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PVC Industry and Stabilisers

-A Discussion From The Environmental Point of View-

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1. Foreword

This article will deal with the changing PVC and stabilizer industry from the viewpoints of environmental protection, safety and hygiene.

Japan's PVC industry has developed as the mainstay of the petrochemical industry, laying foundations for the nation's plastics industry. In the early stage of the 1945-55 period PVC production was put on a commercial basis. Products processed from PVC then on sale at department stores were called "nylon." In the United States nylon resin was being used as raw material for popular products such as stockings.

Today Japan's PVC industry, though beset with many problems, occupies a leading position in world markets. Looking back on the tortuous path which the industry has treated in the past I cannot but feel a thousand emotions. Perhaps nobody could have thought that the industry would show such spectacular growth.

The world's PVC production is estimated at 8 million metric tons annually. The following reasons can be given for the remarkable rise in PVC production.

- (1) PVC is relatively low in price. Japan's production, now running at an annual rate of 1,200,000 metric tons (about half the total output in Western Europe), owes much to the country's traditional and excellent basic technology in electric power generation as well as in carbide-acetylene processes.
- (2) Colorful combinations of stabilizers and lubricants were produced by new technologies. A wide range of applications were developed, including both rigid and flexible products. Full use was made of plasticizers in the field of flexible PVC. Moreover, the transparency of PVC lends itself to coloring in the processing of a variety of general-purpose products. All this helped create a unique market for PVC products.
- (3) Unique physical and chemical properties of this resin including weatherability made it possible not only to develop new variants of PVC resin but also to complete new fabrication techniques. An assortment of sophisticated fabricating equipment was developed to meet the diverse needs of users and customers. Thus the field of application widened to an extent matched by few other plastics.

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All this has led to development of an integrated system of PVC technology. Further innovations in this field are expected to lead the PVC industry to a stage where greater growth on new dimensions can be assured.

2. Changing Economic Climate

Until a year ago the general prediction was that the growth of the PVC industry would either level off or slow down. Nobody painted a rosy picture. A pall of gloom hung over the future of the industry because the Government and its associated agencies established in 1971-72 one statute after another to prevent environmental pollution. The shape of things to come became apparent in the autumn of 1968 when environmental pollution originating from PCB presented a major social problem. The occurrence of itai-itai disease (bone disease caused by cadmium) in areas along the tributaries of the Jintsu river in Toyama Prefecture also evoked strong public concern. These and other developments prompted the Diet to pass environmental protection legislation in 1970. The parliamentary sitting then was referred to as the "antipollution Diet."

The Law Concerning Waste Disposal and Cleaning imposed especially severe restrictions on PVC resin and its products. Chlorine generated by the resin and residual heavy metals from stabilizers and colorants were among the factors that caused the most "undesirable" label to be put on PVC. Casualties in many fires were attributed to the toxic fumes rising from new building materials using PVC. Thus the public image of this resin as the "culprit" became strengthened.

In fiscal 1972, however, the Government's policy of promoting Prime Minister Kakuei Tanaka's plan for remodeling the Japanese archipelago and reflationary fiscal and monetary measures brought about an increase in public investments. At the same time, the excess liquidity that resulted partly from such expansive economic policy created a boom in speculation. In such circumstances the PVC industry, like other major industries, enjoyed strong demand. The market for such building materials as rigid pipe, rain troughs, sheet and electric wires and cables basked in a boom.

Meanwhile, the environmental protection measures that have come into force during the past few years, combined with the decline in the economic power of the United States, dampened investment in productive facilities on a global scale. In Japan, where antipollution legislation is more stringent than in other developed countries, investments in

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