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CONSOLIDATION OF THE FOOD PACKAGING CENTRE - CETEA, WITHIN ITAL

DP/BRA/88/017/11-03

BRAZIL

Technical report: Mission carried out from 1 January to 1 February 1990*

Prepared for the Government of Brazil
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Loa Karjalainen,
packaging information expert

Backstopping officer: J. Belo,
Engineering Industries Branch

United Nations Industrial Development Organization
Vienna

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* This document has not been edited.

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SUMMARY

Facilities for an Information and Documentation Service (henceforth IDS) are under construction and will be completed during 1990, in connection of the extension of CETEA premises.

Two newly graduated librarians have been employed for taking care of the establishment of IDS. A relatively well equipped library, and a number of magazines form the base for the stock of documents of IDS. There is, however, only a poor knowhow on packaging and very poor knowledge in the English language among the two librarians. The technical personnel of CETEA had not a clear view of the objectives and oof their own role in operating the IDS of CETEA.

On the other hand, excellent ways to disseminate information by publishing a newsletter and by organizing various training events have been carried out doing credit to the relatively small personnel of CETEA.

From this starting-point the consultant worked for improvement of overall knowhow about IDS both with the librarians and with the technical personnel. Additionally, she installed the programme for the computerized database PACKDATA, arranged individual training sessions for the personnel on its use, and organized the filing of hard copies which had been sent to CETEA from Geneva.

A classification system for the library of packaging institutes as well as instructions on scanning periodicals were given and described.

Based on the training events, and the recommendations and handouts given about IDS in general and about PACKDATA particularly, it might be concluded that the IDS of CETEA in the future will, in good cooperation of the whole staff, develop to a useful tool for the packaging related industries in Brazil.

On request of the Project Coordinator, the consultant also gave a lecture based on a research project carried out in Finland, " Future in Packaging - PAK-2000".

Additionally, she handed over to CETEA a list of selected books recommended to be purchased for a packaging institute.

TERMS OF REFERENCE

The main objective of the mission was to assist in the establishment of an information and documentation service at CETEA/ITAL by making a general appraisal of the existing conditions in CETEA and in Brazil, by training the staff of CETEA and by giving recommendations for appropriate steps in the setup of an information and documentation system serving the packaging and package using industries in Brazil.The Job Description is attacied to this report as Annex 1.

CONDUCT OF THE MISSION

The consultant left her home on 1 January, spending the following day in Geneva/ITC, where she got final instructions on the installation of the computerized database PACKDATA, together with the actual software for it.
After arrival in Campinas on 3 January the work at CETEA included two fact-finding trips to relevant organizations in Sao Paulo (Annex 2).
After completing this report the consultant returned to Finland on 1st February. Accordingly, the duration of the mission was 32 days.

FINDINGS

LIBRARY

The library consists altogether of 316 documents, all arranged in alphabetical order. Out of them, only about 10% are directly related to packaging: well over 10% are conference/seminar proceedings, and the rest or more than 200 volumes are monographs of various subjects - chemistry, metallurgy, food science, catalogues etc, not closely related to packaging but useful for research.

The majority or 216 documents have been published in the 80's and only 16 before 1970. The library thus consists of mostly recently published material. Additionally, the Project Coordinator has more than 40 documents on packaging related subjects in his office: and the engineers keep some books in their offices, all privately owned by them. Most of these documents or copies of them will be moved to the new library in due time.

As a whole, the stock of printed documents is big for the size of the institute, but not properly organized and as such not as useful as its volume would provide. Documentation of books is carried out manually and without classification. No processing (splitting) of the numerous conference/seminar proceedings has been done.

PERIODICALS

CETEA receives and stores a great number of free periodicals, out of which only a minor part is of interest for the institute: The total number of periodicals/bulletins/newsletters was 97 of which 8 were subscribed to (for 1990, 17 foreign periodicals have been subscribed to). A brief analysis showed that only 23 periodicals were received regularly, and for appr. 60% of them the latest issue had been received before September 1989.

Processing of incoming periodicals included circulation of the list of contents for each (packaging) magazine. Now and then the engineers come into the library to read or lend a magazine for reading, but as a whole the system seemed to be inefficient.

For periodicals there is an laborious manual system for documentation and another for lent-out issues: a card-index has, however, been ordered.

Dissemination of information

'Informativo CETEA" is a newsletter published bimonthly and delivered to 3000 specified persons within the industries and other organisations. It includes technical and statistical articles, information about events in the field of packaging and about CETEA activities. It is edited in cooperation among the personnel of CETEA. As such, it is one of the most informative and best edited packaging newsletters in the developing countries.

Other activities on dissemination of information include courses, conferences and seminars on packaging technology. In 1989, following events were organized:

"Embalagens sopradas de PET par alimentos e bebidas", an 1-day seminar.
"Embalagens de vidro para alimentos e bebidas: tendencias de mercado e inovacees tecnologica", an 1-day seminar;
"Interacao de embalagens metalicas com produtos alimenticios", a 2-day course;
"Embalagens plasticas", a 3-day course;
"III ciclo de debates", a 3-day conference.

Approximately 400 people altogether participated in these events. In connection to each event, e manual was printed in 500-1000 copies, which all have been delivered to the industrries.

CONCLUSIONS AND RECOMMENDATIONS

TRAINING OF THE LIBRARIANS

Although the two librarians have a degree in their field and they are thoroughly dedicated to the organizing of a perfect IDS, it has, due to their lacking experience in maintaining a packaging library, and, on the other hand, their inadequate English, to be recommended that:

1. Intensive, efficient training in English language to be given for at least 6 months;

2. Both librarians should participate in one of the basic courses organized by ITC, on Information and Documentation service of a packaging institute. These courses have been organized once a year and in connection with the next course, the participants attend a basic course in packaging technology (Insitute of Packaging, Manchester, see Annex 3). This course is, because given only in English, not appropriate regarding its point of time: probably the next one will be organized in 1991 and that is recommended to be attended. In the meantime, the classification system for the library (Annex 4) should be practiced on, and basic knowhow on packaging technology improved (a glossary of selected packaging terms was studied and clarified by the consultant, Annex 5), hence giving the librarians some experience in the field, which would improve their ability to take advantage of the course.

3. Practical training on exchange of information and adapting the technical problems within the Brazilian industries, as well as on cooperation among the whole personnel are steps which already have been decided to take.

IMPROVEMENT OF THE OVERALL KNOWLEDGE ON THE CONCEPT OF AN IDS

The consultant lectured on the subject for the individual material groups and handed out guidelines on collecting, processing and disseminating of information (Annex 6). It is recommended that small scale seminars on the subject be organized from time to time in order to strenghten the cooperative atmosphere among the personnel in this respect.

A new scanning system for periodicals was introduced and discussed (Annex 7). It will be operated by the engineers and the Project Coordinator, and the follow-up of its implementation is recommended to be done by the librarians.

EXCHANGE OF INFORMATION

During the visits to selected organizations in Sao Paulo, the possibility of exchanging information was discussed. It is recommended that contracts be made with organizations already possessing documented information - in many cases the information and documentation activities were merely in a stage of intention - especially when it comes to statistics, standards and laws & regulations.

PACKDATA

The computerized information database PACKDATA (Annex 8) gives a considerable amount of additional information to IDS/CETEA. Although its use has been explained and practical training given individually to all engineers and the librarians (Annex 9), it will take some time before it is really utilized. Translation of the keywords in Portuguese (Annex 10) should improve familiarizing with the system.

Adding new records to PACKDATA is, for the time being, not possible. Within the next months a newly created programme for this purpose will be sent to the field stations where the local computer experts might make their own modifications to it without a risk to cause confusion in the main system.

Consequently, the scanning system of periodicals is adapted to be connected to PACKDATA. It is strongly recommended to scan especially the existing conference material, to classify it and to give it appropriate keywords in order to utilize the up-to-date information included in it.

DISSEMINATION OF INFORMATION

It is recommended to continue the publishing of Informativo CETEA. Extension of the issues and possibly selling space for advertising should be considered, depending of the economical situation. In each issue, the system of PACKDATA should be promoted so to present it and make it known within the packaging and food industries. Making inquiries has to be encouraged. instructions on how to make them should be given. Informativo CETEA is an excellent forum for this.

When the industries realise that it is possible to receive fast, accurate and up-to-date information from PACKDATA, the problem of answering all inquiries will arise. It has to be kept in mind in this context that ALL questions have to be answered. for this reason the inquiries have to be clear and unambiguous. It is recommended that in Informativo CETEA or in connection with special events, instructions on "How to make an inquiry from CETEA?" be given.

Organizing the handling of incoming inquiries in advance is recommended to be done: All questions should first be directed to the library. If sufficient material for the problems is found in PACKDATA, the answers could be delivered immediately. In more complex problems it is to the librarians to forward the questions to the engineers who might look for detailed information from the library of ITAL or using their existing contacts with various universities and organizations.

Organizing of courses and seminars should continue, with an emphasis on basic packaging technology directed not only to the big packaging industries, but as a long term programme also to the small and medium size food industries. Probably the consciousness within these industries of their problems will only gradually increase, but thereafter questions will be manifold. PACKDATA is an excellent tool when looking for solutions in basic packaging problems, in addition to the grat amount of material it includes on research subjects.

Annex 1

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

PROJECT IN THE FEDERAL REPUBLIC OF BRAZIL

JOB DESCRIPTION

DP/BRA/88/017/11-03/J-13320

Post title	Packaging Information Expert
Duration	One month
Date required	August 1989
Duty station	Campinas (Sao Paulo), with travel as required
Purpose of project	The Food Packaging Technology Centre (CETEA—Centro de Tecnologia de Embalagem de Alimentos) of the Institute of Food Technology (ITAL—Instituto de Tecnologia de Alimentos) presently works in four research areas of packaging materials and packages, namely within the fields of metal, glass, paper and board, and plastics. This project is expected to increase the number of research areas to six by including a laboratory on distribution packaging and a packaging information and documentation system.
Duties	The expert will be assigned to CETEA/ITAL, where he will work in close co-operation with the technical counterparts designated for the mission in permanent consultation with and under the guidance of the National Project Co-ordinator. He will be specifically expected to:

1. Organize and carry out short courses and an internal seminar on packaging information and documentation;

2. Make a general appraisal of the facilities and bibliographical material available at CETEA/ITAL and advise on complementary requirements for the establishment of an information and documentation service;

3. Analyze the present situation of the documentation and information system in Brazil in the packaging area;

4. Assist in the actual establishment of an information and documentation service at CETEA/ITAL.

..../..

The expert will also be expected to prepare a final report, setting out the findings of the mission and recommendations to the Government on further action, which could be taken.

Qualifications

Packaging technologist with a university degree or equivalent experience and specific specialization in packaging information and documentation.

Languages

English; also Portuguese would be an asset.

Background information

The Food Packaging Technology Centre (CETEA) was created under a former technical assistance project of UNDP/UNIDO, DP/BRA/82/030, entitled Consolidation of the Existing Capacity of the Institute of Food Technology through the creation of a National Food Packaging Centre. The Institute, which is located in the city of Campinas, started its activities as a "Laboratory of Technology", on 27 January 1963, with the inauguration of the new facilities. On 18 December 1964, it was established as the "Tropical Centre of Research on Food Technology", as a result of an agreement signed between the Government and the United Nations Development Programme, the executors of which were the Government of the State of Sao Paulo (Secretariat of Agriculture), representing the Government of the country, and the Food and Agriculture Organization (FAO), representing UNDP.

On 14 July 1969, the "Tropical Centre of Research on Food Technology" became the "Institute of Food Technology—ITAL", co-ordinated by the Co-ordination of Agricultural and Animal Husbandry Research (CPA) of the Secretariat of Agriculture of the State of Sao Paulo.

Until 1969, ITAL has only dealt with the technology of products of vegetable origin. However, from that year on, the research has been gradually extended to products of animal origin, namely dairy products, meat and fish. A dairy pilot plant was put into operation in 1974, followed by the meat and derivatives pilot plant in 1976, both in Campinas. Finally, a pilot plant for fish and marine products was set up in 1978 in the city of Guarujá near Santos.

The present staff of ITAL includes 13 Ph.D.s, 40 M.Sc.s, 21 graduate specialists and 27 graduates. Technical aid staff amount to 52 administratives; there is a general supporting staff of 192.

The physical installations in Campinas cover a surface of 23,000 square meters of buildings located in an area of 101,500 square meters, whereas in Guarujá the Institute has 8,600 square meters and a constructed area of 750 square meters.

Since its establishment in 1963, the Institute of Food Technology has acted as a leader in its field in the country. It is acknowledged as one of the best research institutions in this area.

In 1965, the Tropical Centre of Research on Food Technology was the first institution in the country engaged in pioneer research and technical assistance to the food packaging industry. At that time, only basic quality control tests were carried out by a few packaging industries. Recently, more industries, institutions and universities have contributed to this field.

The priority received by the Food Packaging Section in 1969 has made ITAL the leading Institute in this particular area of activity in the country.

Packaging demand in the country is growing very fast, especially in the food packaging field, which accounts for 64 per cent of metal packaging, 60 per cent of plastic, 40 per cent of paper and corrugated board and 75 per cent of glass in 1979.

Besides the increasing consumption of packaging materials, the technological aspects are becoming more and more important today in the country. As a consequence of the fast rate of industrialization that the country is experiencing, the need for new and better packaging has been hampered by a series of problems, such as the lack of know-how, information support, trained human resources and research facilities.

ITAL's packaging section has followed the demand of the country's industry in such a way that in 1982 it expended its activities and facilities through an integrated programme to put a Food Packaging Centre into operation

under the sponsorship of the Government of the State of Sao Paulo, the Government (FINEP-EMBRAPA) and the United Nations Development Programme (UNDP), through the United Nations Industrial Development Organization UNIDO).

The main objective of the Food Packaging Centre is to up-scale support to the packaging and food industry in the country and also to serve as an international training centre to assist Latin America and other countries in this technological matter.

