OCCASION

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

DISCLAIMER

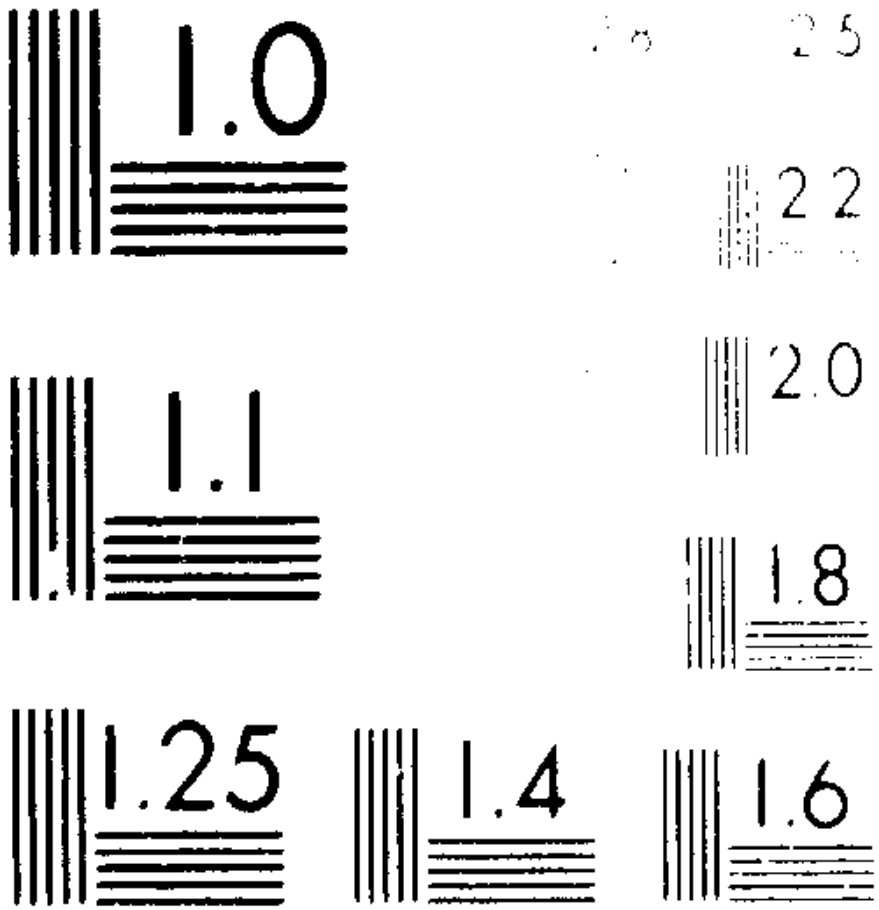
FAIR USE POLICY

CONTACT

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

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

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

RESTRICTED

DP/ID/SER.A/354
30 March 1982
English

CONSOLIDATION OF THE MEXICAN INSTITUTE FOR ASSISTANCE TO INDUSTRY

DP/MEX/78/011

MEXICO

Technical report: Food package standardisation *

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

Based on the work of John Salisbury, expert
in food package standardisation

United Nations Industrial Development Organization
Vienna

* This document has been reproduced without formal editing

V.82-22940

A B B R E V I A T I O N S

ADR	European agreement concerning the international carriage of dangerous goods by road.
AFNOR	Association Francaise de Normalisation.
ANSI	American National Standards Institute.
ASSCO	European Solid Fibreboard Case Manufacturers' Association.
ASTM	American Society for Testing and Materials.
ATCP	Mexican Technical Association for Cellulose and Paper Industries.
BGIRA	British Glass Industry Research Association.
BSI	British Standards Institution.
CONNEE	Mexican National Packaging Standardization Committee.
CEN	European Committee for Standardization.
CETIE	International Technical Centre for Bottling and Packaging.
DGN	Mexican National Standards Organizatior.
DOT	USA Department of Transportation.
ECE	United Nations Economic Commission for Europe.
EEC	European Economic Community.
FDA	USA Food and Drug Administration.
FEA	Federation of European Aerosol Associations.
FEFCO	European Corrugated Fibreboard Case Manufacturers' Association.
GMF	Glass Manufacturer's Federation.
IAPRI	International Association of Packaging Research Institutes.
IATA	International Air Transport Association.
ICAO	International Civil Aviation Authority.
IMAI	Mexican Institute for Assistance to Industry.
IMCO	Intergovernmental Maritime Consultative Organization.
IMDG	International Maritime Dangerous Goods Code.
ISO	International Organization for Standardization.
ITC	International Trade Centre (UNCTAD/GATT).
LANFI	Laboratorios Nacionales de Fomento Industrial.
OECD	Organization for Economic Cooperation and Development.
PIRA	Research Institute for the Paper and Board, Printing and Packaging Industries.
RID	International regulations concerning the carriage of dangerous goods by rail.
SAA	Standards Association of Australia.
SIS	Swedish Standards Institution.
TAPPI	Technical Association of the Pulp and Paper Industry.
UFC	Uniform Freight Classification.
UN	United Nations' recommendations on 'The transport of dangerous goods'.
UNDP	United Nations Development Programme.
UNIDO	United Nations Industrial Development Organization.

C O N T E N T S

A. SUMMARY

The report concerns the mission on food packaging standardisation carried out between 10 April and 7 July, 1981 by UNIDO consultant John Salisbury at the Laboratorios Nacionales de Fomerto Industrial (LANFI) in Mexico.

The consultant worked with members of the Standards Section in preparing draft and final documentation for new standards and made recommendations concerning ways in which procedures might be improved. Subjects suitable for inclusion in the next two years programme were highlighted.

The consultant also helped present two seminars for participants from Mexican Industry, a three day seminar on paper and board packaging and a two day seminar on Flexible Packaging for the Food Industry.

B. INTRODUCTION

The Government of Mexico and the United Nations are consolidating the packaging laboratories at the Laboratorios Nacionales de Fomento Industrial (LANFI).

