

# **The Status of Technology in Interior Design and Decoration**

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*Abstract-Construction industry, including the most desirable and most economical manufacturing industries is a significant contribution to employment and gross domestic product. Unfortunately, in our country because of the use of traditional methods that have little efficiency. This industry did not have the growth and the need for change and replacement of modern methods with high productivity is essential. Producer elements and elements of interior spaces both in public spaces and in spaces of great diversity. The internal architecture of the buildings is defined by the material manufacturer. Today we see many architectural designs inside because there are weaknesses or limitations in materials or features are not implemented or If implemented or are restricted. Despite the problems in the field of construction materials and directly influence its interior spaces, the need for more attention to new technologies and their role in improving the quality performance required materials. In this paper, we have introduced, after the characteristics of the materials used in the interior, their strengths and weaknesses investigated. And then based on nano technology helps in improving the desirable characteristics of materials with changes in its structure in order to improve the quality of the materials step. Nano technology has made significant progress in the field of new materials for the composition of modern methods used in building data and many hope for improved management of materials in the interior promises. For this purpose, using descriptive and help gather documents and library studies, to analyze the role of nanotechnology to improve the properties of the material and qualitative comparison of features, strategies to increase their performance in order to extend the life of building materials have provided.*

**Keywords-Technology, Architecture, Nanotechnology, Building Decoration**

## **I. INTRODUCTION**

Construction of the volume of capital and human resources involved is the largest industry in the country. Rapid population growth and increasing demand, the need to reduce delivery time construction projects and reduce the time to return on investment for investors and other factors have caused the necessity to change the traditional practices are increasingly building industry. The method of "prefabricated structures style", one of the emerging technologies in the field of construction development in the country. The building is immense and each feature a variety of technology and should have its limits. The construction industry has been for a long time by competing in the costs. Due to competitive conditions and variables such as demographic change, climate conditions and competition in the international arena building industry in the long run requires multiple innovations and constant adaptation to customer needs. One of the main challenges in the construction industry, commercial and residential buildings in terms of energy efficiency. For example, almost 80 percent more than double the existing building, new buildings consume heat. Thus, the need for energy management and thermal insulation systems as well as optimal and renewable energy sources (such as photovoltaic) is at a high level. Since the early 1980s, the scope of the design and construction of buildings every day new innovations in the field of materials is more efficient and more productive. In the direction of increasing development, additional material and human capabilities on a daily basis, always saw the introduction of new materials in the field of construction (Golabchi et al., 2012: 12). Materials used by humans throughout history and past periods, vital role in shaping the mindset and thus have human life. Perhaps that is why a group of thinkers, ages human life according to the template element used at the time to the Stone Age, Bronze Age, Iron Age, the era of composite materials (composite) and finally the current era to the era of smart materials has been named (Arbabi Yazdi, 2013). In view of sustainable building design (new approach in the design of buildings that have a high level of environmental standards with an emphasis on life cycle costing satisfy), most of these materials are used efficiently, because the material nature environmentally environment and increase the useful life of the building (Armaghan, 2012).

We are now on the verge of the next generation of buildings, buildings with various degrees of ecological behavior are quite capable compatibility and performance through the intelligent use of new technology suitable materials, directly or indirectly, to changes in their surroundings and react with the right conditions adapt. The use of smart materials is one of the best answers for the relationship

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between architecture and environment (Mehrgan, 2012: 15). Today foresight to see that the architecture and manufacturing systems architecture to soon see the development of smart materials in the field of architecture in the country will be. In fact the use of these materials with regard to their potential in many countries of much research goes beyond the use of smart materials in buildings has become practical. After identify and understand the characteristics of materials and their application in today's world, it seems inevitable (Georgian Mahlabani, 2010: 69). Prediction and forecasting has always been of interest to researchers and engineers to research and development of tools to use in their future. That tell us what is the future. If we briefly review the history of architecture in the last century futurist look, we see that the future generally by materials and technologies which will be built in that era defined. In fact, with the advent of modernism that kind of effort all strains of thinking and thinking about the future of architecture was carried out. In 1914 a group of young Italian architects "architectural statement Futurists" published the statement announcing the Futurists, architecture thinking, reckless and life is unaffected, the architecture of reinforced concrete, iron, glass and all materials is a better alternative to wood, stone and brick are so high that can provide the flexibility and lightness. In fact, the most popular concrete materials modernism because it has many advantages over the old materials and was very affordable. The architects of the early 20th century was about public support. In 1920, Le Corbusier, with special attention to technology, the future home as a machine for living "Buckminster Fuller defined and nine years later he published the plan. Both designers to express their ideas from cars and airplanes were inspired fledgling industry. As the 20th century was instrumental look forward to new technologies and alternative materials look a symbolic available. If in 1934, when aluminum was used in the construction of the Museum of Modern Art in Germany, the main objective Presentation and Demonstration that Hmbh potentials in these materials, facade materials and sympathetic as the structural system was used. Since then, the construction of houses and buildings and manufacturing the latest products manufacturing companies showcasing building materials, flourished. Therefore, there is always a close relationship and a historical link between building materials and architecture is inextricably until the twentieth century, the role of materials and technologies in architecture became more important. We can say that now and at the beginning of the 21st century with the behavior and characteristics of the basic materials are selected not because of performance and how to implement them.the research goes beyond the use of smart materials in buildings has become practical. After knowing and understanding the characteristics of the materials and their applications in today's world is inevitable.