Organizations visited by the expert and persons met

ASSOCIATION	STAFF	AREA
ABIA - ASSOCIAÇÃO BRASILEIRA DAS INDUSTRIAS DE ALIMENTAÇÃO	- LEO F. BICK	- TECHNICAL MANAGER
ABRE - ASSOCIAÇÃO BRASILEIRA DE EMBALAGEM	- MANUEL VIEIRA	- PRESIDENT
DETEC - DEPARTAMENTO DE TECNOLOGIA - NUCLEO DE DESENHO INDUSTRIAL	- LEILA VASCONCELLOS	- SECTION OF DOCU_ MENTATION & INFOR
FIESP-CIESP- FEDERAÇÃO DAS INDUSTRIAS DO ESTADO DE SÃO PAULO CENTRO DAS INDUSTRIAS DO ESTADO DE SÃO PAULO	- EDSON FERMANN	- TECHNICAL DIRECTOR
HERO- CONSERVAS ALIMENTÍCIAS HERO S.A.	- ANTONIO CARLOS TADIOTTI	- PRODUCTION MANAGER
INP - INSTITUTO NACIONAL DO PLASTICO	- EMILIO M. KASUTA JUNIOR	- COORDINATOR
IPT - INSTITUTO DE PESQUISAS TECNOLÓGICAS DO ESTADO DE SÃO PAULO	- ANITA T. DEDDING	- SECTION OF TECHNI- CAL STANDARDS
IPT - INSTITUTO DE PESQUISAS TECNOLÓGICAS DO ESTADO DE SÃO PAULO	- ANNA SYLVIA S. KAIRALLA	- DIR. OF CENTRAL LIBRARY
NESTLÉ - NESTLÉ INDUSTRIAL E COMERCIAL LTDA	- JOSÉ A. CARDEAL LOUZADA	- PACKAGING SPECIA- LIST
Q-REFRES-KO - Q-REFRES-KO S/A	- GUARACY J.O. PESSOA	- TECHNICAL MANAGER- RESEARCH
SERAGINI/YER - DESIGN OF PACKAGING	- LINCOLN SERAGINI	- PRESIDENT

PACKAGING PRINCIPLES AND PRACTICE

Course Objectives

To provide a working knowledge of the packaging function, both as a means of training for new and existing personnel and as a basis for further education for experienced staff seeking to update their knowledge.

Suitable for

This course will be of major value to a wide range of job responsibilities, both within and related to packaging, including buyers, sales and marketing, design research and development and production staff.

The intensive programme, coupled with the technical level of lectures and expected participation in group discussions, suggests that students should be in middle or upper management or technologist positions or trainees being prepared for responsibility at management level.

It is also of particular value as a complement to the Open Learning Course or private studies and has special relevance to those intending to sit the IOP's Membership Qualifying Examination.

Content

- Packaging - Getting at the Facts;
- Closures and Closuring; Cartons and Cartonning; Plastics - an Overview; Plastic Containers; Films; Foils and Laminates; Glass;
- Printing and Decoration for Packaging Materials; Reproduction for Packaging Printing;
- Metal Containers and Closures;
- Paper and Board; Solid and Corrugated Fibreboard;
- Trading Standards Law;
- Labels and Labelling; Adhesion and Adhesives;
- Contract Packaging;
- Packaging Machinery; Stretch and Shrink;
- Packaging Specifications; Packaging Testing, Evaluation and Journey Hazards; Packaging for Warehousing and Transportation;
- Packaging and Marketing;
- Packaging of Food; Packaging of Pharmaceuticals; Packaging Development and the Environment;

Venue

Holly Royde Conference Centre, Manchester;

Course type

Residential;

Fees

IOP member - L1200.00 + L180.00 VAT = L1380.00
non-member - L1350.00 + L202.50 VAT = L1552.50

Accommodation - L430.00 + L64.50 VAT = L494.50

Dates

11-23 March 1990

ANNEX 4

Loa Karjalainen

PROPOSAL FOR A
CLASSIFICATION FOR THE LIBRARY OF A PACKAGING INSTITUTE

MAIN TITLES

1	PRODUCTS
2	TECHNOLOGY
3	MARKET AND MARKETING
4	REGULATIONS AND STANDARDS
5	GENERAL ASPECTS

1	PRODUCTS
11-14	Product groups
111	Fruit & Vegetables
111.1	Post-harvest operations
111.2	Processing of fruit and vegetables
111.3	Packaging of fruit and vegetables
111.4-nn	Specific products
112	Marine products
112.1	Handling of
112.2	Deepfreezing of
112.3	Packaging of
112.4-nn	Specific products

etc.

15	Shelflife
16	Spoilage
161	Contamination
17	Sterilization
171	by heat
172	by chemicals
173	by radiation

etc.

2	TECHNOLOGY
21-23	Materials and packages thereof
211	Fibrebased
211.1	Paper
211.2	Paperboard
211.3	Corrugated board
211.31	Liners
211.32	Flutings
211.33	Boxes and cases
211.4	Solid board
211.5	Moulded pulp

212	Plastics
212.1	PE
212.2	PP
212.3	PS
212.4	PVC
212.5	PET
212.6	Nylon
212.6	Woven plastics
212.7	Others
213	Metal
213.1	Tinplate
213.2	Aluminium
213.21	Aluminium foil
213.3	Other metals
214	Glass
214.1	Bottles
214.2	Jars
215	Wood
215.1	Crates
215.2	Pallets and skids
215.3	Others
216	Textile
216.1	Jute
216.2	Cotton
216.3	Others
217	Composite materials and packages
217.1	Bag-in-box
217.2	Composite can
217.3	Compounds (for closures)
etc.	
218	Auxiliary materials and packages
218.1	Adhesives
218.2	Binding materials (cord,tape,strapping)
218.3	Cushioning materials
218.4	Inks (printing)
218.5	Labels
218.6	Lacquers, varnishes
etc.	
24-27	Methods and machines
241-259	Manufacturing (of packages)
241.1	Coating
241.2	Extrusion
241.21	coextrusion

241.3 Design
241.31 graphic design
241.311 CAD
241.32 structural design
241.4 Diecutting
241.5 Foaming (expanding)
241.6 Folding-glueing
241.7 Glueing
241.8 Marking/coding
241.81 barcoding
241.9 Moulding
241.91 injection
241.92 blow
242.0 Printing
242.01 print preparation
242.02 flexo
242.04 gravure
242.05 offset
242.06 screen
242.07 others
242.1 Thermoforming

etc.

251-279 Packaging methods and machines

251.1 Aseptic packaging
251.2 Bottling
251.3 Cartoning
251.4 Closing
251.41 Heatsealing
251.42 Capping
251.5 Containerization
251.6 Feeding
251.7 Filling
251.8 Form-fill-seal
251.9 Labelling
252.0 Marking/coding (see 241.8)
252.1 Modified atmosphere packaging
252.2 Multipacks
252.3 Transport packaging
252.4 Unit loads (unitizing?)
252.5 Vacuum packaging
252.6 Weighing
252.7 Wrapping

etc.

28 Special techniques

281 Microwave ovens
282 Retort pouches
283 Quality control

etc.

3	MARKETS AND MARKETING
31	Statistics
311	general (/countries)
312	production -"-
32	Retail trade
321	local
322	export markets
33	Market surveys
34	Market research

etc.

4	REGULATIONS AND STANDARDS
41	Packaging regulations
411	labelling
411.1-nn	countries
412	Health regulations (migration etc)
412.1-nn	countries
42	Standards
421	Publications on standardization
422	Size standards
422.1-nn	countries
423	Testing methods
423.1-nn	countries
43	Trade barriers

etc.

5	GENERAL ASPECTS
51	Environment (recycling)
52	Information services
53	Institutions
54	Courses
55	Conferences and seminars
56	Catalogues
571	exhibition catalogues
58	Consultants
59	Consumers

etc.

ANNEX 5

GLOSSARY OF SELECTED TERMS IN PACKAGING

Compiled by Loa Karjalainen

Alfoil	Aluminium foil, rolled section of thickness less than 0.15 mm
Bag	Small, prefabricated package made of flexible material (paper, plastic-film, textile)
Bar coding	Means of coding by using of symbolic bars (see coding), e.g. UPC, EAN systems
Barrel	Cylindrical, large package made of steel, aluminium or wood for liquid, pasty or granular products
Barrier material	Material designed to withstand (to a specified degree) the penetration of oxygen, water vapor or greases
Big bag	Large container (200-2000 kg) for loose materials for shipping in bulk (see bulk packaging)
Blank	Pre-formed piece of material, generally paperboard, from which a package or part of it will be made by further operation
Blow molding	Forming bottles and other packages from plastic by expanding a blank in a hollow mold
Bulk packaging	Method of shipping loose materials
Can	Rigid package generally less than 20 l capacity and made of tinplate, aluminium or fibrebased material
C.A.P.	Controlled atmosphere packaging, generally a method of evacuating the oxygen from a package by vacuumizing or by replacing it with an inert gas
Cap	Cover type closure
Carton	Box (folding box etc) or case generally made of boxboard
Case	Non-specific term for a shipping container

Cellophane	Transparent film made of regenerated cellulose
Check weigher	Weighing scale designed for controlling the actual weight of a filled package
Chipboard	Board made of recycled paper
Coating	Layer or covering of a substance for protective, decorative or other purposes
Coding	Assignment of numerical, alphabetical or symbolic identifying marks to packages
Coextrusion	Extruding two or more layers of thermoplastic materials together to form a combined film or molded unit
Collapsible tube	Cylindrical tube with a screw cap, made of aluminium, lead or plastics (e.g. toothpaste tube)
Composite can	Can with the body made of fibrebased material or laminate and one or both ends of some other material (metal, plastics)
Freight - Containers	Large, reusable enclosure to be filled with smaller packages (cargo transporters)
Contamination	Impurity, tainting
Copolymer	Compound formed by the linking of two or more different molecules to functional groups (see polymer)
Corrugated board	Packaging material consisting of at least one layer of flat paperboard (liner) glued to a corrugated medium (fluting). Majority of corrugated board is double-faced, single-wall (= liner + fluting + liner)
Crate	Rigid shipping container, usually made of wood
Cushioning	Protection from physical damage of an item by placing around its outer surface materials that have been designed to absorb the shock or reactions caused by external forces
Die	Form, usually of hard metal for shaping, cutting or stamping out parts and blanks

Distribution	Integrated package and product handling from factory packaging through the point of sale to the final consumer
Elongation	Increase in length of a material stressed in tensile (stretched). Data usually expressed as per cent increase in length of a specimen stretched just to the breaking point
Embossing	Figures formed by raising on a surface of a material
Extrusion	Method of shaping material by forcing it, with the application of heat and pressure, through a die of the desired shape
Film	Flexible material, basically organic, usually with a thickness not exceeding 0.1 mm. A plastic film might be blown or tubular; cast or flat; biaxially oriented or stretched in both machine and transverse directions (to improve the strength)
Flexibility	Property of a material which permits its bending or twisting without breaking. In machinery, the ability to be adjusted to handle several sizes and shapes
Flexography	Method of printing using raised types of plates
Flowpack	Bag-type package which is heat-sealed in both ends and along the body ("pillow-pack"). A horizontal form-fill-seal machine making such packages
Gas flushing	See C.A.P.
Grain direction	Direction parallel to the grain in paper. In manufacture = machine direction
Gusset	Bellows folded in the side of a bag
Haze	Cloudy or foggy appearance in a transparent plastic
Headspace	Unfilled volume in upper part of a package
Heat seal	Method of uniting surfaces under controlled conditions of temperature, pressure and time (dwell, welding)
Hot melt	Adhesive which can be applied only when melted by heat

	and which has a good bond strength when cooled
Injection molding	A method where molten plastic resin is extruded and injected between two mold halves where pressure and cooling solidify the plastic
Jar	Rigid, flat bottom package with wide mouth opening, usually made of glass or plastic
Keg	Small barrel
Kraft	Unbleached kraft paper, board or pulp
Label	A slip of paper or other material to be affixed to a package and on which is printed the design concerning the product. Also, the graphic design printed directly on a package
Laminate	Product made by bonding together with adhesives two or more layers of material or materials
Lid	Separate top or cover of a box or other package, may be hinged or otherwise attached
Lithography	Printing method utilizing a flat rather than a raised plate
Load	A package or a group of packages forming a shipping unit
Logo	Logotype, usually a company signature or accepted symbol
M.A.P.	Modified atmosphere packaging, refers to a method where the amount of ambient atmosphere has been reduced
Marking	Numbers, nomenclature or symbols affixed to consumer or transport packages for identification, handling, shipment and storage. E.g. shipping marks, bar codes

Melt index	Quantity of a thermoplastic material that will flow through a defined orifice in 10 minutes under described conditions of temperature and pressure
Metallizing	Applying a very thin coating of metal, generally aluminium, to a non-metallic surface. Usually done by exposing the surface to vaporized metal in a vacuum chamber
Migration	Transfer or diffusion of ingredients from contact material to food
Mold	Matrix or cavity in which a material is shaped. Also: mildew
Molded pulp	Package or part of it, molded directly from slush pulp into froms. E.g. egg tray, apple tray
Monomer	Generally a molecule from which polymers are produced by polymerization
Mullen	Test made to determinate the bursting strength of board, generally used for corrugated board
Multiwall	Material or package consisting of more than one wall or ply
Nylon	Generic term for a class of polyamides containing repeating amide groups connected to methylene units
Offset	Printing method where ink is transferred generally from a lithographic printing plate to a rubber blanket and thereafter to the sheet
Olefins	Group of unsaturated hydrocarbons C_xH_{2n}. E.g. Ethylene
Ovenable board	Paperboard so treated as to be placed in an oven with food and will serve as the cooking utensil. Usually coated with PET or other heat resisting material
Overpackaging	Condition where methods and materials used to package an item exceed the requirements for adequate protection
Pallet	Low, portable platform of wood, plastic, metal or fibreboard to facilitate handling, stowage and

	transportation of materials as a unit
PMS	Pantone Matching System, an international system consisting of a standard series of printing colors and used by packaging designers and manufacturers
Permeability	Property of a film or package which permits the diffusion of gases and liquids through (contrast of barrier)
Photoelectric cell	"Electric eye", a vacuum tube or cell whose electrical properties are modified by light. Generally used to register the printed design on packaging machines
Plasticizer	Material, added during the manufacturing process, to increase flexibility
Pouch	Small, flat shaped bag
Recycling	Methods of utilizing the scrap from packaging industries and the packages from household waste by collecting and reprocessing it. Mostly other items than new packages are produced from the recycling materials. See also Returnable bottle
Register	In multicolor printing, to have each impression in the correct position to ensure that the ink deposits every time in the correct position on the material to be printed. The electric eye then registers the print in the packaging machine
Regrind	Ground plastic made from scrap and used for multiwall plastic packages as structural or filler layers
Resin	Term used i.a. for plastic raw-materials, e.g. Polyethylene granulates
Returnable bottle	Generally glass bottles which are returned to a place of collection after use. They are taken back to the bottling factory, washed and refilled

