



# Material Application and Structural Features in the Design of Sales Packaging

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**Abstract.** The purpose of this paper is to study the material application and structural features of sales packaging design. This paper analyzes and interprets the principles of sales packaging container design, packaging structure design, material application and other aspects from multiple aspects. Combined with the requirements of sales packaging attributes, container structure, materials and manufacturing technology, it is discussed that when sales packaging design pursues artistic expression, if it ignores the visual beauty of modeling structure and only pursues the individual expression of packaging form, it will be extremely rough and generalized, which will be detrimental to commodity sales. This paper makes a rational analysis and prospect of materials and structures in sales packaging design and points out that materials and structures are important means of sales packaging design. It is suggested that packaging design should reduce materials as much as possible and improve the rationality of packaging structure on the premise of ensuring the use value of commodity packaging, so that packaging design can meet the requirements of green packaging.

**Keywords:** Sales packaging · Material application · Structure design · Green packaging

## 1 Introduction

Sales packaging design is a creative activity that can be completed according to certain commodity attributes, container structure, materials and manufacturing technology. Its design thinking and creative process involve many factors such as commercial competition, social culture, folk customs, aesthetic value, production process, practical value and economic value. Therefore, it is necessary to have a certain understanding of material application and structure in the design process. At present, the era of global economy has promoted the rapid development of packaging design materials and manufacturing technology, and also made the sales packaging design tend to be multi-specification, serialized and featured, and the sales packaging design materials are constantly developing towards multifunction, light weight and green packaging design.

## 2 Principles of Container Design

Different sales packaging has different structural forms. In the design of the container shape, the packaging shape, material, process, as well as the protection function and aesthetic factors should be taken into account. Packaging needs to be combined with the characteristics of the commodity for targeted container design. Craft packaging containers should pay attention to their craftiness, not only to be able to be put into production, but also to make the process as simple as possible. Packaging designs that cannot be put into production have only artistic value and no economic use value. We often see many students packaging design work with this aspect of the problem, they tend to ignore the production process, too much pursuit of artistry, so that a very good shape cannot be produced or greatly increase the cost of production. Again, the production process can be too cumbersome to cast into production.

Excellent sales packaging design means that the process should be simple and easy to follow, and that the production line process can be used to avoid manual methods as much as possible. Of course, there are some special wrapped items in the packaging container structure that still require hand work to achieve the desired effect. This is a recreation of traditional packaging forms that we need to explore in our studies. The ultimate purpose of practical container design is for the convenience of human use, as well as in the process of handling, storage, easy circulation and transport, and the commodity packaging will not be damaged. Whether it is simple, easy to operate, and whether it is easy to recycle to reduce costs should also be considered [1].

Practicality of the sales packaging will actually end up being directly reflected in the economic benefits. For example, over-emphasis on artistry in packaging design, shaping a commodity container (such as an imitation bamboo form) so slim that the cap breaks when twisted, also loses its practicality. The container is made too small, the outer box is made too large, or the carrying handle is not firm, etc. will cause inconvenience in use. In addition, if the design of packaging container is too complicated and the process is too cumbersome, it will lead to the phenomenon that the value of packaging and commodities does not match. In short, the practicality of packaging containers is guided by the principle of protection and convenience.

Distinctiveness and aesthetics container shape are among the main features that reflect the personality of the product. For example, the traditional sauce products container's shape design usually has not too much decorative pattern, which mainly attracts the attention of consumers via the uniqueness of the container design. For food products, due to various similar products, container image should be unique, multi-style, multi-angle and artistic to impress consumers [2]. Of course, the uniqueness of the packaging should be created on the basis of a harmonious relationship between the functionality of the container and the characteristics of the goods without affecting them. The ultimate purpose of the container shape design is for the convenience of sales and use, if the commodity packaging design in the pursuit of traditional style, ignoring the visual aesthetics of the shape, only the pursuit of packaging shape form of antiquity and traditional expression of personality, and the treatment is extremely rough, generalized, which is detrimental to commodity sales.

### 3 The Principles of Structural Design

According to the interpretation by semantics, the structure refers to the reasonable collocation and arrangement of various components, or the construction of a building to bear gravity or external force [3]. From the packaging design science, one is the combination and collocation of various parts of the packaging (container and liner). The other is the weight of the goods on the pressure of the packaging products generated by the structure of the relationship, as well as the processing of the packaging structure form [4].