One of the subjects in which UNIDO, the implementing agency, is providing consultancy help is standardisation. In 1980 the project was visited by consultant Colin Swinbank who advised on the overall planning of standardisation activities. (Report dated 20 February 1980).

This present report deals with the second consultancy in standardisation which focussed on the packaging of food products and on ways in which the work of the standardisation section could be made most effective.

C. CONDUCT OF THE MISSION

The consultant arrived on the project 13 April 1981 and left, for debriefing in Vienna, on 7 July 1981.

During the period of the mission the following activities were carried out:

1. Working with various members of the Standards Section assisting in their day to day work of preparing the documentation associated with standards. While the opportunity was taken to teach basic packaging technology as required by the work in hand, the principle aim was to better understand the problems being experienced by this Standards Section.

2. Visits were made to three local factories to increase knowledge in carton manufacture, flexible packaging manufacture and waxed paper manufacture. The present level of packaging was examined during a number of supermarket visits.

3. Attendance at subcommittee meetings of the paper and carton, transport, wood, plastics and technical studies sections. Assistance was given with specific problems under discussion and the procedure being adopted was studied with a view to making suggestions as to how the effectiveness of industries' contribution can be improved as this is one of the major problems of the food standardisation programme.

4. The author joined consultant F. Paine in presenting a three-day-seminar on Paper and Board, dealing specifically with manufacturing techniques, structural design and applications of cartons to specific problems.

5. The author joined consultants S. Gilbert and J. Miltz in presenting a two day seminar on Flexible Packaging, dealing with the properties of the main packaging films and how these are combined together, and with aluminium foil, to create the kind of barrier properties required in food packaging.

The above two activities were regarded as part of the technological training for appropriate staff from the standards section.

6. A report was prepared in accordance with the terms of reference.

D. FINDINGS AND COMMENTS.

D.1. THE AIMS OF STANDARDIZATION

Introducing standardisation into a country is by no means a simple matter, the industry are understandably suspicious of the whole idea. They tend to see it as a controlling system that can only increase their costs and give them problems that they could well do without. Eventually there comes a realization that standards have a useful role to play and industry takes the view that they have to be involved at all stages. This desirable state only comes about when industry becomes convinced that standardisation can help, especially in protecting established manufacturers being undercut in price by new competitiors who may produce inferior, or even harmful, material in their efforts to reduce costs.

Some of the advantages of standardisation that are especially relevant to LANFI are :

1. Protection of health by ensuring that materials known to be harmful are not used in contact with food.

2. Rationalization of container size ranges so as to increase run length (so reducing costs), and permitting consumers to make simple and realistic comparisons of value. Simplification of machinery selection and use.

3. Compliance with the rules and regulations of other countries, an essential and growing feature in export development.

4. Standardisation of the test methods being introduced throughout the country to ensure that raw material manufacturers, converters and users can communicate and specify in a consistent manner. The basis of all development is measurement, how else can improvement be adequately monitored and quality disputes settled?

5. Improvement of transit efficiency (largely a dimensional problem) and reduction of damage in transit.

6. Interchangability of components, eg. caps, bottle threads. etc.

7. Reduction of variations in materials and containers that interfer with the efficient use of packaging machinery that grows more and more complex and rapid.

The problem is how to achieve the many aims of standardisation without stiffling the inovative growth of industry, something that can easily happen if standards are produced that define maximum and minimum acceptable limits that do not take into account the wide variation in external conditions that exist.

When health is involved the standards need to be mandatory. When exports of great value to Mexico are involved a good case can be made for mandatory standards. However, the aim of most standards is to help industry achieve satisfactory quality levels and to reduce costs and few of these are mandatory. It is important therefore, that standardisation is approached from this latter stand point - that of being a helpful tool - and that the control aspect is only invoked when there is ample justification.

D.2 ORGANISATION OF THE SUB COMMITTEES

The work of the Standards Section is dealt with in eight specialised sub committees:

Paper and Board
Wood
Glass
Plastics
Textiles
Metals
Technical Studies
Transport

Further details are given in Annex 2.

The Committee is responsible, through the LANFI directorate, to the Comite Consultivo Nacional de Normalización de Envase y Embalaje (CCNNEE).

Under the present arrangements the subcommittee comprises a chairman (from industry) a co-ordinator (the staff member from the Standards Section) and invited members from those industries most likely to be knowledgable and interested in the subject of the standards under discussion and from government and independent organisations whose activities are closely related to the subject.

The co-ordinator's role includes preparation of the documentation (draft standard, final standard, etc.) location and disemination of relevant technical literature (especially the standards of other countries) and progress chasing in all its forms.

The chairmans role is to control the pace and form of the meeting, to guide those present on what points need to be resolved and to summarize the decisions taken so that appropriate action can be taken by the co-ordinator. If a point cannot be resolved in a reasonable short time it is usual in this type of work for the chairman to ask one or two members of the committee to actively persue the point outside the meeting in an attempt to find a solution before the next meeting. The chairman is usually a senior and experienced figure in the industry.

one whose guidance and rulings are readily accepted by the sub-committee members. In all the meetings attended by the consultant the position of chairman was taken by the standards Group staff member (the co-ordinator). In all cases the job was carried out very well indeed, but it is the situation that is by no means the best one and is not in keeping with the whole concept that the industry plays a major role in the development of Mexican Standards. The atmosphere so created is that the industry members are there to help LANFI - it would be much better if the atmosphere created was one in which LANFI's resources and laboratory test facilities are seen to be helping industry.

This is easy to write, the principle problem at the moment is that the industry shows little inclination to help with the standardisation process in that their attendance at the meetings arranged to progress the work leaves much to be desired. For this reason a lot of thought has gone into trying to make positive suggestions as to how industry's role can be made more vital.

The frequency of the meetings seems high, is it really necessary to meet every two weeks ? For a key person this represents a lot of time away from his company, when one takes into account travelling time as well. It also means that little can be done by post or by telephone. Obviously the co-ordinator must be active during the time between meetings but a long period may well make more visits, telephone and postal contact possible. Such contacts can be very effective when they involve specific questions that need to be resolved if progress on the necessary documentation is to be sustained.

