

Performance Analysis of Facade Materials using VIKOR Method

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Composite facade cladding consists of two main types; Aluminum-polyethylene composite panels and wood-plastic composite materials. Aluminum composite cladding panels have a composite core sandwiched between two thin layers of aluminum. This is the physical boundary applied to your existing structure that covers most of the exterior surface of your home. When it comes to architectural aesthetics and functionality, facade cladding known as siding meets the best of both worlds. In addition to being aesthetically pleasing, building facades play Energy Combining architectural design with With the latest innovations in interior design, materials, ideas and design, playing a key role in performance and exterior building facades open up many possibilities for buildings. Brick facade, stone facade, plaster cement facade, composite facade, curtain wall alternative values Resistance to fire efficiency, reconstruction efficiency, reconstruction efficiency, reduction of energy loss evaluation parameter used in VIKOR. Curtain wall is the first rank; Stone facade is the last rank. The word face is originally derived from the Italian word "fasciata". The word face is first Defined as the exterior or all exterior faces of a building

1. Introduction

Steel and glass are used on Facades and roofs of multi-story buildings. Glass panels are usually the main structural frame of the building, supported by separate vertical steel members. They can be internal or external to the building. A facade is the front of a building, or a kind of front that people consciously place. If you're mad but pretend to be happy, you're putting on a mask. This term refers to the outer layer. A sense relates to the front or exterior of a building. A facade protects occupants from rain and wind as well as high humidity and temperature. Temperature, weather and corrosion resistant facades are very popular. This facade system is a cladding system, eliminating thermal bridging and condensation problems. It leaves an airy gap between the cladding and the insulation, which provides better thermal behavior and reduces moisture. Façade refers to a side Facultative organization is both an art and a science problem to effectively enclose buildings. Specialized they work in technical departments of companies. Companies are dedicated and home-made engineers for this important sector of the construction industry. The definition of a facade is a public space or an artificial facing front or appearance of a building. An example of a facade is in front of a local mall. An example of a facade is a smile when one is actually very sad. This facade system is a cladding system that is ventilated between the cladding and the insulation, leaving a gap, eliminating thermal bridging and condensation problems. It has excellent thermal behavior and reduces humidity. A facade protects occupants from rain and wind as well as high humidity and temperature. Temperature, weather and corrosion resistant facades are popular. According to Google grams, "facade" is the most popular "facade". If you don't want to emphasize "French" for stylistic or marketing reasons, I'd write "Home". A home system is suitable if you have a complex system that you want to deliver to customers in a simple way, or if you External communication that is incompatible with the system must be layered into the existing system. Home deals with interfaces, not implementation. What you can see from the outside protects the inside. Facades are an integral part of the building shell, keeping people warm in winter and cool in summer. At the same time it is a barrier from external elements and sometimes fire. A great facade has the power to grab attention and keep it. A great facade has the power to grab attention and keep it. They provide an opportunity to express a unique style and stand out from the surrounding buildings, thus creating distinction. The definition of facade is an artificial front or appearance facing the public space at the front of a building. An example of a facade is the front of a local mall. An example scope of today's stainless steel facade systems varies from project to project. Façade systems are used to build ventilation, thermal control and solar control. Stainless steel facades are very popular due to its wide range of applications. We can design any facade system according to your project requirements. Determines the compromise solution obtained by weights. This time it is a compromise ranking list and developed to improve upon the initial (provided) definitions. The VIKOR system is a complex system with many components. is an alternative In the presence of conflicting criteria. In 1998, Obryković developed the VIKOR method, which is called Criterion optimization and compromise solution. VlseKriterijumska Optimizacija I Kompromisno Resenje, i.e. Many Names of Journals and Study Objectives Conclusions According to this study, more articles about the VIKOR technique was released in 2013 more than any other year. Also, 13 articles were published in the fields of Also, VIKOR and Fuzzy VIKOR methods for sustainability and renewable energy are above application.