### A. Problem Statement

Since significantly reduced, yet proper interaction with the environment in mind. Create sustainable architecture and harmony with the climate, intelligent buildings and making them targets designers and builders with materials such as intelligent materials. Now technology to design and build intelligent buildings and smart materials are available with control systems. Smart materials usually referred to as a logical part of the trajectory of the development of more selective and more specific materials are to return. We have a wide range of products and materials are available or that are supplied to the market. Some of them are produced specifically for use in architecture and some for other applications such as textile industry, automotive, etc. are considered.huge and interesting new possibilities for building design and construction methods will follow. Creative architects can innovative materials and products for special applications architecture and will be able to develop a new industry was created in architecture based on new materials and as a result, architects are more than the building designer, entrepreneur, producer and Producer it will also be (Addington & Schodek, 2005). The aim of this study was to evaluate the technology in interior design and decoration in interior spaces and their impact on the users. The technology used in the original coverage areas and equipment used in interior spaces, from the perspective of nanotechnology are discussed. In this paper an attempt to introduce smart materials architecture, performance and benefits of their interior decoration and seek answers to these questions is the role of technology and nano-technology, interior design and decoration in interior spaces look like?

### B. Theoretical Basics

Smart<sup>1</sup>, clever<sup>2</sup>, sensitive<sup>3</sup>, compatible<sup>4</sup> all to define the structure and materials used, including sensors and actuators<sup>5</sup> and ability to adapt to external stimulation, such as bars and their peripheral (Jhans, 1998: 116-119). Clements Chrome suggests that the definition of intelligence: intelligence is not a feature, but a complex hierarchy of information processing skills, the balance between people and their environment is adaptive. The so-called intelligent objects are said to be similar to human behavior. Sometimes called Smart that they tend to processing (perception) data such as humans and reaction (action) on the basis of an analysis process (thinking) there. Many of these smart features have the same intention, but differ in scale and performance (El Sheikh, 2011). Organic architecture by Frank Lloyd Wright buildings on the placement of structural adjustment as defined in the wild today in the form of sustainable architecture and new horizons, intelligent architecture with smart materials and nano technology will be

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discussed. Because an object using the achievements of smart materials (building) in different times and places can show different behaviors (hard and inflexible or soft and fluid) theories of cognition generally keep changing. In fact, materials, lose their fixed identity and architectural definition will be limited in time and space. An intelligent building, is building its own needs by examining thinks and takes steps to eliminate it. To get to the building, smart materials and the most effective first step (Smith, 2911). Today, the buildings are kind of technology. They adapt their technology and benefit from it. A smart building, materials that increase performance and efficiency of its inhabitants and the possibility of effective management in accordance with specific requirements and provide the lowest cost (Afshar Basir, 2011). The definition of an intelligent building as the United States of America is this: intelligent building construction that includes a dynamic environment and affordable by integrating the four basic elements of the system, structure, and management and the relationship between them Srvys-Ha is (El Sheikh, 2011). Intelligent architecture is dynamic in the sense that the main performance parameters, to suit their needs, demand and changing and dynamic conditions change. Main features intelligent architecture include: (1) dynamic and active; (2) flexibility and adaptability to the environment; (3) Being reactive and responsive. It is necessary to point out that you must distinguish between smart materials and smart systems. Article intelligent but often the small details of life in one smart system. Most intelligent systems intelligent combination of components and materials, and they are multi-purpose performance (Alikhani, 2002).

