people in the space, varying space sizes, use of energy recovery equipment, and climate zone.*

*The addendum in the first public review replaced single threshold parameters with a table where the floor area threshold requirement is based on climate zone and occupant outside airflow rates per 1,000 sq. ft. determined through ASHRAE Standard 62.1. The requirements are grouped by **occupant outside air flow component** ranges (cfm/1000 square feet) based on default parameters in 62.1. While the exact value for a particular space type varies, the three groups in the table generally correspond to (1) retail sales, break rooms, or bank lobbies, (2) classrooms or conference rooms, and (3) lecture halls, theatre or assembly.*

*Based on comments to the first public review, climate zones 0A and 0B were analyzed and the climate zone grouping of requirements was reviewed. Based on this review and additional analysis, Climate Zone 0A was moved to a more stringent requirement associated with climate zones 0B and 1B. Climate Zone 1A was separated from Climate Zones 3B and 4B to provide more appropriate floor area thresholds.*

*In addition, an exception for spaces that are not allowed to reduce outside airflow per the requirements in ASHRAE Standard 170, other applicable codes, or accreditation standards was added.*

*Cost Impact: The net effect of the proposal will increase the cost of construction. Since an economizer or motorized dampers are already required as part of the charging language of this section, the cost to add a sensor and wiring is expected to be \$300 or less per unit. A present value allowance of \$63 is added to the cost to allow for replacement of up to 50% of sensor elements halfway through the measure life. The square footage thresholds in the table result in cost effectiveness for a 15 year life control measure, based on being less than a discounted payback of 11.8 years.*

*[Note to Reviewers: This public review draft makes proposed independent substantive changes to the previous public review draft. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the previous draft 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 substantive changes.]*

## Addendum b to 90.1-2019

Modify the standard as follows (I-P Units)

### 6.4.3.8 Ventilation Controls for High-Occupancy Areas

Demand control ventilation (DCV) is required for spaces larger the floor area shown in Table 6.4.3.8 based on an occupant outside airflow component in cfm per 1000 square feet and served by systems with one or more of the following:

- a. Air economizer.
- b. Automatic modulating control of outdoor air damper.
- c. Design outdoor airflow greater than 3000 cfm.

#### Exceptions to 6.4.3.8

1. Multiple-zone systems without DDC of individual zones communicating with a central control panel.
2. Spaces where >75% of the space design outdoor airflow is required for makeup air that is exhausted from the space or transfer air that is required for makeup air that is exhausted from other spaces.
3. Spaces with one of the following occupancy categories as defined in ASHRAE Standard 62.1: correctional cells, daycare sickrooms, science labs, barbers, beauty and nail salons, and bowling alley seating.
4. Spaces where the requirements of ASHRAE Standard 170, applicable codes, or applicable accreditation standards do not allow the reduction of outdoor airflow.

**Table 6.4.3.8 Demand Controlled Ventilation (DCV) Floor Area Thresholds**

Climate Zone	Occupant outside air flow component (cfm/1000 square feet) <sup>a</sup>					
	100 to 199	200 to 399	≥400	100 to 199	200 to 399	≥400
	Minimum space floor area in square feet where DCV is required					
	Areas without exhaust air energy recovery			Areas with exhaust air energy recovery <sup>b</sup>		
7, 8	400	200	150	800	400	250
5A, 6A, 6B	600	250	150	1,400	900	400
<del>0A, 0B, 1B, 3A, 4A, 5B, 5C</del>	800	400	250	2,000	1,000	500
2A, 2B, 4C	1,100	600	300	2,300	1,100	600
<del>3B, 4B</del>	<del>1,500</del>	<del>700</del>	<del>400</del>	<del>5,200</del>	<del>2,350</del>	<del>1,250</del>
<del>0A, 1A, 3B, 4B</del>	2,400	1,100	600	5,800	2,600	1,400
3C	7,000	3,000	1,700	12,000	6,000	3,000

<sup>a</sup> Occupant outside airflow component in cfm per 1000 square feet shall be calculated as the product of default occupant density and outdoor airflow rate per occupant ( $R_p$ ) as shown in table 6.2.2.1 of ASHRAE Standard 62.1

<sup>b</sup> Where exhaust air energy recovery is required by ~~ASHRAE Standard 90.1~~ Section 6.5.6.1.

Modify the standard as follows (SI Units)

### 6.4.3.8 Ventilation Controls for High-Occupancy Areas

*Demand control ventilation (DCV)* is required for *spaces* larger the floor area shown in Table 6.4.3.8 based on an occupant outside airflow component in L/s per 100 m<sup>2</sup> and served by *systems* with one or more of the following:

- a. Air economizer.
- b. Automatic modulating control of outdoor air damper.
- c. Design outdoor airflow greater than 1500 L/s.

#### Exceptions to 6.4.3.8

1. Multiple-zone *systems* without *DDC* of individual zones communicating with a central *control* panel.
2. *Spaces* where >75% of the *space* design outdoor airflow is required for *makeup air* that is exhausted from the space or transfer air that is required for *makeup air* that is exhausted from other spaces.
3. *Spaces* with one of the following occupancy categories as defined in ASHRAE Standard 62.1: correctional cells, daycare sickrooms, science labs, barbers, beauty and nail salons, and bowling alley seating.
4. *Spaces* where the requirements of ASHRAE Standard 170, applicable codes, or applicable accreditation standards do not allow the reduction of outdoor airflow.

**Table 6.4.3.8 Demand Controlled Ventilation (DCV) Floor Area Thresholds**

Climate Zone	Occupant outside air flow component ((L/s)/100 square meters) <sup>a</sup>					
	50 to 99	100 to 199	≥200	50 to 99	100 to 199	≥200
	Minimum space floor area in square meters where DCV is required					
	Areas without exhaust air energy recovery			Areas with exhaust air energy recovery <sup>b</sup>		
7, 8	40	20	15	80	40	25
5A, 6A, 6B	60	25	15	140	90	40
<u>0A, 0B, 1B, 3A, 4A, 5B, 5C</u>	80	40	25	200	100	50
2A, 2B, 4C	110	60	30	230	110	60
<u>3B, 4B</u>	<u>150</u>	<u>70</u>	<u>40</u>	<u>520</u>	<u>235</u>	<u>125</u>
<del>0A, 1A, 3B, 4B</del>	240	110	60	580	260	140
3C	700	300	170	1,200	600	300

<sup>a</sup> Occupant outside airflow component in L/s per 100 square meters shall be calculated as the product of default occupant density and outdoor airflow rate per occupant ( $R_p$ ) as shown in table 6.2.2.1 of ASHRAE Standard 62.1

<sup>b</sup> Where exhaust air energy recovery is required by ~~ASHRAE Standard 90.1~~ Section 6.5.6.1.