別添資料

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要請書(写)

PC-I

UP GRADATION OF PTC KARACHI

April 2002

Plastics Technology Center (PTC)
Korangi - Karachi.

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EXECUTIVE SUMMARY

1. This project is a part of the proposal prepared by Pakistan-Japan Business Forum (PJBF) based on the study conducted by PJBF in close consultation with industrial groups concerned and related government agencies and public institutions. The philosophy behind the PJBF proposal is that the real "human development" can only be achieved by "human resource development". In other words, instead of giving "fish" to a man, teaching him "how to fish" enables and empowers him for the rest of his life not only to cater for his own family but also become a contributing member of the society, then the exponential alleviation in poverty is achieved. The proposal is aiming at transferring the technological know how, skills and experiences from Japan to Pakistan effectively and efficiently by adopting an entirely new and unique style to provide technical assistance and grant in shape of necessary machinery/plant/equipment simultaneously from the Government of Japan, bearing in mind the assurance of equality, fairness and transparency of the scheme and maximum wide-spread benefit.

2. As plastic products are the most common, popular, versatile, convenient, durable and indispensable material for the people's life, the plastic processing industry of Pakistan has great potentialities for the rapid expansion of its sales not only in domestic market but also the regional market including Afghanistan. However, the consumption of plastic products in Pakistan is quite underdeveloped due to the unawareness of their advantage and versatility by the people as the poor quality products are sweeping over the domestic market. The plastic industry is still regarded as an infant and immature industry, which is restricted by the shortage of skilled workers, lack of appropriate training facilities for workers and no locally manufactured equipments for plastic processing, hence there are very few quality plastic processors.

3. The plastic products cover various kinds of items including tableware, food packages and toys for infants; so poor quality products can endanger the health of people. In particular, Pakistan is one of a few and very unfortunate countries which mainly use Asbestos pipes for water supply and drainage, although the rest of world has already almost replaced them to plastics pipes, and plastic pipes are easier to handle/install and much more cost effective than Asbestos and other conventional pipes. Therefore, from the viewpoint of the health of people, it is urgent to improve the quality of plastic products made in Pakistan.

4. As a material industry, improving the quality of plastic products will benefit every fields of the industry, from Agriculture to Electronics, Automobile and IT industry. At the same time, its improvement will remind the people of the advantages of plastic products and boost its consumption, resulting in upgrading our living standard. In particular, if plastic products become commonplace in irrigation systems, water would be greatly saved and farmers would be released from annoyance of its shortage.

5. Recognizing the importance and urgency to train skilled workers and improve the quality of locally produced plastic products; this project will upgrade the training function of Plastic Technology Centre (PTC) particularly for Pipe and Housing Material Manufacturing.

6. As a result of the implementation of the project, transferred technological know how and qualified skilled workmen trained in PTC will enable small and medium enterprises to produce

high quality plastic products as well as improve their productivity, resulting in expanding their sales both in domestic and regional market. The industry will proceed into a new dynamic phase as one of primary industrial sectors in Pakistan in the near future. On the other hand, since almost all plastic processors are small and medium enterprises, this project will contribute to their capacity building, leading to better employment opportunities and directly helping in poverty alleviation.

7. As stated in "Interim Poverty Reduction Strategy Paper (I-PRSP)" of Government of Pakistan published in November 2001, "For growth to reduce poverty, it must emanate from sectors that have greater employment generation capability. Therefore, poverty reduction in Pakistan requires rapid growth in agriculture, small and medium industry and the IT sectors, all of which have strong potential to create jobs and associated self-employment opportunities." This project adopts the same principle and approach toward poverty reduction.

8. As already explained above, this project will provide PTC with technical assistance and grant in shape of necessary machinery/plant/equipment. Regarding the cost of this project, foreign exchange component covering machinery/plant/equipment will be
except technical assistance that is tentatively estimated to cost approximately million (PAK) for the first phase and will be financed separately by the Government of Japan, while local component occurred for this project will be deminimis and met within the annual budget of PTC.

9. Finally, it must be recognized that this project is in line with the basic policy of the Government of Pakistan and its implementation will materialize the public commitment of the President Gen. Pervez Musharraf. Taking into account the higher maturity and feasibility of this project, both Government of Pakistan and Government of Japan are requested to accelerate their internal procedures toward its implementation as a top prioritized project.

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: B: 1 6252

Code Number of Project
(To be filled by Planning Division)

PART " A"

PROJECT DIGEST

1. Name of Project — Up gradation of training function of Plastic Technology Centre, Karachi (Proposed by the Pakistan-Japan Business Forum "PJBF")

2. Authorities responsible for:

i. Sponsoring — Government of Pakistan
Government of Japan (Grant and Technical Assistance)

ii. Execution — Plastic Technology Centre (PTC) Karachi.

iii. Operation, maintenance — PTC under supervision of Managing Board established under the PJBF proposal attached as the Annex1.

3. Time required for completion of Project in months

24 month (Expected commencement in autumn of 2002) as the first phase, if necessary, to be extended and/or upgraded for the second phase

4. (a) Plan Provision:

i. If the Project is included in the current Five Year Plan, specify actual allocation.

This Project meets the objectives of "Ten Year Perspective Development Plan 2001-11 and Three Year Development Program 2001-2004" prepared by Planning Commission, Government of Pakistan on September 1, 2001 as well as "Interim Poverty Reduction Strategy Paper (I-PRSP)" of the Government of Pakistan published in November 2001 through the capacity building of Small and Medium Enterprises (SME's) and Human Resource Development, leading to Poverty Reduction by vast job creation and income enhancement.

