



Lead Industries Association, Inc.

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August 21, 1971

Recent Trend of the
Consumption of Lead
SUBJECT: and Zinc in Japan

To: Members of Industry Development Committee,
Lead Industries Association, Inc.

Mr. Sunao Tokunaga of the Japan Lead Zinc Development Association has passed along to me a copy, as attached, of his summation of what is happening in Japan relative to the consumption of lead and zinc. I thought you might find this of interest.

Sincerely yours,

A handwritten signature in cursive script, reading "David M. Borcina".

David M. Borcina
Secretary, Treasurer

DMB:so
Att:

Recent Trend of the Consumption
of Lead and Zinc in Japan

July 1971

Sanzo Tokunaga
Director General
Japan Lead Zinc Development Association

Recent Trend of the Consumption of Lead and Zinc in Japan

Sunao Tokunaga
Japan Lead Zinc Development Association

I. Introduction

The economic condition of Japan had been satisfactory owing to the favourable development of the productivity of the whole industry and the satisfactory increase of foreign trade. As shown in Fig. 1 and Fig. 2, the consumption of lead in 1970 was 210,000t, about 11.7% more than that in previous year, and the demand of zinc in 1970 was 646,000t, about 7.7% more than that in previous year. The growth rate of the consumption of lead has been about 11-12% for the last several years, and that of the consumption of zinc had been about more than 2% since 1960, however, the growth rate for zinc decreased to less than 1% in last year.

Even though the authorities on the economics of Japan had commented in 1969 that the economic condition of Japan during the seventies will almost constantly grow, but the economic situation has depressed since the beginning of 1970. Apart from the still continuing excess of export over import in Japan, domestic demand for construction- and fabricated materials has been decreasing. Therefore, the yearly rate of increase of the domestic consumption of lead and zinc began to decline since last year.

The industries such as iron and steel, electric machines and other manufacturing industries have been curtailing their production owing to the depression of the demands since last year. Among all the industries, iron and steel industry has been compelled to push on their output restriction to 80-85%, and, consequently, the consumption of zinc for sheet- and hot dip galvanizing has been decreasing since latter part of 1970.

The share of the domestic consumption of zinc in sheet- and general galvanizing in Japan has been around 57-58% for the past ten years, however, we are afraid of the decline of the share in 1971.

