



Measuring the awareness of architects and designers of modern materials and their role in enriching interior architecture

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Abstract

The research deals with the importance of measuring the architect's awareness of modern finishing materials and their efficiency in using them in interior spaces to achieve efficient use and enrich the interior architecture. The research uses the descriptive approach in the first axis, which deals with the definition of the meaning of the inner space and how it is perceived by the user, and the second axis, which deals with the definition of modern raw materials, then the analytical approach in the third axis within the framework of analysing the development of building materials and studying the relationship between them and the designer's awareness of these materials through a questionnaire in order to improve the quality of interior architecture, enriching it aesthetically, and raising the efficiency of employing finishing materials. The research concludes that there are some finishing materials that architects know well, such as iron, plastic, and epoxy, and they use them in their designs for executive reasons and not for aesthetic or design reasons.

There are some finishing materials such as fiber cement, anodized aluminum, and aluminum foam. A few architects and designers know them, and when they knew them from the questionnaire, they intended to use them in their

ENGINEERING JOURNAL Volume 2 Issue 2

Received Date January 2023

Accepted Date March 2023

Published Date March 2023

DOI: [10.21608/MSAENG.2023.291868](https://doi.org/10.21608/MSAENG.2023.291868)

designs for aesthetic and design criteria. By publishing research on modern finishing materials, we raise the awareness of architects and interior designers with these materials, which helps to enrich architecture

Keywords: Finishing materials–architects awareness, enriching architecture.

1. Introduction

Finishing materials are included in the formation of voids and affect their aesthetic form, as they are the most influential elements in the shape of the void and the user's acceptance of it, where it plays an important role in space formation and the general impression of it. Choosing the right raw materials helps in achieving efficient use of materials and not wasting them. Also, the technological development in materials technology has resulted in modern developed materials and raw materials, aimed at the improvement and preservation of the environment and energy, in addition to the creative aspect in the design and implementation process to achieve modern designs. commensurate with the requirements of contemporary society, and the main goal of architects and designers has become to employ and exploit the technology available to serve architecture and its purposes, through design, implementation, and compatibility of integration between them, and some designers have used these mutations to find a new architectural language commensurate with the era, including innovation and creativity that was not It, was easy to find in previous periods.

1.1. Research problem

Use Significant and rapid developments occurred from the beginning of the second half of the twentieth century, which are continuing until now, in all aspects, especially in the field of architecture. These developments were evident in finishing materials (building materials in general). And in the past, the designer was interested in developing building materials, so whenever there was a development in life, it was accompanied by a development in architecture, and we see this clearly in all previous civilizations. The great development taking place now has enriched the imagination of some designers, but despite this, we sometimes see a failure to achieve the minimum level of efficiency in the use of finishing materials in interior architecture.

1.2. Research hypothesis:

- 1- Studying the latest finishing materials to raise architects' awareness of their importance to achieve effective use.
- 2- Architects' awareness of the criteria for selecting modern materials in finishes achieving high aesthetic, economic, and environmental competitive values

1.3. Page Research themes:

- 1- Characteristics of architectural spaces, their design requirements, and how the user perceives them.
- 2- Explanation of modern finishing materials and the importance of using them in enriching the interior architecture.
- 3- Measuring the awareness of designers and architects of modern materials and knowing the criteria for their use.

1.4. Research objectives:

- 1- An inventory of the most important modern finishing materials.
- 2- Measuring standards for using modern materials in interior architecture.

1.5. Research methodology

- 1- The inductive approach by studying the importance of the architectural space and then makes a list of the latest interior finishing materials.
- 2- The experimental approach is conducting a questionnaire to explore the designers' awareness of modern materials.
- 3- The analytical approach by analyzing the results of the questionnaires.
- 4- The deductive approach by deducing a mechanism to raise designers' awareness of modern materials.

2. Introduction

Place Significant and rapid developments occurred from the beginning of the second half of the twentieth century, which are continuing until now, in all aspects, especially in the field of architecture. These developments were evident in finishing materials (building materials in general). And in the past, the designer was interested in developing building materials, so whenever there was a development in life, it was accompanied by a development in architecture, and we see this clearly in all previous civilizations. The great development taking place now

3. Architectural spaces

The architectural space is a product of the design process and derives its importance from being the first incubator for all human activities of all kinds. Architecture can be defined as an applied art that gives a social and human product that achieves function and beauty, and is produced by the architectural designer, who is considered a main axis in his person and his knowledge of art, science, and the conditions of the age and society. The social dimension also plays a major role in directing the architectural design, to reach an architectural product that fulfils human purposes and life requirements through spatial and temporal means closely related to the life of the group, and subject to social influences, natural factors, climate, and design. Their actual needs are in the form of satisfactory architectural solutions that provide an intellectual and practical balance for the success of the project to be achieved, and the first step of the designer's work is to identify and understand the requirements and tastes of all people. Architecture is not the space itself, but its containment [1]

3.1 Determinants of architectural space:

[2] identified in his book the horizontal and vertical determinants for defining the architectural space, where he classified them into floors and ceilings as horizontal determinants and vertical columns and walls as vertical determinants. And the elements of the architectural void, which are the surrounding surfaces and structural elements

Surfaces play a major role in distinguishing the void, as they represent the box in itself, but the void constitutes the content. The floors are distinguished by their ability to define the shape of the void, and the ceiling also has the same character even without surrounding walls and gives a sense of continuity, while the walls give a sense of closure or continuity. Also [2] classified architectural spaces into three categories: the internal space, the external space, and the transitional space. And in the next part, we will talk about internal spaces.

