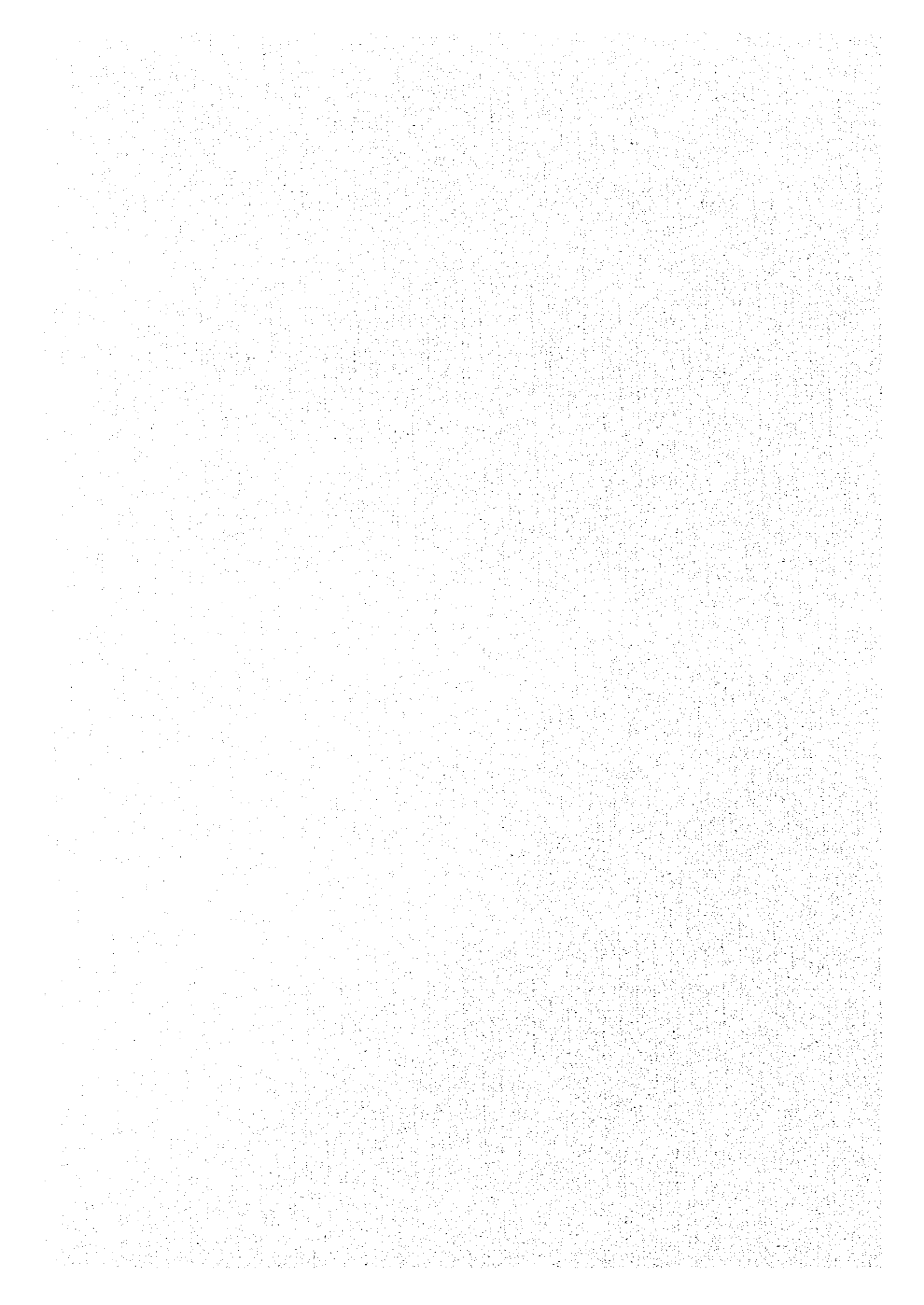


# 資 料



1 合同評価報告書

JOINT EVALUATION REPORT  
ON  
THE JAPANESE TECHNICAL COOPERATION  
FOR  
THE PROJECT ON QUALITY CONTROL  
FOR TEXTILE INDUSTRY  
IN THE REPUBLIC OF PARAGUAY

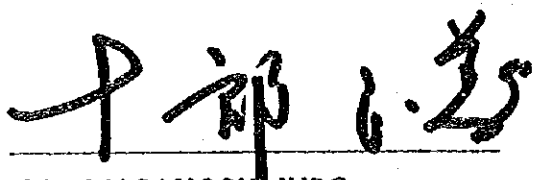
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
MINISTRY OF INDUSTRY AND COMMERCE, THE REPUBLIC OF PARAGUAY

DECEMBER 6 1996  
ASUNCION, THE REPUBLIC OF PARAGUAY

MUTUALLY ATTESTED AND SUBMITTED  
TO ALL CONCERNED

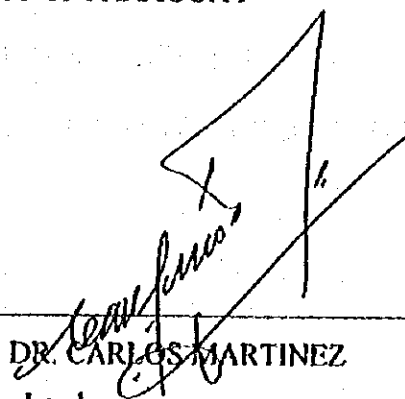
DECEMBER 6 1996

ASUNCION, THE REPUBLIC OF PARAGUAY



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Japanese Evaluation Team  
Japan International Cooperation  
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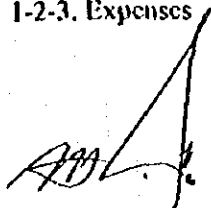
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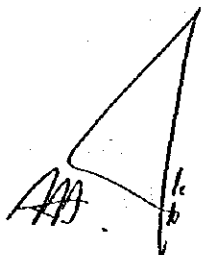
## I. INTRODUCTION

### 1. The Evaluation Teams

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Masayoshi Juro, visited the Republic of Paraguay from November 19 to December 6, 1996 for the purpose of evaluating jointly with the Paraguayan Evaluation Team (hereinafter referred to as "the Paraguayan Team") the achievement of the Japanese technical cooperation for the Project on Quality Control for Textile Industry (hereinafter referred to as "the Project") in the Institute of National Technology and Normalization (hereinafter referred to as "INTN.") on the basis of the Record of Discussions signed on February 28, 1992 (hereinafter referred to as "R/D").

Both teams discussed and studied together the efficiency, achievement, impact, appropriateness and sustainability of the Project.

Through careful studies and discussions, both sides summarized their findings and observations as described in this document.

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**2. Schedule of Joint Evaluation**  
**( November 19 - December 6, 1996 )**

<u>Date</u>	<u>Schedule</u>
	<b>(Consultant)</b>
November 19, 1996	Meeting with the JICA Office in Paraguay and Japanese experts Interview to Secretaría Técnica de Planificación
November 20, 1996	Interview to Ministerio de Industria y Comercio Interview to Ministerio de Integración
November 21, 1996	Interview to Servicio Nacional de Promoción Profesional
November 22, 1996	Interview to Cámara Algodonera del Paraguay Interview to Cámara Textil Paraguaya Interview to Asociación Industrial de Confeccionistas
November 25, 1996	Interview to a private textile manufacturer
November 26, 1996	Interview to a private textile manufacturer and a spinning company <b>(Japanese Evaluation Team)</b> Meeting with the JICA Office in Paraguay and Japanese experts Meeting with the Japanese Embassy
November 27, 1996	Courtesy Visit to Secretaría Técnica de Planificación Courtesy Visit to Ministerio de Industria y Comercio Visit to INTN and observation of activities of the Project <b>(Both Evaluation Team)</b> Preliminary meeting
November 28, 1996	Interview to the Paraguayan counterparts
November 29, 1996	Interview to the Japanese experts
December 2, 1996	Discussions on evaluation
December 3, 1996	Discussions on evaluation
December 4, 1996	Discussions on evaluation and preparation of the joint evaluation report
December 5, 1996	Discussions on the joint evaluation report in the joint committee meeting
December 6, 1996	Signing on the joint evaluation report

### 3. Members of Evaluation Teams

#### 3-1. Japanese Side

Mr. Masayoshi Juro	- Leader
Mr. Tetsuyuki Gennai	- Industrial Standards and Inspection System
Mr. Nobuhiro Tsutsumi	- Testing and Inspection
Mr. Koji Ichikawa	- Cotton Spinning Technology
Mr. Masaki Miyaoka	- Evaluation Management
Mr. Wataru Takada	- Data Analysis and Evaluation

#### 3-2. Paraguayan Side

Dr. Carlos Martínez	- Ministerio de Industria y Comercio
Lic. Osvaldo Martínez	- Secretaría Técnica de Planificación
Dr. Hugo González	- Universidad Nacional de Asunción
Dr. Milciades Artecona	- Federación de la Producción, la Industria y el Comercio
Lic. Pablo Rodríguez	- Instituto Nacional de Tecnología y Normalización
Dr. César Servín	- Ministerio de Industria y Comercio



## II. METHODOLOGY OF EVALUATION

### 1. Evaluators

- 1) Paraguayan Side : The Paraguayan Evaluation Team
- 2) Japanese Side : The Japanese Evaluation Team

### 2. Items of Evaluation

- 1) Input to the Project
- 2) Output from the Project
- 3) Efficiency of the Project
- 4) Achievement of the Project Purpose
- 5) Overall Goal and Super Goal
- 6) Impact of the Project
- 7) Relevance of the Project
- 8) Prospect of Sustainability


### 3. Methodology of Evaluation

1) In order to evaluate the past performance and achievement, the following materials were used:

- i) The Record of Discussions (RD), Tentative Schedule of Implementation, Minutes of Discussions, Annual Work Plan and other documents agreed to or accepted by both sides in the course of implementation of the Project.
- ii) The Project Design Matrix (PDM) as shown in Annex 1:
- iii) Data of Input to the Project and Output from the Project
- iv) Result of Interviews

2) Both Teams have discussed and studied together all questions regarding the items in Section 2 above.

Through careful studies and discussions, the results were summarized into this Joint Evaluation Report.



### III. BACKGROUND AND SUMMARY OF THE PROJECT

#### I. Outline of Project's Background

The international trade structure of Paraguay is based on the export of agricultural product such as soybeans, raw cotton and meat which occupies more than 70% of the total export, and the trade balance is affected by climate and fluctuation of international prices. Industrialization and export promotion of manufactured goods are important policies in order to improve such a trade structure. Under the circumstances, the Government of Paraguay has submitted a request for project type technical cooperation to the Government of Japan in July, 1990, in relation to manufacturing and export of cotton product for the purpose of exporting with more value added by processing raw cotton to manufactured goods such as yarns, fabrics and clothing.

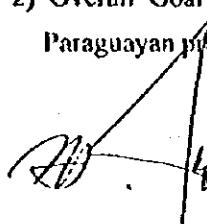
In response to the above request, JICA dispatched Preliminary Survey Team in February, 1991 and prepared the basic policy of the technical cooperation program. In September-October, 1991, the Implementation Survey Team was dispatched to determine the basic idea of the project from technical viewpoints, and to make detailed study and discussions on the implementation plan, method of technical transfer, goals, specification of machinery and equipment, and the measures to be taken by the Paraguayan side. The Record of Discussions was signed on February 28, 1992. Further, the Mutual Consultation Team was dispatched in December, 1992 and reconfirmed the basic idea of technology transfer, progress of the Project, implementation schedule, and the matters to be prepared for project implementation at the time. In December, 1993, the Technical Guidance Team was dispatched to find the progress of the project. In October-November, 1994 and March, 1996, the Consultation Teams was dispatched by JICA for the review of activities and to discuss on annual work plans.

#### 2. Chronological Review of the Project

The chronological review of the Project is shown in Annex 2.

#### 3. Objective of the Project

- 1) Super Goal of the Project is that the textile industry in the Republic of Paraguay is promoted and its export are increased.
- 2) Overall Goal of the Project is that the quality of cotton yarn and cotton fabrics made by Paraguayan private companies is improved.



#### 4. Purpose of the Project

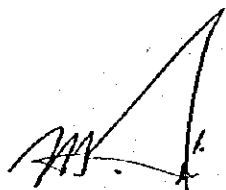
The purpose of the Project is that the content of the service (testing and inspection, technical guidance, etc.) by INTN concerning cotton yarn and cotton fabrics is improved.

#### 5. Tentative Schedule of Implementation

The Tentative Schedule of Implementation is shown in Annex 3.

#### 6. Technical Cooperation Programme

The Technical Cooperation Programme is shown in Annex 4.

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## IV RESULTS OF EVALUATION

### 1. Efficiency of Implementation

#### 1-1. Input to the Project by Japanese Side

##### 1-1-1. Dispatch of Experts and Survey Team

The Japanese side has dispatched 9 long-term experts of 5 fields and 24 short-term experts, also sent survey teams related to the Project until this evaluation as shown in Annex 21 and Annex 22.

##### 1-1-2. Acceptance of Counterpart Personnel for Training in Japan

JICA has accepted 16 Paraguayan counterparts for training in Japan as shown in Annex 23.

##### 1-1-3. Provision of Machinery and Equipment

Up to now, machinery and equipment equivalent to ¥ 373 million approximately have been provided by the Japanese side through JICA as shown in Annex 24.

##### 1-1-4. Expenses

The total outlay of the Project by the Japanese side is approximately ¥ 885 million as shown in Annex 25.

#### 1-2. Input to the Project by Paraguayan Side

##### 1-2-1. Buildings and Facilities

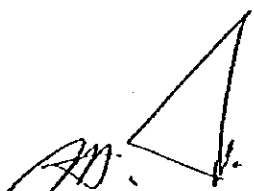
The Paraguayan side has provided to the Project building and facilities as shown in Annex 27.

##### 1-2-2. Allocation of Paraguayan Counterpart and Supporting Staff

The Paraguayan side has allocated counterparts and administrative personnel as shown in Annex 26.

##### 1-2-3. Expenses

The total outlay of the Project by Paraguayan side is approximately Gs. 2,033 million as shown in Annex 28.



### 1-3. Output from the Project

#### 1-3-1. Technology Transfer to Paraguayan Counterparts

Following technologies have been transferred by Japanese experts to Paraguayan counterparts;

##### 1) Testing and Inspection

Physical and chemical analysis of cotton fiber, sliver, roving, yarn and textile fabrics.

##### 2) Cotton Spinning

Production of marketable cotton yarns using the Pilot Plant, maintenance and operation of machinery.

##### 3) Standards and Export Inspection System

Preparation of quality standards and export inspection system in order that the quality of Paraguayan textile products can be recognized in the international market.

Items of Technology Transfer are listed in Annex 5.

#### 1-3-2. Management of Machinery and Equipment

##### 1) Testing and Inspection

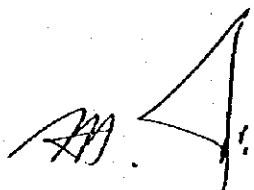
All the equipment is well managed and operating normally. They are maintained according to the manuals, and the records of maintenance and inspection are registered in the testing equipment inventory book.

##### 2) Cotton Spinning

All the machinery and equipment are maintained in good condition by periodical inspection and adjustment according to the manuals. Storage and consumption of spare parts and accessories are well controlled by computer.

#### 1-3-3. Testing and Inspection

Testing of 147 samples by request of private companies were performed by the counterparts, details of which are listed in Annex 7. These testing services include wide range of physical and chemical testing of textile. In addition, charge free testing of samples provided by private companies based on agreements were effectuated, details of which are listed in Annex 7, too. Furthermore, since 1994 periodical quality survey of national cotton yarns have been realized as shown in Annex 8. The data of these surveys is useful for improving the quality of Paraguayan cotton yarns.



#### 1-3-4. Cotton Spinning

Existing 8 counterparts have acquired the technology necessary for operation and maintenance of cotton spinning plant. They have experienced in spinning various different count of yarns of different types of material such as 100% cotton and cotton/polyester blended, utilizing machinery installed in the Pilot Plant during the Technology Transfer activities. They have been spinning up to 50's yarn of 100% cotton. The total production of the Pilot Plant has reached approximately 3,800 kg as shown in Annex 9. The manuals for manufacturing as shown in Annex 10 and the manuals and check-list for technical training as shown in Annex 11 have been prepared up to date.

#### 1-3-5. Standards

Since the standards unit of the Project in INTN were authorized as the secretariat for preparation of standards concerned with textile industry and a technical committee was organized under the secretariat, revision of old standards and establishment of new standards have been studied by this committee. Up to date revision of 8 standards have been approved and 8 new standards are waiting for approval. Details of these standards are listed in Annex 12.

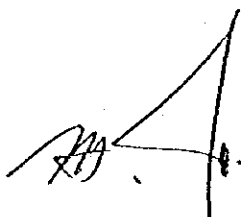
#### 1-3-6. Export Inspection System

The necessity of an official export inspection system has been recognized among authorities concerned. A draft of the official export inspection system which is shown in Annex 13 has been prepared although the decision to introduce such system has not been made.

#### 1-3-7. Dissemination

The quality control technology has been disseminated to private manufacturers of cotton products through the activities such as seminars and publication of magazines as well as individual direct technical guidance. For collection of necessary information several investigations which are listed in Annex 17 were carried out. The list of seminars organized by the Project, the list of publications and the list of individual direct technical guidance are shown in Annex 14, 15 and 16 respectively. Besides, the Project contributed in developing national human resources through providing its human and material infrastructure for practice of trainees in the field of textile as shown in Annex 18.

Studying activities with specific themes are being developed by counterparts, details of which are shown in Annex 19.





#### 1-4. Efficiency of Implementation

Inputs to the Project have been done timely and appropriately by both sides except a few month delay in installation of two testers for laboratory and outputs from the Project have been obtained efficiently as planned. In view of the above, both teams evaluated that the Project has been implemented efficiently. It would have been more efficient, however, if all the counterparts who were sent to Japan for training could stay in the Project.

#### 2. Achievement of the Project Purpose

The purpose of the Project is to improve the service of INTN concerning cotton yarn and cotton fabrics. Through the project period the service of INTN to the private sector has been improving both quantitative and qualitatively. Based on investigations by interview and questionnaire to private sector as well as interested authorities, both evaluation teams confirmed that there have been a certain improvement of service of INTN and prognostic signs for further improvement.

#### 3. Overall Goal and Super Goal of the Project

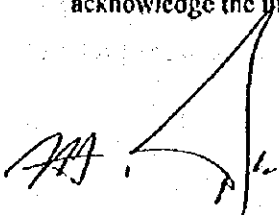
The overall goal and the super goal is quality improvement of cotton products manufactured by private companies and increase of their export respectively. There is no available statistics to indicate recent increase of cotton products export. It seems too early to evaluate these goals.

#### 4. Impact of the Project

##### 4-1. Contents of Impact

##### 4-1-1. Technical Impact

A notable technical impact by the Project is that counterpart personnel has acquired the technology and knowledge necessary for quality improvement of cotton products both in the laboratory and production and also in preparing standards. In the sector level, through dissemination activities of the project such as seminars, the private sector has come to acknowledge the importance of quality improvement.



#### 4-1-2. Institutional Impact

The unit of standards in the Project was nominated as the secretariat of committee to prepare standards and led the committee in drafting standards. INTN has been authorized as the only official agency in charge of quality certification, and has started to organize itself in accordance with ISO Guide 25. Activities related to this purpose are listed in Annex 20. These aspects are considered as impacts of the Project.

#### 4-1-3. Economic Impact

The necessity and possibility to improve the quality and to increase export of cotton products have been recognized among manufacturers through the activities by the Project. A very limited number of manufacturer has achieved a certain quality improvement and increase of export. Also it is noted that testing in the laboratory of the Project helped the private sector to save time and expenses to send samples for testing to outside of the country.

#### 4-1-4. Environmental Impact

A waste water treatment system for the laboratory has been introduced. Also, counterparts made a discourse in this relation in a seminar. These have drawn attention of the concerned party and it is expected similar system will be introduced in private production plant by direction of the authorities concerned.

#### 4-2. Dissemination of Impact and the Range of Beneficiary

To date the impact by the Project is limited to the project level and sector level. However, national level economic impact is expected in the near future.

#### 5. Relevance of the Project

It is confirmed by all the official organization including Ministry of Industry and Commerce and Ministry of Integration that industrialization and promotion of export is one of the most important policy of the country and the policy concerning the textile industry has not changed since the Project started, that is to aggregate values to raw cotton by processing it before export. The purpose of the Project, improving the service of INTN, is aiming at improving quality of cotton yarn and cotton fabrics in order that the Paraguayan cotton products will be more competitive in the international market. In this context, the Project are considered to be totally conform to the national policy.

Furthermore, the majority of private companies who replied to the questionnaire expressed their appreciation for the services given to them and recognized the importance of roles played by INTN for increasing export of cotton products.



## 6. Prospect of Sustainability

### 6-1 Prospect of Sustainability from the Organizational Aspect

INTN, the implementation agency of the Project, is an autarchic institution supported by the Ministry of Industry and Commerce, and is responsible to give technical support to domestic industry which is faced to keen regional and international competition by the participation of Paraguay in MERCOSUR. This is also the only official institution in charge of testing and inspection as well as industrial standard of the country. Within the organization of INTN, the Project has been well established under direct control of the General Director independently of the former leather and textile department and is expected to become an independent textile technical center on basis on the present project office. Thus, the Project has laid a solid and sustainable foundation of technical service agency in the field of textile industry, and it is expected to be given continuous political support.

