

# Smart Materials In Architecture Interior Architec

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*Smart Materials In Architecture Interior Architec*

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## SAWYER ALEXIS

### **Building from Waste** Birkhäuser

This book presents a design-driven investigation into smart materials developed by chemists, physicists, materials and chemical engineers, and applied by designers to consumer products. Introducing a class of smart materials, that change colors, the book presents their characteristics, advantages, potentialities and difficulties of applications of this to help understanding what they are, how they work, how they are applied. The books also present a number of case studies: products, projects, concepts and experiments using smart materials, thus mapping out new design territories for these innovative materials. These case studies involve different fields of design, including product, interior, fashion and communication design. Within the context of rising sustainable and human-centered design agendas, the series will demonstrate the role and influence of these new materials and technologies on design, and discuss how they can implement and redefine our objects and spaces to encourage more resilient environments.

### *Materials in Progress* Routledge

Building Systems for interior designers Second Edition Corky Binggeli, asid The updated guide to technical building systems for interior designers As integral members of the building design team, interior designers share an increasingly complex and crucial role. Now revised in its second edition, Building Systems for Interior Designers remains the one go-to resource that addresses the special concerns of the interior designer within the broader context of the rest of the building design team. Building Systems for Interior Designers, Second Edition explains technical building systems and engineering issues in a clear and accessible way to interior designers. Covering systems from HVAC to water and waste to lighting, transportation, and safety, author Corky Binggeli enables interior designers to communicate more effectively with architects, engineers, and contractors; collaborate effectively on projects; and contribute to more accurate solutions for a broad range of building considerations. Among the many improvements in the Second Edition are: A deeper engagement with sustainable building design, giving the interior designer the resources needed to participate as part of a sustainable design team A reshaped structure that enhances the reader's understanding of the material Many more illustrations and explanatory captions With a host of features to make the book more up to date, easier to use, and more effective as an instructive guide, Building Systems for Interior Designers, Second Edition is a valuable book for students as well as a practical desktop

reference for professionals.

### *Materials that Move* Birkhäuser

In this book, architects, interior designers and designers will find an introduction to the functions and use of nano materials, specifically tailored to their needs and illustrated by numerous international project examples.

### *Smart Materials and Technologies in Architecture* John Wiley & Sons

Polymer Nanocomposite-Based Smart Materials: From Synthesis to Application provides a broad, comprehensive review on all major categories of smart materials and their preparation routes. The main application fields and properties for these diverse types of smart polymer-based composite and nanocomposite materials are also discussed. Chapters on modeling methods and simulation look at the physical or chemical change response that is introduced by the effect of changing environmental conditions such as pH, temperature, mechanical force and light. Written by scholars and experts from around the globe, the book covers key aspects, such as synthesis, processing and applications of polymer and nanocomposite-based smart materials. Features a board range of different polymer nanocomposites-based smart materials Contains coverage of synthesis applications as well as experimental, modeling and theoretical results Includes comprehensive coverage on preparation and testing methods

### *Sustainable Facades* Birkhäuser

The external facades of a building are more than a protective mantle, or an intelligent skin regulating temperature and light, they also determine its very appearance. By unusual choices of materials and the use of complex technology, facades have become increasingly significant in recent years. External surfaces are being perceived as an integral part of the building and are therefore being designed as such. This volume focuses on the wide-ranging aspects of facade design, from the selection and use of materials to the advanced technical possibilities now open to the architect. A wide array of carefully selected international examples show the theory in the practice. All plans, details, and large scale sections of the facades have been researched with the high degree of competence typical of the editorial staff from the review Detail. Expert authors provide the essential information needed to plan and design facades and elucidate on the latest developments in technology and materials.