The members of the committee need to be supplied with background and specific technical data relevant to the topic under discussion. Acquisition of this information is something that industry finds very difficult yet LANFI is an excellent position to do very well. The type of information needed and possible sources are discussed in detail under the section dealing with preparation of draft documentation but it is emphasized here because it can assist in creating meaningful discussion in committee, especially when considering the impact that developing legislation in other countries can have on Mexican imports.

In general, the development of test methods in all the specialised fields is dealt with by the sub-committee for technical studies. Since standardisation of test methods is one of the most useful functions for a technological

institute such as LANFI it is felt that this subject provides one of the greatest opportunities for establishing strong ties with the technical staff in each of the specialised industries eg. paper and board, metals, plastics, etc.

It would seem therefore, that each specialised sub-committee should make test method development an important part of its work and that such development should be done by technical people from industry. This subject is developed more fully under the section dealing with the future programme.

The consultant would like to ask that the practice of reading through the prepared draft at each meeting be reconsidered. This is normally done at a rather brisk pace and then repeated more slowly, paragraph by paragraph so that consideration may be given to the details. There are some apparent advantages in that the overall picture of the draft or final document is presented but the effect seems to numb the mind somewhat and reduce critical appraisal. This may be just the consultants impression but the process does need re-examination in case the industry members of the sub-committee are reacting in a similar manner. One feels that a more effective atmosphere would be created by giving those present a few minutes to refresh their memories as to the content of the document under consideration, at their own pace, before making a critical appraisal, step by step.

The question of what constitutes a quorum has to be more carefully considered. If it is accepted that the presence of industry at sub-committee meetings is essential then a minimum attendance figure has to be agreed and meetings cancelled if the figure falls below this agreed level. This could be painful in the early stages but it does underline the point that standards developed without the involvement of industry will be of little value in that they are unlikely to be implemented.

It is a measure of the amount of involvement expected from industry that standards in many countries can take two, three or more years to bring to completion. A standard can be prepared in much less time, but this is usual only when the various bodies that will be affected by the standard have not been adequately consulted and have not been involved and contributed as they should.

The procedure adopted in sub-committee meetings is very important if the co-operation of senior members from industry is to be obtained and retained.

D.3 PREPARATION OF DRAFT STANDARDS (ANTEPROYECTOS) AND STANDARDS (PROJECTO FINAL).

Once the decision if taken that a national standard will be issued concerning a certain defined topic the co-ordinator responsible is faced with preparing a draft document as the basis for discussion by the sub-committee and for distribution to the interested sections of the industry for comment.

The logical starting point is an examination of the standards already existing in other countries, since this draws attention in an excellent way to most of the points that will need to be taken into consideration in preparing a Mexican Standards. If the standard is one from the International Standards Organization, and Mexico has agreed to abide by it, then all that is needed is a translation into Spanish and presentation in the format laid down as that adopted for Mexican National Standards as detailed in DGN-R-50-1975. However, in the majority of cases the starting point is with the standards of old established organisations such as ASTM, BSI, ANSI, AFNOR, etc.

This use of the standards of other countries has been criticised but the criticism concerns translation and adoption without consideration of the applicability of the contents to Mexico. It is essential that this initial procedure be accepted as a reasonable starting point and no more and it is in this respect that the consultant would like to suggest a change in procedure. At present the co-ordinators do their very best to translate accurately and to rearrange the information into a draft document that follows the format for Mexican Standards. When this is done the anteproyecto (draft) takes on the form of a finished standard but because of their inexperience in the subject there are bound to be decisions taken during this translation stage that are not the best ones. This is especially true when two or more standards exist that are different. The co-ordinators lack the knowledge and experience needed to pick the best from the material gathered together and to relate this to Mexican Industry practice and needs. This is the function of the sub-committee members from industry who are actively engaged in the subject on a day to day basis. It is suggested that if the first draft was a far more incomplete document than it tends to be at the moment, but one that clearly notates the points (eg. terminology, test procedures, material parameters) that need to be resolved by the committee members, the industry would

feel that they really were actively involved in creating Mexican Standards and not just passively observing. In other words the co-ordinator is drawing attention, in as clear as manner possible, to questions that need resolving by the committee.

During the ensuing discussions the committee will no doubt raise many other points that need to be resolved if the finished standard is to be of value to industry and, in the long run, to Mexico.

Another value of such a notated approach is that it provides a record of the points that were given special attention during discussions. It can be of value at a later revision to look back on these notes.

Sometimes, the appropriate standard from another country is very detailed indeed, as happened in the case of a Japanese standard on the use of wood in a packaging application. The standard was full of charts and dimensions relevant to timber in common use in Japan. Obviously much of this material would not be of value if translated and it is very unlikely that equivalent data could be found here in Mexico that refered to Mexican timber.
In this case it would seem that the information should be made available as a technical guidance pamphlet rather than as a standard.

Assuming then that a draft - document is prepared that notates perhaps ten or twenty questions that will initiate focussed discussion designed to arrive at conclusions that will enable the co-ordinator to prepare better draft documents (anteproyectos) and eventually the standard document in its final form ready to present to the CCNNEE committee. If the ensuing discussion is to be constructive both the co-ordinator and the various members need to be well informed about the topic and in this they are going to need help. At present it seems to the consultant that the Standards Section have difficulties in obtaining technical information about the subject of the developing standard.

This is unfortunate, indeed, because one of the "rewards" for the industry representatives for working with such a group is that the knowledge of each committee member is considerably better after the project than before. There has to be a mechanism, therefore, for locating relevant technical information to supplement the knowledge already existing in the committee.

