



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

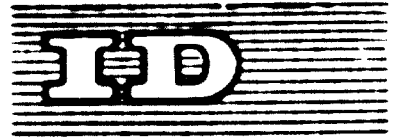
FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org



DO 1678

United Nations Industrial Development Organization

Finstr.
LIMITED

ID/WG.73/9
14 September 1970

ENGLISH
Original: SPANISH

Seminar on Tin Plate Production
Santiago, Chile, 9 - 13 November 1970

TIN PLATE MARKET AND MARKETING IN CHILE ^{1/}

by
Danilo Vucetich
Executive Vice President, Sales
Compañía de Acero del Pacífico S.A.
Santiago
Chile

^{1/} The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

872106

	<u>Page</u>
A. APPARENT CONSUMPTION OF TIN PLATE IN CHILE	3 - 6
Background	3
Structure of consignments of tin plate according to thickness	3 - 4
Factors affecting demand	4 - 5
Forecasts	6
B. TIN PLATE MARKET	6 - 10
End uses for tin plate	6 - 7
Diversity of industries using tin plate	7 - 9
Geographical location of enterprises	9
Availability of lacquering lines	10
C. INTRODUCTION OF ELECTROLYTIC TIN PLATE	10 - 12
ANNEX I	
Apparent tin plate consumption in Chile	13
ANNEX II	
Structure of tin plate demand according to end uses	14
ANNEX III	
Plan for the introduction of electrolytic tin plate	15 - 18

A. APPARENT CONSUMPTION OF TIN PLATE IN CHILE

Background

1. Before the Huachipato plant started operating, tin plate consumption in the country was met by imports, which amounted to an average of approximately 7,500 tonnes a year in the period 1945-1950, inclusive. See Annex I: Apparent tin plate consumption in Chile, 1945-1970.
2. After national tin plate production was begun in 1950, using hot-rolled sheets with normal thicknesses of 0.28 mm and 0.30 mm, treated by the hot-dip process, tin plate demand rose to a level of approximately 17,000 to 18,000 tonnes by 1952.
3. Beginning in 1960, the tin plate produced at Huachipato was prepared from cold-rolled sheets rather than the hot-rolled sheets which had been used up to that time. This made it possible to reduce the thickness of the tin plate and marked a change in levels of consumption, for demand increased from the 17,000-18,000 tonnes at which it had stood in 1952-1960 to approximately 30,000 tonnes by 1962. This represented an even greater actual expansion in the market, because of the reduction in thickness and consequent reduction in the weight/area ratio of the tin plate.
4. At present, annual tin plate consumption in Chile amounts to approximately 38,600 tonnes. This recent increase in demand has resulted, inter alia, from wider marketing of packaged products through sales in self-service shops, the opening up of markets in rural areas, and the decline in the price of tinned goods in relation to fresh goods, owing primarily to the reduction in thickness of the tin plate and to the operation of automatic lines for the production of cans.

Structure of consignments of tin plate according to thickness

5. The technological advance represented by the production of tin plate from cold-rolled sheets, with the resulting reduction and improved uniformity in thickness, provided consumers (in particular the canning industry) with an improved raw material for the production of containers, thereby eliminating one of the principal criticisms of the consuming public, namely, the difficulty of opening cans.

6. However, the new thicknesses had to be adopted gradually by the canning industry because industrialists had to acquire new equipment permitting the use of thinner tin plate. This in turn made available increased production capacity, which promoted the development of new canned food products.

7. The change in the structure of tin plate demand between 1960 and 1968 is shown below.

Structure of consignments of tin plate,
according to thickness, for 1960 and 1968

Thickness (mm)	1960		1968	
	tonnes	%	tonnes	%
	<u>14,425</u>	<u>100</u>	<u>26,852</u>	<u>100</u>
0.22	-	-	-	-
0.23	-	-	9,398	35
0.25	288	2	8,056	30
0.265	144	1	2,685	10
0.28	8,955	62)	6,713	25
0.30	5,049	35 (

Factors affecting demand

8. The demand for tin plate is closely related to the development of the market for a number of canned food products, mainly foods.