### **Digital Transformation of the Design, Construction and Management Processes of the Built Environment** Springer Nature

Smart materials respond to stimuli such as light or temperature by changing their form, color

viscosity etc. These materials make it possible, for example, to develop self-acting, kinetic facades and wallpaper that changes its color and pattern based on temperature and light. The book presents the functions and uses of about twenty groups of smart materials

**Smart Materials Taxonomy** Routledge

Active Coatings for Smart Textiles presents the latest information on active materials and their application to textiles in the form of coatings and finishes for the purpose of improving performance and creating active functional effects. This important book provides detailed coverage of smart coating types, processes, and applications. After an introduction to the topic, Part One introduces various types of smart and active coatings, including memory polymer coatings, durable and self-cleaning coatings, and breathable coatings. Technologies and related processes for the application of coatings to textiles is the focus of Part Two, with chapters devoted to microencapsulation technology, plasma surface treatments, and nanotechnology-based treatments. The book ends with a section on applications of smart textiles with responsive coatings, which are increasingly finding commercial niches in sportswear, protective clothing, medical textiles, and architecture. Introduces various types of smart and active coatings for textiles Covers technologies and application processes for the coating and finishing of textiles Reviews commercial applications of such coatings, including in sportswear, protective clothing, medical textiles and architecture

**Buildings and Environment - Energy Performance, Smart Materials and Buildings** Birkhäuser

From the visionary founder of the Self-Assembly Lab at MIT, a manifesto for the dawning age of active materials Things in life tend to fall apart. Cars break down. Buildings fall into disrepair. Personal items deteriorate. Yet today's researchers are exploiting newly understood properties of matter to program materials that physically sense, adapt, and fall together instead of apart. These materials open new directions for industrial innovation and challenge us to rethink the way we build and collaborate with our environment. Things Fall Together is a provocative guide to this emerging, often mind-bending reality, presenting a bold vision for harnessing the intelligence embedded in the material world. Drawing on his pioneering work on self-assembly and programmable material technologies, Skylar Tibbits lays out the core, frequently counterintuitive ideas and strategies that animate this new approach to design and innovation. From furniture that builds itself to shoes printed flat that jump into shape to islands that grow themselves, he describes how matter can compute and exhibit behaviors that we typically associate with biological organisms, and challenges our fundamental assumptions about what physical materials can do and how we can interact with them. Intelligent products today often rely on electronics, batteries, and complicated mechanisms. Tibbits offers a different approach, showing how we can design simple and elegant material intelligence that may one day animate and improve itself—and along the way help us build a more sustainable future. Compelling and beautifully designed, Things Fall Together provides an insider's perspective on the materials revolution that lies ahead, revealing the spectacular possibilities for designing active materials that can self-assemble, collaborate, and one day even evolve and design on their own.

**Smart Surfaces** Springer Nature

A comprehensive reference of materials for interior designers and architects Choosing the right material for the right purpose is a critical—and often overlooked—aspect in the larger context of

designing buildings and interior spaces. When specified and executed properly, materials support and enhance a project's overall theme, and infuse interior space with a solid foundation that balances visual poetry and functionality. Materiality and Interior Construction imparts essential knowledge on how materials contribute to the construction and fabrication of floors, partitions, ceilings, and millwork, with thorough coverage of the important characteristics and properties of building materials and finishes. Individual coverage of the key characteristics of each material explores the advantages and disadvantages of using specific materials and construction assemblies, while helping readers discover how to make every building element count. In addition, Materiality and Interior Construction: Is highly illustrated throughout to show material properties and building assemblies Supplies rankings and information on the "green" attributes of each material so that designers can make informed decisions for specifications Is organized by application for easy and quick access to information Includes a companion website, featuring an extensive online image bank of materials and assemblies Rather than a typical catalog of materials, Materiality and Interior Construction is efficiently organized so that the reader is guided directly to the options for the location or assembly they are considering. Reliable and easy to use, Materiality and Interior Construction is a one-stop, comprehensive reference for hundreds of commonly used materials and their integration as building components—and an invaluable resource that every interior designer or architect should add to their set of tools.

**Smart Buildings Systems for Architects, Owners and Builders** Springer

The inner architecture of a material can have an astonishing effect on its overall properties and is vital to understand when designing new materials. Nature is a master at designing hierarchical structures and so researchers are looking at biological examples for inspiration, specifically to understand how nature arranges the inner architectures for a particular function in order to apply these design principles into man-made materials. Materials Design Inspired by Nature is the first book to address the relationship between the inner architecture of natural materials and their physical properties for materials design. The book explores examples from plants, the marine world, arthropods and bacteria, where the inner architecture is exploited to obtain specific mechanical, optical or magnetic properties along with how these design principles are used in man-made products. Details of the experimental methods used to investigate hierarchical structures are also given. Written by leading experts in bio-inspired materials research, this is essential reading for anyone developing new materials.