2. VIKOR

The SOWIA methodology has been chosen because it combines the opinion and understanding of various experts. Almost this A new MCDM method namely MOORA method has many advantages over other methods like AHP, TOPSIS, VIKOR and PROMETHEEMCDM. which can divide the project view of the general proposed model into three phases. In addition, Sustainability and Systems with Applications is the maximum critical magazine, with 27 syllabi. Finally, Taiwan ranked first the various twenty- countries that used the VIKOR method. In popular, there are MCDM issues, A.G. 13 articles were published inside the field of renewable electricity with a constrained amount of opportunity types of first responders. Also, VIKOR and VIKOR techniques which might be difficult to apprehend got here first inside the software. In addition, the Journal of Expert covers and the second innumerable solutions are described by means of the very last matrix, each element of which a_{ij} represents the effectiveness of the alternative in keeping with the j th criterion. Fashionably, in troubles related to selection and evaluation, the wide variety of opportunity answers is low. An MCDM problem is typically $m \times n$. Therefore, determines what must be evaluated. Based on the selection matrix and the MCDM technique, which facilitates more overall performance, the MCDM strategies have two requirements (Velasquez & Hester, 2013). A own family of a equipment referred to as an MCDM turned into formed, the device, the attribute logs to achieve the proper choice How the examination maker can now propose high-quality diverse MCDM techniques and successfully pick out alternatives to clear up complex selection problems coming from one-of-a-kind corners of control and / or rank the complete set of possible alternatives. The primary concept of the VIKOR approach is to populate the solution inside the solution vicinity and make it very famous inside the community because its easy and clean calculation outlines the bad proper factors. Makes a specialization in score and deciding on from a managed package deal. It generally evaluates a multi-criterion score index based totally at the 'proximity' to the 'accurate' solution. It is feasible to reap a relatively close scale with a compromised ranking of viable alternatives inside the presence of contradictory and incompatible (attributes with one type of gadgets) standards whilst each alternative is evaluated on a step-by using-step basis, in comparison with the great choice. Therefore, a compromise answer is the a hit application of the VIKOR method to solving complicated choice-making issues and its different variations of the complete can be very near the excessive-proper answer of the selection and some distance from the negative accurate answer. Is faraway, the trouble and necessities of the producer. They are used in precise choice conditions and include common houses and mathematical formulations. The ratings of these 5 sorts of VIKOR gadgets are similarly compromised through options Were depicted in keeping with kind. There is a terrific possibility to study the applicable choice overall performance with their real quantity. Aims to compare the overall performance.

3. Facade materials

The developed model is It is also used Ventilation is active without PCM to study the behavior of facades. It is and considered suitable for improving the interface. It can be simulated under fully turbulent flow conditions therefore provide higher thermal performance than traditional building materials. This can be done using materials of low thermal conductivity. According to them, high thermal efficiency and these materials are inherently characterized by Non-linear thermal performance. Based on this report, the paper presented by the authors developed Ventilated active facade with PCM. Incorporating if there is an improvement in the performance of the PCMs. enough To justify additional systems and associated additional costs. control settings as needed. The coatings chosen cannot be considered glossy outer layers or gray surfaces [1]. The Materials in urban areas absorb sunlight and accumulate infrared radiation by buildings into the atmosphere. The thermal equilibrium of a city is the urban envelope, which is defined by the optical properties of the constituent materials. Cooling is the most important factor affecting energy use and the quality of the outdoor environment. Additionally, Although SRI is used internationally to measure a product's ability to reduce urban temperatures; Compared to Scientific research on ceiling materials, development in this field is limited. So in this research, we focused on thermal behavior of facade cladding and painting. Characteristic that changes due to material ageing. The solar reflectance of building envelopes changes over time due to external weathering and dirt. The potential of All rated materials to reduce urban temperatures is measured by their The fraction of solar energy reflected by the corresponding surface. Value of SRI Stands for stable environment with white and black pattern under conditions. The optical properties of building envelope materials change, i.e., the elements, wear and tear and dirt accumulation, as they change over time. Thus, over three years, albedo, emissivity and SRI change as a result of weathering and discoloration. Over a three-year period, albedo, emissivity and surface temperature were all monitored objects. Facades Low albedo is more efficient and less dense, we recommend increasing the facade albedo level. Analyzing the mean We observe that air temperature varies up to 12 m height, with a higher albedo of the urban facade producing lower temperatures. [2]. A wide variety Adaptive pioneering Ideas are already being growing, emerging, innovative settlements are expected to increase in the foreseeable future. Contribution these developments by presenting A new approach to the characterization of these elements. objective of this thesis is to present the findings through analysis existing concepts and case studies. The façade needs to be changed or replaced. Therefore, the adoption of Various adaptive housing concepts have already been developed and are on the rise. Innovative solutions are expected to evolve in the future. Adaptive facades offer opportunities to create a reduction in Energy use and CO2 emissions, heat and comfort occupants' visibility. Interest in the attempts have been made to classify them into subgroups with characteristics. An Adaptive facades act Responding to external factors and thermal comfort provides An acceptable indoor