4. The inner space

The inner void is part of the outer public void with specifications and limitations, so that man can practice his various vital activities in it. The nature of the space affects and is affected by the activity that takes place inside it, as well as its size, its design form, and its relationship to the external public space surrounding it [3].

4.1. Properties of the inner space

The interior architectural void characterize by a set of features and characteristics mentioned

- Material nature
- Dimensional qualities
- Psychological information
- Function

4.2. Requirements for the design of the architectural space

The design of the interior space requires several requirements

- Functional requirements
- Human requirements
- Structural requirements
- Aesthetic requirements

4.2.1 Functional requirements: Include

- Achieving the basic function by matching the part with the whole, the whole with the general
- Material efficiency for functional performance
- Security and safety for motor performance
- Subjecting the dimensions of space to the dimensions of human need
- Adaptation between the method of use and the type of user

4.2.2 Structural requirements: it includes

- The suitability of the material for direct user handling
- Consider environmental climate factors when selecting the material
- The performance efficiency of the materials used in the internal space

4.2.3 Humanitarian requirements: these includes

- Consider the user's mental, muscular, and motion abilities
- Observance of human body measurements in every movement, along with measurements of internal space
- Aesthetic requirements: these includes
- Consider choosing the dimensions of the internal spaces and furnishing them in a way that achieves the aesthetic proportions
- Adapting the aesthetic appearance in a manner commensurate with the culture and environment of the community
- Choosing the suitable materials [4]

4.3 Human perception of emptiness and its materials

Perception is what reaches a person as an inference from information that exists around him in the external environment. It is formed in our memory as a result of dealing with the outside world. So the ability to evaluate or make a comparison between two subjects must be preceded by initial impressions. The architectural space is not a purely artistic process, but rather a place where people live, use, interact with and analyze their spaces. Thus, perceiving emptiness visually is a multidimensional experience and aspects between man and emptiness. Many theories explain the user's cognition process, such as Gestalt theory, interactive theory, and predictive theory [5]. *This* leads us to talk about the importance of modern finishing materials in the interior spaces

5. Modern materials and their impact on the inner space

The study of new materials for inner spaces has great importance, as it is specialized in interior design. By studying the elements that make up the interior spaces of the building, from formal and functional treatments for ceilings, walls, and floors, as well to the contents of the furnishing, the interior design is concerned with researching the physical composition of the materials that make up these elements, their quality, and their perceived sensory impact, such as color, texture, and shape, and determines the relationship of these elements to each other, so the designer procedure. It interacts with the interior design that achieves an aesthetic and functional performance that is compatible with the architectural design with all its straight and curved lines and other lines, hence the importance of using appropriate materials to achieve this, and modern materials have contributed to achieving a link between architecture and interior design in contemporary buildings and a functional manner. Modern designs are an endless source of inspiration for the designer. The colors of the materials, their surface value, and other characteristics may suggest to the designer many and varied innovations for the interior spaces, which prompts the designer to discover modern technical treatments easily [6].

5.1 Types of materials

The finishing materials are natural. A person may impose an amendment, albeit to varying degrees, on materials from what they are in their form primary [7]

5.1.1 Natural material

Natural materials remain unaltered unless modifications are required surface for their use. stone, and wood, for example, can be used in their image but they are usually converted to other forms according to the different fields of use, The stone that is extracted from the quarries is cut into the form of blocks, while the trees are cut into blocks Wooden blocks turn into slabs of standard shapes and dimensions

5.1.2 Processing material

By transforming natural materials, we get unique shapes, which are the processed raw materials For practical uses, the clay material acquires different properties and is prepared

for various uses When it is converted by burning into bricks and tiles, as for sand and gravel, when You mix them with cement and they turn into concrete, which is a kind of artificial stone that can Casting it in the form of a block and arming it with solid skewers placed inside it, or forming it in the form of molds It is similar to the stone extracted from the quarries, and the wood can be cut in the form of slices Thin veneers or veneer layers can be glued together to make plywood Types of ores to processing to extract them from the ore (their primary structure), technology, and perhaps They are combined into ingots and then formed into thin sheets, tubes, or rolled sections molded, or otherwise.