9. The market for packaged or canned food products is closely related to the purchasing power of individuals. The demand for canned goods is also strongly influenced by marketing systems and consumption habits concerning this type of goods. Thus, for example, the big marketing campaign carried out in our country by the producers of ice-creams and jellies has to some extent caused canned fruit to be dislodged from its position as the traditional dessert.

10. An especially important factor in the apparently abnormal fluctuations which tin plate demand in Chile has undergone is the price ratio between canned products and fresh agricultural products for the prices of agricultural products are subject to sudden changes, depending on supply in a given period and government policy on the matter.

11. Since the prices of canned goods are affected by the prices of agricultural products in preceding periods, divergencies arise between the prices for fresh products and canned products, with a resulting effect on the demand for the latter.

12. Another factor which has played an important part in tin plate demand, especially for so-called miscellaneous uses (containers for non-food products) is the competition between tin plate and other types of packaging. In this connexion, three products which compete with tin plate containers in Chile can be mentioned:

Glass: containers for wine, aerated, alcoholic and novelty beverages, milk and milk products, spirits, powdered and liquid food products, medicaments, toilet products, laboratory products, etc.

Paper and board: biscuits, chocolates, candies, other food products, detergents, etc.

Plastic: food products, pharmaceutical products, oil, etc.

13. New uses for tin plate which may be developed in future are also of great importance. In the case of Chile, it can be expected that, in addition to a steady increase in the range of food products (including prepared foods) marketed in cans, aerosol bombs, which are currently nearly all imported, will be manufactured in the country and cans for beer and novelty drinks may be introduced.

14. Lastly, in view of the special conditions existing in the country with regard to quality and possibilities for the industrial processing of seafood and fruits and vegetables in general, very special consideration should be given to the export market for these products, which is at present still in the early stages of development. In this respect, we might point out that between 1964 and 1968 an average of approximately 3,500 tonnes of canned goods were exported each year, involving an annual consumption of some 500 tonnes of tin plate.

Forecasts

15. The long-term market studies on steel products manufactured by the Compañía de Acero del Pacifico (CAP) which are being made take into account the expected development in individual economic sectors, since the close relationship between various steel products and the economic sectors which consume them makes it possible to estimate fluctuations in the future demand for each product by applying sectoral development criteria. For this purpose, general economic information such as degree of development, levels of investment and consumption, fluctuations in per capita income, etc., are taken into consideration. The above general criterion was also followed in the specific case of tin plate, special attention being paid to the development of the industrial processing of agricultural products and seafood, anticipated consumption habits with regard to canned foods, and the development of new uses and applications.

16. Applying this criterion, and taking into account the fact that, beginning this year, the domestic market will have a regular supply of high-quality electrolytic tin plate, the following figures for demand in the coming five years were estimated.

<u>Demand for CAP tin plate</u>				
(Thousands of tonnes)				
<u>1971/72</u>	<u>1972/73</u>	<u>1973/74</u>	<u>1974/75</u>	<u>1975/76</u>
47.0	52.0	56.0	62.0	65.0

17. The above forecast, which disregards such important new applications for tin plate as the manufacture of cans for beer and novelty drinks, reflects a cumulative annual growth of 6.6 per cent.

B. TIN PLATE MARKET

End uses for tin plate

18. The end uses of tin plate have been ascertained from the results of the Survey on end uses of steel products carried out periodically among our customers since 1966. The results of that survey for the current year are given in Annex II.

19. A clear picture of the development of the various types of end uses between 1952 and the present time can be obtained by analyzing the average tonnage for each type of use in the three-year periods 1952-1954, 1959-1961 and 1967-1969, as shown below:

Average annual consumption (tonnes)

<u>End Uses</u>	<u>1952-1954</u>	<u>1959-1961</u>	<u>1967-1969</u>
Canned milk products and powdered products	16,800	18,900	32,200
Canned fruits and vegetables	4,570	5,500	9,260
Canned seafood	4,080	4,520	8,500
Containers and other uses	1,920	2,360	3,290
Crown caps	4,110	4,290	6,070
	2,120	2,230	5,080

20. The above table shows that there have been no strong fluctuations in the relative positions of the various types of use, despite small percentage increases for canned fruits and vegetables and crown caps, with a corresponding decrease in the containers and other uses category.

