

## **Why did the New and Environmental-friendly Construction Factories Suffer? - A Survey on Zhejiang Yangtze Delta Building Materials Co. Ltd. \***

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**Abstract:** Products of building materials are made from sand, stones, cement, powdered coal ash and constructive rubbish. These products have not been looked as good ones by many constructive institutes and businessmen and consumers. Therefore, factories dedicated to such products find it very hard to survive in the market. The main causes for the above are as follows. First, some departments of local governments and some constructive institutes do not look it as an important thing. The second is that our country makes relevant law and rule behind time. The third is that it is not serious for some local governments to do something according to the relevant law and rule. The fourth is the price of raw material is higher than normal but the price of product being the same as before. Government should regard it as an important matter, and promote it for publicity. It is necessary for us to turn the thoughts of building construction into new ideas which are use of ecologic constructive materials in their buildings among constructive institutes and businessmen and consumers.

**Key Words:** resource recycling; problems; survey; policies

### **Introduction**

Due to the sustainable development, Chinese Government has already prohibited the traditional production and use of clay bricks, which has caused a revolution in the building material industry in China. In May 2003, Huzhou Silk Goods & Materials Co., Ltd invested more than 10 million dollars to establish Zhejiang Yangtze Delta Building Materials Co., Ltd with American G. F. T. Transnational Inc. Zhejiang Yangtze Delta Building Materials Co., Ltd is not only one of the present largest production base of new building materials in China, but also the one with most advanced technology and equipment, and the most complete in the product varieties. Comparing with the traditional clay bricks, Zhejiang Yangtze Delta Building Materials are made from sands, stones, cement, powdered coal ash, with the adoption of international leading production productive technology to produce bricks meticulously approaching the goal of Zero-Emission. This kind of brick producing from the recyclable resource have been used widely in America, Japan and European countries, as well as the north of China. However, the use rate is low in the South which owns great potential. That is why we paid visit to Zhejiang Yangtze Delta Building Materials Co., Ltd.

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## **1. The Adoption of Recyclable Resources**

### **1.1 Technical Innovation**

With latest technical support in the field of bricks from U.S and Japanese companies, the company also concentrates on its self-innovation and research development.

(1) Processing Technology. First, the company adopts electronic measurement which can guarantee the accuracy and stability of quality. In the process of measurement, it changes the traditional conveyer belt into electronic measurement by using the sensor which is a highly commercialized product on the international market. To keep pace with this cutting-edge technology, the company invested about 400,000 RMB on technical reform to make the producing process accurate, stable, and clean. Second, the company also stresses on soundproof effect, recycle and zero-emission. For example, the soundproof panels are placed around the machine so that noise from the machine will be reduced. Third, it uses fragment of mining rock instead of sand and the rate of substitution is between 35%-55%. Fourth, waste materials are reused which contributes to zero-emission.

(2)The Independent Research and Innovation of the Company. It owns a series of cutting edge techniques, for example, chain slope protection, segmental retaining wall technology and some special form of retaining wall series. Based on the innovation, it launches many new products emphasizing on energy-saving and environmental protection.

### **1.2 Products**

(1) Wall Bricks Series. The product of wall furring series which are shaped by one step has many excellent features, e.g. outstanding load-bearing ability, heat preservation, graceful outline, soundproof effect and the use of natural material which drastically saved the use of raw materials and that of energy. The houses in northern part of China are required to achieve three-step energy-saving standard, two-step energy-saving standard are required in the region which have characteristic summer and winter. As a matter of fact, architecture interlayer wall produced by the company greatly exceeds the two-step energy-saving standard (saving by about 50%), and has virtually reached the three-step energy-saving standard (saving by about 65%). In addition, the comprehensive cost is lower than the normal two-step energy-saving wall's. The company invested 600,000 RMB in the construction of the display floor to verify the unique properties of the product and has invited the experts and scholars from Zhejiang University for the testing. Although architecture interlayer wall has been adopted in Northern China for about 10 years, the company is the first large-scale manufacturer in the Yangtze Delta. At present, the technology is more mature in Europe and U. S. It also plays an important role in the north of China. According to the company's budget report, the use of the comprehensive range of products can save the cost by 15%.

(2)Tile Series. According to the general experience of road-paving, rigid basis would be used accompanied by flexible pavement. The defect of this method is that permeability is weak so it is easy to contain water on the ground. Contrarily the use of flexible basis for a flexible pavement is very difficult to solve the contradiction between the road-load-bearing ability and its density.

This is because the stronger the water permeability is, the less the brick density is. To solve this problem, the company has done numerous experiments and end up with a new kind of high-strength concrete slabs with excellent features in water permeability and load-bearing ability, which can reach 30Mpa. Through the use of this new technology, the surface water seeps under the ground mixing with groundwater, which could then reduce not only the urban water-logging chances after heavy rain, but also the heat transfer, noise, heat island effect and the investment in drainage systems.

