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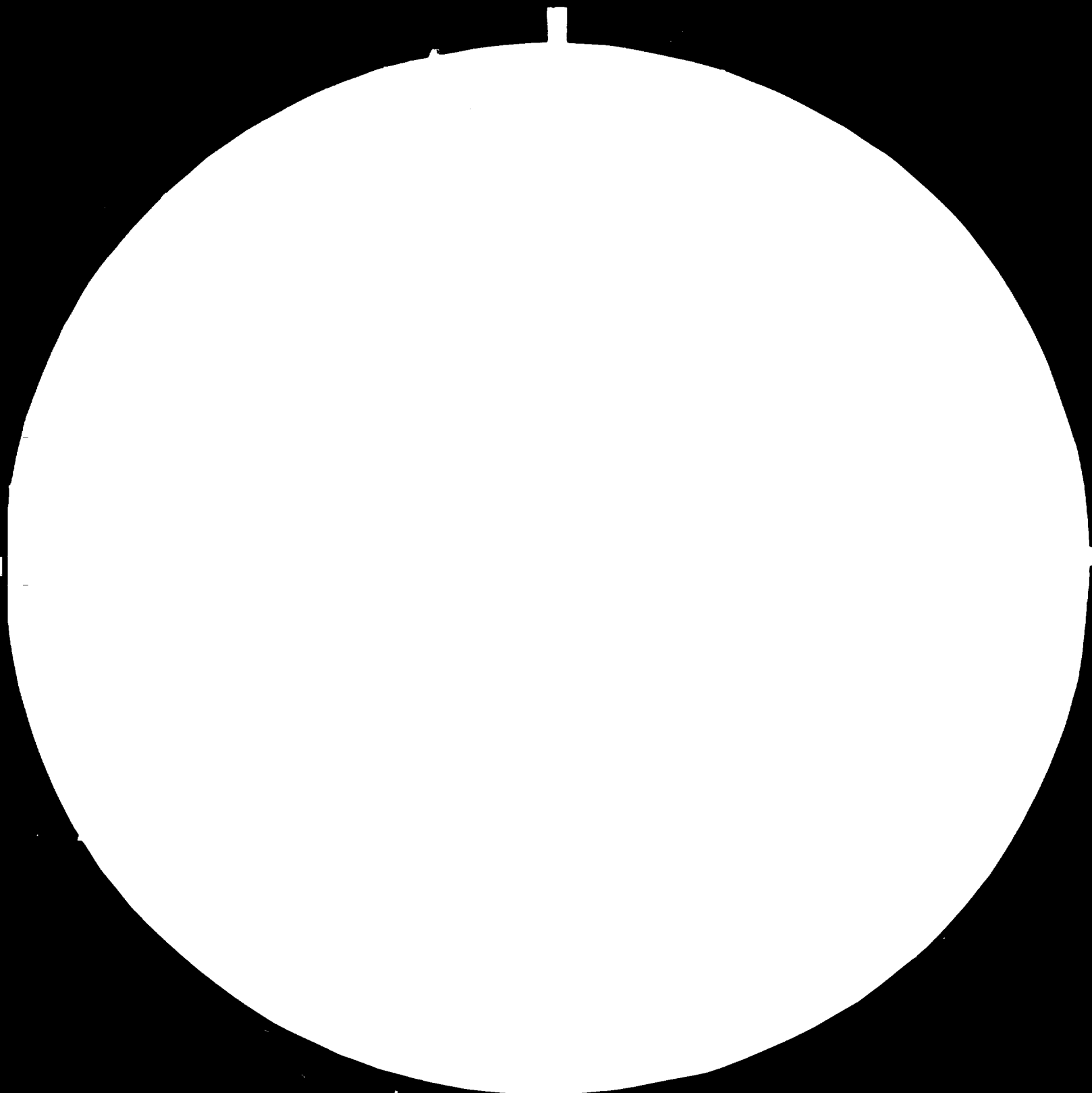

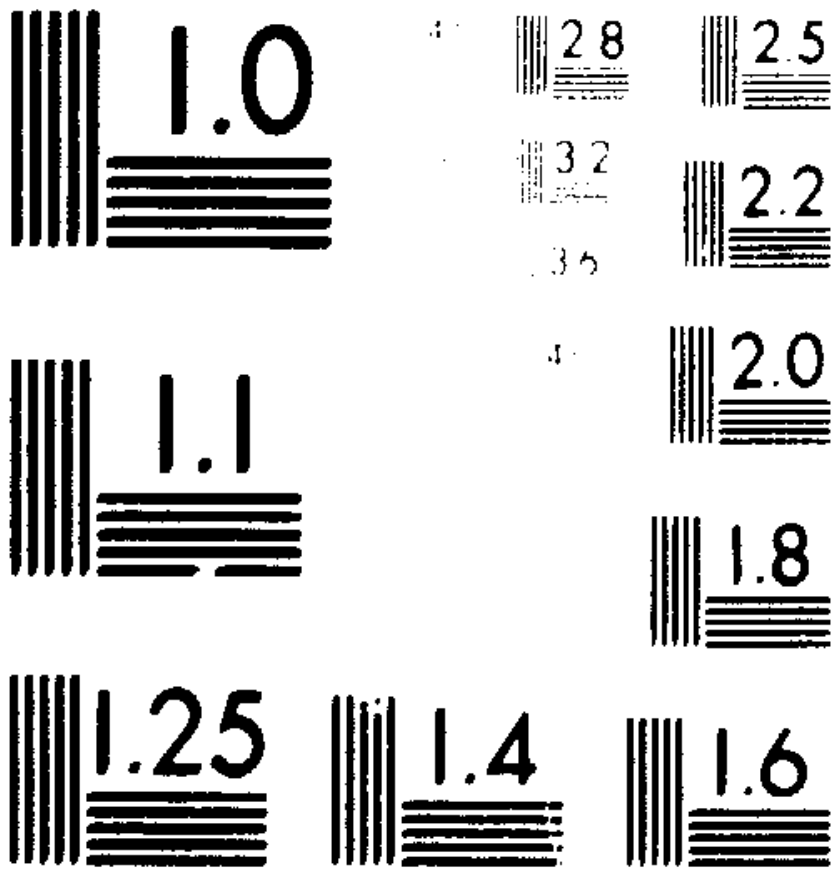

International Packaging Consultants

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PACKAGING TRAINING AND INFORMATION SERVICES FOR THE KOREA DESIGN AND PACKAGING CENTER IN KOREA

FINAL REPORT

by

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Mr. Åke Andersson

of

INTERNATIONAL PACKAGING CONSULTANTS

RESTRICTED

Project DP/ROK/78/006

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I INTRODUCTION

This report describes the results of the studies and planning carried out within the framework of contract No. 80/71 between UNIDO and International Packaging Consultants - hereafter referred to as IPC - and as a part of project No. DP/ROK/78/008 entitled "Korea Design and Packaging Center, Phase II" through which it was financed.

The aim of this report is

- to describe the implementation of the assignment, and
- to give recommendations for improving the packaging information and training services of Korea Design and Packaging Center (hereafter referred to as KDPC).

The effective time of the contract was from the 25th April, 1980 until the 30th April, 1981, during which time the work has been carried out by two consultants of IPC:

- Mrs. Loa Karjalainen, Team Leader and Training Consultant
- Mr. Åke Andersson, Information Consultant,

and by means of visiting the Project Area (five trips, 1.4 man-months altogether) and working at the consultants' home bases (2.4 man-months).

The field visits were composed of

- fact-finding at KDPC and in the industries related to packaging
- in-house training in the fields of packaging information and training
- a two-day seminar given at KDPC for packaging professionals in Korea.

II SUMMARY

1. Findings

General Level of Packaging in Korea

Having in mind that the packaging industry in Korea practically started only some 20 years ago the general level of packaging is reasonable.

There are, however, great problems especially in the package using industry caused by lack of know-how. This, in turn, results in failing sense of economy in packaging, in only scarce knowledge of standardization or distribution requirements and in difficulties to keep up-to-date with the world's rapidly developing packaging technology.

1.1 Information Services of KDPC

At present, the collecting, organizing and disseminating of packaging information is quite inadequate and limited to a sparingly equipped library and to the bimonthly magazine "Design and Packaging", where packaging plays only a minor role.

1.2 Packaging Training Services

The training activities at present consist mainly of one training course for Packaging Engineers (110 h) arranged yearly. Short courses and seminars (1 to 2 days) are given irregularly and without long-term planning. The economical results for all training events have been negatively balanced.

2. Conclusions

There is great need for adequate, up-to-date information as well as for continuous possibilities of training in all fields of packaging.

2.1 Information Services

The information services as a whole need complete re-organizing regarding both collecting, processing and disseminating of information, as well as KDPC's own publications.

2.2 Packaging Training Services

In this area, there is a need for logically planned training schedules; the present course, which is partly profound, partly too superficial, should be improved.

3. Recommendations

3.1 Information Services

Instructions and recommendations are given on:

- collecting information by means of subscribing certain packaging magazines, and of requesting free information from different sources;
- processing the information received by organizing classification and storing systems, by starting scanning activities and abstract writing and by translating an adequate number of handbooks etc. into Korean, to be available at the library;
- dissemination of information by means of publishing a Packaging Newsletter and a Packaging Magazine and by organizing conferences, special seminars and packaging contests.

3.2 Training Services

Recommendations and instructions are given on

- textbooks (in English) to be translated into Korean;
- an integrated programme for training activities by means of a Blueprint on Packaging Education;
- methodical planning of future training events by means questionnaires in order to receive the industry's opinion and information on its demand of different training courses;
- a programme for training the trainers.

III CONDUCT OF THE ASSIGNMENT

The consultants travelled from their home sites on 22nd May, 1980 to Seoul via Vienna (briefing UNIDO), Geneva (ITC), Bombay (Indian Institute of Packaging), Singapore (Singapore Institute of Standards and Industrial Research) and Hong Kong (Asian Packaging Information Centre).

In Seoul, the programme was arranged by KDPC and was composed of meetings and discussions with the KDPC-staff and of visits to different industries related to packaging (see Appendix I). The consultants left Seoul on 8th June, 1980.

The next trip to Seoul was made by both consultants between 2nd and 13th September, 1980, during which a meeting with KDPC-staff members at Tokyo Pack Exhibition was intended to be held, and a two-day seminar "Trends Influencing the European Packaging in the Eighties" was given (see Appendix II) for about one hundred participants representing both the packaging and package using industry. The papers for this seminar were also translated into Korean by KDPC. Further discussions and in-house training were carried out at KDPC.

The last field mission was made during the time between 9th and 18th March, 1981 by the Information Consultant. During his stay in Seoul, the Consultant finalized his in-house training in different information activities and followed up the present situation on proceedings agreed upon, regarding both information and training.

During and between the field visits, KDPC was provided with different kinds of subject-matter and material which are attached to this report as Appendixes. Upon mutual agreement, some tasks were implemented by KDPC between the field missions. The staff of KDPC was most cooperative and helpful and deserves all thanks for the successful proceeding of the assignment.

IV FINDINGS

General Situation in Packaging

Findings about the general level of packaging were briefly referred to in chapter II (p. 2).

Because the objectives of all information and training activities are to improve the technical level and overall economy of packaging in Korea, it is proper to specify the present situation more in detail.

The quantity level of packaging is still low compared to that of Europe and the USA; production of packaging materials per capita is only well over one tenth of that of the USA.

The quality level - which cannot be measured by figures - is, on the other hand, quite good in the local circumstances.

Visiting some factories and the retail market gave the consultants an impression of

- increasing demand of packaging materials, not adequately met by the manufacturers;
- good quality printing, using both full and half tones of both offset and rotogravure;
- good quality paperboard with even and adequate coating;
- small handy inventions regarding technical package solutions;
- overpackaging of some items;
- poor protection of some foodstuffs;
- no visible sense for standardization:

- inadequate creasing (slotting) of especially corrugated but also of paperboard boxes;
- poor heatsealing of especially PP-films;
- failing sense of economy in packaging;
- lack of know-how in general packaging technology. The packaging market, however, is rapidly growing and hence the need of proper kno-how is really imperative.

As the present situation in training and information services has been handled thoroughly and several times with the KDPC staff, there is no need here to go more into the details (please refer to chapter II, p. 2).

This report hereafter deals with the suggestions and recommendations given for improvements in both fields, and with the proceedings undertaken during the assignment.

V RECOMMENDATIONS

1. Information Services

1.1 Collecting of Information

The consultants have provided KDPC with several drafts of standard letters and with around 800 addresses of different packaging manufacturers, publishers, organizations, institutions etc all over the world. This step was taken to gain the following advantages:

- To place KDPC on the mailing-lists of important companies, organizations and institutions, thus establishing a constant in-flow of information from these sources.

- To get for KDPC free copies of different Packaging Magazines etc.

- To get for KDPC free or discounted copies of Packaging Handbooks etc.

From the given 800 addresses, KDPC selected 120 for these purposes. Already during the fifth field mission, results from this activity could be seen (Appendix III). This activity, however, ought to be comleted by sending a new round of standard letters to some other target groups among the remaining 680 addresses - a completing selection has been done by KDPC in cooperation with the Information Consultant.

An agreement has also been reached with KDPC concerning a basic list of selected Packaging Magazines representing the minimum necessary for guaranteeing a proper in-flow of packaging information. If these magazines are not available free of charge, they have to be subscribed to.

1.2 Processing of Information

Classification System

Based on a draft for a standard system for different countries, provided by the Senior Packaging Adviser of the International Trade Centre UNCTAD/GATT, KDPC has translated into Korean a Packaging Classification System (Appendix IV and V). The translation is a very good one according to a language expert in UNIDO headquarters in Seoul.

Storing

A new storing system for different types of packaging information has been discussed, developed and agreed upon. The main component is a Standard Box of corrugated board, manufactured in KDPC's own plant. This Standard Box will be available in different width depending on the type of content (Appendix VI). The librarian of KDPC will organize the storing system in accordance with the national Korean Classification System and the new Packaging Classification System.

At this stage, it is not practical to implement the computerized information system. However, the filing system here described can be adapted to computer later on.

Scanning

During the fifth field mission, a Scanning Organization was established within KDPC. This unit consists of four to five junior officers under supervision of the Officer in charge of the Information Section of the Promotion Department. Each Scanning Officer will regularly scan at least 3 - 4 packaging magazines and other publications recommended by their supervisor. In this context, scanning means the following actions:

- To read through and select from different magazines etc interesting articles relevant for the package manufacturing and using enterprises in Korea.
- To make a basic classification of the article.
- To write an abstract of the contents for an abstract/catalogue card.
- To indicate how the article ought to be utilized - i.e. stored as background information or used for KDPC newsletters and packaging magazines etc.

Abstract Writing

As a part of the in-house training, the group of Scanning Officers were trained in abstract writing. Conclusively, it has to be stated that these young officers did an excellent job of it. They will, certainly, be a very satisfactory group of Scanning Officers, thus establishing a very important basis for the information activities of KDPC. And, in addition, the KDPC Scanning Officers will in a few years be the most well informed packaging generalists in their respective areas.

Target Groups and Address Register

A list of the main target groups to receive information from KDPC has been compiled by the KDPC staff. This list will be included in the Packaging Address Register that will be formed by the librarian of KDPC and his colleagues.

1.3 Dissemination of Packaging Information

It was agreed upon that KDPC will start a newsletter service and that a test newsletter will be sent out in fall 1981. Advice was given concerning journalistic, economical and technical aspects of such a newsletter service.

Magazine. The present Design and Packaging Magazine should be split in two. It was decided that KDPC will begin to publish a special packaging magazine from autumn 1983 (see time table). Advice was given on matters concerning editorial programmes, financing, organization and technical aspects.

Books. The consultants have provided KDPC with a list of handbooks and similar relevant publications. These publications will be translated into Korean by KDPC and plans have also been made to write and publish some basic handbooks by the KDPC.

Conferences. An annual packaging conference, arranged by KDPC, will form an important channel for disseminating information and training packaging personnel in a general way. The first conference will be held in spring 1983 and is meant for both people involved in technncial or marketing aspects of packaging. This ways of disseminating information brings also the advantage of better communication between KDPC and the packaging industry - for which there is a great need.

Contests. In order to strengthen the links between the KDPC and the industry, it was decided that a yearly packaging contest will be organized, starting from spring 1983. Information on this contest will be given to the daily newspapers, television etc., in order to facilitate public understanding of the packaging branch and to strengthen the role of KDPC in the field of packaging in Korea.

