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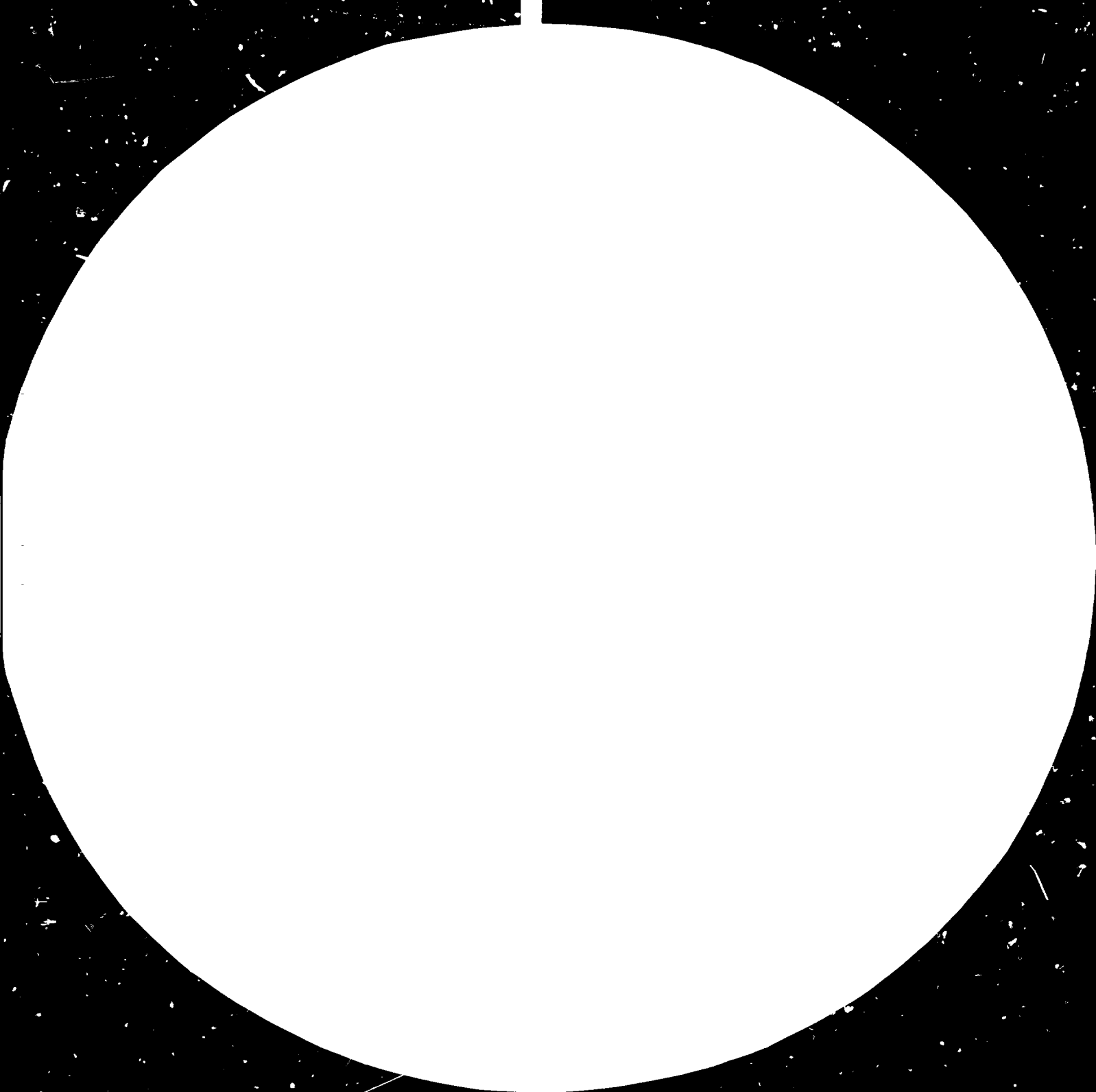


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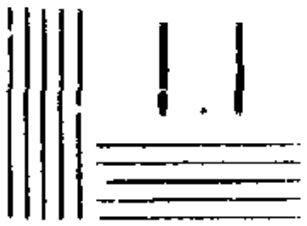
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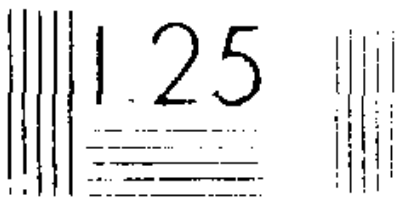
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CONSOLIDATION OF THE MEXICAN INSTITUTE FOR ASSISTANCE TO THE INDUSTRY

DP/MEX/78/011

MEXICO

Technical report: Production of paper and cardboard packages *

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 Frank A. Paine, Consultant in the production of paper and cardboard packages

United Nations Industrial Development Organization
Vienna

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1. INTRODUCTION

1.1 General

The assignment was carried out in two parts. The first part between April 1st. and May 27th and the second between August 18 and October 6, 1981. During the period between the two, LANFI packaging personel continued the work commenced in the first part of the mission. This report summarizes the work carried out in the two periods.

I would like to record my thanks to LANFI for the facilities provided and express my appreciation for the courtesy, cooperation and enthusiasm of all members of the organization concerned.

The laboratories were largely in temporary accomodation during the mission but new and permanent facilities were almost completed by its end. It is anticipated that in early 1982 the laboratory equipment for the groups involved in this project should be in good working order.

1.2 Objectives

To advance the capabilities of the National Laboratories for Industrial Development (LANFI); now consolidated with the Mexican Institute for Assistance to Industry into one autonomous organisation: by work in the following areas:

1) Evaluation of paper and paper board packaging used in Mexico.

2) Appraisal of raw materials, techniques and equipment used in manufacturing paper and board packaging both from technological and economic view point.

3) Comment on the paper and board aspects of a study already completed of the present production capacity for paper based packaging in Mexico in the short and medium term.

4) Suggest means of reducing imports of raw materials for paper and board packaging, including possibilities of increasing the use of recycled fibres collected within the country.

5) Provide guidance in the selection of test methods and procedures; particularly for:

Fibreboard cases and related packaging

Folding boxboard cartons and

Paper wrappers, bags and sacks.

6) Train relevant personel at LANFI in the application of package and materials tests to the solution of packaging problems designed to:

a. Reduce overall costs of distributing goods.

b. Improve performance of unsatisfactory packaging.

c. Develop cost effective packaging for new products or markets.

Items 1, 5 and 6 were studied during both parts of the mission. Items 2, 3 and 4 were investigated during the second period.

1.3 Background

The Mexican Institute for Assistance to Industry (IMAI) was set up in 1977 and was consolidated into the National Laboratories for Industrial Development (which was established in 1948) in April 1981.

LANFI is currently the only Packaging Institute in the Estados Unidos de México and as such must play the major role in promoting good packaging practice and, more importantly, awareness in the country of the importance of packaging in the protection and preservation of agricultural and industrial products.

The packaging department of the laboratories was arranged in three groups:

Transport packaging.

Retail packaging and materials testing.

and Food packaging and preservation, but this arrangement was altered to give better utilization of manpower before the consultant left. (See Appendix VIb).

Other departments are concerned with Packaging Design; (principally graphic design) Plastics, Packaging Machines, Paper and Pulp, Chemical Analysis and etc. and their expertise may be called on as necessary.

The technical personel have good scientific background and although young and relatively inexperienced in tackling commercial packaging problems are enthusiastic and the department as a whole works well together and is begining to develop a pioneering sense in the improvement of packaging as a major contribution to reducing losses of food products during distribution and protecting industrial products for both domestic and export markets.

When this mission started plans for a packaging testing laboratory and most of its equipment had been made and before the end of the mission the building of this Laboratory had been completed and equipment was partly installed.

The principal need is for equipment to enable the making of experimental packages and fittings in paper based materials; particularly corrugated board, to be carried out. Some extra testing apparatus for materials testing, particularly folding boxboard has been recommended.

2. WORK CARRIED OUT DURING MISSION

2.1 Period April 1st. May 27th, 1981

Summary of Position on Completing First Part of Mission.

The modified job description contains seven paragraphs and some work has been commenced on all seven. The general evaluation of paper and board packaging used in Mexico has been made in Mexico City and places in Mexico State, Puebla, Acapulco, and Taxco and this will be extended to other large centres in the second part (Veracruz and Monterrey or Guadalajara are suggested). No comment is considered advisable at this stage. Some discussions and some of the visits to industry have provided data on the raw material situation, techniques and equipment used in making paper board packages. The study of the production capacity in the short and medium term produced by PIRA and LANFI has been examined. These items together with an assessment of the possible increase in the use of recycled fibres will be the principal areas examined in the second part of the mission.

The main emphasis so far has related to paragraphs 5, 6 and 7 of the modified job description and the procedure here has be to work with the appropriate LANFI personel in several ways.

i) On all possible Tuesday and Thursday mornings between 0900 and 1030 an informal presentation of specific aspects of paper and board packaging evaluation, quality control and standardization was made followed by discussion.

ii) Two or Three of the appropriate LANFI staff accompanied the consultant on visits to Industrial Organisations and the packaging manufacturing processes and discussions with production, sales and administrative staff of the visited company were used to illustrate points of detail in the economic use of materials.

iii) Problems resulting from industrial enquiries regarding testing and standardization were discussed as they arose. In particular the packaging of cement in paper sacks, eggs in moulded pulp trays and corrugated cases and packaging for fruit and vegetables were examined.

iv) A formal seminar covering Quality Control for Corrugated Fibreboard Cases and Folding Boxboard Cartons was held.

(May 20-22, 1981, with the assistance of Mr. John Salisbury, UNIDO consultant in Standards for Food

Packaging; Ing. Andrés Guerra, Head of Paper and Cellulosa Group, LANFI; Ing. Olga Arce León, Head of Packaging Evaluation Group, LANFI and speakers from industry. This was well attended by 46 participants (26 from industry and 20 from various LANFI groups) and included demonstrations of the use of test equipments for paper and board packages, and materials by the appropriate LANFI personell.

The consultant also attended and took part in the discussion sessions of a Seminar held 8-10 April on the "Design of Packaging for Food and Industrial Products" conducted by Ing. M. en C. Ernesto Freire Pichler, UNIDO expert and Ing. M. en C. Eli Feingold, Israel Expert on Agricultural Products and a seminar held on 7 May on "Economics of Packaging" conducted by Dr. Karoly Lotz, UNIDO expert.

It is anticipated that a Seminar on Paper Wrappers, Bags and Sacks conducted by the consultant will be held in the second part of the mission.

Although it was not possible to visit all the companies and organisations listed in the program for the first part

of the consultancy, this was 90% achieved and the remainder are scheduled for the second half.

2.2 Period August 18th. October 6th, 1981

On returning to LANFI the first week was spent receiving reports on the work carried out during the consultant's absence and checking the arrangements for visits in the second part of the mission. About 2/3 of the tasks set had been completed and the results were discussed with the staff concerned and plans laid for the next action. In particular the acquisition of data on paper and board packaging in Mexico and observations on the transport hazards of distribution by road in Mexico were noted and converted into a suggested Test Schedule (See Appendix VI a).