There are single-piece, combined, open-window, outer packaging structures and other types of the sales packaging structure design. In the structure, the targeted design can be conducted based on the protection function and use function of the goods [5]. As in the case of the traditional packaging “bruising pills” structure, each pill is wrapped in cotton paper, waxed, then covered with a spherical plastic box, then placed in a cardboard box, so that 6 pills in a box, a total of 4 levels, composed of inner packaging, intermediate packaging and outer packaging respectively. Then there is the ordinary wine packaging, just a bottle of stickers designed on the wine container; mid-range wine packaging with an extra outer box; and high-grade wine packaging not only unique containers, packaging box materials, inside the increase in the corresponding set-off goods decorative objects, to enhance the added value of goods. As shown in Fig. 1, the paper packaging structure is the most widely used and most varied form of sales packaging structure. Through cutting, indentation, folding, bonding and other methods, the paper packaging structure can be presented in various forms, including paper bags, paper boxes, paper tubes, paper trays and special forms of paper boxes [6]. Paper bags tend to be used for simple food or herbal reagents packaging. Paper boxes are mostly used for gifts, handicrafts, and wine packaging. Paper tubes are usually used for wax paper, rice paper and firecrackers and other traditional product packaging. Paper trays are applied in the buffer cushion packaging of fragile goods. Special forms of paper box structure are based on the normal paper box structure of the processing changes, which makes full use of the elasticity of paper and forming characteristics and combines with the shape of the goods to create special form of paper box structure based on the normal paper box structure.

Paper structure has strong plasticity, which is prone to be fold and cut. Whether it is produced by machine or hand, it is easy to process, and can form beautiful packaging products. Paper packaging structure design also has its drawbacks. For example, there are certain requirements on the weight and size of the goods. It is not suitable to be used as a valuable gift packaging, etc.

As for the composite material structure form, composite materials refer to materials synthesized by processing two or more substances with different chemical and physical properties [7], which include plastic, paper, fiber fabric, aluminum foil, adhesive and other materials. Composite materials used in the field of packaging mainly refer to “composite stratotype” composite materials, that is, multi-layer structures formed by combining several substrates with different properties by lamination, extrusion coating, coextrusion and other technologies. In the packaging, it is often used for the protective function of food bags or imitates the traditional packaging form to shape.

In terms of structural forms of wood, wood is a common structural form in packaging design. Timber structure forms are used together with bamboo, rattan, wheat stalk and other materials. Wood packaging is divided into natural wood and artificial wood, among



Fig. 1. Different materials in packaging forms [Self drawn]

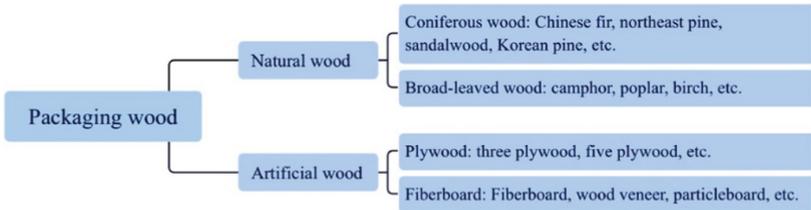


Fig. 2. Classification of wood packaging materials [Self drawn]

which natural wood includes coniferous wood and broad-leaved wood; Artificial wood includes plywood and fiberboard (as shown in Fig. 2). Wood structures mainly include wooden boxes, wooden cases, wooden barrels, wooden pallets and so on. Wooden boxes are mostly used for the packaging of valuable products (famous wines, medicines, cultural relics). They are nail-covered, snap-covered, draw-covered, etc. Wooden boxes are mainly made of fir, northeastern pine, plywood, camphor boards, sandalwood boards, etc. The wood packaging has the advantages of good load-carrying, compressive strength, bending strength and impact strength, and strong applicability. Bamboo products structural forms of bamboo, bamboo baskets, bamboo tube, etc. are mostly used for local characteristics of the product packaging, to highlight the local flavor of goods.

#### 4 Principles of Application of Materials

To the present day, the packaging development, the materials used is very extensive, from natural materials to man-made packaging materials, from a single material to synthetic

materials, for the convenience of commodity packaging. The selection and application of packaging materials should follow the scientific principles of practical, economic, beautiful and convenient, the main performance principles should be reflected in the function, texture, color and beauty [8].