II. The domestic consumption of lead in Japan

A. Lead sheet and pipe

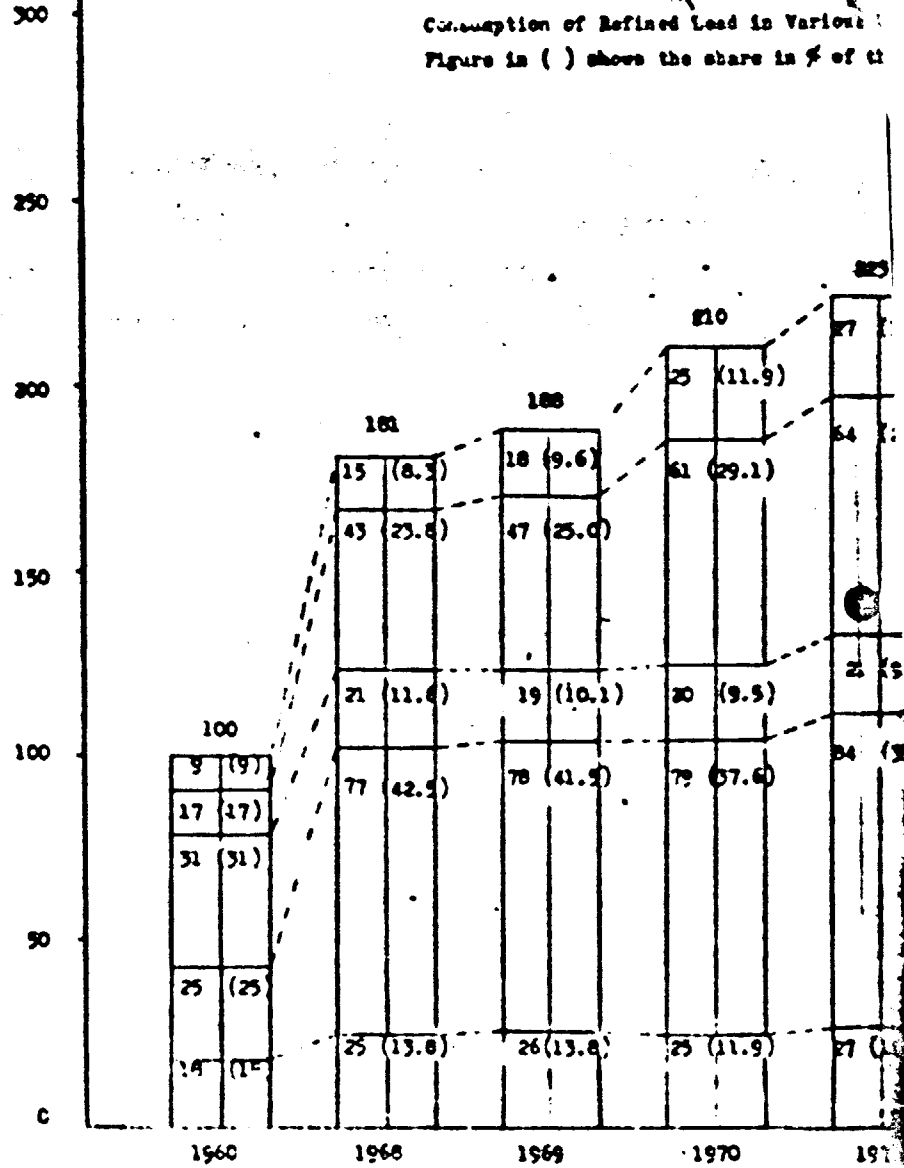
In 1968, total consumption of lead for sheet and pipe was about 25,000t occupying nearly 14% of the total domestic consumption of lead. The consumption of lead in this category has not appreciably increased for two years since 1968, and the consumption in 1970 was 25,000t occupying about 12% of the total. Major reason of the stagnation of the consumption has been due to the fact that some alternative materials such as plastics and aluminium replaced lead as the materials for sheet and pipe. The amount of the consumption of lead in this area in 1971 is estimated as about 27,000t sharing around 12% of the total. According to the undesirable situation, the consumption of lead sheet and pipe will not increase appreciably, so, we estimated that the consumption of lead in this field will be about 33,000t sharing 11% of the total in 1975.

(1,000t)