**Materials Design Inspired by Nature** John Wiley & Sons

Practical information on designing sustainable,energy-efficient building facades As energy and other natural resources are being depleted, it hasbecome clear that technologies and strategies that allow us tomaintain our satisfaction with interior environments whileconsuming less of these resources are major objectives ofcontemporary facade design. Sustainable Facades focuses onthe strategies and approaches for designing sustainable,high-performance building facades, and provides technical guidancefor architects and designers. This timely and useful guide presents strategies and technicalguidelines for designing environmentally sensitive,energy-efficient facades based on scientific principles. Itprovides climate-specific approaches for minimizing energyconsumption, analyzes the thermal behavior of different facadesystems and materials, and illustrates with case

studies how these approaches have been implemented on architectural projects. It also discusses emerging facade technologies, materials, and systems. Topics covered in this unique and indispensable guide include: Climate-based design approaches for high-performance facades  
 Characteristics of sustainable facades: energy efficiency, thermal behavior, and moisture resistance  
 Designing for thermal comfort, lighting and glare control, and acoustic quality  
 Emerging technologies in facade design, including smart materials, double-skin facades, and facades as energy generators  
 Case studies on building orientation and facade design, tectonic sun exposure control, external shading elements, and more

Active Coatings for Smart Textiles Springer Science & Business Media

A fascinating look at the latest trends in contemporary living. Features an array of remarkable ways technology has changed how today's homes are designed and built.

New Materials in Civil Engineering Springer

This book offers an extensive, interdisciplinary overview of dynamic textiles. Specifically, it discusses new findings and design concepts concerning the integration of smart materials into textile substrates and their corresponding dynamic behavior. Introducing the topic of dynamic color in textiles, it presents experimental procedures to achieve color change and dynamic light transmittance in thermochromic textiles, and examines their thermoresponsive behavior and respective electrical activation. Moreover, it also addresses the topic of dynamic form and reports on the authors' original findings using shape-memory alloys and geometric morphologies based on origami techniques. Covering innovative smart textiles and important considerations in terms of design variables when developing textiles with dynamic qualities, and providing extensive, practice-oriented insights into the interaction of textiles with light, it is primarily intended for academics, researchers and practitioners developing smart, dynamic and interactive textiles. The sections describing in detail the experimental work aimed at the integration of smart materials in textile substrates also appeal to professionals in the textile industry.

Polymer Nanocomposite-Based Smart Materials Walter de Gruyter

Material World 3: Innovative Materials for Architecture and Design offers just over one hundred materials and semifinished products carefully selected by matériO, the French library of emerging materials. This exclusive collection covers materials with a wide variety of properties and aesthetic qualities, such as modular, undulating wall coverings, fish-skin leather, photovoltaic textiles, and LED lighting systems powered by wafer-thin batteries. Material World 3 gives architects, designers, students and other creative professionals product information, technical specifications, and suggestions for ways in which to use the latest fascinating materials and finishes. Included are the names, addresses, phone numbers, and websites of suppliers - all the information needed to contact and purchase every item featured in the book. In this book matériO also summarizes fifteen basic concepts to help novices gain a better understanding of this complex topic and to point out, even to the more well-informed reader, aspects of materials that are often overlooked. What do FSC, VOC, Cradle to cradle(tm), and oxo-degradable mean? What are Damascus steel, float glass, and electroluminescence? Find the answers to these and many other relevant questions in this book. Taken as a whole, these features make Material World 3 a virtually encyclopedic survey of exciting materials and finishes for use in interior design and architecture.

Material World 3 Routledge

The choice of materials is critical to the success of an interior. This book examines every aspect of the use of materials in interior design, from initial concept and selection to visual representation and practical application. Following a brief introduction, the first five sections offer historical context and detailed guidance on selection, application, representation, communication, and sources, while the sixth and final section features case studies by international interior designers. The book includes useful step-by-step sequences, information on properties and sustainability, and a list of resources, online archives and sample libraries. It is an invaluable practical and inspirational guide for interior design students.