5.1.3 Synthetic material

These raw materials do not exist in nature, but they are created or manufactured by industrial processes Glass is one of the oldest industrial materials and is made by exposure to sand and several other elements As for plastic, which is the most common modern industrial raw material, it is made of several Chemicals, most of which are derived from petroleum, can be mixed with industrial materials to reach into hybrid materials such as fiberglass

5.1.4 Interactive smart material

It is a group of raw materials that have specific properties that can change from their external properties Or its shape or color, depending on the change in the surrounding environment in terms of changing the temperature or strength lighting, and can return to its original state when this emergency effect is removed

5.1.5 Nanomaterial

It is an innovative type of compound and ores that resulted from the use of nanotechnology in nanotechnology changing the outer surface of some compounds, resulting in new properties of materials to reduce the size of the atoms that make up the materials [8]

5.2 Criteria for selecting finishing materials

To choose a group of raw materials for a specific purpose, one must know all the properties of the selected materials and the criteria necessary for their selection. Criteria for selecting raw materials as finishing and finishing materials [6].

5.2.1 Functional criteria

- Suitability for the purpose of use
- Durability to handle its function
- Easy maintenance
- Damage and storage resistance
- Security properties
- Vocal performance

5.2.2 Aesthetic criteria

- Availability of the required colors
- Texture
- The possibility of creating graphics and shapes
- Visual suitability for the intended function

5.2.3 Economic criteria

- The initial cost
- Permanent cost in terms of expected durability and cost for maintenance and cleaning.

5.3 Material properties:

The raw material in terms of shape, form and texture are very important for designers. New innovative materials, through their new properties and specifications, help realize the new ideas of interior designers as shown in fig.1.

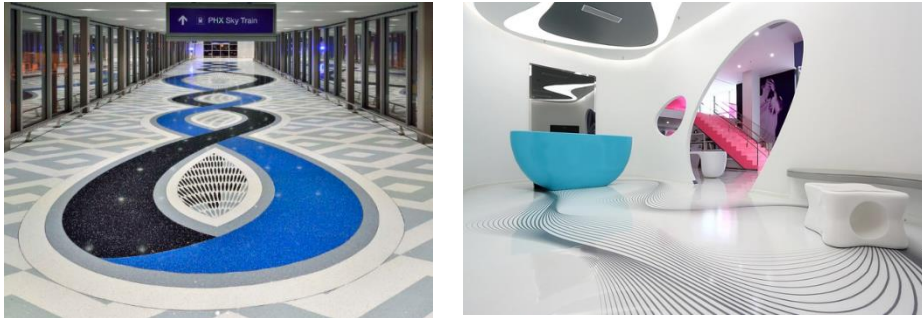


Fig. 1 New Designs
Reference: [9]

5.3.1 Design characteristics:

Design characteristics are related to the shape, color, and texture of the material. Modern materials help designers achieve their innovations and designs as they want them

5.3.2 Technical characteristics:

The development of modern technologies has had a great impact on finishing materials, as the machine has become computer-driven instead of the designer to carry out drawing, engraving, carving, cutting and lathe with an accuracy that reaches miraculous. One of the most important features of modern finishing materials is their ability to deal with modern technologies and their ease of adaptation

5.3.3 Executive characteristics:

Modern materials have opened wide scope for the designer to provide easy and fast practical implementation solutions. For example, it was difficult to clean the glass facades of buildings in the past, unlike now, which uses a modern type of glass that does not hold dust.

5.3.4 Expressive and philosophical characteristics:

It is the aesthetic and sensory values in terms of color, shape and texture of modern finishing materials. We note here the huge diversity because of the technology. From one material, the designer can produce many shapes out of it, such as controlling the thickness and reducing the weight to make the most of the transparency and permeability of the material.

5.3.5 Environmental characteristics:

After governments became aware of the increasing consumption of natural raw materials, two trends emerged. The first of them is the attempt to discover alternative raw materials for natural materials. Indeed, modern materials such as artificial marble and printed cement have appeared. The second trend is the recycling and reuse of materials such as metal, paper, plastic and glass

5.3.6 Formative characteristics:

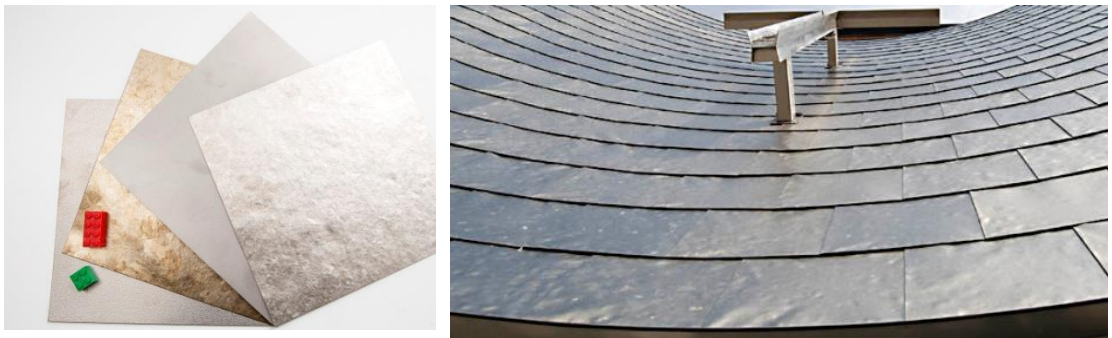
The flexibility of formation is evident in modern materials due to the ease of dealing with them in terms of formation, which were characterized by light weight, precision manufacturing, small thickness and durability [10]

5.4 The most important modified and modern finishing materials:

The raw material is the material before any formation takes place. It is defined as everything material and endowed with the quality of survival, whether from natural materials or industrial materials. The architect was influenced and influenced by modern materials, which sometimes became a support for his innovations and a source of his new ideas.

