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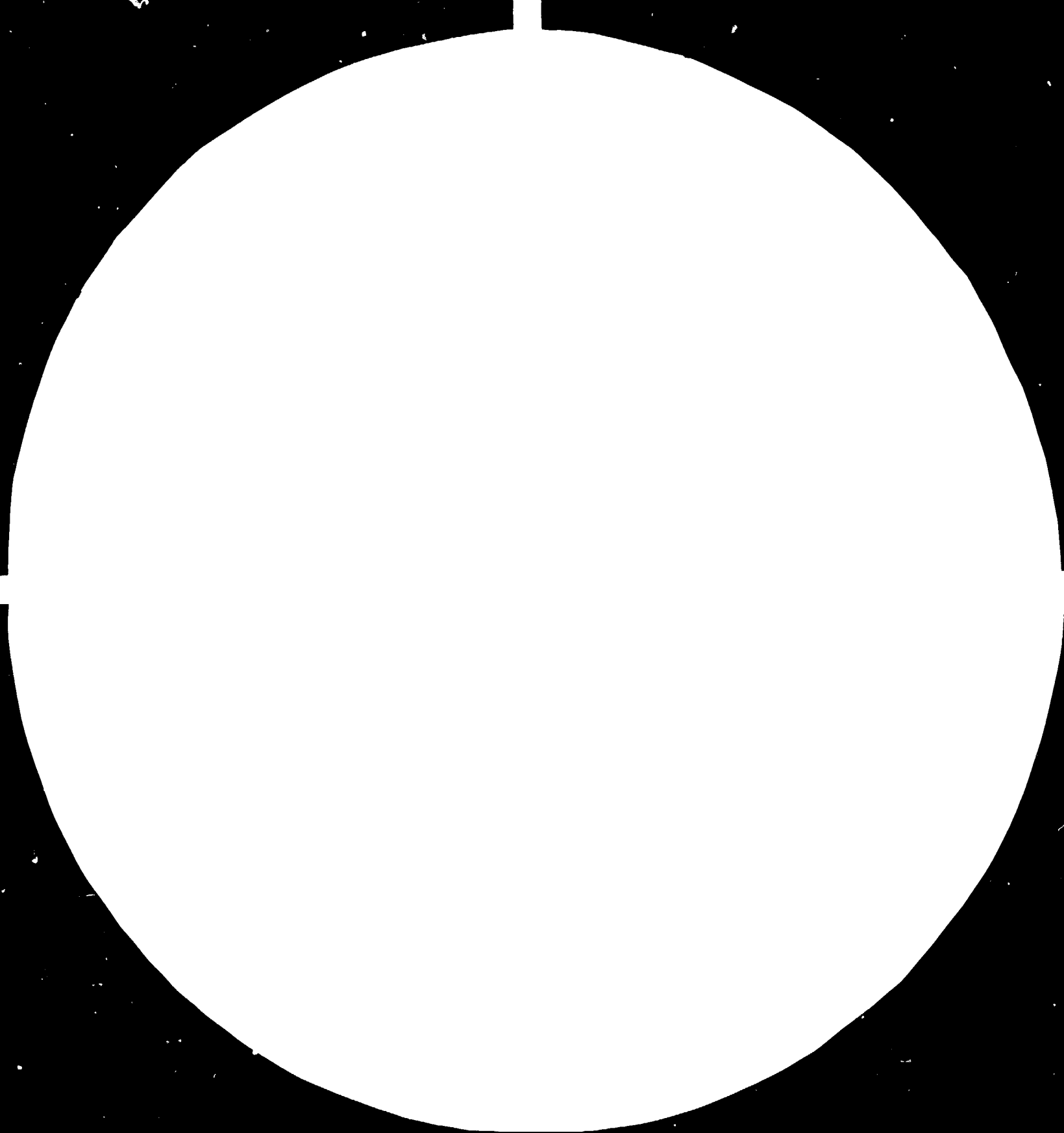
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10X NBS 1963-A

300 LINE PAIRS PER INCH

U.S. GOVERNMENT PRINTING OFFICE

1985

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Brazil. Packaging.

