

International Journal Of Engineering Sciences & Management Research

INTERNATIONAL TRENDS IN ARCHITECTURE: NEW MATERIALS AND NEW TECHNOLOGY IN ARCHITECTURE

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In, Pre-19th century use of materials in design to have been subordinate to issues in function and form. The role of materials changed dramatically with the advent of the Industrial Revolution. Beginning in the 19th century with the widespread introduction of steel, leading to the emergence of long-span and high-rise building forms. The industrialization of glass-making coupled with developments in environmental systems enabled the 'international style' in which a transparent architecture could be sited in any climate and in any context. The broad proliferation of curtain wall systems allowed the disconnection of the facade material from the building's structure and infrastructure, freeing the material choice from utilitarian functions so that the façade, become a purely formal element.

Computer Aided Design/Computer Aided Manufacturing technologies, engineering materials such as aluminum and titanium efficiently and easily employed as building skins, allowing an unprecedented range of building facades and forms. Materials have progressively emerged as providing the most immediately visible & most appropriable manifestation of a building's representation, both interior and exterior. Smart materials and technologies are considered to be a logical extension of the trajectory in materials development toward more selective and specialized performance.

During the 20th century one begin to select or engineer the properties of a high performance material to meet a specifically defined need. Smart materials and technologies properties are changeable and responsive to transient needs. For example, photochromic materials change their color (the property of spectral transmissivity) when exposed to light: the more intense the incident light, the darker the surface. This ability to respond to multiple states rather than being optimized for a single state has rendered smart materials. Smart materials and technology represent a radical departure from the more normative building materials as well are dynamic in as they behave in response to energy fields.

Smart materials and Technology are those that transform energy from one form to an output energy in another form, and again do so directly and reversibly materials are piezoelectrics, thermoelectrics, photovoltaics, pyroelectrics, photoluminescents and nanotechnology, smart intelligent environment as well as Smart sensors, actuators and control systems. Smart materials and technology is a molecule, a material, a composite, an assembly, or a system will exhibit the following characteristics:

- a. Immediacy – they respond in real-time.
- b. Transiency – they respond to more than one environmental state.
- c. Self-actuation – intelligence is internal to rather than external to the 'material'.
- d. Selectivity – their response is discrete and predictable.
- e. Directness – the response is local to the 'activating' event.

Materials that undergo changes in one or more of their properties – chemical, mechanical, electrical, magnetic or thermal – in direct response to a change in the external stimuli associated with the environment surrounding the material. A photo chromic material, for example, changes its color in response to a change in the amount of ultraviolet radiation on its surface. Nanotechnology, by enabling the complete construction of the molecular structure, may afford us the possibility to design unprecedented and dramatically enhanced properties for the macro scale. Indeed, it may even be possible to produce substantially different properties without even changing the chemical composition. Technology can be grouped as.

- f. Energy exchange capability.
- g. Property change capability.
- h. Discrete size/location.
- i. Reversibility