2. Packaging Training Services

2.1 Textbooks

The Training Consultant has provided KDPC with a list of appropriate textbooks in English. A number of them will be selected by KDPC for translation into Korean (Appendix VII). Six books from this list (marked (x) have already been ordered and the translation will be completed before 1982. The books will be utilized on different training courses as textbooks or as instructor's aids.

2.2 Programme of Training Activities

Contents of a training programme

A Blueprint on Packaging Education (Appendix VIII) has been sent to KDPC for evaluation (Appendix IX, pos. 5). This evaluation gives cause to the following comments:

a) When the duration of one session is suggested to be 1.5 hours, it does not exclude the possibility of dividing it into two lectures, 45 minutes each. The important aspect with the concept "session" is that at least after every session there always has to be and interval giving a total duration of 2 hours for the session.

b) Reluctance to "give away" employees for training events is not unknown anywhere. It has been experienced, however, that relieving a person twice for two weeks at a time and with a certain length of time in between has been more favourably regarded by the industry than letting the trainee be absent from his work for four weeks without a break.

This might be one of the items included in the questionnaire described later on.

For continuous follow-up of the teaching level of the courses and of their suitability for the meant purpose and for getting the possibility to improve them, it is essential to receive feed-back from every participant and from all training events. Suggestion for an evaluation form to be filled in after the course has been sent to KDPC (Appendix X)

Planning a training programme

A most uneconomical way to decide upon an integrated programme for training, i.e. for the next coming fiscal year, is to do it without any idea of the number of participants likely to attend each course.

The aims of sending out special questionnaires (Appendix XI) regarding the planned programmes are

- to recieve information of the training needs and proper timing;
- to give information about the coming events in training and other relevant matters concerning packaging;
- to gain status for the activities and thus facilitate adequate charging for the courses, seminars, conferences etc.

Certain amount of tasteful advertising in connection with the questionnaires is recommendable.

2.3 Training the Trainers

Continuous training of KDPC's own trainers is of great importance for the cooperation between the Training and Information Departments. All the persons involved in the training activities should be kept constantly up-to-date on the development in the field of packaging.

It is also important that the personnel of KDPC is kept well informed on the general situation of packaging and package using industries in Korea.

For this reason, a complementing part for the Training of Trainers is suggested:

- A special Field Study Programme should be created including factory visits in Seoul for learning the practice of production techniques, problems, solutions, marketing situation, etc. The Programme should also include interviews with relevant persons in the industry, distribution and transport branches in order to make the KDPC staff well informed on all practical problems and the general situation related to packaging.

This kind of training activity, besides giving a more accurate picture of the whole branch than any textbooks, has the advantage of creating more valuable links between KDPC and the industry. The personal contacts and direct channels for mutual communications will be very useful in the future, and especially when KDPC plans to promote its services into other fields, e.g. research, packaging testing, etc.

4. Time Table

It was decided that the Training and Information Departments of KDPC will work as closely as possible according to the following time table.

1981

Spring:

Completing subscriptions to packaging magazines.

Completing the sending of letters to package manufacturers, institutes etc., in order to be included in their mailing-lists.

Starting of translating of certain text-books into Korean.

Fall:

Starting the scanning activities.

Editing and printing of a test newsletter. Asking for feed-back from the industry and trade.

Sending out of questionnaires concerning packaging training courses.

Organizing the library according to the new classification system.

Organizing the storing facilities in the library.

Completing the address register including important target groups.

Completing the translations of textbooks.

1982 Spring: Starting regular newsletter service based on the feed-back received for the test newsletter.
- E.g., the first 4 issues should be sent out in 1,000 copies to different enterprises with the offer of subscription.

Starting monthly briefings to KDPC's top officers and experts including
- Scanning reports
- Two-way information flow (WPO, etc.)
- Other reports.

Evaluation and elaboration of the returned training questionnaires. Planning of packaging education to be started at the latest in spring 1983.

Fall: Publishing of a special packaging issue of the KDPC magazine for testing purposes.

Preparing of addresses, sales activities, editorial programmes etc. for a packaging magazine.

Establishing of a workshop for considering the idea of own handbooks (s.c. Pack Pockets

Preparation for an annual packaging conference.

Preparations for an annual packaging contest

1983 Spring: Publishing of the first issues of a regular KDPC packaging magazine; during the first year, at least 4 issues, later 8-10 issues annually.

Starting of packaging training with a new basic course (Course 2).

Opening of the first one of the annual packaging conferences.

Fall: Organizing of the first KDPC packaging contest, which thereafter will be held annually or on another suitable regular basis.

Depending on the results of the workshop for Pack Pockets, starting of preparation for publishing 2-3 issues in 1984.

PLACES VISITED AND PRINCIPAL CONTACTS MADE DURING THE FIRST FIELD MISSION

22.-23.05.1980 VIENNA

Briefing, UNIDO

- Mr. I. Soloviev, Contract Officer
- Mr. J. Belo, Industrial Development Officer

23.-25.05 GENEVA

Briefing, ITC

- Mr. J. Selin, Senior Packaging Adviser

26.-27.05 BOMBAY

Indian Institute of Packaging, IIP

- Prof. R. Chowdhary, Director

28.-29.05 SINGAPORE

Singapore Institute of Standards and Industrial Research, SISIR

- Mr. Goh Chee Wee, Director of Standards & Extension Services Division
- Mrs. Lim Lay Ngoh, Head of Industrial Design

30.-31.05 HONG KONG

Asian Packaging Information Centre, APIC

- Mr. Raymond Kam Hoi Yan, Technical Officer
- Mr. K.Y. Chow, Assistant Director

01.-07.06 SEOUL

UNIDO

- Mr. K. Jenkner, Resident Representative
- Mr. R. van Schaagen, Associate Expert

Korea Design and Packaging Center, KDPC

- Mr. Jin-Pill Ha, Vice-President
- Mr. Jong-Whan Kim, Director for Planning & Management
- Mr. Sang-Kyun Bong, Director for Research & Development
- Mr. Dae-Sung Lee, Manager of Packaging Development
- Mr. Seon-Dong Kang, Manager of Promotion Dept.
- Mr. Tae-Sang Yi, Chief of International Affairs Branch
- Mr. Chung-Il Lee, Section Chief of Packaging Technical Support
- Mr. Jae-Hong Kong, Researcher, Packaging Research & Development
- Mr. Byung-Hwa Nam, Researcher, Packaging Research & Development
- Dr. B.S. Luh, Adviser on Food Packaging (UNIDO)
- Mr. Myung-Yong Lee, Section Chief of Packaging Testing

KDPC Corrugated Fiberboard Factory

- Mr. Sung-Han Kwon, Factory Manager

Seo Tong, Wig Factory

- Mr. Cho, Production Manager
- Mr. Kim, Quality Control Manager

Tong Yang Confectionery Co., Ltd.

- Mr. Kwang-Bae Kim, Senior Managing Director
- Mr. Chang, Packaging Manager

Shim Han Heavy Cargo Packaging Co.

- Mr. Jong-Hwa Lee, Factory Manager

Korea Trade Promotion Corporation

- Mr. J.S. Kim, Manager

APPENDIX II

Papers given at Seminar 9.-10.-September, 1980
in Seoul, Korea Design and Packaging Center

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

- General Trends in Packaging
- Trends in Distribution
- Trends in Packaging Materials
- Trends in Packages
- Laws and Regulations
- Standardization in Europe
- Technical Planning of Packaging
- Graphic Design in Europe for Products Imported from Korea

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, JUNE 5, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

GENERAL TRENDS IN PACKAGING

Introduction

It is a difficult task to predict how the scene of the European packaging market will more exactly look like at the end of the next decade. There are too many factors which will affect the development and too many conditions which have to be satisfied. A multitude of political and economic questions will determine the trends also in Europe.

You must also have in mind that Europe is not one country. Although there is a European Economic Community (EEC) with a total population of more than 250 million people, this community is made up of nine member countries covering six major languages and representing a widely varying degree of nationalism. The growth of EEC will certainly be noticed in the 80's. New member countries (e.g. Spain, Portugal and Greece) will be incorporated and closer links to the affiliated countries, as Austria, Norway, Sweden and Switzerland will be established. But the steps towards a real common market in Europe in terms of an equalization of the differences influencing the pattern of the packaging market in the different countries will be far away.

Although no prognosis of the economical growth in Western Europe as such or in its member countries is given in this paper, the close relationship between economy and packaging has to be pointed out. Packaging is, if not a condition of modern economy, at least an inevitable consequence of it.

Independent of these underlaying general conditions for the development and changes in the

packaging market, there are factors of today and trends to be seen, which will affect and steer in the 80's. Certain general tendencies appear to be predictable for the beginning decade:

1. increasingly strict government regulations
2. public opinion
3. energy consumption concern
4. greater use of recycled materials
5. improved product protection
6. increasing standardization of volumes and sizes
7. more cost-effective packages and packaging systems and an increasing awareness of total packaging costs

1. Governmental Steering and Influence

The continuously growing awareness among politicians and among the general public has during the 70's resulted in an increasing amount of laws and regulations affecting the packaging business. This trend is the same all over the industrial world.

The factor which will at present and in the future be of special interest in Europe, is the harmonization of these regulations within the EEC, based upon Article 100 of the original Treaty of Rome.

There are three direct consequences of this course of progress:

- the introduction of new trade barriers, which are a direct result of legislation in separate member states. Such measures are not, however, likely to be common in the very near future.
- a broader base for simultaneous legislation in the whole European market will be formed but the introduction will be delayed

- recommendations from EEC will affect - and have already affected - package sizes, package design and information or labelling on the packages.

It can also be concluded from today's work of the EEC authorities that these intend to deal with specific regulations when a problem is notified, e.g. to limit the vinylchloridemonomer (VCM) content of PVC and contained food, without taking up other aspects of PVC additives, total migration etc. It will also mean, as shown from "the plastic working document" that the legislation of EEC attempts to cover all aspects of the topic "Plastics" - a general solution.

As an example, this document thus covers at present all polymers and indicates the intention to include all possible controls as a "permitted list", total migration limits, as well as specific migration limits. It will no doubt imply that other countries in Western Europe outside EEC will follow and adjust their own rules to the EEC legislation. It will also be necessary for countries outside Europe to work according to this legislation, if they have or will have any intentions to export their products to Europe.

2. Growing Public Opinion

All the alarming reports about both personal health-toxicity-risks as well as environmental hazards, which nowadays will be spread to the big mass of the population through modern means of information, has created a distrust among the consumers especially of industrial food products and the packages for these. Examples of those are the "cancerogenic PVC-bottles", the lead and stannous contents of metal cans and cadmium-containing colours of plastics and printing inks. Several similar matters will also be reviewed, like the risk of distributing "danger goods" in unsatisfying containers, packing of pharmaceutical and toxic substances in packages without "child-proof" closures, as well as litter from broken glass-bottles etc. and propellants for aerosols, considered liable to affect the ozone-layer in the atmosphere.

Reports of such examples, arising from specific types of packages or only from individual incidents caused by "poor manufacturing" or incorrect handling, will certainly affect packaging as such or groups of packages, not just locally but over wide areas.

All this means that the packaging industry in the future needs to spend more money and efforts on more thorough testing and control of materials and products, as well as on information.

The consumers and their organizations will grow strong in power and cannot be neglected when considering the development and marketing of new packages.

It is also a fact worth mentioning that the percentage of elderly people in the population of Europe will grow quite strongly in this decade, at the same time as these people will have an increasing buying capacity. The amount of small households (one to two persons) in Germany will for instance in 1985 be 58 % of the total number, which will mean that a demand for small sizes of packed products will arise as well as for new products, more adapted to this group of households.

Taxation of packages will be increasingly implemented partly for environmental reasons but partly just to collect money from new sources as the ordinary income taxes in Europe have, generally speaking, reached their limit of tolerance. This will rise the demand for cheaper packages and rationalization of the distribution, both for institutional outlets and for general retail trade.

Altogether, these factors may create new market possibilities for new and improved packages in the widened common market of Europe.

3. Packaging and Energy

A new aspect on packaging arose in the seventies. It was based upon both the increasing environmental awareness, especially among younger educated people and a pure economic factor - actualized primarily by the oil-crisis in -74. This aspect is, of course,

the energy consumption concern. All governments in the western world work on programmes of energy saving. EEC announced lately a common programme aiming at a saving of 5 % of the energy per year.

The energy consumption in packaging is 2 - 3 % of the total in most industrialized countries in Europe. A saving of 5 - 10 % of this consumption is as such of minor importance for a community. But the political aspect may be essential as it is easy to point at. It is also an essential cost factor for packages - and energy prices will certainly rise continuously in the nearest future, until new resources of energy can be exploited in an economical way.

The rising price of energy will affect the pattern of packaging towards more standardized, low-volumed and light-weight packages, as it can save a lot of energy - and cost - in the distribution system.

4. Saving Raw Material

Closely linked to the energy concern is, of course, also the concern of saving raw material and the reuse of old packages as well as the use of returnable packages. Many of the biggest package manufacturing companies in Europe, as Metal Box in United Kingdom, Schmalbach-Lübeca in Germany and PLM in Sweden, have in the last years involved themselves deeply into recycling operations and projects.

5. Longer Life-Cycle for the Products

New or improved technology, primarily in combination with flexible packages will increasingly be used and new packaging equipment for this will be developed.

- Packaging in containers with controlled atmosphere (vacuum - gas) expecially in form-fill-seal-equipment.

- New systems for vacuum packaging of aroma-sensitive dried products. A couple of new

systems for packaging of ground coffee - competing the can - based upon a board-film-foil-material combination have been launched during the last years. A second and faster generation of this machinery will be coming.

- Aseptic packaging - providing for the sterilization of the flexible packaging web and maintaining an aseptic environment for the packaging of a pre-sterile product. Both chemical and radiation means of sterilization are and will be used.

- Radiation and microwave sterilization will probably find its way out of the laboratories and be used for packaging different types of non-liquid foods.

6. Standardization

International Standardization Organization (ISO) has accepted the measurements 600 x 400 mm as the world packaging basic module, and pallet sizes 1200 x 800 and 1200 x 1000 mm are both accepted as international standards. Several testing methods and many communication standards are as well internationally accepted and this means speeding up the use of standardized package sizes, unit loads and marking & coding.

7. Packaging Costs

Within this decade, an integrated way of thinking will be utilized in packaging planning, due to the ever strengthening competition on the European market. The package designers will thus take into consideration not only the prices of packaging material and labour but the costs of transport and handling as well, because these may deadly affect the retail price of exported products.

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, JUNE 5, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

TRENDS IN DISTRIBUTION

The distribution of daily consumer products, from the supplier of rawmaterials to the ultimate consumer, takes a still growing share of the total retail price. This share is today as an average in the industrial countries of Europe, around 60 %.

The package and the packaging process is an essential part of distribution and it is today more and more common and useful to see the package as such an element and not as a thing in itself. The role of the package to decrease the cost of distribution is thus of utmost importance.

Packages and the retail trade

Although the change-over to self service and to supermarkets has now proceeded for many years and is almost completed in the most advanced countries it is still the most dominant trend in the less industrial parts of Europe.

The disadvantage of supermarkets is in that it leaves to the individual consumer to take over a lot of the work and trouble which earlier was the shopkeepers' concern. The customer has to spend a lot of time and take trouble in buying and carrying home his need of daily products. This is why you now will find a reaction against the supermarket distribution in those countries where the self service system is established.

Handling costs in the supermarket

The handling of goods in a supermarket - from delivery out of the wholesalers' car to placing the package on the shelf - is in Sweden today estimated to be nearly five US cents per package - and roughly ten billion packages are handled yearly. Just these costs of the operations in the supermarket are quite often much higher than the cost of the package itself. The distribution of daily goods in Sweden is probably the most developed in Europe, and although the wages are

highest in Sweden it is not unfair to conclude that these costs in other European countries are on the same order of magnitude.

A lot of work is going on on plans to reduce the distribution costs in the retail trade. This will have a great influence on the packages.

Standardization

Growing awareness of the importance of an international standardization will probably have the greatest effect. Two significant decisions were made in 1978 by the International Standardization Organization (ISO):

- The international packagie module will be 600 x 400 mm (from this basic module it is possible to deduct a wide range of consumer packages and shipping cases)
- The mostly used pallet sizes 1200 x 800 (EUR-pallet) and 1200 x 1000 mm will both be accepted as international standards.

