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PACKAGING MEDIA SCIENTIFIC RESEARCH AND EXPERIMENTAL INSTITUTE, SOFIA

DP/BUL/71/509

BULGARIA

TERMINAL REPORT

Prepared for the Government of Bulgaria by the
United Nations Industrial Development Organization,
executing agency for the
United Nations Development Programme

United Nations Industrial Development Organization

id.76-1077

United Nations Development Programme

PACKAGING MEDIA SCIENTIFIC RESEARCH AND EXPERIMENTAL INSTITUTE, SOFIA

DP/BUL/71/509

BULGARIA

Project findings and recommendations

Prepared for the Government of Bulgaria
by the United Nations Industrial Development Organization,
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United Nations Industrial Development Organization

Vienna, 1976

Explanatory notes

References to "dollars" ($) indicate United States dollars.

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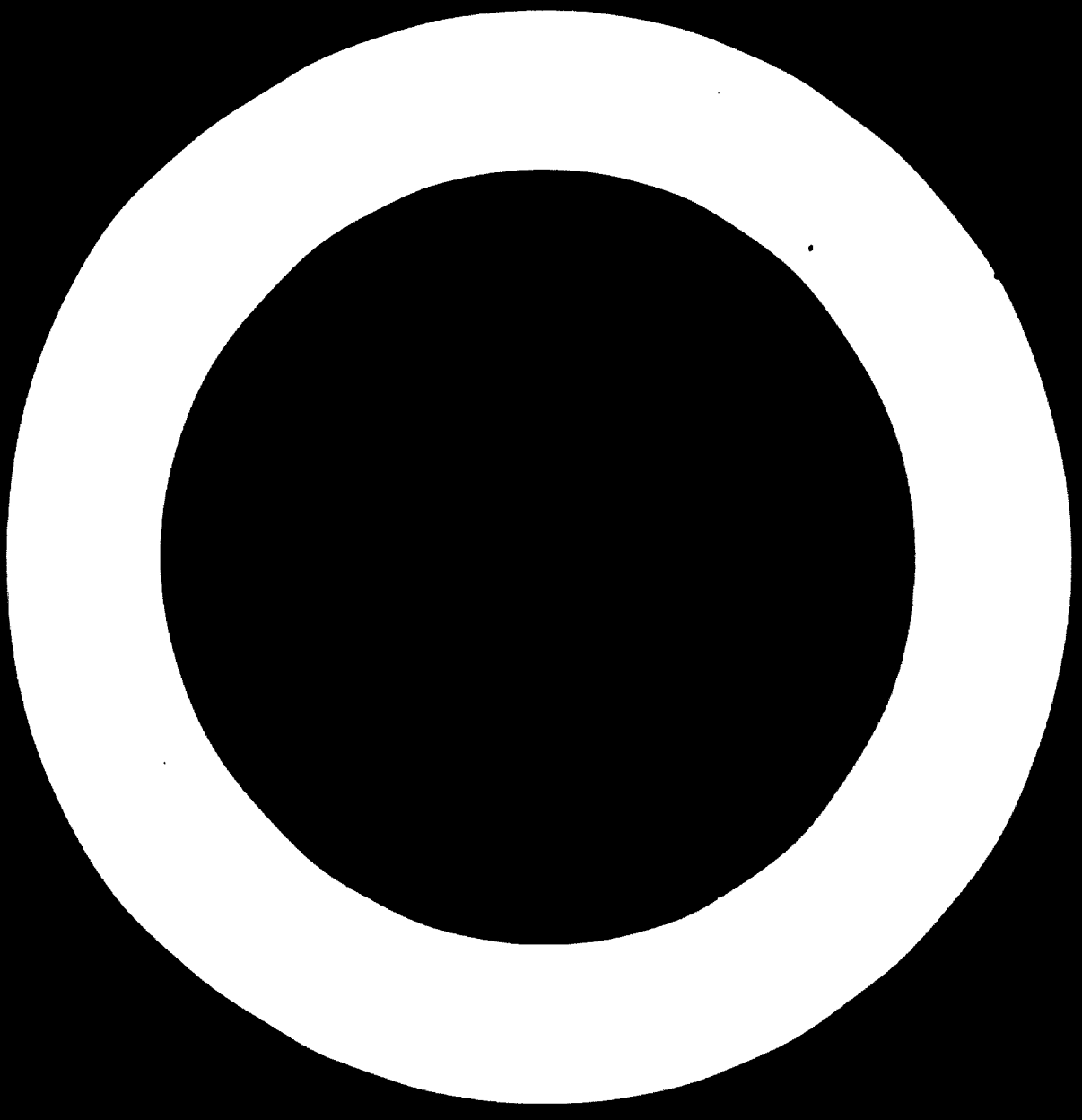

I. INTRODUCTION

The Government of Bulgaria has in recent years encouraged accelerated development of domestic and foreign trade. Trade relations have been established with more than a hundred countries and Bulgarian products are being exported abroad. In a number of recommendations, the International Organization for Standardization (ISO), the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO) and others have suggested that the goods be packaged in accordance with international technical standards and that the quality of packaging should correspond to them in order to be capable of meeting up-to-date requirements.

Urgent need for improving the packaging standards has also been recognized in relation to the development of a new form of trade in Bulgaria, that is, the self-service shops and supermarkets which are supplied with the individual packaged goods in large quantities.

Packaging Research Institute

The Government's 5th Five-Year Plan (for 1965-1970) emphasized the need for the accelerated development of the national packaging industry and in order to ensure the corresponding research and experimental background, it was decided, in April 1967, to establish a packaging research institute. In 1968 the Council of Ministers, in a decree published in the State Newspaper, confirmed the creation of the "Packaging Media Scientific Research and Experimental Institute" (NIERA), Sofia. The purpose of the Institute is to organize research and experimental activities in packaging and undertake extension services to the industry in this field. The Institute is attached to the Ministry of Home/Trade and Services and is supervised by the State Committee for Science and Technology.

The Institute has ten departments, as follows:

Economical research, forecasts and concepts
Packaging technique, pallets and containers
Paper, board, textiles, wood packaging and coating
Metal, glass and plastics packaging
Design
Training
Laboratories for physical-mechanical and physical-chemical testing

Analytical laboratory
Scientific and technical information
Administration

Through the joint work of these departments, complete co-ordination is established between the research and design activities. There is at present a total of 120 employees of whom 50 are engineers.

