

# Sustainable materials and their impact on commercial interior design

**Prof. Amal Abd-ELkhaleq Mahmoud**

**Professor, Department of Interior Design and Furniture - Faculty of Applied Arts - Helwan University**

[amalawad2212@yahoo.com](mailto:amalawad2212@yahoo.com)

## Abstract

Modern trends in architecture and interior design invite to deal with the environment and its ecological system, with compatibility to the economic performance and social responsibility and behavior of preserving the environment, which is called today compatible or sustainable architecture. Environmental sustainability in architecture is a basic part of sustainable development and preservation of natural resources for the coming generations on earth. Concepts of sustainability is the planning to respond to climate by merging power quality, preserving natural resources and lower cost of activation, and the principles of limited wastes, also the use of ecofriendly sustainable materials. We are in a need to apply sustainable design and change traditional styles in design to more sustainable styles which will reflect positively on our lives, economy and environment.

Since the beginning of the nineties the focus has started on sustainability of materials and recycle waste materials to produce new products that rely on the same material, such as recycling of iron, aluminum, glass, paper, etc., then the process of manufacture of sustainable materials through reuse or remanufacture has turned into the most important means for waste disposal in an environmentally, economic and social safe way.

**The research problem** is in the presence of environmental issues, such as (burning rice hays), that enhance the necessity of recycling natural wastes. With the minimal use of environmentally sustainable materials in Egypt for creating contemporary interior design, **the research aim** is to highlight the significances and types of sustainable materials that are liable to be applied in commercial interior design and make it ecofriendly, with understanding and analysis of potentials of modern techniques in application of sustainable materials on contemporary commercial facilities, and will that be compatible with contemporary brand and trend or not?

## The research problem:

- The minimal use of environmentally sustainable materials in Egypt for creating contemporary interior commercial design.
- Interior commercial design in particularly related to brands lacks some elements of sustainable design.
- The low benefit of natural resources in the field of interior commercial design.
- The presence of environmental issues, that enhance the necessity of recycling natural wastes which can be inspiring for designers.
- Identification of sustainable design and role of interior designer to achieve sustainability.
- Highlight the most important materials of sustainable design materials in malls.
- Open new horizons for designers to create sustainable design solutions.

## The research significances:

- The desire to achieve sustainability in commercial malls.
- Use of recycled natural resources in creating new ecofriendly interior designs.
- Application of sustainable materials in interior design to achieve quality of internal environment.

**The research hypothesis:**

Use of renovated and sustainable materials in design of commercial spaces leads to improvement of the quality of internal environment.

**Keywords:**

Sustainability – sustainable materials- sustainable interior design- recycling

Sustainability is the most spread word nowadays; we keep on discovering many benefits for ecofriendly alternatives in our daily life as well as our professional and personal luxury. It leads to providing a high quality for the internal environment in the field of interior design. Sustainable design isn't limited to just finding recyclable natural materials to be used to decorate inner spaces, it is a lot more than that. Focusing on sustainable industry to provide new opportunities for creative interior designs and innovative startup companies that work on development of ecofriendly materials. Sustainability presents a huge share in any industry, definitely it has become a wise investment on the long run. It doesn't only mean reducing carbon print in the commercial project but it is also related to cost reduction through power quality and create value for residents who will enjoy healthier and more relaxing environment to spend time in, which is considered a strong tool that must be put into consideration from marketing perspective, which could create loyalty for the brand, which is a major deal for those brands that work excessively on diversifying their offers to cover large sectors of the targeted audiences and follow up with the residents from early stages of life till further stages in their professional careers and lives. The responsibility of applying standards of sustainability relies in the hands of architect, constructor and interior designer through their understanding for standards of sustainability and the relation to the design of commercial malls.

**Brands that works in the field of interior design with the concept of sustainability:**

Some brands adopted sustainability as its own mission, some companies have developed amazing products for interior design that are all about the concept of sustainability, some other companies follow an unfamiliar and different way. Thanks to the paid attention for the ecofriendly attitude today, new credited solutions are extremely diversified, whether through new techniques, recycling, and highly developed researches about raw materials, interior designers now have a variable group of choices that was never witnessed before.

**Aectual:**

It is a company that offers a number of professional solutions to its clients for design pieces at any size through 3D printing or additional manufacture, (website no.2). Aectual provides among its products a number of choices, starting with flooring, till sound and décor panels, screens, columns, architectural elements even for exterior facades, and more. Using a different approach as Aectual products are produced from bio or recycled materials through neutral waste free production processes.