Most of the visits made in this part of the mission were carried out during weeks 3, 4and 5 i.e. between August 29 and September 20, and to give more time for planning the Seminar on Wrappers, bags and Sacks was moved from the projected dates of Sept. 19-20 to October 1st and 2nd. Visits of 2 or 3 days were made to Veracruz to see dock handling; visiting a corrugated case maker and the Moctezuma Brewery en route; and to Cuadalajara to visit the Instituto Madero, Celulosa y Papel and Atentique to the Pulp and Paper Mill there. (See Appendix VII for visits made during the mission).

Some time was spent in studying the PIRA/LANFI Statistical Survey (as background for the improvement of the raw material situation in Mexico) and in discussing with industry contacts possible changes (See Appendix V). The collection of carton board packaging was continued (Appendix IV).

Discussions on the organisational structure of the Packaging Section of the "Manejo de Productos Envasados" department lead to the Transport and Retail Packaging Groups being consolidated under one head reporting to the Jefe de Sección; Olga Arce León. This removes the difficulty found because many problems involve cooperation between both (originally separate) groups. A Monday morning meeting procedure was suggested and adopted for planning purposes with all staff. In the first six months or so this should also be a useful educational tool after which the procedure should be reviewed and streamlined.

The seminar on Wrappers, Bags and Sacks was held with assistance from Mr. Feingold, Consultant to LANFI from Israel, and speakers from LANFI and Industry. Mr. William Simms and Mrs. Loa Karjalainen, UNIDO Consultants contributed to the discussion periods.

The consultant returned to England via Vienna where debriefing was carried out on October 9th.

3. CONCLUSIONS AND RECOMMENDATIONS

These are written in the order and related to the Consultant's terms of reference as given on page A6 of this report in Appendix I.

1. Evaluate the paper and board packages used in Mexico and their present appropriateness.
2. Appraise the raw material situation the techniques and equipments used in the present production of paper and board packaging materials.
3. Comment on the paper and board aspects of the PIRA/LANFI Statistical Study.

Conclusions on 1, 2 and 3 above.

a. Corrugated Fibreboard Cases and Fittings.

These vary considerably in quality, to some extent because the industry has tried to adopt. U.S.A. standards (Rule 41 American Assoc. Railways) of bursting strength as the only criterion, failing to appreciate that these standards are based on the use of Kraft liners made from softwood pine timbers while even the 100% Kraft liner in Mexico is based on a mixture of several different wood species including hardwoods.

b. Folding Boxboard Cartons

Although the quality of board used here varies it is not markedly different from that found in the middle ranges of many more sophisticated societies. A fairly representative study (See Appendix IV) of the properties of boards used for a variety of retail products was made and this indicates that in many instances thicker and stronger boards than necessary are being used probably because board makers are too limited in the ranges of weights and grades offered. User companies should consider specifying lighter boards for some of their products and LANFI could assist here in determining the strength requirements needed. This should improve the material supply situation since lighter boards from the same tonnage of pulps could increase the area available by 5-12%.

Wrappings, Bags and Sacks

The qualities of papers used for wrapping and bags many of which are made from reclaimed fibre only are very varied and at the worst not capable of doing the job required. Again a shortage of quality pulps is the main cause.

It is a common practice in supermarkets to place two of the larger bags one inside the other, to produce a duplex bag because a single bag is incapable of carrying a full load. This practice

produces a bag, stronger than necessary and uses more material and it would be more economic to make the larger bags of a stronger (heavier) paper than the smaller ones. Incidentally similar practices are adopted with the polyethylene carrier bags used for the same purpose.

The quality of paper sacks; the greater proportion of which are used for cement is generally fairly good and some extensible Kraft (Clupak) is now being manufactured. Comments on stock preparation designed to make better use of present supplies were given in the notes to the Seminar on this subject and target figures for relevant properties where supplied to one paper mill (Atentique).

The FIRA/LANFI Statistical Study was helpful in an understanding of the situation as regards paper, board and pulp availability in Mexico, but it would be advantageous if it could be extended to ascertain the usage of packaging materials of all types in the major industrial sectors e.g. Food, pharmaceuticals and chemicals, household products, consumer durables, etc. Information on specifications or lack of them in specific areas would also be useful.

The main problems from the supply side is the shortage of suitable highgrade (principally Kraft) pulps made in Mexico and I estimated that at least 3; 70,000 tonnes per annum or more Kraft pulp mills should be established in the next 5 or 6 years.

During the short term imports of such pulp will be needed to fill the gap. Paper and board making capacity is not yet reached and should be adequate over the same period.

Recommendations on 1, 2 and 3.

i) Consider establishing 3; 70,000 tonnes (or more) Kraft pulp producing mills during the next 5 or 6 years. It is not essential for these to be adjacent to paper mills.

ii) Improve the quality of current papers by R & D with present paper mills particularly for sack kraft and kraft liner. Cooperation between IMCP, LANFI and consultants such as PIRA, or Scandinavian or American, Research Institutes to

a. Reduce broke

b. Improve stock preparation

c. Increase drainage capacities of paper machine ends and improve stretch characteristics of sack

could assist in these areas.

iii) With the cooperation of the corrugated fibreboard industry consider how the present quality of liner could be improved. In any event grades should specify permissible liner materials and weight and not just bursting strength. Possible improvement might be made (and this could be studied with the LANFI equipment and expertise) by one of the following:

a). Use pure Kraft (100% new pulp) outer liners and 50% new pulp / 50% imported waste mixtures for inner liners instead of present practise of using 75% new pulp/ 25% imported waste as at present for all liners.

b). Consider producing test liners with a pure (100%) Kraft top layer and 2, 3 or 4 inner layers of reclaimed fibre from domestic waste using multiwire paper machines (or cylinder machines).

c). Improvement of the shower resistance of the boards and liners, as measured by a 30 minute Cobb test, should also be attempted. Assistance from a UNIDO consultant on Paper and Papermaking in these areas could be helpful

iv) Extend the PIRA/LANFI statistical study to cover the industry user sectors particularly for Food, Pharmaceutical, and Chemical, household products and consumer durables.

v) Continue to collect, analyse and measure relevant properties of the paper based packages commonly used in U. E. de México and analyse the findings in product areas with a view to making recommendations on the materials needed for particular purposes.

4. Can an increase in the fibre produced from domestic waste assist in reducing imports of pulp, papers and boards used for packaging?

Conclusions

In the consultants opinion the major need in the packaging area is for high grade (mainly Kraft pulp both bleached and unbleached) and this requirement cannot be helped by increased supplies of waste paper for recycling

However, there is a particular need for more and improved packaging for eggs. These are delivered from farm and packaging station to retail outlets on one size of moulded pulp tray and sold as 30 egg packs (whole tray) or 15 egg packs (1/2 tray) by overwrapping in stretch film.

Increase of waste (reclaimed) pulps could be used for producing 6/12 moulded pulp boxes; particularly if the small unit moulded pulp equipments developed for LDC's as intermediate technology were installed adjacent to the egg production areas. Moulded pulp forms for other protective packaging components might also be produced and this could provide part of the (almost certainly) substantial increase in packaging materials needed in the next 5 or 6 years. It should be remembered however that such packs can also be made from expanded polystyrene and since Mexico is a major oil producer and PEMEX are believed to be able to increase the intermediates for EPS production, there will be political, technical and economic consideration on such a decision.

If it is decided to increase the amount of reclaimed fibres from domestic waste if should be remembered that this is never an easy task and often the cost of achieving it is of the same order or greater than using alternatives **such as new pulps; imported and domestic higher grade waste; or foamed plastic alternatives.**

Development of other vegetables fibre sources such as by-product fibres from sugar, tequila and maize etc. which the IMCP at Guadalajara are studying might be equally valuable and pilot scale pulps could be evaluated by the LANFI packaging group.

Recommendations on 4

i) Investigate the possibilities, technical and economic, of using the intermediate technology developed for UNIDO in the area of moulded pulp package production from locally collected waste paper and

ii) Compare this possibility with possible EPS production of similar packaging materials.

iii) Study more carefully the destination of trim and unavoidable waste produced by paper and board packaging and printing converters and the possibility of increasing reclaimed fibres from these sources before undertaking the much more difficult and costly recovery from domestic refuse.

Items 5, 6 and 7 of the Terms of Reference are all related to improvements in LANFI expertise, equipment, test methods and procedures with the commercial objective of:

i) Reducing costs of packaging and distribution where technical performance is adequate.

ii) Improving performance of unsatisfactory packages.

iii) Developing procedures for evaluating new package or designs of packaging for new markets.

These formed a major part of the mission and the main recommendations are as follows:

a. The packaging group as now reorganised with the original transport and material sections as one group is better constructed to tackle the work and;

b. During the next six months or so, efforts should be made to get packaging users in the food, pharmaceutical household and other retail areas to cooperate by supplying packages in current use: the performance of which can be quantified and whose distribution system can be studied, to be subjected to the tentative Standard Transport Test Sequences. I would suggest that companies participating in this study should receive a report on the package (s) submitted at no or a low charge provided they

supply the required number of filled complete packs, the normal expected damage rate, and access to or details about their distribution system in Mexico.

c. The work started on an Accreditation Scheme for other testing laboratories in the E. U. de México should be progressed with the assistance and advice of industry. This fairly long term project will be dependant on the successful evaluation of the test sequences mentioned in b) above and the development of simpler procedures for individual tests. It is not considered advisable (at this moment in time) for these laboratories to use the standard sequence for the evaluation of packs.

d. The studies started on packages collected from retail outlets to provide a base line as to current practise should be continued and the results analysed both according to product area and packaging producing sector. Most work has been done so far on folding box board but this can be extended beyond the paper and board sector into plastics, glass and metal.

e. Training. - When suitable short courses relevant to staff needs become known in other countries advantage should be taken to attend, and staff should be encouraged to develop their own knowledge in specific areas. The possibilities of exchanging reports with other packaging research institutes should also not

overlooked, but there is a need for a period of general consolidation once the equipment is installed in the new building and the suggested program of work is commenced.

f. At present the Papel y Cartón section houses and operates most of the paper and board material tests, whether these are for pulp evaluation, printability or for strength characteristics. If this is to continue, a system should be developed to permit the packaging laboratory staff to obtain greater priority for their tests. Consideration might also be given to the possibility of transferring the relevant test equipment for packaging strength characteristics for both paper and plastics based materials to the packaging group and creating a flexible materials testing laboratory here.

9. Papel y Cartón should also improve the facilities available and the speed with which the determination of fibre furnish (the fibre constitutents and proportion present in any paper or board packaging) can be carried out. If necessary, a member of the staff should be sent for training in this specialization.

APPENDIX 1

ORIGINAL JOB DESCRIPTION

DP/MEX/78/011/11-06/31.7.E

Post title:	Consultant in the Production of Paper and Cardboard Packages.
Duration:	4 months in 2 periods of 2 months each.
Date required:	April/May and mid. August/mid. October, 1981.
Duty station:	Mexico City, with travel within the country.
Purpose of project:	To consolidate the activities of 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 placed on enlarging, complementing and specialising the Institute's technological capabilities, in order to fulfil its role of providing the country with such permanent services as packaging information, standardisation, training, design, applied research, testing and quality control, and to advise on the appropriate development of the packaging industries.