### 6-2 Prospect of Sustainability from the Financial Aspect

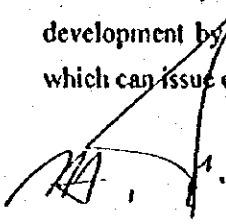
INTN is considered financially sustainable as guaranteed by the national budget. In addition, a certain portion of the income by its operation such as service fee for testing paid by private companies is returned to INTN. In the past record, more or less 80% of the total expenditure is covered by the general budget and the rest by the return of service fees. It is confirmed by the Minister of Industry and Commerce as well as the General Director of INTN that more budget is allocated to the Project in 1997 even after the termination of Japanese cooperation which will come in February. Furthermore, it is informed that the private sector of textile industry has a plan to establish a foundation which can support financially the Project in view of the importance of roles to be played by the Project.

### 6-3 Prospect of Sustainability from the Material and Technical Aspect

Both teams evaluated the Project as sustainable from the material and technical view point with following observations:

#### (1) Testing and Inspection

All technology and materials including manuals necessary to undertake testing and inspection of raw cotton, cotton yarn and cotton fabrics have been transferred, so that, with further development by counterparts, it is possible to be recognized as an international laboratory which can issue certificates.



**(2) Cotton Spinning**

The counterpart personnel acquired necessary technology to control spinning process, to reduce defects and to operate the plant efficiently using the existing Pilot Plant in the Project as well as to give maintenance. In addition, they become able to give a certain service to private companies such as surface treatment of rubber rollers using surface grinder or ultra-violet apparatus.

**(3) Industrial Standard and Export Inspection System**

The technology concerning statistic methodology as well as specific technology necessary for designing standards of raw cotton, cotton yarn and cotton fabrics has been transferred. The standards unit of the Project, which is authorized as the secretariat for preparation of industrial standards related to textile industry and directs the technical committee, had realized revision of old standards and preparation of new standards, and also had proposed a draft of official export inspection system. It is expected that counterparts who acquired technology will contribute in preparing and disseminating standards in view of the international tendency.



## V. CONCLUSION

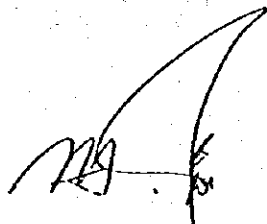
As a result of the joint evaluation, both teams reached the following conclusions:

- (1) In general, it is concluded that the project purpose has been achieved, having the target accomplished.
- (2) The successful implementation of the Project is greatly owing to the cooperation between the parties concerned and experts from Japanese side and Paraguayan parties concerned and counterparts, also to the effective management.
- (3) In consideration of that the technical transfer has been completed, it is prospected that the overall goal and the super goal will be achieved in the near future.
- (4) It is predicted that the Project will be successfully completed as scheduled on February 1997.

## VI. RECOMMENDATION

Based on mutual understanding that the importance of quality control is increasing in accordance with the participation of Paraguay in MERCOSUR, the following items are recommended:

- (1) Those who acquired technical transfer should continue to develop by themselves through their activities and also to disseminate the technology to their colleagues.
- (2) The best effort should be made in order to maintain technical personnel who acquired technical transfer in the organization.
- (3) For the purpose of dissemination of the transferred technology, an organization composed of counterparts and technical personnel of private sector shall be promoted.
- (4) A policy to promote investments for improving the quality and increasing the production capacity shall be applied in order to increase the demand for technology.



Project Design Matrix (PDM) on the Quality Control for Textile Industry in the Republic of Paraguay

Summary of the project	Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Supex Sinal</b> The textile industry in the Republic of Paraguay is promoted, and its exports are increased.</p> <p><b>Cotamil Cmsil</b> The quality of cotton yarn and cotton fabrics made by Paraguayan private companies is improved.</p> <p><b>Phosel Phosel</b> The content of the service (testing and inspection, technical guidance, etc.) by INTN concerning cotton yarn and cotton fabrics is improved.</p>	<p>- Comparison of export quantities of cotton products</p> <p>- The percentage of Paraguayan cotton products which pass the Japanese export standards for cotton</p> <p>- Activities at INTN</p>	<p>- Trade statistics</p> <p>- The record of the Project (inspection results on cotton products)</p> <p>- The records of activities at INTN</p>	<p>- The Paraguayan policy regarding cotton industry will not be changed.</p> <p>- The standards made by INTN are used in the export inspection system, etc.</p> <p>- The counterparts will not leave INTN.</p> <p>- People in the textile industry have the desire to make cotton products of a better quality, and their factories will have enough equipment for that purpose.</p> <p>- Textile industry will foster staff who can cope with the standards and the export inspection system.</p>
<p><b>Phosel Phosel</b> The counterparts acquire manufacturing technology of cotton yarn.</p> <p>2. The necessary equipment is kept in order.</p> <p>3. The skills of testing and inspection of cotton yarn and cotton fabrics is improved.</p> <p>4. The basic system for the technical training of cotton spinning is set up.</p> <p>5. The system at INTN to make and publicize standards is established.</p> <p>6. INTN is able to advise on the technical standards for the export inspection system.</p> <p>7. Dissemination for quality control technology in textile industry is practiced.</p>	<p>1. Level of the success of technical transfer to the counterparts</p> <p>2. Status of the maintenance of equipment</p> <p>3. Results of testing and inspection</p> <p>4-1. Status of the preparation of a manufacturing manual</p> <p>4-2. Status of the preparation of manuals and check-lists for technical training</p> <p>5. Status of the preparation of standards</p> <p>6. Status of examining the export inspection system</p> <p>7. Activities of dissemination</p>	<p>1. Checklist by the experts and the counterparts concerning the level of the success of technical transfer</p> <p>2. Records of the maintenance of equipment</p> <p>3. Records of inspection</p> <p>4-1. Manufacturing manual</p> <p>4-2. Manuals and check-lists on technical training</p> <p>5. Plan for making and publicizing standards</p> <p>6. Results of the examination of export inspection system</p> <p>7. Results of dissemination</p>	<p>- The counterparts will not leave INTN.</p> <p>- The Paraguayan Government regards INTN as the key national institute for promoting textile industry and continues to supporting it.</p> <p>- The local cost will be paid properly.</p>
<p><b>Activities</b></p> <p>1-1. Planning of technical transfer to the counterparts in each fields</p> <p>2-1. Provision and installation of the necessary equipment</p> <p>2-2. Planning of a maintenance program of the equipment</p> <p>3-1. Providing of laboratory service for testing and inspection</p> <p>4-1. Making a manual on cotton yarn manufacture</p> <p>4-2. Training the counterparts in cotton yarn manufacture following the manual</p> <p>4-3. Training the counterparts in the process control of cotton yarn manufacture (including OMT)</p> <p>5-1. Training the counterparts in making standards</p> <p>6-1. Research on the understanding of standards to the people working in cotton industry.</p> <p>6-2. Research on the export inspection systems of other countries</p> <p>7-1. Publication of bulletin</p> <p>7-2. Seminars</p>	<p>Input</p> <p>Input by Japanese side</p> <p>Long-term experts</p> <p>Short-term experts</p> <p>Counterpart Training in Japan</p> <p>Machinery and Equipment</p> <p>Input by Paraguayan side</p> <p>Building and Facilities (Million Gs)</p> <p>Counterpart/Supporting Staffs</p> <p>Expenses (Million Gs)</p>	<p>1994</p> <p>1995</p> <p>1996</p> <p>TOTAL</p>	<p>- The counterparts will not leave INTN.</p> <p>- The working environment at INTN will be appropriate.</p> <p>- Necessary budget for the management of the Project is allocated continuously.</p> <p>- The local cost will be paid properly.</p>
<p>373 (Million Yen)</p> <p>Equipment for Testing and Inspection of Textile Materials, Cotton Spinning Pilot Plant, and others</p> <p>Building (Office, Pilot Plant, Laboratories) Furniture, Accessories, Materials</p> <p>453</p> <p>20 111 317 616 1,579</p>	<p>1994</p> <p>1995</p> <p>1996</p> <p>TOTAL</p>	<p>- The counterparts will not leave INTN.</p> <p>- The facilities at the building are equipped before the beginning of the Project.</p> <p>- Counterparts are placed as planned.</p>	

## CHRONOLOGICAL REVIEW OF THE PROJECT

Year	Month	Item
1990	Jul.	The Government of Paraguay submitted a request to the Government of Japan for technical cooperation.
1991	Feb. Sep.	Dispatch of Preliminary Survey Team by JICA Dispatch of Experts Survey Team by JICA
1992	Feb. Mar. Nov. Dec.	Dispatch of Implementation Survey Team by JICA ( Signing of the Record of Discussions ) Commencement of the Project Training of the first batch of the Paraguayan counterpart personnel in Japan Dispatch of one long-term expert ( Coordinator ) Dispatch of two long-term experts ( Chief Advisor and expert on Testing & Inspection ) Dispatch of Consultation Team by JICA
1993	Jul. Dec.	Dispatch of one long-term expert ( expert on Spinning Plant ) Dispatch of Technical Guidance Team by JICA
1994	Jan. Mar. Oct.	Dispatch of one long-term expert ( expert on Industrial Standards & Inspection System ) Ceremony for completion of facilities in the project Dispatch of Consultation Team by JICA
1995		
1996	Mar. Nov.	Dispatch of Consultation Team by JICA Dispatch of Evaluation Team by JICA

Tentative Schedule of Implementation(TSI)

1/3

TENTATIVE SCHEDULE OF IMPLEMENTATION

Calendar Year	1992		1993		1994		1995		1996		1997		
	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Japanese Fiscal Year													
Term of the Project													
(Paraguayan Side)													
1. Preparation of Facilities													
(1) Testing and Inspection													
(2) Cotton Spinning Plant													
2. Assignment of Counterpart Personnel													
(1) Testing and Inspection (4)													
(2) Cotton Spinning (4)													
(3) Standard and Inspection System (3)													
3. Establishment of Textile Development Department in INTN													
4. Local Cost Budget Allocation													

— Original Plan    — Accomplished    - - - - - Present Plan





TENTATIVE SCHEDULE OF IMPLEMENTATION

3/3

Calendar Year	1992				1993				1994				1995				1996				1997			
	1991	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Japanese Fiscal Year	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
4. Provision of Machinery and Equipment																								
(1) Testing and Inspection							①																	
(2) Cotton Spinning																								
(3) Others																								
5. Counterpart Training in Japan																								
(1) Testing and Inspection	1																							
(2) Cotton Spinning	1																							
(3) Industrial Standard																								

Original Plan    Accomplished    Present Plan

Technical Cooperation Program(TCP)

TECHNICAL COOPERATION PROGRAMME

1/4

Calendar Year	1992				1993				1994				1995				1996				1997			
	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Japanese Fiscal Year																								
Term of the Project																								
1. Testing and Inspection Techniques																								
(1) Preparation of Test Book																								
(2) Equipment Installation																								
(3) Preparation of Manual																								
(4) Equipment Maintenance																								
(5) Technical Transfer																								
1) Test for Raw Cotton																								
① Color																								
② Length of Cotton Fibers																								
③ Foreign Matter																								
④ Fineness																								
⑤ Other Test Items																								
2) Test for Cotton Yarn																								
① Yarn Count																								
② Yarn Evenness																								
③ Yarn Strength																								
④ Number of Neps in Cotton Yarn																								
⑤ Yarn Length																								
⑥ Other Test Items																								
3) Test for Cotton Fabrics																								
① Shrinkage																								
② Strength																								
③ Other Test Items																								

----- Original Plan      - - - - - Accomplished      - - - - - Present Plan

TECHNICAL COOPERATION PROGRAMME

2/4

Calendar Year	1992				1993				1994				1995				1996				1997							
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Japanese Fiscal Year	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
4) Test for Chemical Analysis																												
① Fiber Discriminate & Mixture Ratio																												
② Content of Formaldehyde																												
③ Other Test Items																												
5) Test for Color Fastness																												
① To Laundering																												
② To Perspiration																												
③ To Rubbing																												
④ To Light																												
⑤ To Hot Pressing																												
⑥ To Dry Cleaning																												
6) Inspection Method and Grading Decision																												
① Raw Cotton																												
② Cotton Yarn																												
③ Fabrics																												
2. Cotton Spinning																												
(1) Outline of Production Process																												
1) Machine Installation																												
2) Introduction of Spinning Process																												
3) Production Plan & Control of Actual Production																												

Original Plan ———— Accomplished - - - - - Present Plan

TECHNICAL COOPERATION PROGRAMME

3/4

Calendar Year	1992				1993				1994				1995				1996				1997							
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Japanese Fiscal Year	IV																											
4) Outline of Air-Conditioning																												
5) Safety and Prevention of Disasters																												
6) Quality Control and TQC																												
(2) Maintenance of Production Facility																												
1) Maintenance Manual Review																												
2) Preventive Maintenance & Maintenance Programme																												
3) Lubrication and Roller Treatment																												
4) Investigation of Small Defects																												
5) Machinery Record																												
(3) Plant Operation																												
1) Standard Operation Procedure																												
2) Machine Cleaning																												
3) Investigation of Machine Stoppage																												
4) Actual Method of Spinning																												
① Cotton Carded Yarn																												
② Cotton Combed Yarn																												
③ Polyester/ Cotton Yarn																												

Original Plan ——— Accomplished ----- Present Plan

TECHNICAL COOPERATION PROGRAMME

4/4

Calendar Year	1992				1993				1994				1995				1996				1997							
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Japanese Fiscal Year	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
3. Testing Methods and Standards																												
(1) Research for Standards																												
(2) Raw Cotton																												
(3) Cotton Yarn																												
(4) Fabrics																												
4. Advice on Preparation of Export Inspection System																												
(1) Introduction of Japanese Export Inspection System																												
(2) Preparation of Export Inspection System																												
(3) Preparation of Export Inspection Standard																												

— Original Plan ——— Accomplished

----- Present Plan

**Annex 6**

**Items of Technical Transfer**

**1) Items of Technical Transfer In Laboratories Area**

**(1) Test Items for Raw Cotton :**

Micronaire Value  
Fibre Length  
Tensile Strength  
Moisture Regain  
Foreign Matter  
Colour and Gloss  
Oil and Fat Content  
Honeydew

**(2) Test Items for Slivers :**

Count  
Unevenness U<sub>X</sub> CV<sub>X</sub>

**(3) Test Items for Rovings :**

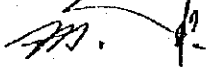
Count  
Unevenness U<sub>X</sub> CV<sub>X</sub>  
Tensile Strength

**(4) Test Items for Cotton Yarn :**

Count  
Twist Number  
Length  
Strength and Elongation  
Unevenness U<sub>X</sub> CV<sub>X</sub>  
I P I  
Slub  
Snarl Index  
Fiber Discrimination  
Fiber Mixture Ratio

**(5) Test Items for Fabrics :**


Mass  
Yarn Count  
Twist Number  
Tensile Strength and Elongation  
Tearing Strength  
Bursting Strength  
Filling Resistance  
Dimensional Change in Washing



Colour Fastness to Laundering  
Colour Fastness to Rubbing  
Colour Fastness to Light  
Colour Fastness to Perspiration  
Colour Fastness to Hot Pressing  
Colour Fastness to Bleaching with Hypochlorite.  
Colour Fastness to Dry Cleaning  
Colour Fastness to Chlorinated Water  
Fiber Discrimination  
Fiber Mixture Ratio  
Identification of Dyestuff Classes  
Identification of Fluorescent Brightening Agents Classes  
Content of Free Formaldehyde  
Oil and Fat Content  
Analysis of Resin

(6) Inspection :

Appearance of Cotton Yarn  
Inspection of Cotton Yarn  
Inspection of Fabrics





## 2) Items of Technical Transfer in Pilot Plant Area

### ① Outline of production process

- (1) Machine installation
  - Machine installation
    - .... Line marking for installation, method for assembling, tools
  - Preparation for workshop
    - .... Preparation of operation utensil and orderliness of workshop
- (2) Introduction of spinning process
  - Spinning process
    - .... Spun yarn, process flow
  - Principal action of process machine
    - .... Principal functions of spinning machinery and elements
  - Unit system of spinning
    - .... Cotton yarn count system, yard-pound unit system, twist multiplier etc.
- (3) Production plan & actual production control
  - Production plan and control
    - .... Production plan, follow-up and variance analysis
  - Operation control
    - .... Preparation for articles, unit weight and product discrimination
  - Decision of machine parameters
    - .... design and setting machine parameters for a product
- (4) Outline of air-conditioning
  - .... Necessity of air-conditioning in spinning process, air-conditioning operation on psychrometric chart
- (5) Safety and prevention of disasters
  - .... Danger actions and parts of machine
- (6) Quality control
  - Organization of control
    - .... Organization of production department
  - Statistical quality control
    - .... Statistics of statistical quality control, application of control chart
  - Method of quality control
    - .... Methods for improvement of quality and works
  - Raw materials
    - .... Material fibers, raw cotton characteristics and blending or mixing method
  - Yarn quality
    - .... Yarn defects and characteristics, test and inspection method and quality level
  - Control points on process
    - .... Control points and levels of in-process products
  - Material and manufacturing cost
    - .... Physical unit and cost of raw material and principal manufacturing costs

### ② Maintenance of production facility

- (1) Maintenance manual review
  - .... Adjusting method of machine
- (2) Preventive maintenance and maintenance plan
  - .... Preventive maintenance works, period and schedule
- (3) Lubrication and roller treatment
  - .... Lubrication and surface treatment of rubber roller and apron
- (4) Inspection of small defects
  - .... Inspection method of machine small that defects affects quality
- (5) Machine records
  - .... Maintenance record and spare parts control

### ③ Plant operation

- (1) Standard operation procedure
  - .... Machine operation method for high quality and high efficiency
- (2) Machine cleaning
  - .... Routine work method of machine cleaning for quality defect prevention
- (3) Investigation of machine stoppage
  - .... Inspection method of end-down and causes
- (4) Actual method of spinning
  - .... production technology through practical production

### 3) Items of Technical Transfer In Standardization Area

#### 1. Technology to draw up industrial standard on cotton fiber, cotton yarn and cotton woven fabric

##### 1-1 General knowledge on standard

##### 1-1-1 International standard and others

ISO

ASTM

AATCC

JIS

##### 1-1-2 Method to draw up standard

General arrangements for drawing up standard

Method to decide number of test

#### 1-2 Technology to draw up industrial standard on cotton fiber

##### 1-2-1 Testing method

Fiber length

Breaking strength

Linear density

Maturity

Non-lint content

Classification and color

Honeydew

Sampling

##### 1-2-2 Standard quality

Standard quality of American upland cotton

#### 1-3 Technology to draw up industrial standard on cotton yarn

##### 1-3-1 Testing method

Linear density

Unevenness (U%)

Single-end breaking force and elongation at break

Appearance

Twist

Moisture content and moisture regain

Yarn length

Corrected mass

Slub

##### 1-3-2 Standard quality

Average yarn length

Coefficient of variation of yarn length

Average linear density

Coefficient of variation of linear density

Average breaking force

Minimum breaking force

Coefficient of variation of breaking force

Appearance

U%

Slub

#### 1-4 Technology to draw up industrial standard on cotton woven fabric

##### 1-4-1 Testing method

- Number of threads per unit length
- Width
- Length
- Linear density of yarn removed from woven fabric
- Breaking strength
- Dimensional change in washing
- Construction
- Bow in woven fabric
- Mass per unit area of woven fabric
- Thickness
- Yarn crimp in woven fabric
- Designation of yarns of woven fabric
- Tear resistance
- Pilling resistance
- Colour fastness to light
- Colour fastness to washing and laundering
- Colour fastness to perspiration
- Colour fastness to rubbing
- Colour fastness to hot pressing
- Colour fastness to bleaching (Hypochlorite)
- Colour fastness to dry cleaning
- Size content
- Resin content
- Free formaldehyde content
- Barium activity number
- Dyestuff classes
- Fiber mixtures
- Fluorescent brightening agents classes
- Qualitative analysis of resin

##### 1-4-2 Standard quality

- Width
- Length
- Appearance
- Dimensional change in washing
- Colour fastness to light
- Colour fastness to laundering
- Colour fastness to perspiration
- Colour fastness to rubbing

AP. 4-

2. Export inspection system of cotton fiber, cotton yarn and cotton woven fabric

- Export inspection system
- Export inspection law of Japan
- Export inspection system of textiles in Japan
- The best inspection system for Paraguay

3. Statistical method for standardization and inspection

- Cause and effect diagram
- Distribution table
- Stratification
- Pareto diagram
- Histogram
- Mean and standard deviation
- Binominal distribution
- Poisson distribution
- Normal distribution
- Significance test of difference between the population mean and the standard (standard deviation known)
- Significance test of difference between the two population means (standard deviation known)
- Significance test of equality of the population variance and the standard
- Significance test of equality of the two population variances
- Significance test of difference between the population mean and the standard (standard deviation unknown)
- Significance test of difference between the two population means (two population have relation)
- Significance test of difference between the two population means (standard deviation unknown,  $\sigma_x = \sigma_y$ )
- Significance test of difference between the two population means (standard deviation unknown,  $\sigma_x \neq \sigma_y$ )
- Analysis of variance
  - One-way layout
  - Two-way layout: without repetition
  - Two-way layout: with repetitions
- Correlation analysis
- Regression analysis
- Regression analysis (with repetitions)
- Rules for rounding off of numerical values
- Random sampling methods
- Orthogonal array
- General knowledge of sampling inspection
- Sampling inspection by attributes
- Sampling inspection by variables
- Sampling inspection by attributes with screening
- Sampling inspection by attributes with adjustment
- Sampling inspection by attributes with adjustment
- Method to drawing up sampling inspection standard
- Matters to be attended to sampling inspection
- Method to make operation order of sampling inspection
- Method of sampling for sampling inspection

Annex 6

Results of Reviewing Technical Transfer

1) Results of Reviewing Technical Transfer in Laboratories Area

Method of evaluation

Level	Test	Inspection
1	☆I've never done this test, or I am not in charge	☆I've never done this inspection, or I am not in charge
2	☆I can carry out the test consulting the manual	☆I can evaluate using the standard samples ☆I can carry out an inspection based on the manual and can evaluate ☆I can carry out the inspection according to the machine's instruction manual ☆I can evaluate and determine the corresponding grade
3	☆I am able to teach this test to other people	☆I am able to teach this inspection method to other people
4	☆I understand the principle of this method and can interpret the values obtained	☆I understand the principle of this inspection method and can interpret the results obtained

