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THE PRESENT STATUS AND FUTURE PLANS
FOR DEVELOPMENT OF THE PLASTICS INDUSTRY IN HUNGARY
AND TECHNICAL ASSISTANCE REQUIRED 1/

by

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i./ Trends in the past and present situation with regard to the production, manufacture and consumption of plastics in Hungary

The first steps in plastic application were made in the early twenties, actually in 1921, when the first electric isolators were produced. 1923 was the year when paperboard production has begun.

Production of phenolic resins and moulding powders started in 1931. Little amounts of urea-type moulding materials were also produced before the second world war, but the production of thermoplastics was not yet introduced at that time. No official statistic data of this period are at our disposal concerning to the total production of moulding powders, but its amount can be estimated to 400 tons in the year 1942.

Application of PVC and polystyrene was mainly constricted to the field of electric and cable industry.

After the second world war the growth of consumption and of production became faster. This increase is illustrated in Table I.

Table I.
Production and consumption of plastics in Hungary

Year	Production of		plastics	Consumption of	
	tons	kg/head		tons	kg/head
1950	1.412	0,15	1.981	0,21	
1955	4.228	0,42	7.313	0,79	
1960	9.935	0,99	22.447	2,25	
1965	30.648	3,03	46.424	4,50	
1970	58.767	5,65	130.952	12,6	
1971	85.208	8,19	141.615	12,6	
1972	103.658	9,95	158.605	15,28	

Table II. shows the consumption distribution among plastic types of main importance.

Table III.

Consumption of plastics of main importance

Type of plastic	1965 /%/	1970 /%/	1972 /%/
Vinyl resins	31,6	25,1	25,1
Polyolefines	9,7	24,8	30,7
Polystyrene	4,3	9,1	8,8
Phenolics	9,0	4,3	4,0
Aminoplasts	16,2	9,8	9,3
Other plastics	29,2	26,9	22,1

Table III. illustrates the development of various conversion processes.

Table III.
Development of plastic-processing

Type of conversion process	1965 tons	1970 tons
Moulding	5.400	6.900
Injection-moulding	4.000	14.100
Blow-moulding	800	4.000
Films and sheets	4.600	20.200
Flooring	2.200	10.500
Foamed plastics /except polyurethanes/	200	3.600
Pipes, rods and profiles	2.800	8.400
Leathercloth ^x	3.500	11.100
Cable-insulation	7.900	15.100
Chip-board ^x	6.400	17.800
Reinforced plastics	1.700	4.400

^x amount of plastic included only

Table IV. shows consumption values of processed plastics, divided according to the field of application.

Table IV.
Consumption of processed plastics

Field of application	1965 tons	1970 tons
Building industry /pipes and electric instal- lations materials not included/	4.000	18.000
Tubes and pipes	3.000	4.000
Agricultural field /pipes and packaging materials not included/	3.000	21.000
Machinery	9.000	13.000
Electrical industry	12.000	23.000
Other application fields	7.000	34.000

2./ Projection of future growth

Projection of future growth of consumption was elaborated by various methods /correlation-functions between plastic consumption and specific national income or between consumption values of plastics and metals/. It was found that best results can be attained by a specially calculated Gompertz-function of the following formula:

$$\log y' = 4,8498 - 4,439 \times 0,9772^t$$

where $y' = t$; and the value of t is taken 0 in the year 1950.

This function was elaborated in the year 1962 and the results of comparing the calculated figures with the actual ones show, that the shape of the function-curve can be justified as correct.

The main problem is that by the help of the Gompertz-function only the total consumption can be calculated and not the

consumption of individual plastic assortments. These figures we gained by comparison of statistic data of different foreign countries and drew conclusion of them to our home situation.

Results of these projections can be seen in Table V.

Table V.
Plastic consumption in Hungary

Type of plastic	1975 1000 tons	1980 1000 tons	1985 1000 tons
Total amount	240	440	750
Vinyl resins	70	120	180
Polyolefines	65	130	250
Polystyrene	20	40	80
Aminoplasts	22	34	50
Phenolics	13	22	30
Unsaturated polyester resins	10	24	50
Acrylics	4	8	16
Epoxy resins	2	4	8
Polyurethanes	8	15	25
Polyamides	3	7	12
Alkyd - and other resins for lacquer	11	17	25
Other plastics	12	19	26

Projection of the structural development of various processing methods was performed by the same method. The result of this is shown in Table VI.