### C. Smart Materials

Intelligent Building a new term for materials and products that have the ability to perceive and process environmental events and respond appropriately to it than that. In other words, this material variability and are able to shape, form, color and your inner energy to be reversible in response to physical or chemical effects change the environment. If the material into three groups: non-smart materials, semi-intelligent and smart classify the first group, the materials are high Ghyrhvshmdnd characteristic, semi-intelligent only able to respond to environmental influences your form for a time or a short time smart materials change but the change will be reversible and reproducible. (Ritter, 2007) intelligent Building materials known as "flexible" and "versatility" are known because of their specific characteristics in the regulation of their environmental conditions (Addington & Schodek, 2005). Electrochromic materials are used in electro-optical Glass. Electro-optical materials with exposure to the sun's rays characteristic of the degree to alter its transparency. Now the world's largest electro coating on a frontage in Tokyo in 2004 was used. According to NASA definition, smart materials are materials that can adapt itself to a stimulus. Elsewhere, smart materials are defined thus: "structural and smart materials to understand environmental events, data processing, and then act accordingly."

### D. Capabilities Of Smart Materials

Smart materials, the definition of engineered materials that react intelligently to their environment, they have become a hot topic in the IT world today. Many architects are now thought to building surfaces, walls and shots are created by smart materials that perhaps the materials automatically optimize your design and become an interactive soulless be from a box. Architects implicitly trying to insert intelligent materials with traditional construction materials. Smart materials, different from the ordinary materials in their structure. Standard construction materials are static and will be building the forces of resistance, but smart materials dynamically and act in response to the flow of energy. This is a very important point that should be considered as normal display of architecture is done by static materials. With the involvement of smart materials, should this become a series of sequential images are of different images. Hvshnd materials, we should focus on what we expect from intelligent material, we focus not on the shape and appearance. Smart materials should be simple to understand material properties is beyond comprehension. The inner physics and chemistry architect should be the primary communication material in response to their external environment, understand and appropriate deployment of command to the materials necessary to allow the appropriate response to the changes we are seeing better quality. Since environmental issue today our cities with a design in harmony with it, according to the forefront the design for construction in harmony with the environment (dexterity, 2012).

### D. Abilities Of Smart Materials

Smart materials can change their properties and can easily respond to the impacts on the physical and chemical change colors and figures. Non-Smart materials did not have that semi-intelligent non-smart materials and materials in these abilities are impressive, For example, changing their shape in response to a work, once or in a short time, but these changes are reproducible in smart materials and reversible. Smart materials are often described as intelligent materials or dumped into. While most versatile smart materials that have been identified to date because of their ability to adapt themselves, may be recognized as versatile materials Many smart materials with changes in both directions, reverse behaviors period. for example displayed. In fact, the intelligent

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building can be created depending on the capabilities of smart materials. The buildings to the structural need the ability to receive and process complex data is a group or the electrical system can be put in a better state. If such a structure in a passive and dependent nature of the stimulus remains, however, is that it can not be described as smart Systmbh (Ritter, 2007).

### E. Classification Of Smart Materials

In fact, the proposed classification of smart materials based on three properties listed below:

Smart materials can change the intrinsic properties

Intelligent Building energy exchange capabilities

Intelligent materials and the ability to change the internal material exchange

But what is important is that the classification system of intelligent materials with respect to the issues discussed in the context of sustainable development concerns century that lies ahead, what functions each of these materials in terms of interaction with the environment, Dvamv stability, the possibility of recycling , beauty and utility, etc.?(Iranmanesh, 2013). Technology concept from different aspects and different approaches can be considered. According to various aspects of scientific, philosophical, social, cultural and even moral and political technologies are getting stronger and more broad-be. The philosophical approach to technology has great importance, one of the most important philosophical approaches to technology, is a phenomenological approach. Phenomenological view was that the most important thinkers of the technology, Heidegger and his deep interest in technology which may arise from the depth of his thought Shnasanh, has led to the issue of technology would find its philosophical significance. One of the first thinkers who have examined the technology to technology, the spirit of it, its relationship with the truth, relevance and its relation to modern science and its inherent nature and by appointment (Asadi and Mousavi Mehr, 2011 : 69-49).

Table 1. Comparison between Architecture And Technology

Technology Architecture	Architecture
Manufacturing tools and methods, materials, power tools and practice and express.	According to the skill and ability of the individual and the facilities, layout and technical requirements, methods and explains how to build and other necessary details.
In the context of the organization of space by means of technology, materials and construction method helps architects.	Due to our spiritual and material needs to organize the space. In the context of the organization of space by means of technology, materials and construction method helps architects.
Using science and technology knowledge and power tool ... in response to the needs of aesthetic and architectural creativity and efficiency to help.	At the same architecture due to the creativity and beauty of the performance and productivity through knowledge and technology, according to Day.