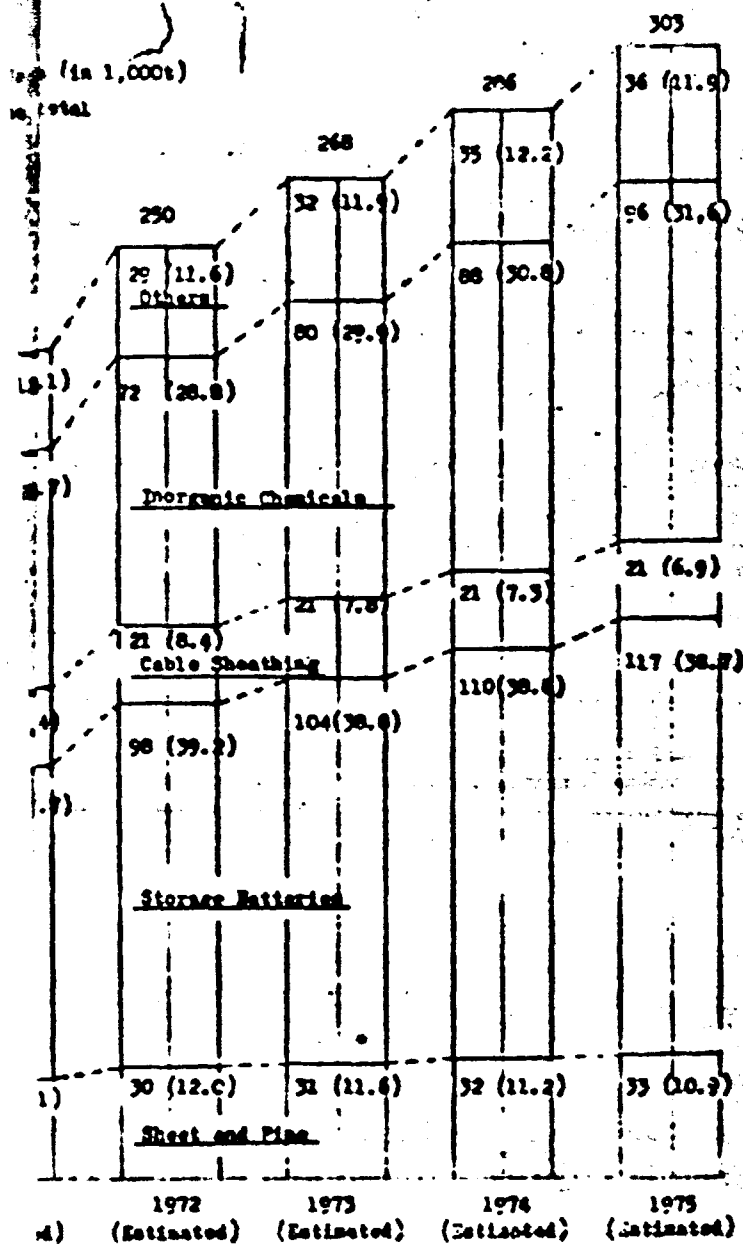
Fig. 1

Consumption of Refined Lead in Various

Figure in () shows the share in % of the



(20)



There are some reasons why the situation of lead sheet and pipe is gloomy in the market:

- i) It is difficult to keep or develop the use of lead sheet and pipe because of the high specific gravity and high price of lead, and these give rise to the incessant alternation by many kinds of plastics.
- ii) The number of skilled technical workers and apprentices for plumbing has been diminishing in these days, something should be done to keep the traditional demand of lead sheet and pipe.
- iii) Most of the Japanese lead sheet and pipe manufacturers are minor industrialists, and each of them has been manufacturing many kinds of their commodities in small numbers. Therefore they can not stand against the invasion of new materials such as PVC and FRP.
- iv) They are not enough enthusiastic to protect themselves against the invasion of plastics even though we have been encouraging them constantly.

For the break through, we have to persuade the lead sheet and pipe makers in reducing the cost of production and in developing the new fields of application. A research work on the performance of the sound barrier with the use of lead sheet-OR lead was carried out, and the research result was published on February, in 1971. This report will be helpful for our campaign to develop the use of lead sheet in buildings and housings.

B. Lead-acid storage battery

Since 1961, consumption of refined lead for lead-acid storage battery has been keeping its dominant position among the various uses of the metal, and the amount of lead used for the battery in 1970 was nearly 80,000t, occupying about 90% of the total domestic consumption of lead. Principal reason for such a great amount of lead consumption for storage battery is the extraordinary increase of the production of automobiles in Japan. Even though the problem of air pollution due to the exhaust gas from the engine-driven automobiles has become more and more serious in big cities, the production of road vehicles has been increasing year by year, and the production of 4-wheeled passenger and freight cars was about 5,450,000 units in fiscal year of 1970, and the number of registered automobiles at the end of March, 1971 was about 18,165,000. Accordingly, the use of lead for SLI batteries has been increasing steadily.

