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CONSTRUCTION MATERIALS AND THEIR PROPERTIES FOR FIRE RESISTANCE AND INSULATION

Edited by
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Preface

Ongoing demands for innovation, sustainability, and safety keep the construction sector constantly changing and pushing its boundaries. It is critical in this ever-transforming environment to comprehend how building materials behave when exposed to varying threats, wherein one such complex threat is fire. The book titled ***Construction Materials and Their Properties for Fire Resistance and Insulation*** explores the intricate realms of construction and insulation materials and fire safety and provides a thorough analysis of the mechanical, structural, and thermal characteristics of different materials spanning a total of 15 chapters.

The first section, *Fire Protection and Materials' Performance*, lays the groundwork by going over basic ideas such as temperature fluctuations, thermal characteristics, and how fire affects various materials. Every chapter clarifies the properties and behaviors that are essential for fire safety engineering, ranging from sprayed fire-resistant materials to cold-formed steels and timber. Effective mitigation techniques are also illuminated by insights into the strength recovery process through postfire curing.

The second section, *Concrete: Behavior under Fire Exposure*, explores the intricacies involved in the behavior of concrete when exposed to fire. This section examines state-of-the-art research on fire reaction and recovery, ranging from the inventive field of 3D-printed concrete to the robustness of zero-cement formulations. Engineers and researchers working to improve fire-resistant concrete structures can learn much from the chapters on strain development, cooling regimes, and residual property evaluation.

This volume also covers the most recent developments in green concrete technology from the lens of fire safety. Information and data regarding the use of eco-friendly materials such as kenaf and the thermomechanical characteristics of structures strengthened with fiber-reinforced polymers (FRP) are documented. The integration of theoretical frameworks and experimental results provides a comprehensive understanding of the obstacles and prospects related to fire-resistant construction materials.

We, the editors of this extensive volume, sincerely thank all contributors for sharing their knowledge and perspectives. Their commitment to expanding our understanding of fire engineering has enhanced this compilation and will surely spur more developments in the area. We believe that engineers, scholars, and students working to improve the sustainability and safety of built environments worldwide will find this book invaluable.

We also sincerely thank each and every reviewer for their thorough analysis and insightful criticism of the chapters that were submitted, which helped to bring this volume to completion. Lastly, we express our gratitude to the Elsevier editorial and management team for their unwavering support during the development and production of this book.

Your Editors
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