In order to develop the Institute and strengthen its activities, a project on packaging was included in the country programme for the period 1972-1976 at the 13th Session of the Governing Council of the United Nations Development Programme (UNDP), January 1972. Following the Government's request, a project document was elaborated and prepared in detail with the assistance of the executing agency, the United Nations Industrial Development Organization (UNIDO). It was signed by the Government of Bulgaria, by UNIDO and by UNDP on 29 December 1972. At the beginning, the duration of the project was fixed as two years, but during the implementation it was increased to three years, that is, until 31 December 1975.

In view of the fact that the Institute had been in existence for some years and already had a reasonably qualified staff of professionals and technicians as well as the director of the Institute and co-manager of the project, M. Konev, who is well known as a specialist in the packaging field, it was decided to implement the project without a project manager. The project manager's duties, since the beginning, have been carried out by an expert of the UNIDO staff, Alexei Nemtchinov, and the money allocated for the post has been distributed within the project.

At the commencement of the project on 1 January 1973, a new building for the Institute had been erected in Sofia. Owing to the rapid increase in the cost of equipment and in fees charged to training, and difficulties encountered in the recruitment of experts, it was necessary to revise the project in March 1973, in March 1974 and again in February 1975. There were also two tripartite reviews held at the project site, in March 1974 and in February 1975.

Objectives of the project

The project is primarily research-oriented and does not have a significant investment potential. The major long-term objective is to strengthen the activities of the Institute so that the final application of its research and experimental work will have immediate influence on trade. The major short-term objectives, which were made before starting the project, are:

(a) To co-ordinate, and establish permanent control over, the activities of all production plants and trade organizations in the field of packaging in Bulgaria. (It is envisaged that the Institute will determine present and future perspectives of the packaging industry and establish a plan for co-ordination in package development and production in different branches of the national economy.) The carrying out of investigations and surveys of the packaging industry in the country, in relation to packaging materials and equipment and methods of transportation, will help the Institute in its work and prevent duplication of activities;

(b) To elaborate, for the pertinent production and commercial enterprises, methodical instructions for the manufacture and use of all kinds of ready packages and packaged materials for both domestic and export markets;

(c) To organize and certify the import of packaging equipment, packaging materials and complete packages;

(d) To assist in the conclusion of special contracts with foreign packaging contractors. (Bearing in mind the state of the packaging industry in the country, its needs and concrete ways to meet them, the Institute is expected to act as a consultant in any bidding and contracting procedures.);

(e) To contribute to improving the professional level of specialists and to widening the scientific-technical information services available. For these purposes, the Institute will organize and carry out courses in packaging, establish permanent contacts with international organizations, and participate in various meetings, symposia and conferences in the country and abroad;

(f) To carry out techno-economic investigations and make projections for the construction of new departments and enterprises for the production of packaging materials and packages based on the use of the latest packaging techniques;

(g) To develop standardization and unification for packages, taking into account the fact that the national packaging industry, whose development is one of the most important goals of the project, must meet international standards. To this end, the Institute will elaborate national packaging standards and regulations, giving special attention to standardization in transport and loading/unloading processes which use the progressive pallet system;

(h) To assist in designing new consumer and transport packages of all kinds as well as various pallets for the packaging industry.

II. FINDINGS

Project activities

The rapid increase in commodity prices and the general instability of convertible currencies made for certain difficulties in the implementation of the project. In addition, it is considered that two years are not enough for a large-scale project of this kind. The duration should be, as a general rule, not less than three years.

At the beginning of the project, some difficulties were also encountered in placing the Bulgarian fellows in suitable firms abroad. Nevertheless it may be said that their training programmes were successful. They have made it possible to reduce the number of international experts needed for the project.

At various stages of the project, six international experts and consultants rendered their assistance to the Institute. This assistance permitted the Institute to achieve a basic level of expertise more quickly. All the accepted recommendations of the experts were implemented during the life of the project, as follows:

(a) The technoclimatic laboratory was equipped with a salt-solution spray chamber that includes devices for measuring surface temperatures, air pollution and vibrations during test journeys;

(b) The mechanical testing laboratory was completed with a machine for tensile, bending and compression testing of materials;

(c) The packaging testing laboratory was equipped with an electronic measuring system consisting of oscilloscope, transducers for vibration and shock testing, measuring amplifier, four-track tape recorder and digital event recorder, one-channel direct recorder, frequency spectrometer etc.;

(d) The climatic chamber was completed by the addition of equipment to measure temperature and relative humidity; to measure temperature on surfaces, in goods and in the air; to measure velocity of air surrounding goods; to determine the dewpoint in the air; to detect the flow and strength of air currents and to determine the gases evolved during ripening processes;

(e) The plastic department was equipped with a gas-chromatograph for qualitative and quantitative determination of retained solvents in coatings, adhesives and lacquers of packaging materials;

(f) Some of the work premises were reconstructed and, consequently, the capacity of the effective work area of the building was increased by approximately 10 per cent;

(g) All specialists of the Institute have been involved in the preparation of a "NIERA packaging manual".

As a result of the follow-up to the experts' recommendations, the technology in the laboratories was considerably improved.

The training programme was completed in full during the project. All the selected fellowship holders were trained abroad and resumed their employment in the project. All of their reports stress the importance of their training, which enables them, in turn, to train Bulgarian specialists in the field and to perfect the qualifications of technical engineering and economics specialists working in the field of trade and economy in the country. For example, more than 350 persons attended the training courses and seminars held by the specialists of the Institute, and three of them took post graduation courses in the Higher Chemical and Technological Institute, Sofia. Ten persons were helped to prepare for their graduation diplomas, with the aim of ensuring their specializing as future experts in packaging. Such activities seem to be very important for the development of packaging in the country and in future similar training programmes should be foreseen in the working plan of the Institute, especially in the field of construction of plastics and metal packaging, taking into account their rapid development in the world.