METROLOGY, STANDARDIZATION AND INDUSTRIAL QUALITY

14517

DF/BRA/S2/020

FEDERATIVE REPUBLIC OF BRAZIL

Final Report *

Prepared for the Federative Republic of Brazil
by the United Nations Industrial Development Organization,
Executing Agency for the United Nations Development Programme.

Based on the work of Kurt H. GARMIN,
UNIDO Expert in Standardization, Quality Control and Quality
Certification in the field of Packaging

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	(PREPARED BY K.H. GARMIN)	

FINAL REPORT

1. INTRODUCTION

1.1 Packaging was selected by the Brazilian planning authorities as one of the high priority fields for development within the project UNIDO/BRA/82/020.

1.2 The expert selected for the project arrived in Rio de Janeiro on 19 August 1984. He worked on the project from his arrival until 19 December 1984 and in a subsequent period 6-15 January 1985.

1.3 According to the assignment the expert was expected to:

1. Study with the national group of standardization, the Brazilian legislation and the existing organizational schemes, directing the work towards the sub-sectors most in need of planning, to involve products related with aspects of health and safety;
2. elaborate a working programme;
3. visit enterprises, public and private organizations with the aim to identify the needs of standards and specify priorities;
4. assist in the elaboration of basic texts of priority items for standardization;
5. assist in establishing sub-committees, technical commissions and elaborating national standards;
6. make a critical analysis of the national standards and draft standards already elaborated in the country;
7. make a list of contacts with persons and foreign institutions related with the sector of packaging;
8. assist in developing and implementing quality control systems in the packaging industry;

9. prepare a report summarizing the observations, describing in details the recommendations and indicating the necessary measures, the infrastructure, for the development of standards, quality control and quality certification in the sector of packaging of products involving healthy and safety;
10. train counterpart personnel.

2. OBSERVATIONS

2.1 Packaging in Brazil

Brazilian packaging producers and users are favoured by availability of all types of raw materilas and a diversified technology for production of packaging.

In general these conditions are appropriately utilized and the standard of packaging is as an average high. This does not signify, anyway, that all Brazilian packaging is without problems or economically optimum.

- 2.1.1 A main problem is inadequate co-ordination between packaging and distribution and related to this insufficient equipment within the distribution to secure an unbroken chain for mechanical handling of unit loads.

Some of the results of this is:

- frequent manual handling which is demanding to the strength and protective properties of the packaging and cause increased damages;
- increased transport costs due to the time consuming piecewise manual handling at each transfer point;
- inefficient utilisation of the mechanical handling equipment and warehouse capacity because of the limitation of the height of the unit loads owing to their manual construction.

- 2.1.2 Packaging of some of the fundamental food stuffs which under the present tough handling show considerable damage frequencies.

The problem is most pronounced within the cheaper types of food stuffs (fluid milk, flour, sugar). The high damage frequencies may be explained as consequence of the price relation between the content and the packaging. Cheap products have an economic optimum at a higher damage rate than expensive products.

- 2.1.3 Some foodstuffs which are hygienicly sensitive to contamination such as meat and meat products, poultry, fish and seafood, cheese, etc. are frequently exposed to the public unwrapped, not only in the open-air markets but occasionally also in supermarket outlets.

This exposure may imply an increased health risk which could be avoided by prevention of direct contact with the products or through compulsory packaging of such products when directly exposed to the public.

- 2.1.4 Fresh horticulture products are frequently marketed bruised, or otherwise damaged. A part of these injuries are due to insufficiently protective packaging or to inappropriate contact between the produce and the packaging, but many of the injuries are owing to improper handling at harvesting and at immediate post-harvesting transport and storage.

- 2.1.5 The types of packaging used for the transport of dangerous products are similar to the types used in other industrialized countries.

At present no quality standards for packaging of dangerous goods are established (but under preparation) and no certification procedure is in force. But, recently certain regulations and procedures for certifying transporting vehicles have been established.

2.1.6 A certain selection of poisonous and flammable products are consumer packed and sold through the general retail trade.

