REVIEW

Study on energy-saving insulation materials in the buildings exterior

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Abstract: Construction industry has been one of Chinas energy guzzlers, if we can reduce the energy consumption of the building industry through the use of new ma-terials or new technologies, which will have a significant impact on the development of economy and society. The status quo of Chinas construction industry, high energy consumption, paper use energy-saving technologies in the field of construction works to expand the analysis, discusses the necessity of the construction industry currently uses energy-saving insulation materials and analyzes the current energy field of construction engineering technology application status, on the basis of focus on the application of energy-saving insulation materials in construction, particularly in the new system and the new glass curtain wall insulation material in construction applications, which fur-ther enhance the energy-saving technology within the field of construction engineering the application level has a certain reference.
Keywords: energy conservation, insulation material, facades

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1 Introduction

With prominent contradiction between economic development and environmental protection, Chinas increasing emphasis on the use of energy-saving technologies in the construction field, Chinas building energy efficiency work long way to go, and sustainable development is Chinas basic national policy, building energy efficiency is a national energy work a top priority. The energy consumption of buildings accounts for the countrys total energy used 1/4, ranking first in energy consumption. In recent years, Chinas construction industry has been rapid development, construction and operation requires a lot of use of energy, especially heating and air conditioning energy consumption of the building. Thus it is necessary to carry out research projects in the field of energy-saving a spects of the building within. This paper discusses the application of energy-saving insulation materials in construction with a view to find a r eliable and effective energy-saving manner possible application methods and materials in the construction engineering field, and hopes to inspire EEB.

2 Necessity of building energy-saving insulation materials engineering applications

2.1 From the viewpoint of environmental protection

The rapid development of Chinas economy and environmental protection prominent contradictions, twenty-first centuries, the continued supply of sustainable energy and economic development is a contradiction, Governments and relevant agencies are trying to find a solution to this effective way contradictory. Chinas economy has maintained sustained and rapid development, in the process, because of Chinas economic development model is based on the cost of sacrificing the environment on the basis of Liu, the country has its own special circumstances, a large population, the demand for resources to survive and develop very huge, this objective requires us to handle the relationship between economic development and environmental coordination between. After building the project by Japan and a lot of items to use energy-saving insulation material can ease the spear of resources between supply and demand to a certain extent, the protection of our country to achieve sustainable economic development and the environment is important.

2.2 From the perspective of market economic point of view

In construction widely energy-saving insulation materials have considerable economic benefits. A number of mandays, a huge market, strengthen the construction of energy-saving insulation materials used in construction engineering, has a very considerable economic benefits, because the development of Chinas construction market prospects, coupled with a large population base, the use of any small energy-saving insulation technology It will have a huge comprehensive benefits. Therefore actively promote energy-saving insulation materials in Chinas construction industry will have a huge economic benefit. This transformation of the con-

struction industry development will have a huge impact[1].

3 Application Status of construction engineering energy-saving technologies

My Government has always attached great importance to energy-saving technologies and energy-saving materials in the construction works in the field of research and application, in order to promote the development of related research, the government invested a lot of money to carry out energy-saving insulation materials engineering experiments, has prospects for energy markets technology, the government actively promoted through various effective means. At the same time our country has also increased cooperation between universities and research institutes abroad, foreign latest and most advanced building energy-saving insulation materials engineering technology introduction or collaborative research, energy-saving technology is currently implemented in the field of construction engineering major focus next aspects[2]: (1) New insulation material with excellent performance energy-saving insulation materials to achieve the goal of building large-scale energy efficiency. Developed countries in building energy-saving insulation materials research and development and the use of already achieved important results. (2) Infrared thermal reflective technology. Infrared thermal reflective technology works is through the inner and outer surfaces of the building or in the external structure of the air between the layers of high-purity aluminum foil or other high heat reflective material, most of the infrared reflecting back, enabling the building insulation role in enhancing the comfort of the living environment. (3) Energy-efficient glass. Heat-absorbing glass or thermal radiation glass can absorb or reflect solar heat shield-ing manner. In construction projects in developing low-E glass, it is the best energy-efficient glass. (4) Heat recovery. For the construction and installation of a heat exchanger, the principle is: the use of hot exhaust air heat the incoming cold air or cold air entering the use of exhaust hot air. This heat recovery unit can be recycled 6080% of the energy from the exhaust air.