Material function and texture material function is a comprehensive selection of materials from the perspective of commodity packaging protection. Texture is the physical form of packaging materials. Such as rough, smooth, solid, moisture-resistant, acid-resistant, easy to erode, easy to mould, easy to moth, strong elasticity and foldability. They play a corresponding role in different packaging applications. For example, aluminum foil has a special texture of gold and silver luster effect, which is mostly used to show the magnificence and noble feeling of the goods. While the stoneware has a rough surface, suitable for traditional commodities (ancient wine and local specialties) packaging texture performance.

The effect of the material packaging effect that is the unique effect of the packaging material itself, to the psychological feelings caused by people. For example, the stoneware container is a material that imitates the original pottery, which has primitive and archaic characteristics and can be applied to the performance of traditional commodity packaging; while the composite material has modern packaging structure characteristics to imitate the traditional parcel structure form for the purpose. The choice of materials should be applied to the characteristics of the goods. The use of reeds, straw mats, yellow straw paper and bamboo skin mixed with modern composite materials should be avoided to avoid the psychological feeling of incompatibility caused by the packaging performance [9].

Material application methods commonly used in sales packaging design are single use method, combination method, substitution method, bionic method and texture effect.

Single-use method: It refers to the use of one packaging material for one commodity. A pound of sugar, packaged in a plastic bag or a paper bag, can be sold to customers. Similarly, a single wooden box, corrugated paper packaging, glass bottles and aluminum foil bags packaging do not need to use other auxiliary materials. The single-use method of material is monotonous in terms of expressing the characteristics of the goods and is often applied in packaging suitable for ordinary goods.

Combination method: It refers to the use of more than two kinds of material combination of packaging containers. The characteristic of the combination is to use the advantages of various materials, the strengths and weaknesses, so as to meet the requirements of the function of commodity packaging.

Substitution method: It is the use of a material instead of another material to achieve the effect of protection and decoration of commodity packaging. For example, wine, beverages, pharmaceutical liquid goods, more glass bottles for packaging containers, now with porcelain bottles, aluminum thin, plastic film bags, and hard Shuo carton for container shape, so that the shape of the packaging has a corresponding change.

Bionic method: It refers to the imitation and use of materials in packaging design, which uses inorganic materials to imitate the form of organic materials. Such as the use of ceramic imitation of bamboo, wood for packaging containers, printed on paper texture effect, showing the characteristics of the goods, with hard plastic imitation of aluminum products packaging form, etc., these are only part of the packaging material

imitation. In fact, there are many material imitation method still to be developed, need to be studied in the design.

Texture: It refers to the application of the texture of the structure of the packaging material itself. Like the wood grain paper used for packaging products, corrugated paper, and aluminum thin products surface art processing treatment. It is a way to cause the surface structure of the packaging to produce special effects. For example, the “affluent old cellar countryside edge of the countryside wine” in the lower part of the bottle and the lower part of the packaging box, resulting in the effect of bamboo weave, to strengthen the local interest of the goods. The use of corrugated paper for the packaging of the “Aizhou preserved egg “ is not only a reasonable choice of material, but also shows the characteristics of the product. The application and selection of packaging materials is an important part of packaging design and directly affects the image of the product [10].

## 5 Conclusion

Now, a large number of successful packaging designs are inspired by nature. The designer not only imitates the natural form to design the package, but also uses natural materials and structures and bioengineering technology to develop and study bionic materials for multi-specification and serial sales packaging. Especially in the application of packaging design materials, the original materials are processed by technology to produce paper, fabric, hard plastic, ceramics, etc. Through the selection and sublation of structural design, unique green packaging is formed, which has simplicity, natural value and environmental protection value [11]. As the design of sales packaging is the display of materials and structures, it affects consumer psychology and purchase to varying degrees. In addition, the treatment of packaging materials and structures is also an important standard to measure the quality of a sales packaging. For the design of green packaging, on the premise of ensuring the use value of commodity packaging, it is required to minimize the use of materials in the design and pay attention to the rationality of packaging structure, achieve and increase the number of packaging reuse, so as to conform to the design concept and development trend of green packaging.

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