

Preface

The global utilization of the various carbon-based energy resources is increasing as the population increases, urbanization increases, and standard of living improves. This increase of energy utilization is resulting in emission of greenhouse gases and in delicate global energy politics. The building sector is one of the primary consumers of energy sources to provide for the differing energy needs of buildings for their occupants.

The maintenance of a comfortable and healthy indoor environment is one of the main consumers of a building's energy. In a temperate climate, the maintenance of a comfortable indoor environment is very important, particularly during the cold winter season. In a subtemperate climate, the application during both winter and summer seasons is important for providing a thermally comfortable indoor environment. In hot and humid climates such as in the tropics, providing cool, low-humidity indoor air is very important.

A heating, ventilating, and air-conditioning (HVAC) system is needed to provide the required comfortable indoor thermal environment and air quality. This system controls the air temperature by cooling the air during the hot season and heating it during the cold season. The system reduces the air humidity content by cooling the air below the dew point. In addition, the introduction of filtered outdoor air provides for the required air quality and minimizes the buildup of indoor pollutants. The desiccant heating, ventilating, and air-conditioning (DHVAC) system is an alternative that can provide the needed comfortable indoor thermal environment and the required indoor air quality.

The progress of the DHVAC system recently has been rapid as shown in several scientific and engineering papers published annually. Installations in both demonstration and actual buildings in temperate and subtemperate climates and in hot and humid climates such as in tropical regions have been carried out using DHVAC. Experts from around the world were invited to contribute to this book covering fundamental aspects, recent research and development, and actual installation and applications. The editors are grateful for the support of well-known and very busy experts in the field for their contributions to the chapters of this book.

The editors are also thankful to Springer for publishing this book as one of the main contributions to the progress and advancement of DHVAC systems.

The book editors, the chapter contributors, and the publisher are hopeful that as a result of this volume, more fundamental research work, novel design, and practical engineering can be developed further by scientists, researchers, engineers, and graduate students for a more comfortable indoor thermal environment and higher quality indoor air in the most energy-efficient way. We believe this can be accomplished by the practical application of the DHVAC system along with the utilization of available alternative energy sources.

Tsukuba, Japan
Reading, UK
Sendai, Japan

Napoleon Enteria
Hazim Awbi
Hiroshi Yoshino

Desiccant Heating, Ventilating, and Air-Conditioning
Systems

Enteria, N.; Awbi, H.; Yoshino, H. (Eds.)

2017, X, 326 p. 181 illus., 138 illus. in color., Hardcover

ISBN: 978-981-10-3046-8