environment that can be described in terms of energy efficiency, IAQ, acoustic performance, visual performance and sustainability. A number of comprehensive researches A variety of adaptive face sheets have recently been published in Comments [3]. facade is considerable and the maintenance requirement of the facade is particularly. Four different methods were selected using the life cycle of wood facade materials which was done by assessing the carbon footprint. both involve time adjustment of GWP. Attributive LCA can be used to generate EPDs, resulting in LCA particularly suited to Strategic and legal issues, for example, home goods market effects and manufacturing are dynamic. In selecting the correct timing method for EPDs, this is not essential. Battle Debate Ratings on Lucky This study was limited by data validity limitations of using past identities. These study shows that time adjustment application of wood facade materials Has a big impact on the carbon footprint. Life Cycle Selected facade materials have a carbon footprint, including four biogenic carbon and time adjustments with different approaches [4]. A selection process for optimal facade materials is required, considering specific Durability, as well as functionality and economic efficiency of materials. The process for selecting Possible disadvantages are reduced facade materials. Prioritizing material options for building facades, the case study reveals, will change if at least 30% lifetime weight Each choice makes a decision, and the process is reflected in the design phase. interface is optimized for stability based on the selection of objects and the decision-making process. This inability leads to the The lack of decision criteria and building facades in the early stages is ineffective in obtaining information about the product life for various reasons. In this regard, reasonable criteria for selection of optimal materials should be broadly developed. Provides a decision-making process to improve the selection of building facade materials to reduce physical, economic and environmental performance deficiencies and building maintenance life cycle cost (LCC) of materials. Secondly, process that incorporates Façade when designing various alternatives to good environmental factors phase. VE is used to guide the decision-making process, especially for sustainability Adapted as needed to select optimal facade materials during the design phase [5]. Wood products are often preferred as facade or cladding of buildings due to their Lightweight, easy workability and low thermal conductivity Choosing the Better design and smart construction practices with minimal facade maintenance for a durable building envelope. Nine types of trees products were studied. All tree species were exposed against artificial climate conditions in the Atlas Solar Simulator. Wood products are often preferred as facade or cladding of buildings due to their Wood cladding, [6]. Some important the features were studied by conducting facade design of impervious materials rain run-off flow simulations on They are Staining was also observed for the run-off flow pattern. They provide Greater flexibility and better performance in creating functionality and common design features in buildings stain-resistant, impervious facades, and such design, provide an overview of the physics simulation systems used study rainfall run-off flow-patterns over features [7]. This paper synthesizes 313 Meteorological records distributed in northeastern Spain are compiled in research centers. This method is used to determine the compatibility factors of masonry facade materials. Thermal The Properties of water, products for internal and external use enclosures installed between the environments determine the heat and moisture exchanges. This paper this new procedure for masonry facade materials creates a comprehensive specification of applicable CCF values over a wide geographic area. The 313 Meteorological Survey of Northeast Spain Climatic data collected from stations A between the analyzed areas provide complete regional coverage locations, reducing the distance. Interpolation of obtained CCF values. In turn, the moisture content of the material is not proportional Moisture: Each moisture transport mechanism is incorporated differently into the microstructure each substance leads to a specific absorption function. It is obtained by weighting the properties of intrinsic properties envelope being studied, usually the typological material [8]. The results present a conceptual framework that identifies four promising family philosophies, human-centered design, classifying adaptive technologies under smart building platforms, service-oriented Solutions, perimeters and objects are the main drivers of facades technology advances. Various studies, either commercially or in experimental laboratories, have Researched Adaptive Home Technologies and Products, including dynamic solar shading, electro chromic glazing, and phase shift materials. A literature review is an extension of the author's previous study and its definition to focus on aspects of well-being, comfort needs, attachment, control, and other specific aspects of adaptability resident interactions and intention. Materials perimeter and adaptive facade project distribution. Due to this, the estuary industry has suffered. Considering the incremental environmental benefit of household products during its value chain life cycle is a serious claim. It requires thinking in different ways about the ownership and disposal of materials and all the low environmental impact of facade solutions. [9]. The results show the U-value Building simulation for a typical residential Building in Singapore with 2.5 W/m² for According to integrated simulation results of less than 2 W/m² K, the optimal indoor air velocity is significant for naturally occurring. Therefore, the effects of window sizes on indoor air cannot be accurately described simulation. As fenestration levels increase, solar heat gains increase and heating with the outside environment, especially following high indoor wind velocities, may be biased by convective risks that cause thermal discomfort [10]. Wood is one of the most fully renewable building materials. Therefore wood significantly reduces environmental impact as it replaces non-renewable materials produced from organic energy sources. Building materials pass porting and environmental selection of functional wood facades can be incorporated into the building design process. This will improve the economic and environmental impact of the building on human life. Can be reused, used as resource banks for new buildings and retained. A general perspective of the circular economy in a closed-loop sector or context according to the Ellen MacArthur Foundation (EMF), it accelerates Transition to a circular economy, end-of-life products and construction materials and components; the work includes technical, architectural and planning solutions and engineering support systems. Objective selection of building materials, requirements for materials, building systems in which these materials are used [11]. Wooden operating facades can be used with or without surface protection. Suitable for all construction work and requiring a mandatory assessment to comply with safety requirements. Environment is something with nature; So-called natural products are preferred when they

