Research on Treatment Process of Decorative Construction Waste

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Abstract. The front processing of decorative construction waste is the key to solve the construction waste disposal technology, and it is prepared for the ending utilization of the decorative construction waste. It mainly introduces the composition and harm of decorative construction waste, the present situation of disposal and utilization of decorative construction waste at home and abroad is summarized comprehensively. It points out the problems existing in the treatment and disposal of decorative construction waste in China, and puts forward two different kinds of sorting technology for decorative construction waste, and it can provide reference for the resourceful disposal and reuse of decorative construction waste. Combining with the present situation and existing problems of construction waste recycling in our country, it puts forward the prospect of the future of decorative construction waste recycling.

1. Introduction
Due to the rapid development of engineering construction and housing industry, the output of construction waste is increasing at a high speed, and the proportion of decorative construction waste is also increasing. The amount of municipal decorative construction waste in China has already accounted for 50%-60% of the total amount of municipal solid waste. At present, the disposal of decorative construction waste is still in the primary stage, and the processing technology and equipment need to be continuously upgraded. The random stacking and landfill of decorative construction waste not only seriously affect the city environment, occupy the land, but also cause the pollution of soil, atmosphere and water. It can be sorted, classified and regenerated by utilizing the reasonable processing technology and technology, and that also can avoid the second pollution of the resources. In the background of advocating energy conservation, it is necessary to make efforts to reduce the decorative of construction waste and improve the classification of the sorting process, improve garbage sorting classification efficiency and optimize of treatment effect.

Based on the status of construction waste treatment at home and abroad, one kind of sorting treatment processes for decorative construction waste are put forward in this paper, which provide reference for future research and development direction of construction waste resource.

2. Content and hazard of decorative construction waste
Because the composition of decorative construction waste is more complex than that of pure construction waste, there are a lot of refuse components, such as big garbage, cotton textiles and household garbage, which are more difficult to deal with. Sorting and classifying in the process of
garbage pretreatment is particularly important. The sorting effect of decorative construction waste directly affects the subsequent middle processing and the resource disposal at the end.

2.1. Composition of decorative construction waste
Decorative construction waste is a major obstacle to urban development, which is generated by building, maintaining and dismantling buildings and structures. Among them, more than 70% of the pollution-free inorganic materials (including soil, stones, concrete blocks, and crushed stones) Inorganic materials, with acid resistance, alkali resistance, water resistance, stable chemical properties and stable physical properties. Scrap includes metal, bamboo, wood, all kinds of packaging materials, wood, plastic, glass, etc. As shown in Figure 1.

![Figure 1. The classification of decoration and construction waste.](image)

2.2. The damage of decorative construction waste

Air pollution. One of the reasons for the fog and haze is the building construction, the blasting of the old buildings and the dust produced in the process of garbage transportation. Other chemical reactions, such as organic decomposition and combustion, which can also produce harmful gases, affect the growth of vegetation and pollute the air.

The impact on the social economy and the life of the residents. Encroach on urban construction land and obstruct the development of cities. Due to the lack of corresponding management policies and effective management measures, the randomly dumping of building garbage is serious. It soon formed encirclement around the city which leading to a series of problems, such as "garbage siege".

Serious waste of building material resources. China City Environmental Sanitation Association building waste Committee data shows that the construction waste generated by continuously increased, and produce a large number of construction waste dumps, which accounted for 70% of the city garbage, it is accounted for 30-40% before 2000 and that is a considerable increasing (Figure 2). The total amount of construction waste is about 15.5-24 million tons per year. By 2020, the amount of construction waste in China is likely to reach its peak. At present, the utilization rate of construction waste is less than 10%.

