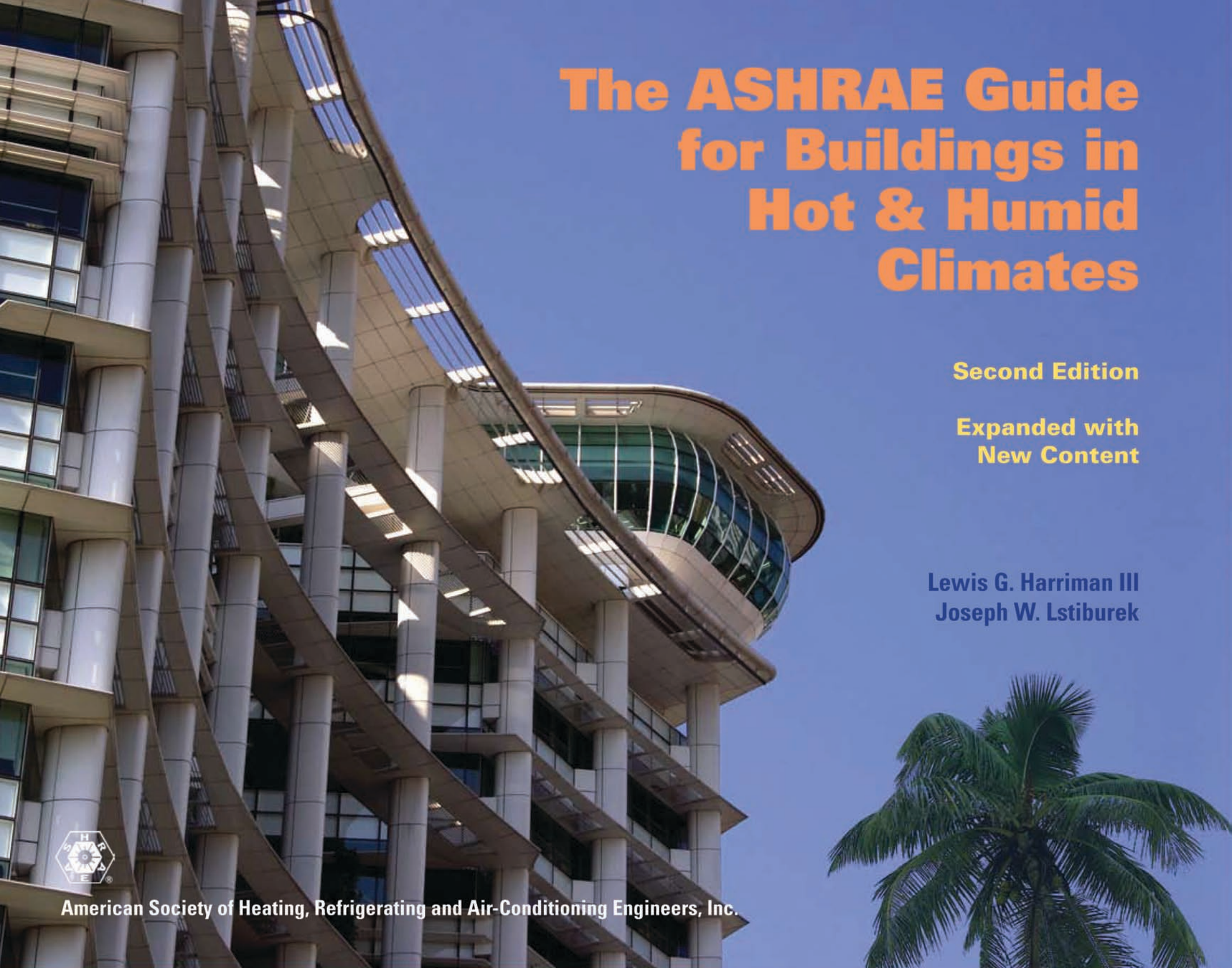


The ASHRAE Guide for Buildings in Hot & Humid Climates

Second Edition

Expanded with New Content

Lewis G. Harriman III
Joseph W. Lstiburek

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

The ASHRAE Guide for Buildings in Hot and Humid Climates

Expanded 2nd Edition

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The ASHRAE Guide for Buildings in Hot and Humid Climates