Reverse printing	Printing on a transparent film so that the printing will be on the inside of the package. Not to be used for food packaging unless sandwiched inside two plies
Sack	Large prefabricated package made of flexible material, mostly kraft paper with several plies, or plastic. Might be equipped with a valve for filling
Sheet	Piece of any thin material, although thicker than film. The term refers to a uniform material with a thickness of about 0.1- 0.6 mm
Shrink packaging	Shrinking plastic film (around the object to be packaged) by heating it
Sleeve	Tubular paper, carton or film, open at both ends which is placed around an item
Spout	Fitting in a package for the purpose of directing the pouring stream of its contents
Stretch wrapping	Use of stretchable films such as LDPE or PVC for wrapping under mechanical stretching. Contrary to shrink wrapping, no heat is used in stretch wrapping
Tear strength	Resistance of a material to tearing as determined by accepted tests
Tensile strength	Resistance of a material to longitudinal tension stress
Thermoforming	Process of forming thermoplastic sheet by heating the sheet and forcing it over a mold e.g. by vacuum. Used to produce blisters, skin packs, trays, cups etc. See thermoplastic
Thermoplastic	Plastic material that will repeatedly soften when heated and harden when cooled
Thermoset	Material which hardens after heating and does not soften again when reheated
Tray	Shallow, open-top package made of paperboard, aluminium sheet or plastic
U.V. inks	Printing inks which consist of a polymeric compound

	which is polymerized in the presence of ultraviolet radiation
Vacuum package	Any type of package made of barrier material where all air has been removed prior to final sealing. Vacuum packaging is used to prevent deterioration of foods, or to diminish the volume of a package (textiles). After vacuumizing, inert gases such as carbon dioxide and/or nitrogen, might be added. See C.A.P. and M.A.P.
Virgin material	Material or liquid that has not been used or processed more than is required for its original manufacture
Web	Roll of paper, film or other material as it moves through a machine
WVTR	Water vapor transmission rate
Yield	Coverable area per unit-weight of material, expressed in sq.m/kg

ANNEX 6

Individual lectures given to the material groups (16.01.90)

Loa Karjalainen:

GUIDELINES FOR THE TECHNICAL PERSONNEL ON ASSISTING THE INFORMATION AND DOCUMENTATION SERVICES AT CETEA

INTRODUCTION

CETEA is not a big enough institute to have the possibility of employing technically (in packaging technology) knowledgeable personnel to independently run the Information and Documentation Services center (IDS) alone. For that reason it is of utmost importance that the engineers of Cetea recognize themselves as part of IDS being together responsible both for the collection and for the disseminating of information.

It has to be remembered thatdissemination is the ultimate goal of IDS, the collection of information being made always with this target in mir An IDS adaptded to its purpose has to be DEMAND or USER ORIENTED, not operating for the internal needs of the personnel only.

COLLECTING, PROCESSING AND STORAGE OF INFORMATION

Before starting the Information and Documentation Service activities, it has to be decided how much and in which areas information be collected, because it is important that only relevant information and only quantities which are possible to be properly processed, are collected. For that reason, strict guidelines are recommended to set, limiting clearly the area of information.

Instructions on what should not be collected:

To collect LARGE QUANTITIES of material without seriously considering its usefulness is tempting for any IDS in the beginning. That might be unnecessarily costly. Only such amounts of info should be collected that can be properly processed.

Collection of material in STRANGE LANGUAGES is of no use. If only one or two persons in the Institute are able to read and understand Italian or German, it would be too expensive to subscribe to magazines in those languages.

To work out a SUBJECT-MATTER CHECKLIST to limit the area for collection is recommended but not easy. The lists of keywords, descriptors, product groups and products in PACKDATA form an extensive shuject-matter checklist related to packaging. This list could be used as a basis, by rejecting words that are not strictly compatible with the principles of CETEA.

Material which already is DOCUMENTED ELSEWHERE, should preferably be collected on the basis of a contract on info exchange.

The following instructions may give an idea of limiting the scope of collecting info.

What info, Where and How to collect and process it?

1. PRODUCTS to be packaged; their properties RELATED TO PACKAGING and DISTRIBUTION only; material on shelflife, post-harvest operations, storage etc. Most of this material exists in PACKDATA. Additional information can be collected from the ITAL library by the materials groups. IDS personnel processes it further to be added into PACKDATA.

2. TECHNOLOGY with priority on packaging techniques, methods and machines; properties of packaging materials; storage, transport /distribution systems. In addition to the existing material of PACKDATA, the engineers have to scan Brazilian and other periodicals (see Annex x) and publications for documentation by IDS.

3. MARKET information including packaging statistics; packaging production in Brazil; company information on Brazilian packaging industry enterprises; package samples from export target markets for important export products. The statistical info to be collected by IDS from existing organizations, e.g.IPT,INP,ABIA etc.; company information by the administration and materials sections; samples by anybody travelling abroad.

Company information should be stored with the administration and packaging samples with the materials sections, not forgetting their cataloguing.

4. LAWS and REGULATIONS related to packaging and labelling; national and international packaging standards; information on trade barriers. Collection through ABRE,ABNT,IPT, Gazettes + other official journals of agreed countries. This material is recommended to be stored separately from PACKDATA because it has to be follwed up continuously.

5. GENERAL ASPECTS e.g. environmental documents, conference proceedings, exhibition and other catalogues etc to be collected passively. Conference proceedings should be split up (by experts in each field) and documented separately in PACKDATA. SPECIALIZED INFO for own research purposes has to be collected by the researchers and documented according to the library classification physically organized either in the library or in the individual offices.

DISSEMINATION OF INFORMATION

Dissemination is the ultimate goal of all information and documentation services, which fact must never be forgotten. Its purpose is to assist the packaging and package using industries

and distribution enterprises both for the national market and for export.

Efficient dissemination has to be carried out by means continuing publishing the well edited newsletters, which might (according to economical needs) be expanded to include payed promotional space or to a packaging magazine; of arranging seminars and courses; and of answering inquiries, where it is important to find an aswer to any question in any area of packaging.

Handling of incoming queries:

Any inquiry should first be directed to the librarians who, according to their ability, should make appropriate searches in the PACKDATA. Only if the result of this operation is not sufficient the inquiry should be turned to the relevant engineers for deeper scruting.

An instructive list of the keywords in PACKDATA will be compiled by ITC and sent to all field stations in the near future. The present list having been translated into Portuguese (see Annex) will help the searching, although the language of PD still is and will be English.

ANNEX 7

INSTRUCTIONS ON SCANNING PERIODICALS

According to the agreed policy in the future, the Materials Groups will receive the periodicals relevant to them, for scanning. General packaging magazines will be scanned by the Administration.

Before sending the magazines for scanning, the librarians shall fix a label on the cover page of each magazine. This label includes space for necessary information for the librarians: Date of scanning, pages to be copied, indication on whether the article should be entered into PACKDATA (PD) or into the TECHNICAL FILES (TF).

If the option of TF is chosen, one keyword indicating the place in the bookcase of the library has to be used (i.e. 'aluminium', 'pallets', 'fruit&veg' etc). The form PACKDATA B is NOT used.

If the article has to be entered into PACKDATA, mark the space PD with 'x' and fill in the following parts of the form PACKDATA B: Title, Text, Keywords and Product groups/Products if needed. The form will then be completed by the librarians. Attach the form to the magazine and send it back to the library.

SPECIAL NOTES: The text should be a brief description of the contents of the article, with some indication of its level (the use of indicative terms such as 'concise','scientific', 'journalistic', 'general' etc. are recommended). The keywords should be in English if not - or until - a special PACKDATA programme for CETEA in Portuguese has been created.

After your article has been processed further by the librarians, it will be found either in the PACKDATA files or the Technical files in its proper place on the bookshelves. Naturally it exists additionally in the magazine from where it was scanned.

ANNEX 7

Scanned ___/___/___		ID	Name
Pages	Copied	TF	
Pages	Copied	TF	
Pages	Copied	TF	

ANNEX 7

PACKDATA B

TITLE: _____

_____

AUTHOR: _____

PUBLISHER: _____

_____

SOURCE: _____

YEAR: _____ ISSUE/EDITION: _____ PAGES: _____

LANGUAGE: _____ ACCESS: _____ PRICE: _____

TEXT: _____

_____

_____

_____

_____

DESCRIPTORS: _____

KEYWORDS: _____

_____

PRODUCT GROUPS: _____

SPECIFIC PRODUCTS: _____

_____

ANNEX 3

PACKDATA-News No. 1

International Trade Centre UNCTAD/GATT

May 1989

PACKDATA

ITC'S COMPUTERIZED PACKAGING INFORMATION SERVICE

A. BACKGROUND

A lack of basic technical and commercial information on packaging is one of the major constraints to effective packaging development in most developing countries. This subject is not covered in sufficient breadth by existing trade information services, maintained by national trade promotion agencies or similar institutions. Existing abstracts from journals in the packaging field do not meet fully the needs of developing countries, as they intended mostly to meet the requirements of packaging manufacturers and users in industrialized countries.

To answer the particular needs of developing countries for appropriate information in this field, the ITC Export Packaging Sub-Programme has created a computerized information system, with several databases on different aspects of packaging, the most important presently available being PACKDATA.

The purpose of this newsletter, the first in a series, is to explain the methodology and the classification of PACKDATA, rather than the manipulation of the database in the computer.

B. BASIC CONSIDERATIONS

In the design of the PACKDATA computerized information system, the following basic aspects have been taken into consideration:

1. The database should be adapted to the specific needs of developing countries;

2. The database should not include high technology information, available from other sources, but should concentrate on appropriate technology;

3. Specific attention should be given to the recording of "hard-to-get" information such as conference papers, experts reports, special studies, etc.;

4. While PACKDATA provides only *reference* to an existing document, access to the original, full text should be simple and fast;

5. Hardware specifications should be as universal as possible at a fairly uncomplicated level and easily obtainable in most developing countries. Each field station would be required to arrange for the financing of its own hardware;

6. The software should be as "user friendly" as possible and the data secured against loss through possible mishandling, ignorance, etc.;

This newsletter has been prepared, without formal editing, as a service to exporters and the packaging industry in developing countries by the Functional Advisory Services Section, Division of Trade Services, International Trade Centre UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10, Switzerland. Telephone: (22) 7300111, Telex: 289052 ITC-CH; Telefax: (22) 7334439; Street address: 54-56 rue de Montbrillant, 1202 Geneva.

7. A condition for access to PACKDATA is that each user accepts a counterpart obligation as an active contribution to the enhancement of the database. This obligation will be adapted to the individual capability of each field station and is defined in the PACKDATA User's Agreement.

8. Lack of resources for prospective field stations should not pose limitations for the widespread use of PACKDATA. In other words, the costs should be kept as low as possible.

C. HARDWARE AND SOFTWARE REQUIREMENTS

ITC delivers the software in a compiled version (Nantucket Clipper Compiler), accompanied by all the necessary auxiliary files, which can be installed directly into the hard disk of a computer with MS/DOS. To ensure the proper functioning of the software, a minimum of 512 KB RAM is required, and an MS DOS Version 3.1 or higher. At present the memory space required on the hard disk is at least 3 MB, but with the planned expansion of the database, further memory space will be indispensable. Both 3-1/2" or 5-1/4" diskettes (DS/DD or DS/HD) containing the software will be provided by ITC.

D. CONTENTS

PACKDATA currently has about 2500 records containing references to information concerned with packaging, which is of particular interest to developing countries. These records have been collected from available published material over many years, and have now been scanned and entered into PACKDATA under a specially designed classification system. Material scanned runs from short articles to complete textbooks, including handbooks, directories, conference papers, experts' reports, standards, etc. The original hard copy material, with the exception of voluminous publications such as handbooks which have to be purchased direct from the publisher, will be delivered to the recipient country upon signature of an agreement.

E. EXCHANGE OF INFORMATION

Field stations using PACKDATA are expected to introduce locally screened records into the database, and send these records to ITC Headquarters periodically. These records are then reviewed for possible incorporation into the main PACKDATA database. Each designated field station will, however, receive a specially designed software programme for local use, i.e., using locally adapted keywords, descriptors, etc. A semi automatic search link between PACKDATA and the local database is designed to facilitate search operations. In order to safeguard the content of the work carried out at ITC Headquarters, it has been decided to deny field stations the possibility of editing existing PACKDATA records.

Field stations proposing new records for inclusion into the database are expected to use the established classification system (annexed to this background paper). However, taking into consideration the need for flexibility in any classification criteria, as well as variation in interpretation, any suggestions for additions or modifications of the established criteria will be considered at ITC Headquarters for possible incorporation in the existing system. Such proposals should be made in writing, giving full information concerning the records under consideration, as well as valid arguments for the suggested deviation from the established classification. These proposals will be reviewed on a case-by-case basis, and possible modifications on the basis of such proposals will take place at ITC Headquarters.

F. CLASSIFICATION SYSTEM

The classification system for PACKDATA is divided into six groups, as follows:

1. *KEYWORDS* - Covering technical and commercial subjects concerned with product processing, packaging, packaging materials, transport, refrigeration, testing and printing relevant to export packaging of products from developing countries. Particular attention is given to the known needs of developing countries when establishing keyword subjects. (Annex I) The number of keywords is kept as low as possible, concentrating only on keywords which are likely to be used in a search operation.

