

Jan F. Kreider et al. "Introduction to the Buildings Sector"
Handbook of Heating, Ventilation, and Air Conditioning
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Handbook of HEATING, VENTILATION, and AIR CONDITIONING

**Edited by
Jan F. Kreider, Ph.D., P.E.**



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Dedication

To the HVAC engineers of the 21st century who will set new standards for efficient and sophisticated design of our buildings.

Preface

During the past 20 years, design and operation of the comfort systems for buildings have been transformed because of energy conservation imperatives, the use of computer-based design aids, and major advances in intelligent management systems for buildings. In the 1970s, rules of thumb were widely used by designers. Today, a strong analytical basis for the design synthesis process is standard procedure. This handbook describes the latest methods for design and operation of new and existing buildings. In addition, the principles of life cycle economics are used routinely in design selections and tradeoffs. The information in this handbook is presented in a practical way that building systems engineers will find useful.

The book is divided into eight sections:

1. Introduction to the buildings sector
2. Fundamentals
3. Economic aspects of buildings
4. HVAC equipment and systems
5. Controls
6. HVAC design calculations
7. Operation and maintenance
8. Appendices

Because of ongoing and rapid change in the HVAC industry, new material will be developed prior to the standard handbook revision cycle. By link to the CRC Web site, the author will be periodically posting new material that owners of the handbook can access.

Jan F. Kreider, Ph.D., P.E.
Boulder, Colorado

Editor



Photo by: Renée Azerbegi

Jan F. Kreider, Ph.D., P.E. is Professor of Engineering and Founding Director of the University of Colorado's (CU) Joint Center for Energy Management. He is co-founder of the Building Systems Program at CU and has written ten books on building systems, alternative energy, and other energy related topics, in addition to more than 200 technical papers. For ten years he was a technical editor of the ASME Transactions.

During the past decade Dr. Kreider has directed more than \$10,000,000 in energy-related research and development. His work on thermal analysis of buildings, building performance monitoring, building diagnostics, and renewable energy-research is known all over the world. Among his major accomplishments with his colleagues are the first applications of neural networks to building control, energy management and systems identification, and of applied artificial intelligence approaches for building design and operation. He also has worked for many years to involve women in the graduate program that he founded. More than 20 women have graduated with advanced degrees in his program.

Dr. Kreider has assisted governments and universities worldwide in establishing renewable energy and energy efficiency programs and projects since the 1970s. He is a fellow of the American Society of Mechanical Engineers and a registered professional engineer and member of several honorary and professional societies. Dr. Kreider recently received ASHRAE's E.K. Campbell Award of Merit and the Distinguished Engineering Alumnus Award, the College's highest honor.

Dr. Kreider earned his B.S. degree (magna cum laude) from Case Institute of Technology, and his M.S. and Ph.D. degrees in engineering from the University of Colorado. He was employed by General Motors for several years in the design and testing of automotive heating and air conditioning systems.

Contributors

Anthony F. Armor
Electric Power Research Institute
Palo Alto, California

Peter Armstrong
Pacific Northwest National
Laboratory
Richland, Washington

James B. Bradford
Schiller Associates, Inc.
Boulder, Colorado

Michael R. Brambley
Pacific Northwest National
Laboratory
Richland, Washington

James Braun
Dept. of Mechanical Engineering
Purdue University
West Lafayette, Indiana

John A. Bryant
Dept. of Construction
Texas A&M University
College Station, Texas

David E. Claridge
Dept. of Mechanical Engineering
Texas A&M University
College Station, Texas

Peter S. Curtiss
Kreider & Associates, LLC
Boulder, Colorado

Ellen M. Franconi
Schiller Associates, Inc.
Boulder, Colorado

Jeffrey S. Haberl
Dept. of Architecture
Texas A&M University
College Station, Texas

Vahab Hassani
Thermal Systems Branch
National Renewable Energy
Laboratory
Golden, Colorado

Steve Hauser
Pacific Northwest National
Laboratory
Richland, Washington

Joe Huang
Lawrence Berkeley Laboratory
Berkeley, California

David Jump
Lawrence Berkeley Laboratory
Berkeley, California

Srinivas Katipamula
Pacific Northwest National
Laboratory
Richland, Washington

Michael Kintner-Meyer
Pacific Northwest National
Laboratory
Richland, Washington

Moncef Krarti
CEAE Department
University of Colorado
Boulder, Colorado

Jan F. Kreider
Kreider & Associates, LLC
Boulder, Colorado

Mingsheng Liu
College of Engineering
University of Nebraska
Lincoln, Nebraska

Paul Norton
National Renewable Energy
Laboratory
Golden, Colorado

Dennis L. O'Neal
Dept. of Mechanical Engineering
Texas A&M University
College Station, Texas

Robert G. Pratt
Pacific Northwest National
Laboratory
Richland, Washington

Ari Rabl
École des Mines de Paris and
University of Colorado
Boulder, Colorado

T. Agami Reddy
Civil and Architectural Engineering
Drexel University
Philadelphia, Pennsylvania

Max Sherman
Lawrence Berkeley Laboratory
Berkeley, California

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