As a result of the project implementation, the Institute has gained a high degree of competence in packaging and hence is able to independently organize various seminars and training courses for packaging specialists from developing countries. The Institute has elaborated a special programme which is being used as a pattern for such courses (annex VI). As a good example, a symposium on packaging, with the assistance and participation of the specialists from the Institute, was held in Plovdiv (Bulgaria) in 1974. Some 850 participants from ministries, scientific organizations and enterprises manufacturing packaging materials and packages (including 37 firms from different countries) took part. Thirty-four papers were presented in the course of a week, and 50 reports were delivered by lecturers from 12 countries. The symposium was accompanied by an exhibition of packaging techniques. The success of both the symposium and the

exhibition was attested to by all participants. A similar undertaking is scheduled for May 1976 in Sofia.

Qualification courses are also being organized for specialists from packaging production enterprises throughout the country in collaboration with scientific and technical societies in the cities. Such courses were held at Pleven, Vidin, Razgrad, Tolbuhin, Sofia, Plovdiv etc., during the implementation of the project.

During the last years the Institute has taken part in international packaging symposia, conferences, congresses etc. It participated in the international packaging conference BUDAPAK in Budapest, in an international conference in Dresden and in the meeting of directors of packaging centres from the developing countries in Vienna. Recently it took part in the Congress of the European Packaging Federation where the first step to co-operation with this organization was established. Talks on the condition of participation of the Institute in the work of the organization have been held.

At these conferences and congresses the Institute presented papers on various aspects of packaging, for example, the efficiency of using non-returnable packages, the prospects of using returnable packages, the mechanization of scientific and technical information in packaging, case study on the organization of packaging centre in a developing country etc. The Institute also participated in exhibitions and symposia on packaging in Denmark, England and the Union of Soviet Socialist Republics.

Additionally, the NIERA Institute has concluded bilateral agreements for co-operation in the field of packaging with the packaging institutes in Czechoslovakia, the Federal Republic of Germany, the German Democratic Republic, Poland and other countries. Consequently, a continuous exchange of information on certain packaging problems has been effected. This co-operation also includes the training of staff members. For instance, in 1975 one staff member of the Institute received training in Italy in the design of new packaging machines.

One of the important achievements of the Institute during the implementation of the project has been the creation of the Scientific Research Information Service. It gives the Institute the possibility to follow closely all novelties in the development of packaging through a systematic processing of scientific and technical information published all over the world. The Institute subscribes to 160 periodicals and other specialized literature on packaging. This information is circulated among all specialized institutes in the country.

The Institute has commended issue of a specialized "Bulletin on packaging" which contains information processed by the staff. This activity is highly appreciated by various organizations and enterprises involved in packaging in the country. The Government of Bulgaria has supported this activity and allocates money in local and foreign currency for this purpose every year.

The rapid increase in the cost of equipment has created many difficulties in the implementation of the project. These have been overcome only through the urgent and effective measures undertaken by special project revision and tripartite review missions. Redistribution of the allocations within the project, necessary to cover the growing needs of the equipment component, have taken place three times already, or practically once a year. At the beginning of the project, a total of $333,400 was allocated for the equipment component, covering the UNDP contribution; during the project this sum has been increased to $419,218 by the redistribution of funds within the project. Such a flexible policy has contributed to the best practical implementation of the project.

Some of the equipment delivered could not be installed by the project personnel. In these cases, assistance was given by the corresponding experts recruited to the project and by specialists specially invited from the manufacturing firms concerned. The payments for these services have been included in the total for the corresponding equipment. This is the most convenient arrangement; it accelerates implementation of the project, reduces the price and provides the project with the most competent service personnel.

In spite of delays, most of the equipment, to the value of $409,000, has been delivered to the project site. The rest of the equipment has already been ordered and should be delivered to the project site during the first quarter of 1976.

The machinery and equipment delivered to the Institute are in good condition and already in normal operation. Owing to the fellowships awarded during the project's implementation, the staff members are trained and competent enough to handle the supplied equipment. However, it is important that, besides current maintenance, some consumable materials such as films, printing plates, and spare parts should be replaced and supplied periodically, taking into consideration their wearing out, as well as ensuring the proper operation of the machinery and equipment. It has been established, on the basis of statistical data regarding expenses for consumable materials and spare parts incurred for the last two years, that an approximate amount of $10,000 should be allocated to ensure the proper maintenance and operation of the equipment supplied.

Finally, all of the above-mentioned undertakings and achievements of the project have contributed to the working out, by the Institute, of about 400 national standards corresponding to international standards in various fields of packaging. This fact is the most striking and the best demonstration of the successful implementation of the project.

The Institute is now able to apply some of the results (in addition to the above-mentioned):

(a) It is assisting Bulgarian industry to design new consumer and transport packages, using all kinds of materials;

(b) Its key staff, through the assistance of the international experts and of the former fellows, are now solving problems in modern packaging;

(c) It is organizing and conducting various seminars and courses in packaging for the representatives of developing countries;

(d) It is carrying out continuous investigations and surveys of the packaging industry in Bulgaria, with particular regard to packaging materials and equipment, methods of transportation, and methods of protecting the environment by means of the re-use or destruction of already used packages;

(e) It is assisting Bulgarian industry to conclude contracts with foreign packaging contractors;

(f) It is carrying out techno-economic investigations in the field of packaging favouring the development of the packaging industry within the country.

In conclusion it can be said, and this is shown above, that practically all the objectives planned for the project at its beginning have been achieved during its implementation.

III. RECOMMENDATIONS

1. The Government of Bulgaria should take all possible measures towards the most effective use of delivered equipment, ensuring the annual delivery of all necessary spare parts, materials and chemicals. An approximate annual average amount of $10,000 would be needed.

2. The Institute should send local specialists abroad regularly in order to keep in touch with latest developments in the construction of plastics and metal packages.

3. The Institute should continue to conduct packaging courses and seminars for specialists from the developing countries.

4. The Institute should participate, on a regular basis, in exchange of knowledge and experience between other packaging institutes and centres with which UNIDO and other international organizations are implementing projects. To achieve this, membership of the Institute in the European Packaging Federation would be advantageous.

5. Attention should be given to developing further the activities of the Scientific Research Information Service of the Institute. The dissemination of scientific and technical information processed and collected by the Institute among packaging institutes of the developing countries would be advantageous.