These decisions - missed for many years - will speed up the development work and the use of international standard sizes will grow very rapidly in the 80's. It will have effect all the way from the production lines to the shelves in the stores.

Recommendations for supermarket packaging

The recommendations of the Swedish ERFA-group - a joint body for the main retail trade chains in Sweden - are an interesting example of what will happen on a large scale in Europe during this decade. These recommendations are already widely spread and accepted as guidelines in Europe.

General requirements for a shipping case for the supermarket, according to these recommendations are to:

- protect and keep together the consumer packages during transport and handling,
- contain a proper amount of consumer packages based on the selling frequency of the product,
- fit the standard module 600 x 400 mm and the standard pallet,

- be stackable,
- be "ready-for-sale" with the lowest possible opening work,
- allow price-marking without picking out the individual consumer packages,
- render it possible to put the "ready-for-sale" case directly on the shelf,
- have a design suitable for display and fitted to that of the consumer packages,
- be easy to pick from,
- have a weight and volume easy to handle,
- give a low scrap volume,
- make the marking easy according to trade requirements.

The depth of shelves in the shops as well as the size of roll-containers and other handling equipment should be fitted to the standard module 600 x 400 mm.

Management Director of the ERFA-group says: "In Sweden today approximately 80 % of all daily commodities sold in the retail shops are distributed in standardized ready-for-sale shipping cases. In practice it means that out of the 6000 articles sold in an ordinary supermarket all big products - around 2000 - are standard-packed. The remaining 4000 articles are more specialised ones and have a lower selling frequency. But we expect that also these products during the 80's will be adapted to these recommendations. In the middle of this dacade the total assortment in a supermarket will fit with the standard module 600 x 400 mm.

The next very important development work for the retail trade is to optimize the modulized shipping case to the selling frequency of the product in an ordinary-size supermarket. A ready-for-sale transport package ought to have a content which suits the sale of the product and never be allowed to waste space on the shelves in the shops".

Simplified check-out systems

In addition to the handling of goods inter alia price-marking and check-out systems are keypoints for the rationalization or cost saving of the retail trade.

Some years ago many supermarkets in Europe discussed the cost reduction possibilities by using automatic check-outs. Different systems were developed and tested but so far none have turned out ot be economical or useful enough to be used on a larger scale. Less complicated new systems have gained some ground instead. An example of such simplified systems is an easy hand opener for plastic carrier bags placed close to the cashier. When the purchase has been registered the product can just be pushed down into the erected bag.

Code marking

A continuous development towards a higher degree of mechanizing operations in the stores is to be seen. The free stacking in the stores will be changed to systems with pallet shelves, enabling utilizing of unit loads.The requirements on both the consumer and transport packages will thus be changed.

This development will increase the demand for more and better handling equipment. It will also create a market for more light-weight and cheaper pallets and/or pallet-free handling systems.

In order to lower the distribution costs a more efficient utilization of transport vehicles is needed, as well. This means that standardized packages and unit loads have to be used to a much higher extent than today. It will also require that distribution of different types of goods - deepfrozen products, cold goods and maybe also dangerous goods - can be effected by the same vehicle. It will mean increasing requirements on the packages for these types of goods, and also increasing demands for thermo-hoods and unit wrapping films.

Ergonometric concern

Ergonometric problems will have much higher dignity in the coming years.

The International Labour Organization (ILO) has recommended a maximum load of 16 kg to be carried manually. Regulations concerning this will come into effect in many European countries in the next years to come.

Energy concern

The growing energy concern will result in an increasing demand for returnable/reusable packages. This will lead to expanding markets for packaging recovery, preparation and cleaning equipment such as washers, inspection equipment and bottle decappers.

It will also increase pressure towards the use of renewable or recyclable materials which in turn will create increasing demand for recycling equipment such as e.g. balers and separators for packaging waste material.

Pallet-free handling

For the transport of many industrial products a pallet-free distribution will be a more economic and better solution than transport on returnable or non-returnable pallets.

It will save the quite high cost of pallets as well as space and money in storing and shipping. The firts pallet-free handling systems are mainly used by the European cement industry. These systems are, however, fairly big, space-demanding and expensive. The economy of pallet-free handling will during this decade create a demand for small and inexpensive equipment which is able to bundle cases and sacks to units of standardized measures, as well as for handling equipment better adapted for this system.

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, JUNE 5, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

TRENDS IN PACKAGING MATERIALS

The following table shows the use of different packaging materials in EEC[x] and USA during 1970-77.

		Million tons 1970	1977	Index (1970=100)
Steel	EEC	2 660	2 855	107
	USA	6 400	5 148	80
Aluminium	EEC	256	314	123
	USA	620	800	129
Glass	EEC	7 047	9 803	139
	USA	9 500	10 500	111
Paper	EEC	2 874	2 366	82
	USA	5 200	5 100	98
Board	EEC	1 918	2 120	111
	USA	6 570	6 500	99
Corrugated board	EEC	5 360	6 568	122
	USA	12 037	16 000	133
Plastics	EEC	1 677	2 788	166
	USA	1 650	3 144	191

x) Only six EEC-countries are included

The figures indicate the packaging development in general during the seventies:

- The steel can kept its total market, mainly because of the increased consumption of canned beverages
- Aluminium has taken a rising share of metal packages due to an increased use of beverage cans, aerosols, easy-opening ends and aluminium-foil as one component in laminations
- Glass has increased mainly due to its use as one-way bottles for beverages and to increased use of glass jars for sterilized food

- Paper had a declining market in favour of plastic films

- Board has also suffered from the inroad of plastic packages but kept its volume fairly well due to an increasing volume of milk and juices packed in cartons, an increased consumption of deep-frozen food and a rising demand for display-packages for non-food household products

- The use of corrugated board has increased because of the growing use of distribution packages for, in particular, industrial products but has on the other hand suffered in the battle with shrink and stretch films

- Plastic is the big winner and has gained markets from most of the other older packaging materials due to its versatility (it is worth observing that the rate of increase of plastics in USA has been still higher than in Europe).

The future use of different packaging materials and their proportional consumption volumes will be governed by the general trends - and especially:

- Cost development of raw materials and production factors like energy and labour,

- The economy of each particular package type or, in other words, the rising demand to obtain an optimal functional value at minimum cost,

- The total energy requirement for each type of package,

- The potential risk that food and pharmaceuticals are contaminated due to toxic substances in the packages.

Metals

Steel is and will be also in the 80's, the dominating metal in packaging. The world production of tinplate in 1977 was around 14 million tons;it is estimated to be appr. 16 million tons during the next years coming. Europe stands for about 5 million tons. Total production capacity is today around 20 million tons and further expansion programmes are announced also in Europe. This shows

an optimistic view among the producers - a view which is not always shared by the packaging experts.Cost of the metal can which is dominated by the material price might be many times that of the contents. This lends itself to create negative reactions by the consumer. The can must also stand the hard competition from other types of packages as well as from other distribution methods when talking of its main end use markets - preserved food and beverages.

As a result of all this the can manufacturers look for every means to reduce the material cost. Even entirely new manufacturing techniques have been developed, mainly for beverage cans where the market is really big and only some few standardized sizes are used.

The dominating tinplate material will increasingly be replaced by tin-free-steel (TFS) which now has a share of only 5 %. The price of TFS is lower than that of tinplate and it also gives incitement to replace soldering by welding on three-piece cans.(The regulations for canned food regarding the presence of particularly lead, but also tin, in the foodstuff have already been sharpened.)

The great cost saving lays in using blackplate: it gives a reduction in the metal cost of about one third.It seems to be predictable that a big share of cans - and primarily of the DWI (Drawn and Wall Ironed) 2-piece cans - will be made of blackplate during this decade.

The use of blackplate will also speed up the development of new and better coatings, both for interior and exterior coating.New coating compositions is or will be unavoidable during our decade from environmental point of view: Air pollution with large volumes of hydrocarbon solvents has to be avoided and the working environment at the can manufacturing plants has to be improved. Here, the development goes in two directions:

- Using water as solvent,
- Production of high-solid coatings or powder. Powder will most certainly be the ultimate

type of coating of both economic and environmental reasons. In a more distant future there also is the possibility of using low-cost monomers - like Propene and Ethene - and polymerize a coating directly on the metal plate or on the already shaped container.

Aluminium has during the seventies taken an increasing share of the beverage can market. It has also dominated the production of easy-open ends and taken a high share of the deep-drawn cans.The cost facts as well as the energy concern point, however, at a reverse development during this decade - back to steel. It is true that new cost and energy saving methods have been developed but they will hardly be implemented in a significant extent.

Packaging materials in this decade have to be recycled to a much higher extent than today. All metals have the advantage over organic materials like paper and plastics to keep their structure unchanged during reprocessing.

An efficient recycling system for aluminium saves around 90 % of the energy needed compared to the process starting from bauxit raw material. Recycling of steel packaging material suffers from the low scrap value and from the fact that steel packaging material, at least until now, is mostly mixed with other metals such as tin, lead and also aluminium.

Development of more economic methods for recycling packaging materials will be a must in the 80's and may influence the choice of material for e.g. beverage cans in certain European countries. As an example the Swedish Packaging Institute has, by commission of the governmental Energy Saving Committee, studied different systems for distributing beverages in Sweden.They have found that a system with a deposit and return of the aluminium cans through the retail trade will, from energy point of view, be the most favourable. Such a system will be implemented in Sweden within the next years.

The increased use of Al-foil in the seventies will most probably be reversed due to the metallizing technique (see under Plastic material).

No other metals - except tin for coating steel - will find any significant use in packaging during the 80´s. Anyhow, the research work going on of the use of magnesium may be worth watching. Magnesium is the third most abundant metal, is second lowest in cost per unit volume and has also a high strength-to-weight ratio.

Glass

Glass is in many ways an odd material on the packaging scene:

- The raw material is available more or less everywhere, is cheap and will stay cheap, compared to other packaging materials.
- The manufacturing of glass packages is a totally integrated process from the mixing of the raw material to the distribution of the ultimate container.
- The energy consumption and the losses in the melting and forming processes are high.
- The cost share of labour is 3-4 times higher than for metal cans.
- The glass package is in general much heavier than other packages.
- The protection of the product packed in glass is in most aspects excellent.
- The resistance to violence of a glass package is low, compared with the theoretical strength of glass and with other rigid packages (this high crushing risk has to be compensated by a thicker glass-wall and will thus lead to a still heavier package).
- Glass is the only material where no package forming can be implemented on the packaging

line. Glass packages are always prefabricated.

The glass-technologists have been aware of these - and many other - "pros and cons" for at least the last two decades, but the visible effects of improvements for the packers, distributors and consumers have been quite small.

The general trend factors will, however, in many ways be favourable to glass and will have influence over the research work towards:

- A lower energy requirement in the melting process as well as on equipment for recovering energy.
- A computer-controlled forming process, which can result in lighter and stronger packages.
- New annealing processes which can produce improved resistance against strength-reducing abrasions.

This will probably imply that glass packages are placed in a still better competitive situation in the 80´s.

Paper and Paper Board

- The consumption of paper in packages has decreased during the seventies, as can be seen from the earlier given figures. This negative trend will continue. The paper pouch, bag and wrap will be continuously substituted by plastic packages.
- The board market has, on the other hand, shown a low but steady growth, which will continue due to reasons already reviewed.
- The corrugated board has had a quite steady increase due to a rising use for packaging of industrial products. In view of distribution trends, this growth rate will slow down in this decade.

The raw material situation in Western Europe was some years ago judged to become quite difficult

in the future, with shortages and price increases as natural effects. Today, the situation is predicted to be more positive with a general speaking balance between raw material supply and consumption. This is due to an increased use of fibre from rapid-growing trees, a better utilization of the raw material and an increased use of recycled fibre materials.

Regulations will be stated, requesting the households to separate the paper material waste for simplified recycling. It is anticipated that roughly 50 % of kraft paper material will, in the middle of the 80's, be reused in corrugated board.

Some special trends in this material sector are worth mentioning:

- A decrease in the great varieties of different qualities and substance weights will take place (standardization).

- Unbleached paperboard will take a much greater share, also for food packaging purposes, in order to increase strength and save material and energy.

- Increasing use of multi-layer board for foodstuffs, which affords possibilities to increase stiffness by using "chemical-mechanical" pulp in the middle layer, to use waste material and to lower price development.

- A more or less new market for board by applying polyester or polypropylene coatings, which give the board heat resistance when cooking in microwave and conventional ovens.

- A development of new paper qualities by mixing the cellulosic fibres with synthetic - basically polyolefines - in the manufacturing process. Such a paper quality can at low cost increase burst and tear strength, but in particular the wet strength quality. A thermoformable board container is an obvious application, as well as heat-sealable portion bags for e.g. teas.

- New qualities of corrugated board, such as board with laminated - double - fluting with increased strength, plastic coated liners and/or flutings to improve wet strength and self-adhesive single board for wrapping purposes.

Plastics

In 1977, the total consumption of thermoplastics in Western Europe was about 10 million tons, appr. 60 % of the total production capacity. The world production is by now about 50 million tons. The consumption in Europe is predicted to increase by 4-5 % per year to about 15 million tons in the middle of this decade. The production capacity will increase at the same rate; thus the over-capacity will be of the same magnitude. Export outside Europe remains therefore essential, if the European production of plastics is to maintain a reasonable profitability. The competition from USA, Japan and later on from the oil producing countries in the Middle East will be tough.

Packaging takes between 25 and 30 % of the total consumption. The very high growth rate for plastics during the two last decades will decrease due to a general market saturation. The biggest potential growth field lies in containers for beverages, but the inroad to this huge market is judged to be percentally limited.

- Polyethylene will remain the leading material for packaging purposes.

- A great volume expansion will be seen for polypropylene - especially for oriented PP - a film which will increasingly substitute cellophane and also have a growing use in the thermoforming of cups and as material for packaging of heat-treated food products.

- Polyester plastic material will also increase substantially due to its use for carbonated beverage containers.

- The technology and costs for metallization of plastic films, primarily polyester, polypropylene and polyethylene, have had a quick and positive development during recent years. Metallized films have already taken essential shares from the Al-foil. The trend will certainly continue, especially if good qualities of metallized film can be developed from low cost film substrates.

- An increased use of expanded polystyrene - EPS - can be anticipated as regards its application as shock absorbing agent in packaging of e.g. electronic equipment, such as trays and boxes for transport and display, and as vacuumformed cups for dairy products and allied lines.

- Another interesting trend to reduce the cost of thick thermoplastic material, and simultaneously obtain the advantage of stiffness and reduced warping, is the use of fillers - i.e. hollow silicates, minerals, talc, chalk as well as wood dust. The big inroad for thermoplastics with fillers will be found in the automotive and recreational fields, but it will certainly also find widened applications in packaging e.g. for thermoformed trays and boxes and maybe as a substitute for board in folding cartons.

Unexpected and unforeseeable events can upset these trends for using plastic materials in packaging. The two main factors for this might be

- the cost development, compared with other packaging materials,

- the potential health hazardousness of any special type of plastic material or compound.

The price of crude oil will most probably continue to increase independent of discoveries of new oil sources both in Europe (the North Sea), in Africa and Mexico. There will be a more favourable price development for polypropylene than for polyethylene in the foreseeable future.

The market for PVC has stagnated and therefore it will be difficult for the manufacturers to increase prices parallel to the increasing cost of raw material.

The growing use of benzene as an anti-knocking agent in petrol will affect also the price of polystyrene.

Independent of these signs, plastics will also in the 80's be highly competitive as packaging materials.

The potential risks for the human being to be exposed to contamination from packed food products due to packaging material are and will be in focus. The stated cancerogenic effect of vinyl-chloride monomer residues in PVC was alarming and brought all plastic packaging materials into the spotlight. It has been now succeeded to reduce the monomer content of PVC to very low values and this material is thus regarded as safe by now. Intensive research work has since long been going on in Europe as well as in USA to prove the safety of other plastic materials and combinations in use.

No serious food packer in Europe today can start using new packaging materials or material from a new supplier without a written certification of the material safety from the health authorities for the area concerned.

Any possible new report - the risk of the styrene monomer in polystyrene has been discussed in public - about health hazards from plastics will without doubt affect the market seriously, not only for the material in question but for the total plastics market. In the general opinion and to the individual consumer "plastic is plastic".

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, JUNE 5, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

TRENDS IN PACKAGES

Package Development

Any sound development of or a concept for a new package has to be based upon the market need.

Thus, the basic factors which influence upon the type and design of the packages of the 80's are - hopefully - already mentioned in the previous parts of this seminar.