Level of technical transfer understood, per test item

July, 1996

Test and Inspection Items	Understood level			
	1	2	3	4
Raw Cotton: Micronaire Value		○	○	○
Fibre Length		○	○	○
Tensile Strength		○	○	
Moisture Regain			○	○
Foreign Matter		○	○	○
Colour and Gloss	○			
Oil and Fat Content		○		
Honeydew	○			
Slivers: Count		○	○	○
Unevenness UX CVX		○	○	
Rovings: Count		○	○	○
Unevenness UX CVX		○	○	○
Tensile Strength	○			
Cotton Yarn: Count		○	○	○
Twist Number		○	○	○
Length	○			
Strength and Elongation		○	○	○

Test and Inspection Items	Understood level			
	1	2	3	4
Cotton Yarn: Unevenness U <sub>X</sub> CV <sub>X</sub>		○	○	○
I P I		○	○	
Slub		○	○	○
Snarl Index		○	○	○
Fiber Discrimination		○	○	○
Fiber Mixture Ratio		○	○	○
Fabrics: Mass			○	○
Yarn Count			○	○
Twist Number		○	○	○
Tensile Strength and Elongation		○	○	○
Tearing Strength		○	○	○
Bursting Strength		○	○	○
Pilling Resistance		○	○	○
Dimensional Change in Washing			○	○
Colour Fastness to Laundering			○	○
Colour Fastness to Rubbing			○	○
Colour Fastness to Light			○	○
Colour Fastness to Perspiration			○	○
Colour Fastness to Hot Pressing				○
Colour Fastness to Bleaching with Hypochlorite		○		
Colour Fastness to Dry Cleaning		○		○
Colour Fastness to Chlorinated Water	○			
Fiber Discrimination		○	○	○
Fiber Mixture Ratio		○	○	○
Identification of Dyestuff Classes		○	○	○
Identification of Fluorescent Brightening Agents Classes	○			
Content of Free Formaldehyde		○	○	○
Oil and Fat Content		○		
Analysis of Resin	○			
Inspection: Appearance of Cotton Yarn			○	○
Inspection of Cotton Yarn		○	○	○
Inspection of Fabrics		○	○	○

*BA*

Level of technical transfer understood by counterparts. Testing and Inspection Area.  
(Research performed on October 1996)

Items of technical transfer performed after July

Level of technical transfer understood, per test item

Test and Inspection Items	Understood level			
	1	2	3	4
Raw cotton: Honeydew			○	○
Roving : Tensile strength			○	○
Cotton yarn : Length		○		
Fabric : - Colour fastness to Chlorinated Water			○	○
- Identification of Fluorescent Brightening Agents Classes		○		
- Analysis of Resin		○		

#### Contents of technical transfers

- ① Raw cotton : Colour  
The *colorimeter 650* doesn't work. The technical transfer will be performed once the repairs have been done.
- ② Raw cotton : Honeydew  
Explanation on how honeydew sticks and its influence on the spinning process, methods for analysis, and practising Benedict's method (August)
- ③ Roving : Tensile strength  
A counterpart from Physical Lab. of Testing and Inspection Area has participated in a technical transfer carried out by an expert from pilot plant. (October)
- ④ Cotton yarn : Length  
Lecture and practical training about instrument operation and calculation of the coefficient, carried out by a short-term expert and experts from other areas. For an optimal operation it is necessary to test with different counts, lengths and drums and calculating the corresponding coefficient. (August)
- ⑤ Fabric : Colour fastness to Chlorinated water  
Lecture and practice testing method. Concerning the practical training there was trouble with the sodium hypochlorite used because of its low concentration;

the training was continued until the stage corresponding the determination of the effective chlorine. The following stages are not difficult, so there will not be a problem; the evaluation method is the same as the other colour fastness tests. The arrangement for ordering a new sodium hypochlorite has already been finished. (August)

- ⑥ Fabric : Identification of Fluorescent Brightening Agents Classes  
The technical transfer in the extraction and purification stages were performed by a short-term expert. Because of a technical problem with the *UV. Vis Spectrophotometer* it was not possible to determine the spectrum. The technical transfer in this stage will be performed once the repairs have been done.  
(August ~ September)
- ⑦ Fabric: Explanation and practical training was carried out by a short-term expert, but the mini hand press was missing and only one already known sample was analysed. More practice is needed to identify the spectrum. To analyse all the resins, the KRS must be considered. (August ~ September)





2) Results of Reviewing Technical Transfer in Pilot Plant Area

Inspected May, 1996

Items of Technical Transfer	Level			Remark
	1	2	3	
1 Outline of production process				
1-1) Machine installation				
-Machine installation	●			
-Preparation for workshop	●			
1-2) Introduction of spinning process				
-Spinning process	●			
-Main action of machine	○			#1
-Unit system of spinning	●			
1-3) Production plan & actual production control				
-Production plan and control	●			
-Operation control	●			
-Decision of machine parameters	●			
1-4) Outline of air-conditioning	●			
1-5) Safety and prevention of disasters	●			
1-6) Quality control				
-Organization of control	●			
-Statistical quality control	○			#2
-Method of quality control	○			#3
-Raw materials	○			#4
-Yarn quality	○			#5
-Control points on process	●			
-Material and manufacturing cost	○			
2 Maintenance of production facility				
2-1) Maintenance manual review	●			
2-2) Preventive maintenance and maintenance plan	●			
2-3) Lubrication and Roller treatment	○			#6
2-4) Inspection of small defects	●			
2-5) Machine records	○			#7
3 Plant operation				
3-1) Standard operation procedure	●			
3-2) Machine cleaning	●			
3-3) Investigation of machine stoppage	●			
3-4) Actual method of spinning	○			#8

- 1) Acquired level of spinning technology
  - Level 1: Not be transferred any of them or not understand enough
  - Level 2: Understand them enough to explain using a manual
  - Level 3: Understand them satisfactorily or enough to instruct a person some of them
- 2) -The levels are marked on the best among the counterparts, with marking "●" or "○"  
 -The items of marking "○" are required to transfer additionally
- 3) R-The contents of additional transfer and transfer plan of them are as following
  - #1: Machine installation  
Impossible to have a experience to install
  - #2: The function of machine element  
Study with making the manuals
  - #3: Method of examination plan making  
Study with examination of thema study
  - #4: Raw cotton blending and thynthetis fiber mixing  
Study when producing a mixed yarn
  - #5: Inspection standard of yarn  
Study with inspection of spinning companies
  - #6: Maintenance of rubber roller  
Study after delivery of the machines for rubber roller maintenance
  - #7: List of spare parts and plan of purchase  
Study to continue a list up working
  - #8: Spinning polyester/cotton yarn (45), combed yarn (50), carded yarn (30)

*AAA*

Technical transfer after the review on May '96

- (1) Maintenance and adjustment of blowing room machineries
  - Adjusting method of
  - Inspection
  - Inspection of small defect
- (2) Maintenance and adjustment of carding machine
  - Practice of machine overhaul and assembling
  - Practice of MCC mounting
  - Practice of gauge adjusting
- (3) Maintenance and adjustment of roving frame
  - Practice of roller gauge resetting
  - Practice of gearing part overhaul and assembling
  - Practice of building motion overhaul and assembling
  - Maintenance of spinning unit
- (4) Maintenance and adjustment of ring spinning frame
  - Practice of roller strain mending
  - Practice of resetting of pendulum weighting arm
  - Practice of operating of spindle lubricating equipment
- (5) Quality control
  - Practice of operating of yarn or roving testing equipment in the theme study
  - Rating or analysis method of yarn quality in the test results of produced yarn in domestic spinning companies
- (6) Outline of raw material
  - Simulation of raw cotton blend planning in case of pilot plant stock cotton
  - Influence of air condition on spinning condition of polyester and cotton mixed yarn
- (7) Surface treatment of rubber roller
  - Operating method of buffering machine and ultraviolet rays treatment machine after installation. More rollers are necessary for practice.
- (8) Standard operation procedure
  - Practice of S.O.P. for roving and spinning frame.
  - The counterparts are proficient, but then different among individuals
- (9) Operation of pilot plant
  - Produced combed yarn of 40 continually
  - Producing combed yarn of 50 in ring spinning
  - Producing polyester and cotton mixed yarn of 45 in roving
  - Practice of changing materials in blowing room machineries
  - Practice of resetting a machine condition with changing a material
  - Producing carded yarn of 30 in drawing process with theme study

### 3) Results of Reviewing Technical Transfer In Standardization Area

#### Understandings of levels

1. General knowledge on standard and export inspection system of cotton fiber, cotton yarn and cotton woven fabric
  - Level 1: No transfer
  - Level 2: Understand roughly
  - Level 3: Understand
  - Level 4: Understand well
  
2. Technology to draw up industrial standard on cotton fiber
  - Level 1: No transfer
  - Level 2: Understand roughly
  - Level 3: The section will be able to draw up industrial standard with more study by itself
  - Level 4: The section will be able to draw up or has drew up industrial standard
  
3. Statistical method for standardization and inspection
  - Level 1: No transfer
  - Level 2: Understand roughly
  - Level 3: Understand
  - Level 4: The section can use those methods for standardization and inspection



Octubre, 1996

Item of Technology Transfer				Level of success					
				1	2	3	4		
Technology to draw up industrial standard on cotton fiber, cotton yarn and cotton woven fabric	General knowledge on standard	International standard and others	ISO			○			
			ASTM			○			
			AATCC			○			
			JIS			○			
		Method to draw up standard	General arrangements for drawing up standard					○	
	Method to decide number of test				○				
	Technology to draw up industrial standard on cotton fiber	Testing method	Fiber length			○			
			Breaking strength			○			
			Linear density			○			
			Maturity			○			
			Non-lint content			○			
			Classification and color			○			
			Honeydew			○			
			Sampling			○			
			Standard quality	Standard quality of American upland cotton				○	
	Technology to draw up industrial standard on cotton yarn	Testing method	Linear density			○			
			Single-end breaking force and elongation at break			○			
			Unevenness (U%)			○			
			Appearance			○			
			Twist			○			
			Moisture content and moisture regain			○			
			Yarn length			○			
			Corrected mass			○			
			Slub			○			
			Standard quality	Average yarn length			○		
		Coefficient of variation of yarn length				○			
		Average linear density				○			
		Coefficient of variation of linear density				○			
		Average breaking force				○			
		Minimum breaking force				○			
		Coefficient of variation of breaking force				○			
		Appearance				○			
U%				○					
Slub			○						

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Item of Technology Transfer			Level of success			
			1	2	3	4
Technology to draw up industrial standard on cotton fiber, cotton yarn and cotton woven fabric	Testing method	Number of threads per unit length			○	
		Width			○	
		Length			○	
		Linear density of yarn removed from woven fabric			○	
		Breaking strength			○	
		Dimensional change in washing			○	
		Construction			○	
		Bow in woven fabric			○	
		Mass per unit area of woven fabric			○	
		Thickness			○	
		Yarn crimp in woven fabric			○	
		Designation of yarns of woven fabric			○	
		Tear resistance			○	
		Pilling resistance			○	
		Colour fastness to light			○	
		Colour fastness to washing and laundering	○			
		Colour fastness to perspiration	○			
		Colour fastness to rubbing	○			
		Colour fastness to hot pressing	○			
		Colour fastness to bleaching (Hypochlorite)	○			
		Colour fastness to dry cleaning	○			
		Size content			○	
		Resin content			○	
		Free formaldehyde content			○	
		Barium activity number	○			
		Dyestuff classes	○			
		Fiber mixtures	○			
		Fluorescent brightening agents classes			○	
	Qualitative analysis of resin	○				
	Standard quality	Width			○	
		Length			○	
		Appearance			○	
Dimensional change in washing				○		
Colour fastness to light				○		
Colour fastness to laundering				○		
Colour fastness to perspiration				○		
Colour fastness to rubbing			○			

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Item of Technology Transfer		Level of success				
		1	2	3	4	
Export inspection system of cotton fibers, cotton yarn and cotton woven fabric	Export inspection system			○		
	Export inspection law of Japan			○		
	Export inspection system of textiles in Japan			○		
	The best inspection system for Paraguay			○		
Statistical method for standardization and inspection	Cause and effect diagram		○			
	Distribution table			○		
	Stratification			○		
	Pareto diagram			○		
	Histogram			○		
	Mean and standard deviation				○	
	Binominal distribution			○		
	Poisson distribution			○		
	Normal distribution			○		
	Significance test of difference between the population mean and the standard (standard deviation known)		○			
	Significance test of difference between the two population means (standard deviation known)		○			
	Significance test of equality of the population variance and the standard		○			
	Significance test of equality of the two population variances		○			
	Significance test of difference between the population mean and the standard (standard deviation unknown)		○			
	Significance test of difference between the two population means (two population line relation)		○			
	Significance test of difference between the two population means (standard deviation unknown, $\sigma_1 = \sigma_2$ )		○			
	Significance test of difference between the two population means (standard deviation unknown, $\sigma_1 \neq \sigma_2$ )		○			
	Analysis of variance	One-way layout		○		
		Two-way layout: without repetition		○		
		Two-way layout: with repetitions		○		
	Correlation analysis			○		
	Regression analysis			○		
	Regression analysis (with repetitions)			○		
	Rules for rounding off of numerical values			○		
	Random sampling methods				○	
	Orthogonal array		○			
	General knowledge of sampling inspection			○		
	Sampling inspection by attributes		○			
	Sampling inspection by variables		○			
	Sampling inspection by attributes with screening	○				
	Sampling inspection by attributes with adjustment	○				
	Sampling inspection by variables with adjustment	○				
Method to drawing up sampling inspection standard	○					
Matters to be attended to sampling inspection	○					
Method to make operation order of sampling inspection	○					
Method of sampling for sampling inspection	○					

Annex 1

List of Tests Performed upon Requests and in the Agreement between INIPI and Textile Companies

1) Tests Performed upon Requests

1994

No.1

Receipt No	Receipt date	INIPI receipt No	Requested by	Type and number of samples	Test items	Lab in charge	Cost(US)
1	2/03		Prime Cotton	Cotton Yarn(1)	Count, Evenness	Physical Lab	71,500
2	2/14		Carpo 9 Cotton	Cotton Yarn(1)	Count, Evenness, Strength	Physical Lab	300,000
3	2/15		Carpo 9 Cotton	Cotton Yarn(1)	Evenness	Physical Lab	185,000
4	2/16		Carpo 9 Cotton	Cotton Yarn(1)	Evenness	Physical Lab	65,000
5	3/04		Carpo 9 Cotton	Cotton Yarn(1)	Strength	Physical Lab	170,000
6	3/07		Carpo 9 Cotton	Cotton Yarn(1)	Evenness, Twist Number	Physical Lab	250,000
7	3/09		Carpo 9 Cotton	Raw Cotton(1)	Foreign Matter	Physical Lab	175,000
8	3/09		Ricardo Arriola	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	103,000
9	3/14		Textil Abay	Cotton Yarn(1)	Strength	Physical Lab	60,000
10	3/15		America Textil	Raw Cotton(1)	Foreign Matter	Physical Lab	50,000
11	3/18		Imalpa S.A.	Raw Cotton(1)	Foreign Matter	Physical Lab	124,000
12	3/21		Algodonera GUARANI	Raw Cotton(1)	length, Foreign Matter	Physical Lab	50,000
13	3/22		Textil Abay	Cotton Yarn(1)	Evenness	Physical Lab	75,000
14	3/24		Textil Abay	Raw Cotton(1)	Finess, length, Foreign Matter	Physical Lab	145,000
15	4/14		Prime Cotton	Raw Cotton(1)	length	Physical Lab	143,500
16	4/15		Prime Cotton	Raw Cotton(1)	length	Physical Lab	73,000
17	4/20	1168	ROD IMPI EXP	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	60,000
18	4/25		Prime Cotton	Raw Cotton(1)	length	Physical Lab	90,000
19	4/26		Prime Cotton	Raw Cotton(1) Cotton Yarn(1)	Finess, length, Foreign Matter Count, Evenness, Strength, Twist Number	Physical Lab	140,000
20	4/21		Textil Abay	Cotton Yarn(1)	Strength	Physical Lab	6,000

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Receipt No	Receipt date	DMN receipt No	Requested by	Type and number of samples	Test items	Lab. in charge	Cost(CS)
2 1	6/03		SIMLEX S.A	Cotton Yarn(1)	Count, Evenness, Strength, Twist Number	Physical Lab	143,000
2 2	6/17		Textil Abay	Cotton Yarn(1)	Evenness	Physical Lab	71,500
2 3	7/07		Prime Cotton	Cotton Yarn(1)	Count, Evenness, Strength	Physical Lab	43,000
2 4	8/03		Bilandria Yyocui	Cotton Yarn(1)	Evenness	Physical Lab	90,000
2 5	8/23	2514	FRANCISCO MADRVA	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	133,800
2 6	8/31	2538	Agencia DWARTE-ROJAS	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	90,000
2 7	9/12	2706	Javier Agüero	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	140,000
2 8	9/15	2741	Ricardo Arriola	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	90,000
2 9	9/20	2766	Dirección General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	140,000
3 0	10/04	2901	Agencia DWARTE-ROJAS	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	90,000
3 1	10/13	3014	Agencia SAN JUAN	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	
3 2	11/16	3306	Dirección General de Aduanas	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	25,000
3 3	12/23		FNDA	Fabric(1)	Residual Acid, Residual Chlorine, Colour Fastness to Light, Content of Formaldehyde	Chemical Lab Physic- Chemical Lab	
3 4	12/27		Textilia S.A	Cotton Yarn(1)	Count, Evenness, Twist Number	Physical Lab	65,000



Receipt No	Receipt date	IGN receipt No	Requested by	Type and number of samples	Test items	Lab in charge	Cost(US)
1	1/20	159	Agencia SANTA MARIA	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	74,750
2	2/15	448	Direccion General de Aduanas	Fabric(6)	Fiber Discrimination & Mixture Ratio	Chemical Lab	350,000
3	2/17	475	TEXTILIA S.A.	Fabric(1)	Fiber Discrimination & Mixture Ratio Colour Fastness to Laundering Colour Fastness to Rubbing	Chemical Lab Physic- Chemical Lab	75,000
4	2/27	542	SAFE Fios S.A.	Fabric(3)	Fiber Discrimination & Mixture Ratio	Chemical Lab	75,000
5	3/16	827	WEJUS BROTHERS	Raw Cotton(1)	Finess, Length, Tenile Strength	Physical Lab	30,000
6	3/21	882	Agust Cristaldo	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	32,000
7	3/31		FABRITEX	Cotton Yarn(1)	Evenness, Strength, Trist Number	Physical Lab	35,000
8	4/04	1067	Bernarda A de Colson	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	30,000
9	4/07	1117	Algodonera GUARANI	Raw Cotton(1)	Finess, Length, Tenile Strength	Chemical Lab	50,000
10	4/11		Carpo 9 Cotton	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	50,000
11	4/19	1179	Algodonera GUARANI	Raw Cotton(1)	Finess, Length, Tenile Strength	Chemical Lab	50,000
12	5/18	1489	Carpo 9 Cotton	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	50,000
13	5/23	1535	Bilandería CENTRAL	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	140,700
14	6/21	1892	Direccion General de Aduanas	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	25,000
15	6/23	1913	Carpo 9 Cotton	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	186,300
16	6/29	1979	Carpo 9 Cotton	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	50,000
17	7/03	2003	Bilandería CENTRAL	Cotton Yarn(1)	Count, Evenness, Strength, Trist Number	Physical Lab	50,000
18	7/03		MAST Tejidos	Fabric(4)	Fiber Discrimination & Mixture Ratio Tearing Strength, Shrinkage Percentage, Tenile Strength and Elongation, Mass, Moist.	Physical Lab Chemical Lab Physic- Chemical Lab	
19	7/07		MAST Tejidos	Fabric(9)	Fiber Discrimination & Mixture Ratio Tearing Strength, Shrinkage Percentage, Tenile Strength and Elongation, Mass, Moist.	Physical Lab Chemical Lab Physic- Chemical Lab	

Receipt No	Receipt date	DTN receipt No	Requested by	Type and number of samples	Test items	Lab. in charge	Cost(US)
20	1/07	2000	Direccion General de Aduanas	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	50,000
21	7/13	2125	Filanderia CENTRAL	Cotton Yarn(1)	Count, Evenness, Strength, Twist Number	Physical Lab	50,000
22	7/21	2211	Algodonera GUARANI	Cotton Yarn(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	30,000
23	7/28	2306	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	60,000
24	7/28	2307	Dra Marta de Ros	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	25,000
25	8/02	2352	Bibiano Benitez	Fabric(2)	Inspection	Inspection Lab	15,000
26	8/11	2513	TEMER Representaciones	Fabric(4)	Mass	Inspection Lab	30,000
27	8/13		Filanderia CENTRAL	Cotton Yarn(1)	Inspection	Inspection Lab	50,000
28	9/04	2848	Estudio aduanero MARELOS	Fabric(1)	Fiber Discrimination & Mixture Ratio Weave	Chemical Lab Inspection Lab	25,000
29	10/09	3341	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	40,000
30	10/09	3342	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	40,000
31	10/10	3385	Agencia SALLUSTRO	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	40,000
32	10/11	3404	Policia Nac.	Fabric(3)	Fiber Discrimination & Mixture Ratio Tearing Strength, Tensile Strength Shrinkage Percentage, Mass Colour Fastness to Laundering Colour Fastness to Rubbing Colour Fastness to Perspiration	Physical Lab Chemical Lab Physic- Chemical Lab	156,000
33	10/12	3423	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	40,000
34	10/17	3492	INDUR S.A	Cotton Yarn(1)	Strength	Physical Lab	40,000
35	10/31	3733	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	40,000
36	11/15	4017	INDUR S.A	Cotton Yarn(1) Cotton Yarn(1)	Count Count, Strength	Physical Lab	45,000
37	12/26	4312	Textil Union	Wool(1)	Count, Strength	Physical Lab	25,000
38	12/27		OFAT	Raw Cotton(1)	Fineness, Length, Tensile Strength, Karnelap Mutter	Physical Lab	
39	12/29	4437	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	45,000

