

Preface

This state-of-the-art report on “Application of Titanium Dioxide Photocatalysis to Construction Materials” was prepared by RILEM TC 194-TDP “Titanium Dioxide Photocatalysis”. RILEM TC 194 was established in 2001, on proposition by Dr. Hiroyuki Yamanouchi, National RILEM Delegate for Japan. The aim of the TC 194 was to collect the theoretical data and practical achievements of titanium dioxide photocatalysis in construction. The beginning of practically applicable photocatalysis of TiO_2 originates with a discovery of the photocatalytic splitting of water on TiO_2 electrodes by two Japanese scientists, Fujishima and Honda in 1972 [15]. In the years after, the technology of TiO_2 photocatalysis has progressed rapidly, and became very attractive in the applications of self-cleaning, air-cleaning and antibacterial effects in the construction industry. The benefits of TiO_2 photocatalysis are further being exploited for cooling effects of heat island phenomena, and for water and soil treatments.

The committee members of RILEM TC 194-TDP have worked together for arranging this state-of-the-art report. Equilibrium was pursued between theoretical background information, practical application aspects in different construction areas, and standardization.

The committee held eight meetings, in which the different aspects of the state-of-the-art report were discussed, and the International Symposium on Photocatalysis, Environment and Construction Materials, held in Florence, 8–9 October 2007, was prepared [3]. The meetings took place in Tokyo (April 2002), Rome (September 2002), Lisbon (September 2003), Leipzig (April 2004), Koriyama (September 2004), Sterrebeek (October 2005), Madrid (May 2006) and London (May 2008).

The state-of-the-art report contains main chapters on principles of TiO_2 photocatalysis, on application of TiO_2 photocatalysis on cementitious materials for self-cleaning purposes, on application of antibacterial and self-cleaning effects to noncementitious construction materials, on applications of TiO_2 photocatalysis

for air purification, and on standardization of testing methods for construction materials with TiO_2 photocatalysis. A list of selected references is presented as a guidance to the readers.

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