On the other hand, the government authorities and public has become more worried of the nuisance of polluted atmosphere in Tokyo and other big cities, and they are seriously considering about the commercialization of battery driven electric cars. Many prototypes and commercial cars were manufactured in these years, and the performance of these cars has been improved year by year. The weight of lead for average SLI battery has been reduced to around 5-7kg per unit car, but the corresponding weight of lead for middle-size electric car is around 300kg. Therefore, if considerable number of battery cars is utilized in the crowded streets, the use of lead in this field will make a rapid progress and the environments of big cities will be bettered conspicuously.

As well known, various kinds of rechargeable cells such as zinc-air, silver-zinc, sodium-sulphur and fuel cell have been experimented in many countries including Japan. However, these are not likely to replace the lead-acid cell on account of the construction, performance and cost.

The use of various kinds of industrial vehicles such as fork lift truck has been growing steadily, and the share of electric fork lift truck manufactured in 1970 of the total production was about 1%, and it will increase to 15-20% in a couple of years. Nippon Yusen Co., Ltd. has achieved to commercialize a "brushless" series motor as a prime mover for industrial trucks and thus they could reduce the volume, weight and cost of the D.C. motor.

They claim that this can naturally be used for battery-driven electric cars.

C. Cable sheathing

In 1960, consumption of refined lead for cable sheathing was 31,000t, which was about 11% of the total domestic lead consumption. However, in 1966, when the National Telegraph and Telephone Corporation decided to use plastic-sheathed cables such as Alpeh- and Stalpeh cables for nearly all of their communication cables, lead producers in Japan lost the two-thirds of the demand of lead for cable sheathing. For that reason, the consumption of lead for cable sheathing dropped down to only 20,000t, about 9% of the total consumption of lead. Even though we have endeavored to recover the use of lead-sheathed communication cables, there is no indication of the recovery. Therefore, the yearly consumption of lead for cable sheathing will be about the same in 5 years to come, and its share of the total will be reduced to less than 7% in the middle of the seventies.

D. Inorganic chemicals

The consumption of refined lead for inorganic chemicals has been growing steadily, and its share of the total domestic consumption has been increasing appreciably.

In 1970, consumption of lead for inorganic chemicals was 61,000t occupying about 23% of the total consumption. The consumption will increase to around 96,000t sharing about 32% of the total consumption in 1975 as shown in Fig. 1.

E. Other uses

As well known, refined lead is used as the raw material for solder, collapsible tube, printing type, hard lead castings, etc.

A group of the enterprises had constructed a big plant to produce tetraethyllead. However, the plant became a white elephant because of the serious grievance of the public against the air pollution due to the exhaust gas from automobiles.

In order to clarify whether or not the lead particulates are harmful to human body, a medical examination on this matter has been carried on with ILIRIO's sponsorship.

III. The domestic consumption of zinc in Japan

A. Galvanized steel sheet

Since more than a decade, the consumption of slab zinc for sheet galvanizing has long been occupying more or less of 3% of the total consumption, and major of the fields of application of galvanized steel are roofing, siding, air duct and many other sheet fabrics for buildings and housings.

In 1970, consumption of slab zinc for sheet galvanizing was 214,000t sharing about 3% of the total as compared with the corresponding 220,000t and 3% in previous year. Slight decline of the demand of galvanized sheet in 1970 was due to the depression of the economics which came about since the early part of 1970 and suppressed the building boom to some extent. However, the economic authorities in Japan consent that the economic depression will not last long but will revive in the last part of this year or in the early part of 1972. So, we are rather optimistic about the consumption of galvanized and coloured-galvanized steel sheet during half a decade to come.

The JIS (Japanese Industrial Standard) for galvanized and coloured-galvanized steel sheet was revised on 1 September, 1970, and it was enforced on 1 April, 1971.

According to the revised JIS, the weight of zinc coating was increased about more than 10% from the original one. Therefore, the consumption of slab zinc for sheet galvanizing will increase in conformity with the revision of JIS.

We have estimated the consumption of slab zinc for sheet galvanizing in 1975 as 387,000t occupying nearly 4% of the total consumption as shown in Fig. 2.