Annex I

PROJECT PERSONNEL

UNIDO experts

International staff

Name	Function	Mission
A. C. Poulter (United Kingdom)	Consultant on packaging	30 Jan. 1973 - 24 Mar. 1973
M. Lubieniecki (Federal Republic of Germany)	Consultant on biological problems	22 Jan. 1974 - 3 Feb. 1974
O. Arborg (Denmark)	Expert of climate control	5 May 1974 - 29 July 1974
A. J. Krosness (Norway)	Consultant on electronic equipment	16 July 1974 - 28 July 1974
J. C. Wolfrum (Federal Republic of Germany)	Expert on plastics packaging	16 May 1974 - 28 July 1974 and 16 Oct. 1974 - 24 Nov. 1974
E. Schmidt (Federal Republic of Germany)	Expert on tropical and arctic packaging	22 Jan. 1974 - 3 Feb. 1974

Co-operating project staff (date of assignment: 1 Jan. 1973)

Name	Function
M. Konev	Director
E. Marinova	Legal Adviser
V. Kirilova	Secretary
E. Peneva	Chief Accountant
T. Kassabova	Chief, Economics Department
S. Setschenski	Chief, Department of Glass, Plastic and Metal Packaging

Name	Function
S. Panajotov	Chief, Department of Paper, Board and Wood Packages
E. Semisova	Chief, Department of Scientific and Technical Information
M. Dischovski	Chief, Chemical and Biological Laboratories
K. Kirkov	Senior Research Officer
R. Stoilov	Chief, Laboratory for Physical and Mechanical Testing
M. Marinov	Research Officer, Mechanical Engineer
L. Jorakov	Scientific Secretary, Research Officer
M. Goranova	Chief, Department of Design
J. Tozeva	Photographer
M. Tschervinka	Photographer
A. Radoslavov	Research Officer, Mechanical Engineer
N. Ivanova	Research Officer, Chemical Engineer
E. Andronov	Research Officer, Mechanical Engineer
T. Karaabova	Research Officer, Chemical Engineer
J. Doitschinov	Metallurgical Engineer
D. Makarieva	Metallurgical Engineer
J. Ilieva	Research Officer, Chemist
I. Dimova	Physicist

Annex II

FELLOWSHIPS AWARDED

Name	Subject	Country and institution	Began	Ended
M. H. Konev	Structure and organization of packaging institutes	Sweden Swedish Packaging Institute	25 June 1973	30 June 1973
		Federal Republic of Germany Institute für Lebensmitteltechnologie und Verpackung	1 July 1973	22 July 1973
		Netherlands Institute TNO for Packaging Research	23 July 1973	28 July 1973
S. A. Kostova	Biological problems in packaging of food products	Norway Institute of Food Science	13 Aug. 1973	23 Sept. 1973
		United Kingdom Tropical Food Institute	24 Sept. 1973	14 Oct. 1973
		Denmark	15 Oct. 1973	3 Nov. 1973
M. M. Georgiev	Installation, maintenance and repair of climatic chambers	United States Webber Manufacturing Co., Inc.	24 Nov. 1973	25 Dec. 1973
M. S. Stoitcheva-Petrova	Plastics technology in packaging	United Kingdom Manchester University	14 Feb. 1974	13 Apr. 1974

Annex II (continued)

Name	Subject	Country and institution	Began	Ended
S. T. Dimtchevska	Design appearance of packaging	Federal Republic of Germany Technical High School of Arts	9 Mar. 1974	7 Apr. 1974
D. N. Slavtcheva	Working out of reporting and foresting information reviews	United Kingdom Wolpert and Jones	20 Mar. 1974	17 July 1974
D. D. Georgiev	Metal aerosol packaging	Belgium General Administration for Co-operation in Development	28 Mar. 1974	1 June 1974
D. M. Mileva	Corrosion problems in packaging	Federal Republic of Germany Beratungstelle für seemässige Verpackung E.V.	16 Sept. 1974	16 Nov. 1974
Pavlov	Packaging techniques	Italy Garibaldo Ricciarelli s.a.s.	22 May 1974	23 June 1974
		Federal Republic of Germany Bosch - Verpackungsmachinen in Waiblingen	24 June 1974	20 July 1974
T. P. Bacheva	Testing of packaging	Sweden Packaging Research Institute	14 Aug. 1975	18 Oct. 1975

Annex III

MAJOR ITEMS OF EQUIPMENT SUPPLIED

One piece each of the following:

	Dollars
Climatic chamber	23,400
Furnace for lacquering plate	3,306
Gauge for deep drawing of metals	5,597
Special hydraulic press	3,142
Box vibration tester	4,590
Box compression tester	13,750
Pilot coating machine	65,863
Case sample making table	11,280
Laboratory heat sealer for plastics	3,300
Plastic corder	57,119
Side-wall glass distribution analyser	5,660
Automatic colour developer	4,407
Offset press	13,309
Electrostatic copying machine	12,130
Composing typewriter	14,000
Gas chromatograph	23,000
Oscilloscope with accessories	34,240
Laboratory lacquering machine	2,797
Aluminium deep drawing unit	2,136
Puncture tester for board	2,300
Profilometre for glass bottles	2,298
Hot-end coating meter for glass	2,900
Studio-lettering machine	2,800
Impact test for tinplate	2,143
Flat crush test for board	1,900
Humidity cabinet with refrigerator	1,925
Impact test for plastic films	1,041
Openability test for plastic bags	1,010
Glass bottle filling line simulator	1,100
Portable camera	1,900
Processing unit for litho-mats	2,280
Analytical balance	1,108
Micro-analytical balance	1,556
Open flow fume cupboard	1,335
Density meter with accessories	6,800
Polariscope with discs	1,200
Hardness tester	1,092

Annex IV

COURSES AND SEMINARS HELD BY THE SPECIALISTS OF NIERA

Course of Symposium	Date	Participants
Post graduate course, Higher Mechanical and Electrical Institute "Lenin", Sofia	June 1973	30
	June 1974	25
"Package and packaging techniques" course (under sponsorship of Scientific and Technical Council), Higher Chemical and Technological Institute and Higher Mechanical and Electrical Institute, Sofia	1st half 1974	50
	2nd half 1974	100
Seminar on bread packaging	2nd half 1973	60
Two seminars on packaging, under sponsorship of Scientific and Technical Council, held respectively in Veliko Tirnovo and Lukovit	1st quarter 1973	45
	2nd quarter 1973	50
Seminar in packaging techniques, held in Plovdiv	2nd half 1974	850 (from various ministries etc.)

