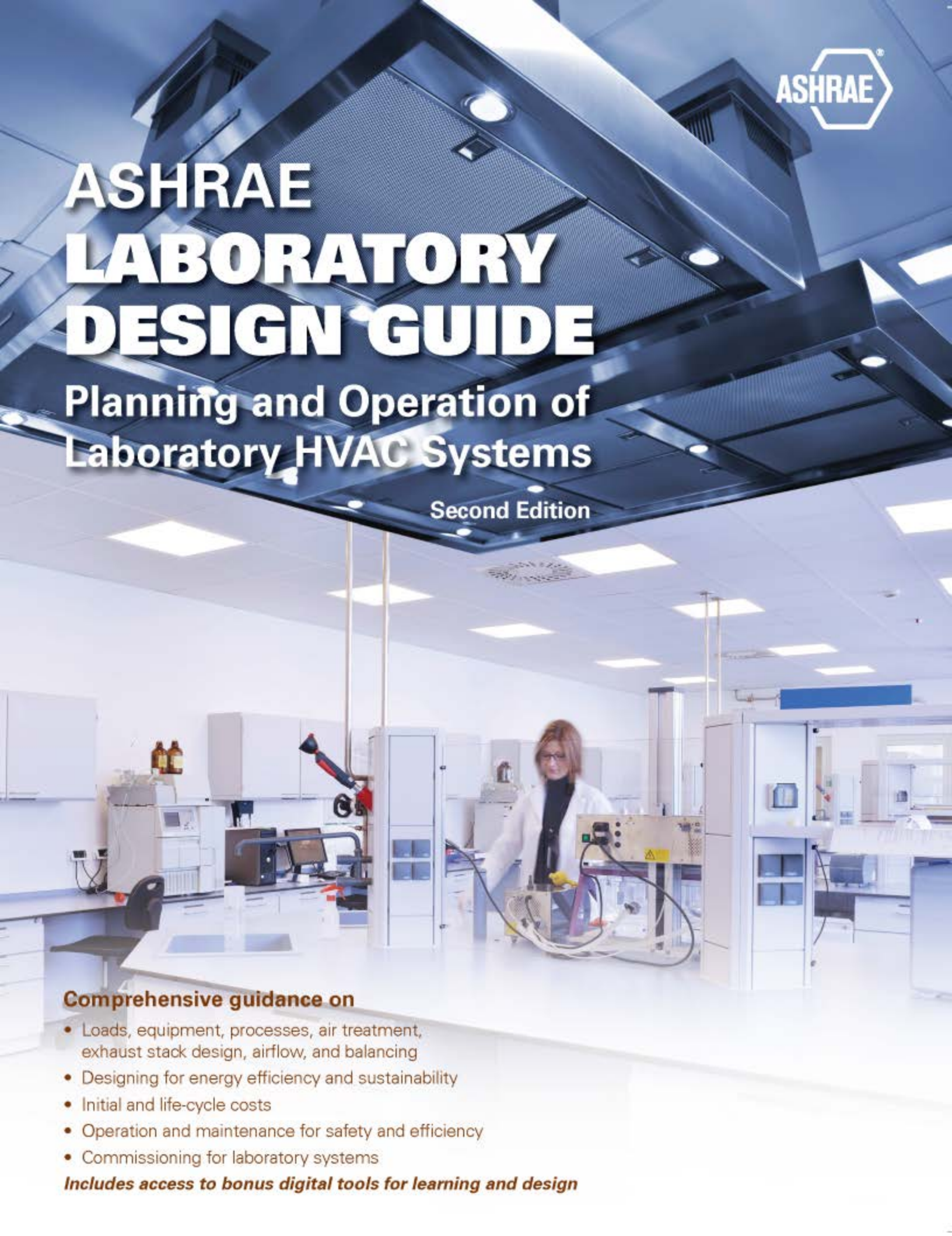


# ASHRAE LABORATORY DESIGN GUIDE

## Planning and Operation of Laboratory HVAC Systems

Second Edition

**Comprehensive guidance on**

- Loads, equipment, processes, air treatment, exhaust stack design, airflow, and balancing
- Designing for energy efficiency and sustainability
- Initial and life-cycle costs
- Operation and maintenance for safety and efficiency
- Commissioning for laboratory systems

***Includes access to bonus digital tools for learning and design***

# ASHRAE Laboratory Design Guide

Second Edition

This publication was prepared under the auspices of
TC 9.10, Laboratory Systems.

Updates/errata for this publication
will be posted on the ASHRAE website at
www.ashrae.org/publicationupdates.