5.4.1 Architectural Titanium:

With the advent of digital technologies, a new employment of many materials has appeared, including titanium, to play an effective role in architecture and interior design. The excellent corrosion resistance of architectural titanium results from the formation of a very stable, continuous surface. Because titanium metal itself is highly reactive and has an extremely high affinity for oxygen, a beneficial oxide film forms immediately when exposed to moisture or air. In fact, a damaged oxide film will restore itself instantaneously. In table 1 extra information about Titanium and its properties encourage architects to use it widely [6]. The next figures (Fig. 2) are examples for using Titanium in architecture indoor spaces or as a cladding



(Fig. 2) Examples for using Titanium in architecture
Reference: [11]

Table1. Titanium properties

The next table describes Titanium sensorial and technical properties

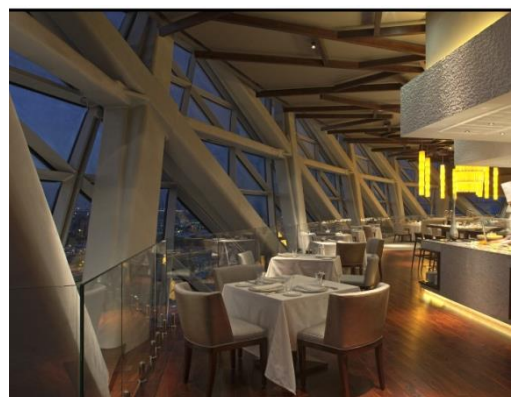
SENSORIAL		TECHNICAL	
GLOSSING	VARIABLE	FIRE RESISTANCE	GOOD

TRANSLUNCESS	0%	UV RESISTANCE	GOOD
STRUCTURE	CLOSED	WEATHER RESISTANCE	GOOD
TEXTURE	SMOTH	SCRATCH RESISTANCE	MODERATE
HARDNESS	HARD	WEIGHT	LIGHT
TEMPERATURE	COOL	CHEMICAL RESISTANCE	MODERATE
ACOUSTICS	POOR	RENEWBLE	NO
ODOUR	NONE		

(<https://materialdistrict.com/>)

5.4.2 Steel:

Architects used steel in contemporary architecture as it made it easy for them to accomplish their designs and innovations. And it is represented in the use of steel instead of reinforced concrete in the construction of the "skeleton" of the building, and with the beginning of the use of steel it appeared more evident in skyscrapers and other huge buildings, and steel is very common, so that some do not distinguish it from iron, but if steel alloys contain iron practically In general, the reason for the mechanical resistance and hardness of steel is due mainly to carbon, whose percentage in steel is 2%, while other metals have percentages from 1% to 5% (such as chromium, molybdenum and nickel) to enhance the hardness of steel, or its resistance to corrosion the major part of the interior space and an element of the interior design, as shown in the figures. Its use of steel has increased recently in interior design, because modern technologies have helped it has the ease of formation, bending, mechanical bonding or drawing on surfaces, discharging and painting to protect against corrosion, which made it easy to be used easily in architecture externally and internally. The steel industry has developed and has lighter and stronger products, more durable, smarter, more resistant and longer lasting. In table2 extra information about Steel and its properties encourage architects to use it widely. The next figures (Fig. 3) are examples for using Steel in architecture indoor spaces or as a cladding [4].



(Fig. 3) Examples for using Steel in architecture

Reference: [11]

Reference: [9]

