

Smart and Multifunctional Materials and their possible application in façade systems

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Smart and Multifunctional Materials and their possible application in façade systems

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Today's society needs to face challenging targets relating to environment and energy efficiency, and therefore the development of efficient façade systems is essential. Innovative concepts such as Adaptive Building Façades might play a role in the near future, as their dynamic behaviour could optimise the performance of a building. For their successful development, a balance between sophistication and benefit is necessary and the implementation of Smart and Multifunctional Materials in building envelopes could be the key, as they have the ability to repeatedly and reversibly change some of their functions, features, or behaviours over time in response to environmental conditions. However, these materials were predominantly developed for use in other fields, and there is a lack of specific technical information to evaluate their usefulness in façade engineering. The aim of this paper is to collect the critical information about promising responsive materials for use in the design of Adaptive Façades, in order to help designers and technicians in decision-making processes and to scope possible future applications in façades. Investigated materials were analysed from the Building Science standpoint; their weaknesses and threats in the built environment were highlighted, and their technical feasibility was examined through the study of their availability in the current market.

Keywords: Responsive, autoreactive, intelligent, adaptive, design, innovation

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