Preface

In the distant past, construction solutions were validated empirically through several years of experience, whereas with the onset of further industrialization of the construction process, it was recognized within the construction community that a performance-based selection of materials, components, and systems was required if innovation was to be fostered and progress in the construction domain achieved. However, it was equally apparent to those promoting such novel approaches that the selection on the basis of understanding of performance requirements could only be met if the results of research and development were made available and indeed exploitable by practitioners.

Building pathologies originated by moisture are frequently responsible for the degradation of building materials or components and can affect users' health, comfort, and durability. The solutions for treating moisture-related pathologies are complex and, many times, of difficult implementation. Several of these pathologies are due to innovative techniques and materials combined with new details and predicted performance. The knowledge of the physical processes that define hygrothermal behavior allows for the prediction of a building response to climatic solicitation and for the selection of envelope solutions that will lead to required feasibility.

Rehabilitation is a strategic area that is concerned not only with historic buildings, but also with other buildings that have been in use for some time and need to be adapted to the demands of the present. The following areas should also be considered: rehabilitation and hygrothermal performance of buildings, diagnosis, measurements in-field and in laboratory, hygrothermal advanced simulation, energy efficiency, risk analysis, and technology.

The main purpose of this book, *Hygrothermal Behavior, Building Pathology and Durability*, is to provide a collection of recent research works to contribute to the systematization and dissemination of knowledge related to construction pathology, hygrothermal behaviour of buildings, numerical simulation and durability, and, simultaneously, to show the most recent advances in this domain. It includes a set of new developments in the field of building physics and hygrothermal behavior and building pathology versus durability. This book is

divided into several chapters that intend to be a resume of the current state of knowledge for benefit of professional colleagues, scientists, students, practitioners, lecturers, and other interested parties to network.

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