



# Chapter 1

## Introduction and Background of the thesis

### 1.1 Background of the thesis

In the world of business competition nowadays, quality has been regarded as one facet of an organization's competitiveness. While competition is intensifying and customers are increasingly demanding, only companies with quality products will be able to survive in the long term. This is especially true for commodity products, which normally have limited chance of differentiation. Customers usually make buying decision of these products based on price. They normally choose the cheapest one that meets their requirements. Manufacturers of commodity products therefore have two necessary tasks to achieve in order to survive; maintain acceptable quality and competitive pricing.

In order to achieve quality in the finished products, at least three factors need to be controlled. These factors are materials, process, and people. While the process and people are internal factors and can be controlled, at least in principle, somehow by the manufacturer, quality of raw materials are beyond the manufacturer's direct control and depends greatly on the quality of suppliers. In order to ensure that materials received are of good quality, buyers normally develop certain forms of inspection to screen out nonconforming articles from the submitted lots. An effective inspection is often defined as one that has high discriminatory power in detecting defective items from the submitted lots of materials. Despite its importance as a tool to ensure incoming material quality, some modern theories view inspection as non-value-added or even wasteful process. According to these theories and principles, quality cannot be built into the product by inspection. No matter how stringent the inspection might be, it can just reduce the chance that defective items will be passed. Hence inspection activities should be eliminated wherever possible. However, in reality this can be achieved only if it can be ensured that products from suppliers are of desirable quality. The focus thus changes from emphasizing on incoming inspection process with the aim to screen out as much defective items as possible to consistent monitoring of supplier quality system to ensure the supplier has good potential to produce good products. The logic behind this is that suppliers with good quality system are more likely to produce quality products.

This thesis is conducted as an illustrative example of how these concepts can be applied and implemented in the selected company.

## **1.2 Statement of the Problems**

The company selected for this study is one of Thailand's largest producers of cast acrylic sheets. Having been rapidly grown during the past 5 years in terms of capacity and sales volume, the company now is encountered with serious problem regarding quality of its products. Customer claim rate and goods rejection is consistently high and this greatly affects the quality image of company's products

Quality of cast acrylic sheets depends on numerous factors with quality of raw materials being one major factor. Raw materials that are critical to the quality of finished products include:

1. Chemicals and additives: affect chemical and physical properties of the sheets, e.g. tensile strength, softening temperature, etc
2. pigments and dyestuffs used in producing colored sheets as specified by customers.
3. tempered glass used as casting molds: surface quality of the glass will affect the surface quality, particularly surface evenness of the sheets produced.

Regarding the chemicals and additives, at present the inspection of incoming materials involve only checking the quantity delivered. Testing for physical and chemical properties normally involve many complicated processes, which makes inspecting the quality characteristics of every lot of goods received, even by sampling, practically impossible. Most of the chemicals are supplied by manufacturers in Taiwan. Lack of effective incoming quality inspection results in low quality materials passing into production and subsequently causes various problems in acrylic sheets.

Pigments and dyestuffs used to color the sheets are usually bought from two suppliers in Taiwan. Problem frequently found is quality inconsistency problem. Pigments of the same color code from the same supplier in different lots often differ in shades. Incoming inspection for color at present is only done visually which is ineffective. Customer complaints and claims about color variations are frequent. Currently there is basically no incoming inspection and testing before using the pigments.

Tempered glass is supplied by two manufacturers – one in Thailand and the other in Europe. These manufacturers are all big-scale producers which are certified

by ISO quality standard. Incoming quality inspection of tempered glass cannot be done in the factory due to the lack of proper instrumentation. Receipt of goods therefore involves only checking quantity and analysis result provided by the suppliers.

Although problems found in different types of raw materials differ in details as explained above, when considering the problems as a whole system, the company appears to have two weak areas.

1. There is no effective inspection plan to screen out the defective items before entering production and causing subsequent problems.
2. There is no system to evaluate the quality of suppliers. Even with the best inspection process, some defective items will pass into production causing subsequent problems. So in order to assure the quality of materials purchased in the long term, quality of suppliers themselves should be carefully considered. Continuous assessment of suppliers will help ensure that suppliers in service are capable of producing and supplying products of satisfactory quality.

### **1.3 Objectives of the Study**

1. To develop effective inspection plan for incoming materials. This is to ensure that the quality of raw materials entering production process is in state of control.
2. To develop a supplier evaluation system. The results from the assessment will be used in considerations regarding supplier rating, continuing business and terminating businesses with suppliers.

### **1.4 Scope of the study**

This study will cover the creation of inspection plans and development of supplier evaluation system in the studied company. Scope of the study are described as follows:

**Creation of inspection plans-** Inspection plans will be created for each kind of key raw materials whose quality have greatest impact on the acrylic sheet's

quality. These key raw materials include 1) chemicals and additives used in production 2) pigments and dyestuffs used to produce colored sheets 3) masking paper used to protect sheet

The inspection plan created for each kind of materials will specify the following:

- Properties and characteristics that need to be inspected and the reasons for the selection of these parameters.
- Standardized procedure for testing the selected parameters. This may include sampling plan, laboratory testing. The appropriate method of inspection method to use in any type of material will be based on the level of impact they have on final product, ease of inspection as well as cost of inspection.

### **Development of Supplier Evaluation System**

Evaluation of suppliers will be based on two criteria; the quality of their product and their delivery performance.

## **1.5 Methodologies**

1. Survey the literature relevant to this study
2. Examine thoroughly the company's existing systems regarding incoming inspection and supplier evaluation system.
3. Select the areas to improve and set goals.
4. Develop a new system for improvement
5. Implement the proposed new system.
6. Assess the success of new system by comparing with the previously set goals.
7. Draw conclusions and summary.

## **1.6 Expected Results**

1. Incoming quality control process is improved.
2. A system is developed for evaluation of supplier performance with respect to the product quality and other criteria.

3. Successful implementation of the system will bring awareness of the importance raw materials have on the quality of finished products.
4. The evaluation results can also be fed back to the suppliers to aid in their product improvement. This sharing of product quality information can lead to cooperative collaboration between buyer and suppliers in developing and improving of product quality, which can mutually benefit both the buyer and suppliers in the long term.
5. With the development of continuous supplier evaluation, the need incoming inspection will be reduced in the long term.