The construction industry has been for a long time by competing in the costs. Due to competitive conditions and variables such as demographic change, climate conditions and competition in the international arena building industry in the long term requires constant adaptation to customer needs is innovation-multiple. One of the main challenges in the construction industry, reconstruction of existing residential and commercial buildings in terms of energy efficiency. For example, almost 80 percent of existing buildings consume more than twice as many new buildings heat. Thus, the need for energy management and thermal insulation systems as well as optimal and renewable energy sources (such as photovoltaic) is at a high level. Other challenges facing the construction industry in the future include:

The combination of performance and value of different parts of the building: for example, multi-view, which creates favorable light and at the same temperature and corrosion, fungus attack or severe beatings from the guards.

Based on the growing demands of customers (customer comfort) in the design and comfort of housing as well as elimination disorders such as pollution, noise, moisture or odor.

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Create safety-oriented structures due to increasing environmental and terrorist risks.

Energy and raw materials for production of building materials and the construction and operation of infrastructure and residential buildings. Nanotechnology, can significantly contribute to meet these needs.

## *F. Nanotechnology And Construction Industry*

Nanotechnology can be specified basic building materials, such as strength, durability and lightness to improve Vkarardhay useful features such as thermal insulation, self-cleaning, monitoring and health safety of buildings and structures used. With increasing population and a rise in construction and also due to limited resources and consumable materials, demand for the use of new materials in the construction industry has increased. Trying to find solutions to improve quality, increase efficiency and reduce consumption of raw materials led to the use of nanotechnology in the energy industry. The advantages of this technology can be used to enhance the quality of materials, save energy and therefore economic saving noted. Nanotechnology is a general term that refers to all the advanced technologies in the field of working with nanoscale. Usually about the size of 1nm to 100nm is the order of the nanoscale (one nanometer is a billionth of a meter). The first spark of nanotechnology (at that time still had to Namshnakth) was struck in 1959. This year Richard Feynman in a speech entitled "There's plenty of room at the bottom" raised the idea of nanotechnology. He theorized that in the near future we can directly manipulate molecules and atoms. The term nanotechnology was first suggested by Nvryvtayngvchy professor at the University of Tokyo in 1974 was uttered. His words to describe the materials (tools) precise dimensional tolerances in the nanometer range is used. In 1986 this word by K. Eric Drexler in his book "Engines of Creation: the beginning of nanotechnology" was recreated and redefined. His words are deeper in his doctoral dissertation examined and then put it in a book titled "Molecular nanosystems machines and how to make their calculations" was developed. The main difference with other technologies in the nano-scale materials and structures that are used in this technology. Of course not only consider the small size, but when the size of this scale is, of their inherent qualities such as color, strength, corrosion resistance and change. In fact, if we want this technology with other technologies for measurable difference in our expression, the existence of "basic elements" to be mentioned as a benchmark. The basic elements are in fact the same elements that their properties at the nano-scale analog Nanvm on a larger scale varies with their properties (website).

## II. MATERIAL AND METHODS

The research method is a descriptive study. The data were collected by direct observation. Variables, including interior decoration, windows, facades, the materials used in the home. Due to the limitation of sampling were made. In this study, to analyze the materials used in residential interior space of nanotechnology and its application in housing is used.

## III. RESULTS

### *A. Knowledge Of Construction Methods Common In Iran And Its Pattern Classification*

In order to make better use of new technologies to achieve superior choice and ease of decision-making structures and construction methods can be divided into five major categories:

Houses primitive methods

Traditional or conventional construction methods

Building techniques

Building Industry

Building with nanotechnology. The following are brief descriptions of each of the researches conducted by presents.

### *B. Houses Primitive Methods*

This type of building since the beginning of human construction begins and continues until the present and yet in the country's villages and towns bordering the need for such a construction will be discussed. . Human resources employed in unskilled or semi-skilled, some of these buildings and the materials used in local access. Houses made of these methods of least resistance against accidents and natural disasters (earthquakes, floods, storms, etc.). And just as a temporary shelter and forced mentioned.