Annex V

DOCUMENTS PREPARED DURING THE PROJECT

1. "Conception for the development of packaging in the People's Republic of Bulgaria up to 1990" (underlines main development trends in packages, packaging materials and techniques)

2. "Programme for industrial portioning and packaging of goods for the 6th Five-Year Plan (1970-1975)" (establishes the optimum amount of portioned goods in order to ensure self-service in shops)

3. "Programme for portioning and packaging of goods for the period 1976-1980 (7th Five-Year Plan)" (also recommends solutions to the above problem)

4. "Instruction for the storage, transport, purchase and use of returnable packages" (ensures the re-use of certain forms of package, mainly glass bottles, with a view to saving glass)

Annex VI

MODEL OF SCHEDULE FOR PACKAGING SEMINAR

Subject	Length of discussion (hours)
Introduction into packaging, economic and legal problems	
Terminology, role and importance of packaging	2
Basic requirements to packaging: place of package production, returnable or non-returnable packages, place of packaging process	4
Economic aspects of packaging	3
Unification and standardization of packages:	
System of dimensions. International standardization organizations and their activities:	
ISO standards CEA (Council for Economic Aid standards, Resolutions of IATA, Resolutions of the International Naval Council, Resolutions of EPF	6
Indices, symbols and marking of packages	1
Legal problems in packaging	3
Labour security	1
Total	20
Packaging materials	
Packaging materials (types, production, application):	
Wood	1
Paper and board	1
Textiles	1
Metals	1
Glass	1
Plastics	1
Combined materials	1
Total	7

Subject	Length of discussion (hours)
Types of packages	
Consumer packages (construction, application, specific requirements, methods and equipment for production):	
Paper and board	4
Plastics	4
Glass	2
Metals	2
Combined materials	2
Combined packages	1
Total	15
Transport packages (construction, application, specific requirements, methods and equipment for production):	
Wood	2
Paper and board	2
Textiles	1
Metals	1
Plastics	2
Combined materials	2
Total	10
Auxiliary means of packaging	
Closing systems	1
Cushioning systems	1
Adhesive tapes and bonding strips	1
Adhesives, lacquers and coatings	1
Total	4

Subject	Length of discussion (hours)
Testing of packages	
Purpose and basic methods of testing packages	2
Physical and chemical testing	2
Analytical testing	2
Biological testing	2
Total	8
Design	
Basic requirements for the appearance of packages and new trends and requirements concerning the artistic lay-out of packages	1
Significance of print for the graphical lay-out of packages and photo-illustration as method and element of the graphical lay-out of packages	1
Methods and equipment for the graphical lay-out of packages	1
Total	3
Packaging technology	
Processes and equipment for packaging of liquids	2
Processes and equipment for packaging of pasty goods	2
Processes and equipment for packaging of powdered goods	2
Processes and equipment for packaging of goods in pieces	2
Processes and equipment for packaging of granular goods	2
Total	10
Handling of loads	
Palletization of loads	2
Containerization	2
	4

Subject		Length of discussion (hours)
Application of packages		
Modern methods of packaging:		
Foods		4
Pharmaceuticals		3
Chemicals		3
Equipment and machinery		4
Ironware		1
Kitchen sets		2
Cosmetic and toilet set		2
Clothes		1
	Total	20
Information		
Information resources		
Establishment and compilation of library funds out of primary and secondary information resources on packaging		2
Introduction into the application of the scientific and technical information to packaging and information research systems.		2
	Total	4

Annex VII

NATIONAL STANDARDS FOR PACKAGING

BDS	7-74 D 92	Glass bottles for food liquids and drinks. Technical requirements
BDS	7-67 D 92	Glass bottles for food liquids, drinks and chemical products for household needs. General technical requirements
BDS	24-73 D 71	Transport package. Wooden lattice cases for eggs in oval-cell boards
BDS	78-70 D 81	Tins for canned food
BDS	79-68 D 82	Hooped tanks of steel for rolling (medium weight) and for liquids
BDS	87-72 D 92	Glass bottles for red wines and other alcoholic drinks. Construction
BDS	112-73 D 95	Bags and sacks of textile
BDS	115-69 M 78	Textile bags, sacks and wrapping for packaging tobacco
BDS	190-72 D 71	Transport package. Wooden case for yellow cheese
BDS	142-50 D 71	Case for bread
BDS	191-73 D 71	Transport package. Wooden case for jam
BDS	193-73 D 71	Transport package. Wooden cases for explosives
BDS	197-74 D 22	Kegs for food and canned products
BDS	198-50 D 74	Waxed pots of board
BDS	206-73 G 36	Steel screw nuts for hexahedral bolts and nuts. Dimensions
BDS	340-72 D 71	Transport package. Case of hard plares made of wooden fibres for canned meat and vegetables
BDS	341-72 D 71	Transport package. Cases of plares made of wooden fibres for boxes with fish cans
BDS	343-64 D 71	Wooden cases for porcelain insulators
BDS	400-73 D 74	Waxed cardboard boxes for frozen foods and vegetables

BDS	450-74 D 71	Sackcloth and sacks. Packaging and marking
BDS	551-73 D 71	Transport package. Wooden case for lumps of sugar
BDS	556-74 D 71	Transport package. Wooden cases for slaughtered birds
BDS	558-71 D 81	Tins for white brined cheese
BDS	631-73 D 71	Transport package. Latticed wooden cases for bottles with nutritious liquids and alcoholic drinks
BDS	662-65 D 74	Cases and boxes for packaging red ground pepper
BDS	683-73 U 13	Zink-coated pots. Basic dimensions
BDS	747-66 D 71	Wooden cases for nails, bolts, nuts, crampons and screws
BDS	788-72 D 72	Transport package. Plywood tanks for oils
BDS	808-71 D 74	Boxes for silk-worm grain
BDS	1044-74 D 71	Transport package. Wooden case for lard and clarified butter
BDS	1045-72 D 71	Transport package. Wooden cases for fruits and vegetables
BDS	1046-64 D 71	Transport case for vegetables. Durable package
BDS	1068-73 D 71	Transport package. Cases from wood fibre boards for soap
BDS	1094-65 D 74	Consumer packages for tobacco products. Types. Dimensions. General requirements
BDS	1101-74 D 91	Glass jars for canned food. Technical requirements
BDS	1101-65 D 91	Glass jars for canned food. Technical requirements
BDS	1188-66 D 72	Oaken barrels for ordinary, dessert and liqueur wines and vinous distillate
BDS	1334-74 D 71	Transport package. Wooden case for bakery yeast
BDS	1434-74 G 86	Box-pallet of wood for cotton yarn
BDS	1484-53 U 11	Glass hollow products. Basic standard