However, due to the newly proposed project as described in the Executive Summary, it has not been allocated any budget by the Government of Pakistan but will be entirely financed by the Government of Japan and will not also cause any kind of new expenditures at PTC. The proposal of this project was highly appreciated by the President of Pakistan, Gen. Pervez Musharraf and supported by the Prime Minister of Japan, Mr. Junichiro Koizumi.

ii. If not included in the current plan, how is it now proposed to be accommodated (Inter-Sectoral adjustments in allocation or other resources may be indicated).

A: Foreign Exchange Component

As answered in the preceding question and mentioned in the Executive Summary, th Government of Japan will finance this project to provide PTC with technical assistance an grant in shape of necessary machinery/plant/equipment, as follows.

A-1: Grant

Machinery/Plant/Equipment (M&E) necessary for the up gradation of PTC as described i Annex 2 to be provided as grant with delivery and installation at PTC, three yea maintenance and supply of consumable items, in addition operational and maintenanc experts for the M&E to be dispatched periodically by the M&E supplier to assure th smooth operation of M&E.

A-2: Technical Assistance

Commencement Period by end of March 2003

- Short-term senior expert to be dispatched to prepare operational master plan for th training and technical support to the industry including methodology and targete periodical progress.

Operational Period for 24 months from April 2003

- Long-term senior expert to be dispatched as a advisor to the General Manager, PTC look after all operational aspects originated by training on metal processing includi supervising daily works, preparing requisition of other short term senior experts wi necessary specialized skill, maintenance of equipments, scheduling training progran including curriculums and giving guidance to other Pakistani instructors.

(NB) Apart from the abovementioned senior experts for short terms and long term separate operational and maintenance experts will be dispatched from supplier Machinery/Plant/Equipment (M&E) as a part of the contract/tender.

B: Local Component

An amount of approximately ı will be required in local component and will be arranged by Government of Pakistan. Affordable under PTC annual budget

iii. If the Project is proposed to be financed out of block provision for a programme indicat

Not applicable

(b) If Project is not in the Plan, what warrants its inclusion in the Plan

As mentioned in the Executive Summary, this project adopts the same principle and approac toward poverty reduction as I-PRSP and meets the objectives of "Ten Year Perspective Development Plan 2001-11 and Three Year Development Programme 2001-2004" prepared Planning Commission, Government of Pakistan on September 1, 2001.

Beside the above facts, this project has many reasonable warrants for its inclusion in the Development Plan as follows.

- The plastic products cover various kinds of items including tableware, food packages and toys for infant, so that poor quality products can endanger the health of people. In particular, Pakistan is one of a few and very unfortunate countries which mainly use Asbestos pipes for water supply and drainage, although the rest of world has already almost replaced them to plastics (PVC) pipes, and plastic (PVC) pipes are easier to handle/install and much more cost effective than Asbestos and other conventional pipes.

- Since almost all plastic processors are small and medium enterprises, this project will contribute to their capacity building, leading to better employment opportunities and directly helping in poverty alleviation.

- Acute shortage of qualified, skilled and trained power in Plastic Industries in the country is adversely affecting the production quality & volume in this specific field. The Government of Pakistan is according special emphasis to Higher Education especially in Science & Technology Sector.

5. ***Objectives and Justification of the Project preferably in quantitative terms.***

The project will ensure to meet the shortages of qualified, skilled & trained workers at the level of engineers, technologists, and technicians to operate plastic processing machines, which are functionally advancing day by day due to rapid technological progress.

The Project is of vital importance for the engineering sector of the country in particular small and medium industry and is conceived as the necessary infrastructure requirement of this sector. For this purpose, it is imperative and very timely to upgrade the facilities at and activities of PTC including training of the industrial personnel, provision of Advisory Services and Technology back up Support to the industry and facilitation of industry through research & development, designing and manufacturing of Production Tooling Equipment, and provision of common facilities, leading to strengthening the efforts of the government..

A: Objective of the projects

- To provide technological back-up support to the industries, particularly small and medium enterprises in Production Tooling Equipment
- To disseminate the latest technological know how and advanced technology to the industry
- To provide training to the engineers, managers, supervisors, technicians and workers to improve their capabilities and skills for better performance
- To organize Training Courses, Workshops and Seminars in collaboration with other institutions to strengthen the Network between National/International Institutions
- To organize Educational and Awareness Program for boosting up Quality, Productivity and Management
- To extend Advisory/Consultancy Services to the industries/organizations in techno-managerial fields

- To provide common facilities to Industry on charge basis, PVC pipes, and housing materials manufacturing etc that are expensive to set up as each individual industry
- To research, develop and introduce new plastic applications, which currently does not exist in Pakistan.

In addition, the objectives of the Center have also been re-defined, so that the reactive role is transformed into a pro-active role of a center, in this role, it will function more effectively and contribute towards the acceleration of the process of Industrialization.

B: Training Plans

The followings are the training plans for the project being pursued by PTC.

- Academic Courses (not covered under this project)
  a. Bachelor of Engineering (Polymer Engineering)
  b. BTEC National Diploma in Science (Polymer Technology)

- Basic Plastics Technology Course
  i. Plastics Processing – Appreciation
  ii. Plastics Materials - Appreciation
  iii. Plastics Materials – Handling & Preparation
  iv. Plastics Materials – Compounding
  v. Plastics Materials – Recycling
  vi. Injection Molding – Appreciation
  vii. Injection Molding – Condition Setting
  viii. Injection Molding – Trouble Shooting
  ix. Injection Molding – Mould Setting
  x. Injection Molding – Mould Design
  xi. Extrusion Technology
  xii. Blow Molding – Appreciation
  xiii. Extrusion Blow Molding – Condition Setting
  xiv. Blown Film Extrusion
  xv. Compression Molding
  xvi. Thermoforming technology
  xvii. Glass Reinforced Plastics (GRP) Hand lay-up
  xviii. Screen Printing and Decoration of Plastics
  xix. Quality Control in Plastics
  xx. Testing of Plastics
  xxi. Plastics Product Deign
  xxii. Plasticulture
  xxiii. Customized Training Programs
  xxiv. Computer Literacy Program.