### *C. Houses Made Of Traditional Or Conventional Methods*

In this way, the construction operations using the primary means of semi-skilled and unskilled done by a dermatologist. Buildings with load-bearing brick wall in this division are in order. Those involved with this method include: labor, building, stucco work, painting, blacksmith, plumber, wiring, insulation, tile, asphalt, glass, etc. on the speed of execution of construction work this way in

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Iran 34 hours in European countries is 24 hours per sqm. Amount of initial investment to implement the work by this method was too small and the number shovel, pick, barrow, Fvrghvn, tanks, barrels and timber and the progress of construction and the building does not exceed the client's tastes building materials purchased. This method has been intermittent stages of construction operations. For example, the construction of the side walls would Foundation after the operation is possible. Any interruption in one of the prolongation of the implementation of the building and has created lengthy intervals. If the project is in an area filled with rain and rain will continue for 20 days and is in process of Dyvarchyny basement, electrical wiring storey building Dvmayn consequently be postponed for at least 20 days. The sequence of the work force is in addition to the financial losses caused Dmamkan planning. Now in most big cities or rural areas or around certain buildings (such as mosques) of these construction methods are used



Fig 1: The Gap between Irons That Are Stainless Joinery With Due

### D. Advanced Building

The method, developed or improved building is also called, include: the performance of individuals and the professionals mentioned in the previous method of mechanical machinery and equipment for the purpose of adding speed and Hjmkar required. Buildings with steel or concrete structure in this division are in order. The construction of some of the instruments and equipment used are: Electric hoists, cranes variety of fixed and mobile, metal scaffolds, made of concrete and mortar fixed and mobile devices, Symanpash and paint machines, welding machines and speed of execution of construction works in this method, 20 to 28 hours on a per sqm to average. In other words, the speed of implementation of construction operations can be used up to two times increase of mechanical and electrical equipment. Due to the use of metal and concrete structure, number of floors and building height up to 100 floors and 400 meters can be predicted. Initial investment to implement this method, the volume of construction operations and purchase or lease the equipment is considerable. Work stoppage due to labor issues or financial problems of negative points and may be harmful latest-project. less time and with efficiency and safety are made.



Fig 2: An Example of Prefabricated Structures Simulated Solar Energy and Generating Electrical Energy and Water Treatment Systems

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### E. Building Industry

In this method pieces such as blocks, joists, precast panels, beams and columns of steel and concrete, metal nets, pieces of plaster and concrete and so on. And most operations using the equipment and the mechanical workshop. Page Kfrazhhay integrated metal types such as Kfrazhhayay, tunnels, slippery modulated and Kfrazhhay made of lightweight materials and plastic Kfrazhhay ups and sliders in this way to concrete Sry about the use of the buildings are in four seasons. The number of people working in this way in terms of expertise and the quantity is less than the previous methods, but the quality should be technical experts and high level of skill and precision.



Fig 3: arch steel elements during assembly in the image

### F. Construction Of Nanotechnology

Nanotechnology as a key technology and interdisciplinary, many opportunities to strengthen competition in the construction industry such as construction faster, more flexible, better, more sustainable and more affordable like fairness, and the applications of this technology in almost all parts of the building including structures, facade design, engineering, construction (building in conflict system) and interior design are included. Control of material properties at the nanoscale, as well as control the physical and chemical effects, construction materials enables high performance multi-function, which creates added value, increased durability, quality and sustainability of the environment. It is noteworthy and remarkable technology has broad application of basic infrastructure such as dams, roads, bridges, canals and so on.

### G. Windows And walls

Glass because of its transparency and high strength with every shape and color is known as a building material for windows and facades. Of course tarnish rapidly, reflecting unfavorable and bad performance as a thermal insulation, the negative aspects of it. for example:

Improve the protection of stored heat energy using coatings

Glass sunscreen (sun protection) using the glass color variable

Improve the use of daylight by using make-up of the Uniform Mykrvaynh

Self- cleaning coating using photocatalytic

Anti-reflection coatings using nano-SiO<sub>2</sub> layer hole

### H. Smart Windows

The term smart window glass panel that is depending on the type of environmental impacts, especially in light transmission