Diversity of industries using tin plate

21. The main feature of the Chilean tin plate market is the great diversity of products manufactured and the large number of enterprises producing containers.

22. There are at present in Chile 82 canneries and crown cap factories, not counting the many small industries which use tin plate for the manufacture of special containers and for other applications. Of the above enterprises, 40 have their own equipment for manufacturing containers, as shown in the following breakdown.

Equipment for the manufacture of containers

	No. of factories	Total	Automatic lines	Manual or semi-automatic equipment
Canned milk products and powdered products	4	4	4	-
Canned fruits and vegetables	59	21	10	11
Canned seafood	15	11	3	8
Crown caps	4	4	4	-
TOTAL	82	40	21	19

23. The excessive number of small lines manufacturing containers is largely due to the sales tax system enforced in Chile up to the present time, under which the cost of the end product must include the entire cost of the taxes paid on the total number of transactions regarding the tin plate from the time of its delivery by the steel manufacturers.

24. The consequence has been a trend towards vertical integration in the canning industry, whereby enterprises purchase their own raw materials and manufacture cans themselves, thereby avoiding the taxes in question.

25. Taking into account only the 13 automatic lines in the canning sector, the country has an installed annual capacity of 314 million cans of three sizes, with one-shift operation, but no more than 38 per cent of this capacity is utilised. Details of the automatic lines for fruit and vegetable and seafood canning are given below:

Type of line	Speed (cans/minute)	No. of lines installed			Total No.
		Up to 5 years old	5-10 years old	10 or more years old	
Low-speed	120-150	2	1	2	5
Medium-speed	250-300	4	1	2	7
High-speed	350-450	1	-	-	1
TOTAL		7	2	4	13

26. The problem of under-utilisation of equipment and installations for the manufacture of cans has been a source of continuing concern to CAP, and at the present time, various technical and trade union bodies are analyzing the possibilities for concentrating production in one or two specialised enterprises, each with several lines.

Geographical location of enterprises

27. Because of the geographical features of the country and the location of fishing and stockbreeding activities, canning enterprises are located in widely-separated areas.

28. Thus, for example, the main shellfish canning plants are concentrated in the extreme south, while the dairy product processing and fish-canning plants are in the south-central area. Virtually all the fruit and vegetable canneries and crown cap manufacturing plants are concentrated in the central area. There is another group of fish canneries in the extreme north.

29. The great distances between canning centres make it somewhat difficult to supply cans or tin plate which have already undergone intermediate lacquering or lithographic processes, owing to increased transport costs.

Availability of lacquering lines

30. Lacquering capacity is available in the country. The lines are concentrated in the central and south-central areas, however, and the canning enterprises in the extreme south and extreme north lack local services which could supply them more easily and save transport costs.

31. However, the weakest point lies in the manufacture of lacquers and the shortage of advisory services for enterprises with their own can manufacturing equipment.

32. This situation is somewhat similar to that in 1960-1963, when there was not adequate equipment for the immediate use of tin plate thinner than 0.28 mm. The situation is expected to improve quickly because a number of firms have undertaken a thorough study of the problem.

C. INTRODUCTION OF ELECTROLYTIC TIN PLATE

33. The introduction of electrolytic tin plate in Chile encountered some resistance to change from canning enterprises, owing to the natural concern of industrialists with regard to the quality of the new tin plate, lacquering or lithography requirements, increase in stocks, etc.

34. First, national approval of the product had to be obtained from tin plate users. This acceptance had to be obtained not only on the basis of laboratory tests, but also on that of industrial-scale use. For this purpose, large-scale experiments were performed in representative groups of enterprises, which provided the point of departure for introduction of the new tin plate and vouched for its quality to the remaining canning enterprises and tin plate users.

