

# 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 the need for and support research, and write the industry's standards for testing and practice. The result of these efforts 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 2000 ASHRAE Handbook

The 2000 *ASHRAE Handbook—HVAC Systems and Equipment* describes both the combinations of equipment and the components or assemblies that perform a particular function either individually or in combination. The information helps the system designer select and operate equipment, although it does not describe how to design components.

Major topic areas include

- Air-conditioning and heating systems
- Air-handling equipment
- Heating equipment
- General HVAC components
- Unitary equipment

Most of the chapters in this Handbook update material in the 1996 *ASHRAE Handbook* to reflect current technology. The following chapters contain major revisions or new material.

- Chapters 1 through 5 are reorganized and tightened for clarity. Chapter 2, Building Air Distribution, contains expanded coverage on VAV systems, including more information on terminal units. Chapter 4, Central Cooling and Heating, is a new chapter that introduces central plant equipment and options.
- Chapter 7, Cogeneration Systems and Engine and Turbine Drives, has more information on combustion turbine inlet air cooling as well as updates for other sections.
- Chapter 9, Design of Small Forced-Air Heating and Cooling Systems, includes revised duct fitting data and new information on duct efficiency testing. In addition, information on system performance from Chapter 28, Furnaces, was moved to this chapter and clarified and updated to be consistent with emerging duct efficiency technology.
- Chapter 11, District Heating and Cooling, includes new information on the effect of moisture on underground pipe insulation, calculation of undisturbed soil temperatures, cathodic protection of direct buried conduits, and leak detection. Also, the information on consumer interconnections and metering is expanded.
- Chapter 13, Condenser Water Systems, has additional information on water hammer, freeze protection, water treatment, overpressure, and free cooling.
- Chapter 16, Duct Construction, refers to new flexible duct, fiber reinforced plastic duct, acoustical rating of duct liner, and blanket duct insulation standards.
- Chapter 19, Evaporative Air Cooling Equipment, contains more information on humidification and dehumidification.
- Chapter 22, Desiccant Dehumidification and Pressure Drying Equipment, has been expanded, particularly the section on liquid desiccant systems.

- Chapter 23, Air-Heating Coils, provides a broader scope of the types of heating coils and their selection and application.
- Chapter 24, Air Cleaners for Particulate Contaminants, discusses the new ASHRAE *Standard* 52.2 for testing of air-cleaning devices and includes new sections on residential air cleaners and bioaerosols.
- Chapter 25, Industrial Gas Cleaning and Air Pollution Control, received a substantial update and includes revised information on electrostatic precipitators and fabric filters.
- Chapter 26, Automatic Fuel-Burning Equipment, is updated and now discusses low oxides of nitrogen emission from oil-fired equipment.
- Chapter 27, Boilers, includes new information on increasing boiler efficiency and on wall hung boilers for residential use.
- Chapter 36, Cooling Towers, has more information about (1) a combined flow coil/fill evaporative cooling tower, (2) precautions about using variable frequency drives, and (3) the increased use and acceptance of thermal performance certification.
- Chapter 40, Motors, Motor Controls, and Variable-Speed Drives, includes a significant new section on variable-speed drives.
- Chapter 43, Heat Exchangers, is a new chapter that provides an overview of the topic.
- Chapter 44, Air-to-Air Energy Recovery, contains new information on ideal air-to-air energy exchange, rating of performance, comparison of devices, and twin tower enthalpy recovery loops.
- Chapter 46, Room Air Conditioners, Packaged Terminal Air Conditioners, and Dehumidifiers, combines information from two previous chapters.
- Chapter 47, Engine-Driven Heating and Cooling Equipment, is a new chapter that includes information on engine-driven chillers, air conditioners, heat pumps, and refrigeration equipment. The chapter also includes and updates information from an old chapter on unitary heat pumps.

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 contains inch-pound (I-P) units of measurement, and the other contains the International System of Units (SI).

Look for corrections to the 1997, 1998, and 1999 Handbooks on the Internet at <http://www.ashrae.org>. Any changes in this volume will be reported in the 2001 *ASHRAE Handbook* and on the ASHRAE web site.

If you have suggestions for improving a chapter or you would like more information on how you can help revise a chapter, e-mail [ashrae@ashrae.org](mailto:ashrae@ashrae.org); write to Handbook Editor, ASHRAE, 1791 Tullie Circle, Atlanta, GA 30329; or fax 404-321-5478.

Robert A. Parsons, ASHRAE Handbook Editor