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properties can change. Chromogenic materials used for this purpose, which can be color or its transparency with respect to stimuli (factors) reversible physical or chemical change. Flat glass, valued at 40 billion dollars annually around the world, America for sale. So even if the smart window only part of the target market, it is expected that proceeds from it are immense. These glasses can be used as a substitute for shading systems such as anti-radiation system and curtains to be considered. Smart glass is produced through different technologies. This technology is largely based on the use of nanomaterials and nano-scale coating systems. Of course, these glasses due to high costs and technical problems have not been widespread commercial use but can be companies producing this type of glass-like Econtrol-glass and Gesimat pointed. Another innovation as well as the University of Kassel in Germany has to offer, future-proof systems, industrial radiation is excluded, heat and daylight in buildings will be recognized. The future micro cell-based innovation that is composed of billions of individual elements in the space between the glass wall and Ai is Qhay Mrsvmqrar. The Mstqymbh light and extra light within a room (annoying) reflected out In the case of glass walls also act nanotechnology to improve fire protection (fire fighting) helps. In the fight against the fire, there's always a negative point and the fragility of glass, flares and smoke emissions from glass melting in the event of a fire. With the nanoparticles, we can create glass fire caused by heat, such as a sponge cover (Fvmmann) form that does better protection against fire. The walls compared with previous samples (the techniques) are approximately 50% lighter and flame retardant effect of 2 times. Based on this method, a nano-transparent gel that fills the space between the outer wall of the heat exposure is made with a hard ceramic foam and tiny holes (micro porous) with high insulation properties is produced. Due to the small nano-particles in the gel, light scattering is reduced and this leads to transparency be maintained for fire walls. Glass Fire tentatively been used in Dubai airport.

### *I. Anti-Reflection Coating*

The development of marketable, anti-reflection coatings for flat glass that boosts light transmission of solar collectors or more, and for example, glass-walled building applications. German company Merck 6 (Merck) is one of the manufacturers of this type of glass which is anti-reflective coating on glass using a nanopore can do. It is expected that with the loss of reflected light (the light that is reflected off reflective Hey Hvsyl b) in glass panels typically from 8 percent to 2 percent.

### *J. Fire Protection*

A variety of methods for developing nanotechnology products against fire (fire) and improving its properties and as an alternative to polluting substances (which in this context is used), offer. The turning point of the silicate particles are nano-structure (nanoclay 7) as fillers, polymers and to enhance fire and heat resistance properties is used. In construction, polymers in the coating cables play an important role (for example, switches, sockets and lamp compartment, etc.). Nanoclay composites anti-fire indicator of this is that the heat and smoke development is significantly reduced and at the same time creating a spark (ignition) to be postponed. Another component of fire-prevention coating for wood, metal, plastic or concrete fire that develop in materials is delayed by this type of coverage and prevent the spread of fire is uncontrolled. Potential applications of nanotechnology, in this part of the nanoparticle coating materials that can be liquid or plastic, is used to protect materials. In a ceramic coating, in case of fire in a few seconds, thermal insulation works and strictly prevent the spread of smoke. Using nano-powder, the coating is formed faster. So that the trapped gas emissions at the same time, the combustion products and water bubbles, thermal insulation secondary acts.

### *K. Interior Decoration*

The interior decoration, nanotechnology for any function, it creates the appropriate levels. Using the modified nanoparticles, coatings can be produced variety, including:

Anti-bacterial coatings with nano-silver particles to the wall color coating has antibacterial properties and is a crime. The proportional distribution of silver particles, silver ions are released (in the range of concentrations of these ions must be safe for humans) and a strong anti-bacterial effect and cause, so that Mtabvlysmarzh bacteria block the enzymes of the respiratory chain genetic processes of microorganisms are involved. Places with specific health conditions (such as internal walls and furniture in public buildings and hospitals) are also among the places that can use the technology to take it. 1. Anti-dust coating: The coating on surfaces such as ceramic, stainless steel, glass and wood properties, protection against dirt (dust), mass, mechanical erosion organisms are created.

Hydrophobic coatings (coatings based on silicon or fluorine-containing compounds) waterproof properties of these coatings show, so that spherical drops of water on the covers come in and sticky dirty particles from the surfaces like tile, ceramic bathroom wash area.

Anti-fingerprint coating: The coating on surfaces such as stainless steel, coating based on sol-gel solutions by using the operating 7



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SiO<sub>2</sub> nanoparticles are made. For properties such as transparency (colorless), abrasion resistance and anti-fingerprint properties to the product obtained, chemical stability, suspension components, is very important. Here suspension of nanoparticles increased stability and create a uniform coating. (Formation of a uniform coating guarantee).

Anti-scratch coating: This coating furniture or flooring to wood surfaces using nano-particles, obtained a hard coating on the sort of coverage performance in coating installations, various properties such as transparency, resistance scratch and UV resistance is together. These coatings are typically a few micrometers thick, and the brightness (luminance) levels can be set optionally. Using nano-particles with different aggregation, increases the mechanical stability of the coatings, thereby greatly increasing the resistance parquet floor.

Multifunctional: other examples of nanotechnology-based coatings, films (var p in) flexible ceramic, wall tiles in the kitchen and places health as used in the manufacture of a flexible ceramic substrate with glue (crosslinking) is used. Next, the ceramic composite ceramic paint and a colorless garment worn. In addition, other functions such as anti-UV properties and hydrophobic properties are to be added at a later stage. As a result, widely and easily with features multi-functional wall coverings withstand pollution, fire and chemicals is made.