Duties:

The activities of the expert will be agreed upon in co-operation with the national counterpart personnel and co-ordinated by UNIDO's project manager in the field. The expert will be assigned to the Mexican Institute of Assistance to Industry (IMAI) and will specifically be expected to:

1. Make a general evaluation of the paper and cardboard packages used in the country and assess how appropriate their present use is.

2. Make an appraisal of the raw materials, techniques and equipment used in the country for the manufacture of paper and

cardboard packages, both from the technological and economic points of view.

3. Carry out a study to assess whether the present production capacity of paper and cardboard packages in the country is sufficient to meet the demands foreseen for the next ten years.

4. Prepare a skeleton plan for the enlargement of the existing paper and cardboard manufacturing plants and/or for the establishment of new ones in order to meet the national demand for packaging materials during the next ten years. Feasibility studies on the execution of this plan should be organised.

5. Prepare the basis for a tentative programme to increase the recycling of paper and cardboard packaging materials in the country and to substitute imported raw materials whenever possible.

6. Give ad hoc advice on other matters related to the technology for the production of paper and paperboard packages according to requests received from the counterparts.

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.

Qualifications: Packaging technologist with a university degree or equivalent experience. Professional specialisation covering the manufacture and utilisation of paper and cardboard packaging materials.

Language: English, Spanish an asset.

Background Information:

From January 1974 to December 1976 a project was implemented at the Mexican Packaging Institute which aimed at establishing a technological institution capable of carrying out specialised functions in the broad field covering information, training, standardisation, applied research and quality control. When the present Government of the Republic took up office, a temporary suspension of the project was requested until such time as the Government policy for the six year period had been defined.

The Mexican Institute of Assistance to Industry was later created by governmental decree, thereby integrating the Mexican Packaging Institute and the departments of design and industrial information from other institutions. The packaging sector has, however, been kept as the main field of application for the new Institute which, for the time being, has directed its design and industrial information activities exclusively towards the field of packaging.

The present project has been requested mainly to consolidate the activities of the Mexican Institute of Assistance to Industry, as described above.

The project includes a general study on the national demand for the products and on production facilities presently available in the country. A study on the complementary facilities to be installed locally in order to satisfy the national needs using locally available raw materials, manpower and appropriate technologies is also included.

LETTER TO MR. MANNING CONTAINING MODIFIED JOB DESCRIPTION AND PROGRAM FOR FIRST PART OF MISSION.

April 13, 1981

E. Manning
Acting Head
Agro Industries Branch
Division of Industrial Operations
UNIDO

Dear Mr. Manning:

Thank you for your letter of welcome dated 30th March, 1981 handled to me via Mr. Belo in Vienna on the occasion of my briefing session for the Mexican Project.

On arrival at LANFI I had discussions on the program with Mr. Madi, Co-Director and UNIDO Project Manager and Mr. Muñoz, Technical Manager responsible for the Paper and Board Packaging Group of LANFI.

As a result it is suggested and I am happy to accept the proposal, that I should concentrate on training LANFI personnel in the analysis and solution of packaging problems involving paper and board, to promote the cost effective utilisation of existing packs and materials. This you will see expands the work covered by the last two items in the original job description, placing more emphasis on the ad hoc requests and will of necessity reduce the time available for other parts of the assignment.

We have therefore prepared a modified job description a copy of which is attached.

You will also recall that this assignment is split into two parts and during my second visit, which we now suggest takes place between

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August 18th and October 11th, 1981 it should be possible to devote more time to items 2, 3 and 4.

I trust this will meet with your approval.

Yours sincerely,

Frank A. Paine

c.c. Mr. Danilo Jiménez
Resident Representative of UNDP

Mr. F. Fajrzylber
Senior Industrial Development Field Adviser

Mr. J. A. Careaga
Director General IMAI-LANFI

Mr. L. F. C. Madi
Co-Director UNIDO Project Manager

Mr. J. Belo
Industrial Development Officer Agro-Industries
Branch UNIDO.

PROPOSAL FOR DUTIES OF CONSULTANT IN THE PRODUCTION

OF PAPER AND BOARD PACKAGES

1. Generally evaluate the paper and paperboard packages used in Mexico and assess their present appropriateness.

2. Make an appraisal of the raw materials, technique and equipment used in the manufacture of paper and board packages, both from the technological and economic view points.

3. Comment on the paper and board aspects of a study already made of the present production capacity for packaging materials in Mexico in the short and medium term

4. Suggest means by which the use of recycled fibres domestically produced from waste paper and board could be increased and thus reduce imports of paper and board based packaging materials.

5. With the objective of achieving cost effective packaging in all product areas; and bearing in mind that 45-50% of all packaging is made from paper and board; to provide guidance to LANFI in the selection of test methods and procedures for specific purposes and to assist in the interpretation of their relevance to Mexican distribution systems and overseas transport requirements.

6. In particular to develop the above for the following media:

   a. Fibreboard cases and related packaging
   b. Folding boxboard cartons
   c. Paper bags and sacks.

   Development should cover testing at all stages of production and use and for both qualification and quality control purposes for industry, national and international standards.

7. Provide guidance and assistance to relevant personnel at LANFI on the application of package and materials tests in the solution of packaging problems designed to:

   a. Reduce the overall costs of packaging and distribution where the technical performance of current packaging is satisfactory.

b. Improve the performance of unsatisfactory packaging or minimum increase in cost

c. Develop cost effective packaging for new products or new markets.

APPENDIX II

MEMORANDUM TO LUIS F.C. MADI ON EQUIPMENT

From: Frank A. Paine Date: April 24, 1981

To: Luis F.C. Madi

Having now considered the equipment available at LANFI for testing packages, containers and packaging materials based on paper and board, I would like to recommend that the acquisition of the following extra equipment be considered.

The Institute has no equipment permiting them to construct corrugated board packaging and fitments and this is essential when considering improvement to or reducing the cost of existing packages. Either a small "make up table" or separate guillotine, slotting and bending equipment should be available.

Apart from this, in the Package Evaluation side (Drop, Inclined Plane, Vibration, Shock, Stacking, etc.) the Institute either has equipment available or is planning to install or construct requisite items.

There are two gaps in equipment for testing materials. These are in the areas of evaluating Carton Board for its creasability; vital in achieving smooth running of cartons on Cartoning and Collating Machines; and the measurement of friction, which is needed to evaluate the suitability of paper based (and plastic and foil) laminates for pouches, sacks, etc. An Instron Tester is already available and it is suggested that the sledge type friction measuring attachment made by the suppliers of Instron be purchased and that consideration be given to the possibilities of the PIRA Running Friction attachment for Universal Testers.

Additionally the necessary equipment to carry out the ASTM Blocking Test would be useful in tackling some problems with coated papers.

A list is attached giving the equipment name, and a rough guesstimate on cost.

c.c. Mr. Danilo Jimenez - Resident Representative of UNDP
Mr. F. Fajnzylber - Senior Industrial Development Field Adviser
Mr. J.A. Careaga - Director General IMAI-LANFI
Mr. J. Belo - Industrial Development Officer Agro-Industries Branch
Mr. E. Manning - Acting Head - Agro Industries Branch UNIDO

RECOMMENDED ADDITIONAL EQUIPMENT NEEDED AT LANFI

IN ORDER OF PRIORITS

		COST
1.	Make up table for cutting, slotting and bending corrugated board	ca $5,000 - 7,000
2.	PIRA Board Creaser	ca $2,000
3.	PIRA Crease Stiffness Tester	ca $3,000
4.	Friction measurement fitment for Instron	ca $2,400
5.	PIRA Running Friction Tester	ca $2,400
6.	Blocking Test- ASTM (Could be constructed locally)	
7.	Two or Three Specimen cutters using replaceable razor blades	$ 200

APPENDIX III

EXERCISE TO FAMILIARISE LANFI PACKAGE TESTING PERSONELL WITH BOX COMPRESSION AND RELATED MATERIAL TESTS

Objective.

To compare the Box Failing Load of cylinders of corrugated board of the same perimeter but different length to width ratios and various heights and to relate the results to the McKee and Buchanan formula using the relevant properties of the board and its components.

Testing to be done.

1. Box compression tests
   Record failing load, and compression at failure and keep charts.

   5 specimens of each shape and each height in all 10 boards to be tested.

2. Use two blanks of largest size to cut specimens for:

   a) Bending test (Ernesto Pichler)
   b) Edge Compression Test (FEFCO No. 8 or TAPPI)
   c) Flat Crush (ASTM)
   d) Total Caliper

3. Use two blanks of smallest size to determine bursting strength (10 dems 5 5)

4. Use two blanks of middle size for Puncture test (10 dems 5 5)

5. On each Kraft linersample determine

   a) Grammage
   b) Thickness
   c) Tensile and Elongation (MD & CD)
   d) Ring Stiffness (MD & CD)
   e) Bursting Strength

6. Measure a) to e) plus Concora on each fluting medium.

Boards suggested originally

1) 130 K/126 B/130 K

2) 130 K/126 B/250 K

3) 250 K/126 B/250 K

4) 250 K/126 B/400 K

5) 400 K/126 B/400 K and

6) 130 K/126 C/130 K

7) 130 K/126 C/250 K

8) 250 K/126 C/250 K

9) 250 K/126 C/400 K

10) 400 K/126 C/400 K

In Mexico corrugated board is characterised by bursting strength alone and not by material used or weight of liner and the original programme based on material spec was modified as follows:

Two types of board to be used

A. From a board maker using kraft liners

1.	7 kg/cm^2	From each board make 20 blanks 1600 x 160
2.	11 kg/cm^2	20 blanks 1600 x 320 20 blanks 1600 x 480
3.	14 kg/cm^2	plus 10 sheets of each component of boards A 1, 2 and 3.

B From a board maker using semikraft liners.

