

CHAPTER II

NEOPRENE ADHESIVES



The Classification of Adhesives

A great many types of adhesives are currently in use and there is no adequate single system of classification for all products.

Here, the classification will base on the British Standards Institution who attempts to classify adhesives on the basis of the chemical type or major ingredient from which the adhesive is made. In addition to this, some consideration is being given to the use of 'tabulated' systems as means of completely describing adhesives in terms of the various factors of interest to the user. The employment of a 'tabulated' system (which could conceivably be extended to computer storage) would enable industrial users to retrieve information on those adhesive types satisfying requirements for form of material, properties, processing features, and performance, to economic advantage.

Table A.1 is based on the origin, physical and chemical type of the main ingredient of the adhesive formulation. This basis for classification, together with other descriptive tables and charts, combines elements of all the aforementioned criteria and has been used to describe the adhesives.

CHAPTER I

INTRODUCTION

Background

Neoprene adhesive, manufactured from a synthetic rubber called "Poly chloroprene", is a general purpose adhesive. The rapid development of bond strength of film from solution, combined with tack or auto - adhesion, as well as resistance of the cured glue line to heat, oxidation, water, solvents, oils, acids and alkalines, have led to the extensive use of Neoprene adhesives in the automotive, furniture, footwear, leather and construction industries.

Presently, Neoprene adhesives have been used in the wide range of applications. Many of them are locally manufactured in house by improper method that can easily cause the fire hazard. The qualities are out of control and the manufacturers do not understand thoroughly for the manufacturing regarding the functions of the raw materials. Some industrial users have to import the Neoprene adhesives due to the quality problems of the local products

Objective

This thesis is to study the feasibility of establishing a Neoprene adhesives factory and to describe the manufacturing process of Neoprene adhesives in Thailand.

Scope

The working on this study are as follows

1. Summarizing and analyzing the market potential, end users and tendency in the future so as to be the data for evaluating the plant size, location and layout.
2. Studying on types, sources and costs of process equipments.
3. Studying on specifications, sources and costs of raw materials.
4. Studying on the manufacturing process, quality control and safe handling of adhesives.
5. Studying on the apparatus for product development.
6. Estimating the total investment, operating cost, cost of goods, profit, return on investment and financial evaluation.

It is important to note that this thesis is to provide the guidance of feasibility the Neoprene adhesives plant operation in Thailand. Market demand and potential was considered only Neoprene adhesives, no automatic machines are involved in the process equipment. For the manufacturing process, it is mentioned generally on the conventional procedure being developed in some other countries and convenient for the situation in Thailand. The functions of raw materials are defined to the major

compositions in a typical Neoprene adhesive. Special additives and fillers are not included because the additional experiment is to be carried out for individual adhesive in particular application. Accordingly, the apparatus for product development is recommended.

Benefits

It is expected that this thesis can be the guidance of the investors who are interested in the manufacturing of Neoprene adhesives in Thailand. The profit estimated provides a good rate of return on investment. The present adhesive manufacturers are able to utilize some of the information such as the method of product development in their existing manufacturing. It is very feasible for the consumers to switch the using of imported Neoprene adhesives to locally manufactured products if we can fulfil their requirement on the reliability on qualities of adhesives.

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2.2 Introduction to Neoprene Adhesives

Type and Physical State

Synthetic thermoplastic elastomers, Viscous liquids composed of polychloroprene rubber in solvent (usually inflammable mixed aromaticaliphatic hydrocarbons), solid content 15-30%, white, brown or tan and coloured; may be translucent or opaque. Shelf life at 20-30°C is 3 months to 1 year in sealed containers.

Performance

Good resistance to water, salt spray, biodeterioration, aliphatic hydrocarbon, acetone and ethyl alcohol, lubricants, weak acids and alkalines.

Applications

Neoprene, or polychloroprene, is the basis for one of the largest and most important groups of rubber adhesives. Worldwide consumption of neoprene in solvent adhesives applications exceeded 90 million pounds in 1976. About one-third were used in the United States.

Neoprene adhesives are widely used for several reasons as follows:

1. General purpose application

Table A₂ illustrates the various substrates that can be bonded by neoprene adhesives with the comparison to other adhesives.

2. Economics and convenience

Neoprene adhesives enjoy a prominent position as an elastomeric binder at the expense of less costly materials (e.g. natural rubber and SBR) primarily because of early bond strength development, bonding range, high ultimate strength adhesion to many surface durability, flexibility, chemical resistance.

3. Method of application

Neoprene adhesives are conventionally applied by spraying, coating by rollers, brushing and extrusion (or by a caulk gun).

The formulations are allowed for the simple designs and adjustments to the specific uses.

2.3 End Users

1. Automotive

Fig A.1 shows the areas utilizing Neoprene adhesives in the car. Car assembly factory is one of the main users for neoprene adhesives. Consumption in one car assembling is varied from one to two kilograms depending on the sizes and types.

2. Furniture and laminated plastics

In Thailand, most of the high pressure plastic Laminate are adhered to substrate such as wood, metal with Neoprene contact adhesives.

3. Footwear and leather products

Shoes have long been a major consumer of Neoprene adhesives, particularly for the permanent attaching of shoe soles. Another advantage of Neoprene adhesive is its adhesion to a wide variety of substrates including leather, rubber and other synthetic materials.

4. Others

- Carpeting in the building
- Television and radio Set
- Household maintenance
- Upholstery