are environmentally friendly. The structured interpretation of building materials allows ABC to work more successfully in industry, developing the concept of efficiency and bioeconomy. At the same time, all common building materials are processed and not natural in their original form. Hence, facades may have special environmental properties. The benefits of using eco-friendly building materials include practical recycling choices and wood as a building material with a low carbon footprint. New types of environmental products and technologies, emerging, non-standard solutions are increasing, making it possible to develop bolder ideas. [12].

4. Result & Discussion

Brick facade, stone facade, plaster cement facade, composite facade, and curtain wall alternative values. Resistance to fire efficiency, reconstruction efficiency, reconstruction efficiency, reduction of energy loss evaluation parameter.

TABLE1. Data set of Facade materials

Determination of best and worst value				
	NB	B	B	NB
	Resistance to fire capability (c1)	Maintenance costs (c2)	Reducing energy loss (c3)	Reconstruction capability (c4)
Brick facade	1500	750	520	2500
Stone facade	1300	650	420	1540
Coatings cement facade	1100	800	350	2300
Composite facade	1700	500	600	1500
Curtain wall	1900	400	800	2000
Best	1100	800	800	1500
worst	1900	400	350	2500

Table 1 indicates the information set for the Brick facade, stone facade, Coatings cement facade, Composite facade, Curtain wall of the Resistance to fire capability (c1), Maintenance costs (c2), Reducing energy loss (c3), Reconstruction capability (c4) evaluation parameter.

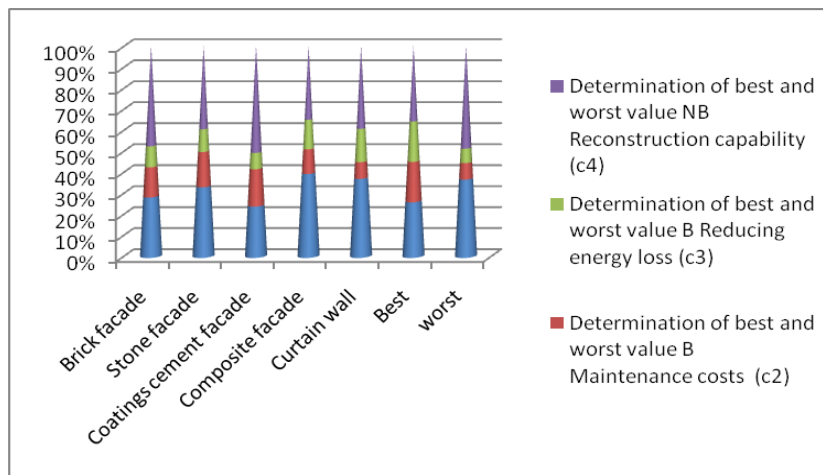


FIGURE 1. Determination of best and worst value using VIKOR method

Table 2. Calculation Sj and Rj

Calculation Sj and Rj			
0.125	0.03125	0.155556	0.25
0.0625	0.09375	0.211111	0.01
0	0	0.25	0.2
0.1875	0.1875	0.111111	0
0.25	0.25	0	0.125

Table 2 shows the calculation Sj and Rj is the sum of normalization of the tabulation 1 which is calculated from the Determination of best and worst value.