The danger warnings on these packages are normally indistinct, and often the strength and tightness of the package does not correspond to the risks by release of the contents.

2.2 ABNT CB-23

Standardization of packaging has a long tradition in Brazil; the number of standards prepared and the interest in further packaging standardization has intensified over the last years. As a consequence of this a special packaging standardization committee - CB-23 - was established in 1983 (Comitê Brasileiro de Embalagens e Acondicionamento).

The CB-23 has been established with the president of Associação Brasileira de Embalagem (ABRE) as chairman.

According to the Regimento Interno laid down for the CB-23 a number of sub-committees (SC's) should be established. It has been decided to establish 9 SC's, of which CB-1 is entitled to deal with general packaging questions; the work of the remaining 8 SC's is subdivided according to packaging raw materials.

The chairman of the 9 SC's are appointed; the selection of SC members is under preparation.

The development of standards is carried through in the study commission (CE's) of which a number was transferred from CB-10. Química, Petroquímica e Farmácia after the formation of CB-23. Some new CE's have been established in order to continue packaging activities earlier carried out within CE's associated with other CB's, or to cultivate new areas.

The secretariat of CB-23 is handled by ABRE on a voluntary basis; no standardization officer is attached to ABRE. The secretarial work of the CE's is done on a voluntary basis by secretaries elected among the commission members.

The organogram of CB-23 is described in the Regimento Interno. This Regimento Interno describes the distribution of duties within the organisation and the appointment and election of members for the managing and executing organs within CB-23.

Borderlines between the work of CB-23 and adjacent CB's have not been defined and the future field of activity of CB-23 is not fully formulated.

Due to the origin there was only little coherence in the work on which the work of CB-23 was started. The fundamental goals of the work and the principles on which the system of standards should be constructed has just been initiated.

When in full operation the CB-23 system can be foreseen to have 25-50 study commission and working groups working covering a widespread field with multiple interrelations and risks of overlapping.

Planning and control procedures for operation of this system have yet to be laid down.

2.3.4 INMETRO

A considerable number of packaging standards have been registered by INMETRO as NBR's.

The improvement of the quality of the Brazilian packaging standards over the past year is undoubtedly a result of the work of INMETRO.

The work of INMETRO in respect to packaging standardization is executed by the chemical department. No packaging specialist is attached to this department. The work is principally carried out by the head of the department.

2.4 Associação Brasileira de Embalagem (ABRE)

2.4.1 ABRE plays an important role in the development of packaging in Brazil. ABRE is a private organisation supported the packaging industry and important packaging users. The main activities are within packaging education and information.

As mentioned above ABRE is functioning as secretariat for CB-23.

2.4.2 In 1984 INMETRO and ABRE signed a contract according to which ABRE against a payment of Cr\$35M has undertaken to prepare 50 basic texts before October 1985. The contract contains a possibility for extension.

2.5 Packaging laboratories

Two independant packaging laboratories are in operation at IPT in São Paulo and at ITAL in Campinas.

2.5.1 Instituto de Pesquisas Tecnológicas do Estão de São Paulo, projeto tecnologia de embalagem e acondicionamento.

At this laboratory all general transport packaging testing, mechanical as well as climatic, can be carried out according to national and international packaging testing standards.

The laboratory has been active in drafting of many of the transport packaging standards which have been developed over the last years. This work has been carried out according to a contract between STI and IPT, a contract which expired in December 1984.

2.5.2 Instituto de Tecnologia de Alimentos, seção de embalagem e acondicionamento

This laboratory works mainly with problems in relation to consumer packaging of foodstuff.

The laboratory is established relatively recently and with considerable support from UNIDO.

The laboratory has compiled "Manual de legislação de embalagens para alimentos no Brasil". It has not been active in development of packaging standards.

2.5.3 Other institutes with main activities in adjacent fields are active in special aspects of packaging, e.g. Instituto Adolfo Lutz, Instituto Oswaldo Cruz, Instituto de Movimentação e Armazenagem de Materiais and Instituto Brasileiro de Petróleo.