The following remarks about different types of packages are therefore mostly a transformation of these factors into an opinion of container design and the competitive situation in the 80's.

Metal Packages

The metal package area is today dominated by the rigid can. The world market is around 190 billion cans. The projection for five years ahead will be around 235 billion - an increase of approximattely 25 %.

The beverage can answers today for 80 billion units, which is projected to increase to around 100 billion after a five years period.

The end-use market for cans shows a quite dramatic change during the last decade. In USA it shows the following picture: (% of market)

	1966	1976	1980	Forecast growth
Food	57	39	36	3,5 %
Beverage	29	54	57	6,6
Non-food	14	7	7	0

The dominant factor steering the development of can design and manufacturing technique is the cost reduction potential of lowering the amount of material in the can. The DWI manufacturing method of a 2-piece can will save at least one third of the material needed for a conventional 3-piece can for carbonated beverages. The swing towards DWI-cans for beverages in Europe is very high and will certainly be complete during this decade. Both steel (tinplate and TFS) and aluminium will be used for these cans but probably the most economical materials, i.e. blackplate will have the biggest increase.

A can for sterilized food will in most cases need a heavier body to reach adequate strength to resist collapsing during the packaging process. Thus, the advantage of the DWI-technique - to make thin side walls and still a thick bottom - will not be that favourable here.

The 2-piece can offers still important advantages over the 3-piece can - a higher safety, one seam instead of three, no soldering material, other coating possibilities with less environmental problems etc.

The long-range trend, also for food-cans, will thus be towards the 2-piece type, but the manufacturing method will mainly be the DRD-technique (Draw and Redraw). This method has not the same economic incentives as the DWI-method in saving material but the investment is considerably lower.

Alternatives to Metal Cans for Beverages and Sterilized Food

The huge market for carbonated beverages and retorted food products has since long been a challenge to the manufacturers and converters of other materials, primarily plastics.

The technical and economic development of plastic materials having better strength and permeability values and also a high temperature tolerance has during last decade made such alternatives economically feasible.

Carbonated Beverages

The returnable - directly reusable - glass bottle will in general keep its market, as it is judged by the consumer to be the most economic and energy-saving package - if not the most convenient.

The non-returnable glass bottle has decreased considerably in use in the last years, and will not pay a very significant role in the European beverage market of the 80´s.

Glass bottles will be redesigned into the wide-mouth shape, as this gives a bottle higher strength and/or lower weight and is space-saving in distribution.

The polyester bottles in 1-2 litre sizes have made their inroads on the soft drink markets very quickly. From the first introduction in 1976, the volume is now close to 2 billion bottles and a further high degree of increase is expected. Quite a lot of different resin manufacturers and bottle blowers are fighting for their shares of the market.

The PET containers are now expected to be used for a variety of other products - such as syrups, edible oils, dressings and liquors - thanks to a breakthrough in mold design and parison technology.

Sterilized Food

The attitude of the European consumer towards the can as a package for sterilized food is not at all as favourable as it is towards cans for beverages. This means that alternatives to cans will probably achieve a fast market acceptance.

On the other hand, these alternatives had to fight the high-quality fresh and deep-frozen foods, which will certainly continue to take market shares from products which have earlier mostly been packed in cans (e.g. meat, fish, vegetables and fruits). The heat-sealed polypropylene-coated aluminium foil container and the retort

pouch have been launched on the market in the seventies but have not yet had any significant success in Europe. Big European converters of flexible packages are, however, convinced of the future of the retort pouch.

The economical positive trends for polypropylene and its suitable temperature tolerance for retorting, as well as other positive qualities, are the background for launching more rigid plastic containers for food, as the Letpak can, which has created a great interest among the packers and has already been launched in Sweden and Germany on a commercial scale. One reason is most probably that this packing alternative is more closely allied to the metal can.

Paperboard Packages

A lot of well-proved systems for carton packaging (e.g. Kliklok, Glolok, Expresso, Stalox, Sprinter and Hermetet) are on the market. New systems for ordinary carton packaging purposes will most probably meet great difficulties to be accepted. On the contrary, there is a visible trend among the packers to get away from these linked systems of machines and packages, and instead buy machinery and packages separately. They may thus get the possibility to benefit from the competition among the manufacturers. New packaging systems are anyhow in focus for vacuum packaging of coffee, milk, powders and similar aroma-sensitive products. These systems are based on lined board cartons or combinations of tight pouches and cartons. These packages will continue to cut market shares from the metal can and the ordinary pouch packages.

The carton pack systems for milk products - especially the Tetrapak and Purepak - are now dominating on many European markets and will take the remaining part from glass and plastic bottles in the 80's. Aseptic packages are more and more in the foreground. The aseptic carton pack will also dominate the increasing market for fuit juices.

In the last decades the combination of a vacuum-formed thinwalled cup with a decorated paper exterior has taken over a great part of the market for butter, margarine and other spreadable products. These packages are now on the way to be substituted by a simpler single-wall design from plastic-coated paperboard.

The ordinary spiral-wound composite container has never been very successful in Europe and has only been used to satisfy some limited markets for dry products.

New designs for both dry food products and liquids have been launched or announced during the recent past. Possible economic in-plant production equipment has been discussed.

Corrugated transport cases will keep their position and possibly strengthen it somewhat thanks to methods in impregnation and coating the liners and flutings. E.g. moisture proofness, grease resistance and oxidization resistance are to be achieved by these methods.

Plastic Packages

Based on figures (-77) plastic resins are used for the following types of packages:

Package type	Share (based on consumption in tons)		
	% in Europe	% in USA	
Films	56	39	
Blown bottles	16	18	
Injection moulded and thermoformed containers	20	26	
Capsules	5	4	
Miscellaneous	4	12	the US figure includes coating (11 %)

The most significant trends in the European flexible packaging market are:

- A very fast increasing market for OPP films.
- An increasing use of peelable coating on films and laminates.
- An increasing market for metallized films substituting Al-foil laminates.
- A fast increasing use of composite structures in film-laminates and especially coextruded films.

Although some plastics as polyester and polypropylene are not suitable for coextrusion, the opportunity exists to create the right coextruded package for many products. The general estimates are that the volume of coextruded films will rise very quickly, in particular when used for packaging meat and meat products.

The expansion within the plastic bottle field for beverages, based upon the advantages of PET-bottles, especially for bigger volumes is obvious and has already been mentioned. The coextrusion technique for making multilayer containers will produce materials with improved flexibility properties and accordingly afford new application possibilities.

The plastic tube market will increase, as by now the use of laminated materials seems to be technically and economically acceptable. New self-opening and -sealing dispensing valves have been developed; thus the advantage of a collapsible tube can be obtained.

The application of the coextrusion technique will also have positive effects upon the thermoforming container market. The use of multilayer materials opens good views for new products or affords better qualities in the market for cups and trays.

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, SEPTEMBER 10, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

LAWS AND REGULATIONS

The main problems typical both for producers and users of packaging on a world-wide basis are more and more related to existing and future legislation. This legislation is connected with

- consumer health protection
- consumer protection in general
- national and international standards
- protection of the environment.

In the European Economic Community, EEC, there is a work going on to harmonize the legislation of the member countries, in order to remove trade barriers within the EEC. At the same time, this type of legislation creates new trade barriers for exporters from non-member countries.

The EEC legislation is implemented by issuing Directives (called Council Directives) which member countries are obliged to bring into effect in their own countries within specified time limits.

In the field of packaging, some important Directives already are ratified; some are still in the status of Recommendations but will doubtless be ratified within the next years.

For every exporter in Korea it is essential to know these new regulations because according to them importers are invariably responsible for imported prepackaged goods.

It means that the importers have to demand packages following the EEC rules. In fact, such packages that violate these rules have no chance in the long term to be sold on the European market.

1. EEC Regulations Related to Packages or Packaging Materials and Aimed at the Consumer's Health Protection

The most important regulations in this group are those concerned with approval of materials, mostly plastics, for use in direct contact with food. EEC has so far issued only a recommendation but is preparing a positive list of monomers and related to it, a global migration list. (A positive list states materials considered safe to use and/or maximum permissible quantities of migration from the material into the food itself.)

In the recommendation it is stated that global migration (= total migration from a package into the food) must not exceed 60 mg/kg or 10 mg/dm^2.

Because in Europe no laws are enacted so far in this connexion, it is usual to appeal to the FDA terms. In the USA, the Office of the Federal Register issues a yearly publication which contains the claims for food packaging in its volume No. 21. In the most countries today it is common practice to state that a certain material comes up to the requirements of FDA.

2. EEC Regulations Related to Consumer Protection in General

The rules in this group are aimed to protect the consumer against misleading packaging and labelling. They can be divided in three subgroups:

2.1 Regulations concerning consumer information on the package

2.2 Requirements with respect to weight or volume of prepacked goods

2.3 Package design

A general description of the objectives for this type of legislation is given in the introduction of the US "Fair Packaging and Labelling Act", 1967. It is described as "An Act to regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging and labelling of certain consumer commodities distributed in such commerce".

This Fair Packaging and Labelling Act has undoubtedly served as a model for legislation in many countries, and also within the EEC.

The EEC Council Directive No. 79/112/EEC of 18. December 1978, is related to the Labelling, Presentation and Advertising of Foodstuffs for Sale to the Ultimate Consumer.

The Directive states in detail what kind of information is compulsory on the labelling of foodstuffs and it is maybe the most important document for every exporter of foodstuffs to the member countries of EEC.

The Council Directive No. 76/211/EEC and its amendment 78/891/EEC concern the making-up by weight or by volume of certain prepackaged products. Here, it is stated that "the packer or importer shall be responsible for ensuring that prepackages meet the requirements of this Directive". "In the case of imports from non-EEC-countries, the importer may instead of measuring and checking provide evidence that he is in posession of all the necessary guarantees enabling him to assume responsibility".

There are requirements for carrying out statistical sampling checks in a certain order and to indicate the nominal quantity of the contents on a package also in a certain way; instructions for printing a small "e" on the package "constituting a guarantee by the packer or the importer that the prepackage meets the requirements of this Directive". This letter shall have a stated form shown in Annex II of Directive 71/316/EEC.

3. EEC Rules Related to Packaging Standards

An EEC Council Directive which will be in force before 15. January 1982 indicates the ranges of nominal quantities and nominal capacities permitted for certain products (No. 80/232/EEC).

Thus, in 1982 only the following sizes of for instance following products are allowed in the EEC countries:

Rice: 125, 250, 500, 1000, 2000, 2500 and 5000 grams

Frozen fish fillets and portions, breaded or not breaded: 100, 200, 300, 400, 500, 600, 800, 1000 and 2000 grams

Preserves and semi-preserves in tins and glass containers may be sold only in containers with a capacity of: 106, 156, 212, 228, 314, 370, 425, 446, 580, 720, 850, 1062, 1700, 2650, 3100, 4250 and 10200 mls.

4. Laws and Regulations Related to the Protection of the Environment

Packaging is an important element in environmental legislation in most industrialized countries today. So far, the legislation is not harmonized but is slightly different in the individual European countries. E.g. in Finland and Sweden there are fiscal duties imposed on non-returnable containers. The economization in energy consumption, recycling and pollution are main aspects towards which the regulations are directed.

Lately (May, 1980), FDA has published a proposed rule to prohibit the PCB´s altogether in or around food or feed packaging materials plants or storage facilities (PCB´s = polychlorinated biphenyls). This kind of regulations are combined for public health-protection and environment protection.

LAWS AND REGULATIONS / ANNEX

SOURCES OF INFORMATION

A. Publications:

Official Journal of EEC (biweekly)

Office for Official Publications of the European Communities
P.O. Box 1003
LUXEMBOURG 1

A Guide to Sources of Information on Foreign Trade Regulations

International Trade Centre UNCTAD/GATT
Palais des Nations
CH-1211 GENEVA 10, Switzerland

Exporter's Encyclopedia (about 1000 p., updated regularly)

Dun and Bradstreet International
99 Church Street
NEW YORK, N.Y. 1007, USA

B. Suppliers of Information on Laws and Regulations: (on order)

United Kingdom:

PIRA (The Research Association for the Paper and Board, Printing and Packaging Industries)
Randalls Road
LEATHERHEAD, Surrey

Her Majesty's Stationery Office (HMSO)
The Overseas Liaison Offices
HMSO, Atlantic House
Holborn Viaduct
LONDON EC1P 1BN

LAWS AND REGULATIONS / ANNEX / 2

Federal Republic of Germany:

Bundesstelle für Aussenhandelsinformation (BfA)
Blaubach 13
Postfach 5
KÖLN 1

Rationalisierungsgemeinschaft Verpackung (RGV)
(Society for efficient packaging)
Gutleutstrasse 163-167
D-6000 FRANKFURT/MAIN 8

France:

Institut Francais de l´Emballage
40 rue du Colisée
F-75008 PARIS

Italy:

Instituto Italiano Imballagio
(Italian Packaging Institute)
via Carlo Cassan 34
I-35100 PADUA

Sweden:

Packforsk (Swedish Research Institute on Packaging)
Box 9
S-16393 SPÅNGA

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, SEPTEMBER 10, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

STANDARDIZATION IN EUROPE

Today, the distribution costs make more than a half of the retail price of consumer products in Europe.

This means that if an item costs 100 units in the retail shop, the producer gets less than 50.- even if the production was in an European country. The exporters price is still less due to the freight costs.

The share of handling is about 40 % of the distribution costs and the share of space is more than 25 %.

What, Then, is Distribution ?

Distribution means all those operations needed to transfer a product from the producer to the ultimate consumer. Distribution costs, caused by those operations thus remarkably raise the product price but they do not at all improve the value of the product.

Consequently, the distribution costs should be kept on as low a level as possible. It is often claimed by producers/exporters that an improved packaging quality will increase costs. In fact, improved packaging means that the merchandise will arrive in better condition, will be easier to handle and display and will thus be more attractive both to the trade and to the final consumer which consequently are willing to pay a higher price. This fact is, however, seldom understood and clearly shows the wide-spread ignorance about the technical and promotional functions linked together in packaging. Instead

supposedly saving some money by using cheap and inadequate packaging materials, the exporters should realise that standardization is the main tool to achieving savings in both handling, storing and transportation costs.

Standards related to packaging can be roughly divided into three categories:

1. Product standards, defining the properties, sizes and shapes of packages

2. Method standards, defining testing or analysis methods

3. Communications standards aim to unify the terminology and symbols used in different countries.

Establishing of standards is, regrettably, not yet quite harmonized in Europe although the European Committee for Standardization, CEN, acts as a harmonizing body of 15 European countries and their national Standardization Organizations. CEN works together also with the world-wide organization for standardization, ISO.

CEN has worked out some recommendations and European standards EN out of which e.g. the capacity standards for tin and glass containers have been enacted as EEC Council Directives, and the EN Standard for detergent packages which is one of the few package standards stating not only capacities but dimensions as well (EN 23).

1. The most important product standard regarding packaging is that of the packaging basic module (ISO 3394) according to which the maximum outer dimensions for a transport package are 600x400 mm. This basic module and its multiples and sub-multiples form a series of package sizes which can be laid without waste of space on the mostly used flat pallets in Europe in order to form an interlocking unit load.

These pallet sizes are

1200 x 1000 mm
1200 x 800 mm

Additionally, a pallet size 1000 x 800 mm is in use to a minor extent.

ISO has asked its member countries to vote on the pallets to be finally standardized for international trade. The voting has been implemented already 5 times and the last one was in December 1979. This voting made by mail ballot gave the following result:

> 28 member countries voted for and 10 countries against that the pallet 1200 x 1000 be stated as the only size in international transport.

However, both pallet sizes 1200 x 1000 and 1200 x 800 will be utilized still during many years in Europe. For an exporter, the question of which of these pallet sizes will win in the future is of minor importance, because the basic module system fits well on both pallets.

An example of international, integrated standardization and How It Should Not be Implemented is the container size vs. pallet size. Because the combining of pallet and container standards was ignored at the time containers were established there is now a permanent problem of space waste in containers when using standard pallets.

Anyway, utilizing the basic module system means increasing use of unit loads.

Although there so far are no official standards for the height of a unit load, big retail chains in Europe today claim that the goods delivered shall form a unit load of standard pallet size and a total height not exceeding 1100 mm. This results from the building of big central stores with standard pallet shelves and mostly operating with computerized systems.