Receipt No	Receipt date	IN/N receipt No	Requested by	Type and number of samples	Test items	Lab in charge	Cost(US)
1	1/08	044	Dirección General de Aduanas	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	80,000
2	2/12	411	Dirección General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	23,600
3	2/19	485	Dirección General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	23,600
4	3/12	794	Dirección General de Aduanas	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	25,000
5	4/11	1136	Fonix S.A	Clothes(2)	Colour Fastness to Laundering Colour Fastness to Rubbing Colour Fastness to Perspiration Tensile Strength, Tearing Strength	Physical Lab Physic- Chemical Lab	102,375
6	5/08	1472	Textil UAOH	Cotton Yarn(1)	Strength	Physical Lab	15,000
7	6/06	1835	Comando en jefe de las FFMA	Fabric(5)	Fiber Discrimination & Mixture Ratio	Chemical Lab	
8	6/11	1923	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Count, Twist Number, Evenness, Strength Count, Twist Number, Evenness, Strength	Physical Lab	144,000
9	6/13		Campo 9 Cotton	Cotton Yarn(1) Sliver(1)	Evenness, Strength Irregularity	Physical Lab	
10	6/17	2004	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	92,500
11	6/19	2000	Dirección General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	23,600
12	6/19	2031	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	92,500
13	6/19		Campo 9 Cotton	Cotton Yarn(1) Sliver(1)	Evenness, Strength Irregularity	Physical Lab	92,500
14	6/20	2049	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	92,500
15	6/20	2000	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	92,500
16	6/21	2005	Campo 9 Cotton	Rowing(1) Cotton Yarn(1)	Irregularity, Strength Evenness, Strength	Physical Lab	68,000
17	6/21	2078	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	50,000
18	6/26	2101	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	50,000
19	6/27	2119	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	50,000
20	6/27	2120	Campo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	150,000

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Receipt No	Receipt date	JMN receipt No	Requested by	Type and number of samples	Test itoss	Lab in charge	Cost(CS)
2 1	6/28	2136	Carpo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	150,000
2 2	7/03	2175	Carpo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	150,000
2 3	7/08	2306	Carpo 9 Cotton	Cotton Yarn(1) Cotton Yarn(1)	Evenness, Strength Evenness, Strength	Physical Lab	
2 4	7/16	2307	Carpo 9 Cotton	Raw Cotton(1)	Finess, Fibre Length, Foreign Matter	Physical Lab	
2 5	7/17	2309	Carpo 9 Cotton	Cotton Yarn(1) Raw Cotton(1)	Evenness, Strength Finess, Fibre Length, Foreign Matter Tensile Strength	Physical Lab	406,000
2 6	8/16	2709	Carpo 9 Cotton	Raw Cotton(1)	Finess, Fibre Length, Foreign Matter Tensile Strength	Physical Lab	50,000
2 7	8/22	2815	Direccion General de Aduanas	Fabric(1)	Identification of Coating Material	Chemical Lab	30,000
2 8	9/17	3148	Direccion General de Aduanas	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	178,000
2 9	10/01	3389	Carpo 9 Cotton	Cotton Yarn(1)	Evenness, Strength	Physical Lab	37,000
3 0	10/03	3418	Fibracet	Fabric(2)	Fiber Discrimination & Mixture Ratio	Chemical Lab	15,450
3 1	10/21	3570	Textil Alay	Cotton Yarn(1)	Strength	Physical Lab	35,500
3 2	10/30	3688	K A Villalba	Fabric(1)	Fiber Discrimination & Mixture Ratio	Chemical Lab	50,000

Number of tests requested per test item (January 1994 ~ October 1996)

Type of Samples	Test Items	Number of tests requested		
		1994	1995	1996
Raw Cotton	Fineness	2	4	3
	Fibre Length	6	4	3
	Tensile Strength		4	2
	Foreign Matter	6	1	3
Sliver	Count			
	Irregularity			2
Roving	Count		1	
	Irregularity			1
	Tensile Strength		1	1
Cotton Yarn	Count	6	9	1
	Twist Number	4	8	1
	Evenness	12	8	17
	Strength	7	10	19
	Fiber Discrimination & Mixture Ratio		1	
	Inspection		1	
Fabric	Mass		4	
	Weave		3	
	Tensile Strength and Elongation		3	1
	Tearing Strength		3	1
	Colour Fastness to Laundering		2	1
	Colour Fastness to Rubbing		2	1
	Colour Fastness to Perspiration		1	1
	Colour Fastness to Light	1		
	Shrinkage Percentage		3	
	Fiber Discrimination & Mixture Ratio	10	20	9
	Content of Formaldehyde	1		
	Residual Chlorine	1		
	Residual Acid	1		
	Identification of Coating Material			1
Inspection		1		

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## 2) Tests Performed in the Agreement between INTN and Textile Companies

The purpose of the services offered by INTN

- (1) Research (Data and test results analysis)
- (2) Reinforcement of the laboratories, promotion of services

### 1. Prime Cotton

Period: August 01 ~ October 31, 1994 (3 months)

Purpose of the company: to know the quality of their products

Frequency of sampling: once a week

Sample types: Sliver 14  
Roving 11  
Cotton yarn 14

Trainee: 1

Test items: Count  
Irregularity  
Twist

Lab. in charge: Physical lab.

### 2. Simplex S.A. (first cycle)

Period: August 16 ~ November 15, 1994 (3 months)

Purpose of the company: to know the colour fastness of their dyestuff

Frequency of sampling: once a week

Sample types: Knitted fabric 129

Trainee: 1

Test items: Colour fastness to laundering  
Colour fastness to rubbing  
Colour fastness to perspiration  
Colour fastness to light

Lab. in charge: Physic-chemical lab.

### 3. Simplex S.A. (second cycle)

Period: May 23 ~ August 22, 1995 (3 months)

Purpose of the company: to know the colour fastness of dyes and the shrinkage percentage of their products

Frequency of sampling: once a week

Sample types: Knitted fabric 112

Trainee: 1

Test items: - Colour fastness to laundering, rubbing, perspiration, light  
- Shrinkage percentage

Lab. in charge: Physic-chemical lab.

### 4. Campo 9 Cotton

Period: July 10 ~ October 9, 1995 (3 months)

Purpose of the company: to evaluate the quality of their products (spun yarn)

Frequency of sampling: once a month

Sample types: Open-end yarn 8s 30

Carded yarn 24s 30

Trainee: none

Test items: - Appearance  
- Length, weight, count  
- Tensile strength  
- Evenness, slubs

Labs. in charge: Physical lab., Inspection Lab.

5. Casa Enca

Period: August 17 ~ November 16, 1995 (3 months)

Purpose of the company: to know the quality of their raw materials

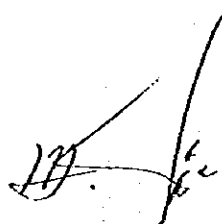
Frequency of sampling: once every 2 weeks

Sample types: fabric 14

Trainee: none

Test items: - Weave, mass per unit area, density, count of yarn used  
- Fiber discrimination, fiber mixture ratio  
- Tensile strength and elongation percentage, tearing strength  
- Appearance  
- Shrinkage percentage  
- Colour fastness to laundering, rubbing, perspiration, light

Labs. in charge: Chemical lab., Physical lab., Physic-chemical lab., Inspection lab.



Annex 8

Investigation on Quality of Cotton Yarn in Paraguay

1. First Investigation (March, 1994)

Investigated Enterprise	Kinds of Yarns	
1. America Textil	C30	note) C : Card Yarn
2. Campo 9 Cotton	C24	P : Comb Yarn
3. Hilanderia Ybycui	OE20	OE: Open End Yarn
4. Manufactura del Este	C24	
5. Prime Cotton	P30	Numeral: Count
6. Simplex Paraguaya	C24	

2. Second Investigation (September, 1995)

Investigated Enterprise	Kinds of Yarns
1. America Textil	C30, C20, OE14, OE8
2. Campo 9 Cotton	C24, C20, OE8
3. Hilanderia Central	P30, OE8
4. Hilanderia Ybycui	O20, O8
5. Manufactura del Este	C24
6. Manufactura de Pilar	P30, C20, C16, OE8
7. Prime Cotton	P30, OE8
8. Simplex Paraguaya	C24, C20, OE8
9. Textil Abay	OE8
10. Textil Union	O24, OE8

3. Third Investigation (August, 1996)

Investigated Enterprise	Kinds of Yarns
1. America Textil	C30, C24, C20, OE14, OE8
2. Campo 9 Cotton	C20, OE8
3. Forno y Valle	OE12
4. Hilanderia Central	P30, OE8
4. Hilanderia Ybycui	OE8
6. Industria Textil Asuncena (ITASA)	C11
7. Lienzos del Paraguay	OE20, OE8
8. Manufactura del Este	C24
9. Manufactura de Pilar	P40, P30, C20, C16, C10, OE10, OE8, OE6
10. Pedro Genovese e Hijos	OE8
11. Prime Cotton	P30, OE8
12. Simplex Paraguaya	OE8
13. Textil Abay	C24, OE8
14. Textil Union	OE20, OE16, OE8
15. INTN	P40, P30



## Annex 9

## Products of Cotton Yarn and Residual Products in Pilot Plant of Project

## 1) Purchase of cotton fiber

Date	Items	Weight(kg)	Cost(Gs)
1993.9.9	Cotton fiber	1.975	5.757.125
1993.9.27	Cotton fiber	1.012	2.949.980
1994.3.29	Cotton fiber	7.154.5	26.128.234
1994.3.29	Cotton fiber	3.051.5	11.144.078

## 2) Production of cotton yarns in Pilot Plant of Project

Date	Items	Weight(kg)
1994.9~12	Comb yarn, 30 Count	1.213.8
1995.1~12	Comb yarn, 30 Count	1.953.0
1996.1~8	Comb yarn, 40 Count	647.2

## 3) Sold cotton yarns

Date	Items	Weight(kg)	Cost(Gs)
1994.10.12	Comb yarn, 30 Count	729.5	5.310.760
1995.3.15	Comb yarn, 30 Count	845.0	6.641.700

## 4) Sold residual products

Date	Items	Weight(kg)	Cost(Gs)
1994.3.22	Rubbish of cotton fiber		128.000
1994.4.18	Rubbish of combing	126.0	100.800
1994.6.6	Rubbish of combing	88.0	70.400
	Rubbish of carding	117.0	76.050
1994.8.16	Rubbish of mixing and carding	57.0	39.900
1994.10.17	Rubbish of mixing and carding	61.0	42.700
	Rubbish of combing	97.0	97.000
1994.11.15	Rubbish of mixing and carding	38.0	26.600
	Rubbish of carding	73.7	73.700
	Rubbish from Laboratory	20.0	22.000
1995.2.13	Rubbish of mixing and carding	48.0	38.400
	Rubbish of combing	140.0	168.000
	Rubbish of roving	73.0	87.600
1995.5.22	Rubbish of combing	190.0	247.000
	Rubbish of roving	70.0	91.000
1995.6.8	Rubbish of mixing and carding	122.0	95.160
	Rubbish of combing	12.5	16.250
	Rubbish of roving	22.5	29.250
	Tow	50.0	42.500
1995.9.6	Rubbish of mixing and carding	35.4	29.000
	Rubbish of combing	82.5	107.250
1995.12.5	Rubbish of mixing and carding	5.0	4.500
	Rubbish of combing	68.5	99.325
1996.3.13	Rubbish of combing	387.0	851.400
1996.7.3	Rubbish of combing	21.5	47.300

## Annex 10

## List of Manual for Cotton Yarn Production

Manual	Contents	Remarks
Quality control	<ul style="list-style-type: none"> <li>-Cotton blending</li> <li>-Quality control norm for in-process product</li> <li>-Control chart</li> <li>&lt;Reference data&gt;</li> <li>-BOUKEN inspection data of raw cotton</li> <li>-BOUKEN inspection standard of cotton yarn</li> <li>-USTER statistics</li> <li>-Yarn irregularity analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Fiber characteristics and blend planning of raw cotton</li> <li>-Control points and level of in-process product or yarn</li> <li>-Preparation of control chart and judgement of outlier on control chart</li> <li>-Data of all the world raw cotton characteristics</li> <li>-Grading method of yarn quality</li> <li>-World wide statistics of yarn quality level</li> <li>-Analizing method of yarn irregularity on spectrogram</li> </ul>
Process control	<ul style="list-style-type: none"> <li>-Process table</li> <li>-Machine condition</li> <li>-Gearing diagram</li> <li>-Calculation of spinning parameter</li> <li>-Production plan and production control</li> <li>-Calculation of cost</li> </ul>	<ul style="list-style-type: none"> <li>-Carded 30, combed 30, 40, 50 and polyester/cotton mixed 45</li> <li>-Decision of machine parameters of roller gauge, twist per inch and others</li> <li>-Preparation of gearing diagram for pilot plant machines</li> <li>-Calculating method of cotton yarn unit system, draft ratio, number of twist, productive capacity and others</li> <li>-Planning of process output and machine arrangement by target of yarn output</li> <li>-Calculation method of row material physical unit and manufacturing cost elements</li> </ul>
Production & Operation	<ul style="list-style-type: none"> <li>-Standard operation procedure</li> <li>-Machine cleaning</li> <li>-Air condition control</li> <li>-Safty and prevention of desaster</li> </ul>	<ul style="list-style-type: none"> <li>-Standerd procedure of machine operation</li> <li>-Cleaning works for keeping machine clean</li> <li>-Suitable temperature and humidity in spinning room and air conditioning theory</li> <li>-Safty work and accident prevention</li> </ul>
Facility maintenance	<ul style="list-style-type: none"> <li>-Maintenance of spinning machine</li> <li>-Adjusting method of sp. machine</li> <li>-Defects of in-process product and recovery</li> <li>-Maintenance of rubber roller</li> <li>-Inspection of small defects</li> <li>-Inspection of machine function</li> <li>&lt;Management data&gt;</li> <li>-Machine record</li> <li>-List of machine spare parts</li> <li>-List of utensils for operation use</li> <li>-List of special tool for adjusting machine</li> </ul>	<ul style="list-style-type: none"> <li>-Works and method of machine maintenance</li> <li>-Adjusting method of machine part</li> <li>-Inspection of in-process product defect and causes of defect</li> <li>-Surface treatment work of rubber roller</li> <li>-Inspection method of machine small defect</li> <li>-Inspection method of machine function</li> <li>-Machine history and maintenance records</li> <li>-Machine spare parts</li> <li>-Fiber can, bobbin, cart and other operating use</li> <li>-Special tools for adjusting machines</li> </ul>
Auxiliary equipment	<ul style="list-style-type: none"> <li>-Manuals</li> </ul>	<ul style="list-style-type: none"> <li>-Manual of maintenance machines and measuring equipment</li> </ul>

Annex 11

List of Manuals and Check-List on Technical Training

1. Manual for technical training

Field	Manual or Check-list		Contents
1) For the person in charge of Quality control	Inspection standard of cotton yarn	M	Yarn characteristics
	Norm of in-process product quality	M	Control point & level etc.
	Control chart	M	Preparation and application of control chart
2) For the person in charge of Maintenance	Maintenance standard	M	Maintenance works & plan
	Defects of in-process product	M	Cause or measure for correction
	Small defects (mechanical)	M	Mechanical defects
	Inspection of process parameters	C	Condition table of process and machine
3) For the person in charge of Operation	Standard operation procedure	M	Principal motion for operation
	Cleaning of machinery	M	Cleaning points and cycles
	End-down control	M	Inspection method, cause and measure
	Air condition control	M	Psychrometric chart and utilizing outdoor air
	Production planning	M	Production capacity and planning
	Small defects (operation)	M	Operational defects

2. Manual for yarn quality improvement

Field	Manual or Check-list		Contents
1) Yarn test and evaluation	Inspection standard of cotton yarn	M	Test method and rating method
	Uster statistics	M	Data of yarn quality level
2) Analysis of yarn quality	Analysis of yarn irregularity	M	Periodical yarn irregularity and drafting yarn irregularity
	Analysis of yarn defects	M	Classification of yarn defects
	Analysis of trash contents	M	Test of trash and other contamination
	Analysis of other problems	M	Yarn count, tensile strength etc
	Cause of yarn defect and measure	M	
3) Improvement of yarn quality	Design of experiment	M	Analysis of variance
	Inspection of process parameters	C	Condition table of process and machine

Remarks: M:Manual C:Check-list

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Annex 12

List of Standards by INTN

1. The revised standards

1-1 The revised standards in 1995

- NP 6 005 83 Cotton bales-Dimensions and density
- NP 6 006 83 Terminology of seed cotton, cotton fiber and by-product
- NP 6 007 83 Cotton fibers - Methods of sampling for testing
- NP 6 008 83 Standard atmospheres for conditioning and testing
- NP 6 010 83 Cotton fibers - Determination of micronaire value
- NP 6 011 83 Cotton fibers - Determination of length (span length)
- NP 6 012 83 Cotton fibers - Determination of breaking tenacity of flat bundles

1-2 The approved standard by the Technical committee in 1996

- NP 6 022 83 Cotton fibers - Classification of seed cotton and cotton fiber

2. The new standards

( Approved Drafts of standard by the Technical committee. Those will be announced publicly. And those will be the National Standards under Industry and Commercial Ministry ordinance. )

( Approved Drafts of standard by the Technical committee in 1995 )

- PNP 6 023 96 Yarn - Determination of linear density (mass per unit length) by the skein method
- PNP 6 024 96 Universal system for designating linear density (Tex System)
- PNP 6 025 96 Woven fabrics - Determination of number of threads per unit length
- PNP 6 026 96 Unevenness of textile strands
- PNP 6 027 96 Woven fabrics - Determination of breaking strength and elongation
- PNP 6 028 96 Woven fabrics - Measurement of width of pieces
- PNP 6 029 96 Woven fabrics - Measurement of length of pieces

( Approved Draft of standard by the Technical committee in 1996 )

- PNP 6 030 96 Yarns from packages - Determination of single-end breaking force and elongation at break



## RESUMEN DEL SISTEMA DE CERTIFICACION DE FIBRA, HILOS Y TEJIDOS PLANOS DE ALGODON

La producción de algodón es uno de los pilares económicos del Paraguay ya que un 30 % aproximadamente de los ingresos por exportaciones se debe a la exportación de esta fibra textil.

Si se incrementase la industrialización de esta materia prima a nivel nacional, debido al valor agregado que ella recibiría, aumentarían aún más dichos ingresos.

Esto implica, por supuesto, no sólo vender dichos productos en competitivos mercados, como por ejemplo el europeo, sino venderlos a buen precio. Si este es nuestro objetivo se hace prioritario hacer esfuerzos reales para producir con calidad, atendiendo lo que significa hoy día en aquellos mercados este nuevo *norte* empresarial.

Pero, qué significa producir con calidad. La base de la calidad y la productividad es la normalización. Si queremos producir con calidad debemos producir de manera normalizada: debemos emplear procedimientos, pruebas, relacionamientos, etc. normalizados. Pero además, necesitamos comprobar que efectivamente los productos que producimos cumplan las normas, lo cual se hace a través de un programa de certificación, conocido habitualmente como sistema de certificación. Debemos pues emplear las normas y certificar nuestros productos.

En lo que sigue, se presenta brevemente un sistema de certificación de lotes de fibra, hilos y tejidos planos de algodón, que tiene como fin último ayudar a las industrias textiles nacionales a vender sus materias y/o productos a buen precio en el mercado internacional.

Este sistema de certificación cubre la certificación de todos los lotes de fibra de algodón, hilos de algodón y tejidos planos de algodón que se producen localmente. Los métodos de muestreo y ensayos; la elección de las propiedades y características tecnológicas específicas que se deben inspeccionar; los criterios de calidad aplicables; y la evaluación global de cada lote están claramente definidos y varían para cada materia o producto textil.

Teniendo en cuenta que uno de los objetivos de un sistema de certificación es la promoción de las exportaciones, el sistema que se propone implica la inspección de los productos exportables, en este caso los productos textiles.

El sistema de certificación varía en detalle de acuerdo al artículo que se inspecciona, pero en general, consiste en:

- ① Una clasificación de la materia o producto textil en tipos según sus calidades;
- ② En la definición cuantitativa de los criterios de calidad y las evaluaciones globales aplicables para realizar dicha clasificación; y
- ③ En la definición de los métodos de muestreo y de los métodos de ensayos de las propiedades y características tecnológicas específicas del artículo a inspeccionar.

La clasificación de las materias o productos textiles en categorías de calidad permitiría:

- Conocer a cada instante (conocimiento *instantáneo*) el nivel de calidad de todas las materias o productos textiles en términos de datos numéricos (datos *cuantificados*), de modo que, con estos datos, se obtenga un mejor control de la situación y el Gobierno pueda *ver* cómo establecer eficientes políticas de desarrollo industrial en el sector textil.
- Que cada empresa del sector (desmotadora, hilandería o tejeduría) conozca en qué nivel de calidad se encuentran sus productos, que identifiase sus problemas y que implementase las soluciones necesarias para mejorar la calidad.
- Que una empresa que decidiese mejorar su calidad, pudiese tener un punto de referencia seguro para dicha mejora. Además, el grado de mejoramiento alcanzable sería fácilmente reconocible ya que a la empresa le bastaría elegir como objetivo de mejora aquella calidad superior inmediatamente más próxima a la calidad que ella está produciendo.
- Que una empresa del sector que produce con buena calidad, con la certificación pueda además vender sus productos a buen precio.

