

Book review

WASTE MATERIALS AND BY-PRODUCTS IN CONCRETE

R. Siddique. Springer, 2008, ISBN 978-3-540-74293-7, £135, 414 pp.

Waste Materials and By-Products in Concrete is part of Springer's engineering materials series, which aims to provide topical information on innovative structural and functional materials with applications in mechanical, civil and medical engineering. This volume, by Rafat Siddique, professor of civil engineering at Thapar University, Patiala, India, gives detailed descriptions of the effects of 12 waste and by-product materials in concrete, with a separate chapter covering each material: ground granulated blast-furnace slag, metakaolin, recycled/waste plastic, scrap tyres, waste glass, coal fly ash, rice husk ash, municipal solid waste ash, wood ash, volcanic ash, cement kiln dust and foundry sand.

The book is essentially a literature review, covering international research and experience on each of the 12 materials. Some, but not all, of the chapters contain a useful summary of the uses, advantages and disadvantages of the material in concrete in the introduction to each chapter; it would have been useful to have included this for all 12 materials. The physical and chemical properties of each material are then described. The remainder of each chapter consists of detailed descriptions and discussions of the effects of the waste and by-product materials on the properties of concrete, drawing on a wide range of sources and illustrated with simple line and bar graphs and tables. Both the workability of the mixtures and the properties of the hardened concrete are covered. Much of the text consists of summaries of detailed

studies carried out by different researchers. It is thus difficult to follow for the reader who is not an expert in concrete. That said, if you want a detailed understanding of how different materials affect the properties of concrete, this is the book for you.

Written from the perspective of an expert in concrete rather than waste management, it is taken as given that the use of these materials in concrete is beneficial. While other uses for the materials are described, there is no attempt to assess what is the most sustainable use for any material. An introductory chapter addressing these issues and explaining the choice of materials for the subsequent chapters would have been useful. The choice of materials is interesting, including well-established materials such as ground granulated blast-furnace slag and coal fly ash and newer materials such as plastic, glass, tyres and various ashes. The selection includes materials that replace cement and ones that replace aggregate. However, no explanation is given as to why these particular materials were chosen and others (such as recycled construction and demolition material or steel slag) were omitted.

The book will be useful for researchers and practitioners in concrete who want detailed information on the state of the art. Those wishing a quick summary of the potential uses of waste and by-product materials in construction or a discussion on the most sustainable way of managing these materials are advised to look elsewhere.

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