**Vinterior:**

It is not a production company but it is an internet platform that promotes independent companies by saying “we believe in everything that the old style represents”, it is easy to determine the message of the brand and its importance in introducing a different path for interior design, most importantly; it can help us move away from mal practices in the industry, with enhancement of individuality through high quality chosen products. Vinterior indirectly doesn't encourage buying a high production furniture, this approach doesn't only encourage taking care of each piece when it comes to interior design, but also encourages more sustainable practices.

**Principles of sustainable interior design:**

Environmental sustainability is considered a part of the cause of global sustainability that occupies the minds of many scientists and researchers in all fields. As interior design deals with important elements that are considered the main axes for sustainability which are (environment-economy-society), sustainable design thought has to deal with such elements with locality, quality and precision in order to achieve sustainability in interior design and maintaining the required environmental balance.

**Recycling:**

The first principle is recycling, its definition (adapt to a new use), while the American agency for protecting the environment identifies recycling as “a process for collecting and treating disposable materials and wastes and convert them into new products” (Haya and Diana-2018).

**Transparency:**

It means questioning and following, recognition of production processes and source of raw materials, it has become a main word in many industries as techniques such as blockchain for companies has allowed (it is a technique that allows I cloud storage and distributed database with advantages of data integration and documentation with less troubles in performance, quality and cost).

**Natural design “biophilia”:**

Self-calmness and sense of safety and security is near nature, the closer to nature the more stable the self and vise versa, the further the more irritation and tension, that’s why horizontal extension of buildings is more humane and soothing than the vertical one. One of the intellectual schools announces more than the others many principles resulting from sustainable interior design that is called biophilic bio design, and the official speaker for this trend is (Oliver Heath).

**Sustainable materials used in interior design:**

Sustainable materials are the ones that are built and can achieve 3 advantages which are (environmental-social and economic) and being local and natural and its use doesn’t lead to health problems, isn’t toxic and chive, renewable, recyclable and reusable, low power consumption with minimal waste. (Hossam Al- Werdany -2010, p76)

**Metals:** construction workers push a huge amount of raw metals in the field of construction, most of those materials are composed of sand, silt, stones and rocks, in addition to other processed materials such as steel (Heba Abd Al- Mohsen- 2000 AD- p28).

**Various woods:** wood is a basic and good building material in interior design, it is a sustainable one as well, with many types such as (oak, Aro, beech, bamboo, and formaldehyde free layered wood).

**Palm leaves:** humans acquire food and medicine from palms, from their roots and branches they make homes and other multiple industries, it has become a source of fortune in the middle east, many parts of the plant can be used such as palm leaves and wickers and also the fruits.

**Bamboo:** it is a type of giant wood with hollow wooden roots divided into nubs, it is considered sustainable as it grows fast (it is actually grass not a tree), renewed rapidly and its production requires less power than wood, and it is of multiuse.

**Rattan:** the modernist ecofriendly material nowadays, it resembles bamboo in being of multiuse.

**Enhanced gypsum:** to achieve a concrete look that doesn’t contain the environmental influences of a concrete wall is truly remarkable, the 4 finishing that must be looked for are: clay plaster, micro cement, tadelakt, lime wash.

**Corian:** it is a plastic substance produced by DuPont company in Europe along with many other companies, it is a derivative of Bauxite and composed of acrylic polymer and Alumina Trihydrate. It is not a new substance anyway; it has been existing since 1967.

**Bluesint PA12:** 3D printing or additional manufacture has become widely spread more than ever, it is involved in many sectors, and is realized by different groups of materials, and has a positive effect on the industry of interior design especially the sustainable one.

**PaperStone:** is a surface substance that was launched by the British CDUK, it is a paper compound related to natural resin, recyclable especial paper accredited by FSC.

**Flex floor:** it is a flexible substance that was developed for floors by Mogu, it is highly resistant, so it fits highly crowded halls and passages, 67% of it is obtained from organic wastes such as sea shells and coffee remains, it is also solvents free and recyclable.

**SeaStone:** it is another sustainable flooring substance, produced from 7 million tons of sea shells that are being dumped yearly by fishing industries and seafood and aquatic agriculture.

**Airlite:** is a sustainable paint made 100% of metals and is being shipped as powder and doesn't contain volatile organic compounds while being on site, water can be added then the paint is ready to be applied.