3. WORK ACCOMPLISHED

3.1 After evaluation of the present status of packaging standardization in Brazil it was concluded that it would be appropriate to develop drafts for:

- terms of reference for CB-23, the SC's and the CE's with well defined borderlines to adjacent activities;
- planning and control procedures; and
- long term objectives and a middle horizon working plan.

Draft basic documents for planning and control procedures (doc. 866-84), for long term objectives (doc. 868-84) and a middle horizon working plan (documents 867-84 and 868-84) were prepared and submitted to the chairman of CB-23.

A survey on the packaging activities within ABNT was carried through and a summary compiled (doc. 897-85) for use as a basis for definition of the borderlines between the work of CB-23 and that of other CB's.

3.2 A number of international and foreign national standards, regulations and industrial branch norms are available as sources for development of Brazilian standards. Unfortunately these standards are not always easily accessible due to the scattered origin and lack of systematic structure in the development of packaging standards within the international society.

A list of packaging related standards issued by ISO, IEC and the UN agencies and a list of packaging related British Standards. (BS has the most elaborated system of national packages standards) was compiled (doc's -85 and 899-85) in order to facilitate the access to these sources in the packaging standards development work.

Further the two-volume collection of French Standards issued by AFNOR and the complete collection of corrugated fibreboard testing standards issued by FEFCO were provided as supplements to the DIN and ASTM packaging standards collection volumes already available in the library of INMETRO.

3.3 A need for general packaging technology documentation was identified within INMETRO, and a selection of fundamental packaging handbooks was recommended for ordering by UNIDO.

3.4 A paper was presented at the 1st Conference on Standardization within Transportation about the functioning of the European pallet pool (doc.863-84). A manuscript for a presentation of the problems related to standardization of packaging for dangerous goods was prepared (doc. 891-84).

3.5 15 draft standards were prepared in order to function as models for preparation of different types of packaging standards and to demonstrate methods for interrelation of packaging standards. The model standards deal with a

wide range of packaging materials and cover aspects related to the two main topics for the project - packaging of dangerous goods and packaging of food.

- 3.6 Visits were paid to the packaging testing laboratories at IPT (São Paulo) and ITAL (Campinas).

Aspects of packaging standardization in general and in Brazil were discussed together with question relevant to the participation of the laboratories in this work. The need for intensified contact and co-operation with the international work within the field was discussed.

Visits were further paid to ABRE, ABNT and the São Paulo distribution center of the Pão de Açúcar Supermarket chain.

4. RECOMMENDATIONS

- 4.1 After establishment of CB-23 it must be expected that the work within packaging standardization will be intensified. In order to secure a system of packaging standards which cover the needs of the producers and the users of packaging without inconsistencies the work to establish a long term plan should be encouraged.

In order to secure that all participants in the work within CB-23 are well informed about the activities, and to secure the ability of the board to guide and control the accordance of the work with the long term plan the efforts to lay down planning and control procedures for the work within CB-23 should be furthered.

Due to the volume of administrative and technical work which can be expected as a result of the increase in activities the personnel resources within packaging standardization should be strengthened by appointment of full-time or substantial part-time employees responsible

for packaging standardization.

- 4.2 It is a general experience that active participation of the packaging users in packaging standardization is difficult to obtain.

In order to attract the interest of the packaging users a special education and promotion effort is required. The central position of ABRE in packaging education and promotion as well as packaging standardization in Brazil form an appropriate background for establishment of such interest. Activities in this respect could be:

- arrangement of courses in packaging standardization;
- inclusion of packaging standards in the general packaging education activities;
- inclusion of news about national and international packaging standards in the information source; and
- preparation of user oriented articles on packaging standardization for publication in the technical journals of the users' trades and industries.

Within the standardization work it might be appropriate to form study commissions which deal with packaging aspects in relation to specific types of products (parallel to the work of CE-23:01.03 - Packaging for dangerous products). Participation in such work appears relevant to more users of packaging than participation in study commissions based on a specific type of packaging material.

- 4.3 Standardization of packaging quality methods is of essential importance in development of packaging quality.