About 56% of the galvanized steel sheet produced in Japan was exported to the United States, South East Asia and other countries in last year.

The renovation and expansion of the continuous galvanizing and coating lines among the iron and steel makers in Japan was restrained in this year because of the dull market for galvanized steel, and the average working rate of their plant has been reduced to less than 70% of their full capacities.

The technique of the continuous galvanizing and coating has been developed remarkably, and the producers can make many kinds of zinc coatings such as minimum spangle, differentially coated, and galvanneal sheets, and these have developed some new fields of application.

B. Hot dip galvanized steel products

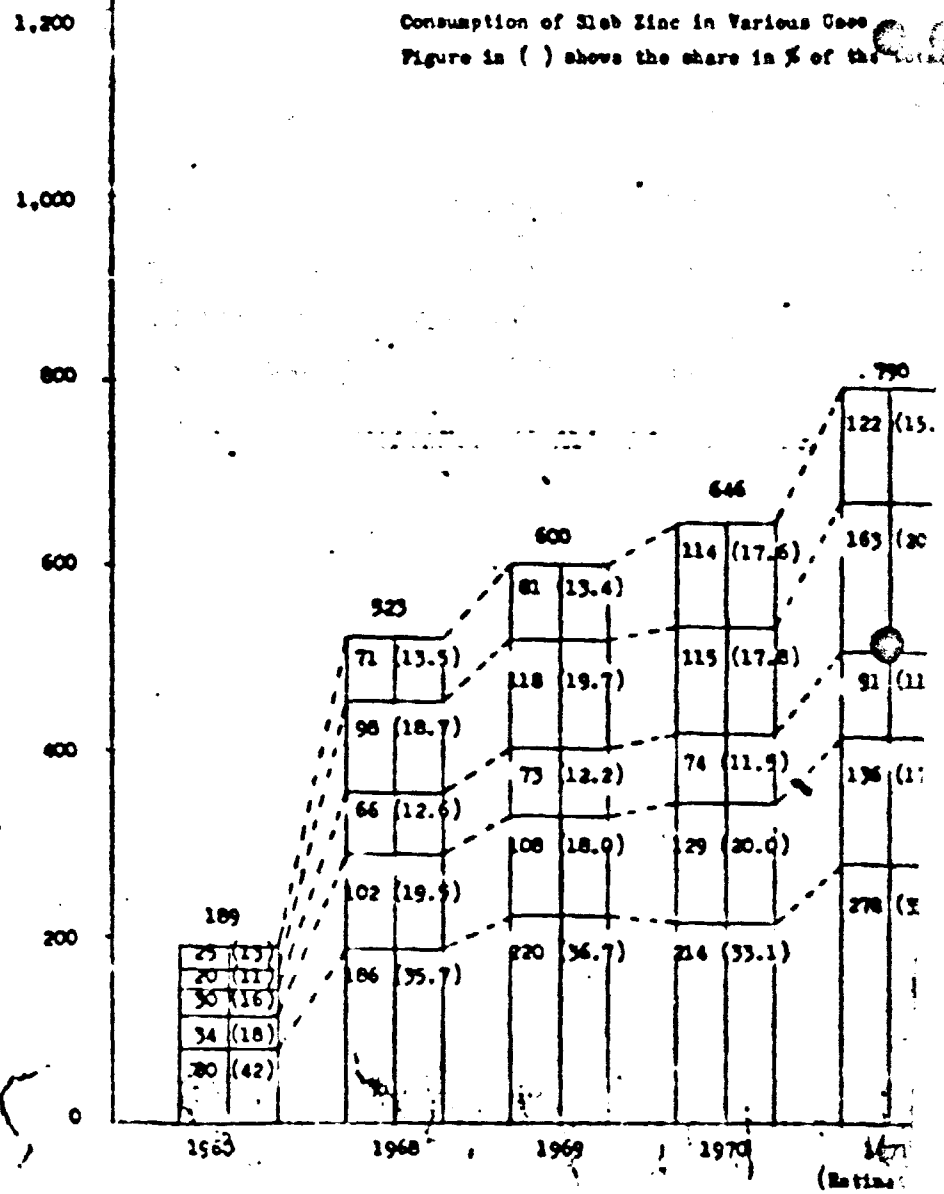
The consumption of zinc for hot dip galvanized steel products in 1960 was only 34,000t. Thereafter, the demand for slab zinc in this field has increased rapidly in favour of the recognition of anti-corrosion of outdoor steel structures among the end users.