(annex VII continued)

BDS	1504-53 D 71	Transport package. Wooden cases for rubber, leather and furrier's products
BDS	1654-74 D 71	Wooden cases for bottles of aerated soft drinks
BDS	1666-74 D 71	Wooden crates for strawberries and raspberries
BDS	1859-72 D 71	Transport package. Wooden cases for apples
BDS	1907-73 D 71	Transport package. Wooden coop for living poultry
BDS	1954-72 D 72	Oak kegs for drinks
BDS	2096-74 D 71	Wooden lattice cage for early cabbage
BDS	2188-74 D 92	Glass bottles for carbonated soft drinks with capacity 0.25 l. Design
BDS	2188-69 D 92	Bottles for lemonade approximately 0.25 l.
BDS	2360-74 D 74	Consumer package. Cardboard boxes for doughy products
BDS	2368-71 D 81	Tubes of lead
BDS	2396-72 D 71	Transport package. Cases from fibreboards for electrodes
BDS	2397-70 D 71	Transport package. Cardboard box for vineyard sprayer
BDS	2493-71 D 75	Consumer package. Paper bags
BDS	2582-75 D 74	Cartons and polyethylene or paper bags for shoes
BDS	2689-67 D 71	Transport package. Cases from fibreboards for grease
BDS	2690-57 D 71	Transport package. Case from fibreboards for small hardware
BDS	2697-66 D 97	Metal bottle closures of the "Crowncork" type
BDS	2751-72 D 88	Containers up to 5 tons. Types, basic dimensions and parameters
BDS	2768-70 L 71	Transport package. Wooden case for lead small shots

BDS	2842-71 D 74	Consumer package. Cardboard boxes for mercerized thread
BDS	2879-57 D 72	Transport package. Case for rennet for cheese in bottles
BDS	2881-66 D 92	Glass bottles for beer of 0.5 l.
BDS	3021-57 D 92	Glass bottles for ether ethylic pro narcosis
BDS	3065-57 D 81	Tin cans for sugar products
BDS	3131-71 D 75	Paper sacks
BDS	3162-73 L 63	Rubber closures for penicillin vials
BDS	3188-72 D 81	Steel tins for liquid food and oil
BDS	3230-64 D 92	Pharmaceutical bottles. Capacity
BDS	3265-73 D 74	Consumer package. Box for hunting capsule "Zivelo"
BDS	3319-58 D 92	Glass packages. Jars for bromic salt
BDS	3323-58 D 92	Glass packages. Jars for medicines
BDS	3330-58 K 70	Paper guts (artificial) for sausage products
BDS	3339-68 D 81	Tin-plated steel ewer for foodstuffs
BDS	3340-58 D 81	Semicircular, steel-transport, tin-plated ewer of 20 l
BDS	3376-73 D 71	Cases for switchboards and electrometers for dwelling houses. Dimensions
BDS	3433-71 D 75	Paper bags for meal, semolina and rice
BDS	3466-72 D 71	Containers for packaging and transportation of flat window glass. General requirements
BDS	3498-64 D 92	Vials for antibiotics
BDS	3600-73 D 71	Wooden cases for earth bore cores
BDS	3629-62 D 71	Transport package. Wooden crate for fresh fruits and vegetables

BDS	3659-73 D 71	Transport package. Wooden cases for glass pots with canned foods
BDS	3688-59 R 19	Perfume products. Pack, marking and rules for acceptance
BDS	3740-59 D 93	Glass tubes
BDS	3826-71 D 97	Cork closures
BDS	3850-59 D 92	Glass packages. Vials for serums, vaccines and others. Preparations for veterinary needs
BDS	3852-73 D 74	Cardboard box for screws for wood
BDS	3853-74 D 74	Transport package. Corrugated cartons for boxes of matches
BDS	3884-71 D 74	Cartons for foam extinguishers' charges
BDS	3904-59 D 74	Corrugated cartons for tins with canned food
BDS	3961-60 D 74	Carton for horse-nails
BDS	3963-74 D 74	Cartons for packing fittings for bags and suitcases
BDS	3977-73 D 71	Wooden lattice case for 0.5 dm^3 bottles with fruit and vegetable juices and syrups
BDS	3988-74 K 23	Wooden drums for cables and wires
BDS	3990-60 U 11	Hollow glassware out of glass wastes
BDS	4175-71 J 58	Tanks for condensed water
BDS	4369-74 D 74	Transport package. Cases from corrugated board for cigarettes
BDS	4382-73 D 72	Transport package. Plywood casks for fruit pulp
BDS	4411-74 D 75	Paper bags of the pharmaceutical type
BDS	4532-73 D 71	Wooden cases for faience tiles
BDS	4541-73 D 71	Transport package. Wooden case for tin box packed cheese

BDS	4549-73 D 71	Transport package. Cases from wood fibreboards for hollow glassware
BDS	4609-70 D 71	Transport package. Wooden boxes for batteries
BDS	4644-65 D 71	Transport package. Wooden case for medicinal herbs and mushrooms
BDS	4703-65 D 70	Packages. System of dimensions
BDS	4752-69 D 71	Transport package. Cases of wood fibreboards for doughy products
BDS	4762-70 D 71	Wooden cases for bottles, type "Maria Farina". Types. Dimensions. Technical requirements
BDS	4802-66 D 71	Transport package. Wooden cases for bottles with mineral water
BDS	4821-72 D 74	Transport package. Cases from corrugated board for antibiotics
BDS	4175-71 J 58	Tanks for condensed water
BDS	4703-65 D 70	Packages. System of dimensions
BDS	4828-73 G 40	Tanks and apparatuses. Nominal volumes
BDS	4900-63 D 71	Latticed wooden cases for eggs in honeycomb trays
BDS	5041-71 D 71	Transport package. Wooden cages for fresh peppers for export
BDS	5042-63 D 71	Transport package. Wooden latticed cage for lettuce, turnips and other vegetables
BDS	5043-72 D 71	Transport package. Wooden crate for greenhouse tomatoes
BDS	5144-74 D 71	Transport package. Cases of solid wooden fibreboards for silk, linen and cotton fabrics
BDS	5151-74 D 71	Wooden crate for germination of potatoes
BDS	5165-74 D 71	Transport package. Wooden case for alcoholic drinks
BDS	5166-64 D 71	Wooden cases for tooth-paste
BDS	5183-74 D 71	Box pallets and semi-pallets from solid wooden fibreboards for household porcelain and faience articles