2. *DESCRIPTORS* - Describing the kind of publication from which the data is taken, whether it is a short article, expert's report, conference paper, textbook or any other form of publication. (Annex II)

3. *PRODUCT GROUPS* - Most products to be packed are classified into general product groups, established with particular export packaging problems in mind, and therefore do not follow the normal SITC product classification, i.e. dry foods, processed foods, glass and ceramics. (Annex III)

4. *SPECIFIC PRODUCTS* - The list of specific products to be packaged, indicating also the product group they belong to, assists in searching for very specific items. Efforts have been made to include most products of particular interest to developing countries, but it should be noted that this list is not exhaustive, and new products can be easily introduced, if and when needed. (Annex IV)

5. *BIBLIOGRAPHIC TERMS* - This classification has been established with a view to printing and issuing, from time to time, bibliographies on selected subjects directly or indirectly concerned with packaging and of particular interest to developing countries. This feature of PACKDATA is included only in the version used in ITC Headquarters. Arrangements for the compilation of specialized bibliographies can be made with ITC on an *ad hoc* basis. The structure of the bibliographic classification is presented in Annex V.

6. *GEOGRAPHICAL TERMS* - Records related to a particular geographical area are classified accordingly. (Annex VI)

TEXT - The PACKDATA records do not contain an *abstract* in its traditional sense. The text, included in each record, aims only at describing briefly the type and scope of the document referred to.

G. COSTS AND DISTRIBUTION

The establishment and current maintenance/enhancement of PACKDATA has been financed by a contribution from the Government of Finland (Project INT/26/47), and the access to this information system, at least initially, is free of charge. A reasonable service fee might be foreseen in the future. One set of reproduced hard copy material for each country is also available free of charge. Shipping costs (approximately 100 kgs) should, if possible, be covered by the field station.

There is no limit, in principle, to the number of field stations in a given country, provided that each station is willing to accept a counterpart obligation as specified in each User's Agreement.

H. FUTURE PLANS

Although the present version of PACKDATA is ready for distribution and can easily be used by field stations after simple installation into an IBM compatible PC run by DOS 3.1, minor modifications are foreseen to make the program even more "user friendly", with possible smallchanges in the classification system (combining product groups with specific products, automatic addition of the product group whenever a specific product is selected, etc.). The present system is readily available for delivery upon signature of the User's Agreement.

It is estimated that between 200 and 500 additional records will be introduced to the database annually, and an updated version will be sent to field stations periodically, including any other modifications in the program or the classification system. At the same time, field stations are expected to send their input to ITC, thus establishing a constant flow of information between participating field stations and ITC Headquarters.

Annex I

KEYWORDS USED IN PACKDATA

KEYWORD	MOTS-CLE
ABBREVIATIONS OF TERMS	ABREVIATION DES TERMES
ADDED VALUE CONCEPT	VALEUR AJOUTEE
ADHESIVE	ADHESIF
AEROSOL	AEROSOL
AIR TRANSPORT	TRANSPORT AERIEN
ALUMINIUM	ALUMINIUM
ALUMINIUM FOIL	FEUILLE D'ALUMINIUM
APPROPRIATE TECHNOLOGY	TECHNOLOGIE APPROPRIEE
ASEPTIC PACKAGING	CONDITIONNEMENT ASEPTIQUE
BAG	SACHET
BAG-IN-BOX	CAISSE OUTRE
BALE	BALLE
BARCODING	CODAGE A BARRES
BARRIER PROPERTIES	PROPRIETES BARRIERE
BASKET	PANIER
BIBLIOGRAPHICAL REFS.	REFERENCES BIBLIOGRAPHIQUES
BIG BAG	CONTENEUR SOUPLE
BLISTERPACK	BLISTER
BOTTLE	BOUTEILLE
BOX	CAISSE
BULKPACK	CONTENEUR VRAC
CAD/CAM	CAD/CAM
CAN	BOITE
CAP/MAP	ATMOSPHERE MODIFIEE
CARTON	CARTONNAGE
CELLOPHANE	CELLOPHANE
CERAMIC PACKAGING MAT.	MATERIAU D'EMBALLAGE CERAMIQUE
CERTIFICATION	CERTIFICATION
CHECKLIST	LISTE DE CONTROLE
CLOSING	FERMETURE
CLOSURE	BOUCHAGE
COATING	ENDUCTION
CODING	CODIFICATION
COEXTRUSION	COEXTRUSION
COLD	FROID
COMPETITION	CONCOURS
COMPOSITE CAN	BOITE MIXTE
CONSULTANTS	CONSULTANTS
CONSUMER TESTS	TESTS SUR CONSOMMATEUR
CONSUMERISM	CONSUMERISME
CONTAINER	CONTENEUR
CONTAMINATION	CONTAMINATION
CONTRACT PACKING	CONDITIONNEMENT A FACON
CONVERSION TABLE	TABLE DE CONVERSION
CORROSION	CORROSION
CORRUGATED FIBREBOARD	CARTON ONDULE
CRATE	CASIER
CUP	POT

KEYWORDS USED IN PACKDATA (CONT'D)

KEYWORD	MOTS-CLE
CUSHIONING	CALAGE
DESIGN STRATEGY	STRATEGIE DE LA CONCEPTION
DEVELOPING COUNTRY	PAYS EN DEVELOPPEMENT
DEVELOPMENT OF PACKS	DEVELOPPEMENT DE L'EMBALLAGE
DIE CUTTING-CREASING	DECOUPAGE/REFOULAGE A LA FORME
DIRECTORY	REPERTOIRE
DISTRIBUTION	DISTRIBUTION
DRUM	FUT
ECONOMY	ECONOMIE
ENERGY	ENERGIE
ENVIRONMENT	ENVIRONNEMENT
EXHIBITION	EXPOSITION
EXPANDED PLASTICS	PLASTIQUES EXPANSES
EXPORT PACKAGING	EMBALLAGE POUR L'EXPORTATION
EXTRUSION	EXTRUSION
FACTORY LAYOUT	PLAN D'USINE
FIBREBASED	A BASE DE FIBRE
FILLING	REMPLISSAGE
FILM	FILM
FLEXIBLE PACKAGING	EMBALLAGE SOUPLE
FLEXO	FLEXO
FOAM-IN-PLACE	CALAGE IN SITU
FOAMED PLASTICS	MOUSSE PLASTIQUE
FOOD	ALIMENT
FOOD ADDITIVE	ADDITIF ALIMENTAIRE
FOOD PACKAGING	CONDITIONNEMENT ALIMENTAIRE
FOOD PROCESSING	TRANSFORMATION PROD. ALIMENT.
FORM-FILL-SEAL	FORM-FILL-SEAL
FROZEN	SURGELE
GLASS	VERRE
GRAPHIC DESIGN	CONCEPTION GRAPHIQUE
GRAVURE	GRAVURE
HISTORY OF PACKAGING	HISTOIRE DE L'EMBALLAGE
HOTFOIL STAMPING	ESTAMPAGE A CHAUD
INDIGENOUS MATERIAL	MATERIAU INDIGENE
INFESTATION	INFESTATION
INFORMATION SERVICE	SERVICE D'INFORMATION
INSTITUTION	INSTITUTION
INTERNATIONAL	INTERNATIONAL
INTERNATIONAL TRADE	COMMERCE INTERNATIONAL
IRRADIATION	IRRADIATION
JAR	BOCAL
LABEL	ETIQUETTE
LABORATORY LAYOUT	PLAN DE LABORATOIRE
LETTERPRESS	TYPOGRAPHIE
MACHINERY	MACHINES
MAINTENANCE	MAINTENANCE
MANAGEMENT OF PACKAGING	GESTION DE L'EMBALLAGE
MANUAL PACKING	CONDITIONNEMENT MANUEL

KEYWORDS USED IN PACKDATA (CONT'D)

KEYWORD	MOTS-CLE
MANUFACTURE	FABRICATION
MARKET RESEARCH	ETUDE DE MARCHE
MARKETING	MARKETING
MARKING	MARQUAGE
MATERIALS HANDLING	MANUTENTION
MECHANIZATION	MECANISATION
METAL	METAL
METAL DETECTING	DETECTION DU METAL
METALLIZING	METALLISATION
MICROWAVE	MICRO-ONDE
MOULDING	MOULAGE
MULTILAYER MATERIAL	MATERIAU COMPLEXE
MULTIPACK	MULTIPACK
NET PACKING	CONDITIONNEMENT SOUS FILET
NYLON	NYLON
OFFSET	OFFSET
PACKAGING IN GENERAL	EMBALLAGE EN GENERAL
PACKING STATION	STATION DE CONDITIONNEMENT
PALLET	PALLETTE
PAPER	PAPIER
PAPERBOARD	CARTON
PATENT	BREVET
PE	PE
PET	PET
PHOTOGRAPHY	PHOTOGRAPHIE
PILFERAGE	VOL
PLASTICS	PLASTIQUES
POLYESTER	POLYESTER
POST-HARVEST OPERATION	OPERATIONS APRES RECOLTE
PP	PP
PRINT PREPARATION	PREPARATION AVANT IMPRESSION
PRINTING	IMPRESSION
PRINTING INK	ENCRE D'IMPRESSION
PROCESSING	TRANSFORMATION
PROTECTION	PROTECTION
PS	PS
PULP	PATE A PAPIER
PUNNET	BARQUETTE
PVC	PVC
PVDC	PVDC
QUALITY CONTROL	CONTROLE DE LA QUALITE
RAIL TRANSPORT	TRANSPORT PAR CHEMIN DE FER
RECYCLING	RECYCLAGE
REGULATION	REGLEMENTATIONS
RETAILING	VENTE AU DETAIL
RETORT PACKING	CONDITIONNEMENT APPERTISE
ROAD TRANSPORT	TRANSPORT ROUTIER
SACK	SAC
SEA TRANSPORT	TRANSPORT MARITIME

KEYWORDS USED IN PACKDATA (CONT'D)

KEYWORD	MOTS-CLE
SEALING	SCELLAGE-SOUDAGE
SHELFLIFE	DUREE DE VIE
SHRINKWRAPPING	ENVELOPPAGE SOUS RETRACTABLE
SILK SCREEN	SERIGRAPHIE
SKINPACK	SKINPACK
SOLID FIBREBOARD	CARTON COMPACT
SPECIFICATION	SPECIFICATION
SPOILAGE	GASPILLAGE
STANDARDIZATION	NORMALISATION
STATIC ELECTRICITY	ELECTRICITE STATIQUE
STATISTICS	STATISTIQUES
STERILIZATION	STERILISATION
STORAGE	STOCKAGE
STRAPPING	CERCLAGE
STRETCHWRAPPING	ENVELOPPAGE SOUS ETIRABLE
STRUCTURAL DESIGN	CONCEPTION DE STRUCTURE
TAMPER EVIDENT CLOSURE	FERMETURE DE SECURITE
TECHNICAL ASSISTANCE	ASSISTANCE TECHNIQUE
TECHNOLOGY TRANSFER	TRANSFERT DE TECHNOLOGIE
TERMINOLOGY	TERMINOLOGIE
TEST EQUIPMENT	MATERIEL D'ESSAI
TESTING	ESSAI
TEXTILE PACKAGING MAT.	MATERIAU D'EMBALLAGE TEXTILE
THERMOFORMING	THERMOFORMAGE
TINPLATE	FER-BLANC
TRADE NAMES	MARQUES DEPOSEES
TRAINING	FORMATION
TRANSPORT IN GENERAL	TRANSPORT EN GENERAL
TRENDS	TENDANCE
TROPICAL CONDITIONS	CONDITIONS TROPICALES
TUBE	TUBE
UNIT LOAD	UNITE DE CHARGE
UV	UV
VACUUM PACKING	CONDITIONNEMENT SOUS VIDE
VALUE ANALYSIS	ANALYSE DE LA VALEUR
WEIGHING	PESAGE
WIREBOUND CRATE	CAISSE ARMEE
WOOD	BOIS
WOODEN CRATE	CADRE EN BOIS
WOVEN PLASTICS	PLASTIQUES TISSES

Annex II

DESCRIPTORS USED IN PACKDATA

DESCRIPTOR	DESCRIPTEUR
ARTICLE	ARTICLE
BIBLIOGRAPHY	BIBLIOGRAPHIE
BOOK	LIVRE
BOOKLET	BROCHURE
CALENDAR	CALENDRIER
CODE	CODE
CONFERENCE PAPER	NOTE DE CONFERENCE
CONFERENCE REPORT	RAPPORT DE CONFERENCE
DICTIONARY	DICTIONNAIRE
DIRECTORY	ANNUAIRE
EXPERT REPORT	RAPPORT D'EXPERT
EXTRACT	EXTRAIT
GLOSSARY	GLOSSAIRE
GUIDELINES	DIRECTIVES
HANDBOOK	GUIDE
MARKET STUDY	ETUDE DE MARCHE
MONOGRAPH	MONOGRAPHIE
PERIODICAL	PERIODIQUE
PROJECT REPORT	RAPPORT DE PROJET
REGULATIONS	REGLEMENTATIONS
RESEARCH PAPER	RAPPORT D'ETUDE
STANDARD	NORME
STATUTES	STATUTS
TECHNICAL SPECS	SPECS TECHNIQUES
TEST METHOD	METHODE D'ESSAI
TEXTBOOK	MANUEL
THESAURUS	THESAURUS
TRAINING MATERIAL	MATERIEL DE FORMATION