35. One obstacle which electrolytic tin plate had to surmount arose from the increased complication of its use, since hot-dip tin plate could be used without additional treatment for all types of canned goods, while with electrolytic tin plate, intermediate processes such as the application of lacquers or lithography, to which some industrialists were not accustomed, had to be used.

36. In addition, electrolytic tin plate can be supplied in a full range of differential coatings, depending on the products to be packed. Although this represents an obvious advantage as regards the cost of the product, at the same time, it gives rise to new problems owing to the need to maintain a stock of different types of tin plate.

37. In addition to the above problems, there was the multiplicity of canning enterprises and can manufacturing installations. CAP therefore organized a campaign for the introduction of electrolytic tin plate, aimed at replacing hot-dip tin plate to the greatest extent possible.

38. The programme adopted consisted of the following stages:

- (a) Experimentation in Chilean canning enterprises with electrolytic tin plate produced in the USA by tinning cold-rolled CAP coils;
- (b) Approval of a standard for electrolytic tin plate;
- (c) Experimentation with CAP electrolytic tin plate in the so-called miscellaneous uses market;
- (d) Experimentation with CAP electrolytic tin plate in canning enterprises;
- (e) Determination and publicizing of information on appropriate uses for electrolytic tin plate;
- (f) Establishment of a national consultative committee to regulate the utilization of electrolytic tin plate;
- (g) Advisory services to electrolytic tin plate users concerning the application of lacquers;
- (h) Promotion of electrolytic tin plate;
- (i) Determination of price levels.

39. As a result of the activities listed above, which are described in detail in Annex III, it has been possible to introduce the new tin plate gradually into the various user sectors.

40. The replacement of hot-dip tin plate in the manufacture of crown caps and various types of containers began in October 1969, and in five months' time (February 1970) 1 lb. coated electrolytic tin plate had achieved full acceptance. The experimental use of 0.25 lb. coated tin plate for the manufacture of crown caps was started in July 1970.

41. Various small-scale tests were carried out on the manufacture of cans for dry food products and powdered coffee in conjunction with CHIPRODAL, a Chilean enterprise which produces the full line of Nestlé products under licence and receives advisory services from Switzerland. In June 1970, the approval of the Nestlé company was obtained for the use of the new tin plate in cans for dry foods and powdered coffee.

42. In view of the success of the many experiments performed, the fruit, vegetable and seafood canning industries have accepted 1 lb. coated electrolytic tin plate from the 1969-1970 season onwards. Deliveries of the new tin plate for the manufacture of cans for the various products in this sector, with the exception of tomato concentrate and other products with similar corrosive or tin-attacking properties, are starting in August 1970.

43. Users have not so far definitely accepted electrolytic tin plate in the powdered milk, cream and liquid milk market. However, testing has entered its final stage, and we think that it will be possible to start deliveries this year.

44. The percentages accounted for by electrolytic tin plate in the national market are listed below:

	<u>Percentage</u>
October 1969 - March 1970	20
April 1970 - June 1970	25
July 1970 - September 1970	54
October 1970 - December 1970	70
January 1971 - March 1971	85

45. Electrolytic tin plate is expected to have entirely replaced hot-dip tin plate by January 1971 for all types of applications, with the exception of a few food canning uses.

ANNEX I

Apparent tin plate consumption in Chile

1954-1970

YEAR	CAP CONSIGNMENTS (Tonnes)	IMPORTS (Tonnes)	TOTAL (Tonnes)
1945	-	7,305	7,305
1946	-	4,874	4,874
1947	-	7,955	7,955
1948	-	11,838	11,838
1949	-	9,793	9,793
1950	5,772	3,612	9,384
1951	13,128	1,533	14,661
1952	15,119	2,003	17,122
1953	14,133	653	14,786
1954	18,237	-	18,237
1955	18,149	31	18,180
1956	19,591	792	20,383
1957	15,575	241	15,816
1958	17,888	243	18,131
1959	17,506	601	18,107
1960	14,425	1,786	16,211
1961	17,433	5,068	22,501
1962	26,203	3,490	29,693
1963	29,420	732	30,152
1964	26,840	104	26,944
1965	19,984	4,022	23,916
1966	33,259	1,840	35,099
1967	36,066	830	36,896
1968	26,852	1,100	27,952
1969	30,472	1,200 ^{1/}	31,672
1970	37,400 ^{2/}	1,200 ^{2/}	38,600

^{1/} Partly estimated.