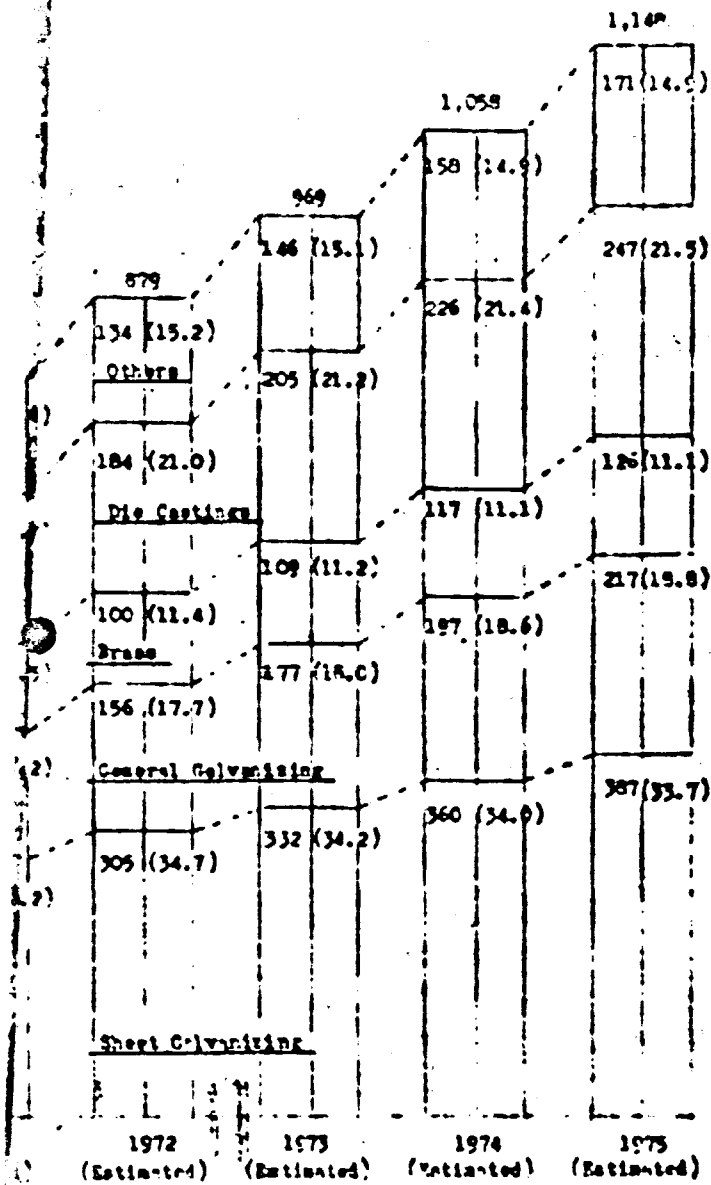
(1,000t)

Fig. 2

Consumption of Slab Zinc in Various Uses

Figure in () shows the share in % of the total





In 1970, consumption of slab zinc for general galvanizing was about 130,000t occupying nearly 70% of the total domestic consumption. The architects, civil engineers, and others pertaining to the construction of buildings, concrete structures, bridges and other steel structures have been more and more conscious about the corrosion protection of steel. Most recently, the National Telegraph and Telephone Corporation decided to construct a pier made of reinforced concrete structure in which hot dip galvanized steel bars are utilized for the first time in Japan. This, as a good example, will stimulate the use of galvanized reinforcing bars in the concrete structures in marine environment. All in all, the demand of slab zinc for hot dip galvanizing in 1975 is estimated as around 220,000t sharing about 19% of the total consumption of zinc. Therefore, the use of slab zinc for sheet galvanizing together with hot dip galvanizing will boost up to 607,000t which occupies about 53% of the total zinc consumption in 1975.