#### Fibra de algodón

La certificación de la fibra de algodón está perfectamente definido en el Decreto N° 9165 del 1 de abril de 1985 por el cual "se establecen normas de comercialización, calidad, fiscalización de precios y control de pesas y medidas utilizadas para la compraventa del algodón".

La aplicación sería de la certificación de la fibra de algodón es muy importante para asegurar la calidad y una demanda internacional creciente.

Sin embargo, este sistema de certificación debería ser completado en términos de la determinación de específicas características tecnológicas de la fibra. Estas características tecnológicas que deberían medirse son:

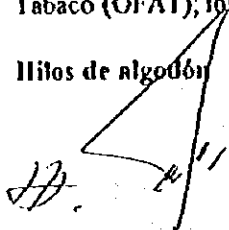
- 1) La finura.
- 2) La longitud y la uniformidad.
- 3) La resistencia.
- 4) El color.
- 5) El contenido de impurezas.

Estos ensayos deberían hacerse empleando un *Hight Volume Instrument (HVI)*.

El empleo de un HVI está plenamente justificado por el hecho de que si se pretende la inspección de todos los fardos de todos los lotes producidos, se necesitaría hacer los ensayos lo más rápido posible, para lo que un HVI está adecuadamente diseñado.

El organismo fiscalizador debería seguir siendo la Oficina Fiscalizadora de Algodón y Tabaco (OFAT); los ensayos de HVI podrían hacerse en el Proyecto INTN/JICA.

Hilos de algodón



La certificación de los hilos de algodón coincide en líneas generales con el Sistema de Certificación para Exportación de Productos Textiles del Japón, aunque existen varias adaptaciones a la realidad paraguaya.

El sistema de certificación de materias y productos textiles prevé la certificación de todos y cada uno de los lotes de hilos de algodón 100 % paraguayos que se produzcan.

En principio, el Proyecto sería el organismo encargado de realizar inspecciones de hilos de algodón. Sin embargo, el sistema de certificación deberá prever otro organismo que lo realice (ya sea público o privado), ya que el Proyecto tiene trabajos de envergadura tales como revisión (a través de muestreo y ensayos) de los criterios de calidad, asesoramiento al gobierno (por ejemplo, a Proparaguay), trabajos conjuntos con otros organismos regionales y extraregionales, investigación aplicada, etc.

Los valores y propiedades de los hilos que deberán medirse son:

- 1) Apariencia de los hilos.
- 2) Diferencia porcentual entre las masas real y nominal de los hilos.
- 3) Coeficiente de variación (CV) del título de los hilos.
- 4) Diferencia porcentual entre los títulos real y nominal de los hilos.
- 5) Diferencia porcentual entre la resistencia promedio y la resistencia normalizada.
- 6) Diferencia porcentual entre las resistencias mínimas real y normalizada.
- 7) CV de la resistencia.
- 8) Diferencia porcentual entre los U% real y normalizada.
- 9) Defectos remanentes.

El método de muestreo que se aplica consiste en seleccionar 5 muestras al azar del el lote a inspeccionar.

Los hilos de algodón son clasificados en tipos según su calidad. Cada tipo está certificado.

**Hilos de algodón de Tipo 1.** Son hilos de primera calidad; correspondiente a una calidad internacional; exportables a cualquier país sin ninguna restricción.

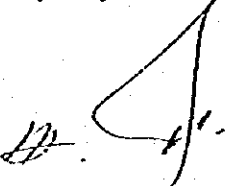
**Hilos de algodón de Tipo 2.** Son hilos de segunda calidad; correspondiente a la mejor calidad de hilo producido localmente.

**Hilos de algodón de Tipo 3.** Son hilos de tercera calidad; correspondiente a la calidad media de hilo producido localmente.

**Hilos de algodón de Tipo 4.** Son hilos de cuarta calidad; correspondiente a la calidad inferior de hilo producido localmente.

La inclusión de un lote particular en cualquiera de estos tipos depende de que el mismo cumpla con ciertos rangos o valores máximos o mínimos explícitamente establecidos para cada propiedad que se inspecciona, a los que se llama criterios de calidad.

**Tejidos planos (de calada) de algodón**



La certificación de los tejidos planos de algodón coincide en líneas generales con el Sistema de Certificación para Exportación de Productos Textiles del Japón, aunque existen varias adaptaciones a la realidad paraguaya.

El sistema de certificación de materias y productos textiles prevé la certificación de todos y cada uno de los lotes de tejidos planos (de calada) de algodón 100 % paraguayos que se produzcan.

En principio, el Proyecto sería el organismo encargado de realizar inspecciones de tejidos de algodón. Sin embargo, el sistema de certificación deberá prever otro organismo que lo realice (ya sea público o privado), ya que el Proyecto tiene trabajos de envergadura tales como revisión (a través de muestreo y ensayos) de los criterios de calidad, asesoramiento al gobierno (por ejemplo, a Proparaguay), trabajos conjuntos con otros organismos regionales y extraregionales, investigación aplicada, etc.

Las propiedades de los tejidos planos (de calada) que deberán medirse son:

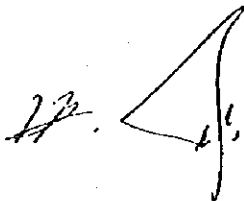
- 1) Apariencia de los tejidos (observación e identificación de defectos).
- 2) Solidez del color al lavado (sólo para tejidos teñidos).
- 3) Solidez del color al sudor (sólo para tejidos teñidos).
- 4) Solidez del color al frote (sólo para tejidos teñidos).

El método de muestreo que se aplica varía de acuerdo a la propiedad que se inspecciona:

- Para la inspección de la apariencia (defectos) se deben inspeccionar todos y cada uno de los paquetes de tejidos elaborados en todos y cada uno de los lotes producidos.
- Para los demás ítems de ensayo se debe seleccionar una muestra por lote a inspeccionar.

Los tejidos de algodón son clasificados en 3 tipos según su calidad: Tipo 1, Tipo 2 y Tipo 3. Cada tipo está certificado.

La inclusión de un lote particular en cualquiera de estos tipos depende de que el mismo cumpla con ciertos rangos o valores máximos o mínimos explícitamente establecidos para cada propiedad que se inspecciona, a los que se llama criterios de calidad.

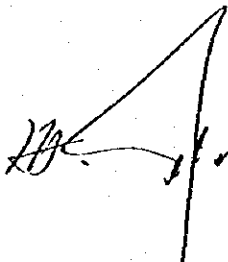




Annex 14

List of Seminars

1. The Ceremony for completion of facilities in Project and donation  
Date: March 25, 1994
  
2. Seminar on Quality and Technology in Textile Industry  
Date: March 28 - 29, 1994
  
3. Seminar on Activities and Contribution of INTN for Textile Industries in Paraguay  
Date: October 30, 1995
  
4. Second Seminar of INTN/JICA Project for Quality Control for Textile Industry  
"Textile Technology and Its Quality further on 2000 year"  
Date: October 22 - 23, 1996

A handwritten signature or set of initials, possibly 'AB', written in dark ink. The signature is stylized and somewhat abstract, with a large, sweeping stroke that extends upwards and to the right.

Annex 15

Diffusion of Activities in INTN/JICA Project

1) Publishing the report in Project: "TEXTILES"

(1) Number one; the date of publication: December, 1995

pages: 28  
the number of copies: 500  
main theme: Textile Project INTN/JICA

(2) Number two; the date of publication: May, 1995

pages: 39  
the number of copies: 500  
main theme: The cotton textile industry in Paraguay and its possibility

(3) Number three; the date of publication: September, 1996

pages: 51  
the number of copies: 500  
main theme: The quality of cotton yarn in Paraguay

2) Publication of Pamphlet introducing Textile Project INTN/JICA

(1) First time the date of publication: March, 1994

pages: 12  
the number of copies: 1000

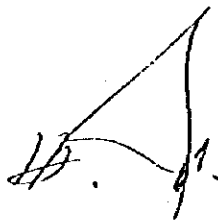
(2) Second time the date of publication: October, 1996

pages: 24  
the number of copies: 1000

3) Publication of glossary textile (spanish)

the date of publication: November, 1996

the number of copies: 200



Annex 16

Technical Guidance and Maintenance of Facility

1) Technical orientation for cotton spinning enterprise (March, 1994)

Enterprises :

1. America Textil
2. Campo 9 Cotton
3. Hilanderia Ybycui
4. Lenzos del Paraguay
5. Manufactura del Este
6. Manufactura del Paraguay
7. Manufactura de Pilar
8. Prime Cotton
9. Simplex Paraguaya
10. Textil Abay

2) Technical orientation for weaving enterprise (April, 1995)

Enterprises :

1. Lenzos del Paraguay
2. Manufactura de Pilar
3. Textil Union

3) Technical orientation for spinning enterprise (June, 1995)

Enterprises :

1. Manufactura del Este
2. Seda y Fibras

4) Technical orientation for cotton spinning enterprise (September, 1995)

Enterprises :

1. Campo 9 Cotton
2. Hilanderia Central

5) Maintenance of Carding Machine, for M.C.C. (Metallic Card Clothing)  
mounting work (May, 1996)

Enterprises :

1. Prime Cotton

6) Technical orientation for cotton spinning enterprise (October, 1996)

Enterprises :

1. Campo 9 Cotton
2. Hilanderia Central
3. Hilanderia Ybycui
4. Manufactura del Este
5. Prime Cotton
6. Simplex Paraguaya
7. Textil Abay
8. Textil Union

in continuation

1. America Textil
2. Forno y Valle
3. Industria Textil Asuncena (ITASA)
4. Lenzos del Paraguay
5. Manufactura de Pilar
6. Pedro Genovese e Hijos

Annex 17

Investigation on Textile Industries In Paraguay

1) Investigation on Scale of facilities and Productes in Textile Enterprise of Paraguay(1993)

Corporaciones and Production :

1. America Textil	G, S, V, D	(nota) G:ginning
2. Campo 9 Cotton	S	S:spinning
3. Delta 2	G, S, V	V:weaving
4. Fabritex	S, V, Se	K:knitting
5. Hilanderia Ybycui	G, S, V	D:finishing
6. Lenzos del Paraguay	S, V, D	Se:sewing
7. Manufactura del Este	S	
8. Manufactura de Pilar	G, S, V, D	
9. Pedro Genovese e Hijos	S, V	
10. Prime Cotton	S	
11. Semilpal	S, V	
12. Simplex Paraguaya	S, K, D, Se	
13. Textil Abay	S	
14. Textil Asuncena	G, S, V	
15. Textil Sanitaria	S, V, D	
16. Textil Union	G, S, V	
17. Textilia	S, V, D	

2) Investigation on the Actual Situation of Activiteis in Textile Industry (1994)

Investigated Coporaciones :


1. Campo 9 Cotton
2. Delta II
3. Fenix
4. Grupo Plastimar
5. Hilanderia Ybycui
6. Hilos del Paraguay
7. Industria Textil Asuncena
8. La Esperancita
9. Manufactura del Este
10. Manufactura de Pilar
11. Pedro Genovese e Hilos
12. Prime Cotton
13. Reciclase Textil
14. Seda y Fibras
15. Textilia
16. Textil Abay
17. Textil Union

3) Investigation on Scale and Items of Machinery and Products in Spinning Enterprise(1996)

Investigated Enterprises :

1. America Textil
2. Campo 9 Cotton
3. Forno y Valle
4. Hilanderia Central
4. Hilanderia Ybycui
6. Industria Textil Asuncena (ITASA)
7. Lienzos del Paraguay
8. Manufactura del Este
9. Manufactura de Pilar
10. Pedro Genovese e Hijos
11. Prime Cotton
12. Simplex Paraguaya
13. Textil Abay
14. Textil Union

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**Annex 18**  
**Cooperation for Personal Training**

**1) Acceptance of trainee from National University of Asuncion (UNA)**

(1) Faculty of Chemistry Science 1 student

Period: September - November, 1994

(2) Faculty of Chemistry Science 1 student

Period: February - May, 1995

(3) Faculty of Chemistry Science 1 student

Period: July - November, 1995

(4) Faculty of Natural Science 2 students

Period: September - November, 1995

**2) Training for participantes of SNPP's Textile Course**

(SNPP: Servicio Nacional de Promocion Profesional)

Date: July 13 - October 19, 1995 (14 days)

Participantes: 6 - 14 trainees

**3) Acceptance of trainee from the enterprise**

(1) Simplex Paraguaya S.A. 1 trainee

Period: July - September, 1994

(2) Prime Cotton S.A. 1 trainee

Period: June - September, 1994

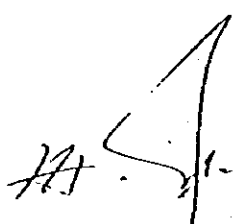
**4) Acceptance of trainee from the textile technology college**

(1) Juan O'leary 1 trainee

Period: February, 1996

(2) Colegio Politecnico Gutenberg 1 trainee

Period: May - June, 1996



## Annex 19

### List of Research Theme

#### 1) Research themes - 1995

1. Classification of the cotton yarn produced in Paraguay
2. Study on the colour fastness of woven fabric to washing
3. Relationship between the maturity and the micronaire value of cotton fiber produced in Paraguay
4. Evaluation of the appearance of cotton yarn produced in Paraguay
5. Treatment of the waste water in cotton textile industry (dyeing and finishing processes)

#### 2) Research themes - 1996

1. Effect of the sliver count setting of the machine on the variation of sliver count in drawing frame process
2. Influence of the roving frame adjustments (sliver feeding disposition and roving tension) on the roving count variation
3. Influence of the yarn twisting on the yarn strength (and Snal Index)
4. Relationship between the drawing frame condition (rollers and pressure bar gauges) and the U% of the sliver
5. UAM sensitivity level related to yarn remaining defects
6. Comparison of the fabric resistance results obtained through different measuring instruments
7. Relationship between pilling formation and the construction, material of fabrics
8. Relationship between the colour fastness and type of dyestuff
9. Study on the free formaldehyde content in textile products sold in domestic
10. Comparison of the results of colour fastness to robing between ISO method and Glass stick method
11. Comparison of the results of unevenness U% from instruments of different factories
12. Study on the accuracy of the breaking tenacity of flat bundles of cotton fiber among testers
13. Treatment of the waste water in cotton textile industry (dyeing and finishing processes)

Annex 20

Activities Related to the Accredited Laboratory

1) Internal seminar

Date: December 20, 1995  
Lecturer: Luis Fleitas (INTN)  
Contents: Introduction on accreditation and certification

2) Internal seminar

Date: March 6, 1996  
Lecturers: Luis Fleitas, Cristobal Gayoso (INTN)  
Contents: Accreditation and certification

3) Seminar in Project

Seminar on "ISO/IEC Guide 25"  
Date: March 29, 1996  
Lecturer: N. Mizuno (JICA Expert)  
Contents: General manual general for quality of laboratory

4) Attendance at seminar in Argentina

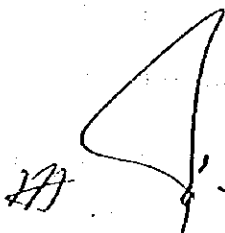
Date: May 20 - 22, 1996  
Organizer: Proyecto OEA/GRZ, CIT-INTI  
Lecturers: Brasil, Argentina, Paraguay, Mexico, Espana  
Contents: Experiences on accreditation of laboratory

5) Attendance at "Workshop on Quality of Laboratory"

Date: May 27 - June 1, 1996  
Organizer: RELAT(Rede de Laboratorios Tecnologicos)  
INTN(Institute Nacional de Tecnologia y Normalizacion)  
APC(Asociacion Paraguaya para Calidad)  
Lecturers: Galindo Guttman Bicho, Madeleine Matossajan (INMETRO - Brasil)  
Contents: ISO/IEC Guide 25

6) Dispatch of counterparts

Counterparts: Chief of Laboratory in Project Textile  
Responsibler of Physic Laboratory in Project Textile  
Dispatched laboratory: INMETRO, SENAI (Rio de janiero - Brasil)  
Period of dispatch: September 9 - 20, 1996





JAPANESE EXPERTS DISPATCHED BY JICA

## (a) Long-term Experts

Chief Advisor

Mr. Takeo Ouchi 1992/12/ 2 - 1994/12/ 1

Mr. Yasushi Watanabe 1995/ 1/ 9 - 1997/ 2/27

Coordinator

Mr. Katsuya Kamisato 1992/11/20 - 1994/12/19

Ms. Yoko Akimoto 1994/12/ 7 - 1997/ 2/27

Testing & Inspection

Mr. Toshiharu Fukai 1992/12/ 2 - 1994/12/ 1

Mr. Nobuo Takahashi 1994/11/21 - 1997/ 2/27

Cotton Spinning Technology

Mr. Takeshi Watanabe 1993/ 7/26 - 1994/ 1/29

Mr. Takashi Maeshima 1994/ 5/14 - 1997/ 2/27

Textile Industrial Standards & Inspection System

Mr. Naokiyo Mizuno 1994/ 1/21 - 1997/ 1/20

## (b) Short-term Experts

Installation of Equipment

Mr. Yoshio Sawamura 1993/ 8/11 - 1993/ 9/10

Mr. Hitoshi Hori 1993/ 8/21 - 1992/11/ 1

Mr. Eitsugu Okita 1993/ 8/28 - 1993/ 9/13

Mr. Suehiro Kobayashi 1993/ 9/ 4 - 1993/10/18

Mr. Mitsuo Okui 1993/ 9/ 4 - 1993/ 9/30

Mr. Kenetsu Saka 1993/ 9/ 4 - 1993/ 9/15

Mr. Masayuki Horiguchi 1993/ 9/ 4 - 1993/ 9/30

Mr. Kazuhisa Maeda 1993/ 9/18 - 1993/11/ 8

Mr. Masayuki Horiguchi 1995/ 4/10 - 1995/ 4/27

Testing & Inspection

Mr. Akie Yamagata 1995/ 8/16 - 1995/ 9/13

Mr. Kazumi Sagisaka 1996/ 9/21 - 1996/10/11

Cotton Spinning

Mr. Tsukasa Kishimoto 1994/ 2/26 - 1994/ 5/28

Mr. Hitoshi Hori 1994/ 7/ 9 - 1994/ 8/ 9

Mr. Masuhiro Fujitani 1995/ 6/12 - 1995/ 7/10

Mr. Kichiji Fuse 1995/ 9/ 7 - 1995/10/ 9

Mr. Masaaki Koike 1996/ 4/22 - 1996/ 6/23

Mr. Masaharu Tsuzawa 1996/ 8/24 - 1996/ 9/21

Industrial Standards

Mr. Toshi Yakumaru 1994/ 9/ 5 - 1994/10/ 4

Mr. Yuzo Ishii 1995/ 8/21 - 1995/ 9/24

Mr. Toshi Yakumaru 1996/ 6/17 - 1996/ 7/19

Quality Control for Textile Mills

Mr. Hitoshi Hori 1994/ 2/ 5 - 1994/ 3/ 5

Mr. Tadaaki Ikeda 1994/ 2/26 - 1994/ 3/26

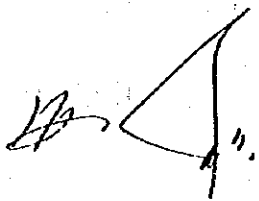
Mr. Kikuo Higashikawa 1995/ 3/27 - 1995/ 4/23

Testing & Inspection, Consultation for Textile Mills

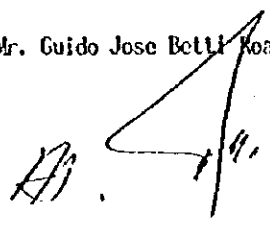
Mr. Tadaaki Ikeda 1996/ 9/14 - 1996/11/10

JAPANESE SURVEY TEAMS DISPATCHED BY JICA

1. Preliminary Survey Team	1991/ 2/ 9 - 1991/ 2/23
2. Experts Survey Team	1991/ 9/20 - 1991/10/ 4
3. Implementation Survey Team	1992/ 2/21 - 1992/ 3/ 4
4. Consultation Team	1992/12/12 - 1992/12/22
5. Technical Guidance Team	1993/12/ 4 - 1993/12/16
6. Consultation Team	1994/10/31 - 1994/11/11
7. Consultation Team	1996/ 3/12 - 1996/ 3/25
8. Evaluation Team	1996/11/18 - 1996/12/ 9



COUNTERPART PERSONNEL TRAINED IN JAPAN

( name )	( training fields )	( term of training )
1. Mr. Norberto Jose Ramon Zaracho Echague	Testing of Textiles	1992/ 3/30 - 1992/ 6/ 6
2. Ms. Nancy Esther Vega Daher	Textile Inspection	1992/10/13 - 1992/12/19
3. Mr. Eduardo Venancio Gonzalez	Cotton Spinning	1992/10/13 - 1992/12/19
4. Mr. Francisco Parisi	Cotton Spinning	1992/10/13 - 1992/12/19
5. Mr. Shigeru Yano Ykeda	Cotton Spinning	1993/ 5/25 - 1993/ 7/30
6. Mr. Norberto Jose Ramon Zaracho Echague	Cotton Spinning	1993/ 6/17 - 1993/ 7/30
7. Mr. Jose Luis Alvarenga Rodas	Standardization and Inspection System	1993/10/12 - 1993/12/15
8. Ms. Esperanza Midori Mitsui Nakane	Testing and Inspection	1994/ 5/10 - 1994/ 7/14
9. Mr. Julio Edgar Acosta Dominguez	Cotton Spinning	1994/ 5/10 - 1994/ 7/14
10. Mr. Jorge Enrique Perez Ramirez	Cotton Spinning	1994/ 5/10 - 1994/ 6/ 8
11. Mr. Humberto Daniel Riquelme Bareiro	Standardization and Inspection System	1995/10/10 - 1995/12/17
12. Mr. Luis Fernando Ruiz Diaz	Testing and Inspection	1995/10/10 - 1995/12/17
13. Mr. Ruben Ricardo Ramirez Gayoso	Cotton Spinning	1995/10/10 - 1995/12/17
14. Ms. Maria Eugenia Cardona Gomez	Testing and Inspection	1996/ 5/14 - 1996/ 7/20
15. Mr. Mario Gustavo Leiva Enrique	Testing and Inspection	1996/ 5/14 - 1996/ 7/20
16. Mr. Guido Jose Bettl 	Cotton Spinning	1996/ 5/14 - 1996/ 7/20