The LANFI computor terminal has access to data bases in a number of leading packaging institutes and in theory is the best way of obtaining information. There is an alternative approach, however,

that has certain advantages. The British institution PIRA has been publishing their monthly abstracts from over 500 publications. In LANFI library they are available from 1972 to 1980. A search of these abstracts for information relevant to a given topic does not take very long and in the process of searching, the co-ordinator gains a good overall knowledge of the subject. The abstracts that appear to be relevant to the topic under study can be collected, classified, and presented to the sub-committee who can then choose the references that appear to be especially useful to their deliberations. Photocopies of these articles can then be obtained for distribution to the members of the committee.

To illustrate th s proposed approach we took the present work of the plastics sub committee. Their interest is in plastic bottles that need to withstand the pressure associated with carbonated beverages and the materials, eg. polyesters (PET), that are being used in recent developments. This is particularly important in the case of acrylonitriles because of suspected problems with monomer content. During the search any reference to plastics standardisation, especially plastic bottles which are being made the subject of a special study. The results of this survey were left at LANFI and it has been seen that a very thorough coverage of the subjects was achieved. Photocopies of all of this information can be obtained from PIRA at a price of 50 pesos per article. It is suggested that the system of prepaid vouchers be used so that the Standards Section can obtain the information they need quickly. Since a time lage of at least one month is involved, information should be sort well in advance of the time that it will be required by the committee. This is not difficult since the programme is set for the year. Once this general search has been carried out and the information digested, there will no doubt be specific points that need resolution and for this, use of the compator can be very useful especially since the committee and the co-ordinator will be in a position to frame their question precisely.

Another point that needs clarification concerning anteprojecto (draft) preparation is the difference between specifications and standards.

Specifications are written tc communicate and establish what is required in certain clearly defined circumstances. There are purchasing specifications, production specifications and quality control specifications, they can be very comprehensive or relatively brief in a less demanding industry but the important thing is they do refer to a well established set of conditions. To clarify exactly what constitutes a specification, an article by William Hughes is reproduced as Annex 2. A standard, on the other hand, is meant to give guidance

as to the important factors that must be taken into account when aiming for a satisfactory quality level that will be suitable under a wide range of conditions. For example, in preparing a recent standard for bags made from waxed paper it was necessary to indicate possible styles, the requirements for the wax coating if direct contact with food stuffs was involved, and which dimensions of the bag should be clearly indicated as a guide to the supplier as to the needs of the user. What cannot be "standardised" are the dimensions of the bag because of the wide variety of applications. The exact dimensions will be established in the specification prepared to cover any specific case. It is helpful, however, to give examples of typical bags in common use and this was done. In pallet standardisation it is important to establish the pallet sizes that are prefered if optimum use of the various transport equipment is to be obtained.

ISO has published a list of such sizes including 1200 mm x 800 mm and 1200 mm x 1000 mm. These are examples of the sizes that many people feel are the optimum, they do not necessarily fit all cases and if a fruit and vegetable exporter feels be can obtain better economic results by using 1100 mm x 1100 mm it would be unfortunate for him and for Mexico if he was not permitted to use them. But in that case he needs to establish his special need with his pallet supplier (by means of buying specification) and ensure that his use of these dimensions do not cause problems to his customer in the receiving country. Departure from established standards can cause problems (which often means higher costs).

Another example concerns corrugated boxes for export. It is possible to establish certain parameters, such as those base dimensions that will give efficient fill on standard pallets. Prefered styles can be established and the kind of test to which the pack should be subjected in order to establish its resistance to damage in transit from compression, vibration and shocks due to dropping or other impacts. What is more difficult in a standard, is to set the minimum acceptable value for the results from such tests because the conditions of the journey cannot be defined adequately since they vary so much with the route and the mode of transport. For this reason many workers prefer to leave these minimum values until the journey hazards in a given case can be described.

Once minimum values have been established for a box known by the exporter to be satisfactoryfor his needs, he can then include them in the buying specification addressed to his box maker.

However, if examples can be given in the standard of the performance data for well established packs being used on defined sea, road or air routes for a given product this may well deter an exporter from using a pack that is almost bound to fail.

It has been said that the people responsible for preparing standards would benefit greatly by visiting covertors and users so as to better understand their needs and this is undoubtably true. The contacts made on such visits can be extremely important in resolving the doubts that arise when preparing standardisation documents. It would seem that the needs of the technical staff working in various specialised laboratories are the same and perhaps joint visits can be arranged.

With one person working in each speciality eg. plastics, glass, transport, etc, there could be problems in succession when that person leaves. Her accummulated experience leaves with her. There is also the question of maintaining continuity during holidays, sickness and absences for other reasons. It is also felt that interest would be better maintained over a long period if a Standards Section staff member was associated with more than one subject. Consideration of the above points leads to the idea that if the co-ordinators worked in pairs their work would be more effective and interesting. Certain subjects appear to go together naturally. in that they have some things in common for example glass and metal containers. plastics and technical studies, transport and wood, but how they are paired up is a matter for local decision if the idea is found attractive.

The members of the subcommittee should ideally see the draft (anteprojecto) before the meeting in which it is to be discussed but if the local post is unreliable this can be very difficult to achieve.

Draft and final documents contain many words and phrazes such as "debe ser", "tener que", "se deben consultar", "indispensable consultar", tolerancias permitidas". In a number of discussions the consultant expressed the view that in many cases the imperative sense did not seem justified as the standard was not intended to be mandatory and the item refered to was often not actually essential, but only helpful as in the case when reference is made to other

standards. It has been said that because a Mexican characteristic is a dislike of standards, forceful expression is regarded as necessary to command attention. The consultant is of the view that such forceful language may alienate industry because it could indicate a desire to control by legislation rather than a desire to improve the competitiveness of Mexican products in the world markets, protect the consumer and the environment and reduce packaging costs were ever possible. If industry are not convinced that the basic aim is to help they are hardly likely to devote their time and money to the standardization process.

D. 4 THE FUTURE PROGRAMME

The key to success in the Standards activity of LANFI is based on gaining the co-operation of industry. This will take a long time but it will come if the approach is right LANFI should, in the consultants opinion, concentrate on those things that it can do better than the industry now, or which it will eventually do better by virtue of its facilities, the qualified nature of its staff, and the specialities being developed in the many training exercises taking place at the present time. LANFI is best equipped to contribute to the scientific aspects of standard preparation and should focus on these aspects for the next two years.