Major Sections & Chapter Titles

Common Issues

1. Introduction
2. Improving Thermal Comfort
3. Managing Ventilation Air
4. Reducing Energy Consumption
5. Avoiding Bugs, Mold & Rot
6. Improving Sustainability

Enclosure Design

7. The Components of a Perfect Wall
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III. I-P to SI Conversion Factors
IV. Dew Point and Humidity Ratio Tables
V. Psychrometric Charts (I-P and SI)

Preface To The 2nd Edition

The first edition of this book contained a subset of the information we provide here. It dealt with the broad, cross-cutting issues of thermal comfort, ventilation air, energy consumption and mold. In this 2nd edition, the book has expanded from 100 to over 300 pages.

As the book expanded, it became apparent that although experts often agree about general principles, digging into the details sometimes generates passionate debate. Strongly-held opinions based on decades of the different experiences of our expert advisors made writing this second edition quite a challenge.

So it's useful to keep in mind that the suggestions presented in this book include a broad range of opinions and judgements. It is quite possible—even probable—that there will be different opinions between experts about any single suggestion. But the authors trust and expect that taken as a whole, the information provided here will be helpful when making the key decisions about design and operation of buildings in hot and humid climates.

Above all, what we have tried to achieve is a clear and engaging presentation of the critical issues. Most experts will probably agree that as long as the key issues are given some attention, more often than not the building will be quite successful. It's when the decision makers are simply *not aware* of the issues that the real problems occur.

For example, it's not obvious to most architectural designers that the design of a building's glazing will govern the comfort of the occupants, the cost of its HVAC system and the building's energy use for all time. Nor is it obvious to HVAC designers that sealing up the connections in exhaust duct work will greatly reduce the risk of mold. But when the *entire team is aware* of the importance of glass design, the importance of overhanging the roof and importance of sealed duct connections, the decisions the team makes on behalf of the owner are likely to be better. Then we will have achieved the purpose of this book: to improve buildings in hot and humid climates for the benefit of their owners, for their occupants and for society as a whole.

Acknowledgments

This book was prompted by the long-standing sustainability concerns of Terry Townsend, P.E., President of ASHRAE during 2006 and 2007. Based on his concern that without ASHRAE guidance, hot and humid climate design practices may not be as sustainable as what will be needed by future generations, President Townsend asked the ASHRAE Board to approve this special project.

This expanded second edition has been made possible by the technical and financial support of: the Office of Building Technologies of the U.S. Department of Energy; the Commercial Systems Division of Munters Corporation in San Antonio, Texas; the Services Division of the Southern Companies in Birmingham, Alabama and Venmar CES Inc. in St-Léonard-d'Aston, Quebec. On behalf of the Project Committee and of the future readership of this book, we express our great appreciation for the support of these generous sponsors, without whom this second edition could not exist.

Dedication

We also appreciate the support of the many donors of the technical material, photos, diagrams and field experiences which enrich and enliven this book. General principles, while useful, are much easier to understand, to remember and to apply when their relevance is made clear through real-world experience and examples. We are very grateful for those experiences, and for the enormous amount of time volunteered by our reviewers and by our Project Monitoring Committee to help improve the text. Wherever the book is clear, accurate and useful, it is largely because of the contributions and the oversight of these generous experts. To them, we dedicate this second edition.