Annex III

PRODUCT GROUPS USED IN PACKDATA

PRODUCT GROUP	GROUPE DES PRODUITS
BAKERY PRODUCTS & BISCUITS	PRODUITS DE BOULANGERIE-BISCUITERIE
BEVERAGES	BOISSONS
CHEMICALS	PRODUITS CHIMIQUES
CONFECTIONERY	CONFISERIE
DAIRY PRODUCTS	PRODUITS LAITIERS
DRY FOOD	PRODUITS ALIMENTAIRES SECS
FRESH FOOD	PRODUITS ALIMENTAIRES FRAIS
FRUITS& VEGETABLES	FRUITS ET LEGUMES
FURNITURE	AMEUBLEMENT
GENERAL FOODS	PRODUITS ALIMENTAIRES EN GENERAL
GENERAL NON-FOOD	PRODUITS NON ALIMENTAIRES EN GENERAL
HAZARDOUS PRODUCTS	MATIERES DANGEREUSES
HORTICULTURAL	PRODUITS HORTICOLES
LIVE ANIMALS	ANIMAUX VIVANTS
MARINE PRODUCTS	PRODUITS DE LA MER
MEAT & MEAT PRODS, POULTRY	VIANDES-PRODUITS CARNES-VOLAILLES
PHARMACEUTICALS	PRODUITS PHARMACEUTIQUES
PROCESSED FOODS	PLATS CUISINES
SPICES	EPICES
TEA, COFFEE & COCOA	THE, CAFE & CACAO
TOBACCO & TOBACCO PRODUCTS	TABAC & PRODUITS A BASE DE TABAC

Annex IV

SPECIFIC PRODUCTS USED IN PACKDATA

SPECIFIC PRODUCT	PRODUIT SPECIFIQUE
APPLES	POMMES
APPLIANCES	ACCESSOIRES
APRICOTS	ABRICOTS
AQUARIUM FISH	POISSONS D'AQUARIUM
AVOCADOS	AVOCATS
BANANAS	BANANES
BEANS	HARICOTS ECOSSES
BED ACCESSORIES	ACCESSOIRES DE LITERIE
BEER	BIERE
BERRIES	BAIES
BISCUITS	BISCUITS
BREAD	PAIN
BROCCOLI	BROCOLI
BUTTER	BEURRE
CASHEW	NOIX DE CAJOU
CEMENT	CIMENT
CEREALS	CEREALES
CHEESE	FROMAGE
CHERRIES	CERISES
CHINAWARE	PORCELAINE
CIGARETTES	CIGARETTES
CITRUS	AGRUMES
COCOA	CACAO
COCONUT FIBRE	FIBRE DE COCO
COFFEE	CAFE
COIR	COIR
COSMETICS	COSMETIQUES
CRUSTACEA	CRUSTACES
CUCUMBERS	CONCOMBRES
CUT FLOWERS	FLEURS COUPEES
DATES	DATTES
DEHYDRATED VEGETABLES	LEGUMES DESHYDRATES
DRIED FRUITS	FRUITS SECS
DRUGS	MEDICAMENTS
EDIBLE OILS	HUILES COMMESTIBLES
EGGS	OEUFS
ELECTRICAL APPLIANCES	APPAREILS ELECTRIQUES
ELECTRONICS	ELECTRONIQUE
FISH	POISSON
FLOUR	FARINE
FRUIT	FRUITS
FRUIT PULP	PULPE DE FRUIT
GARMENTS	VETEMENTS
GRAPES	RAISINS
GUAVA	GOYAVE
HAM	JAMBON
HANDICRAFTS	PRODUITS ARTISANAUX
HARDWARE	QUINCAILLERIE
HERBS	HERBES

SPECIFIC PRODUCTS USED IN PACKDATA (CONT'D)

SPECIFIC PRODUCT	PRODUIT SPECIFIQUE
HONEY	MIEL
HOSPITAL SUPPLIES	EQUIPEMENTS POUR HOPITAUX
ICE-CREAM	CREMES GLACEES
JAMS	CONFITURES
JUICES	JUS
JUTE	JUTE
LEEKS	POIREAUX
LENTILS	LENTILLES
LETTUCE	LAITUE
LOBSTERS	HOMARDS
MACHINERY	MACHINES
MANGOES	MANGUES
MANGOSTEENS	MANGOUSTAN
MEAT	VIANDE
MEDICAL DEVICES	APPAREILS MEDICAUX
MELON	MELON
MILK	LAIT
MILK POWDER	POUDRE DE LAIT
MINERAL WATER	EAU MINERALE
MINT	MENTHE
MUSHROOMS	CHAMPIGNONS
NECTARINES	NECTARINES
NUTS	NOIX
OCTOPUS	POULPE
OFFAL	ABATS
OIL	HUILE
ORANGES	ORANGES
OYSTERS	HUITRES
PAPER	PAPIER
PARSLEY	PERSIL
PEACHES	PECHES
PEARS	POIRES
PEAT MOSS	TOURBE
PEPPERS	POIVRONS
PET FOODS	ALIMENTS POUR ANIMAUX DOMESTIQUES
PICKLES	PICKLES
PINEAPPLES	ANANAS
PLANTS	PLANTES
POMEGRANATES	GRENADES
POTATOES	POMMES DE TERRE
POULTRY	VOLAILLES
POWDERS	POUDRES
PRAWNS	CREVETTES
PREFAB HOUSES	MAISONS PREFABRIQUEES
RAISINS	RAISINS SECS
RECORDS	ENREGISTREMENTS
RICE	RIZ
RUBBER	CAOUTCHOUC

SPECIFIC PRODUCTS USED IN PACKDATA (CONT'D)

SPECIFIC PRODUCT	PRODUIT SPECIFIQUE
SALMON	SAUMON
SCALLOPS	COQUILLE SAINT-JACQUES
SHIRTS	CHEMISES
SHRIMPS	CREVETTES
SNAILS	ESCARGOTS
SOAP	SAVON
SOFT DRINKS	BOISSONS GAZEUSES
SOUPS	POTAGES
SPIRITS	SPIRITUEUX
SQUASHES	COURGES
STRAWBERRIES	FRAMBOISES
SUGAR	SUCRE
TANNING EXTRACT	EXTRAIT DE TANIN
TEA	THE
TOILETRIES	PRODUITS DE TOILETTE
TOMATOES	TOMATES
TOYS	JOUETS
TROPICAL FRUIT	FRUITS TROPICAUX
VEGETABLES	LEGUMES
WATERCRESS	CRESSON
WINE	VIN
YOGHURT	YOGHOURT

Annex V

BIBLIOGRAPHICAL TERMS USED IN PACKDATA*

TECHNOECONOMIC STUDIES ON PACKAGING- INDUSTRIALIZED COUNTRIES	ETUDES TECHNOECONOMIQUES SUR L'EMBALLAGE: PAYS INDUSTRIALISES
TECHNOECONOMIC STUDIES ON PACKAGING- DEVELOPING COUNTRIES	ETUDES TECHNOECONOMIQUES SUR L'EMBALLAGE: PAYS EN DEVELOPPEMENT
GENERAL DOCUMENTATION ON PACKAGING IN DEVELOPING COUNTRIES	DOCUMENTATION GENERALE SUR L'EMBALLAGE DANS LES PAYS EN DEVELOPPEMENT
GENERAL TEXTBOOKS, HANDBOOKS	LIVRES, MANUELS GENERAUX
WOODEN PACKAGING	EMBALLAGES EN BOIS
FIBREBASED PACKAGING	EMBALLAGES A BASE DE FIBRES
PLASTICS AND FLEXIBLE PACKAGING	EMBALLAGES PLASTIQUES ET SOUPLES
GLASS PACKAGING	EMBALLAGES EN VERRE
METAL PACKAGING	EMBALLAGES METALLIQUES
TEXTILE PACKAGING	EMBALLAGES TEXTILES
PACKAGING ACCESSORIES AND AUXILIARY MATERIALS	ACCESSOIRES D'EMBALLAGE ET MATERIAUX ANNEXES
PACKAGING MACHINERY	MACHINES D'EMBALLAGE
PRINTING, PRINT PREPARATION	IMPRESSION, PREPARATION A L'IMPRESSION
FOOD PACKAGING AND PROCESSING IN GENERAL	EMBALLAGE ET TRANSFORMATION DES PRODUITS ALIMENTAIRES EN GENERAL
FRUIT AND VEGETABLES	FRUITS & LEGUMES
MARINE PRODUCTS	PRODUITS DE LA MER
MEAT AND MEAT PRODUCTS, POULTRY	VIANDE & PRODUITS CARNES, VOLAILLES
BEVERAGES	BOISSONS
OTHER FOOD PRODUCTS	AUTRES PRODUITS ALIMENTAIRES
FURNITURE, HANDICRAFTS	MEUBLES, PRODUITS ARTISANAUX
CHEMICALS, PHARMACEUTICALS	PRODUITS CHIMIQUES, PHARMACEUTIQUES
HAZARDOUS PRODUCTS	PRODUITS DANGEREUX
OTHER NON FOOD PRODUCTS	AUTRES PRODUITS NON-ALIMENTAIRES
INSTITUTIONAL INFRASTRUCTURE FOR PACKAGING DEVELOPMENT	INFRASTRUCTURE INSTITUTIONNELLE POUR LE DEVELOP DE L'EMBALLAGE

BIBLIOGRAPHICAL TERMS USED IN PACKDATA (CONT'D)

IN-COMPANY ORGANIZATION FOR PACKAGING DEVELOPMENT	ORGANISATION INTERNE POUR LE DEVELOPPEMENT DE L'EMBALLAGE
TESTING OF PACKAGES AND MATERIALS, QUALITY CONTROL	ESSAIS DES EMBALLAGES ET DES MATERIAUX, CONTROLE DE LA QUALITE
DEVELOPMENT OF SPECIFICATIONS, PROTOTYPES	REALISATION DE SPECIFICATIONS, PROTOTYPES
PACKAGING STANDARDS AND CODES	NORMES ET CODES SUR L'EMBALLAGE
CHECKLISTS	LISTE DE CONTROLE
PACKAGING ECONOMICS	ASPECTS ECONOMIQUES DE L'EMBALLAGE
PACKAGING FOR EXPORT	EMBALLAGE D'EXPORTATION
PACKAGING AND LABELLING REGULATIONS	REGLEMENTATION EN MATIERE D'EMBALLAGE ET D'ETIQUETAGE
PROMOTIONAL DESIGN OF PACKAGES AND LABELS	CONCEPTION PUBLICITAIRE DES EMBALLAGES ET DES ETIQUETTES
RETAIL DISTRIBUTION	VENTE AU DETAIL
TRANSPORTATION BY SEA, AIR, ETC.	TRANSPORT PAR MER, AIR, ETC
MATERIALS HANDLING, WAREHOUSING	MATERIEL DE MANUTENTION, D'ENTREPOSAGE
UNIT LOADS, CONTAINERIZATION	CHARGES UNITAIRES, CONTENEURISATION
PACKAGING INFORMATION SERVICES	SERVICES D'INFORMATION SUR L'EMBALLAGE
GLOSSARIES, DICTIONARIES	GLOSSAIRES, DICTIONNAIRES
DIRECTORIES, YEARBOOKS AND EXHIBITION CATALOGUES	ANNUAIRES, REPERTOIRES ET CATALOGUES D'EXPOSITION
CLASSIFICATION SYSTEMS, THESAURI	SYSTEMES DE CLASSIFICATION, THESAURI
BIBLIOGRAPHIES, LISTS OF PUBLICATIONS	BIBLIOGRAPHIES, LISTES DE PUBLICATIONS
PERIODICALS ON PACKAGING AND RELATED SUBJECTS	PERIODIQUES SUR L'EMBALLAGE ET SUJETS S'Y RAPPORTANT
MANPOWER DEVELOPMENT	FORMATION DE LA MAIN D'OEUVRE

BIBLIOGRAPHICAL TERMS USED IN PACKDATA (CONT'D)

RECYCLING, ECOLOGY	RECYCLAGE, ECOLOGIE
EXPORT PROMOTION TECHNIQUES	TECHNIQUES DE PROMOTION DES EXPORTATIONS
INDUSTRIAL PROJECT AND TECHNICAL ASSISTANCE MANUALS .	PROJET INDUSTRIEL ET MANUELS D'ASSISTANCE TECHNIQUE

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* Not included in PACKDATA field versions. Tailor-made bibliographies, based upon the above classification system, are readily available *ad hoc* from ITC's Headquarters

Annex VI

GEOGRAPHICAL TERMS USED IN PACKDATA

COUNTRY/REGION	PAYS/REGION
AFGHANISTAN	AFGHANISTAN
AFRICA	AFRIQUE
ALBANIA	ALBANIE
ALGERIA	ALGERIE
ANDORRA	ANDORRE
ANGOLA	ANGOLA
ANTIGUA & BARBUDA	ANTIGUA & BARBUDA
ARAB COUNTRIES	PAYS ARABES
ARGENTINA	ARGENTINE
ASEAN	ASEAN
ASIA	ASIE
AUSTRALIA	AUSTRALIE
AUSTRIA	AUTRICHE
BAHAMAS	BAHAMAS
BAHRAIN	BAHREIN
BANGLADESH	BANGLADESH
BARBADOS	BARBADE
BELGIUM	BELGIQUE
BELIZE	BELIZE
BENIN	BENIN
BERMUDA	BERMUDA
BHUTAN	BHOUTAN
BOLIVIA	BOLIVIE
BOTSWANA	BOTSWANA
BRAZIL	BRESIL
BRUNEI DARUSSALAM	BRUNEI DARUSSALAM
BULGARIA	BULGARIE
BURKINA FASO	BURKINA FASO
BURMA	BIRMANIE
BURUNDI	BURUNDI
CAMEROON (REP OF)	CAMEROUN (REP DU)
CANADA	CANADA
CAPE VERDE	CAP-VERT
CARIBBEAN	CARAIBES
CAYMAN ISLANDS	CAYMAN ILES
CENTRAL AFRICAN REP	REP CENTRAFRICAINE
CENTRAL AMERICA	AMERIQUE CENTRALE
CHAD	TCHAD
CHILE	CHILI
CHINA	CHINE
CHRISTMAS ISLAND	CHRISTMAS, ILES
COLOMBIA	COLOMBIE
COMOROS (THE)	COMORES (LES)
CONGO	CONGO
COOK ISLANDS	COOK, ILES
COSTA RICA	COSTA RICA
CUBA	CUBA
CYPRUS	CHYPRE
CZECHOSLOVAKIA	TCHECOSLOVAQUIE
DEMOCRATIC KAMPUCHEA	KAMPUCHEA DEMOCRATIQUE
DEMOCRATIC YEMEN	YEMEN DEMOCRATIQUE