Table2. Steel properties

The next table describes steel sensorial and technical properties

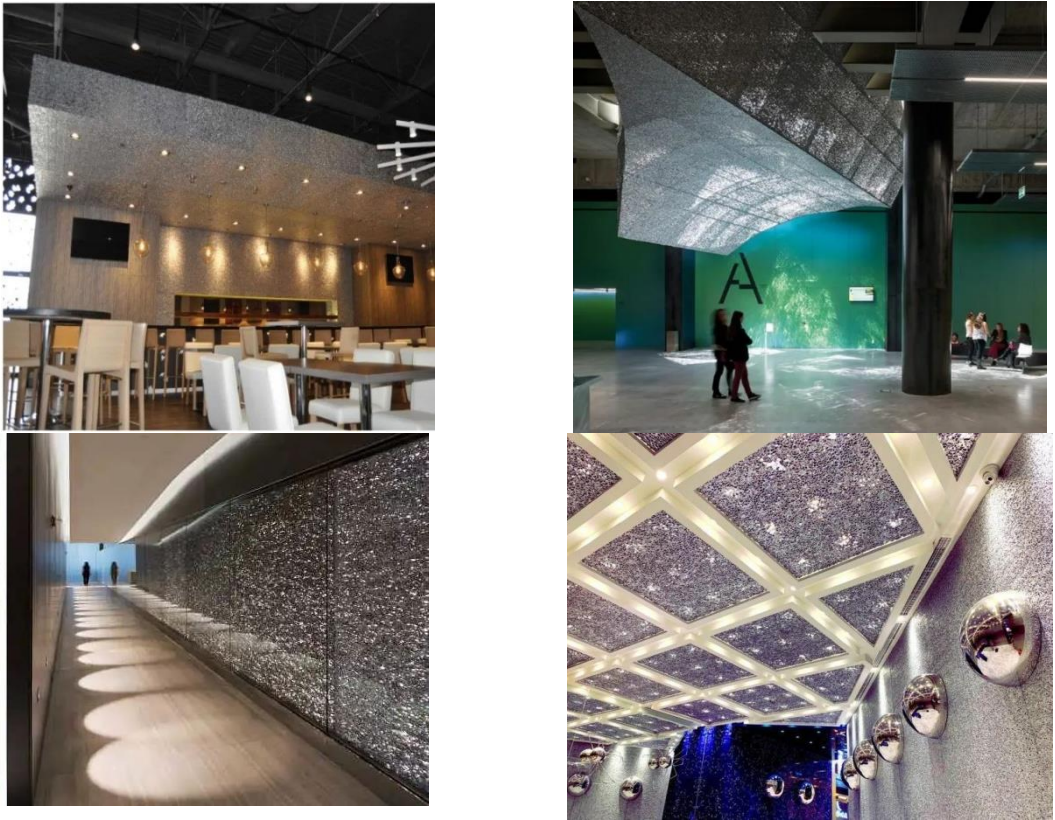
SENSORIAL		TECHNICAL	
GLOSSING	VARIABLE	FIRE RESISTANCE	GOOD
TRANSLUNCESS	0%	UV RESISTANCE	GOOD
STRUCTURE	CLOSED	WEATHER RESISTANCE	GOOD
TEXTURE	VARIABLE	SCRATCH RESISTANCE	GOOD
HARDNESS	HARD	WEIGHT	MEDIUM
TEMPERATURE	COOL	CHEMICAL RESISTANCE	GOOD
ACOUSTICS	GOOD	RENEWBLE	NO
ODOUR	NONE		

[11]

5.4.3 Aluminium Foam:

Research into and development of aluminium foam has made enormous progress in recent years. From being a laboratory material about which in the last ten years few scientists were fully informed, aluminium foam has definitely made the leap to industrial application. The number of different types of aluminium foam has risen exponentially. Each type has its own specific properties, properties which make it unique and make possible completely new product applications. Aluminium foams are pre-eminently suitable for applications which are innovative and revolutionary. In table 3 are extra information about Aluminium Foam and its properties encourage architects to use it widely [11].

The next figures (Fig. 4) are examples for using Aluminium Foam in architecture indoor spaces or as a wall cladding.



(Fig. 4) Examples for using Aluminium foam in architecture
Reference: [12]

Table 3. Aluminium foam properties

The next table describes Aluminium foam sensorial and technical properties

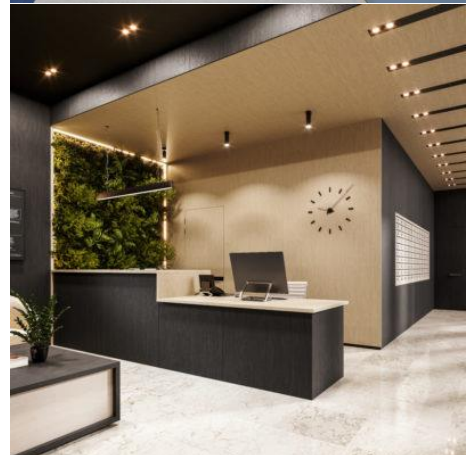
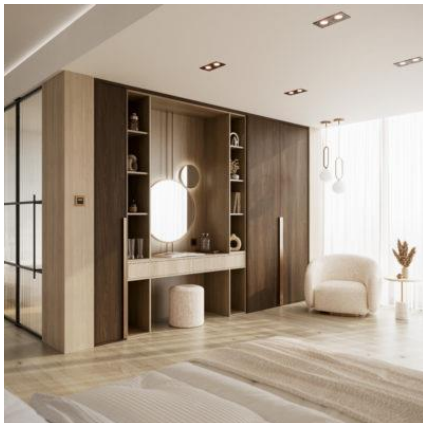
SENSORIAL		TECHNICAL	
GLOSSING	GLOSSY	FIRE RESISTANCE	GOOD
TRANSLUNCESS	0%	UV RESISTANCE	GOOD
STRUCTURE	CLOSED	WEATHER RESISTANCE	GOOD
TEXTURE	COARSE	SCRATCH RESISTANCE	GOOD
HARDNESS	HARD	WEIGHT	LIGHT
TEMPERATURE	MEDIUM	CHEMICAL RESISTANCE	MODERATE
ACOUSTICS	MODERATE	RENEWBLE	NO
ODOUR	NONE		

[11]

5.4.4 Plastic in architecture:

Plastic is a contemporary, durable and high-performance material. It is easy to machine, to design with, to clean and maintain and it combines effortlessly with other materials. Typical applications include wall panel, doors, cubicles, furniture, worktops and more.