Table VI.
The structure of plastic-processing in Hungary

Type of processing	1975 1000 tons	1980 1000 tons	1985 1000 tons
Moulding	40-50	100	160-180
Blow-moulding	10	25-30	45-50
Films and sheets	45-50	90-100	150-170
Flooring	15-20	25-30	35-40
Pipes, rods and profiles	20	35-40	60-80
Cable insulation	25	35	50-60
Foamed plastics	15-20	30-40	60-70
Reinforced plastics	10-15	25-30	50-60
Leathercloths	20	40-50	60-70
Chipboard	20	30	40-50
Total	220-245	435-480	720-830

3./ Plans for future expansion

Fundamental change will be attained in the Hungarian plastic industry by the execution of the planned petrochemical-program. An ethylene-pyrolysis plant with a capacity of 250.000 tons/year of ethylene is under erection. On the basis of ethylene the production of plastics will attain 410.000 tons/year in 1980. The structure of production attained in 1980 is shown in Table VII.

Table VII.
Plastic-production in 1980 /1000 tons/

PVC	180
Polyethylene	55
Polypropylene	30
Aminoplasts	24
Phenolics	9
Unsaturated poly- ester resins	14
Other plastics	68
Total	410

By comparing the planned production values to the calculated figures of consumption, it can be seen that at some types of plastics production exceeds home consumption, while in the case of others importation shall be necessary.

Increase of consumption will extend on a wide scale, so that it will comprise more and more new application fields. The main field of interest is concentrated on application in the building industry, packaging, agriculture, electrical- and furniture-industry.

4. Major problems impeding growth.

In course of the past 20 years requirement for various plastics was larger than the possibilities of plastic-industry. Situation has changed now. In spite of the fact that types of plastic-products are required in larger quantities than the production capacity, yet the number of products which seem to show marketing difficulties increases.

After analysing the difficulties it was found that the problems of main importance are the following:

Insufficient knowledge of: detailed engineering of the design, technical and economic advantages of plastic products, the need of construction alterations in consequence of the application of plastic elements.

The risk caused by the high cost of press dies in the experimental period.

Uneasiness caused in some cases by the fire hazard /in the building industry/, by the toxicity in others /packagings/.

Uneconomical production-series with regard to the home-market, which is limited by the Hungarian economical life and the number of population.

Currency-problems arising from buying machines, tools, licences etc. from foreign countries.

5./ Problems solved already

In order to solve all the problems mentioned above, various measurements were executed. These can show some effort in all cases, but general solution cannot be expected. In order to propagate knowledge on a wide scale a Plastic Technological Centre was organized in frame of the Hungarian Research Institute of Plastics. One of the tasks of this centre is to collect and propagate any news that can be obtained. Special courses are organized in the Technical University in Budapest and in the Academy of Kecskemét with the aim to educate specialists of plastics. A great number of specialist visit international exhibitions and since 1966 an international exhibition of plastics has been organized regularly in Budapest under the tradename Hungaroplast.

A special periodical is published in Hungarian, bearing the title: Műanyag és Gumi /Plastics and Rubber/.

The demand, however, for more and more information and knowledge cannot be satisfied.

In order to lower financial risk of experimental new products the convention has been established in the last few years, that in the first period of the application of new plastic materials its use is exercised with imported plastic parts and their production will start only then, when the market is disclosed already. This method is effective enough but has the disadvantage of remaining always behind world-level.

