ADDENDA

ASHRAE Addendum a to
ASHRAE Guideline 28-2012

Air Quality within Commercial Aircraft

Approved by the ASHRAE Standards Committee on January 18, 2014, and by the ASHRAE Board of Directors on January 22, 2014.

These addenda were approved by a Standing Guideline Project Committee (SGPC) 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 guideline. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Manager of Standards.

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SPECIAL NOTE

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ASHRAE Guidelines are prepared by project committees appointed specifically for the purpose of writing Guidelines. 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 Guideline.

Development of ASHRAE Guidelines follows procedures similar to those for ASHRAE Standards except that (a) committee balance is desired but not required, (b) an effort is made to achieve consensus but consensus is not required, (c) Guidelines are not appealable, and (d) Guidelines are not submitted to ANSI for approval.

The Manager of Standards of ASHRAE should be contacted for:

a. interpretation of the contents of this Guideline,
b. participation in the next review of the Guideline,
c. offering constructive criticism for improving the Guideline, or
d. permission to reprint portions of the Guideline.

(This foreword is not part of this guideline. It is merely informative.)

FOREWORD

This addendum provides a brief description of the use of flame retardants in the passenger cabin, as well as a short summary of some flame retardant exposure data collected on aircraft and a list of references for the user to review some of the related health hazard literature. This addendum represents a new stand-alone section intended for Guideline 28-2012.

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 a to Guideline 28-2012

Add a new Section 8.1.2.14 as follows.

8.1.2.14 Flame Retardants. Halogenated flame retardants, such as polybrominated diphenyl ethers (PBDEs) and chlorinated tris (TDCPP), are organobromine and organochlorine compounds, widely used as flame retardants in foams, fabrics, carpets, electronics, molded plastics, and resins. They are used in residential and occupational environments, as well as in transportation vehicles, including aircraft. Flame retardant compounds can be released from treated compounds during the product's life cycle.

Many halogenated flame retardants are known to bioaccumulate. Published studies have identified them as disrupting hormones, interfering with reproduction and thyroid function and impairing the development of the nervous system (Chevrier 2010; Harley 2010; Herbstman 2010; Schreiber 2010; Darenud 2008; Herbstman 2008; Turyk 2008; Chao et al. 2007; Costa et al. 2007; Main et al. 2007; Hardell 2006). In 2009, the Environmental Protection Agency committed to summarize PBDE exposure hazards and outline the health risks and specific actions (EPA 2009).

Concentrations of flame retardants in the aircraft cabin air have yet to be adequately quantified. To date, only two small exploratory studies have investigated potential PBDE exposure in aircraft cabins, and none have investigated exposure to other types of flame retardants, such as, for example, TDCPP. One of these exploratory studies reported the presence of PBDEs in aircraft cabin dust (Christiansson 2008). That study also identified a small increase in the PBDE serum level of nine passengers after a round trip flight, although this increase cannot necessarily be attributed to exposure in the aircraft because of the opportunity of those passengers to have been exposed to nonaircraft sources between flights. In contrast, blood serum analyses of two frequent flyers did not show elevated PBDE levels as compared to the general population. The second study (Schecter 2010) measured some PBDEs in the blood of nine flight attendants and one pilot. The authors reported that PBDE blood levels of the subjects were comparable to those of the general public, although the presence of other flame retardants was not investigated.

Aircraft and interiors must meet regulatory standards intended to prevent the spread of fire on aircraft. The FAA has issued a performance standard for cabin materials that an ignited source must self-extinguish per requirements of 14 CFR Part 25 Appendix F, but it neither prescribes nor proscribes the use of any particular fire retardant.

Add the following references to Section 9.

9. REFERENCES

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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.