

## CHAPTER 1

### INTRODUCTION



#### GENERAL

The role of packaging has become increasingly significant in the production industries. Generally, most of the properly packed products are usually contained in packages for additional protection. These packages may be seen in several forms such as corrugated fibreboard box, plastic, wood or metal, etc. Apparently, the most preferred and widely used type of transport package today is corrugated fibreboard box which can be used for food and non-food products or even large-size and weighty products such as electrical appliances. The popularity of corrugated fibreboard boxes results from the fact that they are lighter in weight and lower in cost and, if properly designed, adequate strength can also be achieved.

Popular as they may be, the design of corrugated fibreboard boxes in Thailand should be improved. Experience is also required for the manufacturer to design the box that suits the purpose. For example overpacked boxes may result in unnecessary increase in cost whereas underpacked boxes may result in damage of products and thus economic loss.

Therefore, a study on problems in the use of corrugated fibreboard boxes and their improvement towards proper design will be able to persuade the industries to realize the benefits and significance of designing corrugated fibreboard boxes to suit the intended purpose. This will directly benefit the industry as a whole in so

far as the decrease in product damage and in production cost is concerned.

### OBJECTIVE

The main objective of this research is to encourage the industries concerned to use package with consideration given to the type of product and the purpose. Readers should use this research as guideline and apply it as they see fit for their own purpose.

In this research, corrugated fibreboard box, due to its popularity reason, is taken as representative package together with canned products packed in. This package system attributes to a large portion of our nation's income.

This research will present factors to be considered so as to derive a design of package that is most appropriate for a specific product. However, readers should bear in mind that package, the design of which they will be working on, needs not be of the type readily available in the market, i.e. other materials may and can prove to be more suitable for their product.

The objectives of this research are as follows.

1. To study the mechanical properties of corrugated fibreboard box.
2. To study main problem found with corrugated fibreboard box.
3. To present the appropriate design of package to suit the purpose of any industries concerned.

4. To decrease production cost through the appropriate design of package.

#### SCOPE OF RESEARCH

This research aims at studying problems of packages at various stages starting from canning factories to sales destination. The residual strength of the boxes after transportation will be evaluated in comparison with that of boxes prior to handling. Selected material properties are determined, i.e. bursting strength, puncture resistance, flat crush resistance, ring crush resistance, edgewise crush resistance and basis weight. Then analysis will be conducted on data obtained so as to arrive at the appropriate design of corrugated fibreboard box.

Since corrugated fibreboard boxes are used with various types of products, to suit each type of product the box must be specifically designed. The research may take unreasonably longer time to obtain data on all types of products for the design of their packages. Thus, canned products packed in corrugated box have been chosen as representative products in this research.

#### STAGE OF RESEARCH

The research shall be studied in the following stages.

1. Study on manufacturing process of corrugated fibreboard boxes.

2. Study on problems of corrugated fibreboard boxes.

3. Study and test on mechanical properties of corrugated fibreboard :

3.1 Basis weight

- 3.2 Bursting strength
  - 3.3 Puncture resistance
  - 3.4 Flat crush resistance
  - 3.5 Ring crush resistance
  - 3.6 Edgewise crush resistance
  - 3.7 Box compression strength
4. Design model for testing.
  5. Conclusion and recommendation.

#### BENEFIT

This research shall provide with the following benefits.

1. To identify problems in the industry concerning packaging.
2. To develop the package system to the appropriate design.
3. To enable optimum use of resource.
4. To decrease the economic loss and to promote the sale of goods to remote places such as foreign countries.

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