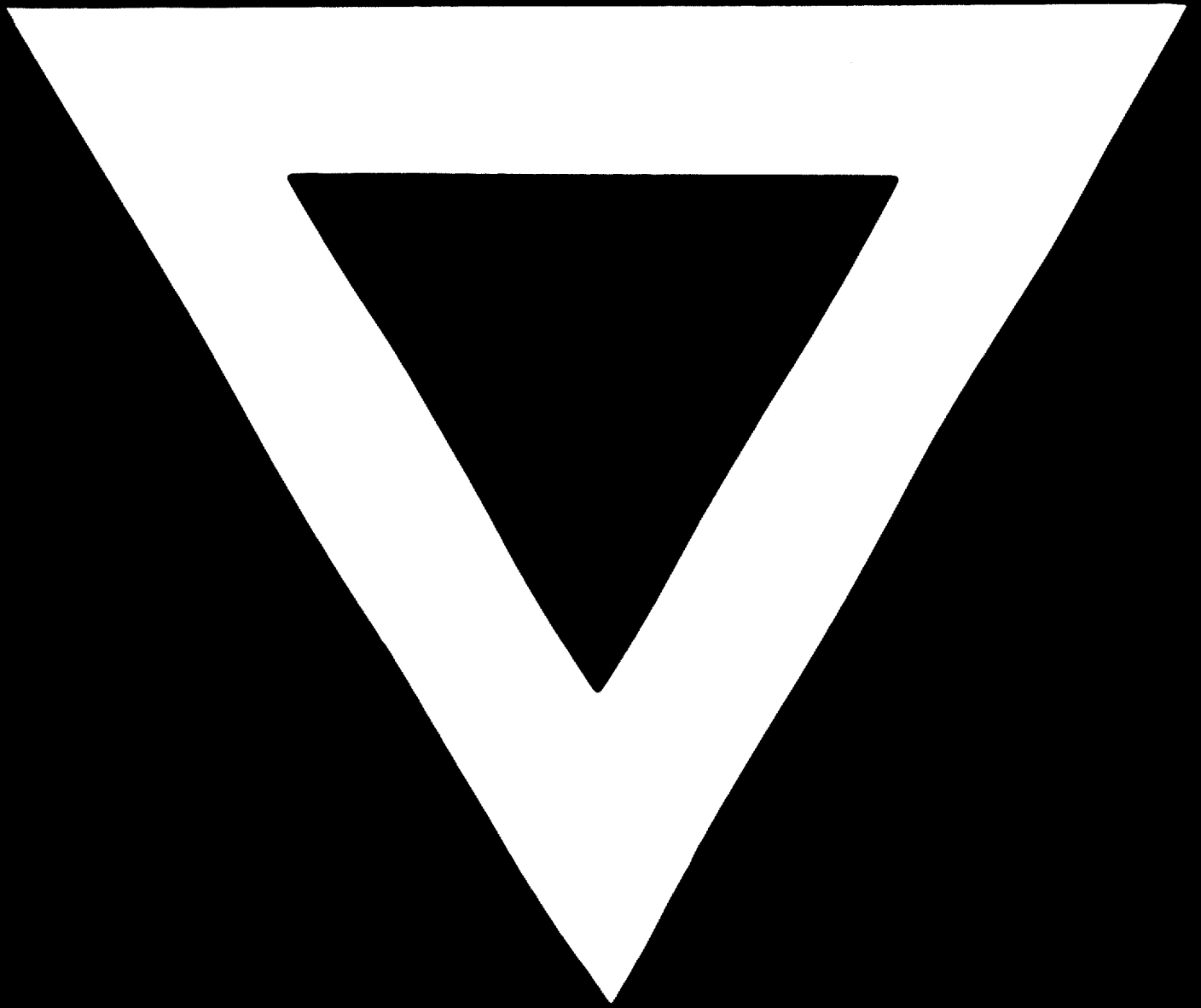
In order to avoid fire-hazards, and life-hazard caused by toxicity, competent research institutes are performing central-directed investigations. In this respect, however, they could use informations about experiences and regulations both, from other countries.

To overcome the problem of uneconomical production series and the currency-problems too, cooperative-connections are planned instead of purchasing. There are, however, only a few firms which understand the possibilities in this field.

6./ Area in which United Nations assistance may yield the most critical results.

In order to solve the main problems mentioned above, United Nations could assist by giving informations, reassuring publicity, establishing connections between partners having the same interest and could assist in the educational field.





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