BDS	5271-66 G 86	Box pallets and post pallets. Types, basic external sizes and parameters
BDS	5294-64 D 79	Cases of cardboard. Methods for testing the mechanical properties
BDS	5349-74 D 92	Bottle throats with "crown" closing. Design
BDS	5350-74 D 92	Glass bottles for soft drinks. Basic parameters
BDS	5351-69 D 71	Transport package. Cases of wooden fibreboards for batteries and dry elements
BDS	5382-64 D 70	Cases of corrugated board. Types. General technical requirements
BDS	5451-66 G 86	Flat pallets. Types. Basic dimensions and parameters
BDS	5463-64 D 69	Wooden cases. Regulations for sampling. Their preparation for testing and reading the test results
BDS	5526-65 D 70	Wooden cases. Types. Dimensions of the parts. General technical requirements
BDS	5529-72 D 71	Transport package. Cases of plywood and solid wooden fibreboads. Types. Dimensions. General requirements
BDS	5555-74 D 92	Bottle for beer of 0.33 dm^3 capacity. Design
BDS	5565-65 D 69	Wooden cases. Test methods. Determination of compression strength
BDS	5566-65 D 69	Wooden cases. Test methods. Determination of strength during drop testing
BDS	5567-65 D 69	Wooden cases. Test methods. Determination of strength during inclined plain test.
BDS	5568-65 D 69	Transport package of wood. Regulations of acceptance
BDS	5569-65 D 70	Volume package. Paper bags. System of dimensions
BDS	5614-65 D 92	Bottle neck for combined closure. Shape and dimensions
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BDS	5631-65 D 92	Bottle throat closed by means of foil cap. Shape and dimensions
BDS	5643-65 J 58	Metal cylindrical tanks. Elliptical bottoms. Shapes and dimensions

BDS	5686-65 D 81	Metal cases for milk bottles
BDS	5687-68 D 81	Metal case for lemonade bottles
BDS	5688-65 D 92	Glass and plastics bottles. Caps. Types. Classification. General requirements
BDS	5770-65 G 86	Box pallets for fruits and vegetables. Technical requirements
BDS	5787-65 D 81	60 1 tin
BDS	5796-74 D 74	Consumer package. Cardboard boxes for sugar products
BDS	5827-65 I 19	Glass. Determination of water resistance
BDS	5868-66 D 91	Glass packages. Determination of thermal resistance
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BDS	5905-66 D 70	Basic joining dimensions for packages. Transport and storage
BDS	5907-74 G 86	Flat timber pallets. Methods for strength tests
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BDS	5932-66 D 92	Household glass demijohn. Design
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BDS	5934-71 D 81	Aluminium tubes
BDS	5935-74 D 92	Glass jars for canned food. Jar throat of the "Omnia" type. Design
BDS	5935-66 D 92	Glass jars for canned food of the "Omnia" type. Throat. Design
BDS	5944-66 D 92	Glass containers. Methods for physical-mechanical tests
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BDS	6016-68 D 92	Glass packages for vegetable oils. Shapes and dimensions

BDS	6017-66 D 91	Glass jar for sour milk of 0.5 l. Design
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BDS	6204-74 D 92	Glass containers. (Straight throat closed with cork). Design
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BDS	6390-74 D 74	Consumer package. Folding cartons. Volume package. System of dimensions
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BDS	6425-67 D 92	Glass bottle for carbonated mineral water with capacity 0.330 l
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BDS	6542-71 D 70	Packages and packaging. Terms
BDS	6546-67 D 81	Transport package. Metal cases for jogurt jars
BDS	6549-67 G 86	Flat four-way wooden pallet
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BDS	6675-67 D 74	Transport case of plastics for bottles for soft drinks with a maximum diameter of 63 mm. Dimensions
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BDS	7063-74 D 71	Transport cases of corrugated board for poultry
BDS	7084-68 D 71	Transport cases of corrugated board for honey
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BDS	7236-68 D 74	Transport package. Case of corrugated board for paste products
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BDS	7690-69 D 71	Transport package. Wooden case for frogs
BDS	7827-70 D 92	Consumer package. Glass bottle for natural frothy wines
BDS	7837-70 D 71	Transport package. Wooden cases for ink and glue
BDS	7876-70 D 92	Consumer package. Glass bottle for mineral water with 3 l capacity
BDS	7877-70 D 74	Transport package. Cases of corrugated board for products pre-packed in metal cans
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BDS	7879-70 D 93	Transport package. Low density polyethylene bags. Classification and dimensions
BDS	7880-72 D 93	Consumer package. Low density polyethylene bags
BDS	7962-70 D 75	Paper bags. Test method for drop strength
BDS	7966-70 D 74	Transport package. Cases of corrugated board for washing preparations

BDS	7967-70 D 74	Consumer package. Cartons and paper bags for washing preparations
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BDS	8153-70 G 86	Net-shaped box pallet for knitwear
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BDS	9394-72 D 88	Containers up to 5 tons (series 3) Test methods
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BDS	9859-72 D 71	Transport package. Wooden case for jars of 3 l capacity
BDS	9996-72 D 92	Glass bottle for vermouth of 1 litre capacity. Design
BDS	9997-72 D 71	Transport package. Wooden case for sugar products
BDS	10019-72 G 86	Box semi-pallet for packed goods