(NB) Each course has 20 to 30 students and repeats 5 to 10 times per year.

6. ***Relationships of the projects with the objectives of the Sector. Indicate names of other projects (Whether sanctioned or under preparation), which would form part of an integrated programme within the sector:***

As plastic products are the most common, popular, versatile, convenient, durable and indispensable material for the people's life, the plastic processing industry of Pakistan has great potentialities for the rapid expansion of its sales not only in domestic market but also the regional market including Afghanistan. However, it is still regarded as an infant and immature industry, which is restricted by the shortage of skilled workers, lack of appropriate training facilities for workers and no locally manufactured equipments for plastic processing; hence there are very few quality plastic processors.

Pakistan has reached that stage of economic development where-in production of capital and intermediary goods can be undertaken. Pakistan already has developed many engineering projects besides hundreds of small units. There is now a very strong base for further development of capital goods producing industries. It is, therefore, imperative that the technical know how & the proposed training strategy for Engineering and Manufacturing Industries be planned, developed and put into action.

In view of the Government's future vision for economic development and self reliance, it is expected that the requirements of Training, Advisory and Technological support to the industries will increase to a great extent particularly in terms of the services for small and medium enterprises while the existing facilities at PTC are currently insufficient to fulfill even the present needs.

The proposed up gradation will not only develop the Human Resources but will also prove to be a successful venture for imports substitution, poverty alleviation, job creation and a strong foundation for future Industrialization and enhanced competitiveness for exports.

It is also important to note that there is no other institution/organization but PTC, which is addressing these vital issues of the industrial sector in letter and spirit in the field of plastic processing. The benefits of the proposed modernization and up gradation of PTC shall therefore be multi dimensional and several fold through need-based Human Resource Development, Industry-demanded Advisory Services and the Manufacturing sector-required Technological Backup Support. The Expertise and Services available due to the proposed project at PTC shall be shared by the industry as a whole without any preference and its effect shall be catalytic and facilitative in technological development of industry of the country.

As a result of the implementation of the project, transferred technological know how and qualified skilled workmen trained in PTC will enable small and medium enterprises to produce high quality plastic products and expand their sales both in domestic and regional market. The industry will proceed into a new dynamic phase as one of primary industrial sectors in Pakistan in the near future.

7. ***Capital cost of Project: Stating the foreign exchange component at actual and projected conversion rates.***

Capital Cost			
1.	Land and Building	Nil	LC

2.	Machinery/Plant/Equipment (Details described in the Annex 2) i. Plastic Pipes Manufacturing ii. Plastic Compounding v. Miscellaneous	US$ (PAK Rs.) Foreign Exchange	FC
3.	Installation Machinery & Equipment	Covered in the cost in column 2 above	FC
4.	Office Furniture, Cabinets and other Items	Nil	LC
5.	Cartage	Nil	LC
Operational Cost			
6.	Training and Development of Staff	Existing Staffs	LC
7.	Dispatch Senior Expert during phase 1 (One long term and four short term)	US$ (PAK Rs.)	FC TA
8.	Utilities	Deminimis (affordable under PTC own resources)	LC
9.	Maintenance including Standard parts & Spare parts etc ((Details described in the Annex 2)	Covered in the cost in column 2 above	FC G
10.	Commutation & Pension etc.	N.A	LC
11.	P.O.L, Telephone etc.	Deminimis (affordable under PTC own resources)	LC
Total:	**FC: Grant: US$ (PAK Rs.)** **TA: US$ (PAK Rs.)**		
	LC: Deminimis (affordable under PTC annual budget)		

(NB) FC: Foreign Exchange Component, G: Grant, TA: Technical Assistance
LC: Local Component

8. ***Sources of local and foreign Financing:***

i. ***Local Financing:*** Affordable under PTC annual budget
ii. ***Foreign Financing:*** Government of Japan

9. ***Annual Output, (quantitative term), operating expenditure, cost of production, cost per unit, initially and on full operation.***

i. ***Capacity Utilization*** 100% from the initial stage (Except Technical Assistance)

ii. ***Quantity Produced*** Approx.2500 Trained skilled workers produced annually

iii. ***Cost***	***Fixed***	***Variable***	***Total***
a. ***Local***	Nil	Deminimis	Deminimis
b. ***FEC***	G: US$	TA: US$	US$
c. ***Total***	G: US$	TA: US$	US$
	(Rs.	(Rs.	(Rs.)

iv. Cost per Unit. NA

10. Previous Approvals/Anticipatory Approval or Concept Clearance if any:

The proposal of this project was prepared in response to the requests to Minister of Economy, Trade and Industry, Government of Japan, Mr. Takeo Hiranuma made by Minister of Finance, Government of Pakistan, Mr. Shaukat Aziz on the capacity building of small and medium enterprises.
At the Pakistan-Japan top-level summit on March 14, 2002, the President of Pakistan, Gen. Pervez Musharraf expressed his appreciation for the PJBF proposal including this project and requested assistance from Government of Japan, and the Prime Minister of Japan, Mr. Junichiro Koizumi committed to support it. In the following meeting, Minister of Commerce, Industries and Production, Government of Pakistan, Mr. Abdul Razzak Dawood requested assistance particularly on this project as one of the prioritized projects to Minister of Economy, Trade and Industry, Mr. Takeo Hiranuma and he accepted the request.
Minister of Finance, Mr. Shaukat Aziz has pledged to allocate at least US$ to the projects under PJBF proposal from the Japanese grant.