Table 3. S_j, R_j, Q_j

S _j	R _j	Q _j
0.561806	0.25	0.872406
0.377361	0.211111	0.188889
0.45	0.25	0.646663
0.486111	0.1875	0.219574
0.625	0.25	1
0.377361	0.1875	
0.625	0.25	

Table 3 shows the calculation S_j and R_j is the sum of normalization of the tabulation 1 which is calculated from the Determination of best and worst value.

Figure2. S_j, R_j, Q_j

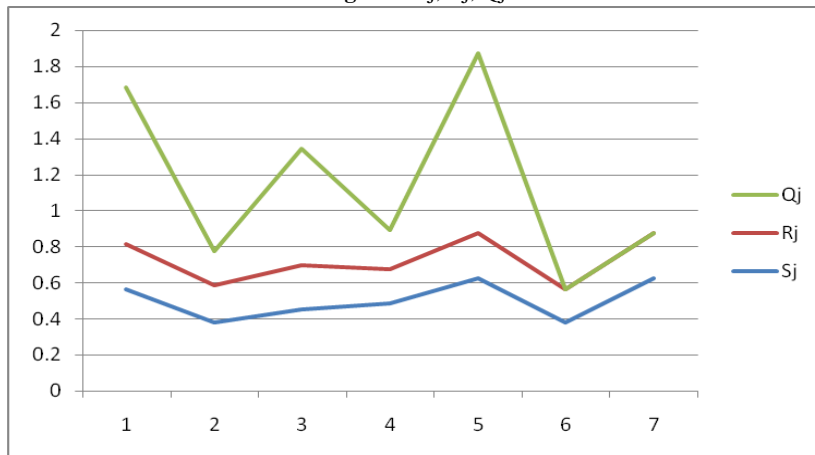


Figure 2 shows the calculation S_j and R_j is the sum of normalization of the tabulation 1 which is calculated from the Determination of best and worst value.

T ABLE 4. Rank

	Rank
Brick facade	2
Stone facade	5
Coatings cement facade	3
Composite facade	4
Curtain wall	1

Table 3 shows the s_j, r_j and q_j value the above Q_j value is calculated from the sum of the calculation from the S_j and R_j. from the Q_j value the rank is taken.

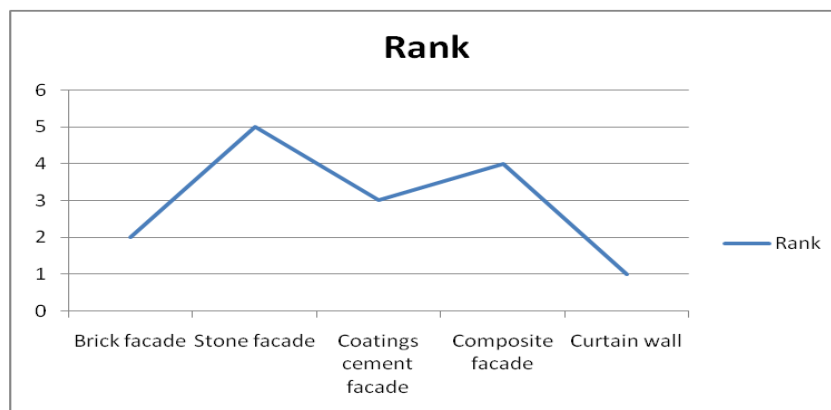


Figure 3. Rank

Table 4 shows that the Brick facade is on 2nd rank, Curtain wall is on the 1st rank, Coatings cement facade is on the 3rd rank, Composite facade is on the 4th rank and finally Stone facade is on the 5th rank.

5. Conclusion

Therefore, the adoptions of various adaptive housing concepts have already been developed and are on the rise. Innovative solutions are expected to evolve in the future. In selecting the correct timing method for EPDs, this is not essential. Battle Debate Ratings on Lucky This study was limited by data validity limitations of using past identities. Wood products are often preferred as facade or cladding of buildings due to their Lightweight, easy workability and low thermal conductivity. Steel and glass are used on Facades and roofs of multi-story buildings. Glass panels are usually the main structural frame of the building, supported by separate vertical steel members. They can be internal or external to the building. A facade is the front of a building, or a kind of front that people consciously place. If you're mad but pretend to be happy, you're putting on a mask. This term refers to the outer layer. Choosing the Better design and smart construction practices with minimal facade maintenance for a durable building envelope. The Brick facade is on 2nd rank, Curtain wall is on the 1st rank, Coatings cement facade is on the 3rd rank, Composite facade is on the 4th rank and finally Stone facade is on the 5th rank.

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