2. Method standards for testing and analysing materials are used mostly on national basis as many countries issue their own mandatory standards such as DIN in West Germany, AFNOR in France, SIS in Sweden and BSI in the U.K. Many such national standards are backed by technical institutes like PIRA in the U.K., CNEC in France and so on.

3. Out of the communications standards, the most important ones are the Pictorial Markings for Handling of Goods (ISO/R 780) which necessarily have to be used for all exported goods - if needed with added written instructions in the language of the country of destination (Annex II).

   The before explained standards are valid in Western Europe. The COMECON countries have their own cooperation organization responsible for COMECON Standards. As far as possible, they are based on ISO-Standards. COMECON-Standards are binding only for those countries having participated in the ratification of those standards.

STANDARDIZATION IN EUROPE / ANNEX I

INTERNATIONAL STANDARDIZATION BODIES

International Organization for Standardization (ISO)

1, rue de Varembe
Case Postale 56
CH-1211 GENEVA 20, Switzerland

Codex Alimentarius Commission

Joint FAO/WHO Food Standards Programme
Via delle Terme di Caracalla
I-00100 ROME, Italy

United Nations Economic Commission for Europe (ECE)

Palais des Nations
CH-1211 GENEVA 10, Switzerland

Inter-Governmental Maritime Consultative Organization (IMCO)

101-104 Piccadilly
LONDON W1V 0AE, United Kingdom

European Economic Community (EEC)

200 rue de la loi
B-1040 BRUSSELS, Belgium

European Committee for Standardization (CEN)

Rue Brederode 2
Bte 5
B-1000 BRUSSELS, Belgium

Council for Mutual Economic Assistance (CMEA)

Permanent Commission on Standardization
Kalinin Street 65
MOSCOW G-205, USSR

STANDARDIZATION IN EUROPE / ANNEX I / contnd.

NATIONAL STANDARDIZATION BODIES

Austria (ON)

Österreichische Normungsinstitut
Leopoldsgasse 6
Postfach 130
A-1021 VIENNA 2

Belgium (IBN)

Institut belge de normalisation
Av. de la Brabanconne 29
B-1040 BRUXELLES

Denmark (DS)

Dansk Standardiseringsraad
Aurehojvej 12 and 15
DK-2900 HELLERUP

France (AFNOR)

Association francaise de normalisation
Tour Europe
Cedex 7
F-92080 PARIS - La Defence

Germany (DIN)

DIN Deutsches Institut für Normung
Burggrafenstrasse 4-10
Postfach 1107
D-1000 BERLIN 30

Italy (UNI)

Ente Nazionale Italiano di Unificazione
Piazza Armando Diaz 2
I-20123 MILANO

Netherlands (NMI)

Nederlands Normalisatie-Institute
Polakweg 5
P.O. Box 5810
2280 HV RIJSWIJK ZN

STANDARDIZATION IN EUROPE / ANNEX I / contnd.

Norway (NSF)

Norges Standardiseringforbund
Haakon VII´s gt. 2
N-OSLO 1

Portugal (IGPAI)

Reparticao de Normalizacao
Avenide de Berna 1
LISBOA 1

Spain (IRANOR)

Instituto Nacional de Racionalizacion y´Normalizacion
Serrano 150
MADRID 6

Sweden (SIS)

Standardiseringskommissionen i Sverige
Tegnergatan 11
S-10366 STOCKHOLM

Switzerland (SNV)

Association Suisse de normalisation
Kirchenweg 4
Postfach
CH-8032 ZURICH

United Kingdom (BSI)

British Standards Institution
2 Park Street
LONDON W1A 2BS

USSR (GOST)

Gosudarstvennyj Komitet Standartov Soveta
Ministrov S.S.S.R.
Leninsky Prospekt 9
MOSKVA 117049

ENGLISH	SWEDISH
Handle with care	Försiktigt
Fragile	Omtåligt
Glass	Glas
This side up	Denna sida uppåt
Use no hooks	Inga krokar
Keep dry	Förvaras torrt
Keep cool	Förvaras kallt
Open here	Öppnas här
Sling here	Slingas här
Centre of gravity	Tyngdpunkt
Inflammable	Eldfarligt
Poison	Gift

GERMAN	FRENCH	ITALIAN
Vorsichtig	Attention	Attentione
Zerbrechlich	Fragile	Fragile
Glass	Verre	Vetro
Nach oben	En haut	Dessus alto
Keine Haken anwenden	Ne pas crocheter	Non usare ganci
Trocken aufbewahren	Grain l'humidité	Teme l'umiditá
Kühl aufbewahren	Garder au frais	Conservare in luogo fresco
Hier öffnen	Ouvrir ici	Lato da Aprire
Hier anschlingen	Elinguer ici	
Schwerpunkt	Centre de gravité	
Feuergefährlich	Inflammable	
Giftig	Poison	

ANNEX II

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, SEPTEMBER 10, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

TECHNICAL PLANNING OF PACKAGING

In discussing the design of a package it is usual to distinguish between two aspects: technical design, related to the technical construction of the package from a functional point of view, and visual design, relating to the appearance of the package and its promotional value. Although these aspects should never be separated, this session does not consider the visual design as such.

The title of this session, Technical Planning of Packaging, means in fact more than only the technical design of a package.

It includes all the planning of the package itself, all packaging methods, all packaging costs and quality control methods.

Many books have been written on the variety of factors that must be taken into consideration in package planning. In the case of export packaging, the requirements are far more severe than for packaging for local needs.

When discussing the export package, it is necessary always to consider the whole entirety, because it is the combined properties of the

- retail pack
- transport pack
- unit load

that have to meet the strains during distribution.

Thus, such an export package entirety has to:

- Preserve the special features of the product in the package (taste, shape etc.)

- Protect the product against transport damages throughout the distribution, so

that both the product and the package reach their ultimate consumer in perfect condition. The frequently heard argument that the shipping insurance will take care of the damages is of little comfort to the consumer who bought it because he needed the product - not necessarily the money from the insurance company.

- facilitate handling of the product by making savings possible in both handling and space costs
- be adjusted to the requirements, needs and taste of the target market
- comply with existing standards, laws and regulations in the target market

Logistic planning of packaging takes into consideration all aspects influencing the quality of package and packaging methods: Thus, it is never sufficient to make a decision of the type and visual design of a consumer package only, although still today in most cases packaging planning is understood to be just consumer package design and nothing more.

A checklist of factors to be considered in connexion with packaging should be worked out at every plant producing and packaging goods.

Especially packaging for export needs continuing efforts in the planning and implementing sectors. The rapid changes that are taking place in packaging technology and distribution systems may, otherwise, pose difficult problems even for well-established exports.

1. Checklist Related to Product Requirements

- List the chemical, physical and mechanical properties of the product. State the requirements for barrier properties and mechanical strength.

- Is the product designed to be easily packed for transport? In consumer packages?
- Are changes in product design possible in order to adapt it to the transport package?
- Does the product need extra protection such as anti-corrosive agents, protection against contamination, shock-absorbing materials, protection against infestation?

2. Checklist Related to Consumer Requirements

- What is the best suitable size of consumer package in the target country regarding volume, number of servings, dimensions of home storage facilities, price?
- Convenience requirements, such as handling, opening, re-closing, emptying, dosing
- Have laws and regulations related to consumer protection in the target markets been observed?
- List compulsory information to be printed on the package
- Is the additional information easy to understand? Is it adequate?

3. Checklist Related to Distribution Requirements

- List all means of transportation and handling for this specific product
- List the mechanical strains (in "g":s) generally known for different vehicles
- Is it reasonable to use containerization for export?
- List all standards valid in the target countries related to dimensions and capacities/weights

- Is the planned brand name in use/registered in the target country? What legal action is needed for registering?
- What kind and size of transport packs and consumer packages are used for this specific type of product by other producers?
- Can standardized size of unit load be combined with minimum consignment to be delivered from importer to wholesaler?
- Is the planned size of consumer/transport pack optimal regarding shelf life and price?
- Requirements for display of the transport pack
- Easiness of unpacking the transport pack and pricemarking

4. Checklist Related to Production

- Size of batch being produced
- Production capacity
- Yearly production volume
- Has the product to be protected immediately after manufacturing or must it get some time before packaging?
- Existing packaging facilities
- Technical and commercial details of planned new packaging equipment
- Availability of labour
- Availability of space
- Is air conditioning needed for packaging?
- Hygienic conditions in packaging
- Ergonomic conditions in packaging

A proper utilizing of this kind of checklist requires time and, in most cases, travelling to target countries for collecting package samples, discussions with agents or potential buyers, and collecting market data which may influence packaging decisions. The packaging planner has, as well, to be familiar with relevant distribution systems and to be well aware of transport and handling hazards.

After all relevant facts have been collected and studied, the final decisions have to be made, and

- packaging costs calculated
- time table for the programme established
- policies and objectives of programme decided upon
- package designer briefed

Packaging costs include

- all material costs that comprise of
  - price of materials
  - price of accessories
  - their handling costs
  - material waste
- packaging work costs
  - cost of labour
  - running cost of machinery
  - energy costs
  - product waste caused by rejected packages

5. Checklist Related to Economy in Packaging

- Could any of the selected packaging materials be replaced by cheaper materials without loosing indicated qualities?
- Is it possible to use same size of transport/ consumer pack for several products?

- Is the consumer package dimensioned in a way to give best possible strength when filled and to save material?

- Can the packaging method be improved as to save manual labour?

- Is it possible to decrease the amount of defective packages?

- What kinds of quality control serve the packaging as a whole in the most efficient and economical way?
  - checking the incoming materials
  - checking the packaging work quality
  - checking ready packages

Time table has to indicate realistic dates of ordering machines, materials and accessories, of installing new machines, of making trial runs with new materials and finally the starting of actual packaging.

PACKAGING SYMPOSIUM AT KOREA DESIGN
AND PACKAGING CENTER, SEPTEMBER 10, 1980

"TRENDS INFLUENCING THE EUROPEAN PACKAGING IN THE EIGHTIES"

GRAPHIC DESIGN IN EUROPE FOR IMPORTED PRODUCTS FROM KOREA

In packaging, the role of illustration is to convey an intended message to the consumer/user. The combined elements of design exceed even language barriers, delivering the initial, immediate impression.

So the product's package must not only be attractive but it must convey, in understandable terms, how the product is to be used. A well designed package comes to life before the eyes of the consumer. It is talking to you

- to the sense of taste: sweet, savoury, spicy, soft, hearty, tangy, mellow
- to the sense of smell: fragrant, cool, exotic, nostalgic
- to the sense of hearing: smooth, rough, textured
- to the sense of touch: crisp, heavy, dainty, modern, firm

The eye is an interpreter for all of the senses. It is the designer's prime target that the spectator instinctively also tastes, smells, hears and feels the product.

Every designer is an individual and works in his own way to create a good and functional design.

Designers of consumer packages for export should, anyhow, take into logical consideration vital elements of visual design.

The basic elements are:

1. Illustration
2. Colour
3. Shape and size
4. Copy (text and brand name)

These four elements make up the overall layout of the package. The factors set out below should be considered in planning the design of consumer packages for export.

1. Illustration

- Pictures should show the result of using the product, or the product itself.
- Account should be taken of laws and regulations.
- The illustration should be adapted to the taste and surroundings familiar to the target markets (not too Korean).
- The exporter should not, however, loose his identity altogether.
- Unacceptable illustrations must be avoided.
- The illustration on the package should be suitable for co-ordinated use in connexion with advertising in black and white or colour, in TV etc.

2. Colour

The following points should be considered:

- Preference colours in different markets
- Colours to be avoided in different markets
- Fashion colours

- Relationship of colours to types of products
- Relationship of colours to type of customers
- Values of colours in respect of association, symbology, visibility, readability in texts, effect on apparent size etc.

3. Shape

The following points should be considered:

- Shape as a brand image
- Symbology of shape
- Convenience of shape
- Effect on apparent size
- Voluntary and mandatory size standards in target markets.

4. Copy

The following points should be considered:

- Visibility, readability and attention value of different sizes, types and colours of texts
- Influence on copy layout of laws and regulations in target markets on mandatory product information etc.
- Influence on copy layout of laws and regulations in target markets on deceptive labelling and unfair trade practices
- Influence on copy layout of use of different languages for different target markets
- Comprehensive instructions for use of product, recipes etc.
- Brand name and logotype suitability for target markets and incorporation in the layout of the package

Many of the aspects mentioned above need familiarity with life and surroundings in the target countries.

Therefore, the designer should preferably have travelled in those countries but should at least carefully study relevant publications and procure a sufficient collection of sample packages in the same group of products than that getting a new package design.

Further, the package designer has to keep in mind that the field of packaging is not static - no one knows what will happen next in it.

Continuous studying of the markets and keeping up-to-date in all progress and changes concerning packaging and distribution is a good and efficient tool for a successful package designer.

Appendix #2

Results of Reply for Collection of Packaging Information

No.	Company/Organization	Country	Contents	Rec'ed date	Remarks
1	Bemrose UK Ltd.	U.K.	Information Book (2)	2. 16	
2	Oliver Machinery Co.	U.S.A.	Information Pamphlet (6)	"	Introduction of New Product Packager No. 10-80
3	Bespak Industries Ltd.	U.K.	Information Book	2.10	
4.	SWF Machinery	U.S.A.	Information Book/Design Bulletin	2.10	
5.	UK Plastics Ltd	U.K.	Information Bulletin	2.2	
6.	Adhesive Tape Manufacturers' Association	U.K.	The list of Association Member	2.3	
7.	Aluminum Foil Container Manufacturers Association	U.K.	Information Pamphlet	2.8	
8.	The British Paper & Board Industry Federation	U.K.	Information Pamphlet/Trade Journal	2.6	Magazine "Paper Technology & Industry" Subscription rate per year = £29.00
9.	British Cellophane Ltd. (BCL)	U.K.	Brochures/Leaflets (7)	2.8	
10.	Arenco-Alite Ltd. (Neumo-alite Lrd.)	U.K.	Bulletin for Products	2.7	

APPENDIX III

11.	A P I C	HongKong	Bulletin for Products	2.17	1 subject = US$75.00
12.	P I R A	U.K.	* Packaging Abstracts/ Management's Guide to Problem Solving. * Information on visual Aid Kits		Visual Aid Kits = ฿30.00 per kit.
13.	Industrial Publications Inc.	U.S.A.	Union Standard Newspaper	2.18	
14.	Industrial Publications Inc, (Aerosol Age)	U.S.A.	Magazine "Aerosol Age" Enclosed	2.20	Surface mail = US$19.00/year Air mail= US$45.00/year
15.	Harland Group (Harland Machine System Ltd.)	U.K.	Information Brochure		
16.	Eastman Chemical Int'l Company	U.S.A.	Introduction of its Branch in Korea and Hong Kong	2.23	
17.	Pack-Rite Machines	U.S.A.	Information Pamphlet	3.2	

D R A F T

A CLASSIFICATION SYSTEM

OF INFORMATION ON PACKAGING AND LABELLING

Major categories of classification:

00 General subjects
05 Information on packaging
10 Education in packaging
15 Legislation, regulations
20 Standardization
25 Organization for packaging
30 Packaging research, testing & quality control
35 Planning and development of packaging
40 Protective packaging
45 Packaging raw materials, packages & accessories
50 Machinery for manufacturing of packages
55 Packing machinery and equipment
60 Packaging and production economics
65 Packaging of various products
70 Packaging for transport & storage
75 Packaging in the distribution system
80 Promotional value of packaging
85 Visual design of packages & labels
90 Packaging and the environment
95 Miscellaneous

Sub classification of major categories:

(No digit numbers have been designed for the sub-classes, pending further refinement of sub-headings)

00. General subjects

History of packaging
Terminology & definitions
Overall functions & importance
Packaging and the national economy
Packaging in industrialized countries
Packaging in developing countries
Government/packaging relations
Custom duties, import restrictions
Trends in use of different types of packages
Prices

05. Information on packaging

Collection and dissemination of information
Classification systems, thesauruses
Bibliographies, lists of publications
Abstracting service
General handbooks
Directories, yearbooks, catalogues
Periodicals
Bulletins and newsletters
Packaging statistics
Exhibitions, trade fairs

Packaging competitions
Dictionaries, glossaries, codes
Suppliers lists
Addresses

10. Education in packaging

Education programmes, syllabuses
Academic level education
Courses, seminars
Audiovisual programmes
Films
Correspondence courses
Examinations
In-plant training

15. Legislation, regulations

International
National
Health protection
Fair trade regulations
Environment protection
Hazardous materials
Informative marking & labelling
Voluntary measures

20. Standardization

International
National
Dimensional standards
Weight & measures standards
Marking and labelling
Modular systems
Metrification
Standardization & grading of products for packing

25. Organization for packaging

International organization related to packaging
National packaging associations
National trade associations
Packaging and related institutes and laboratories
Statutes, by-laws, objectives
In-company organization of the packaging function

30. Packaging research, testing & quality control

Multinational research programmes
National research programmes
Laboratory facilities
Testing equipment
Testing methods
Testing programmes, certification
Test shipments
Quality control

./..