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Checked by — **Ahsan Siddiqi**
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Approved by — **Dr. Akram Sheikh**
Secretary of Industries
Ministry of Industries and Production

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B: 1 6252

PART "B"

PROJECT'S DESCRIPTION AND FINANCING

11. Location of project

Present Location: Korangi Industrial Area, Karachi.

12. Market Analysis

a) Description of Products / Services.

The following services shall be extended to the Industries, particularly SME's:

i. Training

Training of the Plastic Industrial personnel, Engineers, Managers, Supervisors, Technicians and Workers, particularly from SME's

ii. Advisory Services

Advisory Services for Improvement of Products, Processes, Quality and Productivity of the Plastic Industrial sector shall be provided particularly to SME's

iii. Technological Backup Support Services.

Technological Backup Support Services shall be provided to Plastic Industry, particularly SME's, in Research, Designing, Development and Manufacturing of variety of Products specially automotive plastic parts and components and large diameter of PVC pipes.

b) Local and World wide Demand/Supply for last five years (Indicate Sources)

Serious shortage of qualified and skilled workers for plastic processing industry has been observed in this country (General Observation)

c) Projected demand, supply and price over the life of the project (Indicate source and assumptions)

Demand for qualified and skilled workers is expected to surge in the near future (General Assumption)

d) Projected Demand/Supply gap over the life of the Project

Although this project will boost the supply of skilled workmen, demand will continue to exceed the supply over the life of the project, since rapid increase of the demand is also predicted in the near future.

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e) ***Projected international demand and supply situation (if imports are not banned and some part of production is intended for exports)***

Demand of skilled workmen is increasing and supply continues to be insufficient in international market.

f) ***Market survey and analysis of the product(s) of all the existing and potential users.***

There exists a very high demand for the services expected to be delivered by establishment of the up gradation of PTC in Training, Advisory and Technological Backup Support Services

g) ***Give details of existing and proposed marketing arrangements/channels***

Marketing of the Services shall be done through strengthening relationship with Educational & Research Institutions, Industrial Associations, and by visiting small and medium enterprises by Marketing Personnel of the Centre

13. ***Description and justification of Project (enclose Feasibility Study)***

a. As plastic products are the most common, popular, versatile, convenient, durable and indispensable material for the people's life, the plastic processing industry of Pakistan has great potentialities for the rapid expansion of its sales not only in domestic market but also the regional market including Afghanistan. However, it is still regarded as an infant and immature industry, which is restricted by the shortage of skilled workers, lack of appropriate training facilities for workers and no locally manufactured equipments for plastic processing, hence there are very few quality plastic processors. As a result of the implementation of the project, transferred technological know how and qualified skilled workmen trained in PTC will enable small and medium enterprises to produce high quality plastic products and expand their sales both in domestic and regional market. The industry will proceed into a new dynamic phase as one of primary industrial sectors in Pakistan in the near future.

b. The proposed Project will prove to be an essential infrastructure for improving performance of the industrial sector, leading to Human Resource Development in Techno-Managerial fields, Import Substitution specially for automotive plastic parts and components and large diameter PVC pipes etc. and making the country self reliant in Designing and Manufacturing of variety of products specially plastic automotive parts and components.

c. The complete description of Machines/Plant/Equipment Required for the Project is given at Annex 2 that is all imported ones. The origin of imported machines / equipment will depend on the donor country. In fact, the proposed Centre will be a unique facility for the industries and will act as catalyst and facilitator to boost their Production, Productivity and Quality.

14. ***Environmental Effects:***

Entirely environment friendly project

15. *Describe R&D and Quality Control Facilities to be generated.*

As already described, the proposed Centre will focus on three major areas, viz.; Training, Advisory and Technological Backup Support Services. For providing Technological Backup Support to the Industries particularly to SME's, the existing practices and problems must be taken into consideration. Most of the Small & Medium Enterprises (SME's) usually intend to develop the Products & Processes following the concept of Reverse Engineering in which the Research, Designing and Development are started from the available/imported Products/ Samples. To carry out these activities the Design Division and Inspection & Quality Control Division of the proposed Centre are well-equipped, therefore, Training, Advisory and Technological Backup Support Services will be strengthened by Research & Development in the down stream and with the Inspection, Testing, Quality Control and Quality Assurance, Techniques, Systems and Procedures on the up stream to ensure High Quality / Productivity of the Products / Services Extended.

16. *Give date when capital cost estimates were prepared, if prepared more than one year confirm if these are still valid.*

April 2002

17. *Give breakdown of capital cost covering the whole of investment period as indicated below (give annual phasing over the life of the project both local as well as foreign exchange component and item wise details of capital cost).*

a) *Production facilities.*
Please see Annex 2

b) *Ancillary facilities.*
Please see Annex 2

c) *Services and welfare facilities.*
Please see Annex 2 for maintenance service, others are not applicable.

d) *Import duties, taxes and insurance etc.*
Import duty and taxes are exempted, as Machines/Plant/Equipment provided for this project will be a property of the Government of Pakistan.

e) *Pre-production/commissioning expenses*
Included in the cost of Machines/Plant/Equipment provided for this project

f) *Interest capitalized.*
Not Applicable

g) *Contingencies.*
Not Applicable

h) *Cost escalation*

Not Applicable

i) *Working capital*
Affordable under PTC annual budget

18. *Basis of cost estimates.*
The cost estimates have been worked out by PTC experts and are based on Local /Import prices of the various items as in April 2002.

19. *Give cost of sales in the first year of operation and on full operation of project*

Not Applicable

20. *a) Benefits of the Project including indirect benefits/social benefits i.e. employment by gender, specific facilities such as schools, roads, water, hospital etc.*

As a result of the implementation of the project, transferred technological know how and qualified skilled workmen trained in PTC will enable small and medium enterprises to produce advanced stage products specially plastic automotive parts and components, which are currently being imported, resulting in saving precious foreign exchange. In particular, PTC will train unskilled workmen of small-scale industrial units (cottage industry), resulting in better income and employment opportunities, so that this project directly contributes to poverty alleviation.