GEOGRAPHICAL TERMS USED IN PACKDATA

COUNTRY/REGION	PAYS/REGION
DENMARK	DANEMARK
DJIBOUTI	DJIBOUTI
DOMINICA	DOMINIQUE
DOMINICAN REPUBLIC	REPUBLIQUE DOMINICAINE
ECOWAS	ECOWAS
ECUADOR	EQUATEUR
EEC	CEE
EFTA	AELE
EGYPT	EGYPTE
EL SALVADOR	EL SALVADOR
EQUATORIAL GUINEA	GUINEE EQUATORIALE
ETHIOPIA	ETHIOPIE
EUROPE	EUROPE
FAEROE ISLANDS	FEROE, ILES
FALKLAND ISLANDS	FALKLAND ISLANDS
FIJI	FIDJI
FINLAND	FINLANDE
FRANCE	FRANCE
FRENCH GUYANA	GUYANE FRANÇAISE
FRENCH POLYNESIA	POLYNESIE FRANÇAISE
GABON	GABON
GAMBIA	GAMBIE
GERMAN DEM REP	ALLEMANDE REP. DEM.
GERMANY FR	ALLEMAGNE REP. FED.
GHANA	GHANA
GIBRALTAR	GIBRALTAR
GREECE	GRECE
GREENLAND	GROENLAND
GRENADA	GRENADE
GUADELOUPE	GUADELOUPE
GUAM	GUAM
GUATEMALA	GUATEMALA
GUINEA	GUINEE
GUINEA-BISSAU	GUINEE-BISSAU
GUYANA	GUYANA
HAITI	HAITI
HONDURAS	HONDURAS
HONG KONG	HONG KONG
HUNGARY	HONGRIE
ICELAND	ISLANDE
INDIA	INDE
INDONESIA	INDONESIE
IRAN	IRAN
IRAQ	IRAQ
IRELAND	IRLANDE
ISRAEL	ISRAEL
ITALY	ITALIE
IVORY COAST	COTE D'IVOIRE (REP. DE)
JAMAICA	JAMAIQUE
JAPAN	JAPON
JORDAN	JORDANIE

GEOGRAPHICAL TERMS USED IN PACKDATA

COUNTRY/REGION	PAYS/REGION
KENYA	KENYA
KIRIBATI	KIRIBATI
KOREA DPR	COREE RPD
KOREA REP	COREE REP
KUWAIT	KOWEIT
LAO PDR	LAO RDP
LATIN AMERICA	AMERIQUE LATINE
LEBANON	LIBAN
LESOTHO	LESOTHO
LIBERIA	LIBERIA
LIBYA	LIBYE
LIECHTENSTEIN	LIECHTENSTEIN
LUXEMBOURG	LUXEMBOURG
MACAU	MACAO
MADAGASCAR	MADAGASCAR
MALAWI	MALAWI
MALAYSIA	MALAISIE
MALDIVES	MALDIVES
MALI	MALI
MALTA	MALTE
MARTINIQUE	MARTINIQUE
MAURITANIA	MAURITANIE
MAURITIUS	MAURICE
MEXICO	MEXIQUE
MONGOLIA	MONGOLIE
MONTSERRAT	MONTSERRAT
MOROCCO	MAROC
MOZAMBIQUE	MOZAMBIQUE
NAURU	NAURU
NEPAL	NEPAL
NETHERLANDS	PAYS-BAS
NETHERLANDS ANTILLES	ANTILLES
NEW CALEDONIA	NOUVELLE-CALEDONIE
NEW ZEALAND	NOUVELLE-ZELANDE
NICARAGUA	NICARAGUA
NIGER	NIGER
NIGERIA	NIGERIA
NIUE	NIOUE
NORFOLK ISLAND	NORFOLK, ILE
NORTH AMERICA	AMERIQUE DU NORD
NORWAY	NORVEGE
OECD	OCDE
OMAN	OMAN
PACIFIC (TRUST T)	PACIFIC
PAKISTAN	PAKISTAN
PANAMA	PANAMA
PAPUA NEW GUINEA	PAPOUASIE N GUINEE
PARAGUAY	PARAGUAY
PERU	PEROU
PHILIPPINES	PHILIPPINES
PITCAIRN ISLAND	PITCAIRN, ILE

GEOGRAPHICAL TERMS USED IN PACKDATA

COUNTRY/REGION	PAYS/REGION
POLAND	POLOGNE
PORTUGAL	PORTUGAL
PUERTO RICO	PUERTO RICO
QATAR	QATAR
REUNION	REUNION
ROMANIA	ROUMANIE
RWANDA	RWANDA
SADCC	SADCC
SAINT LUCIA	SAINTE LUCIE
SAMOA	SAMOA
SAO TOME & PRINCIPE	SAO TOME-ET-PRINCIPE
SAUDI ARABIA	ARABIE SAOUDITE
SCANDINAVIA	SCANDINAVIE
SENEGAL	SENEGAL
SEYCHELLES	SEYCHELLES
SIERRA LEONE	SIERRA LEONE
SINGAPORE	SINGAPOUR
SOLOMON ISLANDS	SALOMON, ILES
SOMALIA	SOMALIE
SOUTH AFRICA	AFRIQUE DU SUD
SPAIN	ESPAGNE
SRI LANKA	SRI LANKA
ST KITTS & NEVIS	ST. KITTS ET NEVIS
SUDAN	SOUDAN
SURINAME	SURINAME
SWAZILAND	SWAZILAND
SWEDEN	SUEDE
SWITZERLAND	SUISSE
SYRIAN ARAB REPUBLIC	REP. ARABE SYRIENNE
TANZANIA (U.R.)	TANZANIE (R.U.)
THAILAND	THAILANDE
TOGO	TOGO
TOKELAU ISLANDS	TOKELAOU, ILES
TONGA	TONGA
TRINIDAD AND TOBAGO	TRINITE-ET-TOBAGO
TUNISIA	TUNISIE
TURKEY	TURQUIE
TUVALU	TUVALU
UGANDA	OUGANDA
UNITED ARAB EMIRATES	EMIRATS ARABES UNIS
UNITED KINGDOM	ROYAUME-UNI
URUGUAY	URUGUAY
USA	ETATS-UNIS D'AMERIQUE
USSR	URSS
VANUATU	VANUATU
VENEZUELA	VENEZUELA
VIET NAM	VIET NAM
WAKE ISLAND	WAKE, ILE DE
WESTERN SAHARA	WESTERN SAHARA
YEMEN (ARAB REP.)	YEMEN (REP. ARABE)
YUGOSLAVIA	YOUGOSLAVIE
ZAIRE	ZAIRE
ZAMBIA	ZAMBIE
ZIMBABWE	ZIMBABWE

ANNEX 9

N.B. In the following, the marks ' are used to clarify some instructions. NEVER TYPE THEM.

HOW TO USE PACKDATA

PACKDATA is a "user friendly" menu driven computerized database. No previous knowledge of the use of computers is required.

To start the system, turn on the computer and at the DOS prompt C:> change the default directory to the directory, where PACKDATA is stored. In most cases the name of the directory will be PACKDATA.

Type 'C:>\PACKDATA' and then press ENTER.

The following will appear on the screen:

C:\PACKDATA>

Now you are in the PACKDATA directory. To access the files, type 'PACKDATA' and press ENTER.

Now you have access to the PACKDATA database. The screen will show you that you are now in PACKDATA. Press ENTER to continue.

Now you have the 2 starting menus in front of you. The first menu allows you to set up the search. The action is chosen by moving the menu bar up or down, using the arrow keys. If required, there is a help screen (press F2) which explains the terms used in this menu.

The first action is to set up the search criterion. To do this, press ENTER. It will automatically move you across to the 2nd menu. Here again the menu bar can be moved up or down. It is from this second menu that the selection of terms by which you want to search, is taken. For a description of the terms used in this menu, see PACKDATA-News No.1.

A window will now appear. In the case of all phrases except 'Author', 'Title' and 'Record number', a list of terms will appear in the window. In the case of the three mentioned above the window will contain a line for you to type on. Here, the menu bar works in the same way as above, but to move more quickly from page to page, the PgUp and PgDn keys can also be used. Once the item has been chosen, press ENTER. Another window will appear confirming your choice. If correct, press ENTER but if you have made an error you can redo your selection by pushing ESC key. (You can also exit

from all windows by using the ESC key.)

At this point, you can either execute the search on the criterion you have chosen or you can combine this criterion with two others. The computer will tell you in a message window if you have exceeded the maximum number which is three, or if you have chosen the same criterion twice.

You can combine any of the search criteria except 'Record number'. If this is tried, the message line will read:

"Search on Record number cannot be combined. Press ENTER to continue."

If at this point you realize that you have made a mistake while choosing the search criteria then, before you execute the search, you have the possibility to discard the last criterion. It can be done by moving the menu bar to 'Discard last criterion' and pressing ENTER, or just by pushing the D key. The last criterion is removed automatically. Now you have the possibility of deleting the next criterion, of choosing a new one or of executing the search.

No matter whether you wish to use a combined criteria or a single criterion, the 'Execute search' remains the same. The menu bar will automatically go to 'Execute search' if a single criterion or three criteria are chosen. In the case of using two criteria only, it is necessary to move the menu bar down to 'Execute search' and to press ENTER.

Now another window will appear giving you the option to count the number of records, by pressing F1. This is a time consuming action and should be used only if you are not sure that the correct terms have been used for the search. If this option has to be chosen, a message window will appear stating:

"Counting the number of records in database... Please wait..."

This message line will then tell you how many records are found. Now you have to press ENTER to continue, and the first record matching your selected criteria will appear.

This option can be bypassed by entering any key, and the message line will read:

"Searching for selected records... Please wait..."

The first matching record will appear automatically.

If you do not wish to see the selected records on the screen but you want to print them out immediately, then move the menu bar down to 'Print records' instead of executing the search. It will search for the records first, and once the

first record has been found, it will start to print. If there is a problem with the printer a message will appear on the message line:

"Printer not ready. Correct or press ESC to exit."

When executing the search, once the first matching record has appeared you will notice at the very top of the page in the center, there is the Record ID. This number is very important if you wish to retrieve the "hard copy" of the record. The "hard copies" are filed in Record ID order.

The screen then gives the

- Title
- Author

- technical information:
    - Descriptors
    - Keywords
    - Product groups
    - Specific products
    - Geographical terms

- library data:
    - Source
    - Publisher
    - Year
    - Issue/edition
    - Number of pages
    - Language
    - Access

- Text.

The title is given exactly as it appears in the document, the author is listed only if known, and the text gives a very brief description of the document.

In many cases, if some of the fields are empty they will not appear on the screen at all.

At the bottom is a message line. This enables the searcher to perform certain tasks. The menu bar can be moved by using the arrow keys, and it will be noticed that the bottom line explains what the words mean. If you want to see the next matching record, move the bar to 'Forward' and press ENTER. A message will appear:

"Searching for next record... Please wait..."

If it is found that you have missed a record or you wish to check again the previous one, move the menu bar to 'Backward' and press ENTER. The computer will search for the previous record. If you do not remember the criteria chosen,

press F2. Pressing F3 gives you the full address of the publisher.

All the information described above is shown in the print-outs.

ANNEX 10

KEYWORDS USED IN PACKDATA

English - Portuguese (Português)