**Kvadrat Really:** Kvadrat is a Danish company (website no. 15), it was founded in 1968, it recycles wastes of cotton and wool to create different materials including audio felt of textile and hard panels used in interior design, furniture and construction.

**Vinly Flooring:** modern researches are directed to produce natural flooring tarpaulin made of natural components to handle moisture, bacteria and temperature. Natural linoleum was achieved; its commercial name is Mamoleum. One of the reasons for the demand of natural flooring linoleum is the looking for alternatives for oil based products that have polluting chemical emission.

**Foresso (Terrazzo Flooring):** there is a special philosophy adopted by Terrazzo Timber the British company that produces Foresso, this substance is obtained as the Airlite without the volatile organic compounds, using only wood pieces and food remains.

**StoneCycling:** this Dutch company was established in 2011 for the aim of recycling buildings wastes out of old buildings, according to the company StoneCycling; it represents only 30% of the total waste resulting only from Europe, in addition to that industry of construction and building is one of the main reasons for production of carbon dioxide in the world.

**Eco- Friendly Aluminum:** it causes a change in interior design, it has become the favorite substance in green design, it is not limited to being of lowest cost but also quality in power use and sustainability, aluminum also adds elegant and modern appearance on any design.

**Smile Plastics:** recycling of plastic wastes and yogurt packages using an innovative technique to create a new safe material by the company Smile Plastics that puts it in the surface of its wooden panels with an area of 1\* 2 m, to get maximum benefit out of it.

**Cork:** many trends appeared to use it in flooring and in manufacture of natural insulators, it is extracted from phloem of cork oak trees, it is a light spongy material that doesn't absorb water easily.

**Plants to purify internal air:** real plants are necessary almost in all interior, they act according to type and size for air purification of pollutants and moisturizing.

#### **Other types of sustainable materials:**

**1- Bio Materials:** such materials are produced from renewable energy resources, and they are considered out of the most highlighted materials recently, such as the use of CO<sub>2</sub> in biodegradable plastic production. Plastic is considered biodegradable if it can be decomposed into water and carbon dioxide and biomass within a certain time frame, (depending on different criteria).

**2- Smart Materials:** these substances are characterized by being able to change its outer appearance or color when subjected to external stimuli (physical or chemical) with the

possibility to return back to its genuine state easily when such stimuli are removed. Smart materials are resulting from interference of traditional substances with accurate electronic systems, such interference created a revolution in materials and caused it to respond to changes that are happening around them and interact with them with what fits its function.

3- **Power saving types:** with the crises of energy depletion that the world is witnessing now, studies are directed to look for economic means in power consumption using appropriate materials to cover facades. Most studies focus on finding new materials suitable to be able to maintain power, store it and release it when needed.

**Smart sustainable materials:** complication of required performance standards to design furniture or interior compositions requires more materialistic solutions that provide extra functions and interactive quality, such as air cleaning tiles in kitchens and bathrooms, light transferring wood for domestic use, concrete surfaces with touch screens. Such groups of substances currently are called (smart materials or multifunctional materials).

**Sustainable materials in commercial malls:** sustainability in interior design is an accelerated concept that is aiming to limit the environmental effect through continuous use of recyclable materials and energy saving devices, as well as green practices, sustainable design isn't a square that must be checked once, it is a new way to deal with how we interact with the environment. Interior designer can create practical and beautiful areas with consideration to environmental influence as well, through the use of long term materials from responsible resources, companies can have interior designs that carry brand with lower ecological footprint, in addition to finding furniture and compositions that meet standards of sustainability.

## Results:

- 1- The concept of environmental sustainability appearance at malls leads to providence of more comfortable and safer environment.
- 2- Sustainable practices are applicable on almost all interior design projects.
- 3- Sustainability standards that should be applied are modeled in appropriate lighting, heat, moisture, airing, quality and availability of water, security services, use of ecofriendly materials, use of renovated natural resources, in interior designs and smart system application in commercial design.
- 4- In order to apply sustainability in design of stores, green electricity must be used through solar panels on the roofs of shops or use of wind energy from the net.
- 5- Observation of guiding principles for sustainable buildings linked to interior design, that focuses on power improvement, prioritizing natural lighting and ventilation as an alternative to reducing its consumption, in addition to identifying recyclable materials from renewable resources.
- 6- Combine sustainable practices with architecture and interior design can elevate power use in a building and reduce wastes.