In addition, the plastic products cover various kinds of items including tableware, food packages and toys for infants, so that poor quality products can endanger the health of people. In particular, Pakistan is one of a few and very unfortunate countries which mainly use Asbestos pipes for water supply and drainage, although the rest of world has already almost replaced them to plastics pipes, and plastic pipes are easier to handle/install and much more cost effective than Asbestos and other conventional pipes. This project is critical from the viewpoint of health conditions.

As a material industry, improving the quality of plastic products will benefit every fields of the industry, from Agriculture to Electronics, Automobile and IT industry. At the same time, its improvement will remind the people of the advantages of plastic products and boost its consumption, resulting in upgrading our living standard. In particular, if plastic products become commonplace in irrigation systems, water would be greatly saved and farmers would be released from annoyance of its shortage.

b) Give details of revenues (taxes etc.) to accrue to the Government

The proposed Project will be mainly focusing on Development of the Human Resource and to provide infrastructure for the growth of Industrial sector of the country to make it Globally Competitive through Production of High Quality Products / Services. Increase in national revenue is expected due to the better profit & earnings of companies & factories and income of workers.

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PART "C"

PROJECT REQUIREMENT

21. a) *Manpower: (please specify by gender where-ever possible)*

For Execution: No additional Staff required
For Operation: No additional Staff required

b) *Likely shortage of manpower by occupation.*
Nil

c) *Steps to be taken to assure availability of manpower.*
Not Applicable

d) *Approximate number of persons required to be trained per year (locally and abroad) and the kind of skills to be learnt.*
Not Applicable

e) *Cost per job created*
Nil

22. *Physical and other facilities/infrastructure required for project:*

Additional Civil Construction is required with existing building, whose cost shall be borne and to be budgeted by Government of Pakistan.

23. *Provide the following information regarding civil works of any kind including Building, Housing, Town Planning, Water Supply and Sewerage activity/ies, included in the Project.*

i) *Total covered area of the Building (basis for determining the space requirements) along with Line-plans, Number of stories etc.*
Approximately 15,000sqf covered area as an extension of existing building is required for housing the new equipment, whose implementation and cost are borne by Government of Pakistan.

ii) *If Houses provided, their number and categories along with covered area and Line-plans.*
No requirement

iii) *Size of the Plot, on which Buildings/Houses are to be constructed viz the percentage of open and constructed area.*
No additional area required

iv) *Give description of already completed or under construction Buildings/Houses viz the new proposed construction.*

Not Applicable

v) *Existing Water Supply and Sewerage arrangement in the area as well as for t present project.*
Satisfactory No Additional requirement

vi) *Unit-cost supported by item-wise detailed estimates of the Building/Houses, separately for Civil-works; Water Supply and Sewerage; other Utilities includi Heating, Ventilation and Air Conditioning, (if present); external development etc*
No additional requirement

vii) *Percentage of Contingencies, Departmental Charges and Escalation based Base-Cost*
Due to one time transaction, contingency or other similar cost was not taken i account.

24. *Materials, supplies and Equipment Requirements:*

A) *Minimum total requirements during execution:*
Not Applicable due to the training facilities only

B) *Materials, Spares and Supplies and equipment during operation of the Project*
Not Applicable due to the training facilities only

25. *In the case of imported material and equipment for execution, indicate:*

Machinery/Plant/Equipment necessary for up gradation of PTC is to be provided as Gr with three years maintenance and the Government of Japan will also provide supply consumable items.

26. *Material, supply and equipment already available with the agency specifying transfer pr etc. (during execution and operation) as market prices.*

Grand total prices of Machinery/Plant/Equipment necessary for up gradation of PTC is assessed at US$ (PAK

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PART "D"

FINANCIAL STRUCTURE, FINANCIAL & ECONOMIC ANALYSIS

The project is aimed at upgrading the academic & technical capabilities of the centre catering f manufacture of PVC Pipes up to 24" dia, and as such the economic return cannot be precise translated into Financial Returns.

As already mentioned in items 7 of part A, the proposed Project of upgrading PTC shall be th part of Government Infrastructure for Development and Facilitation of the Industrial Sector t way of:

i. Capacity enhancement to cope up additional number of trainees per year

ii. Techno-managerial Training in the fields of Designing and Manufacturing, Automati Processing, Process Control, Quality Management and Productivity Improvement for plasti products

iii. Advisory Services in Production Management, Plant Engineering, Process Improvemen Work Study, Methods Engineering, Quality and Productivity Improvement for plasti processing industry and Imparting technical know how for the manufacturing of PVC pipes u to 24" dia.

iv. Technological Backup Support Services in terms of Research, Designing, Development an Manufacturing of Production, particularly small and medium plastic processors.

Therefore, this project to upgrade PTC will make the plastic industries globally competitiv with increased market share in the International market, particularly regional market includin central Asian nations resulting in enhanced Quality of Life, Economic self-reliance and overa prosperity of the country.

Production capabilities of the related industrial sector would increase, which cannot b quantified in terms of cash/amount. However this benefit would keep on multiplying, as th knowledge & technical know how of this specific field is spread over different industrial units.

The demand of qualified engineers/technician/workers is much more than the trained manpowe and such there are positive job opportunities.