^{2/} Estimated.

ANNEX II

Structure of tin plate demand according to end uses

	CURRENT DEMAND (Tonnes/year)	PROPORTION (%)
	38,600	100.0
(a) <u>Canned milk products and powdered products</u>	<u>14,204</u>	<u>36.8</u>
Condensed milk	4,632	12.0
Evaporated milk	193	0.5
Dairy cream	965	2.5
Powdered milk	4,555	11.8
Powdered coffee	2,547	6.6
Other powdered products	1,312	3.4
(b) <u>Canned fruits, vegetables, etc.</u>	<u>8,724</u>	<u>22.6</u>
Fruits in syrup	3,049	7.9
Fruit juices	695	1.8
Jams	425	1.1
Vegetables	1,390	3.6
Sauces	2,316	6.0
Miscellaneous	849	2.2
(c) <u>Canned seafood</u>	<u>2,625</u>	<u>6.8</u>
(d) <u>Crown caps</u>	<u>5,327</u>	<u>13.8</u>
(e) <u>Containers</u>	<u>7,025</u>	<u>18.2</u>
Paints	1,775	4.6
Lubricants	1,621	4.2
Polishes and waxes	1,853	4.8
Edible oil	116	0.3
Butter and fats	618	1.6
Chocolates, biscuits and candies	193	0.5
Miscellaneous containers	849	2.2
(f) <u>Miscellaneous uses</u>	<u>695</u>	<u>1.8</u>
Kitchenware	193	0.5
Stoves	77	0.2
Electronic equipment	77	0.2
Filters	116	0.3
Lamps and accessories	39	0.1
Hunting equipment	77	0.2
Expanded metal	77	0.2
Sprayers	39	0.1

ANNEX III

Plan for the introduction of electrolytic tin plate

1. Electrolytic tin plate produced in the USA in an equivalent line, using CAP steel strip

While the line was being installed, a batch of cold-rolled coils of various thicknesses was sent to the United States to be tinned in a Ferrostan electrolytic line equivalent to the one being installed by CAP. The tin plate thereby obtained was distributed in small batches to various canneries, manufacturers of industrial containers, etc.

The products packed were collected for laboratory analysis and subjected to accelerated ageing processes.

2. Standardization of tin plate

A draft standard for electrolytic tin plate was submitted to the Instituto Nacional de Investigaciones Tecnológicas y Normalización (National Institute for Technological Research and Standardization) (INDITECNOR) since national standards existed only for hot-dip tin plate. In accordance with the procedure followed by the Institute, meetings were organized at which its engineers and representatives of the manufacturing industries and CAP were present. The standard was approved before the large-scale introduction of electrolytic tin plate and is now before the public authorities for consideration.

3. Introduction of electrolytic tin plate into the miscellaneous uses sector

When the electrolytic tinning line started operating at the end of 1969, the first deliveries of tin plate were made to the actual consumers for miscellaneous uses such as the packing of fats, oils, lubricants, waxes, polishes, biscuits, etc., as well as for the manufacture of crown caps.

This tin plate was marked with a line at a certain distance from the edge to enable users to distinguish it, thereby preventing confusion and possible wrong utilisation of the product.

After electrolytic tin plate had been used for a period of four to six months in this miscellaneous products consumption sector, the users were convinced of the quality of the product and the good results obtained owing to its increased suitability for the lithographic processes necessary for this type of packaging.

4. Second series of tests in the canning industry

At the same time, samples were again selected to be sent to canneries for further tests. This time, the tin plate was produced by the line which had now been installed. These experimental canned goods samples, which were analyzed in the new laboratories installed at the same time as the new electrolytic tinning line, represented a maximum of variety - nearly 95 per cent - of the types of canned goods produced in the country.