There are a lot of series tile varieties, such as pavement bricks, load-bearing bricks, planting grass bricks, etc. Among these products, the paving brick and planting grass brick focus on the ecological effect and load-bearing brick is usually used in airports, ports, docks and related areas for its bearing capacity and anti-power features. The equipment and technology of tile series has reached the advanced level in the international market. At present, the R&D division is trying to work out the lightweight concrete block to enhance its performance.

(3)Scenic and Hydraulic Brick Series. Scenic and hydraulic bricks are mainly used at scenery parks, small gardens, slope protection, water conservancy. These kind of bricks have strong commonality. The products have reached the US ISTM Standard which also have two promotion technologies i.e. chain slope protection and segmental retaining wall. The feature of the products are high water permeability, effective reduction of water flow pressure and improvement of water drainage. Further, plants growing among the holes of bricks improve the durability and stability of the pavement.

### 1.3 The Traits and Achievements of the Company

Presently the company is one of the highest-utilization of industrial waste R&D base, specialized in researching and developing concrete. The main raw materials are mineral slag, building junk, coal ash, silicon powder and so on. In 2006 and 2007, the amount of waste usage reached 16 tons. The minimum infiltration rate of waste in the products is between 35%~37%, in some products this rate has reached 56%~57%, ranking first rate in China. The company reached an annual output capacity of 400,000 cubic meters.

## 2. The Problems in the development of the company

2.1 The government doesn't pay adequate attention to energy saving and emission reduction and some departments of local government do not see energy saving as an important matter. New building materials were not widely used in South China and the publicity and promotion in this aspect is not sufficient. On the other hand, many local government authorities and major department officials are not familiar with the concept. All the above mentioned causes counteract the widely use of the new building materials in the southern area.

2.2 The prices of raw materials are increasing constantly but the prices of products are the same as before. Influenced by the macro economy of the country, the cost of the labor force and the prices of raw material which make the building bricks are much higher. The price of mining debris was 10 RMB/ton in 2004, however, it rose to 40 RMB /ton in 2008. Nevertheless the prices of the products kept the same all the time and those reduce the company's profits.

2.3 Some design institutes don't identify with the concept. First, they don't have great demand for the new business because they have enough other traditional business. Second, they can't accept the products completely. In order to develop this new business they need to learn new technology, purchase new design software and recalculate the structure data of the products, so they refuse to have a try. Third, it's risky. The products have not been accepted completely, and there are some difficulties to promote the new products. Fourth, some experts can't accept the new concept, they believe infiltration, leakage, cracking will appear while using these blocks.

2.4 Law-making and enforcement lags behind, some local governments don't take the relevant law and rules seriously. For example, in 2001, the Ministry of Construction promulgated a standard of energy-saving design for the residential building at hot-in -summer and cold-in-winter area, and this standard was to be implemented since October 1, 2001. However, due to inadequate supervision, very few units in Zhejiang Province implemented this project actually. There are other factors in our country's constructive market, that is the builders have the right to purchase the raw materials. In order to reduce the cost, builders will purchase the unqualified bricks from some small factories, so that the roof may have infiltration, leakage, cracking while using these bricks, like what has happened at Daqing in Northeast China some years ago. But in US, Japan and European countries, there problems won't appear for the law in these countries forbid builders to purchase raw materials.

### **3. Policies and Measures**

3.1 The Government needs to pay more attention to energy saving and emission reduction, promoting it through media and leading the public, especially constructive institutes and businessmen and consumers, to new ideas which are the use of ecologic constructive materials in their buildings,. It will make the public realize the urgency of using ecologic constructive materials. In the north of China, the new concept of building construction has been widely used. Hence, it is necessary for constructive institutes and businessmen to visit the North. At the same time, promoting the new ideas among the public would let the consumers know the excellent features of the new building materials. In order to change the bias of constructive institutes, the identification by authority is indispensable too. Accordingly, the sample communities supported by government policies using the new building materials can also demonstrate its unique character.

3.2 In order to promote the development of energy saving and emission reduction, government can give more support to the relevant enterprises. Taxation relief and financial subsidies could be considered as solutions to support the enterprises, for example, relieving the Value-Added Tax, reducing the Operation Tax or subsidizing the energy saving projects to reduce the cost.

3.3 The related departments of government should concentrate on legislation and law enforcement, preventing the unqualified products from flowing into the market and setting up some compulsory enforcing criteria, which can put the sustainable development of energy-conservation and environment-protection into effect.

### **Conclusion**

In order to set up a harmonious society, under the conditions for one to maintain constructive quality, it is important for us to turn waste materials into useful building materials. Local governments should help factories which have been regarded as cutting edge in environmental protection and 3R in order to lead industry in the right direction. Relevant departments of local governments should better do something according to relevant law and rule.

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