1.	7 kg/cm^2	From each board make 20 blanks 1600 x 160

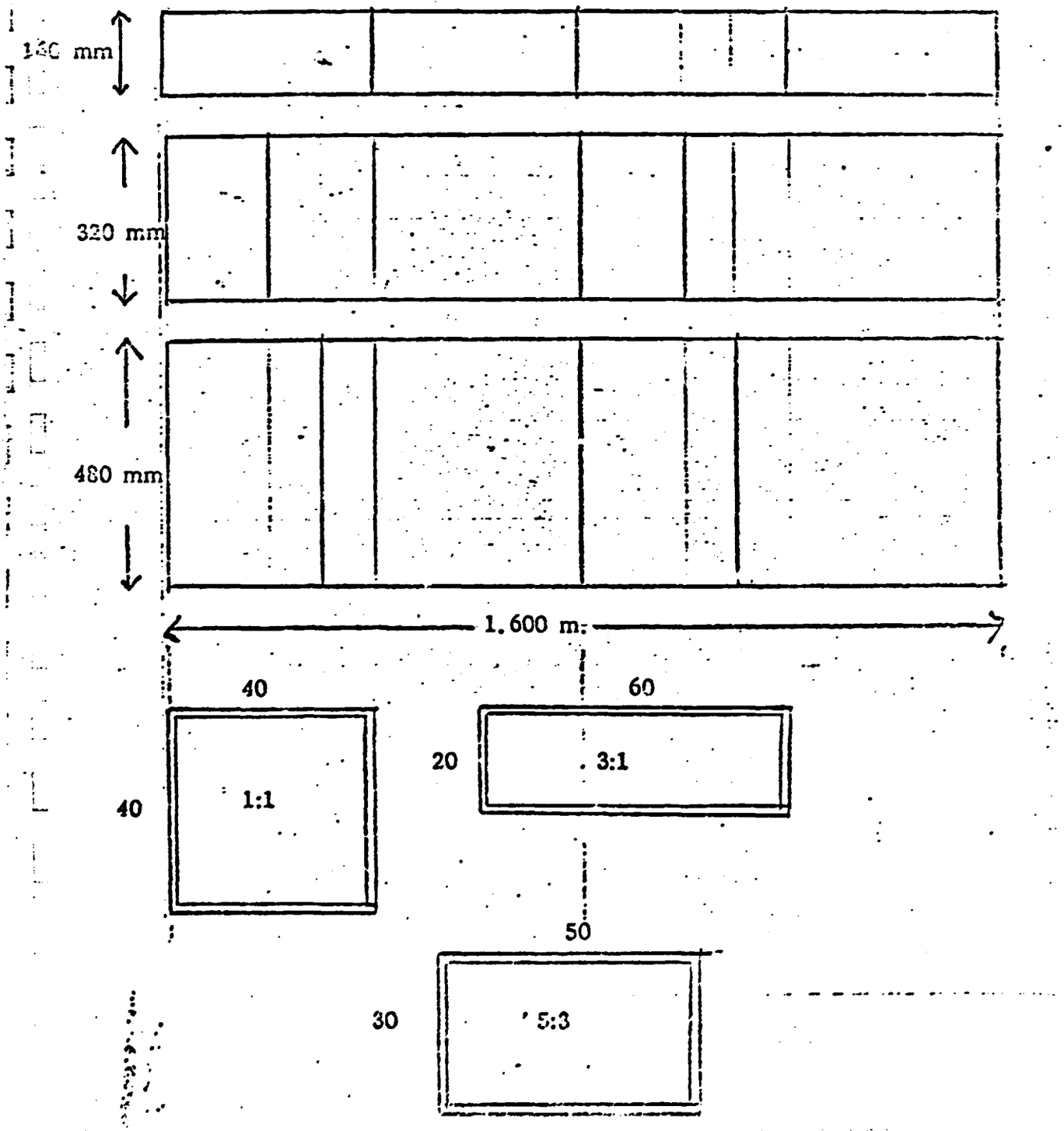
2.	11 kg/cm^2	20 blanks 1600 x 320 20 blanks 1600 x 480
3.	14 kg/cm^2	plus 10 sheets of each component of boards B 1, 2 and 3.

During the period between the two parts of the mission the results on the board made with semikraft liner were completed and the results are given here.

The boards made from Kraft liner have not yet been obtained but, when they are available the exercise should be completed. This cannot now be until the equipment has been moved to the new location.

Required

3 Sizes of blank to make 3 base ratios of same perimeter.



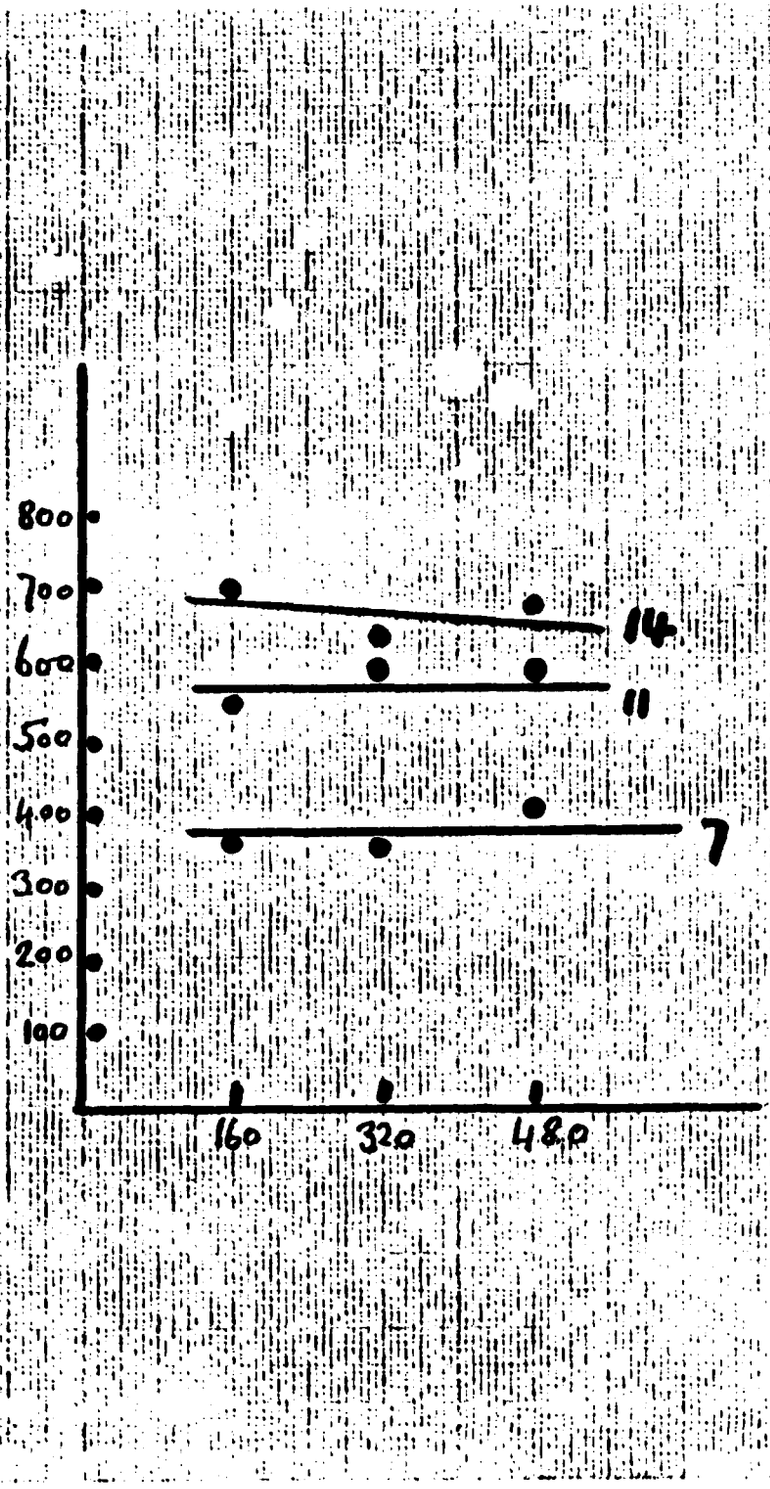
INDIVIDUAL RESULTS MEANS AND STANDARD DEVIATIONS OF SLEEVE FAILING LOADS (lbs)

Nominal Burst	Sleeve height (mm)		160			320			480			Grand Mean
Kg/cm^2	Ratio L/W		1:1	5:3	3:1	1:1	5:3	3:1	1:1	5:3	3:1	
7	Test No	1	426	353	252	345	315	405	420	375	320	
		2	360	435	300	270	381	315	450	575	450	
		3	435	440	310	320	390	387	480	368	390	
		4	405	375	335	360	365	297	490	375	360	
		5	400	330	360	300	345	370	485	465	240	
	Mean		405 lbs	387	311	320	359	355	465	392	354	372
	Std Dev.		29	49	41	36	30	47	30	41	78	42
11	Test No.	1	420	645	570	570	645	645	750	600	600	
		2	495	640	560	550	780	684	745	610	570	
		3	490	600	560	560	590	510	725	420	600	
		4	540	525	450	630	471	480	760	540	630	
		5	570	465	660	665	405	600	740	510	645	
	Mean		503	575	560	595	578	584	738	536	509	575
	Std Dev.		57	78	75	50	147	87	15	77	28	68
14	Test No.	1	780	900	801	705	489	670	735	510	840	
		2	510	540	789	900	653	576	660	690	645	
		3	720	660	750	635	525	510	855	534	720	
		4	700	585	465	790	546	675	630	705	495	
		5	774	683	765	780	510	564	486	780	720	
	Mean		697	674	714	762	545	599	673	644	684	666
	Std Dev.		110	139	141	99	64	72	136	117	127	112

RESULTS OF SLEEVE FAILING LOADS (MEANS IN KGS)

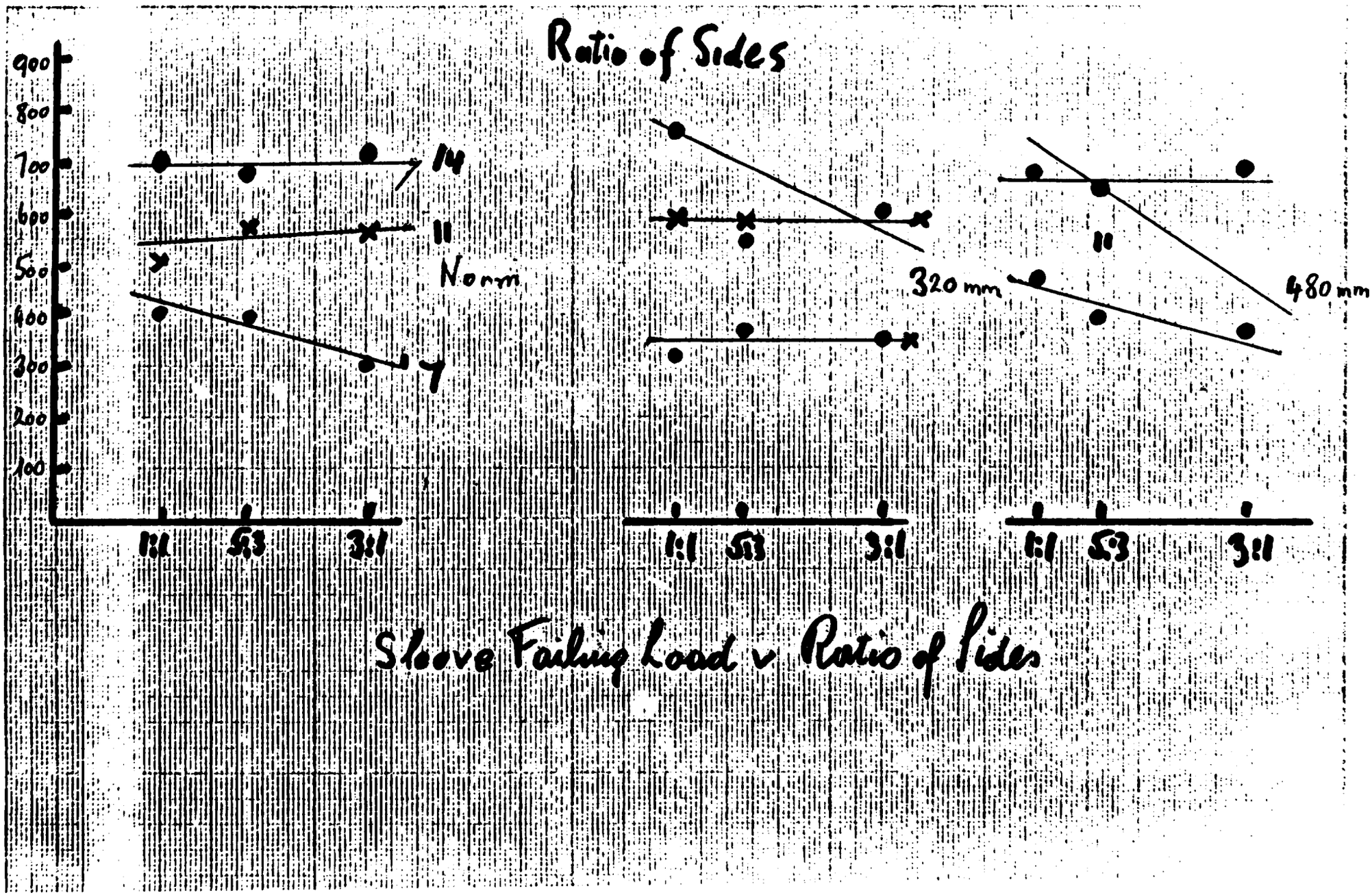
(1, 600 mm perimeter sleeves)