Fig 4. Ceramic Plates with Cnc-Flex Nanotechnology Coating Processes Are Thinner And More Flexible Production

The main areas of application of nanotechnology in the field of interior and exterior walls and windows that manufacturers of prefabricated houses such as Rensch-Haus developing functional. In buildings with insulation, the exterior surfaces due to low level of heat dissipation attack by algae and lichens are vulnerable. Nanotechnology can create hydrophobic properties, adhesion of soil particles and other crimes on the facade to reduce and prevent the ingress of moisture to the surface. In this case the adhesion of soil particles is reduced and thus self-cleaning facade by rain. Also in the inner part of modern buildings, many applications of nanotechnology. Examples of such mortar for tiling and brickwork now 9 PCI (used in Rensch-Haus) are caused by crosslinking, leading to control of nanostructures in the matrix of cement and thus adhesion properties increases.

### IV. NANOTECHNOLOGY APPLICATIONS IN THE DECORATION

#### A. Bedroom Decoration

To make your experience better sleep in her bedroom is better to use bright colors cream, chocolate cream, green and brown paint for the walls. The colors help you to be better prepared psychologically for sleeping. According to experts on color therapy colors easily affect human nervous system sedative and go to sleep deep Ramv help. Bedroom is a place for rest, and a restful sleep and pleasant. The use of these devices in the bedroom, your mind occupied and causes sleep deprivation and you are welcome. Also fit your bedroom decoration with your relaxation and comfort, not to make better use of these technologies.

#### B. Nanotechnology Applications In The Bedroom

Bed anti-bacterial mats, mattresses antibacterial coating of silver nanoparticles and nanoparticle composites are produced.

Leave for color, the color combination of various additives and polymer nanoparticles that are effective in causing cracks in the paint for use in the decoration.

Anti-bacterial paint, using silver nanoparticles and achieved supplementation.

Self-cleaning photocatalytic paint, then paint sunlight on the surface of fat droplets and smudges and analysis with a brief rinse, the

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surface is cleaned.

### *C. Application Of Nanotechnology In The Bathroom Decoration*

For those who are interested in modern mechanical means, methods and equip a bathroom decorated with the latest equipment and technology will be very interesting. Lions equipped with electronic eye, interesting Shower heads and so on. Shower heads are adjustable variety of models with multiple output types are water and geysers of two or more directions are available on the market. Light sensor taps also one of the things that really worth the cost of supplying and installing and saves a lot of water. Decorate bathroom toilet hair so that it is attractive to children, to reinforce their interest in the cleanliness.

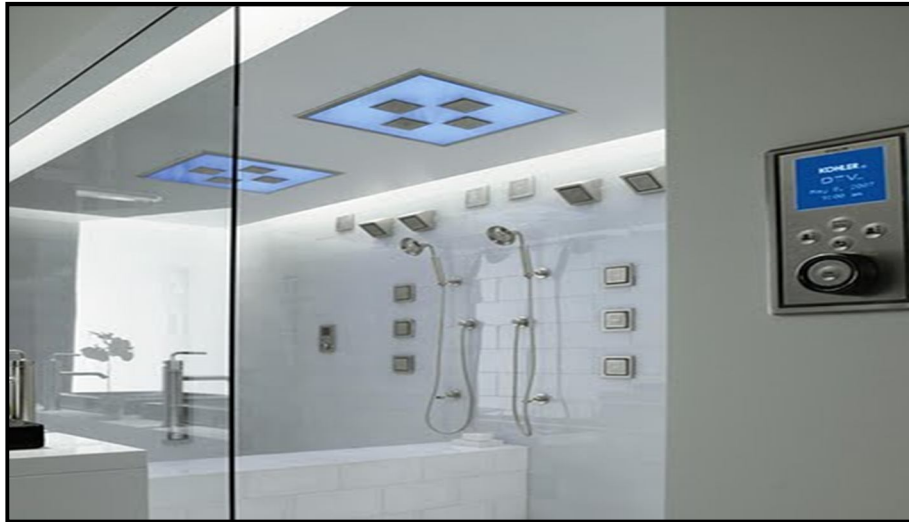


Figure 5: A view of the technology used in the decoration of bathrooms

An important element in creating a beautiful and perfect bathroom there is: suitable flooring, wall covering, use the fan with the proper authority to discharge steam cabinets to put towels and other accessories, variety of textures and colors display. All this set with the correct selection of the desired space you establish that you find peace.