The next figures (Fig. 5) are examples for using Plastic in architecture indoor spaces or as a wall cladding.



(Fig. 5) Examples for using Plastic in architecture
Reference:[11]

Table 4. Plastic properties

The next table describes Plastic sensorial and technical properties

SENSORIAL		TECHNICAL	
GLOSSING	GLOSSY	SCRATCH RESISTANCE	GOOD

TRANSLUNCESS	0%	CHEMICAL RESISTANCE	MODERATE
TEXTURE	COARSE	RENEWBLE	NO
HARDNESS	HARD		
ODOUR	NONE		

[11]

5.4.5 Epoxy in Architecture:

Epoxy resin-based floor finishing with mineral additives. Available in various colours, they are suitable for use as a durable, seamless finish on cement and plaster-bonded substrates as well as tile floors. Resin Screeds are intended for use as a floor finishing in industrial buildings, slaughterhouses, commercial kitchens, workshops and locations where high demands are placed on floors in terms of their mechanical load-bearing capacity, chemical resistance and hygiene. The next figures (Fig. 6) are examples for using epoxy in architecture indoor spaces.



(Fig. 6) Examples for using Plastic in architecture

Reference: [9]

Table 5. Epoxy properties

The next table describes Epoxy sensorial and technical properties

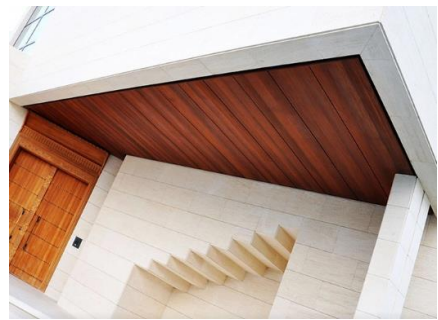
SENSORIAL		TECHNICAL	
GLOSSING	VARIABLE	FIRE RESISTANCE	GOOD

TRANSLUNCESS	VERIABLE	UV RESISTANCE	MODERATE
STRUCTURE	CLOSED	WEATHER RESISTANCE	POOR
TEXTURE	COARSE	SCRATCH RESISTANCE	GOOD
HARDNESS	HARD	WEIGHT	HEAVY
TEMPERATURE	COOL	CHEMICAL RESISTANCE	GOOD
ACOUSTICS	POOR	RENEWBLE	NO
ODOUR	NONE		

[11]

5.4.6 GRP IN Architecture:

(Fibre) Glass-reinforced plastic (GRP) is a state-of-the-art construction material that is an alternative to traditional materials such as concrete, steel and wood. The companies offer profiles, gratings, planks and brackets. Products can be supplied individually and unmachined, or machined according to recommended specifications. They can also be supplied ready for on-site installation. The next figures (Fig. 7) are examples for using GRP in architecture indoor spaces.



(Fig. 7) Examples for using GRP in architecture

Reference: https://www.archdaily.com/catalog/us/products/10621/grp-siding-facade-system-technowood/97816?ad_source=neufert&ad_medium=gallery&ad_name=next_image

Table 6. GRP properties

The next table describes GRP sensorial and technical properties

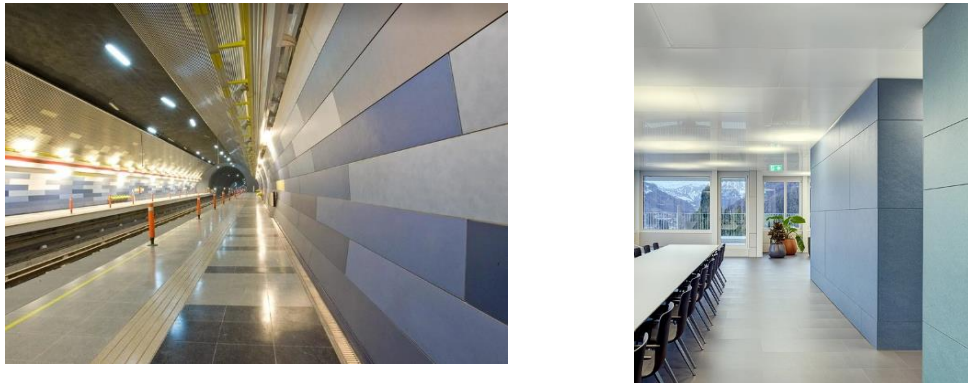
SENSORIAL		TECHNICAL	
GLOSSING	SATIN	FIRE RESISTANCE	GOOD
TRANSLUNCESS	0-50%	UV RESISTANCE	GOOD
STRUCTURE	OPEN	WEATHER RESISTANCE	GOOD
TEXTURE	SMOTH	SCRATCH RESISTANCE	GOOD