There is a security risk by stacking randomly. Most of the city without decorative construction waste disposal sites or sitting consumptive randomness, it isn’t to develop effective and reasonable scheme for decorative construction waste disposal. It will cause harm to pedestrians and traffic because of the lack of protective measures. In the outskirts of the city, pits and ponds are the preferred addresses of construction waste stacking, which not only pollutes the water, but also leads to the reduction of surface drainage and flood discharge capacity.
3. Present situation of treatment of decorative construction waste

3.1. Foreign study on present situation
Construction and decorative garbage sorting equipment produced by BUSSCHERS company in Holland, it through the three-dimensional separation drum sieve and characteristics of winnowing machine, that realizes the three-dimensional separation of construction waste. The roller structure of the three dimensional sorting drum screen improves the applicability of the separation line and the purity of the classification. The winnowing machine adopts vacuum technology in effective sucked light materials at the same time, which reduces dust emissions.

The Nordic countries have implemented the Nordic environmental symbols in a unified way. For example, the Danish government attached great importance to the recycling of construction waste, and established a joint system closely integrated with technology, science and organizational structure and management tools to ensure the control of main waste logistics and the recycling of construction waste.

3.2. Domestic research at present
In 2013, the State Council issued the national development and Reform Commission, the Ministry of housing and urban construction to develop "green building action plan", and China's current construction waste disposal related "of city appearance and environmental sanitation management regulations", "Circular Economy Promotion Law" and "city building waste management regulations" and other laws and regulations.

At present, the domestic decorative construction waste treatment technology and technology is relatively rough than abroad, most of the equipment used mining machinery, which lack of corresponding functional requirements of the processing equipment; the overall processing technology is simple, the production efficiency is low, the processing capacity is limited, and the treatment effect is faultiness.

4. Problems

4.1. The defects of the garbage classification system and lower utilization
Most of the decorative construction waste is piled up on the spot directly. Before recycling, the waste can’t be classified effectively. The resource utilization rate of China's construction waste is less than 10%, most of them are directly dumped in landfills without disposal.
4.2. The defects of the Processing technology and low marketability of terminal products

The technological content of mechanical equipment such as crushing, screening is low. The production capacity is insufficient and the appearance and quality of the products produced by the resources are not guaranteed. There are few ways of the end product resource utilization. The quality of recycled aggregate is difficult to guarantee and limits the application scope of recycled building materials. The links such as generation, transportation, resource processing and engineering application have not been linked up. The industrial chain of construction waste recycling has not yet formed.

5. Design of the Processing technology

Due to the housing demolition and modification, and other decoration replacement, there are many different kinds of construction waste, most of them are miscellaneous. The sorting and separation of the waste materials that made of such materials is carried out by water flotation, which separates the materials with different gravity, so as to prepare for the subsequent waste disposal. (Figure 3).

![Flow chart of water flotation process.](image-url)
Firstly decorative construction waste should be manual sorted, sorting out pieces of scrap metal and directly send it into the shear processing, sending large garbage into the large caliber crusher to break, then the magnetic separation of magnetic materials, sending scrap metal into the processing of packaging machine; Using engineering vehicle to sort out the fabric ribbon rope and other large pieces of garbage, then the sorted things are sent into the packaging machine that in order to be incinerated; Using impact rammer to reduce the size of the rest of waste, and then break it up and magnetic separation of magnetic materials. After the vibration screening, screening the fine sediment from waste; Sending the remaining material into the water tank, floating out of the light substance floater directly into the rubbish compressing machine and then go into incineration; Materials are pure construction waste which are transferred down from water tank, it can be disposed by the subsequent processing.

The above sorting processing (pretreatment process) is the main processing technology for the disposal of the decorative construction waste. At the same time, the auxiliary processing is also required, such as dust removal unit, noise reduction unit, deodorizing unit and spray atomizing unit, which is in order to protect the spot operator.

6. Conclusion
Construction waste recycling technology is still in its infancy, and there are still many problems, which are not compatible with the rapid development of economic construction. The efficient and reasonable of decorative construction waste treatment process not only helps to improve the waste treatment and improve the processing efficiency, but also effectively ensures the environmental protection and recovery efficiency in the process of treatment; the resource treatment of construction waste needs professional technology to support, the core technology is processing of screening and impurity removal. A high level of production technology should be designed to solve the efficiency of construction waste, which is to achieve industrialization, thus promoting the green development of China's engineering construction.

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