35. Planning and development of packages

Checklists
Network planning
Design briefs
Specifications
Consulting services, designers
Development costs

40. Protective packaging

Mechanical shocks & strains
Climatic hazards
Corrosion prevention
Permeability
Protection against light
Thermal insulation
Contamination e.g. bacterial
Insects, rodents etc.
Pilferage
Shelf life
Other

45. Packaging rawmaterials, packages and accessories

Wood:	General
	Raw materials+
	Packages++
Pulp:	General
	Raw materials+
	Packages++
Paper:	General
	Rawmaterials+
	Packages++
Paperboard & Fibreboard:	General
	Rawmaterials+
	Packages++
Plastics	General
	Rawmaterials+
	Films+
	Combined flexible materials+
	Flexible packages++
	Rigid packages++
Metal:	General
	Rawmaterials+
	Packages++
Glass & ceramics:	General
	Rawmaterials+
	Packages++
Textile:	General
	Rawmaterials+
	Packages
Accessories:	General
	Closures, seals, dispensing devices++

Tying, strapping and taping materials++
Stapling, mailing and other fastening materials++
Cushioning materials++
Waxes and adhesives++
Coating and proofing materials++
Printing and marking inks++
Unit load devices, pallets, containers, etc.++

\+ For sub-classification see Annex I (under preparation)
++ For sub-classification see Annex II (under preparation)

50. Machinery for manufacture of packages

Machinery for production of basic rawmaterials

Sawn goods, plywood, particle board etc.
Pulp
Paper and paperboard
Plastic rawmaterials
Metal (steel plate, aluminium foils etc.)
Textile & fabrics

Machinery for converting rawmaterials to packages+

Wood-based packages
Moulded pulp packages
Paperboard packages
Paperboard packages (incl. corrugated & solid fibre-board)
Plastic films
Flexible plastic packages
Rigid plastic packages
Metal-based packages
Glass & ceramic packages
Textile packages
Printing methods & equipment
Coating, laminating, proofing, etc.
Closures
Tying, strapping & taping materials
Stapling, stitching & other fastening materials
Cushioning materials

\+ For sub-classification see Annex III (under preparation)

55. Packing machinery and equipment

For transport packages:

Wrapping machines including shrink & stretch wrapping
Wrap-around machines for corrugated & solid fibreboar
Forming & erecting machines
Case packers
Case sealers
Sack filling and closing equipment
Palletizing equipment

For consumer packages+

Web-fed bagging & pouching machines
Machines for packing of liquids in flexible packs
Machines for packing of premade bags & pouches
Machines for vacuum, gas and hermetic packing
Wrapping machines
Net-filling equipment
Carton forming, filling & closing machines
Form, fill and seal thermoforming machines including blister & skin packing
Filling and closing of metal & plastic tubes
Filling and closing of rigid containers (glass, plastic, metal etc)
Aerosol filling equipment
Labelling of bottles, cans, jars, etc.
Metering, counting, weighing equipment

Auxiliary equipment+for:

Stitching, stapling and nailing
Strapping, tying and taping
Marking, coding, pricing and dating
Materials handling

\+ For sub-classification see Annex IV (under preparation)

60. Packaging and production economics

Elements of packaging cost
Relation of packaging costs to product costs
Relation of packaging costs to different modes of transport
Pre-packing economics, added value
Packaging costs in relation to expected transport damage
Effect of good packaging on shipping rates
Effect of good packaging on insurance rates
Manual packing operations
Mechanization of packing operations
Contract packing
In-plant production of packages
Leasing of packaging machinery & methods
Rentability of investments in package production
Local manufacture versus import
Purchasing procedure economics
Economics of package design
Effects of quality/price on runnability
Use of value analysis in packaging
Storage of packaging materials
Economics of unitized loads & materials handling
Economics of checkweighing/counting
Reconditioning of packages
Recycling of packaging materials

65. Packaging of various products

The sub-classification of this heading is depending on each country's specific needs. Data can also be collected and classified under existing trade information systems, using e.g., the SITC or BTN product classification.

A proposed sub-classification based upon the EPF classification schedule (facet 7) is however presented in Annex V. (Under preparation)

70. Packaging for transport and storage

Packaging for road transport
Packaging for air transport
Packaging for sea transport
Packaging for railway transport
Packaging for postal transport
Unitizing for transport and materials handling
Warehousing and storage practices

75. Packaging in the distribution system

Packaging for self service
Packaging for display
Packaging for wholesale
Packaging for institutions
Packaging for vending machines
Packaging for mail order distribution
Packaging for export
Spoilage of food during storage and distribution
Universal product code (UPC)

80. Promotional value of packaging

Packaging and marketing
Packaging and advertising
Impulse buying
Customer tastes
Consumer convenience
Testing consumer acceptance
Test marketing
Visual laboratory tests

85. Visual design of packages and labels

General lay-out
Illustration
Colour
Shape/size
Copy, lettering
Information, mandatory/voluntary
Logotypes
Trademarks, brand names
Languages
Design changes

90. Packaging and the environment

Information on packaging waste, waste disposal problems, pollution through packaging etc. can be collected under this heading.

95. Miscellaneous

Information on subjects not classified above or current subjects deserving particular attention can be collected under this heading.

Appendix #1.

분 류 표 (포장 및 라벨링)

○ 대 분 류

00	포장일반
05	포장정보
10	포장교육
15	법률 및 규정
20	표 준 화
25	포장기구
30	포장연구, 시험, 품질관리
35	포장계획 및 개발
40	보호포장
45	포장원료 및 관련부자재
50	포장제조를 위한 기계
55	포장기계 및 장비
60	포장과 경제
65	여러제품의 포장
70	수송 및 저장을 위한 포장
75	유통관련포장
80	포장의 판촉효과
85	포장 및 라벨의 시각디자인
90	포장과 환경
95	기 타
00	포장일반
	포장의 역사
	용 어 및 정의

기능 및 중요성
포장과 국가경제
선진국의 포장
개발도상국의 포장
정부와 포장의 관계
관세 및 수입제한 사항
포장이 다른형태로 사용되는 경향
경 비

05 포장정보
정보수집 및 보급
분류표, 백과사전
문헌목록
일반핸드북
인명록, 연감, 카탈로그
정기간행물
회보 및 비정기 간행물
포장통계
전람회, 전시회
포장콘테스트
사전, 용어풀이집, 약호
포장공급자 일람표
주 소

10 포장교육
교육과정 및 시간표
대학교육과정

세미나, 단기코스
시청각 교육과정
필 름
통신교육과정
시 험
현 장 교 육

15 법률 및 규정
국 제 법
국 내 법
건강보호규정
무 역 규 정
환경보호규정
위 험 물
표시와 라벨링 규정
자율적 규 정
20 표 준 화
국제적표준화
국내적표준화
치 수 표준화
중량 및 도량형 표준화
표시 및 라벨링
모듈 시스템
미 터 법
제품표준화

25 포장기구

국제포장기구

국내포장기구

무역협회

관련연구소 및 시험소

통계, 규칙

회사내의 포장기능 조직

30 포장연구, 시험, 품질관리

국제적인 연구

국 내 연구

시험실설비

시 험 기

시 험 방법

시험항목 및 성적서

운 반 시험

품 질 관리

35 포장계획 및 개발

체크리스트

전반적인 계획

설계상의 중요사항

규 격 서

자문기구 및 디자이너

개 발 비

40 보 호 포장

기계적 충격 및 변형

기 후 조 건
방 식 및 방 청
투 과 도
빛 차 단
열 차 단
오 염(박테리아등)
곤 충 , 쥐
도 둑
보 관 수 명
기 타

45 포장원료 및 관련부자재

목 재 : 일 반
원 료
포 장

펄 프 : 일 반
원 료
포 장

종 이 : 일 반
원 료
포 장

판 지 : 일 반
원 료
포 장

플라스틱 : 일 반
원 료
필 름

혼합 유연성 포장재

유연성포장재

경질포장재

금　　속 : 일 반

원 료

포 장

유리 및 도기 : 일 반

원 료

포 장

부　자　재 : 일 반

봉함, 봉관

결 속 재

못, 스테이플, 테이프

완 충 재

왁스 및 접착제

코팅 및 방수, 방청

인쇄 및 표시용 잉크

팰리트, 콘테이너, 일관수송용 기구등

50　포장제조를 위한 기계

기초원료제품 제조기계

톱밥, 합판, 나무조각판등

펄　　프

종이 및 판지

플라스틱 원료

금속(강판, 알미늄박등)

섬유, 직물

가공기계

나무로 만들어진 포장

성형펄프 포장

종이제품 포장

판지제품 포장(골판지 및 합판지)

플라스틱 필름

유연성 플라스틱 제포장

경질 플라스틱제 포장

금속포장

유리 및 도기포장

섬유포장

인쇄방법 및 장비

코팅, 접합, 방수, 방습, 방청등

봉 함

결속재, 테이프제품

스테이플, 스티치, 기타 결속재

완 충 재

55 포장기계 및 장비

° 수송포장

겉싸개(수축 및 연신포장포함)기계

골판지 및 합판지용 겉싸개 기계

조립기, 성형기

케이스포장기

케이스봉함기

봉지 충진 및 봉함기

팰리트화에 필요한 장비

○ 소비자포장

주머니 및 봉지제조기

액체포장용 유연성 포장재료 포장기

주머니 및 봉지포장기

진공 및 개스충진 포장기

겉싸개 기계

네트 충진기

판지상사, 성형, 충진, 봉함기

열성형포장기(블리스터 및 스킨포장)

금속 및 플라스틱 튜브 충진, 봉함기

경질용기(유리, 플라스틱, 금속등)충진, 봉함기

에어러졸 충진 포장기

라벨링(병, 캔, 항아리)

중량 및 체수측정기, 계수기

○ 기타장비

스위치, 스테이플, 못

스트랩, 테이프

표시, 번호, 가격, 날짜기입

재료취급 등에 사용되는 장비

 포장과 경제

포장비요소

포장비와 생산원가의 관계

포장비와 수송 수단과의 관계

사전 포장의 경제, 부가가치

수송상의 위험과 포장비의 관계

우수포장의 수송상 효과

우수포장의 보험상 효과

수동포장작업

포장작업의 기계화

계약포장

공장내에서의 포장생산

포장기계 임대 및 그 방법

포장자금 임대

국내생산과 수입의 경제관계

구매상의 경제

포장설계상의 경제

조업성에 따른 품질과 가격의 영향

포장에서의 가치 분석기법

포장재의 저장

단위화물 및 재료취급상의 경제

중량측정 및 계수상의 경제

회수용 및 비회수용 포장의 경제

포장의 재활용

포장재 재사용

65 여러제품의 포장

각 제품의 포장규격

70 수송 및 저장을 위한 포장

육상수송용 포장

비행기 수송용 포장

해상수송용 포장

색

형태 및 크기

복사,

정보사항

로고타입

상 표

해 설

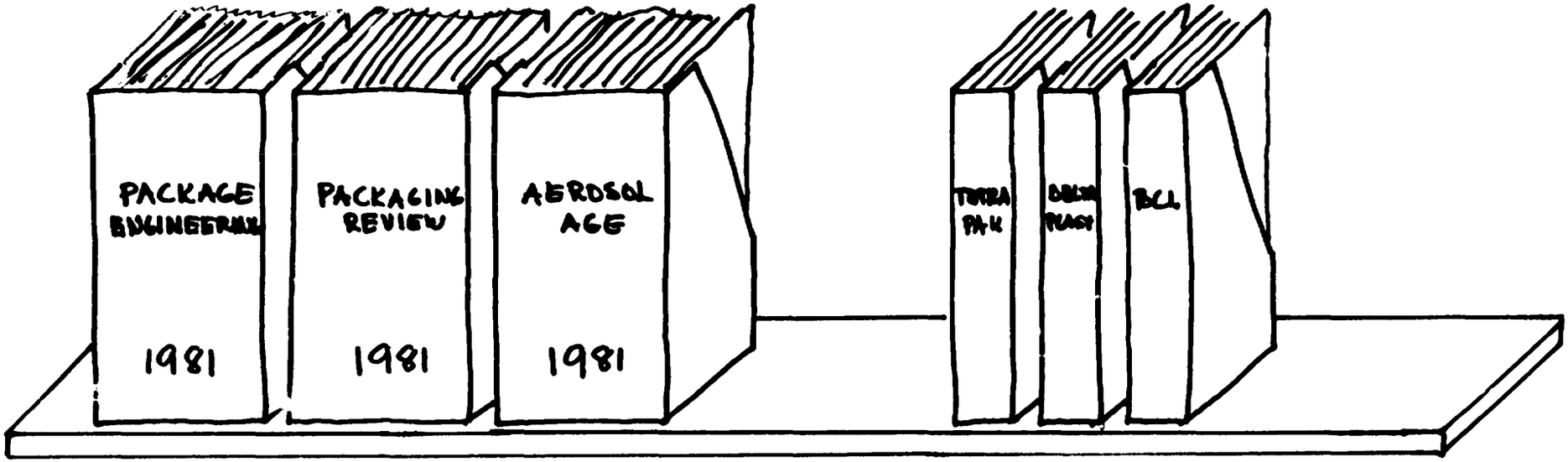
디자인변경

90 포장과 환경

포장폐기물, 공해, 환경에 대한 사항.

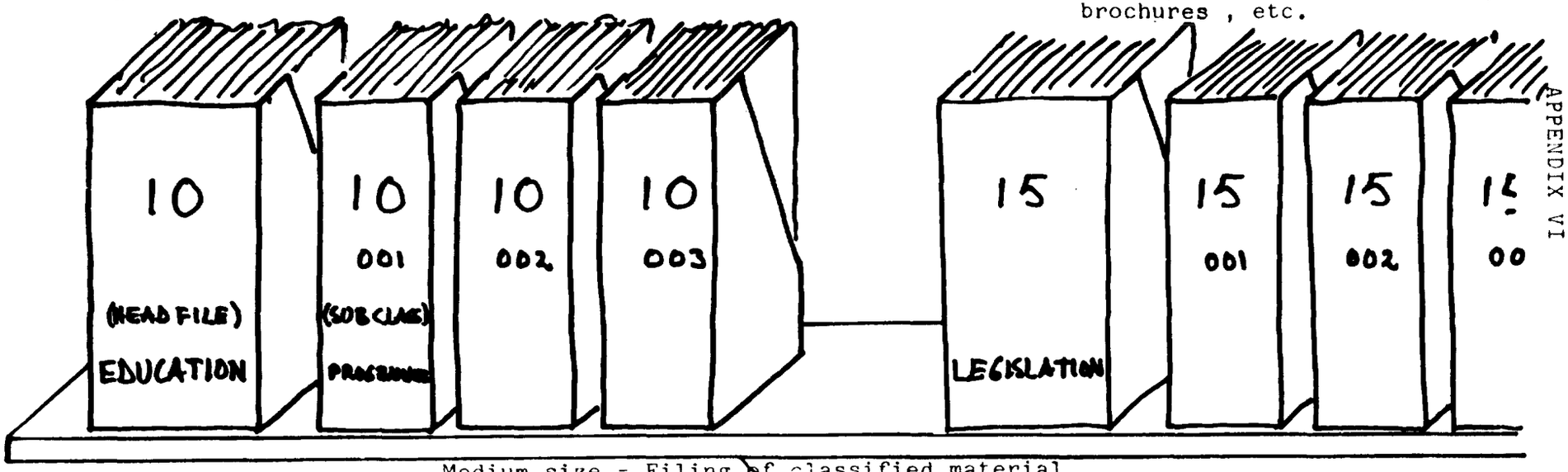
95 기 타

위에 포함되지 않은 사항.



Big size = Annual volumes etc.

Small size = Companies' annual reports, brochures , etc.



Medium size = Filing of classified material

Boxes of corrugated board

STORING SYSTEM OF INCOMING INFORMATION

APPENDIX VI

APPENDIX VII

BIBLIOGRAPHY

This annotated list of publications is aimed to serve as a guide when selecting textbooks for packaging courses and other training events. The list is not exhaustive; new publications appear continuously in the industrialized countries.