Abreviations of terms - abreviações de termos

Added value concept - conceito de valor agregado

Adhesive - adesivo

Aerosol - aerosol

Air transport - transporte aére

Aluminium - alumínio

Aluminium foil - folha de alumínio

Appropriate technology - tecnologia apropriada

Aseptic packaging - acondicionamento asséptico

Bag - saco

Bag-in-box - bag-in-box

Bale - fardo

Barcoding - código de barras

Barrier properties - propriedades de barreira

Basket - cesto

Bibliographical Refs. - referências bibliográficas

Big bag - big bag

Blisterpack - blisterpack

Bottle - garrafa

Box - caixa

Bulkpack - Embalagem para grande quantidade

CAD/CAM - CAD/CAM

Can - lata

CAP/MAP - CAP/MAP

Carton - cartão

Cellophane - celofane

Ceramic packaging material - embalagem de material cerâmico

Certification - certificação

CheckList - CheckList

Closing - fechamento

Closure - tampa

Coating - camada/cobrir com outro material

Coding - codificação

Coextrusion - coextrusão

Cold - frio

Competition - competição

Composite can - lata composta

Consultants - consultores

Consumer tests - testes com consumidores

Consumerism - consumismo

Container - contentor

Contamination - contaminação

Contract packing - empresas de prestação de serviços

Conversion table - tabela de conversão

Corrosion - corrosão

Corrugated fibreboard - papelão ondulado

Crate - engradado/caixa de madeira para transporte

Cup - copo

Cushioning - acolchoamento

Design strategy - estratégia de desenho

Developing country - país em desenvolvimento

Development of packs - desenvolvimento de embalagens

Die cutting-creasing - matriz de corte - vinco

Directory - guia/catálogo

Distribution - distribuição

Drum - barril

Economy - economia

Energy - energia

Environment - meio ambiente

Exhibition - exibição

Expanded plastics - plásticos expandidos

Export packaging - embalagem para exportação

Extrusion - extrusão

Factory layout - Layout da fábrica

Fibrebased - a base de fibra

Filling - enchimento

Film - filme

Flexible packaging - embalagem flexível

Flexo - impressão flexográfica

Form-in-place - espessura no local

Formed plastics - plásticos na forma de espuma

Food - alimento

Food additive - aditivo para alimentos

Food packaging - embalagem para alimentos

Food processing - processamento dos alimentos

Form-fill-seal - formação-enchimento-selagem

Frozen - congelado

Glass - vidro

Graphic design - desenho gráfico

Gravure - gravura/estampa

History of packaging - história da embalagem

Hotfoil stamping - estampagem a quente

Indigenous material - material nativo

Infestation - infestação

Information service - serviço de informação

Institution - instituição

International - internacional

International Trade - comércio internacional

Irradiation - irradiação

Jar - pote

Label - rótulo

Laboratory layout - layout do laboratório

Letterpress - texto impresso

Machinery - maquinário

Maintenance - manutenção

Management of packaging - administração de embalagem

Manual packing - acondicionamento manual

Manufacture - manufatura

Market research - pesquisa de mercado

Marketing - marketing

Marking - marcação

Materials handling - manuseio de materiais

Mechanization - mecanização

Metal - metal

Metal detecting - Detecção de metal

Metallizing - metalização

Microwave - microondas

Moulding - moldagem

Multilayer material - material com várias camadas

Multipack - Multipack

Net packing - acondicionamento em rede

Nylon - náilon

Off set - Off set

Packing in general - embalagem em geral

Packing station - estação de acondicionamento

Pallet - palete

Paper - papel

Paperboard - papelão

Patent - patente

PE - PE

PET - PET

Photography - fotografia

Pilferage - roubo/furto

Plastics - plásticos

Polyester - Poliéster

Post-harvest operation - operação pós-colheita

PP - PP

Print preparation - preparação para imprimir

Printing - Impressão

Printing ink - tinta para impressão

Processing - processamento

Protection - proteção

PS - PS

Pulp - polpa

PVC - PVC

PVDC - PVDC

Quality control - controle de qualidade

Rail transport - transporte por estrada de ferro

Recycling - reciclagem

Regulation - regulamento

Retailing - comércio varejista

Retort Packing - Embalagem esterilizada

Road transport - transporte rodoviário

Sack - saco

Sea Transport - transporte marítimo

Sealing - Selagem

Shelf-life - Vida-de-prateleira

Shrinkwrapping - envoltório encolhível

Silk screen - sil screen

Skinpack - skinpack

Solid fibreboard - papelão sólido

Specification - especificação

Spoilage - deterioração

Standardization - normalização

Static electricity - eletricidade estática

Statistics - estatísticas

Sterilization - esterilização

Storage - Armazenamento

Strapping - fitamento

Stretchwrapping - envoltório esticável

Structural design - desenho estrutural

Tamper evident closure - lacre evidente na tampa

Technical transfer - transferência de tecnologia

Terminology - terminologia

Test equipment - equipamento para teste

Testing - ensaio

Textile packaging material - material têxtil para embalagem

Thermoforming - termoformação

Tinplate - folha-de-flandres

Trade names - nomes comerciais

Training - treinamento

Transport in general - transporte em geral

Trends - tendências

Tropical conditions - condições tropicais

Tube - tubo

Unit Load - unidade de carga

UV - UV/ultravioleta

Vacuum packing - acondicionamento à vácuo

Value analysis - análise do valor

Weighing - pesagem

Wirebound - caixa de madeira envolto em arame

Wood - madeira

Woven - tecido

Descriptor - Descritor

Article - artigo

Bibliograph - bibliografia

Book - livro

Booklet - livro de bolso

Calendar - calendário

Code - código

Conference paper - separata de conferência

Conference report - relatório de conferência

Dictionary - dicionário

Directory - guia/catálogo

Expert report - relatório técnico

Extract - uma parte

Glossary - glossário

Guidelines - guia de instruções

Handbook - handbook

Market study - estudo de mercado

Monograph - monografia

Periodical - periódicos

Project report - relatório de projeto

Regulations - regulamentos

Research paper - pesquisa científica publicada

Standard - norma

Statutes - estatutos

Technical specs - especificações técnicas

Test method - método de ensaio

Textbook - livro texto

Thesaurus - tesauro

Training material - material de treinamento

Product Group - Grupo de produtos

Bakery products & Biscuits - produtos de panificação e biscoitos

Beverages - bebidas

Chemicals - produtos químicos

Confectionery - confeitos/confeitaria

Dairy products - produtos derivados do leite

Dry food - alimento seco

Fresh food - alimento fresco

Fruits & vegetables - frutas e vegetais

Furniture - móveis

General foods - alimentos em geral

General non-foods - não alimentos em geral

Hazerdous products - produtos perigosos

Horticultural - horticultura

Live animals - animais vivos

Marine products - produtos marinhos

Meat & Meat products, poultry - carne, produtos de carne e carne de aves

Phamaceuticals - produtos farmacêuticos

Processed foods - alimentos processados

Spices - condimentos

Tea, coffee & cocoa - chá, café e cacau

Tobacco & tobacco products - tabaco e produtos do tabaco

Specific products - Produtos específicos

Apples - maçãs

Appliances - utensílios

Apricots - damascos

Aquarium fish - peixe de aquário

Avocados - abacates

Bananas - bananas

Beans - feijões

Bed accessories - acessórios para cama

Beer - cerveja

Berries - bago

Biscuits - biscoitos

Bread - pão

Broccoli - brócoli

Butter- manteiga

Cashew - cajú

Cement - cimento

Cereals - cereais

Cheese - queijo

Cherries - cereja

Chinaware - porcelana

Cigarettes - cigarros

Citrus - cítricos

Cocoa - cacau

Coconut fibre - fibra de coco

Coffee - café

Coir - fibra

Cosmestics - cosméstico

Crustacea - crustáceos

Cucumbers - pepinos

Cut flowers - vasos de flores

Dates - tâmaras

Dehydrated vegetables - vegetais desidratados

Dried fruits - frutas secas

Drugs - drogas

Edible oil - óleos comestíveis

Eggs - ovos

Electrical appliances - utensílios elétricos

Electronics - eletrônicos

Fish - peixe

Flour - flocos

Fruit - fruta

Fruit pulp - polpa de fruta

Garments - peça de roupa

Grapes - uva

Guava - goiaba

Hendicrafts - artesãos

Hardware - ferragens

Herbs - ervas

Honey - mel

Hospital supplies - provisões hospitalares

Ice-cream - sorvete

Jams - geléia de frutas

Juices - sucos

Jute - juta

Leeks - alho poró

Lentils - lentilhas

Lettuce - alface

Lobsters - lagosta

Machinery - maquinário

Mangoes - mangas

Mangosteens -

Meat - carne

Medical devices - aparelhos médicos

Melon - melão

Milk - leite

Milk powder - leite em pó

Mineral water - água mineral

Mint - menta

Mushrooms - champignons

Nectarines - nectarinas

Nuts - nozes

Octopus - polvo

Offal - intestino

Oil - óleo

Oranges - laranja

Oysters - ostra

Paper - papel

Persley - salsa

Peaches - pêssego

Pears - pêra

Peat moss - turfa

Peppers - pimenta

Pet foods - alimentos para animais

Pickles - picles

Pineapples - abacaxi

Plants - plantas

Pomegranates - romã

Potatoes - batata

Poultry - ave

Powders - pulverizados

Prawns - camarão grande

Prefab. houses - casas pré-fabricadas

Raising - uva-passa

Records - registro/arquivos

Rice - arroz

Rubber - borracha

Salmon - salmão

Scallops - escalopes

Shirts - camisas

Shrimps - camarões pequenos

Snails - escargots

Soap - sabão

Soft drinks - bebidas com gás

Soups - sopas

Spirits - alcoólicos

Squashes - suco de legumes ou frutas - esmagados

Strawberries - morangos

Sugar - açúcar

Tanning extract - extrato curtido

Tea - chá

Toiletries - artigos de toalete

Tomatoes - tomates

Toys - brinquedos

Tropical fruit - fruta tropical

Vegetables - vegetais

Watercress - agrião

Wine - vinho

Yoghurt - iogurte

Bibliographical terms - termos bibliográficos

- Technoeconomic studies on packaging: industrialized countries
  Estudos tecno econômicos sobre embalagem: países industrializados

- Technoeconomic studies on packaging: developing countries
  Estudos tecno econômicos sobre embalagem: países em desenvolvimento

- General documentation on packaging in developing countries
  Documentação geral sobre embalagem em países em desenvolvimento

- General text books, handbooks
  Livros texto em geral, handbooks

- Wooden Packaging
  Embalagem de madeira

- Fibrebased packaging
  Embalagem celulósica

- Plastics and flexible packaging
  Embalagens plásticas e flexíveis

- Glass Packaging
  Embalagem de vidro

- Metal packaging
  Embalagem metálica

- Textible packaging
  Embalagem têxtil

- Packaging acessories and auxiliary materials
  Acessórios para embalagem e materiais auxiliares

- Packaging machinery
  Maquinário para embalagem

- Printing, print preparation
  Impressão, preparação para imprimir

- Food packaging and processing in general
  Embalagem e processamento de alimentos em geral

- Fruits and vegetables
  Frutas e vegetais

- Marine products
  Produtos marinhos

- Meat and meat products, poultry
  Carne e produtos de carne e carne de aves

- Beverages
  Bebidas

- Other food products
  Outros produtos alimentícios

- Furniture, handicrafts
  Móveis, ofícios manuais

- Chemicals, pharmaceuticals
  Produtos químicos, produtos farmacêuticos

- Hazards products
  Produtos perigosos

- Other non-food products
  Outros produtos não alimentícios

- Institutional infrastructure for packaging development
  Infraestrutura institucional para o desenvolvimeto de embalagens

- In company organization for packaging development
  Organização na empresa para o desenvolvimento de embalagens

- Testing of packages and materials, quality control
  Testes de embalagens e materiais, controle de qualidade

- Development of specifications, prototypes
  Desenvolvimento de especificações, protótipos

- Packaging standards and codes
  Normas e códigos de embalagem

- Checklists
  Lista de instruções

- Packaging economics
  Economia de embalagem

- Packaging for export
  Embalagem para exportação

- Packaging and labelling regulations
  Regulamentos para embalagem e rotulagem

- Promotional design of packages and Labels
  Desenho promocional de embalagens e rótulos

- Retail distribution
  Distribuição para varejo

- Transportation by sea, air, etc.
  Transporte por mar, ar, etc.

- Materials handling, warehousing
  Movimentação de materiais, armazenamento

- Unit loads, containerization
  Unidades de carga, contentorização

- Packaging information services
  Serviços de informação sobre embalagem

- Glossaries, dictionaries
  Glossários, dicionários

- Directories, yearbooks and exhibition catalogues
  Guias, anuários e catálogos de exposições

- Classification systems, thesauri
  Sistemas de classificação, tesauro

- Bibliographies, lists of publications
  Bibliografias, listas de publicações

- Periodicals on packaging and related subjects
  Periódicos em embalagem e assuntos relacionados

- Manpower development
  Desenvolvimento de mão-de-obra

- Recycling, ecology
  Reciclagem, ecologia

- Export promotion techniques
  Técnicas de promoção de exportação

- Industrial project and technical assistance manuals
  Manuais de projeto industrial e de assistência técnica

ANNEX 11

Loa Karjalainen

THE PRESENT AND FUTURE IN PACKAGING

INTRODUCTION

Urbanization of society has had a considerable impact on the structure of economy and it has, in fact, created the branch of packaging. Along with urbanization, high labour costs have affected the development of retail business. Neighbourhood shops have been replaced by supermarkets, and there are no more shop assistants who could give information on the characteristics of the products. But the modern consumer can obtain safe, hygienic, non-perishable and undamaged products in packages which contain information on the product and its use.

Packaging is, however, not limited to consumer goods; almost without exceptions, packaging is the last stage of finishing any product; and it is as such an integral part of production.

In Finland, the packaging industry has quickly expanded to one of the largest branches of industry. It is characterized by high quality and sophisticated level of knowhow. In 1987, the production value was FIM 6,000m (USD 1,43 billion). Already for several years, more than half of the production has been exported, which is one of the highest figures internationally. Fibre-based materials comprise over 75 % of exports.

Globally, Finland stands for 0,6% of world's packaging production which is estimated to be USD 250 billion. Covering less than 25% of the total population of the earth, the industrial nations produce over 80 % of the packages.

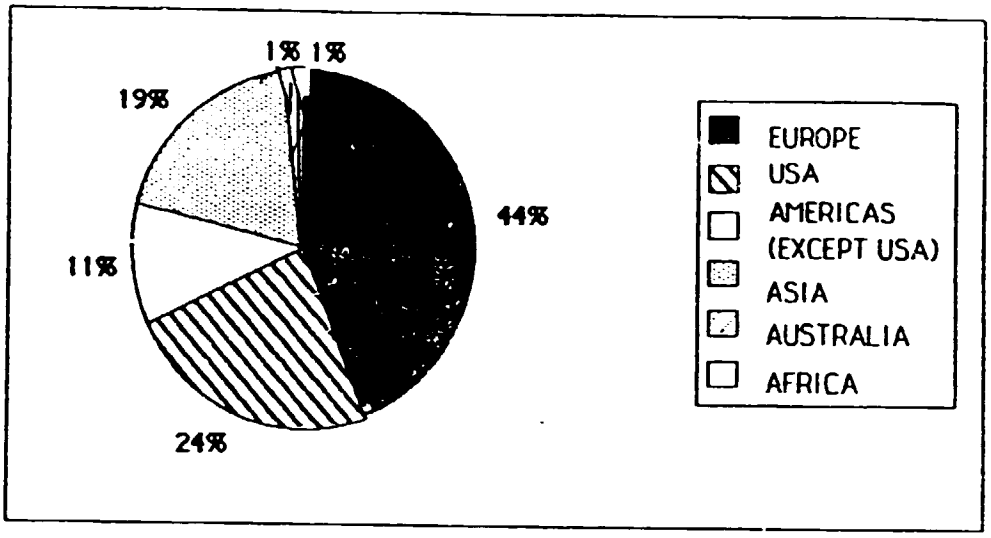

Fig.1. Production of packages on various continents, based on the production value. Source: ITC.

Production value of the packaging industry in industrialized countries commonly comprises 1.5 to 2 % of the gross national product, and the gross value is estimated to be 2 x production value, or 3-4 % of GNP.

Packaging as such will not increase in industrialized countries. Growth of the GNP is no longer considered to affect the use of packages in countries with high standard of living; the only growth in the use of packages will be caused by population increase which is almost nil in Europe and North America but only about 1%/annum in Japan.