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BDS	10271-72 E 07	Techniques on safety. Vessels under compression. Requirements to bottles for transportation of compressed, liquified and dissolved under compression gasses
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BDS	10292-72 D 92	Glass packages for medical purposes. Technical requirements
BDS	10293-72 D 92	Glass packages for medical purposes. Jars for infusion solutions. Technical requirements and test methods
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BDS	10556-72 D 92	Souvenir glass bottle for alcoholic drinks of 100 cm^3 capacity. Design
BDS	10557-72 D 92	Glass bottle for vegetable sauces. Design
BDS	10558-72 D 91	Glass jar of 3 dm^3 capacity for canned food. Design
BDS	10559-72 D 91	Glass jars of 650 cm^3 capacity for canned food. Design
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BDS	10632-72 L 93	Plastics packages. Neck threads for bottles and jars. Technical requirements
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BDS	11282-73 D 74	Consumer package. Cardboard boxes for sodium bicarbonate, coffee and tea
BDS	11283-73 D 75	Consumer package. Paper envelopes for spectacle lens
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BDS	11375-73 D 74	Cases from corrugated cardboard for household electric boilers
BDS	11376-73 D 75	Commercial package. Envelopes with handles for ready made clothing
BDS	11453-73 G 28	Gauges and templets for package control. Technical requirements
BDS	11454-73 G 28	Gauges and templets for necks of glass bottles with outer screw thread. Shape and dimensions
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BDS	11458-73 G 28	Gauges for plastics capsules. Shape and dimensions
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BDS	11460-73 G 28	Gauges and templets for metal caps of the "twist-off" type. Shape and dimensions

BDS	11461-73 G 28	Gauges and templets for metal caps of the "Omnia" type. Shape and dimensions
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BDS	11468-73 G 28	Gauges and templets for glass jar necks of the "Omnia" type. Shape and dimensions
BDS	11469-73 G 28	Gauges and templets for glass necks of the "Kronencork" type. Shape and dimensions
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BDS	11608-73 D 81	Aluminium caps for jars for infusion solutions
BDS	11609-73 D 71	Transport package. Wooden cases for car and tractor radiators
BDS	11610-73 G 86	Box pallet. Test methods.
BDS	11611-73 G 86	Box pallet of wood for fruits in bulk
BDS	11612-73 D 71	Transport package. Hard fibreboard cases for typewriters
BDS	11684-74 D 74	Cases from corrugated cardboard for typewriters
BDS	11694-74 D 74	Consumer package for powdered and dried foodstuffs. Types. Dimensions. Technical requirements
BDS	11823-74 D 92	Gauges and templets for necks of the glass type "twist-off". Forms and dimensions
BDS	12003-74 D 74	Transport package. Case from corrugated cardboard for sodium bicarbonate, tea and coffee
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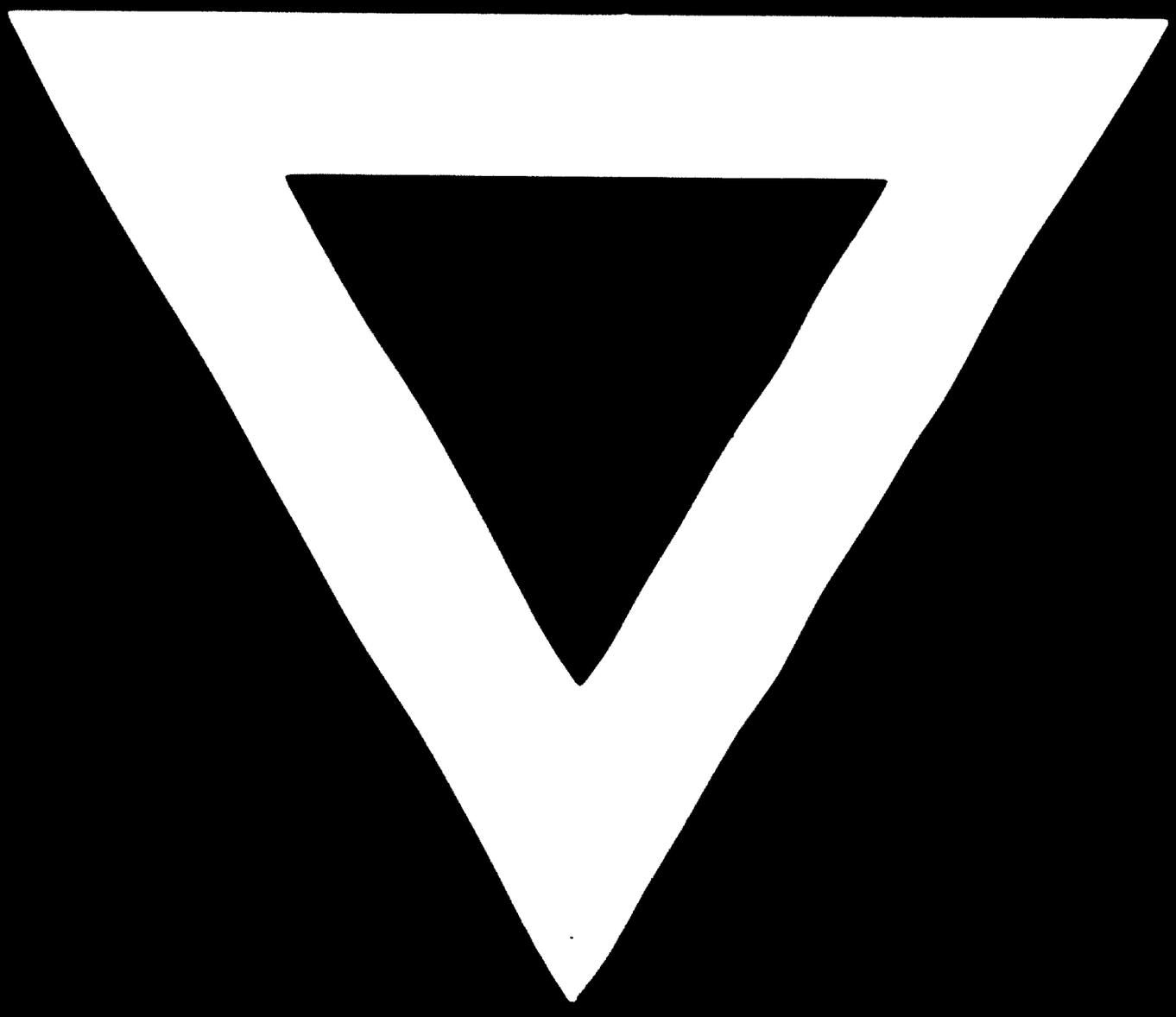

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