HARDNESS	HARD	WEIGHT	LIGHT
TEMPERATURE	MEDIUM	CHEMICAL RESISTANCE	GOOD
ACOUSTICS	MODERATE	RENEWBLE	NO
ODOUR	NONE		

[11]

5.4.7 Fiber cement panel:

Fiber Cement boards developed in friendly environmentally manner and available as “Tongue and Groove” panels. The core is cementations based backer board with a recycled fiber cement mix top layer. The secret of these panels is a special oil layer, to improve quality. Also special glue was used to safely and strongly bond the layers. The glue is 3 mm recycled rubbers granulate. The result is a weather and fire-proof board that stays mould free. The next figures (Fig. 8) are examples for using Fiber cement in architecture indoor spaces or as a cladding



(Fig. 8) Examples for using Fiber cement in architecture
Reference: [9]

Table7. Fiber cement properties

The next table describes Fiber cement sensorial and technical properties

SENSORIAL		TECHNICAL	
GLOSSING	MATTE	FIRE RESISTANCE	GOOD
TRANSLUNCESS	0%	UV RESISTANCE	GOOD
STRUCTURE	CLOSED	WEATHER RESISTANCE	GOOD
TEXTURE	MEDIUM	SCRATCH RESISTANCE	GOOD

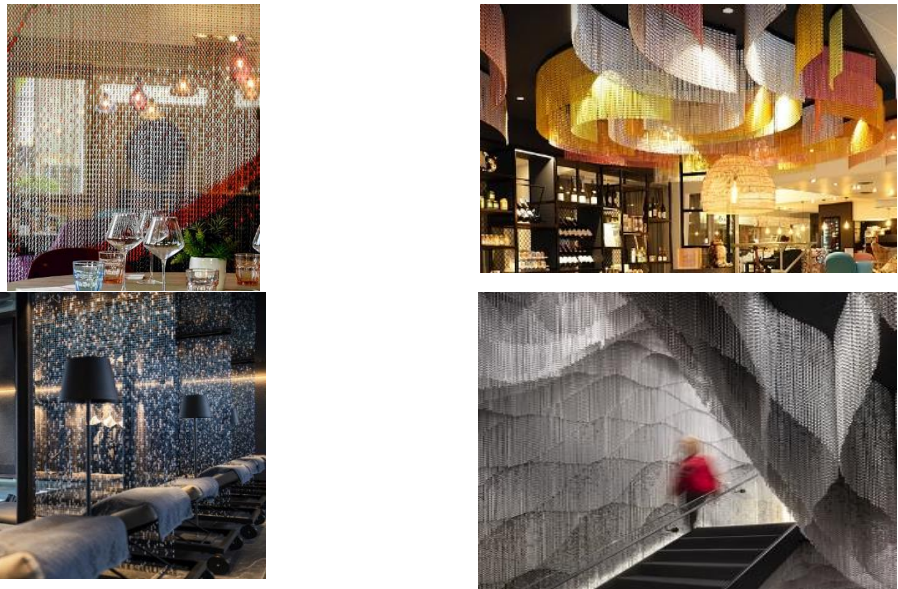
HARDNESS	HARD	WEIGHT	HEAVY
TEMPERATURE	COOL	CHEMICAL RESISTANCE	GOOD
ACOUSTICS	GOOD	RENEWBLE	YES
ODOUR	NONE		

[11]

5.4.8 Anodized Aluminium:

Anodizing is an electrochemical process that converts the metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish. Aluminum is ideally suited to anodizing. The material can be used in many applications including:

- Fashion: clothing, accessories, jewellery, inlays...
- Theatre: costumes, curtains, light screens, back drop...
- Lighting: shades, sculptural elements, light screens
- Architectural: curtains, screen dividers, canopies, cascading water fall treatments, light columns. The next figures (Fig. 9) are examples for using Anodized Aluminium in architecture indoor spaces or as a cladding [13].



(Fig. 9) Examples for using Anodized Aluminium in architecture
Reference: [9]

Table8. Anodized Aluminium properties

The next table describes Anodized Aluminium sensorial and technical properties

SENSORIAL		TECHNICAL	
GLOSSING	GLOSSY	FIRE RESISTANCE	POOR
TRANSLUNCESS	0-50%	UV RESISTANCE	GOOD
STRUCTURE	CLOSED	WEATHER RESISTANCE	MODERATE
TEXTURE	SMOOTH	SCRATCH RESISTANCE	GOOD
HARDNESS	RESILENT	WEIGHT	LIGHT
TEMPERATURE	MEDIUM	CHEMICAL RESISTANCE	POOR
ACOUSTICS	MODERATE	RENEWBLE	NO
ODOUR		NONE	

[11]

6 Measuring the awareness of architects and designers of modern materials and their role in enriching interior architecture (Applied study):

The aim of using modern finishing materials is to keep pace with technology and enrich architectural spaces by employing technology to serve modern innovations in the field of interior architecture, as is done in all fields. To achieve this goal, it is necessary to know the extent and awareness of architects and interior designers of modern finishing materials and why they prefer raw materials over others based on the properties of these materials. Therefore, a study should be done on the extent of this awareness. The problem lies in the fact that despite the availability of a large number of modern finishing materials, traditional materials are often resorted to, which does not achieve the required enrichment of architecture. The main objective of the applied study is to measure the awareness of architects with modern materials to enrich the interior architecture.