In all of the specialised laboratories, being built up or established, the most vital need is to be able to carry out a wide variety of tests in a way that inspires confidence in the results. These are the tools of development work, in LANFI and in industry. Each laboratory has a reasonably clear idea of the tests methods they are going to be involved in over the coming two years, normally because they have the equipment to do them, or the neccessary equipment is on order. It is then a question of examining these methods and selecting those most likely to be of interest to the industry. Once a method has been established within the LANFI laboratories and confidence exists that its use, interpretation and possible applications to industry's problems are well understood, it can be presented to the relevant sub-committee for preparation as a national standard. There are a number of advantages in this approach.

1. Many of industry's problems are associated with quality disputes and a major type of help they require is in reaching a settlement. This normally involves careful comparison of physical and /or chemical properties.

2. More and more, Mexican industry is accepting the need for specifications (especially buying specifica tions) and for quality control of finished products. The basis for both of these activities is the measurement of relevant properties, therefore, it seems logical that the testing techniques are standardised. One of the major problems in the application of scientific methods to industry in those countries now described as developed was one of communication

because of the use of different types of test equipment and different methods. It is interesting to note how many standards have been issued by the British Standards Institute in recent years concerned with plastics test methods (See Annex 6). It seems unfortunate that such guidance was not available earlier in view of the widespread use of such testing techniques.

3. A most valuable service that LANFI offers is the testing of physical and chemical properties of packaging materials and containers. Establishing as Mexican Standards, the test methods, of which this service is based, is an excellent way of drawing attention to the testing service.

4. It is not only the test techniques that become standardised it is the type of test equipment too.

5. The activities of the Standards Section, are thus strongly reinforcing those of the various technical laboratories whose staff, in turn, will play a leading role in resolving the technical problems that arise during the subcommittee discussions.

6. A major contribution by LANFI to improving the technological base of the packaging industry will be in training courses. Therefore, it is important to establish that the methods being employed have been accepted and will be followed by Mexican Industry.

7. The kind of representation needed from industry and the nature of their contribution is much more clear cut than in other activities and this gives the system of working together a much greater chance of successful growth. Industry should feel it is gaining more and revealing less of its "trade secrets" then in other activities.

This approach can be applied to each speciality i.e. metals, glass, paper and board, plastics etc., but it is not suggested that it is the only material for a programme. To deal with this it would seem reasonable to form a special subcommittee in each to[illegible]e comprising of technical people from industry, from LANFI and related technological institutions. The

organisation of the subcommittee would be the same as that suggested earlier. Where two subcommittees exist for one speciality, as could well be the case with plastics, paper and board, metals and transport the logical thing would appear to be to alternate them so having one meeting each two weeks but the members only have one per month, which people from industry probably prefer.

PLASTICS SUBCOMMITTEE

Probably the most important facet of LANFI's work in food packaging concerns toxicological hazards. This is particularly important in the case of vinyl chloride monomer and acrylonitrile monomer and the fact that the presence of these in food products has been linked with possible cancer development. A great deal of work is being done in ths field and consultant - Dr. J. Miltz is guiding LANFI staff in the technology necessary to understand and overcome the problems involved. There will be a pressing need for standards to guide industrial practice when the position is clearer.

The question of permitted plasticizer type and concentration plus stabilizer and other processing aids needs to be standardised too. Related standards are BS 5638, EEC Directive 78/142 and SAA 2070 Part 2. The above remarks apply to acrylonitrile butadiene styrene (ABS) too.

Closely related to toxicity is the problem of odour and taint. In the case of styrene monomer toxicity and taint may well be involved (according to Dr. Miltz). However, the off flavour and odour problems being tackled by the plastics laboratory could well lead to acceptable levels for retained solvents, and various monomers such as styrene, and the Standards Section should stay close to this work. The standardisation of testing procedures for toxicity work (eg. agreement on food simulants to be used) and the test procedures for odour testing at factory quality control level and at the more sophisticated level necessary for shelf life determinations or for settling quality disputes between a seller and a buyer, would make a useful contribution to industrial practice.

A related standard is: BSI (PD) 6459" Guidance on avoiding odour from packaging materials used in Foodstuffs".

Packages for Dairy Products is a subject for standardisation in rigid, semi-rigid and flexible packaging. Relevant standards are BS4806, BS 4839,

SAA (Aust) 1326, SAA 1440. Cheese packaging may or may not be included with dairy products but it's packaging has been the subject of standardisation as in BS 4855, SAA 2071, Part 1 and SAA 2183.

Standardisation of test methods in the plastics industry is of considerable importance as indicated by the very large number of test methods issued by British Standards Institute in the last four years. Mr. Swinbank drew attention to the Handbook of Plastics Test Methods" (available in LAMFI library) which lists all the ASTM and BSI methods.

A related topic already started is that of the application of large plastic bottles to the carbonated drink industry, e.g. polyesters and acrylonitriles.

A very useful activity, is that of rationalising the range of plastic containers available from suppliers. This especially applies to screw capped jars and bottles. As mentioned in Mr. Swinbanks report the prefered sizes normally follow the progression 0.5, 1.0, 2.5, 5.10.

As with all subjects, establishing common terminology is important and although one standard is shortly to be published this needs expansion.

At the present time it appears that flexible packaging is not included in the plastics section. As the technology of plastic films and plastic rigid containers is so closely related it seems logical to deal with them both under one subcommittee.

Another subject well worthy of inclusion is that of stretch and shrink film technology. Shrink film (or stretch) has enabled reductions to be made in the use of corrugated board, an activity in keeping with the aim to increase the application of plastic materials. It is particularly attractive in export packaging, especially in the preparation of unit loads.

It is recommended that standardisation work in the field of the sterilizable pouch is not entered into as this subject is still undergoing intensive development and it will probably be several years before procedures can be standardised satisfactorily.