On this background it is of utmost importance to maintain and extend the active participation of the packaging research and testing institutes in the work of CB-23.

Due to the weak economic position of these institutes such participation will require remuneration for the work involved, e.g. by payment for development of draft testing standards as it has earlier been practised.

- 4.4 The development within the packaging technology follow a general worldwide trend; this trend is further promoted by the increase in the world trade.

On this background it is important that Brazilian packaging standardization develops in correspondance with this general trend.

In order to keep abreast with the trends and actively participate in development of international standards Brazil should register as a P-member of ISO/TC122 - Packaging. The Brazilian branch organizations within packaging should further be informed about the specialized packaging standardization work carried out by other ISO Committees and sub-committees related to (e.g. pallets, metal cans, glass packaging, sacks). They should be encouraged to take active part and support active Brazilian participation in this work.

Efforts should further be made to allow active Brazilian participation in ISO/TC122/SC3 - Testing of packaging.

- 4.5 Packaging is an integral part of the distribution system and an important tool in the reduction of the distribution costs.

Efforts be done in order to coordinate packaging and distribution efforts which should be encouraged.

The most urgent action to be taken is establishment of a dimensional standards module for the domestic distribution of daily consumer goods. Most probably the 1200 x 1000mm module is the most practical module, as it

is already widely used and correspond to the dimensions of the primary unit load base area recommended by ISO.

On the basis of such module dimensions of transport packaging and consumer units can be derived by subdivision and dimensions of storage sacks supermarket shelves and internal and external means of transport derived by adaptation to the sizes of the module and its sub-modules.

4.6 Some cheaper types of food stuffs tend to be packed in packaging which lead to considerable losses throughout the chain of distribution. The packaging may be the best possible within the narrow cost limits valid for such products. But, health and esthetical aspects as well as the aspects of cleaning of the distribution chain should be considered as well. Quality Standards based on performance requirements should be established in order to prevent the use of low grade packaging for these products.

4.7 Internationally it has been agreed that from 1990 all packaging for international transport of dangerous goods should be certified according to the recommendation of the UN group of experts. The work involved in testing of the many types of packaging in use and accomplishment of the necessary corrections in the production of such packaging will require several years. It is therefore urgently required to enforce the UN recommendation and establish the procedures for certification and certification mailing of packaging for international transport of dangerous goods.

Similarly if not identical requirements should be established for domestic transportation, but could be introduced gradually on the basis of the experience gained in the introduction of the certification for international transport.

The labelling and performance properties of consumer packaging for dangerous products should be improved by introduction of mandatory distinct danger labels and performance testing requirements.

- 4.8 In order to improve the export of Brazilian products and strengthen the position of these products on the export markets standards should be established on packaging for important Brazilian export products. Whenever possible such standards should be based on performance requirements.

5. ACKNOWLEDGMENTS

The expert wishes to express his sincere thanks guidance and useful discussions with the Chief Technical Adviser, Dr. B. S. Krishnamachar and to acknowledge the co-operation received from the officers of INMETRO, the head of the Chemical Department, Ms. Fátima Leone Martins in particular. He further wishes to acknowledge the assistance from the President of ABRE, Dr. Manuel Vieira and the assistance of the secretaries of ABNT and UNIDO project office.

ANNEX

DOCUMENTS AND REPORTS

MR. KURT H. GAMRIN

PACKAGING EXPERT

POST 11-11

01. 01/R/851-84 - Report of visit to São Paulo - 28 to 29 August 1984.
02. 02/R/853-84 - Preliminary report
03. 03/R/855-84 - Notes from meeting with CB-23 chairman Dr. Manoel Vieira
04. 04/R/856-84 - Notes from meeting with Dr. Ernesto Pichler, IPT
05. 05/R/857-84 - Notes from meeting in CE-23:05.05 (2nd. meeting of the CE)
06. 06/R/858-84 - Visit to the São Paulo distribution center of Pão de Açúcar for daily goods and clothing furniture household machines and similar products - 20 September, 1984
07. 07/R/860-84 - Notes from meeting on 04 October 1984 with Gerson Andrade Novaes, INMETRO, Agro-Industrial Department
08. 08/R/861-84 - Notes from "1º Seminário de Normalização nos Transportes" - São Paulo - 4-5 October, 1984
09. 09/R/862-84 - Notes from meetings in ABRE, São Paulo on 26 September, 1984