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Annex 1

Originated on December 12, 200
Modified on February 12, 200

Proposal on Industrial Development Centers for the capacity building of small and medium enterprises prepared by PJBF

1. Background

The ultimate solution for poverty reduction and growth facility is vitalization of the indust leading to stable and constant economic growth, job creation and the improvement of living standard, as proved in the successful precedents of the Japanese economic assistance policy to other Asian countries. However, on going discussion among donor countries in Islamabad seems to be a little slanted to non-project grant and commodity grant concentrating on necessities of life, which is undoubtedly important but only effective as a temporary relief. It is of vital importance to install the corner stones for th promotion of the industry, which promise the peaceful and prosperous future of the country, and now is our best chance in the history we have never had before as allied countries and international organizations are backing up Pakistan as the front line state fighting terrorism.

Recognizing the above-mentioned situation and taking into account that Japan is well-experienced and has necessary know-how and resources in this field, Pakistan Japan Business Forum (PJBF) is pleased to propose the unique scheme explained below for the capacity building of Pakistani industry to make it competitive enough to substitute import in domestic market and later possibly to expand its export. This scheme is designed as a long-term assistance package mainly composed of grant and technical assistance, bearing in mind the assurance of equality, fairness and transparency of the scheme and maximum wide-spread benefit.

2. Basic Design

(1) Establishment of Industrial Development Centers or Up Gradation of Existing Training and/or Testing Institute

The Pakistani Government will establish Industrial Development Centers or upgrade the exiting Centers functioning as quality control centers, training centers and public equipments centers based on this scheme all over Pakistan with assistance from Japar

(NB) Details of the Programs are attached, and list of the programs is explained below.

(2) Primary Function of Industrial Development Centers

Each center is envisaged to have the following functions more or less to the extent follows;

- Site for public equipments for collective use of companies concerned
- Training Center to impart practical training to workers and improve their shop floor skills
- Quality Control Center checking the quality of products to meet international standards as well as seeking continuous improvement "KAIZEN"

(3) Contents of assistance

The Japanese Government will
- grant necessary machinery/plant/equipment to the centers*
- give an appropriate and continuous maintenance for the provided machinery/plant/equipment
- dispatch long-term/short term experts and/or advisors to the centers

(NB*) Taking into account the size of necessary fund for machinery/plant/equipments, we do not have to preclude the possibility of the finances from soft term loan and the provision through leasing association.

(4) Expected disbursement by the Japanese Government

5 ~ 20 million dollar for each center
covering only necessary expense for the above three assistance
not including cost for non movable property i.e. land and building for the centers which will be provided by the Pakistani Government or the operational body of the center

3. *Selection of Industrial Development Centers*

As attached, PJBF prepared a concrete plan including the following tasks in collaboration with industrial or agricultural associations and industrial park associations, and designate an appropriate association having a public nature as an operational body for each center. This plan including the designated associations is subject to the approval of the Ministry of Industry and Production, Government of Pakistan and Embassy of Japan/Consulate General of Japan in Karachi.

- to identify the necessity for the establishment of Industrial Development Centers and its primary function.
- to identify necessary machinery/plant/equipment for each center
- to identify appropriate training programs of each center and necessary technical assistance

4. *Parties concerned and their roles*

- **The Government of Pakistan will set up a managing board consisting of nominees of PJBF, representatives from the concerned Ministries and representatives from Embassy of Japan/Consulate General of Japan in Karachi and JETRO/JICA. The managing board will be given full authority for the disbursement and in charge of policy matter as a steering committee in implementation of this scheme.**
- **The Ministry of Industry and Production will render necessary supports as well as advice and recommendation to the board.**

- Embassy of Japan/Consulate General of Japan in Karachi will provide necessa machinery/plant/equipments to all the centers as grant.
- JETRO (Japan External Trade Organization) and/or JICA (Japan Internatio Cooperation Agency) will provide technical assistance including maintenance servi and long-term/short-term experts and/or advisors to all the centers.

5. Monitoring Function

A third party accounting firm and engineering consulting firm designated by t managing board will conduct a regular financial and technical audit on the operation each center, possibly in collaboration with Embassy of Japan/Consulate General Japan in Karachi and will report the results of the audit to the board. If necessary, t managing board will recommend necessary measures to improve its operation to t Minister of Industry and Production.

6. List of Programs

1. **Fishery Development Program**
   – Up gradation of Public Facilities, Training, Research and Testing functions of Karachi Fish Harbor Authority (KFHA) and Marine Fisheries Department (MFD)

2. **Food Processing Program**
   – Establishment of Food Processing Development Center

3. **Textile Program**
   – Up gradation of Training functions of Textile Training Institutes
   – Establishment of Pilot Farm for Cotton Quality Control in Multan for the extermination of Pink Ball Worms

4. **Plastic Processing Program**
   – Up gradation of Training functions of Plastic Technology Center (PTC)

5. **Metal Processing Program**
   -- Up gradation of Training functions of Pakistan Industrial Technical Assistance Center in Lahore and local offices (PITAC)

6. **Auto Parts Program**
   -- Up gradation of Testing and Training function of Automotive Testing and Training Center (AT&TC)

7. **SITE Support Center Program**
   – Establishment of SITE Industrial Support Center for the stable supply of electricit and potable water, and treatment of industrial effluent wastewater

/e

(NB) The proposal papers on individual programs are omitted.