Machinery and Equipment Provided by JICA

EQUIPMENT INVENTORY BY JICA

1. CLASSIFICATION

Testing & Inspection

Chemical Laboratory  
Physical Laboratory  
Physical-Chemical Laboratory  
Inspection room  
Common use

Spinning Pilot Plant

Machine  
Spare parts  
Equipment for maintenance  
Equipment for operation  
Equipmento for measure  
General equipment

Standardization

Businnes machine, common use

2. Note

K-Equipment by project expenses  
S-Equipment by expert expenses  
G-Local purchase by local project expenses  
GK- Local purchase by project expenses

L - Testing & Inspection  
P - Spinning Pilot Plant  
N - Standardization  
J - Businnes machine, common use

## EQUIPMENT INVENTORY BY JICA

Testing &amp; Inspection Chemical Laboratory-1

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
95-S	2-L	Spectro photometer (Shimadzu UV-1201)	1,177,750	1set	21.11.1995	
96-GK	1-L	Infrared spectro photometer (Shimadzu FTIR-8201PC)	5,000,000	1	26. 7. 1996	
92-K	41-L	Zoom stereo microscope (Olympus SZ5045TRCIV)	334,500	1	2. 7. 1993	
	96-L	Fluorescence illuminator for microscope (Olympus SZ-FLR)	45,500	1	2. 7. 1993	
	42-L	Microscope for TV monitor (Olympus BS-321)	722,000	1	2. 7. 1993	
	43-L	TV monitor (Olympus)	730,500	1	2. 7. 1993	
	44-L	Camera (Olympus OM4)	152,000	1	2. 7. 1993	
95-G	4-L	Photographic tube for microscope (Micronal, SZ-PT)	Gs. 409,035	1	17. 1. 1996	
	7-L	Microscope (Olympus mod. CHD)	Gs. 1,678,875	1	29. 3. 1996	
93-K	33-L	PH meter (Horiba F-22)	230,000	1	12. 7. 1994	
92-K	94-L	Balance (Shimadzu EL-600S)	73,000	1	2. 7. 1993	
	95-L	Balance (Shimadzu EL-6000S)	73,000	1	2. 7. 1993	
92-G	86-L	Digital balance (Ohaus CT-1200)	114,166	1	31. 3. 1993	
96-GK	3-L	Balance (METTLER-TOLEDO AG, mod. AB204)	US\$ 2,981.00	1	13. 8. 1996	
92-K	99-L	Hydrometer (Nihonkeiryō)	75,000	1set	2. 7. 1993	
93-K	38-L	Chlorine measure (Shibata)	31,000	1	12. 7. 1994	
	40-L	Chlorine measure set	28,000	1	12. 7. 1994	
92-K	40-L	Oven (Asahi AN-6D)	293,500	1	2. 7. 1993	
94-S	10-L	Moisture measuring fixed temperature dryer (Daiel mod. COR-1)	765,000	1	7. 4. 1995	
92-K	39-L	Hot Plate (Otsuka HC-6C)	347,500	1	2. 7. 1993	
	46-L	Soxhlet extractor (Shibata)	196,500	1	2. 7. 1993	
	47-L	Rotary evaporator (Shibata RE111ASW)	314,000	1	2. 7. 1993	
	48-L	Shaker (Tuchi SRR-2)	233,000	1	2. 7. 1993	
	112-L	Shelf (Uchidayoko DS-6B)	89,600	1	2. 7. 1993	

## EQUIPMENT INVENTORY BY JICA

Testing &amp; Inspection Chemical Laboratory-2

Year	No.	Equipment (Specification)	Price (¥)	Qun.	Date	Remark
92-K	45-L	Ultrasonic cleaner (Yamato 5200-J4N)	314,000	1	2. 7. 1993	
93-K	32-L	Water bath shaker (Taitec Personal 11SD)	360,000	1	12. 7. 1994	
92-K	113-L	Dispenser (brown 10ml)	45,800	2	2. 7. 1993	
	114-L	Desiccator (240mm φ)	105,200	4	2. 7. 1993	
	30-L	Distilled water apparatus (Advantec CS4200)	1,068,000	1	2. 7. 1993	
	2-L	Waste water treatment apparatus (Shimadzu DP-25)	2,962,000	1	2. 7. 1993	
	29-L	Collector tank (Shimadzu 50L)	170,000	1	2. 7. 1993	
94-K	2-L	PH neutralization apparatus (Nakagawa)	6,370,000	1	10. 4. 1995	
92-G	118-L	Refrigerator (Brastemp BRY-26X)	47,416	1	31. 3. 1993	
93-K	31-L	Medical freezer (Hitachi CR-32)	580,000	1	12. 7. 1994	
92-G	119-L	Vacuum cleaner (Map PET)	28,325	1	31. 3. 1993	
92-K	22-L	Draft chamber (DC-H18)	1,600,000	1	2. 7. 1993	
	23-L	Table (Dalton GA315)	715,000	1	2. 7. 1993	
	25-L	Sink (Dalton NA215)	316,000	1	2. 7. 1993	
	26-L	Locker (Dalton CS212)	188,000	1	2. 7. 1993	
	27-L	Small table (Koyama LWA-II)	345,000	3	2. 7. 1993	
	28-L	Large table (Koyama LWA-II)	278,000	2	2. 7. 1993	
	24-L	Reagent locker (Dalton CA521)	323,000	1	2. 7. 1993	
92-G	121-L	Reagent Locker (Saermo)	32,266	1	31. 3. 1993	

## EQUIPMENT INVENTORY BY JICA

Testing &amp; Inspection Physical Laboratory-1

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	3-L	Microdust trash analyzer (Spinlab MD1A3)	6,870,000	1	2. 7. 1993	
	49-L	Micronaire (Spinlab 175-C)	1,124,000	1	2. 7. 1993	
96-S	4-L	Micronaire Fiber Fineness Tester (Keisokki)	760,000	1	24.10.1996	
	4-L	Fibrograph (Spinlab 630)	6,190,000	1	2. 7. 1993	
96-S	1-L	Double sorter (Asano No.151)	241,000	1	18. 6. 1996	
95-K	1-L	Cotton colorimeter (Spinlab 650)	3,100,000	1	31. 5. 1996	damage, in contact with maker
93-K	36-L	Pressley tester (Kisokki)	1,080,000	1	12. 7. 1994	
92-K	5-L	Uster analyzer (Uster UT3EM)	14,448,000	1	2. 7. 1993	
96-K	1-L	Hairiness Tester (Zelleweger Uster, UT-3-H, UT3-FM)		1		
	52-L	Auto sorter (Uster 3)	1,265,000	1	2. 7. 1993	6.1994 damage, repaired
	7-L	Classimat (Uster II-1)	6,160,000	1	2. 7. 1993	installed in Pilot Plant
95-K	1-L	Selemasure (Nihon selen ND-37K)	550,000	1	31. 5. 1995	
92-K	51-L	Wrap reel motor driven (Daiei SSD2)	740,000	1	2. 7. 1993	
	53-L	Twist counter electric driven (Daiei MM2)	460,000	1	2. 7. 1993	
	55-L	Yarn inspector (Asano)	339,800	1	2. 7. 1993	
	56-L	Kringelfactometer (Keisokki)	267,000	1	2. 7. 1993	
	6-L	Tensorapid (Uster UTR3/500N)	13,586,000	1	2. 7. 1993	8.1994 damage, 1.1995 repaired
95-S	4-L	Bursting strength tester (Daiei ML-45KG)	884,000	1	21.11.1995	
94-S	8-L	Tearing tester (TOYOSEIKI 163)	1,250,000	1	7. 4. 1995	
95-S	3-L	Pilling tester (Daiei ICI P-3)	663,400	1	21.11.1995	
92-K	97-L	Thermogravimeter (Nihonkeiryō NWR9003E)	67,800	1	2. 7. 1993	
	37-L	Balance (Shimadzu AEI-200)	445,800	1	2. 7. 1993	
	38-L	Balance table (Dalton BT-100)	264,900	1	2. 7. 1993	
95-S	2-L	Standard weight 100g~1mg		1set	18. 6. 1996	



## EQUIPMENT INVENTORY BY JICA

Testing &amp; Inspection Physical Laboratory-2

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
95-S	3-L	Standard weight 200 mg		2	18. 6.1996	
93-K	4-L	Infrared rays oven (Asano No.142)	2,780,000	1	12. 7.1994	
96-GK	7-L	Refrigerated Constant Temperature Humidity Chamber (TOYOSEIKI, AGA205)	US\$ 38,610	1		
92-K	50-L	Compressor (Sanki HSB)	445,000	1	2. 7.1993	
93-K	34-L	Incubator (Alp ILD-110HL)	940,000	1	12. 7.1994	
92-X	31-L	Computer (IBM PS5510-TJ4)	589,000	1	2. 7.1993	
	32-L	Display (IBM 8515-A01)	162,000	1	2. 7.1993	
	33-L	Printer (IBM 5573H02)	144,800	1	2. 7.1993	
	34-L	UPS (Omron BU504XL)	172,200	1	2. 7.1993	
	88-L	Floppy disk drive (IBM 95F4389)	40,500	1	2. 7.1993	
	89-L	OA stand for PC (Sigma WD-1001)	57,800	1	2. 7.1993	
	90-L	Sheet feeder for PC (IBM 35G2392)	35,500	1	2. 7.1993	
96-G	4-L	Computer (486-DX4, 100MHZ)	Gs.2,259,570	1	14. 8.1996	
92-K	91-L	Software Ichitaro Ver. 4.0	58,900	1	2. 7.1993	
	92-L	Software Wordstar 6.0	99,300	1	2. 7.1993	
	93-L	Software Lotus 1-2-3	99,300	1	2. 7.1993	
	35-L	Air conditioner (Daikin FRY8M13YE)	902,000	1	2. 7.1993	
	36-L	Air conditioner (Daikin CRY8MYE)	567,000	1	2. 7.1993	
94-G	14-L	Humidify-dehumidify system (KLIXON)	Gs.4,840,000	1	31. 5.1995	
93-K	3-L	Hose pipe for air conditioner	215,903	1	4.10.1993	
92-K	23-L	Table (Dalton GAS15)	715,000	1	2. 7.1993	
	27-L	Small table (Koyama LWA-II)	230,000	2	2. 7.1993	
	28-L	Large table (Koyama LWA-II)	139,000	1	2. 7.1993	
92-G	121-L	Reagent locker (Saermo)	32,266	1	31. 3.1993	

EQUIPMENT INVENTORY BY JICA

Testing & Inspection Physical-chemical Laboratory

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	8-L	Washer extractor (Grozbeckett FOM71PM)	1,722,000	1	2. 7.1993	
	60-L	Laundry meter (Daiel L12)	1,277,000	1	2. 7.1993	
	57-L	Stepdown transformer 3-phase (Yamabishi)	187,000	1	2. 7.1993	
	10-L	Long life weather meter (Suga WEL-6X-RC-BECS)	12,260,000	1	2. 7.1993	
	61-L	Xenon lamp (Suga)	227,000	0 (1)	2. 7.1993	8.1995 changed
	62-L	Dyeing abrasion tester (Kowa mod.I)	937,000	1	2. 7.1993	
96-GK	6-L	Clockmeter (Shirley Dev. Ltd. M238A)	US\$ 1,878	1	30. 9.1996	
92-K	87-L	Perspiration meter for JIS-L8033 (Daiel)	184,000	1	2. 7.1993	
94-S	9-L	Hot pressing tester (Kishino KD-101)	415,000	1	7. 4.1995	
92-K	59-L	Colorimeter (Minolta CR200)	920,000	1	2. 7.1993	
	63-L	Standard light source (Suga F65D-A)	476,000	1	2. 7.1993	
	40-L	Oven (Asahi AW-6D)	293,500	1	2. 7.1993	
93-K	35-L	Spin drier (KOKUSAN H-130A)	610,000	1	12. 7.1994	
94-G	1-L	Sewing machine (Janome L-373)	Gs. 890,000	1	26. 1.1995	
92-K	102-L	Color calibration plate (red)	22,000	1	2. 7.1993	
	103-L	Color calibration plate (yellow)	22,000	1	2. 7.1993	
	104-L	Color calibration plate (light blue)	22,000	1	2. 7.1993	
	98-L	Refrigerator (Sanyo SR-22NF)	92,400	1	2. 7.1993	
	23-L	Table (Dalton GA315)	715,000	1	2. 7.1993	
	25-L	Sink (Dalton NA215)	316,000	1	2. 7.1993	
	27-L	Small table (Koyama LWA-II)	115,000	1	2. 7.1993	
	28-L	Large table (Koyama LWA-II)	139,000	1	2. 7.1993	
	24-L	Reagent locker (Dalton CA521)	323,000	1	2. 7.1993	

## EQUIPMENT INVENTORY BY JICA

Testing &amp; Inspection      Inspection room

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	9-L	Inspecting & winding machine (Kitamura KM7E)	4,170,000	1	2. 7.1993	
93-K	39-L	Paper tube for cloth roller	24,000	5	12. 7.1994	
94-S	14-L	Cloth roll conveyer 115cm	95,000	1	6. 7.1994	
	15-L	Cloth roll conveyer 160cm	100,000	1	6. 7.1994	
92-K	58-L	Lux meter (Minolta T-1M)	150,000	1	2. 7.1993	
93-K	37-L	Black light (Hamamatsu hotonic)	54,000	1	12. 7.1994	
92-K	54-L	Sample ruck (Daiei for JIS-L-1095 T19A)	770,000	1	2. 7.1993	
	100-L	Standard sample for card yarn (1.2.3)	34,600	3set	2. 7.1993	
	101-L	Standard sample for comb yarn (1.2)	23,500	4set	2. 7.1993	
95-S	1-L	Standard sample of thread (Boken 14-25)	25,200	1set	23. 8.1995	
	26-L	Locker (Dalton CS212)	188,000	1	2. 7.1993	

EQUIPMENT INVENTORY BY JICA

Testing & Inspection      Common use

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
95-G	3-L	Bookshelf-locker (Simplex)	Gs. 450,000	1	14.11.1995	

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EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant Machine

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	11-P	Blow room machine (OHARA)	57,000,000	1	2. 7. 1993	
	12-P	Carding machine (CMK-3)	17,400,000	2	2. 7. 1993	
	13-P	Drawing frame (DF/5)	11,700,000	2	2. 7. 1993	
	14-P	Lap former (DY No.5)	11,800,000	1	2. 7. 1993	
	15-P	Comber (KZ-3)	12,000,000	1	2. 7. 1993	
	16-P	Simplex fly frame (RME)	10,400,000	1	2. 7. 1993	
	17-P	Ring spinning frame (UA33G)	7,500,000	1	2. 7. 1993	
	18-P	Auto winder (No. 7R-II)	7,000,000	1	2. 7. 1993	
	19-P	KT winder (No.141I)	1,800,000	1	2. 7. 1993	
	20-P	Ring twisting frame (S75)	7,600,000	1	2. 7. 1993	
93-S	1-P	Compressor (Hitachi DF-2)	885,600	1	15.11.1993	
95-S	6-P	Bro-cleaner (Luwa Japan)	620,000	1	21.11.1995	
93-G	2-P	Compressor (Shultz MSV40SA)	234,350	1	8.1993	
93-GK	127-P	Humidifier (Kaiken)	1,676,620	4	16. 1. 1994	
	128-P	Package air conditioner (Hitachi RP1514)	2,242,766	1	28.12.1993	

## EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant Spare parts

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
94-K	1-P	Spare parts for Drawing frame	1,275,000	1set	24.11.1995	
	3-P	Spare parts for Carding machine	2,550,000	1set	24.11.1995	
	4-P	Spare parts for Simplex fly frame	1,955,000	1set	24.11.1995	
	5-P	Spare parts for Ring spinning frame	1,620,000	1set	24.11.1995	
93-S	9-P	Comb cylinder	207,000	2	9. 6.1994	
	10-P	High comb needle bar & ribbon	125,500	2	9. 6.1994	
	11-P	Draw top roller (for CM)	40,600	2	9. 6.1994	
	12-P	Cylinder brush (for CM-DT)	204,400	8	9. 6.1994	
	13-P	Ermen's clearer (for CM-DR)	44,700	1	9. 6.1994	
	14-P	Nipper complete	507,000	1	9. 6.1994	
	15-P	Draw top ermen's clearer (for CM-DT)	99,800	1	9. 6.1994	
	16-P	Oil pump (for CM)	31,480	1	9. 6.1994	
	17-P	Waste chute (for CM)	71,500	1	9. 6.1994	
	18-P	Perforated roller	187,700	1	9. 6.1994	
	19-P	Dumper roller	118,450	1	9. 6.1994	
	20-P	Auto counter (for CM coiler)	66,500	1	9. 6.1994	
	21-P	Main motor (for CM 2.2KW x 4P)	27,700	1	9. 6.1994	
	22-P	Brush motor (for CM 1.5KW x 4P)	22,300	1	9. 6.1994	
	23-P	Top roller complete (for LF)	136,800	9	9. 6.1994	
	24-P	Second top roller with end bush (for LF)	218,800	4	9. 6.1994	
	25-P	Auto counter (for LF)	20,800	1	9. 6.1994	
	26-P	Solenoid valve (for LF)	52,000	1	9. 6.1994	
	27-P	Main motor (for LF 3.7/1.85KW x 4/8P)	122,100	1	9. 6.1994	
	28-P	Pneuma motor (for LF 0.75KW x 2P)	152,830	1	9. 6.1994	

EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant Equipment for maintenance

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	21-P	Tool for Ring spinning frame	2,490,000	1	2. 7. 1993	
	64-P	Tool for Carding machine	880,000	1	2. 7. 1993	
	65-P	Tool for Drawing frame	170,000	1	2. 7. 1993	
	66-P	Tool for Lap former	390,000	1	2. 7. 1993	
	67-P	Tool for Comber	630,000	1	2. 7. 1993	
	68-P	Tool for simplex fly frame	640,000	1	2. 7. 1993	
	77-P	Portable tool box with vice	420,000	2	2. 7. 1993	
93-K	30-P	Grinding roller (YAWATO KOEI)	1,258,000	1	12. 7. 1994	
94-K	1-P	Metallic wire winder (KANAI RAM-2)	3,010,000	1	10. 4. 1995	
95-K	2-P	Buffing machine (Daiko)	6,250,000	1	31. 5. 1996	
	3-P	UV rays rubber roller treatment (Daiko)	4,485,000	1	5. 9. 1996	
	2-P	Spindle oil cleaner (Nihon spindle)	1,100,000	1	31. 5. 1996	
94-S	11-P	Card cleaning roller (YAMATOKOEI No.11)	268,000	1	13.12.1995	
	12-P	Long grinding roller (YAMATOKOEI No.9)	353,000	1	13.12.1995	
	13-P	Thermal press type spindle tape bonder (HABASHI PT-100/8)	75,000	1	13.12.1995	
96-G	5-P	Sink for Buffing machine (CONSTRUFERRO)	Gs. 3,080,000	1	9. 9. 1996	
96-K	1-P	Eccentricity Checking & Repairing Stand for Fluted roller (TOYOSHO Engineering)	540,000	1		

EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant Equipment for operation

Year	No.	Equipment (Specification)	Price (¥)	Qun.	Date	Remark
92-K	69-P	Cart for lap	110,000	1	2. 7. 1993	
	70-P	Carrier for fiber	220,000	2	2. 7. 1993	
	71-P	Trailer for raw cotton	200,000	2	2. 7. 1993	
	72-P	Hand lift truck	130,000	1	2. 7. 1993	
	73-P	Cart for roving	130,000	1	2. 7. 1993	
	74-P	Cart for cops (RF)	135,000	1	2. 7. 1993	
	75-P	Cart for cone	450,000	3	2. 7. 1993	
	76-P	Cart for cops (RIF)	135,000	1	2. 7. 1993	
	105-P	Cart for roving bobbin	70,000	1	2. 7. 1993	
	106-P	Hanger for doffing	140,000	4	2. 7. 1993	
	107-P	Polivel picker	66,000	3	2. 7. 1993	
	108-P	Hand knotter for RTW	150,000	3	2. 7. 1993	
	109-P	Hanger for RIF doffing	90,000	2	2. 7. 1993	
	110-P	Handling carrier	70,000	2	2. 7. 1993	
	111-P	Grass tube thermometer	140,000	5	2. 7. 1993	
94-G	12-P	Automatic recorder of temperature & humidity (Ohtakeki E-III)	Gs. 3,560,000	2	29. 3. 1995	



EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant Equipment for measure

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-K	78-P	Wrap reel	650,000	1	2. 7. 1993	
	79-P	Wrap block	220,000	1	2. 7. 1993	
	80-P	Digital balance	120,000	1	2. 7. 1993	
	81-P	Twist counter	220,000	1	2. 7. 1993	
	82-P	Other accessories	446,500	1	2. 7. 1993	
95-S	5-P	Roving tester (Asanokikai 9511)	690,000	1	21. 11. 1995	
94-G	13-P	Digital stroboscope (Shinokogyo DT-315)	Gs. 4,700,000	1	29. 3. 1995	
96-K	2-P	Portable Hygrometer (MUNDINGER AQUA-BOY BAFI)	Gs. 3,439,480	1	7. 8. 1996	