This part of the study deals with the field aspect to answer several questions about the research problem. This part of the study also explains the methodology and the tool that was used for the questionnaire method and how it was constructed and formulated. It is also exposed to the method of selecting the sample and how to distribute and compile the questionnaire, followed by a presentation of the statistical method used in data processing in preparation for discussing the results. This is done for you by clarifying the following points

- The study sample
- Study tool
- The method used to process the data statistically

6.1 Study sample:

According to the nature and purpose of the research topic, the sample was selected from architects and interior designers, whether they have practical or academic experience.

6.2 The study tool:

The questionnaire tool was used as appropriate for the current study

6.3 Correction of study tool:

The study tool includes a set of declarative questions and sentences that the respondent is asked to answer in a specific way. The study tool concluded with several questions about knowing the material placed the image. If the answer is yes, then the respondent moves to the next question, which is the arrangement of the reason for using the finishing material based on its properties shown in the declarative sentences.

7 Results and Discussion

✓ Titanium material:

60% of the respondents know titanium and intend to use it in their upcoming designs, based on its high executive standards, then the technical and plastic standards, and finally the environmental, economic and design standards.

✓ Iron material:

90% of respondents know iron ore well, and 60% of them intend to use it in their designs, based on its technical and operational quality, and finally the expressive, philosophical and environmental criteria.

✓ Aluminum foam material:

50% of the respondents know the aluminum foam material, and only 55% intend to use it in their designs, for reasons including its design and technical standards.

✓ Plastic material:

80% know about plastic and intend to use it in their designs. This is due to its design, technical and formative standards

✓ GRP material

85% know this material and 90% intend to use it in their designs because of its formative and expressive properties

✓ Fiber cement

Only 60% know fiber cement and 90% intend to use it later because of its design, environmental and technical standards.

✓ Anodized Aluminum.

50% know the material and 90% intend to use it because of its design, plastic and technical characteristics

8 Conclusion

- There are some finishing materials that architects know well, such as iron, plastic, and epoxy, and they use them in their designs for executive reasons and not for aesthetic or design reasons.
- There are some finishing materials such as fiber cement, anodized aluminum, and aluminum foam. A few architects and designers know them, and when they knew them from the questionnaire, they intended to use them in their designs for aesthetic and design criteria.
- By publishing research on modern finishing materials, we raise the awareness of architects and interior designers with these materials, which helps to enrich architecture

9 Recommendations

- Increasing the number of building materials exhibitions to introduce modern finishing materials
- Encouraging students, architects and designers to attend exhibitions, seminars and workshops related to finishing materials by holding them in colleges and increasing the number of these activities.
- Increasing the number of researches in the field of modern finishing materials
- Constant knowledge of market needs

10 References.

1. Elsherif, A. Aziz. "Systems and Contemporary Construction Materials and their Impact on the functional and aesthetic performance of architectural spaces" Master thesis, The Islamic university of Gaza, Gaza. (2019).
2. Ching, F. "Architecture: Form, Space & Order" Stanle Harper and Ron publishers, New York, USA. (1979).
3. Zaaror, Rawand, "The impact of interior design on the success of the content of architectural spaces internal and external" Master thesis, Najah University, Nablus.
4. Malnar, J. M., & Vodvarka, F. (1992) "The interior dimension: A theoretical approach to enclosed space" New York: John Wiley. (2013).
5. A. alraouf, Ali, "Architectural Criticism and its Role in the Development of Contemporary Urbanism: The Egyptian and Arab Cases" Egypt. (2014).
6. Ibrahim, Zakaria Sayed Saeed. "The development of interior design services in the light of the intellectual and technological progress of the contemporary architectural form". Journal of Architecture, Arts and Human Sciences, p. 28, 47-67, (2021).

7. Mostafa, Manal, "Using High Technology and its impact on local materials modifications for more affordable Interior Design". Doctoral thesis in Applied arts, Helwan University, Egypt, (2021).
8. Hesham, Eman Mohamed, "The Role of Innovative Technologies in the Use of Alternative Design Elements", N 20, 1629, Journal of Architecture, Arts and Humanities, (2020).
9. https://www.archdaily.com/?ad_name=small-logo
10. Abdo, Mohamed, "The impact of the development of finishing materials on public buildings" Master thesis, Islamic university, Gazza, (2016).
11. <https://materialdistrict.com/>
12. <https://www.metalfoamweb.com/aluminium-foam-with-amazing-effects/>
13. <https://www.anodizing.org/page/what-is-anodizing>