### *D. Applications Of Nanotechnology In The Kitchen Decoration*

Refrigerators and washing machines antibacterial, containing polymer-based nanocomposites antibacterial and environmental causes kill bacteria, reduce pathogens and increased the shelf life of contents and fruits.

Hood, stove, cabinets, sink, dishwasher dirty anti-stain, by applying silica derivatives, modified the anti-smudge properties and significantly improved water and smudge effect and repelled from the surface is dirty.

The water treatment system, using polymer nanomembranes eliminate pollutant i in the water.

### *E. Nanotechnology Applications In The Living-Room Decoration*

Living room space that we spend most of your time there. So this room should be comfortable and fit our tastes, and we relax when we get there, give us a feeling of pleasure. The living room is not only a place for entertaining guests, but also a place to study, relax, listen to music and watch TV and more. So it is very important how to choose and sort it depends on the size of furniture in the living room. Low-emission glass; nanometer layer on the surface of the glass makes a striking reflection of infrared and ultraviolet-be. Heat insulating paint, this paint contains nanostructures and reduce heat transfer from hot to cold environment and protects from corrosion and fire. Air Purifier; Tytana of the device is based on the photocatalytic properties of nanoparticles. Curtains, sofas, rugs, waterproof and smudge; using the basic ingredients silica nanoparticles and Lotus properties on the non-woven industry.

### *F. The application Of Nanotechnology In WC*

Tiles and mirrors anti-smudge and water and applying the silica derivatives, modified and anti-smudge and water level significantly improved.

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Silent sewage pipes, sewer pipes consists of three layers is quiet middle layer is made of polymer nanocomposite.

Table 2: Factors in Construction

Nanotechnology	Industrial	Advanced Common	Traditional or conventional	Primary	Building method
					Effective factors
Very good (60 years)	Very good (55 years)	Good (25 years)	Average (25 years)	Low (10 years)	Life and durability (average)
Capital and management expertise	Specialized and capital	Common Knowledge	easy	Very easy	initial starting conditions
Excellent	Very good	Good	Average	low	Earthquake resistance
Least	least	low	high	Very high	need for unskilled labor
Low	Average	Average	Average	low	Semi-skilled manpower
Very high	Very high	high	-	-	need for skilled manpower
Average	Average	Average	amount required	low	Light machinery needed
Average	high	Average	-	-	Heavy machinery needed
Very high	high	Average	Average	low	Initial capital costs
and lower 10 – 14	24 – 14	20 – 28	24 – 34	40-50	Construction time (m <sup>2</sup> / h)
Excellent	Very good	good	-	-	Speed of installation
Good	Good	Good	Average	low	Cleared price
Low	low	Average	Good	Good	Coordination of architectural design and construction
Good	Average	Good	Very good	Good	Harmony with the environment

Anti-static flooring, anti-static properties by using nano ceramic particles and silica modified epoxy coatings decreased level of electric charge buildup.

Sanitary ware, the use of silver nanoparticles kill bacteria and unpleasant odors are caused supplementation.

### V. CONCLUSION

Since the bulk of the country's total energy consumption in the building sector and the use of energy management systems optimize energy consumption and thus saving the planning and optimization of energy consumption in throughput and costs as well as reducing power consumption significantly reduced, at the same time interaction correct with the environment in mind. Creating sustainable architecture and harmony with the climate, intelligent buildings and making them targets designers and builders with materials such as intelligent materials. Now technology to design and build intelligent buildings and smart materials are available with control systems. Smart materials usually referred to as a logical part of the trajectory of the development of more selective and more specific materials are to return. Smart materials are virtually inexhaustible power, they can respond to their surroundings changed so that natural materials (non-smart) is not capable of it. They are capable of positive developments in architecture, construction and lifestyle cause. Smart materials can change according to color or to generate electricity during the day and at night put it at our disposal and indirectly their energy from their surroundings. Access to new technologies, especially smart materials, paying particular attention by architects to design buildings with high durability against environmental conditions have been conducted and it is expected that the demand and utilization of smart materials, increased day by day. With the help of smart materials, buildings are future buildings that will be able to color, size and shape change in the exchange with their environment. Relying on demand using smart materials in the future and will have a significant effect on our buildings, our imagination in relation to the built environment as an architect surroundings and what they thought, to be positively will change. Access to new technologies on smart materials, special attention from architects to design buildings capable of high durability against environmental conditions have been conducted and it is expected that the demand and utilization of smart materials, increased day by day.

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