5. Publicization to enterprises of the results of analysis of the samples of canned goods collected

After holding the various cans containing a wide variety of canning industry products for a certain period, the Metallurgical Department of CAP ascertained that electrolytic tin plate could be used immediately for virtually all canned goods with the exception of those internationally recognized as corrosive or tin-attacking, which must be packed in hot-dip tin plate. This information was then publicized, together with general rules for the products (such as tomato concentrates) which need to be packed in electrolytic tin plate covered with protective lacquer.

6. Establishment of a national committee

It is interesting to note the success achieved in the establishment of a committee for analyzing the various aspects of the use of electrolytic tin plate and possible attendant problems. In Chile, the Food Supervision Department of the National Health Service supervises and controls packaged products. Its participation in this connexion was therefore particularly important. The matter was broached far in advance with the General Directorate of the Service, and its full co-operation was obtained, as was, later on, its participation in a committee made up of representatives of the Asociación de Fabricantes de Conservas (Association of Canners), the Instituto Chileno del Acero (Chilean Steel Institute), the Instituto Nacional de Investigaciones Tecnológicas y Normalización (National Institute for Technological Research and Standardization), The Compañía de Acero del Pacífico (Pacific Steel Company), and the Fabricantes de Envases (Packaging Manufacturers).

This committee will continue to operate according to a set programme, discussing the various recommendations and rules for the use of electrolytic tin plate and also control methods to ensure proper use of the raw material and canned goods. In addition, it will take up technical problems raised by users.

7. General recommendations for the use and application of lacquers

CAP thought it necessary, as an indispensable concomitant to the Company's direct promotion of the introduction of electrolytic tin plate, that an independent technical body should produce studies designed to provide advice (recommendations) concerning the use of lacquers with such tin plate. The task was entrusted to the Chilean Steel Institute, which, in collaboration with the Association of Cannerymen, published a brochure before the line started large-scale production. The first part of this brochure informs all users of electrolytic tin plate concerning types of coatings, the naming of products according to INDITECNOR standards, the precautions which enterprises must take in handling both the raw material and the containers, conditions for storage of containers before and after filling, etc.

The second part of the brochure lists all types of canned seafoods, fruits and vegetables, and gives guidance for the gradual introduction of electrolytic tin plate to enable industrialists to make maximum use of differentially coated tin plate, once they have acquired confidence and experience in its use. This part includes recommendations for the use of lacquers.

8. Meetings and circulars

CAP has assigned a specialist in its sales organization to take charge of the entire promotion and introduction process for electrolytic tin plate because it considers this matter of vital importance, owing to the large investment involved in the installation of the electrolytic line. The programme in this field comprised several stages.

- (a) A letter to each of the 93 tin plate users who are direct or indirect customers of our Company, providing full information on the technological progress which a line of this type means for the country. In addition, the price policy which CAP has decided to apply is emphasized, and the importance of standardization in the consumption of electrolytic tin plate is noted so that increased costs can be avoided by achieving economies of scale in its manufacture.