Lew Harriman
Portsmouth, NH
January, 2009

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Chapter 1
Introduction

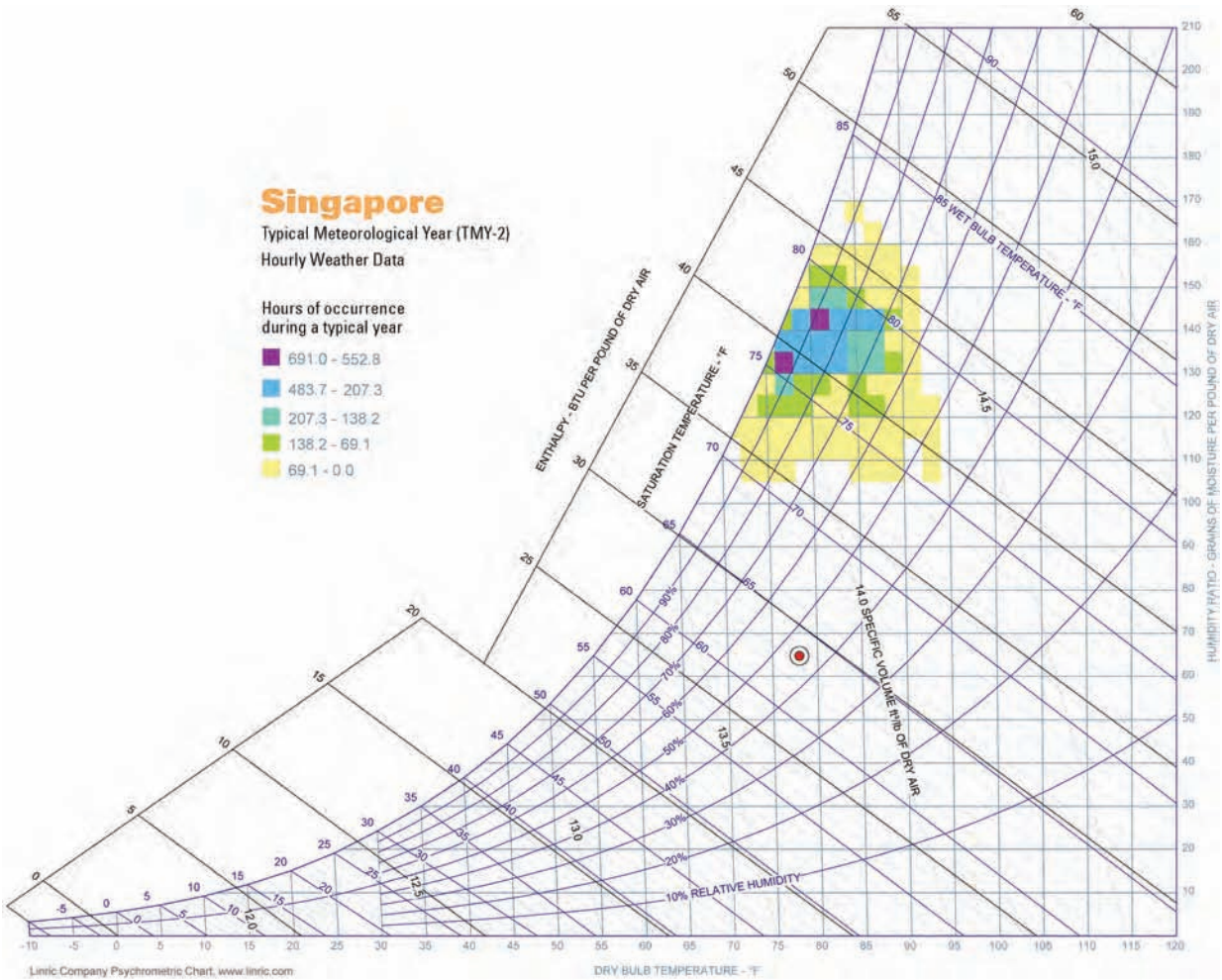


Fig. 1.1 Hot & Humid Climates

*In mixed climates like Chicago's, there are certainly many hours each summer when the weather is both hot and humid. But in Singapore, **all** the hours are **very** humid, and most of the hours are also hotter than the indoor temperature.*

*The adjectives "hot" and "humid" suggest the principal challenges addressed by this book. Namely, how to keep heat and humidity **out** of a building.*