Nominal Bursting Strength of Board	Sleeve height mm	160			320			480			
	Ratio L/W	1:1	5:3	3:1	1:1	5:3	3:1	1:1	5:3	3:1	
7 Kg		184	175	141	145	163	161	211	178	161	
	Mean		167			156			183		169
11 Kg		228	261	254	270	263	265	335	243	278	
	Mean		248			266			285		266
14 Kg		316	306	324	346	247	271	305	292	311	
	Mean		315			283			303		302
	TOTALS		730			710			771		737



Compression at failure

Height variation of Cylinder



Sleeve Failing Load v Ratio of Sides

RESULTS OF TESTS ON BOARDS (MEANS)

Nominal Burst (kg/cm^2)	Actual Burst (kg/cm^2)	Total Caliper (mm)	Dynamic Stiffness (Beach)	Edge Crush (kg)	Flat Crush (kg)	Pichler-ometer
7	5.2	3.6	42	39	82	10.0
	(0.7)	(0.06)	(5)	(4)	(7)	(1.8)
11	14.0	3.6	51	55	113	7.3
	(1.5)	(0.13)	(5)	(4)	(6)	(0.6)
14	13.7	4.0	65	64	89	5.3
	(1.5)	(0.06)	(4)	(6)	(14)	(0.3)

Figures in ( ) are the standard deviation.

MEAN RESULTS OF TESTS ON MATERIALS

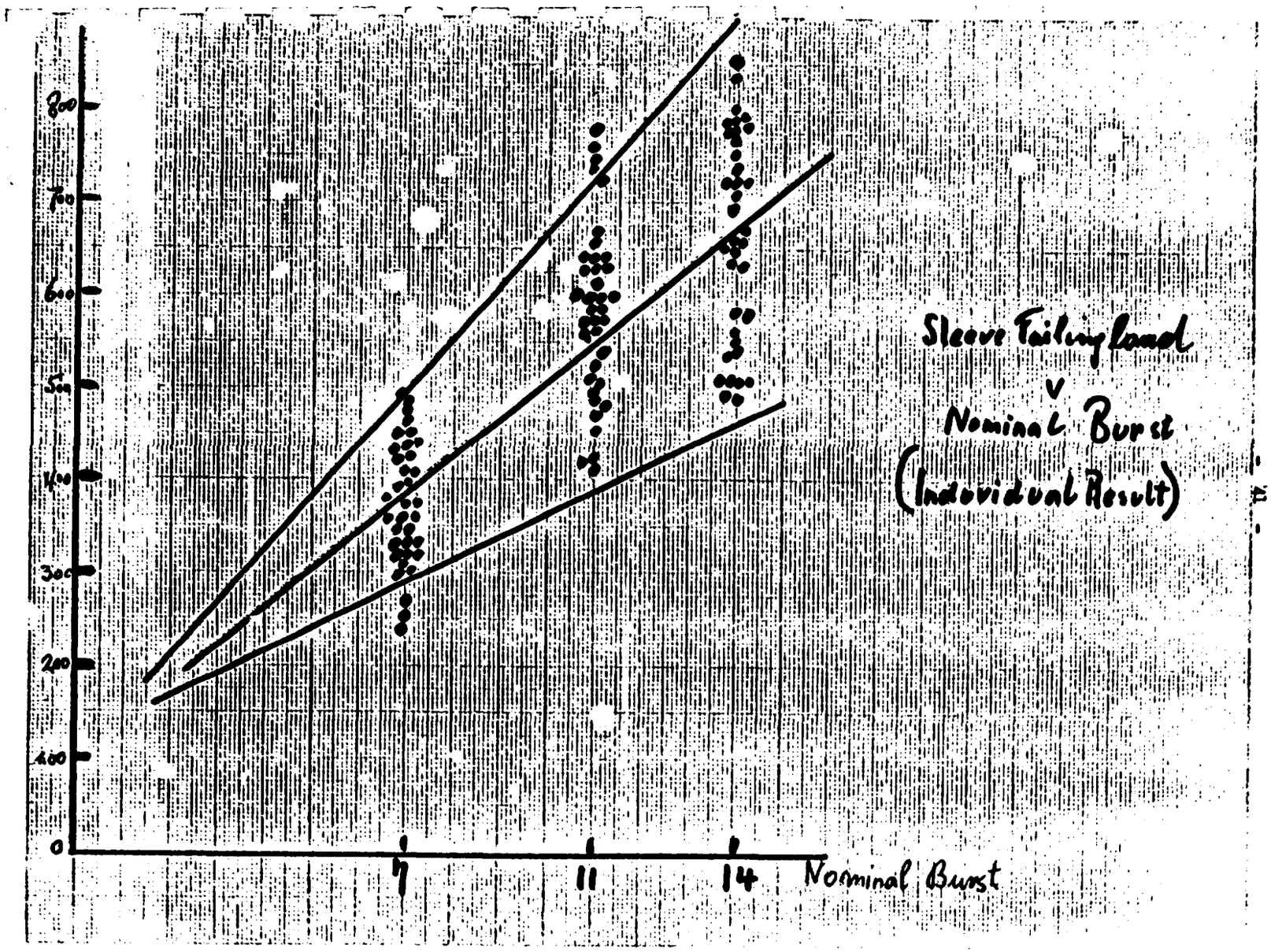
Material	Grammage (g/m^2)	Caliper (mm)	Burst (kg/cm^2)	Ring Stiffness (kg) M.D.	C.D.	Tensile M.D.	C.D.	Elongation (%) M.D.	C.D.
Fluting Medium	145 (2.3)	0.34 (0.02)	2.17 (0.24)	13 (1.3)	18 (1.2)	4.7 (0.3)	2.7 (1.0)	6.1 (0.7)	7.1 (2.2)
M 17	179 (6.6)	0.24 (0.04)	1.93 (0.32)	13 (0.5)	18 (1.8)	3.7 (0.3)	2.1 (0.2)	5.4 (0.9)	10.1 (2.4)
M 18	186 (3.8)	0.28 (0.01)	2.69 (0.37)	14 (1.3)	17 (0.8)	5.0 (0.5)	2.5 (0.2)	6.3 (0.5)	15.4 (2.8)
G 22	257 (7.1)	0.37 (0.01)	5.64 (0.58)	22 (2.9)	30 (5.1)	11.1 (0.8)	2.8 (0.2)	7.3 (0.9)	12.7 (3.1)
G 28 CI	418 (14.5)	0.63 (0.04)	5.65 (0.70)	-	-	11.6 (0.6)	3.3 (0.3)	6.2 (0.7)	10.4 (1.3)
42 lb	207 (1.7)	0.31 (0.01	8.18 (0.94	19 (1.2)	23 (2.6)	13.6 (0.8)	3.4 (0.4)	7.5 (0.7)	10.5 (3.1)

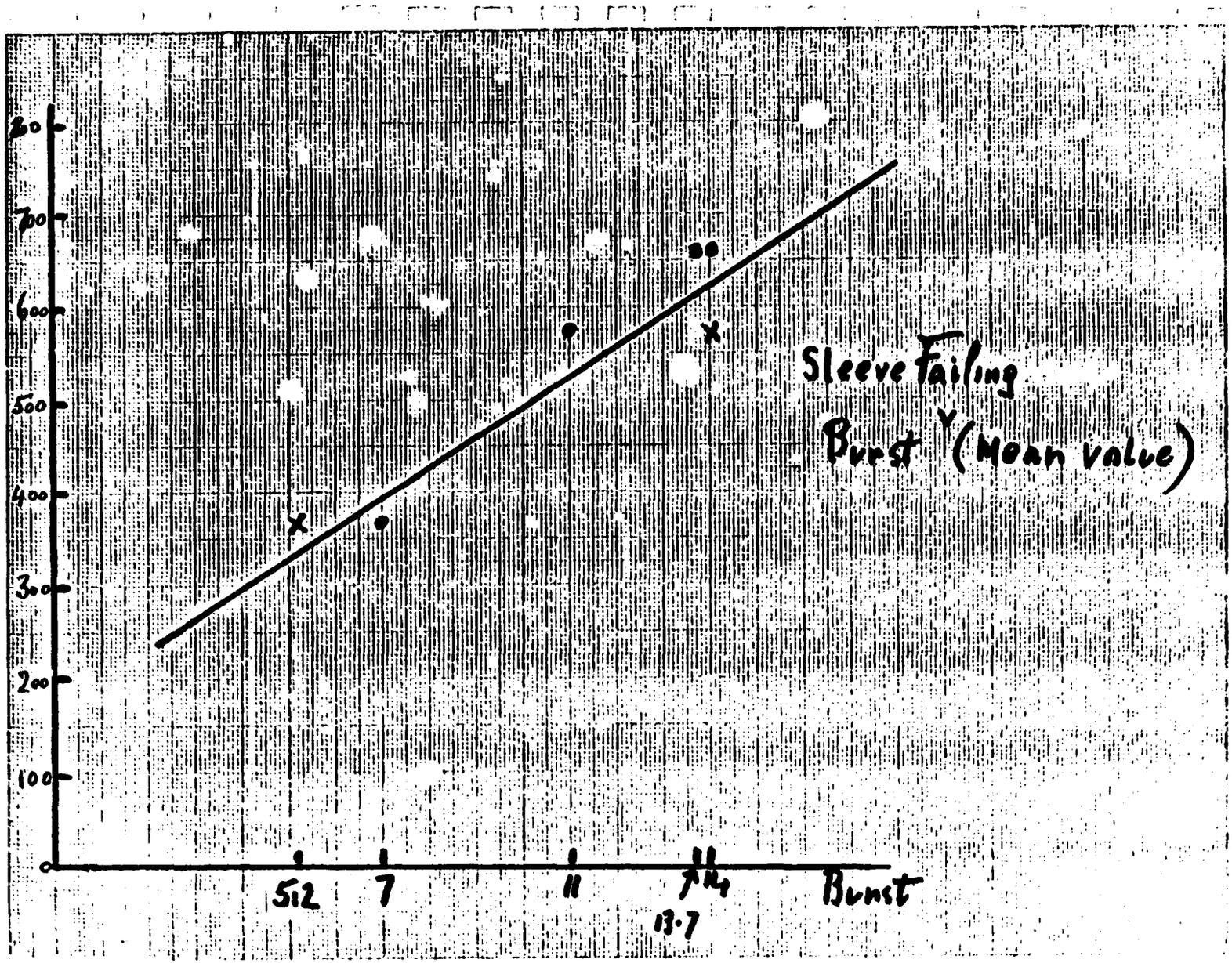
Figures in ( ) are the standard deviation