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## Planning and Operation of Laboratory HVAC Systems

**Second Edition**




Peachtree Corners

ISBN 978-1-936504-98-5

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Peachtree Corners, GA 30092
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Cover design by Laura Haass

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Library of Congress Cataloging-in-Publication Data

ASHRAE laboratory design guide : planning and operation of laboratory HVAC systems. -- Second edition.
pages cm
Revised edition of: ASHRAE laboratory design guide / Ian B.D. McIntosh, Chad B. Dorgan, Charles E. Dorgan. 2001.
Includes bibliographical references and index.
Summary: "Reference manual for planning, design, and operation of laboratory HVAC systems to reduce the laboratory's energy footprint while ensuring safety, providing good comfort and indoor air quality, and protecting the integrity of experiments; includes online access to electronic design tools that illustrate features of laboratories and provide practical design aids"-- Provided by publisher.
ISBN 978-1-936504-98-5 (softcover : alk. paper) 1. Laboratories--Design and construction. 2. Laboratories--Safety measures. 3. Laboratories--Energy conservation. 4. Buildings--Environmental engineering. I. American Society of Heating, Refrigerating and Air-Conditioning Engineers.
TH7688.L3M35 2015
697.9--dc23
2015016133

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ASHRAE Laboratory Design Guide: Planning and Operation of Laboratory HVAC Systems is accompanied by supplemental material, which can be found online.

# Preface

*ASHRAE Laboratory Design Guide: Planning and Operation of Laboratory HVAC Systems* is a significant revision of the first edition of the design guide, which was published in 2001. It is intended that the information in this Guide assist engineers, owners, and system operators in determining the needs of their laboratory facility and how to best match these needs to mechanical system options.

This Guide is written in a manner that progresses from general to specific to reach a wide target audience of designers, architects, engineers, owners, operation and maintenance personnel, and others in the heating, ventilating, air-conditioning, and refrigerating (HVAC&R) industry. The first chapters of the Guide present general background information and prescribed design frameworks, whereas the later chapters are more specific, providing detailed design and application information. A primary benefit of this structure is that many types of readers can use the Guide. Whereas an owner may only read the first two chapters, an engineer may focus on the design chapters.

This new edition has been updated to reflect current standards and industry practices. Web links to these standards and to additional laboratory-related resources have been expanded. Many of the chapters have been significantly revised or rewritten.

This edition also contains two new chapters, one that covers sustainability and one that covers computer modeling of ventilation effectiveness.

It is hoped that this revised edition of the Guide will be even more useful to the laboratory designer, owner and operator, and anyone else involved in the design, construction, and operation of laboratories.

# Acknowledgments

This Design Guide is the product of many members of Technical Committee (TC) 9.10, Laboratory Systems, as well as others in the laboratory and HVAC community.

Special thanks go to the chapter leaders and contributors:

- Pete Gardner was the leader and a contributor for Chapters 2 and 7.
- John Varley and Erik Eaves were the leaders and contributors to the revision of Chapter 3.
- John Castelvecchi was the leader for the significantly revised Chapter 5. In addition to John, George Sestak, Kurt Rindoks, and Bill Peters also were contributors to this chapter. John also was the leader for Chapter 11, which is a totally rewritten and expanded chapter. In addition to John, Jim Coogan and Gordon Sharp were contributors. John also was the leader and a contributor for Chapter 14.
- Carl Crow was the leader and a contributor to Chapter 6.
- Charles Henck was the leader and a contributor for Chapter 8.
- Brad Cochran was the leader and a contributor for Chapter 9.
- Roland Charneux was the leader and a contributor for Chapters 10 and 18. He authored Chapter 18, which is a new chapter to the Design Guide, with John Varley as a contributor.
- Mike Ratcliff was the leader and primary author for Chapter 17, which is a new chapter. Gordon Sharp and Bob Weidner were also contributors.
- As the leader and a contributor for Chapters 1, 4, 12, 13, 15, and the totally rewritten Chapter 16, I worked with Carl Crow as a major contributor to Chapter 1, with John Varley on Chapter 4, with Tom Smith and Jeff Traylor on Chapter 13, and with Chris Kiley, David Duthu, and Carl Crow as major contributors to Chapter 16.

Also, much thanks goes to the chapter reviewers, who in most cases reviewed multiple chapters and whose comments have greatly improved this edition of the Design Guide: Mike Brueggeroff, Hwakong Cheng, Bob Cochran, Jim Coogan, Carl Crow, Brent Eubanks, Mary Foutz, Dan Frasier, Pete Gardner, Kevin Gilkison, Traci Hanegan, Nathan Ho, Mark Hydeman, Chris Kiley, Ken Kuntz, Guy Perreault, Mike Ratcliff, David Rausch, Scott Rusk, George Sestak, Gordon Sharp, Tom Smith, John Varley, Mike Walsh, Bob Weidner, Ron Wendorski, and myself.