PAPER AND BOARD

The laboratory for testing paper and board is well established and well equipped. It is suggested that the programme should focus on test method standardisation throughout Mexico. There are forty or more test methods suitable for use by manufacturers and users. Special attention should be given to those associated with printing as this is such a widespread industry.

Examples of such important test methods concern:

Wet strength	BSI	2922
pH, Cl^-, SO_4^{--}	BSI	2924
Air permeability	BSI	2925
Rub resistance	BSI	3110
Burst	BSI	3137
Water vapour permeability	BSI	3177
Conditioning	BSI	3431
Basis weight	BSI	3432
Stiffness	BSI	3748
Tensile strength	BSI	4415
Tear	BSI	4468
Flat crush	BSI	4686
Puncture	BSI	4816
Thickness	BSI	4817
Crease quality	BSI	4818
IGT pick		
ORT	Tappi	
Edge crush	FEFCO	
Friction		

Consultant F.A. Paine will be working with the technical group in August and September and will be emphasizing the importance of performance testing of packs in place of the present reliance on material tests such as Mullen Burst.

A particularly troublesome subject on which the industry will need guidance concerns the rules governing contact between foodstuffs and paper and board, particularly if they are printed. There is quite a range of additives to be taken into account and the problem of impurities present in recycled board would be serious if direct contact is involved. Many countries have followed the lead of the F & DA (USA) organisation and listed permitted materials and those not permitted in contact with food. Manufacturers are called upon to give the assurance to users of packaging materials that everything present in the materials is

permitted under the F & DA rules and regulations. For exports to the United States this will be of considerable importance hence there is a real need to sort out the Mexican position on this problem and to issue documented guidance as to what should be done by Mexican industry.

Paper sacks can be standardised for certain applications eg BS 3725, Paper sacks for Potatoes, and EEC regulation 1636/74 concerning Paper sacks for skimmed milk.

Paper products in direct contact with dairy products, especially vegetable porchment, have been the subject of standards as in BS 1820, BS 5637.

A key subject will be standardisation of corrugated containers for fruit and vegetables and guidance on this work will be given by consultants A. Paine and E. Feingold.

GLASS SUB-COMMITTEE.

A most important task here is the standardisation of finishes, ie the finish of the neck and the screw threads. The final aim is that the caps from one supplier fit a given neck as well as those from any other. Relevant standards are: ISO/R1115, CETIE BV-1, BS 1918 Parts 1 and 2. BS 4602, BS 3130.

Standardising the capacities of glass containers for various applications has received a lot of attention in these last years and consultant C Swinbank draws attention to the increased activity of ISO T.C. 63 which should be closely monitored. Relevant standards are listed in Annex 4/3 (pages 1 and 2) of Swinbank's report, especially applicable are CEN Standards EN 76. and EEC Directives 75/107 1974.

A glossary of terms would be helpful, as in BS 3130.

Coatings are being used on glass containers to reduce scratching, and subsequent breakage, and to reduce the chances of splintering that can be a special danger in food packaging. Coloured glass is used to reduce the deteriorating effects of light on some food products but the colouring agents must be non toxic and should be standardised.

Standard test methods should be established for example for thermal shock (ASTM C 149-71), acceptable tolerances, especially for wall thickness (GMF, UK) and the vertical compression test to complement the internal pressure test method already issued.

METAL CONTAINERS.

The standards concerned with test methods could be a major part of the work of this sub-committee.

A most serious problem is that of lead content in canned food products. This is principally absorbed from contamination of lead solder traces that have contaminated the inside of the can. The permitted levels are being reduced, especially in EEC countries, and the general opinion is that lead soldering as a process will not be viable in the years to come but will be replaced by soudronic welding. This subject needs intensive study and standardisation.

Tin content of processed foods is not so serious but the present high permitted levels are being challanged by a number of countries, especially Holland, and reductions in permitted levels may well take place.

A special problem in the above studies concerns the distribution of the metal contaminant in a semi solid or solid canned product. Guidance by means of an acceptable method of analysis will be needed.

Consultant C. Swinbank draws attention to the increased activity of ISO Technical Committee TC 52 and the need to monitor their work. Due aspect of this will concern the further standardisation of metal container volumes, already a subject of issued Mexican Standards and one dealt with in such foreign standards as: CEM. EN 76, ISO 3004/1 1979, ISO 3004/2 1979, ISO 90 1977, ISO 1361, ISO 2735, BS 1764 and BS 5596.

TEXTILES.

Perhaps the most important new product in textiles is the intermediate bulk containers (IBC) made from woven polypropylene or other plastic of similar tensile strength. These large bags hold up to 1 ton of product and some are intended for re-use. There is a real need to standardise design features and testing techniques for this type of container.

WOOD

The work on standardising fruit and vegetables packaging in corrugated boxes needs to be complemented in wooden containers too. Relevant foreign standards are: N 54 (Aust) 255, BS 2892, BS 3018, BS 4144 and the OECD & EEC recommendations on the packaging of fruit and vegetables.

TECHNICAL STUDIES

This sub-committee has been actively involved with test methods for transit testing and a number of standard test procedures have been issued. There still appears to be a lot of work to do, however, in particular.

a. General topics

Relevant foreign standards are ISO 2206, ISO 2233, ISO (DIS 4180/1, BS 4672, ISO (DIS 4180/2, BS 4826, BS 6000, BS 6001

b. Stacking tests

ISO 2234, ISO 2874

c. Inclined plane test

ISO 2244, AMSI. MH 12.4

d. Water spray test

ISO 2875

e. Water vapour transmission

ANSI MH 12.12

f. Shok

ANSI/ASTM D 3332-77
ANSI/ASTM D 2956
ANSI/ASTM D 3331-77

The subject of adhesives would appear to fall in this grouping, for example:

a.	Classification of adhesives	BS 5407
b.	Adhesive test methods	BS 5350

Another subject that could be examined is that of standardisation of printing ink properties. This is a very difficult subject but are in which industry is always very interested.