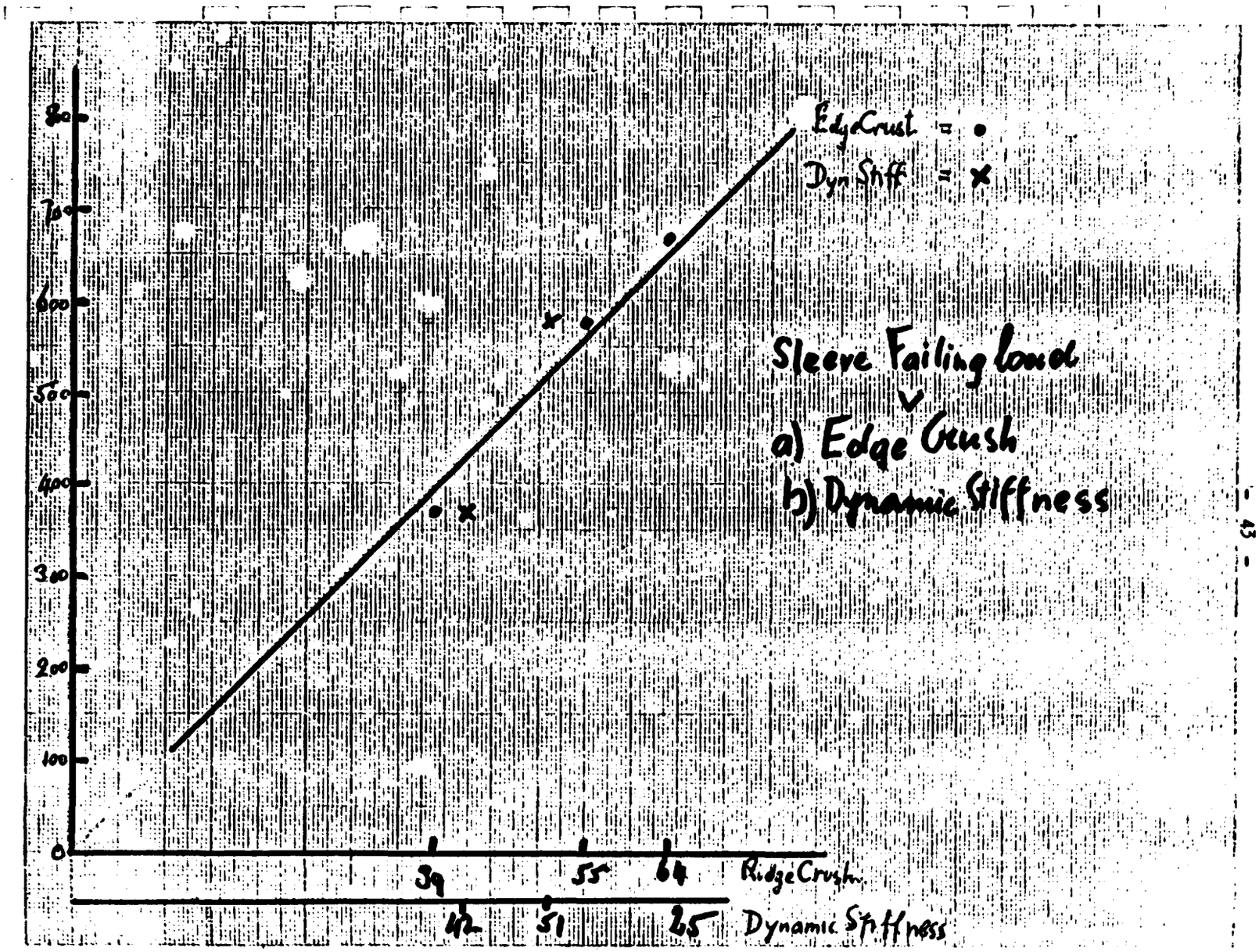
Concora Test on Fluting Medium

MD 17.5 (1.2)

CD 12.9 (0.9)


800
700
600
500
400
300
200
400
0
7
11
14
Nominal Burst
Sleeve Failing Load
v
Nominal Burst
(Individual Result)


800
700
600
500
400
300
200
100
0
Sleeve Failing
Burst Y (Mean value)
5·12
7
11
13·7
14
Burst


Edge Crush = •
Dyn Stiff = ×
Sleeve Failing load
v
a) Edge Crush
b) Dynamic Stiffness
800
700
600
500
400
300
200
100
0
39
55
64
Ridge Crush
42
51
65
Dynamic Stiffness

APPENDIX IV

EVALUATIONAND APPRAISAL OF PAPER AND BOARD PACKAGES IN MEXICO

Folding Boxboard

During the period of the mission some 70 folding boxboard cartons were examined for relevant properties. (thickness, basis weight, stiffness, etc.).

The products varied from processed foods, through carrier packs for beer to pharmaceuticals, cosmetics and the boards used by laundries for shirt packing.

Initial examination of the results indicates that most boards used in Mexico lie between 0.4 and 0.7mm thick with a basis weight of between 300 and 500 g/m^2, i.e. on average about 75 g/m^2 per 0.1 mm thickness.

Some of the cartons are obviously thicker and stiffer than necessary and it is considered that useful quantities of board could be saved if the optimum calipers and stiffness were employed. Industry should be encouraged to use the LANFI services to achieve this optimum and later on, industry sectors, might consider a publication giving advice on how to choose the optimum boards for specific uses and products.

Analysis of the stiffness measurements will give a more detailed view of the requirements in this area.

Paper Sacks

A start was also made on collecting some data on paper properties of currently used sacks. Here, tensile and elongation are the most important properties as they give a measure of the work energy required to break the paper (see notes pages A21 etseq).

Initial examination of the results, (so far incomplete), indicate a wider variation in basis weight than is desirable. 80, 90 and 100 g/m^2 papers seem to be the most common, 2 and 3 plies per sack although occasional weights of 130 g/m^2 are employed.

If the elongation properties can be improved, weights of 70 g/m^2 may be possible thus providing more available paper area for use.

Corrugated Fibreboard

In addition to the boards examined in the familiarisation exercise. (Appendix III) many other CFC's were examined.

As stated in the conclusions to this report page 15, better liners and more resistance to moisture are the principal requirements but specifications must be changed to include gramage and nature of liners rather than the sole statement of bursting strength which as the results in Appendix III show are neither met nor particularly reliable.

NOTES ON STOCK PREPARATION FOR SACK KRAFT MANUFACTURE.

1. INTRODUCTION

The terms "beating", "refining", "jordaning", etc., are all used in a rather loose manner to describe the mechanical treatment of a suspension of pulp to prepare it for the paper machine. For clarity we will use the word "refining" to cover all these terms, and the word "refiner" as a generic term covering all types of machine used for such purposes.

The mechanical action of any refiner can result in four principal changes in the nature of paper stock:

a. The separation of bundles and agglomerates of fibres into individual fibres or smaller bundles. This action will be referred to as "fibre disintegration".

b. The reduction of shives, shivy material, pitch, etc., into particles of small size to make them less noticeable in the finished sheet. This action will be referred to as "shive and dirt reduction".

c. The development of strength, flexibility, and effective bonding area of the fibres without any significant decrease in fibre length. The term "beating", will be reserved for this action only.

d. The cutting of fibres into shorter lengths which will be referred to simply as "cutting".

All types of refiners are capable of performing all these functions and the degree to which any one is carried out is dependent not only on the construction of the refiner, but also on the method of operating it.

2. THE OBJECTS OF REFINING PAPER STOCK FOR MULTIWALL SACK KRAFT PAPER.

Kraft paper for the manufacture of multiwall sacks requires as high a tensile strength as possible, consistent with good stretch characteristics in both the machine and cross directions. Although

the normal fourdrinier sheet possesses a higher tensile strength in the M.D. than in the C.D., this will be compensated by the proportionately higher stretch in the C.D. to produce a sheet which is "square" in respect of the energy required to break the paper in both directions. Such a sheet will also need good tearing resistance both as an indication of general toughness, as well as a specific requirement in the stitching of the ends of sacks.

The refining procedure for sack kraft stock must therefore develop strength in respect of breaking length without reducing the length of the fibres significantly in order to maintain both stretch and tear resistance. Hence whatever type of refiner is used it must be so constructed and operated to give maximum beating, good fibre separation, reasonable shive and dirt reduction and minimum cutting. From experience a breaking length of 9,000 m., as determined on hand sheets from the thick stock, should be developed.

Typical figures for good running on a Foundrinier machine are given in Table I from which it can be seen that the values for stock properties after refining given in Table 2 are attainable under good conditions.

As previously stated, the principal property required in sack Kraft paper is as high a breaking energy as possible. The breaking energy in the machine and cross direction should not be markedly different, the higher tensile in the machine direction being offset by the higher stretch of the cross direction.

The development of tensile strength in chemical pulps is brought about by that mechanical action on the fibres which promotes the entry of plasticising water into the interior of the cell walls, and at the same time disrupts some of the internal lateral bonds between adjacent cellulose molecules on the inner and outer surfaces of the fibres to produce fibrillation. Such an action, by making the fibres more flexible, promotes plastic deformation when they are subjected to surface tension forces during the drying process, and thus increases the bonded area between fibres.

Stretch, the other component of breaking energy, is mainly developed in the finished sheet by the shrinkage which is allowed to occur during the drying process, and is dependent on the action of the refiner only insofaras beating gives a greater potential

shrinkage than cutting. It has been shown that the best development of stretch is achieved by operating refiners at as high a consistency as is possible. A stretch of about 4.7% was achieved by one investigator at a C.S.F. of 500 when the consistency of refining was 5%, while beating to the same freeness at consistencies of 4% and 2% gave stretch values of 4.2% and 3.3% respectively.

In the general theory of the beating process, it is considered that the majority of the work is done on the fibres as they pass between the bars. There is also evidence that strength development with minimum fibre shortening depends very much more on a vigorous turbulence in the space between the refining surfaces than on the direct action of the refiner bars on the fibres. It is fairly easy to visualise that such highly turbulent conditions would promote the sort of action required.

3. PAPER MACHINE CONSIDERATIONS

To achieve good formation on the paper machine wire using a well beaten long fibred stock, a low consistency in the breast box is very desirable. For this reason the wet end of the machine must be capable of dealing with large volumes of water, and the amount of the refining treatment should not be governed by any limitations imposed by the drainage capacity of the paper machine.