EQUIPMENT INVENTORY BY JICA

Spinning Pilot Plant General equipment

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
93-S	29-P	Polaroid camera (Impulse AF)	22,500	1	9. 6.1994	
92-G	119-P	Vacuum cleaner (Nap PET)	29,235	1	31. 3.1993	
	129-P	Room air conditioner (TGM)	566,487	1	27. 1.1993	
95-G	5-P	Shelf (Technica Maderil Ind. 2.30x1.05)	Gs. 520,000	1	28. 2.1996	
	6-P	Desk (Simplex. 1.55x0.70 6 drawers)	Gs.1,734,000	3	27. 3.1996	
	8-P	Printer (Apple Color Style Writer 2400)	Gs.1,221,000	1	29. 3.1996	

EQUIPMENT INVENTORY BY JICA

Standardization

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-G	121-N	Locker (Saerme)	32,256	1	1993. 3.31	
94-G	2-N	Scanner & memory RAM (H. PACKARD ScanJet IIP)	Gs. 1,599,000	1	1995. 2. 1	
	9-N	Hard disk (PERFORMANCE)	Gs. 561,450	1	1995. 3.10	
	10-N	Back up system (TRIPP LITE Model BCint400)	Gs. 587,060	1	1995. 3.10	
95-G	1-N	Locker (Simplex 1,80x0,90)	Gs. 384,000	1	1995. 6.22	
93-S	5-N	Cotton yarn sample No. 1~13	24,000	1	1994. 4.18	
	7-N	Cotton yarn sample No. 14 ~24	24,000	1	1994. 4.18	
	8-N	Cotton yarn sample No. 25 ~34	24,000	1	1994. 4.18	

## EQUIPMENT INVENTORY BY JICA

Business machine, common use

Year	No.	Equipment (Specification)	Price (¥)	Qua.	Date	Remark
92-GK	1-J	Land Cruiser II (Toyota JL77LV-MXX)	1,830,000	1	14. 9.1993	
92-G	84-J	Copy machine (Ricoh FT280)	US\$ 1,800	1	10.1992	1.1995 damage
	85-J	Over head projector (Lanier 4020)	130,088	1	25. 2.1993	
	115-J	Type writer (Olympia Startype 1301)		1	10.1992	
	116-J	Facsimile (Sanyo HS2G)	81,083	1	12. 1.1993	1.1995 damage
	117-J	Refrigerator (Climax 3.3 Super Luxo)	60,833	1	3. 3.1993	
	120-J	Locker (Saerno)	127,233	2	31. 3.1993	
94-G	3-J	Facsimile (Panasonic KX-F500)	Gs. 728,000	1	16. 2.1995	
	4-J	Copy machine (Mita DC-1435)	Gs. 5,669,200	1	16. 2.1995	
	5-J	Cabinet (Silvestri)	Gs. 456,500	1	21. 2.1995	
	6-J	Video camera (Panasonic NV-M200PV)	Gs. 1,507,000	1	2. 3.1995	
	7-J	TV monitor (Goldstar CP-20870)	Gs. 581,000	1	2. 3.1995	
	8-J	Video deck (Goldstar Cinemaster R-B44A VHS)	Gs. 486,000	1	2. 3.1995	
	11-J	Desk (ZANELLA)	Gs. 357,500	1	29. 3.1995	
	2-J	Bookshelf (Simplex)	Gs. 395,000	1	24.10.1995	
92-S	83-J	Word processor (Canoword α85HL)	194,400	1	17.12.1992	
93-S	5-J	Word processor (Canoword α85HL)	194,400	1	18. 4.1994	
94-S	1-J	Personal computer (Apple FC48N89-BM)	246,000	1	24. 8.1994	
	2-J	Personal computer (Apple FC43DJJ-BM)	246,000	1	24. 8.1994	17.11.1994 lost
	3-J	Printer (Apple)	112,000	1(2)	24. 8.1994	17.11.1994 lost (1) 2.1996 damage (1)
	4-J	Ten key board (Apple)	32,000	1(2)	24. 8.1994	17.11.1994 lost (1)
	5-J	Software (8 series)	294,000	8	24. 8.1994	
	6-J	Memory RAM 8M	98,000	1(2)	24. 8.1994	17.11.1994 lost (1)
	7-J	Mouse	18,000	1(2)	24. 8.1994	17.11.1994 lost (1)

EXPENSES BY THE JAPANESE SIDE

(unit : thousand yen)

Japanese Fiscal Year	1990	1991	1992	1993	1994	1995	1996	Total
Item								
Dispatch of Survey Teams	6,541	14,083	9,309	9,180	6,931	6,747	<u>11,220</u>	64,011
Dispatch of Experts			25,657	95,578	94,089	83,267	<u>81,497</u>	380,088
Training of C/P in Japan		<u>3,198</u>	<u>9,455</u>	<u>8,157</u>	<u>7,508</u>	9,594	10,538	48,450
Provision of Machinery & Equipment		224	267,356	43,532	24,381	18,235	19,310	373,038
Local Cost			1,296	4,770	4,626	4,078	4,767	19,537
Total	6,541	17,505	313,073	161,217	137,535	121,921	127,332	885,124

Amounts underlined are estimated figure.

Annex 26

List of Paraguayan Counterpart and Administrative Personnel

Dr. Juan Francisco FACETTI

General Director of INTN  
and of Textile Project

LABORATORIES AREA

T.A. Delfina de FRANCO

Chief of Laboratories Area

Dra. Midori MITSUI

Counterpart

Lic. Maria Eugenia CARDONA

Counterpart

Ing. Nancy VEGA

Counterpart

Lic. Luis Fernando RUIZ DIAZ

Counterpart

Ing. Susana CABRERA

Assistant of Counterpart

Lic. Mario LEIVA

Assistant of Counterpart

PILOT PLANT AREA

Ing. Norberto ZARACHO

Chief of Pilot Plant

Ing. Shigueru YANO

Counterpart

Mr. Ricardo RAMIREZ

Counterpart

Mr. Guido BETTI

Counterpart

Mr. Euclides FRANCO

Assistant of Counterpart

Mr. Ever CABRERA

Assistant of Counterpart

Mr. Silvio ZARZA

Assistant of Counterpart

Mr. Carlos SENA

Assistant of Counterpart

STANDARDIZATION AREA

Dr. Eduardo GONZALEZ

Chief of Standardization Area

Ing. Daniel RIQUELME

Counterpart

A. J. Carlos TABOADA

Counterpart

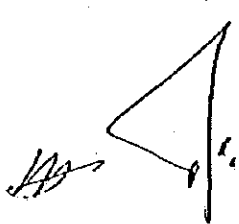
ADMINISTRATIVE PERSONNEL

Ms. Silde BRUNSTEIN

Secretary

Mr. Priciliano ORTIZ

Driver



Annex 27

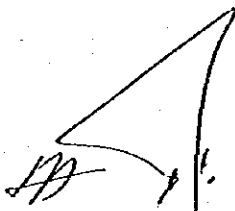
Supply of Equipment and Construction by the Paraguayan Side

1. SUPPLY OF EQUIPMENT

1993	1) Cabinet, meeting table	1,108,180 (Gs.)
	2) Various furniture	755,500
	3) Various furniture	906,600
1994	1) Meeting table & tables	1,750,000
	2) Cases for cone of yarn	1,672,000
	3) Table, desk & chairs	5,067,660
1995	1) Maintenance works for Tensorapid (Uster-Spinlab)	1,294,625
	2) Cotton fiber	6,000,000
	3) Chemical products	8,300,000
	4) Polyester fiber	7,401,375
	5) Bobbins for roving & spinning machines	6,600,000
	6) Personal computer & printer (donation by OEA/GTZ)	3,597,825

2. CONSTRUCTION.

1992	1) Project office, Pilot Plant & Laboratory	370,443,600
1993		
1995	1) Plant for Pll treatment apparatus	8,459,564
1996	1) Partition wall for chemical laboratory	948,750



## BUDGET FOR THE PROJECT BY THE PARAGUAYAN SIDE

(Thousand Guaranies)

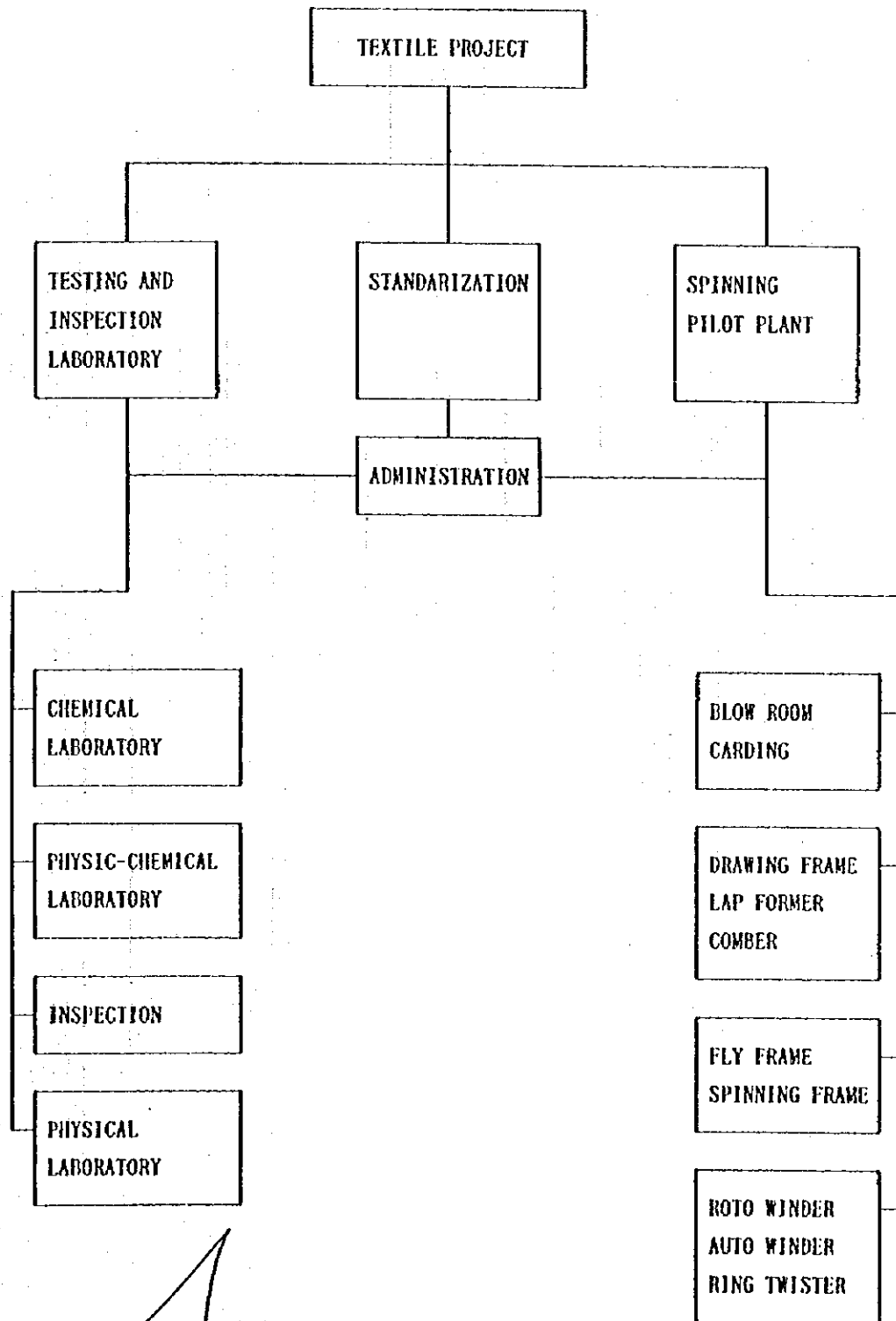
Item	1992	1993	1994	1995	1996	Total
1. Expenses for Employees Salary, Bonus, Extraordinary salaries, Pension charge, Journal.	<u>15,410</u>	84,755	203,266	350,860	404,908	1,059,199
2. Expenses for Services Electricity Power, Water Supply and Sewerage Services, Telephone Service, Transportation, Provision for Journey, Maintenance and Repair, Insurances, Protocolar Fees and others.	<u>2,753</u>	15,144	92,653	125,667	167,000	403,217
3. Expenses for Goods Textiles and Fabrics Products, Chemical Products, Office supplies, other goods.	<u>2,090</u>	11,500	21,208	38,488	43,750	117,036
4. Buildings & Facilities	370,443	41,874	18,927	21,256	948	453,448
<b>T o t a l</b>	<b>390,696</b>	<b>153,273</b>	<b>336,054</b>	<b>536,271</b>	<b>616,606</b>	<b>2,032,900</b>

Amounts underlined are estimated figure.



Annex 29

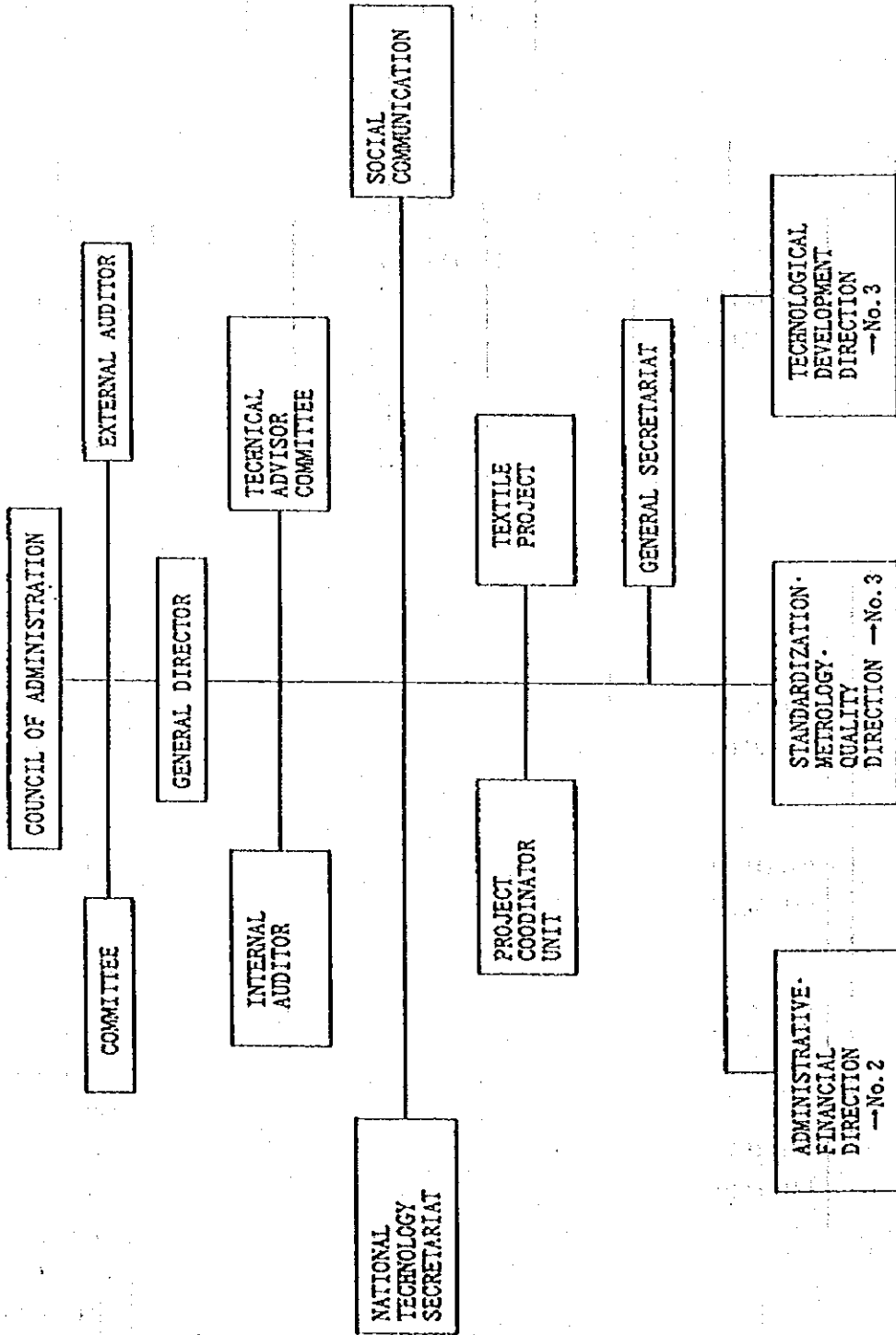
Organization Chart of Project

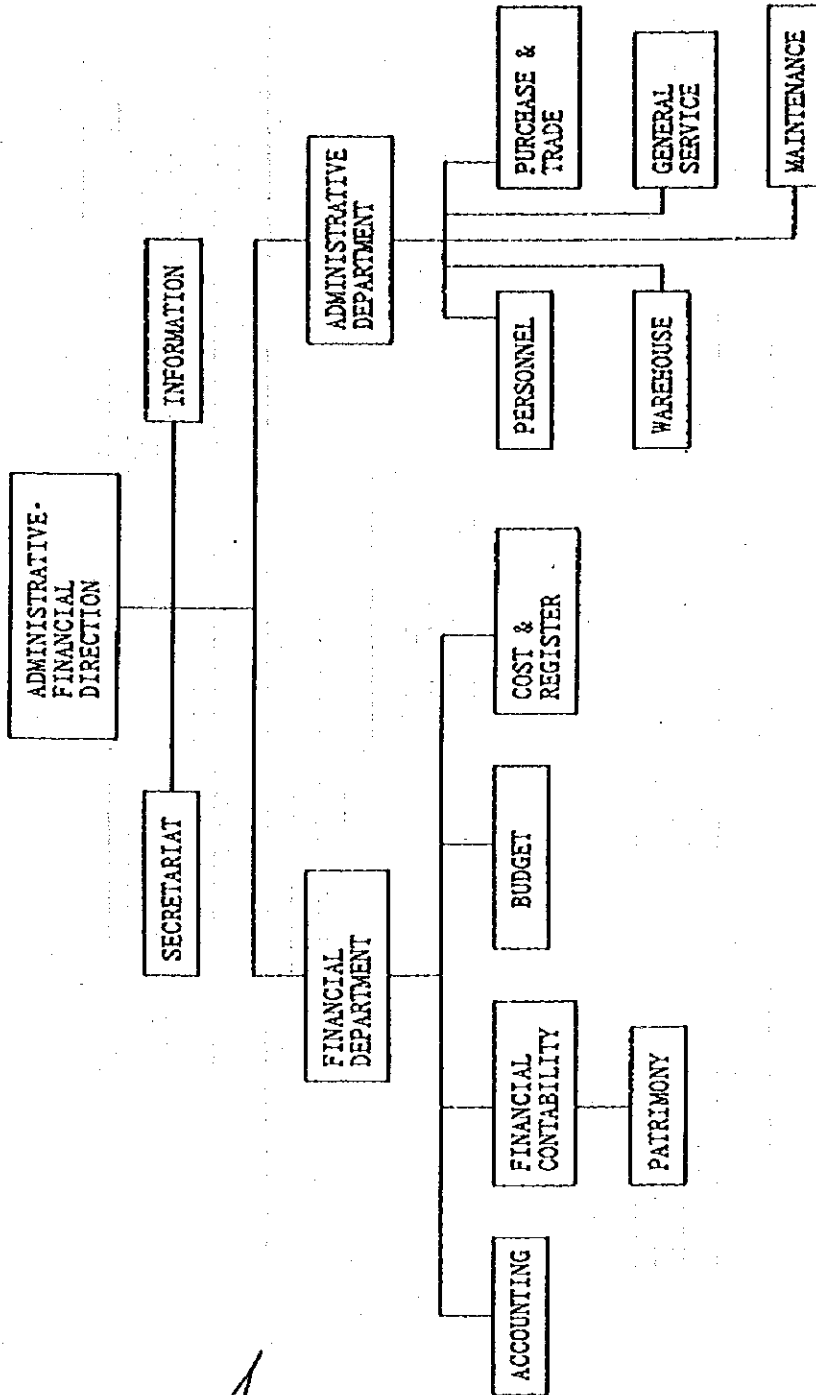


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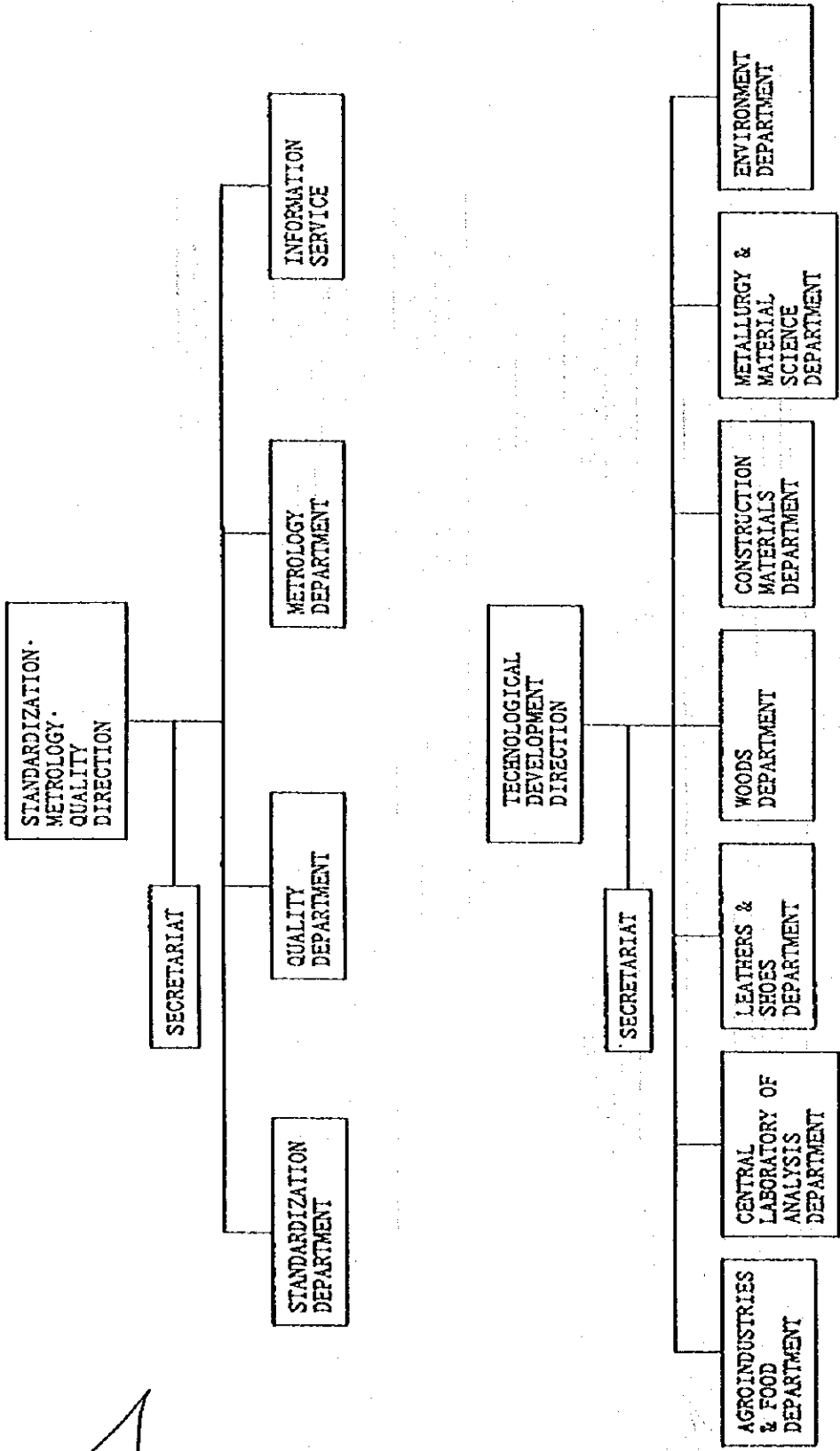
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ORGANIZATION CHART OF INTN