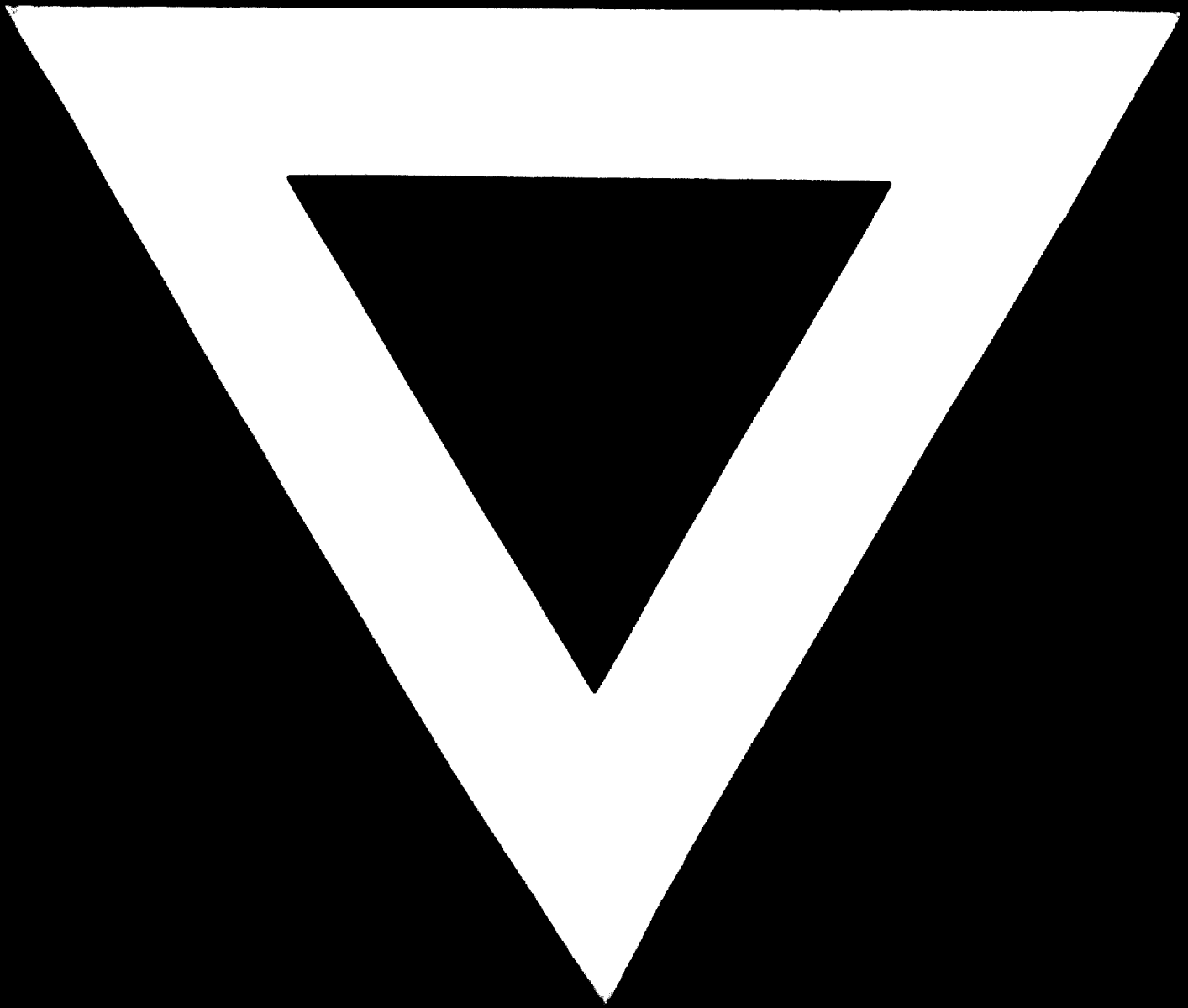
- (b) A personal visit to each of the tin plate users, in which all operational matters are dealt with and detailed information is given on the use of electrolytic tin plate.
- (c) Talks and lectures for organized groups of manufacturers with the purpose of initiating round-table meetings at which the problems connected with the use of electrolytic tin plate can be discussed openly and frankly.
- (d) Programme of visits by all users, in small groups, to the installations and laboratories of the Huachipato plant.

9. Price policy

No attempt was made in the campaign for the introduction of electrolytic tin plate to use price policy as an active instrument for promoting penetration of the new product.

In this way, it was possible to avoid a situation where customers would decide to use the new tin plate for reasons of economy, without giving due attention to all the technical questions which had to be solved in advance, in view of the great importance of the health aspects and the serious consequences which indiscriminate use of electrolytic tin plate might have.

Once full familiarity with this type of tin plate and the precautions indispensable for its use had been disseminated and general confidence in its high quality promoted, the lower prices for various types of electrolytic tin plate were announced. In this way, price came to be one of the factors taken into consideration in determining the advantages afforded by electrolytic tin plate, providing an additional incentive and accelerating the replacement of hot-dip tin plate by electrolytic tin plate.



74. 10. 11