10. 10/T/863-84 - I Seminário de Normalização nos Transportes - I NORMAT, São Paulo - 04 and 05 October 1984
11. 11/R/864-84 - Notes from meeting in CE-23:05.07 - Embalagens plásticas para alimentos - 26 September 1984
12. 12/R/865-84 - Notes from meeting in CE-23:05.08 - Embalagem de material plástico para água
13. 13/T/866-84 - CB-23 Planning and control procedures
14. 14/T/867-84 - Priority areas of CB-23
15. 15/T/868-84 - Purpose of packaging standardization
16. 16/T/869-84 - Work plan for the study commissions within CB-23 for the period 1985-1987
17. 17/T/870-84 - Discussion points for meeting with CB-23 Chairman
18. 18/R/871-84 - Notes from visit with Dr. Manuel Vieira - ABRE
19. 19/R/872-84 - Proposal for establishment of CE's within CB-23
20. 20/R/873-84 - Subjects for lectures on packaging standardization
21. 21/R/874-84 - Notes from meeting with Prof. Sidney Silveira Jatobá - INMETRO - 24 October 1984
22. 22/S/876-84 - Draft standard - Packaging - Dangerous goods testing for international transport
23. 23/S/877-84 - Draft standard for corrugated and solid fibre-board boxes graphical symbols for construction drawings
24. 24/S/878-84 - Draft standard - Packaging - Light duty mild steel and tinplate drums with fixed ends - Specification

25. 25/S/879-84 - Draft standard - Plastics - Determination of overall migration into rectified olive oil testing method
26. 26/S/880-84 - Draft standard - Packaging - Metal drums threads for screw closures - Specification
27. 27/S/881-84 - Draft standard - Packaging - Collapsible metal tubes - Nozzles and plastic caps - Specification
28. 28/S/882-84 - Draft standard - Packaging - Testing sampling for inspection by variables for per cent defective procedure
29. 29/S/883-84 - Draft standard - Packaging - Complete, filled transport packages rolling test
30. 30/S/884-84 - Draft standard - Round metal cans for food and drinks recommended diameters
31. 31/S/885-84 - Draft standard - Packaging - Crown finishes for glass containers - Specification
32. 32/S/886-84 - Draft standard - Corrugated and solid fibreboard boxes determination of the strength of the manufacturer's joint testing method
33. 33/S/887-84 - Draft standard - Packaging - Collapsible tubes testing for air tightness of the closure testing method
34. 34/S/888-84 - Draft standard - Hermetically sealed metal cans for food and drinks determination of the capacity testing method
35. 35/S/889-84 - Draft standard - Hermetically sealed metal cans for food and drinks terminology, nominal dimensions and designations

36. 36/S/890-84 - Draft standard - Corrugated and solid fibre-board boxes base areas adapted for 1200 x 1000 mm pallets - Padronização
37. 37/C/891-84 - Packaging of dangerous goods standards and legal aspects
38. 38/S/892-84 - Coments to "Frascos de vidro - control de qualidade"
39. 39/B/895-85 - International standards relevant to the field of packaging
40. 40/T/896-85 - Packaging of foods - Observations from supermarkets and open-air markets in Rio de Janeiro on 15 and 16 December, 1984
41. 41/T/897-85 - Standards being developed by ABNT committees outside CB-23 activity in standardization and packaging related fields
42. 42/R/898-85 - Final Report
43. 43/R/899-85 - British standards related to packaging - extract from BSI Catalogue
44. 44/S/900-85 - Comments on draft standards - Note on drop testing of plastic for water

LIST OF REPORTS PREPARED

BY MR. KURT H. GARMIN

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01. 38/S/892-84 - Comments to "Frascos de vidro - Control de Qualidade"
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