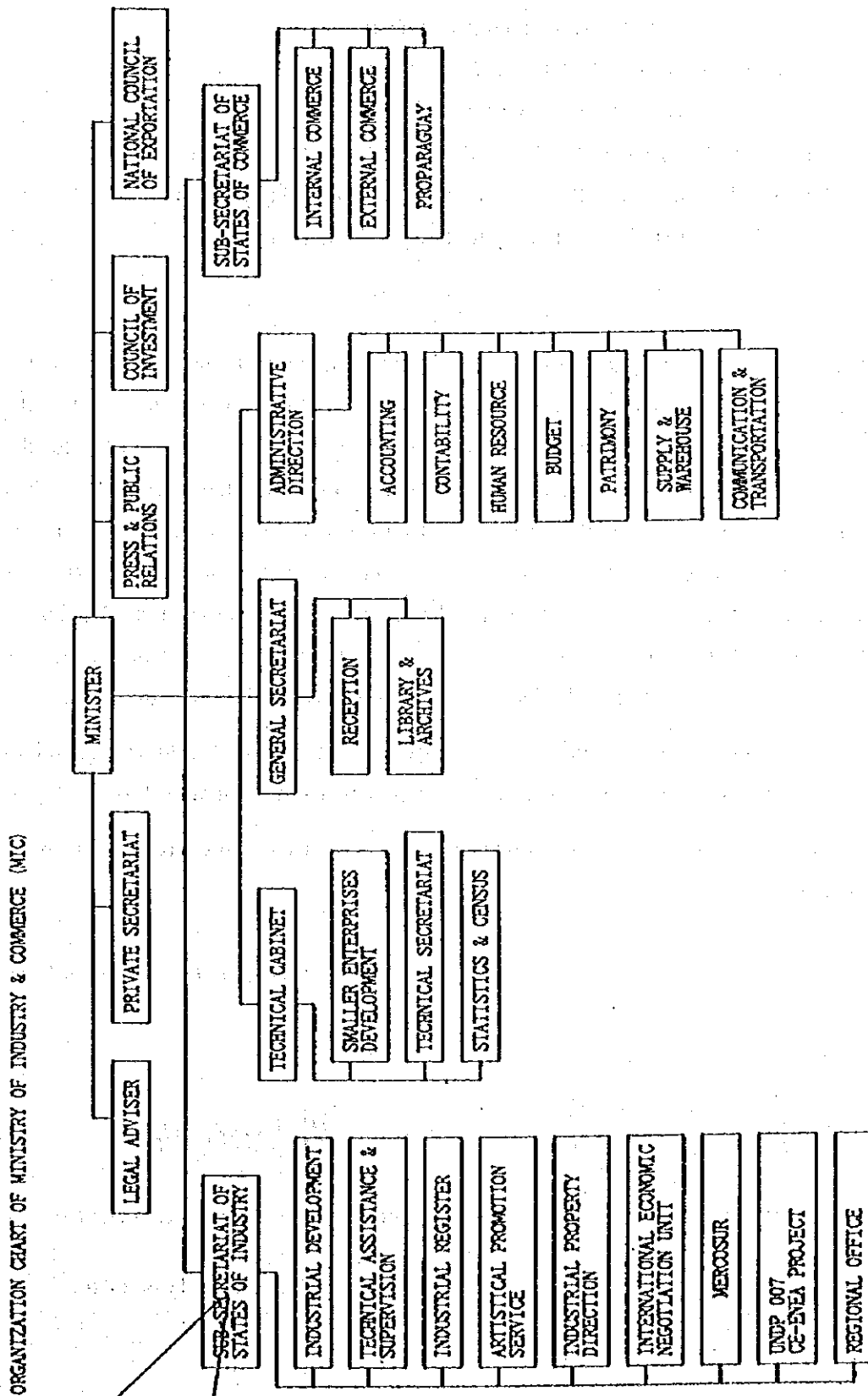




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Organization Chart of Ministry of Industry and Commerce (MIC)



MINUTES OF DISCUSSIONS  
 BETWEEN THE JAPANESE EVALUATION TEAM AND  
 THE AUTHORITIES CONCERNED  
 OF THE GOVERNMENT OF THE REPUBLIC OF PARAGUAY  
 ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT  
 ON QUALITY CONTROL FOR TEXTILE INDUSTRY

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), and headed by Mr. Masayoshi Juro, visited the Republic of Paraguay from November 19 to December 6, 1996 for the purpose of evaluating jointly with the Paraguayan Evaluation Team (hereinafter referred to as "the Paraguayan Team") the achievement of the Project on Quality Control for Textile Industry in the Republic of Paraguay (hereinafter referred to as "the Project") on the basis of the Record of Discussions signed on February 28, 1992 (hereinafter referred to as "the R/D"). During its stay in the Republic of Paraguay, both the teams had a series of discussions and exchanged views over the matters for the progress and achievements of the Project and formulated the Joint Evaluation Report on the Project.

After the joint evaluation of the Project, the Japanese Team discussed with the authorities concerned of the Republic of Paraguay over the matters for successful termination of the Project.

As a result of the discussions, both sides mutually agreed upon the matters referred to in the document attached hereto.

Asuncion, December 6, 1996



MR. MASAYOSHI JURO  
 Leader,  
 Japanese Evaluation Team  
 Japan International Cooperation Agency  
 (JICA)  
 Japan



DR. UBALDO SCAVONE YODICE  
 Minister,  
 Ministry of Industry and Commerce  
 Republic of Paraguay

## THE ATTACHED DOCUMENT

### 1. Recognition of the Joint Evaluation Report by the Joint Committee

The Joint Committee recognized the Joint Evaluation Report submitted by both Evaluation Teams.

### 2. Further Input to the Project until February 27, 1997

The both side confirmed that the present activities shall be continued until the termination of the project period. In addition, they agreed on that further input to the Project as mentioned below is necessary to complete the Project;

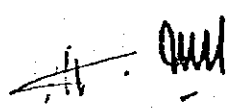
#### (1) The Japanese Side

To provide a Hairiness tester and to dispatch a short term expert for installation

#### (2) The Paraguayan Side

To provide necessary services in relation to the above

### 3. Participants in the discussion are as shown in Appendix.



Appendix

LIST OF PARTICIPANTS

1. Japanese Side

(1) The Japanese Evaluation Team

- |                       |  |
|-----------------------|--|
| Mr. Masayoshi Juro    | - Leader                                     |
| Mr. Tetsuyuki Gennai  | - Industrial Standards and Inspection System |
| Mr. Nobuhiro Tsutsumi | - Testing and Inspection                     |
| Mr. Koji Ichikawa     | - Cotton Spinning Technology                 |
| Mr. Masaki Miyaoka    | - Evaluation Management                      |
| Mr. Wataru Takada     | - Data Analysis and Evaluation               |

(2) Japanese Experts

- |                      |  |
|----------------------|--|
| Mr. Yasushi Watanabe | - Chief Advisor                                      |
| Mr. Nobuo Takahashi  | - Testing and Inspection                             |
| Mr. Takashi Maeshima | - Cotton Spinning Technology                         |
| Mr. Naokiyo Mizuno   | - Textile Industrial Standards and Inspection System |
| Ms. Yoko Akimoto     | - Coordinator  |

(3) JICA Paraguay Office

- |                     |   |
|---------------------|---|
| Mr. Koji Tomizu     | - Resident Representative                     |
| Mr. Takahiko Kasama | - Assistant of Deputy Resident Representative |
| Ms. Takako Koizumi  | - Officer in Charge of Technical Cooperation  |

(4) Japanese Embassy in Paraguay

- |                       |  |
|-----------------------|--|
| Mr. Hidchiko Hagiwara | - Second Secretary, Technical Cooperation Department |
|-----------------------|--|

AA. *Chuy*



## 2. Paraguayan Side

### (1) The Paraguayan Evaluation Team

Dr. Carlos Martínez	- Ministry of Industry and Commerce
Lic. Osvaldo Martínez	- Technical Planification Secretariat
Dr. Hugo González	- Asuncion National University
Dr. Milciades Artecona	- FEPRINCO
Lic. Pablo Rodríguez	- Institute of National Technology and Normalization
Dr. César Servín	- Ministry of Industry and Commerce

### (2) INTN

Dr. Juan Francisco Facetti	- General Director
Dra. Margarita Wood de Fretes	- Administrative and Financial Director,
Dr. Andrés Vasquez	- Technical Director
T. N. Delfina de Franco	- Responsible of Laboratory Area, Counterpart
Ing. Nancy Vega	- Counterpart
Dra. Midori Mitsui	- Counterpart
Ing. Luis F. Ruiz Diaz	- Counterpart
Lic. Mario Leiva	- Counterpart
Lic. María E. Cardona	- Counterpart
Ing. Susana Cabrera	- Counterpart
Ing. Norberto Zaracho	- Responsible of Pilot Plant Area, Counterpart
Ing. Shigeru Yano	- Counterpart
Sr. Guido Betti	- Counterpart
Sr. Ricardo Ramírez	- Counterpart
Sr. Ever Cabrera	- Counterpart
Sr. Euclides Franco	- Counterpart
Sr. Carlos Sena	- Counterpart
Sr. Silvio Zarza	- Counterpart
Dr. Eduardo González	- Responsible of Normalization Area, Counterpart
Ing. Daniel Riquelme	- Counterpart
A. I. Carlos Taboada	- Counterpart

3 終了時プロジェクト・デザイン・マトリックス (PDM)

プロジェクト・デザイン・マトリックス (PDM)

パラグアイ繊維産業品質管理計画事業

プロジェクトの要約	指標	実績	外貨条件										
<p>プロジェクトの要約</p> <p>＜スーパーゴール＞</p> <p>パロの繊維産業が発展し、輸出が増加する</p> <p>＜上位目標＞</p> <p>民間企業における綿糸および繊維物製品の品質が向上する</p> <p>＜プロジェクトの目的＞</p> <p>INTN による綿糸および繊維物に関するサービス(試験・検査、技術指導等)が向上する</p>	<p>指標</p> <p>・綿製品の輸出量(トン)</p> <p>・パロの綿製品が日本の綿製品輸出成長基準に合致する度合い</p> <p>・INTN の活動状況</p>	<p>実績</p> <p>・輸出増加を示す統計なし。評価には時間早尚</p> <p>・日本の輸出検査適合商品のゲークなし。評価には時間早尚</p> <p>・企業アンケートによる評価良好 (8社)</p> <table border="1"> <tr> <td>優</td> <td>良</td> <td>普通</td> <td>可</td> <td>不可</td> </tr> <tr> <td>0</td> <td>5</td> <td>3</td> <td>1</td> <td>0</td> </tr> </table>	優	良	普通	可	不可	0	5	3	1	0	<p>外貨条件</p> <p>・パロの綿産業に係る政策に変更がない</p> <p>・INTN で作成した規格が、輸出検査制度等の中で活用される</p> <p>・C/P が難職しない</p> <p>・繊維業界に良質の綿製品を生産する意欲と、それに対応する工場施設がある</p> <p>・繊維業界に規格、および輸出検査制度に対応できる技術者が乏しい</p> <p>・C/P が難職しない</p>
優	良	普通	可	不可									
0	5	3	1	0									
<p>＜成果＞</p> <p>1. C/P が綿糸の製造技術を習得する</p> <p>2. 必要な機材が整備される</p> <p>3. 綿糸、繊維物に関する試験・検査技術が向上する</p> <p>4. 綿糸に関する技術指導の基盤が確立する</p> <p>5. INTN において規格の作成・普及が行える体制が確立する</p> <p>6. INTN が輸出検査制度の技術規格に関する助言ができる。</p> <p>7. 繊維業界に品質管理技術が普及される</p>	<p>1992 1993 1994 1995 1996 合計</p> <p>1. C/P への技術移転達成度</p> <p>2. 機材の整備状況</p> <p>3. 試験・検査の実績</p> <p>4-1. 製造マニュアルの整備状況</p> <p>4-2. 技術指導に関するマニュアル、チェックリスト等の整備状況</p> <p>5. 規格改定8件承認、新規規格8件公告中</p> <p>6. 輸出検査制度(案)策定</p> <p>7. セミナー3回開催、機関紙発行3回、工場指導5回(延べ32社)、研修生受入、大学5名、SNPP14名 企業2名 工業高校2名 他</p>	<p>＜収入＞</p> <p>日本側</p> <p>長期専門家 3 5 5 5 5</p> <p>短期専門家 10 6 6 6 6 24</p> <p>研修員受入 4 3 3 3 3 16</p> <p>機材供与 (百万円)</p> <p>繊維製品の試験検査機材、糸紡織パイロットプラント用機材、その他</p> <p>建物(事務所、パイロットプラント、試験室) 家具、用品、資材</p> <p>977千ペー/ (百万グアタニ)</p> <p>3 12 20 20 18</p> <p>1 3 3 3 3</p> <p>20 111 317 515 616 1,579</p>	<p>・C/P が難職しない</p> <p>・施設内の作業環境が整っている</p> <p>・プロジェクト運営に必要な予算が継続的に充当される</p> <p>・ローカルコストが適切に支出される</p> <p>＜前提条件＞</p> <p>・プロジェクト開始までに建物の準備が整う</p> <p>・C/P が計画通りに配置される</p>										

#### 4 原綿、綿糸および綿織物の検査制度の概要

綿はパラグアイ経済の主要製品のひとつであり、総輸出額の約30%が原綿の輸出によるものである。

したがって、同原料の国内加工度をあげることによって付加価値を高めることができれば、よりいっそうの外貨収入を獲得することが可能となろう。

当然のことながら、この意味するところは、欧州のような競争市場に単に製品を売るのみならず、高価格で売ることができなくてはならないということである。これをわれわれの目的とするならば、今日の新しい北の国々と称される新興企業市場をにらんだ、質の高い製品の生産にプライオリティーを置く努力をする必要がある。

しかし、高品質の生産とは何を意味するのであろうか。品質と生産性の基礎は規格化である。品質の高い生産を行うには規格化による生産が必要である。すなわち、手順、検査、連関性などの規格化である。加えて、生産した製品が規格を満たしているかどうかを効率的に確認しなくてはならない。その作業は通常、検査制度と呼ばれる検査プログラムに準じて行われる。つまり、われわれが実行すべきことは規格を取り入れ、製品を検査することである。

以下は、わが国繊維業界が原料や製品を国際市場において高価格で販売するという最終目標のための、原綿、綿糸、綿織物のロット検査制度を簡単に説明したものである。

この検査制度は、国産の原綿、綿糸、綿織物の全ロットの検査を含む。サンプリングと試験方法、検査すべき技術特性の選択、適用可能な品質基準、各ロットの総合的評価は、各原料および製品に応じて、明確に決定される。

検査制度の目的のひとつが輸出振興にあることを勘案し、現在提案されている制度には輸出可能製品、すなわちこの場合は繊維製品の検査が含まれている。

検査制度の詳細は、対象となる製品により異なるが、通常、以下の内容から構成される。

- 1 品質に応じた原料と繊維製品の種類別格づけ
- 2 前項の格づけを実施するための適用可能な総合的評価と品質基準の量的決定
- 3 サンプリング方法、検査項目の技術特性試験方法の決定

原料と繊維製品の品質に応じた格づけで以下のことが可能となる。

- ・あらゆる原料と繊維製品の品質レベルをあらゆる時点で(即座に知り)計量的(量的データにより)に把握することにより、データを基礎とした状況を的確に管理することができる。また、政府は繊維部門の効果的な産業開発政策を打ち出すことができる。

- ・当該部門（操綿、紡績、織布）のそれぞれの企業が自社製品の品質水準を知り、問題を見つけ出し、品質改良に必要な解決策を講じることができる。
- ・品質改善をめざす企業が、そのために必要な確実な目標を定めることができ、また、現在の製品品質のすぐ上の到達可能なレベルの目標を設定することで十分であり、改善の進捗度を容易に知ることができる。
- ・当該部門内で高い品質の生産を行う企業は、格づけによって高価格で自社製品を販売することができる。

#### 【原綿】

原綿の検査制度のは1985年4月1日発令の農牧省令9165により、「綿の取引基準、品質と価格監視、計量管理、売買方法」が明確に規定されている。

原綿の検査制度の適用は、増大しつつある国際的需要と、要求される品質を満足させるためにきわめて重要である。

しかしながら、検査制度をより完全なものにするためには、原綿の技術特性を決定する必要がある。計測が必要な特性は以下のとおりである。

- (1) 織度
- (2) 繊維長と均斉度
- (3) 引張強度
- (4) 色
- (5) 不純物

これらの特性検査にはHVI (high volume instrument)を使用しなければならない。生産全ロットのすべての俵の検査をめざすのであれば、ひとつひとつの検査を迅速に行う必要があるため、適切に設計されたHVIの使用は当然の処置と考えられる。

監査機関は引き続き綿タバコ監査事務所(OFA T)であり、HVI検査は、INTN/JICAプロジェクトで実行することが可能であろう。

#### 【綿糸】

綿糸の検査は、パラグアイの現状に応じて若干の変更を行ってはいるが、大筋において日本の繊維製品輸出用検査方法と一致している。

原料と繊維製品の検査方法は、パラグアイ産の綿100%の糸の全ロット検査を規定するものである。

原則的には当該プロジェクトが検査を担当する。しかしながら、将来的に検査を実施していく他の機関（政府機関もしくは民間機関）を視野に入れるべきである。なぜなら当該

プロジェクトは（サンプリングと検査による）品質基準の見直しや、他の地域の機関との共同作業、政府への助言（例：Proparaguay）、応用研究など、その重要な業務を抱えているからである。

計測すべき綿糸の特性と数値は以下のとおりである。

- (1) 綿糸の外観
- (2) 質量開差率
- (3) 番手変動率（CV）
- (4) 番手開差率
- (5) 平均協力上昇率
- (6) 最低協力上昇率
- (7) 協力変動率（CV）
- (8) U%開差率
- (9) 残存欠点

サンプルは、各ロットからランダムに5個採取する。

綿糸は品質に応じて以下のように分類される。

1級：第1級の品質を持つ糸。国際的品質であり、いかなる市場にも何ら制限なく輸出可能である。

2級：第2級の品質であるが、国産原系のなかでは上級の品質である。

3級：第3級の品質であり、国産原系のなかでは中級の品質である。

4級：第4級の品質であり、国産原系のなかでは下級の品質である。

それぞれのロットは、品質基準と呼ばれ、検査対象の各特性ごとに明確に設定された一定の範囲、または、上下限値を満足するかどうかによって等級が定められる。

#### 【綿織物】

綿織物の検査は、パラグアイの現状に応じて若干の変更を行っているが、大筋において日本の繊維製品輸出用検査方法と一致している。

原料と繊維製品の検査方法はパラグアイ産の綿100%の織物の全ロット検査を規定している。

原則的には当該プロジェクトが検査を担当する。しかしながら、将来的に検査を実施していく他の機関（政府機関または民間機関）を視野に入れるべきである。なぜなら当該プロジェクトは（サンプリングと検査による）品質基準の見直しや、他の地域の機関との共同作業、政府への助言（例：Proparaguay）、応用研究などの重要な業務を抱えているからである。

計測すべき綿織物の特性と数値は以下のとおりである。

- (1) 織物の外観（目視および欠陥の点検）
- (2) 洗濯に対する染色堅牢度（染色織物のみ）
- (3) 汗に対する染色堅牢度（染色織物のみ）
- (4) 摩擦に対する染色堅牢度（染色織物のみ）

サンプリング方法は、検査対象特性により異なる。

- ・外観（欠点）は全生産ロットについて全反検査する
- ・その他の検査項目については、各ロットごとにサンプルをひとつ採取する。

綿織物は品質に応じて3つの異なった級、1級、2級、3級に区分され、各級ともに規定されている。それぞれのロットは品質基準と呼ばれ、検査対象の各特性ごとに明確に設定された一定の範囲、または、上下限値を満足するかどうかによって等級が定められる。









JICA