The productivity of hot dip galvanizing in Japan has been improved remarkably, and some of the galvanizers have achieved their production rate of 15-20tons/hour.

C. Zinc die castings

Consumption of special high grade zinc for die castings had grown steadily for the past 5 years even though some commodities have been replaced by plastics and aluminum die-castings. In 1960, the consumption of zinc for die casting was only 20,000t, and it has grown up to 115,000t in 1970. The end users of zinc die castings have been more and more comprehending about its good quality, versatility and productivity, so, we estimate that the use of zinc for die castings in 1975 will increase to 247,000t sharing about 22% of the total zinc consumption. Until last year, about 40% of zinc die castings was used in automobile industry, and 25% for domestic electrical machines and electronic industry.

Plastics has been the most aggressive competitor against zinc die castings, however, the alternation has recently been decreasing because of its poor mechanical strength and platability. Some of the designers and stylists of automobiles, electrical machines and others have been interested in the composite articles of electroplated zinc die castings and colourful plastics.

We have been sponsoring some die casters and electroplaters for their research works on the thinner die castings, vibratory finishing, and the improvement of the levelling qualities of the plating electrolytes, thereby to reduce the cost of production to considerable extent.

D. Brass and other copper alloys

Consumption of slab zinc for brass, bronze, nickel bronze and many other copper-zinc base alloys has been continuously growing every year in accordance with the remarkable development of various fabricating industries in our country.

Consumption of slab zinc, mostly special high grade zinc, in these fields was only 30,000t in 1960. In 1970, the consumption grew up to 74,000t, about 12% of the total zinc consumption. It is expected that the consumption for copper alloys will steadily increase for some years to come, and the amount of the zinc consumption in 1975 will be 126,000t, 11% of the total zinc consumption.

E. Other uses

Consumption of zinc for zinc sheet, zinc oxide, zinc dust and many kinds of inorganic chemicals has grown steadily, but not abruptly, in recent years. Zinc sheet has not traditionally been used for roofing and siding of the buildings and housings in Japan, but it is mainly used for printing and Leclanché batteries.

In 1960, the use of zinc in these categories was 25,000t, about 1% of the total zinc consumption, and it increased to 114,000t, about 18% of the total consumption of zinc in 1970. We estimate that the consumption will increase to about 170,000t occupying around 1% of the total in 1975.

IV. Summary

The remarkable development of Japanese heavy- and light industries has continued during the last two decades after the end of the war, and it was estimated that the Japanese economy has grown up at the yearly rate of 9% in fifties, 10% in sixties and 14% in the past few years. As long as the Japanese economy continues to stride for prosperity during the seventies, the consumption of lead and zinc, particularly that of zinc will increase meeting with the well balanced and successful advancement of our industry consuming these metals.

As to the consumption of lead, the demand of lead for SLI battery will rapidly increase in favour of the increased production of engine-driven automobiles. Furthermore, if battery-driven electric cars become more common in the big cities where the air pollution is causing serious problems, the consumption of lead will increase rapidly.

As to the consumption of zinc in Japan, we are confident of its increased consumption in sheet- and hot dip galvanising in favour of the continuous building and housing construction boom in Japan.

It is our great pleasure that the architects and civil engineers in here have become more conscious about the importance of the service life of steel structures, and they have been persuading their clients to use galvanized steel and coated-galvanized steel.

Production and consumption of zinc in 1975 will surely exceed our target of 1,000,000t thanks to the acute demand of the metal and the strong intention of our zinc producers to increase their production capacities to meet with the rapid increase of the demand of zinc in the years to come.