



# ADDENDA

**ANSI/ASHRAE Addendum e to  
ANSI/ASHRAE Standard 161-2018**

# Air Quality within Commercial Aircraft

Approved by the ASHRAE Standards Committee on June 22, 2019; by the ASHRAE Technology Council on June 26, 2019; and by the American National Standards Institute on June 27, 2019.

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**ASHRAE Standing Standard Project Committee 161**  
**Cognizant TC: 9.3 (Lead), Transportation Air Conditioning and**  
**4.3 (Co-Cognizant), Ventilation Requirements and Infiltration**  
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## FOREWORD

*Addendum e tempers the statement in Section A4.8, "Bacteria and Viruses," regarding whether HEPA filters remove bacteria and viruses.*

**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 e to Standard 161-2018

*Revise Section A4.8 in Informative Appendix A as shown. The remainder of Appendix A is unchanged.*

**A4.8 Bacteria and Viruses.** Aircraft air distribution system design is intended to minimize the spread of people-generated contaminants, including bacteria and viruses, by minimizing the airflow in the fore and aft directions, while providing ventilation to the airplane occupants. In addition, high-efficiency particulate air filters (HEPA) on the recirculated air component are standard on most large, new production aircraft but are uncommon on the regional fleet. These filters ~~are designed to~~ may remove bacteria and viruses. Aircraft occu-

pants may be infected by several routes of transmission: proximity, including direct contact (contact with an infected person) and indirect contact (touching an infected surface such as a cup or lavatory door handle and then touching one's mouth or eyes); exposure to aerosols due to proximity (aerosols generated by an infected person that land within a short distance); and, potentially, exposure to smaller airborne particles that are affected by airflow patterns in the cabin. The relative contributions of these transmission routes within the aircraft have not yet been quantified, but an important transmission route is believed to be close proximity. Other variables include pathogen type (i.e., clinically relevant dose) and individual susceptibility to infection. For both routes, the exposure potential, and therefore the risk of infection, will increase relative to the duration of the flight. For the contact route, regular hand washing and avoidance of touching one's face is expected to reduce the risk of infection. For the airborne route, the residency time of infectious agents in the passenger cabin air will be influenced by the total ventilation rate. That is, the greater the per-person total ventilation rate, the shorter the residency time, everything else being the same. Properly installed and maintained HEPA filters are designed to be effective at removing small particulate in the size range of single viruses and clusters and bacteria, which makes the total ventilation flow effective for dilution of particulates. Seating configuration and occupant activity will affect the degree of overlap between occupants' microenvironments. The relative contributions from contact with infected surfaces and airborne exposure should be assessed by a cognizant health organization.



## **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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