**Dynamic Light Filters** Woodhead Publishing

Today, architects and designers are beginning to look toward developments in new "smart" or "intelligent" materials and technologies for solutions to long-standing problems in building design. However, these new materials have so far been applied in a diverse but largely idiosyncratic nature, because relatively few architects have access to information about the types or properties of these new materials or technologies. Two of the leading experts in this field - Addington and Schodek - have solved this problem by incorporating all the relevant information of all the latest technologies available to architects and designers in this one volume. They present materials by describing their fundamental characteristics, and go on to identify and suggest how these same characteristics can be exploited by professionals to achieve their design goals. Here, the wealth of technical understanding already available in the materials science and engineering literature is at last made accessible to a design audience.

**Smart Materials and Technologies in Architecture** Walter de Gruyter

How can smart technology open up new design opportunities - for the design, the execution, and the operation of buildings and for the digitalization of construction? A hitherto unusual conception of the building as a cybernetic architectural system forms the basis of this integrated design approach. The authors - architects and engineers with extensive design experience - contribute an overview of current technical components of automation and communication systems, as well as a summary of relevant laws, standards, and guidelines. Six example projects demonstrate completed applications at different scales, from a single-family residence to office buildings, and through to the Elbphilharmonie concert hall - amply illustrated in text, drawings, and photos.

**Smart Materials in Architecture, Interior Architecture and Design** Springer Science & Business Media

The use of smart materials in architecture is a dynamic and innovative area merging research, development, and use. Smart materials, with their reversible characteristics, respond to stimuli such as light, temperature, and electrical field by changing their form, color, viscosity, etc. One of the most fascinating developments is the advent of Phase Change Materials. These materials make it possible, for example, to develop self-acting, kinetic facades and wallpaper that changes its color and pattern based on temperature and light. The book presents the development of these materials and also describes their use in the contexts of architecture, design, and art. It offers a systematic overview with a detailed discussion of properties, technologies, products, and projects based on twenty groups of smart materials.

**Building Systems for Interior Designers** John Wiley & Sons

Smart Technologies and Design for Healthy Built Environment connects smart technology to a healthy built environment that builds upon the sustainable building movement. It provides an overall summary of the state-of-the-art technologies that are applied in the built environment. The book covers a broad spectrum of smart technology categories ranging from dynamic operability, energy efficiency, self-regulating and self-learning systems, and responsive systems. The foreseeable challenges that are associated with smart technologies are discussed and outlined in the book. Firstly, this book provides a snapshot of state-of-the-art smart technologies being applied in the built environment. It covers a broad spectrum of smart technology categories, ranging from dynamic operability, energy efficiency, self-regulating and self-learning systems, to responsive systems. Secondly, this book provides in-depth analysis of the four primary components of health (biological, physical, physiological and psychological); their effects on wellbeing and cognitive performance are introduced as well. Thirdly, it connects smart technologies to those health-influencing factors by reviewing three completed smart building projects. This book can also serve as a basis for education and discussion among professionals and students of diverse backgrounds who are interested in smart technologies, smart building, and healthy building. Smart Technologies and Design for Healthy Built Environment serves as the basis for education and discussions among professionals and

students who are interested in smart technologies, smart building and healthy building, as it bridges the gap between smart technologies and a healthy built environment. The book also provides a foundation for anyone who is interested in the impact of smart technology on the health of built environment.

*Building Skins* Birkhäuser

This book presents a design-driven investigation into smart materials developed by chemists, physicists, materials and chemical engineers, and applied by designers to consumer products, buildings, interfaces, or textiles. Introducing a class of smart materials (referred to as stimuli-responsive, morphing or kinetic materials) that move and change their shape in response to stimuli, the book presents their characteristics, advantages, potentials, as well as the difficulties involved in their application. The book also presents a large number of case studies on products, projects, concepts, and experiments employing smart materials, thus mapping out new design territories for these innovative materials. The case studies involve different fields of design, including product, interior, fashion, and communication design. Reflecting the growing demand for sustainable and human-centered design agendas, the book explores and reveals the role and influence of these new materials and technologies on design and human experience, and discusses how they can be used to redefine our objects and spaces so as to promote more resilient environments. The book offers an intriguing and valuable resource for design professionals, engineers, scientists and students alike.