With sack Kraft paper, the strength characteristics of the sheet are or vital importance. If the wet end is flexible enough to deal with a range of drainage rates, and provided the refining is carried out properly, the amount of extra work required on the stock just prior to the head box can be kept to a bare minimum. Major difficulties produced by unacceptable stock, from the papermaking point of view, should be corrected at the main refining plant and not arbitrarily at the paper machine. The emphasis must be on producing "kraft paper for multiwall sacks", and not merely on making a well formed sheet of paper.

The problem of making the best of the properties of the refined kraft stock is a difficult one in that all commercial machines produce a sheet which is much weaker than the corresponding laboratory made paper. Because of its better formation, the quality of the laboratory sheet is usually some 50% better than the commercially made paper, and therefore there is considerable

scope for reducing these differences, for example, by avoiding wet end drainage limitations in practice, as has been advocated.

The importance of formation and strength, and the relation of these to consistency, is illustrated by the following experimental figures.

A sample of moist kraft was disc refined in two passes through a laboratory Sprout-Waldron disc refiner to a freeness of 400 mls. C.S.F. Handsheets were made at 90 g.m.$^{-2}$ in the standard sheet machine, using the following volumes to obtain a range of formation in the hand sheets :

1. 7 litres (standard), stock consistency 0.026%

2. 2 litres, stock consistency 0.09%

3. 1 litre, stock consistency 0.18%

4. 0.5 litre, stock consistency 0.36%

Strength tests on these handsheets were then made and the results show that as the formation becomes less uniform there is a considerable decrease in all strength properties except tear factor. See Table 3.

TABLE 1

FIGURES FOR GOOD RUNNING ON A FOUNDRINIER m/c.*

	Pulp Evaluation				Refiner Stock Evaluation			Paper		
	Unbeaten		Beaten							
	Pulp A	Pulp B	Pulp A	Pulp B	Inlet	Outlet	Breast Box	M. D.	C. D.	Average
Burst factor ($g/cm^2/g/m^2$)	43.7	36.4	71.1	69	42.7	64.7	66.5	51		-
Breaking length (meters)	5920	5450	10, 170	10, 180	5, 900	8, 890	9, 500	7, 300	4, 000	5, 650
Tear factor ($100xg./g/m^2$)	195	209	141	139	204	150	135	116	126	121
Bulk ($microns/g/m^2$)					1.69	1.52	1.50	1.66		-
Density					0.59	0.66	0.67	0.60		-
Basis weight (g/m^2) (Grammage)								86.5		-
Stretch %								3.0	5.7	4.4
Consistency (%)					3.82	3.62	0.40			
Freeness (C.S.F.)					631	406	228			
Drainage time 60 g/m^2					5.0	6.2	12.0			
								Paper machine speed - 250 m/min.		

* Brief m/c details. 5.4 meters wide - producing about 110 tons per 24 hours. When making 70 g/m^2 sack Kraft at 250 m/min.

TABLE 2

TARGET VALUES FOR STOCK PROPERTIES AFTER REFINING

Burst factor (minimum)	65
Breaking length (minimum)	9,000
Tear factor (minimum)	150
Bulk	1.6 ±
Drainage time 60 gm.	5 to 15

TABLE 3

STRENGTH TESTS

Consistency in sheet making	0.026%	0.09%	0.18%	0.36%
Burst factor	55.6	48.5	40.2	36.0
Breaking length (m.)	8,220	7,290	6,370	5,810
Stretch %	2.2	2.0	2.2	1.8
Tear factor	176	178	189	171
Bulk	1.51	1.49	1.50	1.51
Basis weight g/m^2	93.3	92.8	92.2	90.2

Formation becomes progressively worse.

APPENDIX V

Possibility of reducing imports of raw materials for paper and board by better utilisation of current production and increase in use of recycled fibre from waste.

As already mentioned in the conclusions to this report the main need in Mexico is for more high grade (Kraft) pulp and while more reclaimed fibre from waste materials collected could be used in areas like moulded pulp trays for eggs it is not considered that this would reduce the import requirements of pulps for packaging.

It is estimated that at least 3; 70, 000 ton Kraft pulp mills will be needed by the end of the next 6 years or imports of Kraft pulp to cover this requirement.

Useful savings (between 5 and 20%) of currently used pulps may be made by improvements in package design and by using optimum weight of paper and board for all types of paper based packaging. User industries should be encouraged to optimise their specifications by using LANFI equipment and expertise. Improved handling in transport can also play a part here, in reduction of protection needed.

Cooperation between IMCP (University of Guadalajara) and LANFI using the former to improve pulp and packaging paper production methods and the latter to evaluate the package made from them should be encouraged and a project such as that suggested to UNIDO some time ago, by IMCP and PIRA to improve paper mill efficiencies could prove useful.

Following a visit of the consultant to IMCP arrangements are in hand for Dr. Careaga of LANFI and Dr. Grellmann of IMCP to meet with a view to formulate plans for cooperation between the two organisations.

It is also possible that increases in paper and board from bagasse and other vegetable fibre sources could improve the supply situation and IMCP will probably examine this.

Measures such as these are considered to have a better chance of improving the situation than the steps needed to improve paper collection which is more likely to provide a greater recovery of newsprint and magazine papers which have very limited use in packaging material supplies apart from the moulded pulp areas already mentioned.

APPENDIX VI (a)

SUGGESTED STANDARD PERFORMANCE TEST-SCHEDULE FOR COMPLETE FILLED TRANSPORT PACKAGES-INTERNAL TRANSPORT MEXICO.

Scope

Parallelepipedal packages for bottles, jars, cans, cartons and other collations of unit packs and for single items such as household appliances.

Two ranges of weight are envisaged

I 15 Kg ± 10 Kg and
II 50 Kg ± 20 Kg

Weight range I

(5 Kg - 25 Kg)

Minimum number required	3 filled packs
Preferred number	6 filled packs

a) All packs will be conditioned for 24 hours (minimum) at 23° C 50% RH or other appropriate conditions.

They will then be subjected to a sequence of tests in the following order:

Stacking test,
Impact tests
A shower test followed by a conditioning period
Vibration test
A second stacking test and finally a second set of impact tests.

Details in Table 1 and 2.

TABLE 1

DAY	TEST	PACK NUMBER 1	2	3	4	5	6
1	Conditioning	All packs for a minimum of 24 hrs. at 23°C 50%.					
2	First Stack Test (metres 24 hrs)	1.5	1.5	1.8	1.8	2.5	2.5
3	First Impact Test i) Drops (4) m	0.3	0.4	0.3	0.4	0.3	0.4
	ii) Inclined plane test (IPT) (8) metres	1.5	2.0	1.5	2.0	1.5	2.0
	Shower test	Optional - 5 mins. followed by 24 hours at 23°C 50% RH					
4	Vibration (LAB)*	Under load equivalent to 1.8 m - 20 mins.					
	Second Stack Test	1.5	1.5	1.8	1.8	2.5	2.5
5	Second Impact Tests i) Drops (3)	According to weight (See table 2)					
	ii) Inclined plane Test (IPT) (8) metres	1.5	2.0	1.5	2.0	1.5	2.0

* Note: Should a resonance test of vibration be required it should be placed between the First Stack Test and the First Drop Test (i.e. between 2 and 3).

TABLE 2

SUGGESTED HEIGHT OF SECOND DROP TEST

Weight of pack	Drop Height
5 - 7 Kg	0.7 m
7 - 10 Kg	0.6 m
10 - 15 Kg	0.5 m
15 - 25 Kg	0.4 m

Weight range II

(50 Kg ± 20 Kg)

a) Conditioning - standing on base 24 hours. 23° C 50%

b) First Impact Tests

i) Drops (3) B. LBE. SBE 0.3 m (0.4 m)*

ii) IPT (4) Each Side Face 2.5 m

c) Shower Test

5 mins standing on base

d) Vibration LAB

10 minutes each way under 1.8 metre load standing on base.

e) Stacking Test

2.5 m; 24 hours

f) Second Impact Tests

i) Drops (3) 0.3 m (0.4m) *

ii) Topple Test - stand on smallest face and allow to fall over on to the 4 faces in turn.

Notes:

1) Drops (4) is 4 drops as follows:

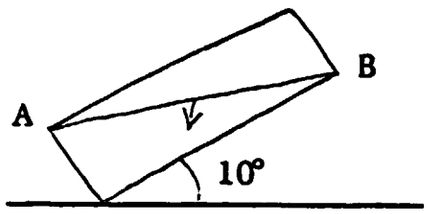
Onto: Base, longer base edge, shorter base edge, included base corner.

2) Drops (3) is 3 drops as follows:

Onto: the order longer base edge and shorter base edge and included corner.

* Note: 0.4 m if weight below 40 Kgs.

3) All drops (except the base drop which is a flat impact) at 10° to horizontal, or with the diagonal AB horizontal whichever is more likely (see Diagram).



4) IPT (8) is 1 blow on to each side face and vertical edge in turn rotating the pack clockwise and commencing with a face containing the manufacturers joint. (if present).

CRITERIA FOR JUDGEMENT

Weight Range I

If all 6 packs are satisfactory in performance, should be suitable for all types internal transport in Mexico.

If only pack #1 is satisfactory, suitable for distribution system with good handling only e.g. palletised loads.

Degree of damage can be derived from where satisfactory level is found.

Weight Range II

If pack and contents are in satisfactory condition, pack should be suitable for internal transport in Mexico.

APPENDIX VI b)

The areas covered in the LANFI organization and reporting to Ing. Francisco Muñoz are five in number:

i) Industrial Design

ii) Paper and Board

iii) Plastics and Metals

iv) Packaging Processes and

v) Handling and Distribution of Packaged Products.

The last section was mainly the concern of this consultant although some contact and discussions with the others particularly paper and board and the standards section of the Design department was necessary.

Before the study commenced, section v) was divided into 3 areas, covering:

Food Packaging
Transport Testing
and Materials evaluation and retail packs

It has now been arranged that Transport testing, materials and retail packs will form one group as many of the problems involved both the(originally separate) areas and difficulties which formaly occured should now be avoided. The institution of a regular weekly meeting of the staff to report progress on specific problems will also provide better liason and understanding of the work.

APPENDIX VI (c)

Notes on a meeting
August 27, 1981
to discuss:

ACCREDITATION SCHEME FOR MEXICAN LABORATORIES ON PERFORMANCE TESTING FOR TRANSIT PACKS

Circulation

Those present plus:

Olga Arce León

Francisco Muñoz Ruiz

Luis F. Ceribelli Madi

Present

Frank A. Paine
Verónica García
Alejandro Perales Martín del Campo
Alejandro Olvera
Hildeberto López Cervantes
Daniel Ramírez
Miguel Quijano Madrigal
Eli Feingold

The meeting discussed a distributed paper (attached) and these notes record the conclussion and action to be taken before the next meeting on Monday 7 September at 10:00 a.m.

../

PAPER FOR DISCUSSION AT MEETING ON AUGUST 27TH.

ESQUEMA PARA ACREDITACION DE LABORATORIOS EN MEXICO

Evaluación del comportamiento de empaques para transporte.