TRANSPORT AND HANDLING

A glossary of terms is always useful (as in BS 4778) and pallet terminology (ISO/R/445).

Method of defining optimum pallet dimensions have been dealt with in standards ISO/R 198, ISO R 329, ISO/DIS/3676.3, ANSI/MH 10.1 SAA (Aust) 1899 and ANSI / MH 1.2.2.

The above pallet dimensions can only be guidelines as opinions still differ widely throughout the world as to what are the optimum dimensions for through transit pallets. The exporter should have the possibility to take maximum advantage of the kind of transport he is using ir any given case. However, it is important that he is made aware of why certain sizes are prefered to make it clear and that any decision to move away from those sizes recommended by ISO needs to be carefully considered as problems may well arise in the importing country.

Guideline standards are needed relating the dimensions of rigid packages to the efficiency of loading on standard pallets. Relevant standards are ISO/3394 and ANSI MH 10.2.

Pallet testing methods need to be standardised as in BS 2629 Part 3 and ANSI MH 1.4.1.

A growing field is the use of slip sheets in place of pallets, especially for exports. There are a variety of material and designs and if it appears that their application is relevant to Mexico, it would be helpful to standardise their form and strength characteristics.

E. RECOMMENDATIONS

1. The co-ordinators should actively seek out information about the subjects under discussion by their subcommittee. A system is needed by which they can obtain photo copies of relevant articles, standards etc. The subscription to PIRA abstracts should be re-instated and the 1980/81 gap filled.

2. Industry must play a more important role in standards preparation.

3. The frequency of meetings should be reduced to one per month.

4. A second committee concerned only with test method standardisation should be formed in the case of plastics, metals, technical studies, paper and board, and transportation.

5. Instead of Standards Section Staff specialing in one topic they should specialise in two subjects at east e.g. wood, textiles and transportation: technical studies, plastics and paper and board: metals and glass.

6. The first draft document presented to the sbucommittee should reflect the doubts and difficulties experienced by the co-ordinator. The points on which committee discussion and agreement is required should be clearly noted, to supplement those raised by the subcommittee members.

7. The future programme should concentrate on those aspects in which LANFI is best equipped to handle, i.e. scientific aspects, especially measurement.

8. The wording of standards should be softened somewhat in all non mandatory standards. The purpose to help should be more obvious than the purpose to control.

ANNEX I

JOB DESCRIPTION

DP/MEX/78/011/11-05/B/ 31.7.E

Post title Expert in Food Package Standardization

Duration three months

Date required 1 July 1981

Duty station Mexico City, with travel as required

Purpose of the Project

To consolidate the Mexican Institute of Assistance to Industry from the technical and performance points of view, with regard to its basic activities in the field of packaging. Particular emphasis is put on the enlargement, complementation and specialization of the Institute's technological capabilities, in order to accomplish its role in providing the country with permanent services as packaging information, standardization training, design, applied research, testing and quality control and advice on appropriate packaging industries development.

Duties

The expert will be assigned to the Mexican Institute of Assistance to Industry where he will report to the local UNDP Resident Representative and the UNIDO SIDFA for the region. His activity will be agreed upon with the national counterparts and co-ordinated by the UNIDO's Project Manager in the field. He will specifically be expected to:

1. Get acquainted with the status of food packages standardization in the country, specifically with existing standards, standards under preparation and standards being requested at present.

2. Prepare a programme of food package standards to be agreed upon and proposed by the Mexican Packaging Institute of Assistance to Industry for a certain period, such as two years, taking into consideration the national prevailing conditions and priorities.

3. Elaborate a list of international standards and national standards from other countries suitable to be used for the study and drafting of the food package standards proposed in the above paragraph.

4. Co-operate actively with the counterparts in the preparation of drafts for national food package standards, according to its priorities which, in principle, will be agreed upon by the Mexican Institute of Assistance to Industry and the General Direction for Standards.

5. Participate as an observer and/or adviser whenever requested during his mission in the meetings of the National Committee for Packages Standardization.

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

ADDITIONAL ACTIVITIES

In addition to the duties included in the job description it was agreed with the Project Managers that the following activities would be carried out:

1. To join the Paper and Board consultant in presenting a seminar on paper and board packaging and the flexible packaging consultant in presenting a seminar on the flexible packaging of food.

2. To give periodic talks to the standardisation group and other members of staff.

3. To pay a series of visits to industry to ascertain the level of standardisation at present in existance. Members of the standardisation group to accompany the consultant on these visits to orientate them into the methods of operation common in the packaging industry.

4. Liaze with the specialist consultants also on the project to ensure that the recommendations they are making related to standardisation group and that the group are given guidance as how to follow up these recommendations.

5. To arrange a slide presentation on the various types of test equipment used in packaging laboratories in other parts of the world.

ANNEX 2

LIST OF CONTACTS

United Nations Development Programme

A. Faust	UNIDO Programme Officer
F. Fajnzylber	UNIDO Senior Industrial Development Field Adviser

United Nations Industrial Development Organization

L. F. Ceribelli Madi	Project Manager

Laboratorios Nacionales de Fomento Industrial

Dr. J. A. Careaga	Director General
Ing. A. Reynosa Vega	Director Técnico
F. Muñoz Ruiz	Subdirector de Tecnología de Envase y Embalaje
E. González Rocha	Jefe del Depto de Diseño Industrial
Ricardo Monroy Morales	Jefe del Depto. de Productos Alimenticios
Rolando Inzunza Camacho	Jefe del Depto. de Procesos Tecnológicos
Gabriel Cendejas Avalos	Jefe del Depto de Productos Químicos
José de Jesús Lozano López	Jefe del Depto. de Química Analítica

Renán Pérez Priego	Jefe del Depto de Proceso de Minerales
Andrés Guerra Aguilera	Jefe del Depto. de Papel y Cartón
Sarah García Silberman	Jefe del Depto de Relaciones Públicas

