

# ASHRAE Research: Improving the Quality of Life

The American Society of Heating, Refrigerating and Air-Conditioning Engineers is the world's foremost technical society in the fields of heating, ventilation, air conditioning, and refrigeration. Its members worldwide are individuals who share ideas, identify needs, support research, and write the industry's standards for testing and practice. The result is that engineers are better able to keep indoor environments safe and productive while protecting and preserving the outdoors for generations to come.

One of the ways that ASHRAE supports its members' and industry's need for information is through ASHRAE Research. Thousands of individuals and companies support ASHRAE Research

annually, enabling ASHRAE to report new data about material properties and building physics and to promote the application of innovative technologies.

The chapters in ASHRAE Handbooks are updated through the experience of members of ASHRAE technical committees and through results of ASHRAE Research reported at ASHRAE meetings and published in ASHRAE special publications and in *ASHRAE Transactions*.

For information about ASHRAE Research or to become a member, contact ASHRAE, 1791 Tullie Circle, Atlanta, GA 30329; telephone: 404-636-8400; [www.ashrae.org](http://www.ashrae.org).

## The 2003 *ASHRAE Handbook*

The 2003 *ASHRAE Handbook—HVAC Applications* contains chapters on a broad range of applications, written to help design engineers use equipment and systems described in other Handbook volumes. This edition includes two new chapters, Chapter 8, Justice Facilities, and Chapter 55, Electrical Considerations. Nearly every Applications chapter has been revised for current requirements and techniques. The ASHRAE technical committees that prepare chapters have provided new information, clarified existing information, deleted obsolete material, and reorganized chapters to make the Handbook more understandable and easier to use. Some of the revisions are as follows:

- Chapter 7, Health Care Facilities, contains extensive updates to HVAC requirements for hospitals, including new temperature and humidity design guidelines for various facility areas.
- Chapter 8, Justice Facilities, is a new chapter with information on related terminology, requirements, and design considerations for these facilities.
- Chapter 14, Laboratories, has new data on biological safety cabinets and scale-up laboratories, and research updates on exhaust stack location and caging system ventilation.
- Chapter 21, Museums, Libraries, and Archives, rewritten, contains more information on pollutant sources, indoor air quality, and threats to artifacts.
- Chapter 26, Nuclear Facilities, has updates for regulatory requirements plus added information on international reactor designs and standards, cascade ventilation, heavy water reactors, and gas-cooled reactor HVAC systems.
- Chapter 27, Mine Air Conditioning and Ventilation, updated for current practice, has expanded text on ventilation system design, health and safety, and new examples, including one using the factor-of-merit method for designing direct-contact heat exchangers.
- Chapter 29, Ventilation of the Industrial Environment, has been completely rewritten for clarity and ease of use.
- Chapter 30, Industrial Local Exhaust Systems, has been extensively revised and refocused for ease of use.
- Chapter 31, Kitchen Ventilation, has new cooking emission and hood flow rate information, plus schlieren photographs of hood tests showing actual containment and spillage.
- Chapter 32, Geothermal Energy, updated for new research, has expanded text on ground-source heat pumps, covering site characterization, thermal testing, load calculations, borehole options, design strategy, water quality, well pump control, and horizontal closed-loop systems.
- Chapter 34, Thermal Storage, contains updates for research, operation and control, and combustion turbine inlet air cooling in storage applications.
- Chapter 35, Energy Use and Management, retitled and rewritten, also has updated DOE energy consumption data.

- Chapter 36, Owning and Operating Costs, contains new service life considerations, energy cost analysis resources, and updates for deregulation issues and ASHRAE research.
- Chapter 37, Testing, Adjusting, and Balancing, has a rewritten hydronic balancing section, and updated text on instrumentation and sound and vibration testing.
- Chapter 38, Operation and Maintenance Management, substantially revised, has a new section on results-oriented maintenance management.
- Chapter 39, Computer Applications, has new and revised information on hardware, development tools, networking, the Internet, web sites, and application software and utilities for HVAC design tasks, simulation, business management, and monitoring and control.
- Chapter 42, New Building Commissioning, rewritten and expanded, has more information on commissioning at every stage, from owner project requirement development through occupancy and operation.
- Chapter 44, Building Air Intake and Exhaust Design, has updates from ASHRAE research, covering dilution equations, stack height estimating, air intake design, and the dilution effects of architectural screens.
- Chapter 47, Sound and Vibration Control, updated for current technology and standards, also has new sections on emergency generators and plumbing system noise.
- Chapter 50, Snow Melting and Freeze Protection, retitled, now covers freeze protection systems, and has updates from ASHRAE research on transient analysis of snow-melting performance.
- Chapter 55, Electrical Considerations, a new chapter on building electrical issues for HVAC equipment, has sections on electrical principles, codes, performance, safety, power quality, motor-starting effects, and rates.

This Handbook is published both as a bound print volume and in electronic format on a CD-ROM. It is available in two editions: one using inch-pound (I-P) units of measurement, the other using the International System of Units (SI).

Corrections to the 2000, 2001, and 2002 Handbooks are posted on the ASHRAE web site at <http://www.ashrae.org>. Corrections for this volume will be reported in the 2004 *ASHRAE Handbook—HVAC Systems and Equipment* and on the ASHRAE web site.

To make suggestions for improving a chapter or for information on how you can help revise a chapter, please comment using a form on the ASHRAE web site; or e-mail [mowen@ashrae.org](mailto:mowen@ashrae.org); or write to Handbook Editor, ASHRAE, 1791 Tullie Circle, Atlanta, GA 30329; or fax 404-321-5478.

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