Requerimientos para la acreditación.

1. Equipo de prueba correcto, con mantenimiento adecuado periodicamente checado y usado por personal entrenado.

2. Personal calificado, tanto administrativo como técnico.

3. Reporte y procedimiento de certificación estandar.

Preguntas para discusión:

1)

a) ¿Qué pruebas?

¿ISO y UN?
¿Alguna otra?

b) ¿Cómo asegurarse que los equipos están correctos?
¿Cuando se instalan? ¿A intervalos regulares?

c) ¿Cómo deberán entrenarse los operadores?

2) ¿Qué escolaridad necesitaremos para?

- Jefe de Laboratorio
- Cualquier asistente, y
- ¿Deberán ser entrenados en LANFI?

3) ¿Cómo producir formas de reporte y certificaciones estandar?

Preguntas adicionales.

1) ¿Puede ser acreditado un laboratorio para una sola prueba? ¿para un número dado de pruebas? ¿o deberá ser capaz de hacer todas las pruebas?

2) ¿Puede un laboratorio acreditado programar sus secuencias de pruebas de comportamiento o sera LANFI la única fuente de éstas?

ENGLISH TRANSLATION OF PAPER FOR DISCUSSION

ACCREDITATION SCHEME FOR LABORATORIES IN MEXICO

Performance Testing for Transit Packs.

REQUIREMENTS FOR ACCREDITATION.

1. Proper test equipment, collectly maintained, regularly checked, and used by trained personnel.

2. Qualified staff, both managerial and technical

3. Standard reporting and certification procedure.

Question to be discussed:

1) a) What tests - ISO and UN?

Any others

b) How to ensure that equipment is correct?

When installed? - at regular intervals?

c) How should operators be trained?

2) What qualifications are needed by:

a) Head of Laboratories

b) Any assistants

and should they be trained at LANFI?

3) How to produce a standard report form, and certificates?

Further Questions

1. Can a Laboratory be accredited for individual tests, for a number of tests or must the laboratory be able to do all the tests?

2. Can an accredited laboratory devise performance test schedules or is LANFI the only source of these?

QUESTION 1

a) What tests?

i) ISO 2206 2244 2872 2875
2233 2247 2873 2876
2234 2248 2874

All these are parts of Testing of Complete Filled Transport Packages, plus LANFI Test Schedules based on:

ISO 4180 4181 and 4182

ii) UN Tests on packages for dangerous goods.

iii) Any Mexican Standard

ACTION Alejandro Olvera will produce a list of the appropriate Mexican Standards for discussion.

b) Equipment Checks

Inspection procedures based on the ISO Standards for equipment must be written and these will be used to check installed equipment.

Inspection by LANFI will be mandatory at regular intervals. (e.g. every 12 months).

c) Operator Training

All operators will be required to undergo training at LANFI.

QUESTION 2

Qualifications for Testing Laboratory Personnel.

a) Head of Test Laboratory.

Minimum requirements.

i) Education to graduate level in a Scientific Discipline.
ii) Training at LANFI.

b) Assistants

Minimum requirements.

i) Education in science subjects, etc. to Mexican Technician level.
ii) Training at LANFI.

ACTION

i) Alejandro Perales will write suitable technician level educational needs.

ii) Procedural details for each test equipment (drop, inclined plane, stacking, LAB vibration, compression test, etc.) currently used at LANFI will be written by the appropriate LANFI operator.

iii) The training programme for Heads and Assistants needs further thought and discussion.

QUESTION 3

Standard report formsand certifications.

The Standard report formswill be those used by LANFI

ACTION Collect together all standard formsnow used. Hildeberto López

FURTHER QUESTIONS

1. To be accredited, laboratories must be able to carry out all the standard transport tests used by ISO and UN

i) No laboratory will be accredited for one or only a few tests.

ii) Laboratories may be accredited for only one type of package. e.g. Steel and Plastic drums, or Fibreboard packaging.

2. Accredited laboratories should be able to suggest test schedules for specific packs but LANFI only can approve them.

NOTES ON SECOND MEETING TO DISCUSS ACCREDITATION SCHEME SEPTEMBER 7, 1981

Present

Frank A. Paine
Olga Arce (in the chair)
Verónica García
Estela Ruiz Cano
Miguel Quijano
Eli Feingold
Alejandro Olvera
Alejandro Perales
Hildeberto López
Daniel Ramírez
Francisco Muñoz

Documents before the meeting

1) Notes on meeting held 27, 1981

2) Suggested Scheme for Implementation (attached)

The notes of the last meeting were agreed.

All action noted there had been taken and details were provided. (with V.G.)

The meeting discussed and agreed the suggested scheme as a basis for further action and then discussed possible ways and means of proceeding.

No decisions were made and further meeting will be called when progress has been made by Sr. Muñoz and Srita. Arce.

SUGGESTED PLAN FOR INTRODUCING AN ACCREDITATION SCHEME FOR LABORATORIES WITHIN 2 YEARS FROM START.

Stage 1

(6-9 months)

a) Check and document all current LANFI test procedures, report forms and certificates as if LANFI itself was seeking accreditation.

b) Decide upon, write syllabus for the general training programms for laboratory Heads and for Assistants.

Consider following sections

i) Background knowledge of transport hazards and distribution systems and packaging to meet them.

ii) Use of specific tests

iii) Use of test schedules

iv) Reporting procedures

v) Certification procedures

Lab. heads will obviously need more detailed section 1. Assistants may not require everything in any section.

Stage 2

Commencing after Stage 1 has been agreed (3-6 months)

A) Inquire in industry as to likely companies and places where accredited laboratories might be set up.

b) Work out staffing level, and write man and job descriptions for operating the scheme within LANFI

c) Estimate costs of running scheme assuming 3, 5, 10 or 20 laboratories require monitoring after initial training.

d) From c) decide the charges to laboratories applying for accreditation giving details of:

Training cost - Lab head and Assistants

Installation check

Regular inspection cost

Stage 3 (6 months)

Introduce and sell the scheme to companies identified as likely customers in Stage 2.

APPENDIX VII

CONTACTS AND VISITS DURING MISSION

1) Members of Working Groups formed during mission.

Ing. Francisco Muñoz Ruiz
Ing. Olga Arce León
Química Verónica Estella García
Química Carmen Olmedo Badier
Ing. Alejandro Perales Martín del Campo
Ing. Alejandro Olvera
Ing. Hildeberto López Cervantes
Q. F. B. Ninfa Yolanda Rodríguez de Leo
Sr. Miguel Quijano Madrigal
Ing. Estella Ruiz Cano
Ing. Marco Antonio Trejo
Ing. Daniel Ramírez
Ing. Elhanan Feingold - Consultant

2) Visits and Contacts.

Ferrocarriles Nacionales de México.

Sr. Fausto Ramirez Patrón - Agente Comercial
Ing. Jaled Saab - Traffic Rep. Missouri Pacific Railroad

Takayaki Mori - Traffic Dept. - Kanematsu Gosho.

Merced - Mexico City
Aurrera, Gran Bazar. Mexico City
Liverpool, Suburbia, Sumesa, Gigante, Sears and Sanborns stores and Supermarkets in Mexico City.

Smaller Food Stores in Puebla

Envases y Empaques Naturales

C. P. Cesar August Herrero. Gerente General

Aurrera Distribution Centre

Shops and stores (food mainly) in Acapulco, Taxco and Cuernavaca.

Titán - Alfa en Papel y Empaque.

Ing. Enrique Falcony G. Superintendent.

Merck, Sharp and Dohme.

Ing. Jorge León - Jefe Quality Control.

Nestlé - Toluca

Cartón y Papel de México

Sres Uribe and Caballero

Guide - Sr. Jorge Uribe

Encerrado Laredo

Ing. Enrique Arenas Acuña - Servicios y Control de Riesgos.

Ing. Mario Sierra B

Cartón y Papel de México

Ing. Carlos Castillejo Esser

Gerente de Empaque Técnico, Anderson Clayton

Bolsas y Artículos de Papel

Ing. Amilca Caballero - Gerente Técnico y de Proyectos
Ing. José de Jesús Ruiz Esparza - Gerente General

Cotesa. Corrugados Telnacan

Ing. René del C. Luengar G. - Gerente General

Cervecería Moctezuma - Orizaba

Ing. Bernardo Hernández Velazco - Jefe de Control de Calidad.

Servicios Portuarios de Veracruz
Ing. Enrique Cardenas Trigos - Director General

Cementos Apasco and
Sacos Mexicanos Apasco

Ing. Juan María Maso Goiri

Avon Cosmetics

H-24

Grupo Atentique - Jalisco

Sr. Ortega - Managing Director and several colleagues

Instituto Madera, Celulosa y Papel - Guadalajara Jalisco

Ing. Dr. K. Grellmann - Director IMCP and colleagues

APPENDIX VIII

PROGRAMME AS CARRIED OUT

A. PERIOD APRIL/MAY

Week No. 1

April 6 - 10

Produced detailed program for first part of mission attended and took part in design seminar of Ernesto Pichler (see programme attached). Discussed in outline Seminar programme on Quality Control to be given with John Salisbury on May 20 - 22. Made preliminary visits to see laboratories and testing equipment.

Week No. 2

April 13 - 15 (16 and 17 holidays)

Arranged for the workshop discussion group to meet as possible on Tuesdays and Thursdays between 0900 and 1030 hrs. Visited road and rail depots handling packages, saw several kinds of retail outlet (Supermarkets, etc.) Made recommendations for extra test equipment needed (See Appendix II).

Week No. 3

April 20 - 24

Held Group meetings on Tuesday 21st and Thursday 23, one on the philosophy of Solving Packaging Problems and one on specific examples. Visited an Egg Packer; the plant making egg trays in moulded pulp and a corrugated case maker for eggs. Discussed standards and specifications for egg packing.

Week No. 4

April 27 - 30 (May 1st holiday)

Held Group meeting on Tuesday 28 and Thursday 30 on Problem Solving. Visited a Flour confectionery producer, (bread, biscuits and cakes.

Week No. 5

May 4 - 8 (May 4 - 5 holidays)

Visited retail outlets in Mexico City, Cuernavaca, Taxco and Acapulco. Visited Sugar packer and the Cement and Sack producing plant currently having paper tests made. Held one group meeting to discuss Standards and Specifications for Cartons. Checked the start up of the corrugated study. Attended and took part in Karoly Lotz Seminar (see program attached).

Week No. 6

May 11 - 15

Held group meetings on Tuesday 12 and Thursday 14 to discuss Standards and Specifications for Corrugated Cases and Paper Sacks and Bags. Visited a pharmaceutical manufacturer using cartons and cases and the Nestlé Company on a corrosion problem.

Week No. 7

May 18 - 22

Prepared for and took part in Seminar on 20-22 with John Salisbury on Quality Control for makers and users of folding cartons and corrugated cases. (See program attached).

Week No. 8

May 25 - 26 only: Departure from Mexico, 27

Completed Interim report, finalised, dated and outlined program for Second half of mission in middle August - middle October 1981. (Suggested dates including travel and debriefing in Vienna, August 18 - October 11).