Standards Section

María del R. Cervantes Nova	Head
Ninfa Rodríguez de Leo	Paper and Board
Guadalupe Ayala Piñón	Wood
Mar. del Carmen Barba Franco	Glass
Nury López Fraga	Plastics
Ana Luisa Rentería	Textiles
Elsa Austria Mireles	Metals
Angélica Armenta Castellanos	Technical Studies
Ma. del Pilar Aguilar Orozco	Transport

Cartón de México

A. Caballero	Sales Manager

Merck Sharp and Dohm, Cía

Jorge León	Head of Quality Control

Loreto y Peña Pobre, Cía

Mario Calderón	Head of Quality Control

ANNEX 5

WRITING AN EFFECTIVE SPECIFICATION FOR A BASIC PACKAGING MATERIAL

INTRODUCTION. Package development, originally considered an art, is now rapidly becoming a science. More package engineers entering the field are college trained in the sciences with degrees in packaging, mechanical engineering, etc. The design of the package itself has gone from a task performed at the end of the product design to a concurrent engineering development program.

The packaging material has developed from an unimportant add-on integeral part of the product. The modern packaging material is now an engineering material much like a piece of engineered plastic or steel. The ever increasing costs to manufacture and deliver a product to the customer dictates that the package be more than an interim container, and the selection of the correct materials to package a product has become as critical as the design of the product itself.

Correct selection of packaging materials. An important part of the package engineers job is the selection of the package material used to manufacture the selected design. The correct selection of materials and the constant assurance the material is best suitable to adequately protect the product at a reasonable cost is a very difficult task. The package material specification is the package engineer's component drawing for the design and should be developed and used as comprehensively as any product designer's drawing or specification.

Specifications can be written for finished materials, such as corrugated or paperboard, for machinery, to describe the expected functions and requirements, for basic materials such as, inks, adhesives or paper, or for finished converted materials, such as polyethylene coated paper or an adhesive coated film. The possibilities of combinations are endless. This article will describe the basic package material specification by describing and listing the basic format of a material specification and utilizing a converted material, for example, a paper/polyfoil/adhesive.

SUMMARY: This article describes the basic package material specification and explains how it is used. Using a typical material, the author provides a step-by-step review of the formulating and writing of the specification for it. Examples are used to show how to develop the material specification. The content of each individual section is explained in detail.

SPECIFICATION DESCRIPTION. The package material specification is a written description of an approved material. This includes a description of the basic components (optional) of the material (in this case, paper, foil, polyethylene, and an adhesive), a description of the properties of the converted material combination and a listing of the approved vendors.

The specification is an effective tool used by engineering, purchasing, quality control and manufacturing to deliver a finished product. A properly written specification can be beneficial to all of the material suppliers and the user. The material suppliers know exactly what materials they are expected to supply. The customer or end user benefits because he knows exactly what materials he will receive, additionnally he has a basis for rejecting poor quality materials, to search for alternate sources or cost reduction proposals, and finally he has an exact record of what materials have been approved and what suppliers and converters of these materials have been approved.

The specification of a packaging material is as important as the selection of the material. The specification may be used to supplement the component drawing or quality control specifications, or be adding various sections to the basis specification such as physical dimensions and acceptance test requirements, the material specification can be an all-inclusive document and eliminate the need for additional specifications.

The specifications can be written to meet the requirements of the industry. For the pharmaceutical industry a very comprehensive specification may be required. For a less demanding industry, a far less complicated document may be required. In general, the more complicated the specification, the more demands are required, therefore, the cost of the material is usually higher.

The specification should be written with care to define meaningful parameters. The material, as described by the package specification, should never be considered the minimum acceptable which will do the job unless testing proves this is so. The properly written specification should be utilized as a tool to evaluate and approve alternate, possible lower cost materials which will have the same usage value as the original approved material.

Specification outline. The package specification is divided into a number of sections. Depending upon the complexity of the requirements of the material, sections may be divided into a number of subsections. Length is not a determining factor. One page may be acceptable for a very simple item, and 20 pages may not be enough to describe a complex laminated material. For a multilayer flexible packaging material such as the paper/poly/foil/adhesive combination used as the example, the sections can be expanded to include a full descriptive section on each of the four subject materials or one section with four subsections to describe each of the basic materials, and one section to describe the properties of the final configuration.

A basic outline for the specification of the flexible material used for our example is contained in Figure 1.

The title of a specification should be an exact description of the contents of the specification. The purpose lists the exact accomplishments of the specification. The basic material sections describe each of the basic materials as they are received from the suppliers. The converted material specifications are a listing of the requirements of the finished converted material including the requirements of the material as it is received in the production plant. The suppliers' requirements include a listing of additional details on the materials including warranties, certifications, etc. The approved suppliers include a listing of each of the approved suppliers of the basic materials and the final converted material. The revisions are a chronological listing of the changes made to the original documents.

I. Title

II. Purpose

III. Properties of the basic materials (optional)

- A. Paper
  - 1. Base constituents
  - 2. Physical Properties
  - 3. Dirt and cosmetic requirements
  - 4. Receiving requirements
- B. Polyethylene
  - 1. Base constituents
  - 2. Physical properties
  - 3. Dirt and cosmetic requirements
  - 4. Receiving requirements
- C. Foil
  - 1. Base constituents
  - 2. Physical properties
  - 3. Dirt and cosmetic requirements
  - 4. Receiving requirements
- D. Adhesive
  - 1. Base constituents
  - 2. Physical properties
  - 3. Dirt and cosmetic requirements
  - 4. Receiving requirements

IV. Converted materials specifications

- A. Basic materials
- B. Physical properties of the converted material
- C. Dirt and cosmetic requirements
- D. Coating and printing requirement
- E. Material as received by the user's production plant

V. Supplier requirements

- A. Warranty and guarantee
- B. Quality control
- C. Processability
- D. Traceability
- E. Other specific requirements

VI. Approved Suppliers

A. Approved paper suppliers

B. Approved polyethylene suppliers

C. Approved foil suppliers

D. Approved adhesive suppliers

E. Approved converters

F. Approved combinations

VII. Revisions

Figure 1