*****

Annex 2

NOTE

TOTAL COST OF NEW EQUIPMENTS: US$ 5.3million

Cost of Attachment – I & II =

Cost of Attachment - III =

ANNEX 2

Attachment-

SHOPPING LIST

PLASTICS PIPE MANUFACTURING EQUIPMENT

1.00	**Design Basis**	
1.01	Plastics(PVC) Pipes :1" to 24" dia	
1.02	Production output :750 Kgs/hours	
1.03	Pipe Standards :B.S. 3505 (1986)/ P.S. 3051 (1991)/ B.S. EN-1,2,3 (2000)	
1.04	Fittings :Pressure and soil, waste, vent (SWV) type	
1.00	**Raw Material handling and preparation.**	
2.01	PVC Bags emptying station with controls and dust filter	1Set
2.02	PVC conveying system with small silo and dust filter	1Set
2.03	*High speed mixer with controls and chutes and valves.* Pneumatic controls Capacity 1 Ton/hour.	1Set
2.04	*Mixer/Cooler complete with control* Capacity IT/hour	1Set
2.05	Discharge bin *Capacity 500 liter*	1Set
2.06	Weighing Scale 0--20 Kgs.	1Set
2.07	*Weighing Scale* 0–1 Kg	1Set
2.08	Special Maintenance Tools	1Set
2.09	*Complete spares set for 2 year normal operation*	1Set
3.00	**Extrusion Line I**	
3.01	Vacuum feeder for hopper Capacity 700 Kgs/hour	1Set
3.02	Extruder • Twin screw parallel/conical • Counter rotating screw • Control panels • *Dosage feeder* • Microprocessor control • Hopper • Output 500 Kgs/hour	1Set
3.03	Extrusion Dia head	1Set

	12" to 24" dia with die die trolley complete	
3.04	Die sets one each For 12", 14", 16", 18", 20", 24" Class C and D	1Set
3.05	Vacuum calibration sleeves One each for 12", 14", 16", 18", 20", 24" dia pipe	1Set
3.06	Vacuum spray bath 12" to 24 dia	1Set
3.07	Water spray bath For 12" to 24" dia pipes • Spray nozzles • Seals	1Set
3.08	Haul off 12" to 24" dia with measuring and auto thickening device	1Set
3.09	Laser printer jet	1 Set
3.10	Pipe Saw 12" to 24" dia • Chamfering option	1 Set
3.11	Pipe belling machine • Complete with controls • Tooling suitable for rubber ring joints 12" to 24" • Tooling for Solvent Cement joints 12" to 18" dia	1Set
3.12	Pipe trolleys for handling pipes	3Set
4.00	**Pipe Crushing equipment**	
4.01	PVC pipe crusher • Mouth dimension 750 x 750 mm • Output 400 Kgs/hour	1Set
4.02	Granule conveyor • Blower • Pipeline	1Set
4.03	Storage tank • 2 M^3 Capacity • Cyclone • Dust collector	1Set
5.00	**QC/Testing Laboratory**	
5.01	Short term (1 hour) Hydrostatic testing bath (20° C test) 5 station type • Control system • Testing bungs • 1" to 24" dia	1Set
5.02	Long term Hydrostatic test • 5 Station type • Control system	1Set

5.03	Long term Hydrostatic test 60° C bath • 5 Station type • *Control system*	
5.04	Methylene Chloride Test Equipment 15° C control Upto 24" dia	1Set
5.05	*Glycerine test -- Heat reversion test equipment at 150 ° C* Suitable for upto 24" dia pipe	1Set
5.06	Falling ball/weight Impact test equipment • Auto control • Suitable for 1" to 24" dia • Complete set of weights	1Set
5.07	Softening point test machine VICAT type	1Set
5.08	Fracture toughness test equipment 3" to 24" dia Complete with clamps	1Set
5.09	Water quality test lab	1Set
5.10	Opacity test equipment	1Set
6.00	**Slotting Machine suitable for producing Well Screens** • Out of line type • Suitable for 1 1/2" to 24" dia • Computerized control for setting and slotting. • Complete with cutting/slotting blade sets	1Set
7.00	**Pastic Injection Moulding Machine I**	
7.01	Injection moulding machine Pipe fitting • Capacity 40--50 Kgs/hour • Clamping force 3500 -- 4000 KN • Shot Capacity 50 -- 50 Ounces • Suitable for dry blend operation • *Microprocessor control and PV loop control for injection* • Hydraulic core puller • Quality monitory package • Startup circuit • Other recommended features	1 Set
7.02	Hopper	
7.03	Hooper loader 100 Kgs/hour	

8.00	**Injection Moulding Machine II**	
8.01	Capacity 15--20 Kgs/hour • Clamp force 1500 – 2000 KN • Shot capacity 15 ounces • Suitable for dry blend operation • Microprocessor and PV loop control • Start up circuit • Other recommended features.	
8.02	Hooper Stainless Steel	1 Set
8.03	Hooper loader 50 Kgs/hour	1 Set
9.00	**Injection Moulds pressure type fitting**	
9.01	Injection Moulds for solvent type pressure fitting B.S.4346/B.S (EN) 2000 One each for: • 1/2" (90° elbow, Tees, Valve Socket)	3 Sets
	3/4" (90° elbow, Tees, Valve Socket)	3 Sets
	1" (90° elbow, Tees, Valve Socket)	3 Sets
	11/4" (90° elbow, Tees, Valve Socket)	3 Sets
	1 1/2" (90° elbow, Tees, Valve Socket)	3 Sets
	2" (90° elbow, Tees, Valve Socket)	3 Sets
	• Option inserts for producing faucet fittings	1 Set
9.02	Injection Moulds for solvent type pressure fitting B.S. 4346/B.S (EN) 2000 One each for:	
	• 3" dia (90° elbow, Tees, Valve Socket)	3 Sets
	• 4" dia (90° elbow, Tees, Valve Socket)	3 Sets
	• 6" dia (90° elbow, Tees, Valve Socket)	3 Sets
9.03	Injection moulds for SWV fitting One each for: • 32 mm, 40 mm, 50 mm	6 Sets
	(90° 45° elbows)	
	• Reducer 40 x 50 50 x 75 mm	2 Sets
	• Inserts for M/F	1 Set
9.04	Injection Mould fitting for SWV System	
	B.S 4515/equivalent ISO • 3" 92 1/2° sweep bend	1 Set
	• 4" 92 1/2° sweep bend	1 Set
	• 3" 92 1/2° sweep branch	1 Set
	• 4" 92 1/2° sweep bend	1 Set
	• 3" 135° bend	1 Set
	• 4" 135° bend	1 Set
	• 4" 135° branch	1 Set
	• 3" 135° branch	1 Set