4 The new energy-saving insulation materials in construction engineering

4.1 New wall insulation system application

New wall insulation system design applications capable of providing adequate date for construction, good ventilation, the proportion of energy consumption in buildings, air-conditioning energy consumption accounts for about five percent, the lighting energy consumption accounts for about three percent. The remaining part is consumed by other activities. Glass curtain wall as a building sensing device, and that helps the user to provide a safe and comfortable indoor environment, but also that the building offers plenty of sunshine and good ventilation. Architectural glass curtain wall design is energy-saving technologies through scientific material matching, structural design, spatial composition, equipment layout, natural and effective way to prevent or to achieve transfer and conversion process heat, so that the building walls to achieve low energy consumption, environmental pollution low, healthy and comfortable indoor environment, building ecological and economic coordination. Studies have found that the heat transfer by conduction, convection, radiation three forms. Glass curtain wall is also a result of heat transfer combined effects in three ways. Three ways to heat the glass curtain wall in the process: First, by way of the glass and metal frame grid heat, including heat flow through a heat transfer single glass grid heat through the metal frame; the second way is through the inner wall surface of the indoor air and heat transfer between the indoor environment; the third is the way through the outer surface of the glass curtain wall and between the ambient air and ambient heat exchanger. Depending on the area of the glass curtain wall heat transfer in different ways with different energy-saving measures. At this stage the main measures to improve the energy efficiency of glass curtain wall insulation performance is the use of energy-saving glass and aluminum thermal break insulation to reduce heat transfer coefficient, eliminating the structural system thermal bridge, reducing air infiltration heat loss, reduce open sash area, improve sealing, etc. With the development of curtain wall technology, the gradual emergence of a double wall system[3]. Double-wall system, do not perish of its lighting permeability, or insulation, are more single-wall systems have a greater degree of improvement. Double glazing from the inside and outside wall composed of two layers of glass, the outer wall generally use hidden frame, exposed frame or point-glass curtain wall, the inner wall generally use the next box walls or aluminum doors and windows. Formed between the inner and outer walls of a relatively closed space be-tween a ventilation layer, the air enters from the lower portion of the outer wall of the inlet, is discharged from the upper part of the air vents, the heat buffer layer is formed to regulate the indoor temperature. Double glazing system is mainly for ordinary glass curtain wall, high energy consumption, indoor air quality and other issues, with double system for the building envelope, providing natural ventilation and lighting, increase the interior space of comfort, reduce energy consumption, thereby representing a better solution to the conflict between natural lighting and energy efficiency.

4.2 Energy-saving application of new glass material

New glass material due to the performance of its exter-nal appearance and performance are widely used in high storey building, the energy consumption of glass high-rise buildings have been about four percent of total energy consumption, energy consumption caused by the glass and has not been effectively utilized, resulting in a huge waste. Can be used in technically mature new energy-saving glass such

as heat-absorbing glass and insulating glass, heat-reflective coated glass and Low-E coated glass, these new energy-saving glass can effectively reduce the energy con-sumption of buildings.[4]

5 Conclusion

To promote energy-saving insulation materials, to pro-mote the development of Chinas economic construction, environmental protection and economic development to achieve the goal of coordination is important. Our energy-saving insulation materials research and development in the BU to increase investment, and to strengthen technological exchanges and cooperation between developed countries and the West, especially for new glass materials research and development and promotion of the relevant government departments to carry out intensive work. Energy-saving insulation material in the construction field China has broad prospects for development, I believe that to make new contributions to the development of energy-saving insulation materials have construction industry.

Conflicts of interest

These authors have no conflicts of interest to declare.

Authors contributions

These authors contributed equally to this work.

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