1. PRINCIPLES OF FOOD PACKAGING - AN INTERNATIONAL GUIDE

ed. Rudolf Heiss
Food and Agriculture Organization of the United Nations (FAO)
Via delle Terme di Caracalla
00100 Rome, Italy

332 pp. Free to qualified organizations. Published 1970

A comprehensive guide based on contributions from specialists from all over the world. Its 22 chapters are divided into seven sections: basic packaging terminology; special questions of packaging of foods; flexible packaging materials; food packaging and equipment; shipping materials and equipment; food packaging in the tropics; test methods.

2. FUNDAMENTALS OF PACKAGING

F.A.Paine
The Institute of Packaging
Fountain House
1A Elm Park, Stanmore
Middlesex HA7 4B2, United Kingdom

330 pp. Published 1974 (possibly new edition recently)

A basic textbook on United Kingdom packaging education. Contains chapters on specific packaging principles such as cushioning, adhesion and permeability, as well as on the packaging of individual product groups such as chemicals, pharmaceuticals, clothing and machinery. Used as textbook also on Hong Kong packaging engineering courses.

3. PACKAGING MATERIALS AND CONTAINERS

F.A.Paine
The Institute of Packaging
Fountain House
1A Elm Park, Stanmore
Middlesex HA7 4B2, United Kingdom

377 pp. Published 1974.

A very readable account of the basic characteristics of various packaging materials, as well as containers, showing how they are used to package goods. Suitable as a general reference book, although designed as a textbook for students preparing for the membership examination of the United Kingdom Institute of Packaging.

4. HANDBOOK OF PACKAGE ENGINEERING

J.F.Hanlon
McGraw-Hill Inc.
1221 Avenue of the Americas
New York, N.Y.10020, USA

544 pp. Published 1971 (new edition)
Comprehensive textbook on packaging. Describes all major types of packages and their manufacture. Includes chapters on laws and regulations, test methods, quality control and machinery selection.

5. PACKAGING FOR CLIMATIC PROTECTION

Newnes-Butterworths
Borough Green, Sevenoaks
Kent, United Kingdom

112 pp. Published 1975

A basic textbook intended for both theorists and practitioners of packaging. Outlines the theory of permeability, describes various methods of measuring permeation rates of certain gases and liquids, and explains significance for packaging of different forms of permeation. Discusses various package testing methods.

6. CODE FOR PROTECTION AGAINST SPOILAGE OF PACKAGES AND THEIR CONTENTS BY MICRO-ORGANISMS, INSECTS, MITES AND RODENTS

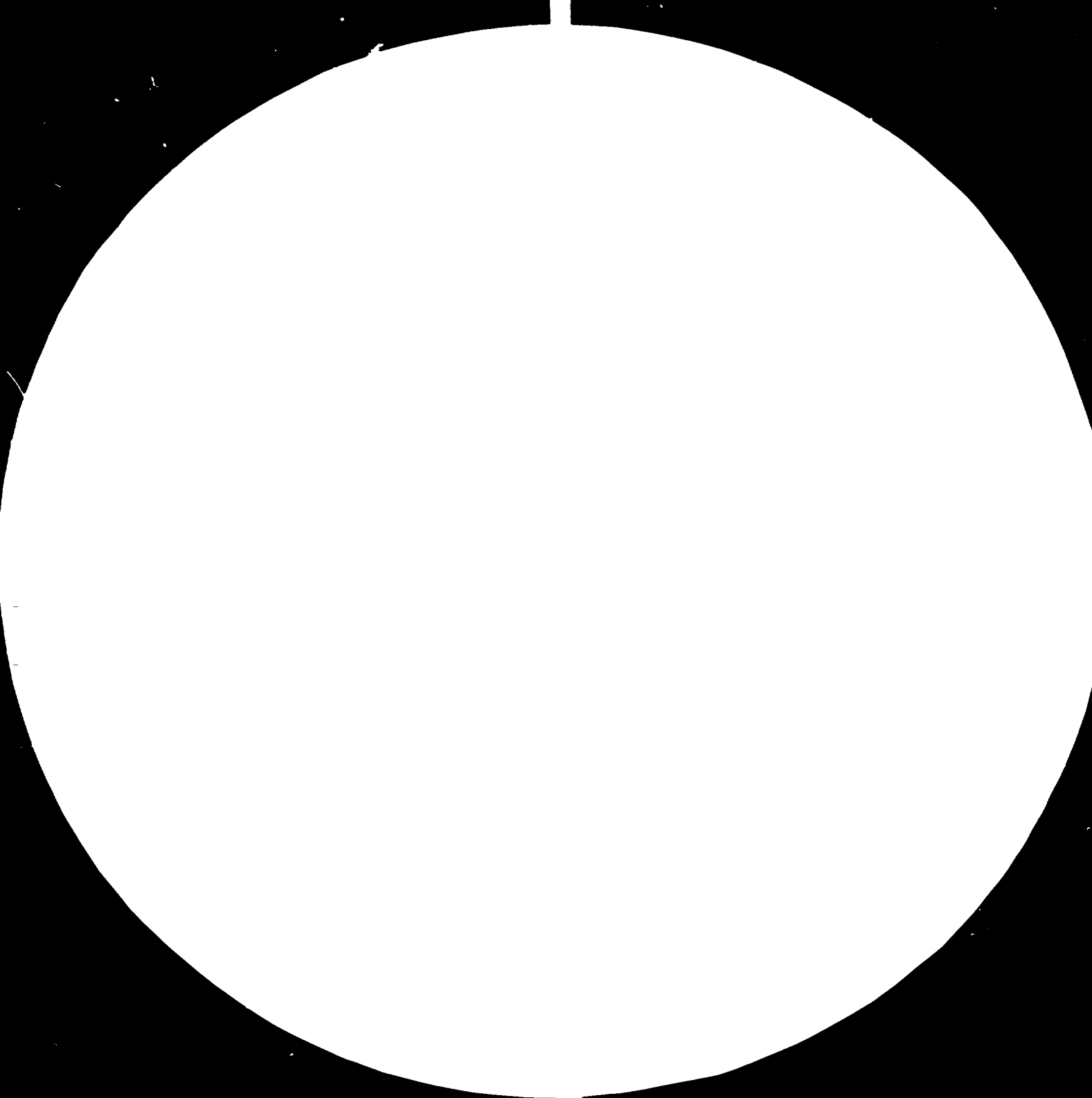
Australian Standards A.S.1471-1973
Standards Association of Australia
Standards Hous
80-86 Arthur Street
North Sydney, NSW 2060, Australia

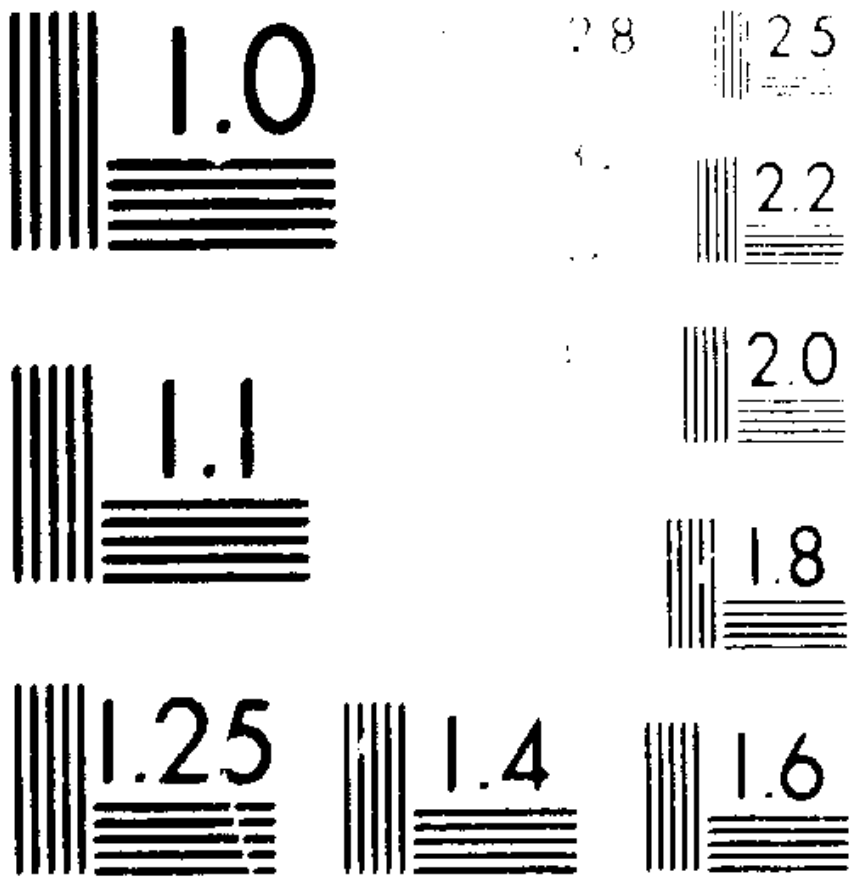
12 pp. Published 1973

Sets out recommended precautionary measures to be taken by packers.

7. WOOD AS PACKAGING MATERIAL IN THE DEVELOPING COUNTRIES

B.Hochort
United Nations Industrial Development Organization (UNIDO)
P.O.Box 300
A-1400 Vienna, Austria




1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

111 pp. Published 1972

Study on recent development in wood packaging; characteristics of species used; types of wooden packing cases; standardization; laboratory tests and quality control; manufacturing techniques and investment needed; international regulations and documentation; trends in developing countries.

8. PAPER AND PAPERBOARD IN PACKAGING

Indian Institute of Packaging (IIP)
E-2, MIDC Area, Chakala, Andheri (East)
Bombay-400093, India

176 p. Published 1973

A technical monograph dealing with the manufacture of paper, speciality papers, paperboards, functional qualities of paper, printing and conversion of paper and paperboard, paperboard containers, composite containers, laminations and coatings, labels and labelling, multiwall paper sacks, testing and test procedures, Indian standards, and actual and estimated demand for paper and paperboard. Includes a glossary and a list of suggested readings.

9. BASIC GUIDE TO PLASTICS IN PACKAGING

Stanley Sacharow & Roger C. Griffin Jr.
Canners Books
89 Franklin Street
Boston, Mass. 02110, USA

211 pp. Published 1973

A study of the technology and applications of plastics in packaging. Richly illustrated, and intended to serve as a textbook for packaging courses at college level. Special attention is given to marketing and to the role of plastics packaging in solid waste disposal.

10. PLASTICS IN CONTACT WITH FOOD

J.H.Briston & L.L.Katan
Food Trade Press
7 Garrick Street
London WC2E 9AT, United Kingdom

400 pp. Published 1974

Covers every aspect of the use of plastics in the packaging of foodstuffs. Divided into three parts: materials and chemistry of plastics manufacture; hygiene, including a detailed discussion of laws and regulations, assessed country by country; manufacturing techniques involved in all types of packaging materials made from plastics.

11. GLASS CONTAINERS IN PACKAGING

Indian Institute of Packaging (IIP)
E-2, MIDC Area, Chakala, Andheri (East)
Bombay-400093, India

Summary of lectures delivered at training courses organized by the IIP for middle management packaging executives.

12. A COMPLETE COURSE IN CANNING

Anthony Lopez
The Canning Trade, Inc.
2619 Maryland Avenue, Baltimore
Maryland 21218, USA

755 pp. Published 1975 (10th edition)

An exhaustive handbook in canning technology. It includes data on all facets of canned foods, such as product formulas, manufacturing procedures, food laws, sanitation, sterilization, spoilage, containers, food plant characteristics, warehousing and equipment.

13. FOOD PACKAGING

Nicholas D. Pintauro
Food Technology Review No. 47
Noyes Data Corporation
Park Ridge, Noyes Building
New Jersey 07656, USA

414 pp. Published 1978

A detailed, technically oriented review of food packaging, based onU.S. patents issued since July 1966. It includes richly illustrated information on packaging materials, package types, packaging methods and equipments for all types of foodstuffs.

14. ECONOMIC FACTORS IN PACKAGE DESIGN

J.M.McChesney & A.Jones
Wolpert & Jones (Studies) Ltd
Greensleeves, Woodlands Road
Bickley, Kent, United Kingdom

109 pp. Published 1973

A study on packaging economics with frequent references to conditions in developing countries.The book is divided in eight chapters: The packaging market; cost reduction; sales appeal; mechanization; research and development; conservation; market statistics; conclusions.

15. CHECKLIST FOR THE PLANNING OF EXPORT PACKAGING

International Trade Centre UNCTAD/GATT (ITC)
4, route des Morillons
CH-1211 Geneva 22, Switzerland

Published 1975, free of charge

A comprehensive list of the principal factors to be considered in planning effective packages for export.

16. PACKAGE PRODUCTION MANAGEMENT

Raphael-Olsson
AVI textbook
The AVI Publishing Company, Inc.
Westport, Connecticut, USA
ISBN-0-87055-217-1

17. PACKAGING REGULATIONS

Stanley Sacharow
AVI textbook
The AVI Publishing Company, Inc.
Westport, Connecticut, USA
ISBN-0-87055-274-0

18. GLOSSARY OF PACKAGING TERMS

The Packaging Institute, USA
Packaging Manufacturers Institute

The Packaging Institute, USA
342 Madison Avenue
New York, N.Y.10017. USA

214 pp. Published 1979 (fifth edition)

A comprehensive list of up-to-date definitions of packaging terms in the United States. Appendices give dimensions of major types of containers commonly used in the USA, summarize types of package tests in force in the USA market and define abbreviations frequently found in packaging. The glossary is officially approved as an American National Standard.

19. PACKAGING LAWS AND REGULATIONS (as obtaining in India)

R.K.Chowdhary & M.R.Subramanian
Indian Institute of Packaging (IIP)
E-2. MIDC Area, Chakala, Andheri (East)
Bombay-400093, India

477 pp. Published 1978

This comprehensive publication gives an exhaustive outlook on the laws and regulations related to packaging in India. It includes three parts: a review on the status of packaging laws; abstracts on rules and regulations; extracts on rules and regulations.

20. PAC AUDIOVISUAL COURSE IN PACKAGING

Packaging Association of Canada (PAC)
45 Charles Street East
Toronto 5, Ontario, Canada

This major audiovisual course is divided into 20 subject areas. The material includes over 2000 colour slides, 24 hours of taped lectures, 20 textbooks and 20 lecturer's notes. The regular price might be reduced to qualified organizations in developing countries.

21. PIRA VISUAL AID KITS

The Research Association for the Paper and Board, Printing and Packaging Industries (PIRA)
Randalls Road, Leatherhead
Surrey, United Kingdom

These kits contain a set of 20-30 colour slides each, with a textbook of commentaries and student exercises. The kits are intended as material for lecturers and training officers. The current list of titles has to be requested.

22. PACKAGING/CONVERTING MACHINERY COMPONENTS - A TRAINING AND REFERENCE MANUAL

Packaging Macninery Manufacturing Institute (PMMI)
2000 K Street, N.W.
Washington D.C.20006, USA

A training manual designed for use by potential packaging machine operators as part of a self-study programme developed by the PMMI. Detailed descriptions and explicit diagrams explain the workings of the important building blocks used in most types of packaging machinery. Thirty chapters cover components such as gears, gauges, valves, transformers etc.

APPENDIX VIII

BLUEPRINT FOR PACKAGING EDUCATION

GENERAL NOTES:

The courses should be given according to demand but at least once a year. Seminars could be arranged on suitable occasions when specialists are available e.g. from abroad.

1. Each working day consists of four sessions. The duration of a session is 1.5 hours, including discussion.

2. Participants are given a pre-course assignment of preparing background reports to be presented during the first day. This helps to identify typical problem areas both to the instructors and to the participants.

3. Participants should be encouraged to discuss and ask questions during the sessions.

4. Group work and case studies can be carried out during additional evening sessions.

COURSE 1

FOUR WEEKS INTENSIVE TRAINING COURSE IN PACKAGING TECHNOLOGY & PROMOTION

This course could be divided into two phases of two weeks each. There might be a time space between the phases of 1-2 months.

Entrance qualifications: High school education and adequate practical experience in the field of packaging.

Phase I

1st day

1. Opening ceremony, course presentation, administration
2. Participants' reports
3. Participants' reports continued
4. Participants' reports continued

Part A: General Principles in Packaging 12 hours

2nd day

1. Packaging as part of the production process
   - The influence of packaging considerations on all operations from the initial design or formulation of the product to its use.

