Record Nr.	UNINA9910797066803321
Titolo	Eco-efficient materials for mitigating building cooling needs : design, properties and applications / / edited by F. Pacheco-Torgal [and three others] ; contributors N. L. Alchapar [and thirty six others]
Pubbl/distr/stampa	Amsterdam, [Netherlands] : , : Woodhead Publishing, , 2015 ©2015
ISBN	1-78242-401-6 1-78242-380-X
Descrizione fisica	1 online resource (552 p.)
Collana	Woodhead Publishing Series in Civil and Structural Engineering ; ; Number 56
Disciplina	691.0286
Soggetti	Building materials - Environmental aspects
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Front Cover; Eco-efficient Materials for Mitigating Building Cooling Needs: Design, Properties and Applications; Copyright; Contents; List of contributors; Woodhead Publishing Series in Civil and Structural Engineering; Foreword; Chapter 1: Introduction to eco-efficient materials to mitigate building cooling needs; 1.1. Climate change and urban heat islands (UHIs); 1.2. Adaptation to climate change and mitigation of UHI effects and of building cooling needs; 1.3. Outline of the book; References; Part One: Pavements for mitigating urban heat island effects Chapter 2: Coating materials to increase pavement surface reflectance2.1. Introduction; 2.2. Organic polymers used as coating overlay materials for pavements; 2.2.1. Epoxy resins; 2.2.2. Acrylic ester polymers; 2.3. Advantages and disadvantages of various polymers; 2.3. Inorganic materials used as polymer fillers to increase reflectance; 2.3.1. White color materials for increasing visible light reflectance; 2.3.2. Various color materials for increasing NIR reflectance; 2.4. Aggregate materials with high reflectance; 2.5. Future trends; Acknowledgments; References Chapter 3: Pavements made of concrete with high solar reflectance3.1.

1.

	Introduction; 3.2. Materials for high solar reflectance concrete; 3.2.1. Water; 3.2.2. Aggregates; 3.2.3. Portland cement; 3.2.4. Slag cement; 3.2.5. Latex; 3.2.6. Fly ash; 3.2.7. Pigments; 3.3. Heat transfer in pavements; 3.4. Other potential benefits of high solar reflectance concrete; 3.5. Modeling the benefits of widespread use of high solar reflectance concrete; 3.5.1. Benefits associated with the use of SCMs; 3.5.2. Benefits as a result of mitigating urban heat island effects 3.6. Leadership in Energy and Environmental Design (LEED) credit3.7. Other resources; 3.8. Future trends; References; Chapter 4: A comparison of thermal performance of different pavement materials; 4.1. Introduction; 4.2. Albedo of pavement materials; 4.2.1. Albedo field measurement methods and equipment; 4.2.2. Pavement materials and plan for albedo measurement; 4.2.2.1. Pavement materials and plan for albedo measurement; 4.2.2.1. Pavement materials for albedo weasurement; 4.2.2.2. Plan for albedo measurement; 4.2.3. Albedo values of different pavement materials; 4.2.3.1. Albedo of nine test sections without traffic 4.2.3.2. Albedo of other different pavement materials from UCPRC testing pavements without traffic4.2.3.3. Albedo of slurry seal, cape seal, fog seal, and chip seal with more data of PCC and AC measured from field pavem; 4.2.4. Main factors affecting field albedo measurement; 4.2.4.1. Influence of wind speed and air temperature; 4.2.4.2. Influence of cloudiness; 4.2.5. Diurnal and seasonal variation of albedo; 4.2.5.1. Diurnal variation of albedo; 4.2.5.2. Seasonal variation of albedo; 4.2.6. Change of albedo over time; 4.2.7. Summary of albedo of pavement materials 4.3. Thermal properties of pavement materials
Sommario/riassunto	Climate change is one of the most important environmental problems faced by Planet Earth. The majority of CO2 emissions come from burning fossil fuels for energy production and improvements in energy efficiency shows the greatest potential for any single strategy to abate global greenhouse gas (GHG) emissions from the energy sector. Energy related emissions account for almost 80% of the EU's total greenhouse gas emissions. The building sector is the largest energy user responsible for about 40% of the EU's total final energy consumption. In Europe the number of installed air conditioning sys