

The book 'Acoustic Absorbers and Diffusers: Theory, design and application' has been one of the most popular and useful books in the area of room acoustics. The authors are two leading experts, Prof. Trevor Cox, Professor of acoustic engineering at the University of Salford, UK, and Dr. Peter D'Antonio, Founder of RPG diffusor Systems. The first edition of this book was published in 2004, the second edition in 2009, the third edition in 2017, with an increasing number of pages from 405 to 526. This third edition adds the latest status of measurement methods, standards, and prediction models with additional case studies in the measurement, modelling, and design of rooms and semi-enclosed spaces. In addition, sustainability, new hybrid diffusive devices, and design charts for Helmholtz absorbers are just a few new sections. Perhaps, it is the only book at the moment, which covers metamaterials, sonic crystals, natural absorbers, and green walls even with sustainability considerations and global warming and acidification potentials.

This book covers the state of the art in absorber and diffuser theory, design, and applications. Absorbers and diffusers are the most important acoustic devices to control room acoustic quality and metrics. Moreover, this book also deals with acoustic reflectors (Chapter 11) and hybrid surfaces (Chapter 12) as well as good illustrations and application examples to deal with ever-changing challenges of our society.

This book contains a lot of details, but is condensed in a well-organized way in the explanations and equations so that readers can understand the principal concepts behind the absorbers and diffusers without needing to look into other references. Good illustrations and practical case examples are also helpful, making this book most useful for graduate students and acoustic practitioners. Since it includes the state of the art acoustic studies and material database, it is also highly useful for those who want to be quickly updated on recent developments of absorbers and diffusers.

Regarding sound absorption, Chapter 2 describes the basic principles and applications; Chapter 4 about the pros and cons of various measurement techniques of sound absorption properties; Chapter 6 about porous absorbers with lots of useful database on the flow resistivity, porosity, empirical models for the characteristic impedance, characteristic lengths, and tortuosity values from previous studies. Chapters 7 and 8 detail resonant and other absorbers, such as audience, metamaterials, and green walls. Chapters 12 and 14 introduce hybrid and active absorbers.

Regarding sound scattering and diffusion, Chapter 3 introduces basic principles and applications of diffusers. Chapter 5 discusses the measurement of scattering and diffusion coefficients. Chapter 9 discusses the method for predicting reflections both in the time and frequency domain. Chapters 10-12 deal with the design of Schroeder, geometrical, and hybrid diffusers.

The most unique part of this book is Chapter 13, which discusses the role of scattering and absorption in room acoustics models and addresses unsolved problems, which gives very good insights into the uncertainty and main problems of the input data for acoustic simulations and how to deal with absorption and diffusion properties in room acoustic simulations (not only the geometrical room acoustics but also the wave-based methods). This is a very important research topic in architectural acoustics. Current characterization techniques of the absorption, scattering, and diffusion properties are a lot more uncertain than the simulation schemes themselves, so acousticians should devote their endeavours to accurate characterisation of input data and correct use of the input data for acoustic predictions.

Lastly, the most useful part of this book from a practical viewpoint is the vast amount of absorption, scattering, and diffusion coefficient databases in the main part and the appendices via predictions and measurements. The appendices include lots of absorption coefficients of typical building materials, normalized diffusion coefficients, and correlation and random incidence scattering coefficient with proper citations to reliable sources, e.g., published articles, which clearly proves the thoroughness of this book.

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