2. The role of package in distribution
   - Distribution means safe transfer of the product from manufacturer to ultimate consumer. It consists of physical distribution and marketing.

3. Products and product requirements
   - Physical, chemical and mechanical properties and their protection.

4. Food preservation
   - General principles.

3rd day

1. Production requirements
   - Especially in food processing, certain requirements have to be considered.

2. Functional requirements
   - Convenience packages, packages easy to handle and pick up, package sizes.

3. Market requirements
   - Local and export markets put different strains on the package mechanically; but the consumer tastes and habits are also highly varying in different markets.

4. Environment and the package
   - Recycling; natural resources; disposal.

Part B: Packaging Materials 42 hours

4th day

1. Cellulosic materials
   - Processing principles

2. Paper & cellophane
   - Quality properties

3. Board
   - Paperboard, fibreboard

4. Corrugated board
   - Manufacturing & qualities

5th day

1. Testing methods for cellulosic materials
2. Paper packages
3. Folding boxes
4. Corrugated boxes

6th day

1. Labels
   - Materials, properties
2. Flexible packaging; plastics
   - General principles
   - Main plastic films & properties
   - Material combinations
3. Flexible packaging continued
4. Rigid plastic packages
   - Injection molding
   - Blow molding

7th day

1. Glass and glass packages
2. Metal and metal packages
   - Tinplate
   - Aluminium
   - Can manufacturing
3. Metal packages continued
4. Wooden packages

8th day

1. Textile & indigenous materials
2. Cushioning materials
   - Rigid materials
   - Shock absorbing materials, elastic and non-elastic
3. Testing methods
4. Testing methods continued, visit to testing laboratory

9th day

1. Printing methods
   - Flexographic
   - Rotogravure
   - Offset litho
   - Letterset
2. Printing methods continued
   - Artworks for reproduction
3. Field visit to selected packaging industry
4. Field visit continued

10th day

1. Standardization
   - Material and dimensional standards
   - Korean standards
   - International standards
2. Economy of packaging materials
   - Material costs
   - Dimensioning a package
3. Group work on selecting packaging materials and sizes
4. Evaluation of group work; general discussion on the Phase I

- Inter-course assignment -

Phase II

1st day

1. Opening ceremonies, administration etc.
2. Evaluation of inter-course assignments
3. Evaluation continued
4. Evaluation continued

Part C: Packaging Methods — 24 hours

2nd day

1. Packaging of food
   - Migration
   - Contamination
   - Preservation methods

2. Product feeding and measuring
   - Measuring by volume
   - Measuring by weight
   - Measuring by counting

3. Packaging of liquids
   - Dairy products
   - Beverages

4. Packaging of liquids continued.

   Packaging of semi-liquids
   - Collapsible tubes

3rd day

1. Field visit to a brewery or other relevant factory

2. Field visit continued

3. Packaging of powdered and free-flowing products
   - Bagging methods
   - Vertical cartoning systems

4. Packaging of toiletries & pharmaceuticals

4th day

1. Packaging of solid items
   - Electronics
   - Machines
   - Carpentry

2. Multi-unit packaging
   - Shrink wrapping
   - Stretch wrapping

3. Packaging for transport
   - Different types of transport packages
   - Marking

4. Unit loads
   - Pallets
   - Strapping
   - Standardization

5th day

1. Auxiliary operations in packaging
   - Check-weighing
   - Metal-detecting
   - Labelling
   - Price-marking
2. Auxiliary operations continued
3. Maintenance of packaging machinery
4. Purchasing of packaging equipment
   - Capacity calculations
   - Cost calculations

Part D: Handling & Storing — 6 hours

6th day

1. Materials handling & internal transfer
   - Transfer & handling equipment
2. Storing of packaging materials & packaged goods
   - Facilities and equipment
   - Storing conditions
3. Purchasing of packaging materials
   - Specifications
   - Delivery times
   - Samples & testing
4. Packaging costs; case work

Part E: Distribution — 18 hours

7th day

1. Packaging for export
   - Requirements of different export markets
2. Road and railroad transport
3. Air transport
4. Sea transport

8th day

1. Transport hazards & insurance
   - Mechanical hazards
   - Climatical hazards
   - Contamination
   - Principles of transport insurance
2. Containerization
   - Container types and sizes
   - Container handling and maintenance
   - Condensation
3. Visit to port or other terminal
4. Visit continued

9th day

1. Chain of distribution
   - Wholesailer
   - Retailer
   - Consumer
2. Laws and regulations
3. Promotional packaging
   - Principles on package design
4. Promotional packaging continued

10th day

1. Packaging planning
   - Technical planning
   - Integrated planning
2. Case on packaging planning
3. Packaging management
4. Evaluation of the course; closing

Net duration: 80 sessions = 120 hours

After the course, an examination might be implemented in case a certificate or degree is wanted.

The examination (duration one day) should consist of questions in approximately following proportions:

General Principles in Packaging	10 %
Packaging Materials	30 %
Packaging Methods	20 %
Handling & Storing	10 %
Distribution	15 %
Design & Planning	15 %
	100 %

COURSE 2

BASIC COURSE IN PACKAGING TECHNOLOGY AND PROMOTION, TWO WEEKS

This course is aimed for persons with little experience in packaging or those intending to enter the field. Lecturers should not go too deep into scientific details.

1st day

1. Opening ceremony, course presentation, administration
2. Participants' reports
3. Participants' reports continued
4. Participants' reports continued

2nd day

1. General principles in packaging
2. General principles in distribution
3. Protection
4. Product requirements

3rd day

1. Flexible packages and their properties
   - Paper & cellophane
   - Plastic films & laminations
2. Flexible packages continued
3. Rigid packages and their properties
   - Metal

- Glass
- Rigid Plastics

4. Rigid packages continued

4th day

1. Semi-rigid packages and their properties
   - Folding boxes
   - Corrugated boxes
   - Collapsible tubes
2. Semi-rigid packages continued
3. Printing methods and inks
4. Printing continued

5th day

1. Wooden packages and their properties
2. Textile; indigenous materials; compounds
3. Visual design
   - Preparing artworks for reproduction
4. Case work on selecting packaging material and package type

6th day

1. Evaluation of case work
2. Auxiliary packaging
   - Labelling, marking, check-weighing, metal-detecting
3. Unit loads & containerization
   - Pallets, load building, container sizes
4. Standardization

7th day

1. Packaging for export
   - Different means of transport and their requirements
2. Transport hazards and insurance
3. Visit to port or other terminal
4. Visit continued

8th day
1. Distribution
   - Storing - wholesaler - retailer - consumer
2. Laws & regulations
3. Promotional packaging
4. Promotional packaging continued

Case work on visual design

9th day
1. Evaluation of case work
2. Packaging methods & machines
3. Packaging methods continued
4. Packaging costs

10th day
1. Packaging management
2. Information systems, institutional aspects
3. Integrated packaging planning
4. Evaluation of course; closing

COURSE 3

EXTENSION COURSE IN PACKAGING:
SPECIFIC MATERIALS, ONE WEEK

This kind of training is aimed at students with profound experience in packaging; entrance qualifications should be at least attending course 2.

1st day
1. Opening ceremonies, course presentation, administration
2. Participants' reports
3. Participants' reports continued
4. General principles in packaging

2nd day
1. Standardization
2. Distribution
3. Packaging planning
4. Economy in packaging

ALTERNATIVE PROGRAMMES FOR 3. AND 4. DAY:

Alt. 3.1: Cellulosic Materials

3rd day
1. Paper
   - Manufacturing, qualities, properties
2. Paperboard
   - Manufacturing, qualities, properties
3. Corrugated board
   - Manufacturing, qualities, properties
4. Laminated/coated materials, cellophane
   - Manufacturing, qualities, properties

4th day
1. Packages of paper & laminates
2. Folding boxes
3. Corrugated boxes
4. Printing methods

Alt. 3.2: Plastic Materials

3rd day
1. Basic chemistry of plastics
2. Polythene
   - Manufacturing, types, use & properties
3. Polypropene
   - Manufacturing, types, use & properties
4. Polystyrene
   - Manufacturing, types, use & properties

4th day

1. PVC, PVDC
   - Manufacturing, types, use & properties
2. PA & newly invented plastic materials
   - Manufacturing, types, use & properties
3. Plastic packages
   - Rigid packages
   - Flexible packages
4. Printing methods

Alt. 3.3: Metal & Glass

3rd day

1. Metal
   - Manufacturing & converting of tinplate and aluminium
   - Printing methods
2. Metal continued
3. Metal cans
4. Collapsible tubes & foil

4th day

1. Glass
   - Manufacturing & properties
2. Bottles
   - Sizes, standards and use
3. Jars & closures
4. Printing methods

For all alternatives:

Case work on technical design & dimensioning

5th day

1. Evaluation of case work
2. Testing methods in the related field
3. Visit to laboratory
4. Evaluation of course and closing

SUBJECTS FOR SPECIAL SEMINARS

Duration of a seminar in most cases is one day. Only if specialist speakers on the subject are temporarily available and the usefulness of the seminar thus granted, it might be extended to two days.

A. CONSUMER PACKAGING IN SPECIFIC COUNTRIES/REGIONS

1. Laws and regulations
2. General information
   - Economy
   - Households
   - Market situation
3. Consumer habits for related products
4. Existing packages for related products

B. PACKAGING OF SPECIFIC PRODUCTS

1. Product processing when related to packaging
2. Product requirements
3. Existing package types and possible packaging methods
4. Consumer expectations (in different countries)
5. Packaging for export
   - Standardization
   - Unit loads
   - Coding & marking
   - Mechanical strains

C. FOOD PRESERVATION

1. Sterilizing methods
2. Canning
3. Flexible packaging
   - Vacuum
   - Gas

4. Aseptic packaging

D. PACKAGING MANAGEMENT

1. Product development
2. Integrated packaging planning
3. Responsibilities & organization
4. Purchasing

E. ECONOMY IN PACKAGING

1. Packaging costs
   - Material
   - Labour
   - Methods
   - Energy
2. Standardization
3. Transport hazards & insurance
4. Evaluation of packaging costs versus marketing value of the product

F. VISUAL DESIGN

1. Laws and regulations
2. Code marking
   - EAN
   - UPC
3. Printing methods
4. Artworks for reproduction
5. Principles of promotional design

6.-8. Workshop

APPENDIX IX

The Contents of Activities taken & to be taken

for the proposals and Agreements

Activities	Actions taken/to be taken
1. Translating into Korean a classification system of information on Packaging and Labelling.	This information was already translated into Korean by KDPC (See Appendix #1).
2. Sending letters to different editorial offices asking for free copies and other publication.	Based on the letters drafted by the consultant, KDPC sent its letters asking for free copies and other publications to a total of 120 addressees abroad which were selected by KDPC out of about 800 addressees on the list handed over by the consultant (See Appendix #2).
3. Appointment of relevant people to take part in the scanning activities.	For the preparation of Newsletter to be published from the latter half of 1981 or the early of 1982, KDPC is going to appoint relevant people, who have good command of English, to take part in this activity. Name of Scanning officers Mr. Kim, Soo Gun Mr. No, Seung Kil Mr. Yim, Hun Geon

4. Making decisions upon activities aimed to extend the share of packaging in the magazine "Packaging and Design"	At present time, it is difficult to extend the share of packaging in the magazine "Packaging and Design". From 1982, however, we are going to publish the magazine exclusive for packaging by breaking away from the magazine presently "Design & Packaging".
5. Evaluating the Blueprint on Packaging Education handed over by the consultant.	We think, in principle, it is proper plan for packaging education. Some opinions by KDPC on the Blueprint for packaging education are as follows: a. <u>On page 1, No. 1</u>: Each working day consists of four sessions. The duration of a session could be one (1) hour including discussions instead of 1.5 hours due to special circumstances in Korea. b. <u>On page 1, Course 1</u> : The duration of intensive training could be four weeks. But we think it is not proper to implement it with time space for 1-2 months. Because most of industries in Korea are reluctant to give opportunities to their employees for training. c. <u>On page 8, course 2</u>: This basic course for two weeks is necessary for us. This course can be implemented after 1981 due to the shortage of budget and lecturers for training.

6. Selection of textbooks from the Bibliography, applicable to be used on the training courses after translation	KDPC Selected a total of 6 textbooks from the Bibliography to be used on the training courses. These textbooks are being ordered to each publishing company, and we will translate the books into Korean as soon as we get them. <u>List of books on order</u> 1. Fundamentals of Packaging 2. Packaging for Climatic Protection 3. Food Packaging 4. Economic Factors in Package Design 5. PAC Audiovisual Course in Packaging 6. PIRA Visual Aid Kits
7. Sending out a questionnaire to all industries involved in packaging in order to assess the needs for special training events.	This activity will be implemented in 1982.

APPENDIX X

DRAFT

EVALUATION FORM

Please fill in this form after careful consideration of every question. Please do not sign the form. The results will be handled confidentially, and, if your opinions are truly given, will help to improve the coming training events.at Korea Design & Packaging Center.

Questions:

1. Give your personal evaluation of each instructor by grading them from 1 to 10 (10 is the best grade).

2. Which was in your opinion the most interesting topic of each instructor? Why?

3. Which was in your opinion the least interesting topic of each instructor? Why?

4. Give your general comments on the way of presentation by each instructor (voice, manners, appearance etc.).

Name of the first instructor:

His topics listed

Question 1: ____

Question 2: _____

_____

_____

Question 3: _____

_____

_____

Question 4: _____

_____

_____

Name of the second instructor:

etc.

Here you have the chance to give any comments you like concerning the Seminar, the instructors, topics and general arrangements (schedule, duration etc.). Do you think you will benefit in your work from attending this seminar?

APPENDIX XI

Draft letter to the General Managers of all industries in Korea involved in packaging:

SOMETHING TO CONSIDER FOR EVERYONE INVOLVED IN PACKAGING:

The volume of the packaging industry in Korea exceeds already 1.5 billion dollars

ARE YOUR OWN PACKAGING COSTS UNDER CONTROL ?

Korea Design & Packaging Center is well aware of the fact that a lot of know-how is needed in the field of packaging in Korea in order to

- save materials, energy and manpower
- rationalize
- intensify the marketing operations both locally and for export

For this reason we are prepared to extend our activities on training by means of arranging seminars and short courses on different topics.

Because we at KDPC want to give you the best possible service we ask for your opinion about the training events:

We would simply like to know which topics are of interest to you, how many employees would you be likely to send to an occasion and which month do you prefer for a training course.

Returning the enclosed questionnaire, duly filled, does not put you under any obligation but does help us a lot and will certainly serve for improving the important know-how within your enterprise in the long run.

Thank you for your cooperation.

KOREA DESIGN & PACKAGING CENTER

Company: _____

Signature: _____ Title: _____

Our company would benefit of participating in the following training events (please tick ☑)

☐ FOOD PRESERVATION Price: _____

One day seminar with lectures on sterilizing methods, vacuum and gas packaging and aseptic packaging.

Preferable month: _____

We would possibly send _____ participants

☐ ECONOMY IN PACKAGING Price: _____

One day seminar consisting of lectures on packaging costs, standardization, transport hazards & insurance and marketing value/packaging costs:

Preferred month: _____

We would possibly send _____ participants

☐ VISUAL DESIGN FOR EXPORT TO EUROPE

Price: _____

☐ VISUAL DESIGN FOR EXPORT TO USA

Two days seminar/work shop. Following topics are handled: laws and regulations, code marking, printing methods, artworks for reproduction, principles on promotional design for the European (resp. USA) market. A practical half-day workshop will be conducted.

Preferred month: _____

We would possibly send _____ participants

☐ BASIC COURSE IN PACKAGING TECHNOLOGY AND PROMOTION Price: _____

Two weeks intensive training course for persons with some experience in the field. Pre-course assignments are given to participants in connexion with course announcement. Each day consists of 4 sessions, duration of one session is 1.5 hours. E.g. following topics are handled:

- General principles in packaging
- Protection
- Product requirements
- Market requirements
- Different packaging materials and accessories
- Packaging for export
- Visual design
- Packaging methods & machines
- Case work, excursions, etc.

Preferred month: _____

We would possibly send _____ participants

☐ PACKAGING FOR EXPORT

etc.
etc.

☐ TRAINING COURSE FOR PACKAGING ENGINEERS Price: _____

This well-known training course will arranged for the _____ time in _____ 1981. A syllabus is enclosed.