Based on a study on Western Europe and the USA, the graph below indicates the shares of various packaging materials related to their tonnage. But packaging materials can not be realistically evaluated by tonnage. Some materials, e.g. glass, are heavy by weight whereas others, such as aluminium, are light. This is why the graph also shows the surface area[1] of materials produced. Since the shares of materials are very much alike in all countries where statistics are available, it can be assumed that the figures are valid globally, too.

The share of fibre-based materials or paper and board, is close to 50% by weight but, thanks to the high grammage of corrugated board, hardly 30% by surface area.

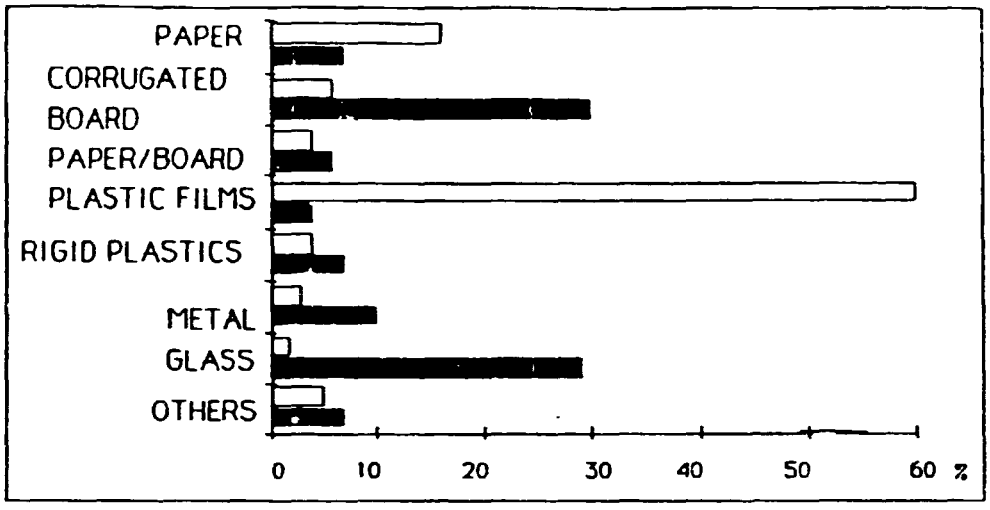

Fig.2. The shares of various materials of package production as based on area and weight. Sources: Packaging industries in France and W. Europe, Francoise Pardos and Pakkaus, Loa Karjalainen

1) Tons have been converted into square meters by using the average square mass, grammes per square meter, of each material. The white bars (based on area) clearly indicate that plastic films are the most commonly used packaging materials.

Most packaging materials are produced by large integrated companies. Initially, the manufacturing of packaging materials has been but one way of processing the bulk product. Compared with the main part of the company production, package manufacturing usually has shown the best profitability. The major part of today's packaging industry , however, consists of independent package manufacturers using many different types of materials. This is a consequence of general development: the main part of packaging materials are made of more than just one raw material. E.g. plastics have a share of appr.70% as being one member of the packaging material.

The field of packaging is complex and interdisciplinary. Society itself, economical development, technical innovations, changes in distribution, price of energy etc. affect the development. Only by collecting and analyzing all these factors it is possible to draw conclusions and make forecasts on the development of the packaging branch in forthcoming years.

An extensive research project in Finland, called **PAK-2000** was so planned that all factors, from changes in the society to internal

outlook of packaging industry, could be gathered, and based on all these factors, a forecast on the future of the packaging industry was made. Although the Finnish packaging industry only was concerned in the study, its results are applicable in all industrialized countries and, for the most part, in the developing countries, too.

A prestudy for the actual project was started as early as in 1983. This work yielded five subprojects, on which 11 researchers worked, three of them having a Ph.D degree, three being M.Sc (Tech.) and four making theses for diplomas at Technical Universities.

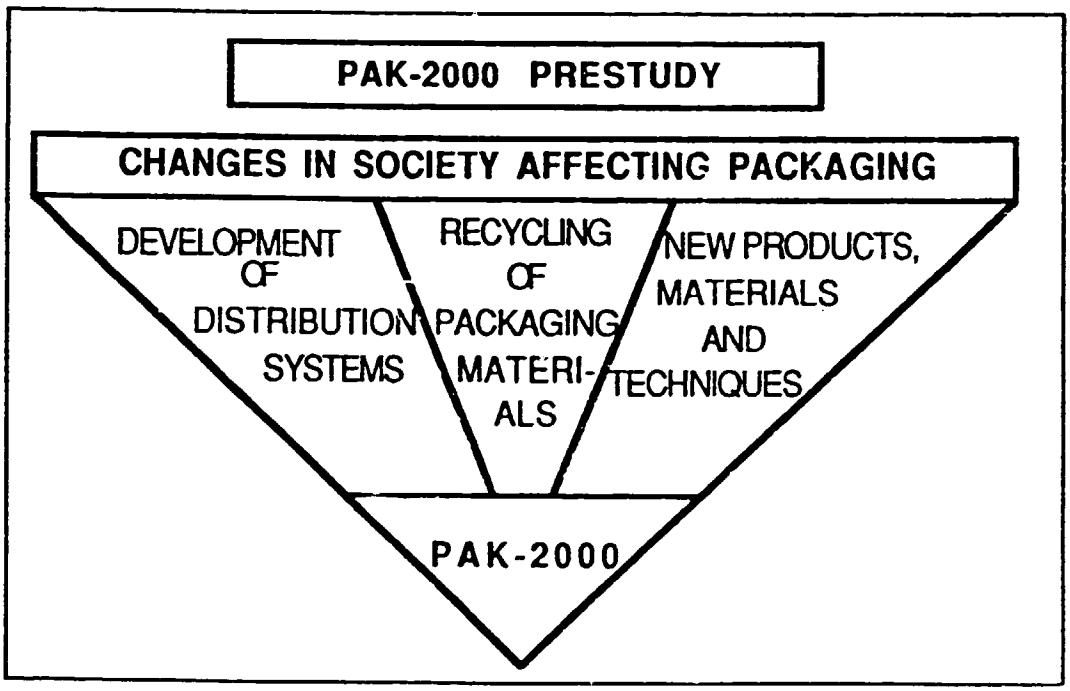

Fig.3. PAK-2000 project structure

CONCLUSIONS AND RECOMMENDATIONS

Every person handles packages every day of his life. Packaging is also a part of nearly all industrial production, and the corner stone of the whole distribution system. However, packaging is not a well known concept. Its size and significance and, above all, its essential integration in modern society is hardly recognized. The packaging branch has to blame itself for this situation, which benefits neither the packaging nor the package using industry. A **higher profile** towards both the authorities and the consumers is vital for favourable development.

Changes in society such as increasing average age, smaller families, increasing leisure and changes in the ways of life, as well as improvement of quality of work, standard of living and general level of education all affect the product range, package types, sizes and materials. These facts are valid globally, only to a narrower scale in the developing countries.

Still in its initial stage, computerization of society will make new demands on packages, as new types of shops, electronic payment and distribution systems are introduced. Based so far on large units and long production runs, the profitability of the packaging industry in a computerized society will be based on small units, flexibility and ability to deliver on short notice. Small manufacturing units will specialize and considerably more attention has to be paid to uniformity of quality, adapted to the user's needs.

The often rather rapid changes in society imply flexible, small-scale investments in the packaging branch. The packaging and package using industries have to improve their level of knowhow enough to take up a sufficiently critical attitude towards fashionable packaging trends requiring considerable investments.

There is a growing demand for packaging in the **developing countries**, both for local use and for products to be packaged for export. Additionally, there is a really considerable need for packaging expertise. Expert services given together with planning of equipment and factories as well as with training and education are what in fact is most needed in the third world.

The **authorities** have a considerable impact on the development and use of packages. E.g. in Finland, there are already appr. 270 laws, statutes and decrees with rules and regulations on packaging. It is obvious that the legislation will become stricter in all countries with new regulations and limitations which mostly are related to packaging of food or the environment.

It is therefore of utmost importance that correct techno-economic information and expertise is available to the authorities for fair decision-making. The industry should be able to anticipate future development, and it should take the initiative, when there are foreseeable changes of society in sight. The industry should cooperate ***with*** the authorities, not ***oppose*** them

The packaging branch is typically customer oriented and develops together with the society. The needs and demands of the **consumer** will become more varied, as the standard of living still improves, the number of ethnic groups increases, people are ageing, tourism increases and the society becomes internationalized.

The future consumer is educated. He is willing to pay for quality. The so called green values are held in respect but , regrettably, most often practical decisions are affected by pursuit of wealth and indolence.

The consumer demands absolute product safety and reliable information on what he is buying. Especially for food products this means high standards of hygiene, fresh products without additives and clean, safe packages which are easy to handle. The package should be informative, but the information has to be absolutely honest. However, increasing consciousness of costs affects purchase decisions of the consumer in that he reacts negatively to an expensive looking package unless it is in harmony with the value of the product.

National and international customs and habits intermingle. The population becomes increasingly segmented. The packaging and package using industries must closely observe this development, because it implies changes affecting packaging at a relatively short notice.

The forecasts concerning **packaging materials** are quite similar in all industrialized countries. The dominant trend is the continuous increase of the share of plastics at the cost of other materials, particularly of glass and metal. Moreover, all types of packaging materials are becoming thinner, the quality is improving and materials manufacturing is requiring less energy.

The use of paper as packaging material is decreasing. Sack paper is predicted to decline appr. 1 % per annum. The market for paperboard is slightly falling, as well. Processed food products are increasingly being packaged in all-plastic containers suitable for handling in all situations and temperatures. For corrugated board, no noticeable changes are forecasted. Additional markets could be gained by developing new methods, e.g. for manufacturing inexpensive, moisture resistant corrugated board.

During the past decades, plastics have overwhelmingly led the development of packaging materials. Used as such in innumerous types of packages, plastics are also used in connection with other materials, thus improving their markets as well. According to forecasts, the growth rate of plastics for packaging will be at least 3 to 5 % per annum within the next 15 years, which means a considerably slower growth than in the previous 15 years but even so the figure is higher than that of any other group of packaging materials.

Glass is the only packaging material never degrading. The growth or decline of glass packages thus depends closely on recycling systems. Although not very economical, the returnable bottle system works well e.g. in Finland. If effectively organized, the collection of one-way glass packages may lead to abandonment of the returnable bottle system.

Tinplate is slowly losing its share of the markets, even if the European market for tinplate beverage packages is still slightly growing. In beverage packaging aluminium can is winning markets from tinplate, and it seems that in the long run food cans, as well as metal packages used by technochemical industry, are threatened by plastic packages.

Effective R&D clearly is the best means of maintaining or increasing the share of the market, and this applies to all packaging materials. In this respect, product development of fibre based materials has obviously not been sufficient.

Because the total volume will not increase, competition between materials will be mainly a fight for shares of the present total volumes, if the development goes on unhindered.

It would, however, be shortsighted to expect that the present development continued everywhere and forever. Being aware of changes in the political atmosphere, anticipating the decisions of authorities and by cooperation with the public sector it is to some extent possible to influence that part of development which is normally controllable. This, however, requires closer cooperation and more activity within the packaging branch.

New materials and techniques will follow the general trends: tamper-evident packages, dual ovenable materials, packages for small

households, new printing techniques to be applied in the packaging process etc. are details in the integrated packaging concept

Traditionally, packaging materials, packages and machines are manufactured and marketed separately. The modern customer is, however, not anymore interested in these; he wants a **certain, functioning product**. Integrated packaging systems in the forthcoming years have to be planned to completion, utilized and marketed as functioning entities. Such integrated, hi-tech packaging systems are, however, viable only if sufficient uniformity of quality and dimensional accuracy of the packaging materials can be maintained.

The computerized society, increasing international trade and future fragmentation of the industry are signs indicating good potential for small, flexible and high-level packaging enterprises, for which specializing and know-how will allow profitable business. R&D in the future packaging techniques such as aseptic packaging, CAP, printing, coding and control systems, robots, CAD in design, etc will be of utmost importance.

Protection of **environment** has become one of the major sociological problems in all countries. Industry and traffic, with their destructive effect on the nature, are considered the biggest threat. The waste management and its problems are, regrettably, often left to politicians.

Packaging and package using industries are minor sources of pollution; the most important environmental effects of packaging materials include energy consumption, effluents and the volume of solid waste. Air emissions are mainly caused by transports.

Thanks to advanced production technology, considerably less energy than earlier is required in the manufacturing of materials which additionally, have become thinner in all material types. This development can be expected to continue in future.

More effluents still result from the production of bleached fibre-based materials than from other materials. Finland is one of the leading countries in the research work aiming at reducing these emissions.

Solid waste is the most serious environmental factor in packaging, not least in the developing countries where it is common to throw away packaging waste in the nature. Municipal waste in the inbdustrialized countries includes nearly 30% packaging waste by tonnage. Only part of it can be economically recycled although new methods of collecting, handling and re-processing different packaging materials are invented continuously. If the waste handling were based on modern incineration plants and not on dumps, incineration of non-recyclable packaging waste would not only save space and pollution of the ground and groundwater but yield considerable amounts of energy. Properly organized waste management also changes attitudes towards the packaging branch into a more objective and positive direction.

Environmental effects of any material should always be calculated as total effects from the whole chain: starting from producing the raw materials and materials manufacturing via package manufacturing, packaging and distribution until handling of waste. Contrary to the popular and political way of evaluating the environmental effects of materials, which mainly concentrates on handling of solid waste, this more serious approach puts quite another light on the effects caused by different packaging materials. It is to the packaging branch to publish reliable facts in this respect.

The last conclusions from the report of PAK-2000 would be:

1 The packaging industry is more a follower than a leader of the general development, where the general attitudes, political currents, demographic changes, strictening legislation, computerization of society, technical inventions, fragmentation of industry and changes in the international markets are the main factors affecting the development of packaging;

2 Making long-range forecasts for the packaging branch is even more difficult than for other areas of economy, due to its interdisciplinary nature. These forecasts should therefore be considered as short- and medium-range outlooks, which should be updated every 2-3 years.