9.05	• I/O and M/F INSERTS *For above fitting*	16 Inserts
9.06	Gully trap moulds 50 mm x 110 mm 50 mm x 75 mm	1Set
9.07	Cowl mould 50 mm	1 Set
9.08	P-Trap Moulds (4: dia)	1 Set
10.00	**Measurement Equipment**	
10.01	Outside dia measurement gauges 1" -- 24"	1 Set
12.02	Pipe wall thickness measurement gauges	1 Set
10.03	Groove dia and internal dia measurement gauges • Grooves of rubber ring jont 3" – 24" dia	1 Set
10.04	• Fittings internal dia measurement gauge sets 1/2" to 2" dia 3" to 6" dia	2 Sets
10.05	• Pipe Minimum and Maximum outside dia Measurement system 1" to 24" dia	2 Set
11.	**Miscellaneous**	
11.01	Crane Gantry for injection area (10 Ton) with 10 Ton Hoist	1 Unit
11.02	Crane Gantry for test lab. 2 Tons with hoist	1 Unit
11.03	500KVA Diesel Generator	1 Unit
11.04	250KVA Diesel Generator	1 Unit
11.05	Air conditioner for Laboratory	1 Unit
11.06	*Software & Training Aids as specified in Annex-2, Attachment IV*	

B: 1 6252

ANNEX 3

Attachment-

SHOPPING LIST

EQUIPMENT LIST FOR COMPOUNDING PLANT
CAPACITY 3000 T/Y
PRODUCT : SOFT / RIGID PVC COMPOUND

S.NO.	EQUIPMENT	SPECIFICATION	QTY
1.	HIGH SPEED MIXER	600 LITER MATERIAL ASI 321 500– 1000 RPM	1
2.	LOW SPEED COOLER	MATERIAL SS 321 MAX. JACKET PRESS – 0.8 BAR 1200 –– 1500 LITER	1
3.	EXTRUSION FEED HOPPER	700 KG	1
4.	EXT. FEED CONVEYOR	1000 KG/HR	1
5.	TWIN SCREW EXTRUDER	700 KG/HR	1
6.	HOT CUT PALLETIZER	700 KG/HR	1
7.	PNEUMA BLOWER	———	1
8.	COOLER STIRRER	800 KG/HR	1
9.	COOLER FAN	———	1
10.	PNEUMA BLOWER	800 KG/HR	1
11.	CONVEYOR	BELT– ROLLER TYPE	1
12.	STITCHING HEAD	———	1
13.	METAL DETECTOR	———	1
14.	BAG FILTER	20 FILTER	1

15.	VIBRATOR MOTOR	———	1
16.	EXHAUST FAN	———	1
17.	DOP CHARGING PUMP	3000 LTR/HR	1
18.	DINP CHARGING PUMP	3000 LTR/HR	1
19.	DIDP CHARGING PUMP	3000 LTR/HR	1
20.	DINP/DIDP TRANSFER	AIR PUMP	2

NOTE:- Total Cost of Attachment I & II =

ANNEX 4

ATTACHMENT –

PROCESSING & TESTING EQUIPMENT REQUIREMENT

PROCESSING EQUIPMENT

1	INJECTION MOULDING MACHINE (LSR)
2	INJECTION MOULDING MACHINE (THERMOSET)
3	VACUUM FORMING
4	DOWN STREAM EQUIPMENT FOR SHEET FORMING
5	BLOW MOULDING (IBM TYPE)
6	PLASTOGRAPH
7	COMPRESSION MOULDING
8	VACUUM DEHUMIDIFIER
9	RUBBER EXTRUDER
10	BANBU8RY MIXER
11	POLY MERIZER

TESTING EQUIPMENT

TOTAL

ANNEX 5

Attachment

LIST OF SOFTWARE FOR POLYMER ENGINEERING

Softare

1. Unigraphics Solutions (Mold/Die Design)
2. Processing/Piping Training
3. ANSYS (Product Development Software)

Training Aids

1. Multimedias
2. Overhead Projectors
3. Dedicated Workstations and Peripherals
4. White Boards
5. Books & Jounals
6. Testing and Production Standards

Annexure-III(a)

PROCESSING EQUIPMENT

1. GRANULATOR

Make	BLACK FRIARS (England)
Model	23/20
Speed	35 Rpm
Elec. Load	3.5 KW

2. TWO ROLL MILL

Make	Francis Shaw (U.K.)
Capacity	150*300 Mm
Back Roll Speed	26 Rpm
Front Roll Speed	20-30 Rpm
Mechanical Drive	Variable Pulleys
Elec. Load	7.5 KW

3. OIL HEATING UNIT

Make	Churchill (U.K)
Model	9-250
Heating Capacity	250 Deg. C
Elec. Load	10 KW

4. EXTRUSION

Make	Toshiba (Japan)
Model	Se 40 A9-250
Screw Dia	42 mm
Plasticizing Capacity	45 Kg/Hr.

5. BLOW MOULDING

Make	Bekum (Germany)
Model	Hbd 50
M/C Type	S50/Hbd 50
L/D Ratio	20 :1
Screw Dia	50 mm
Screw Speed	18 to 100 Rpm
Driver Power	7 kw
Parison Controller	Moog
Make	Plabo (Japan)
Model	Sg 45
Screw Dia	30 mm
Screw Speed	15 to 65 Rpm

6. INJECTION MOULDING

A.

Make	Demag (Germany)
Model	D 100 NC Ii System
Shot Weight	80 gm.
Clamp. Force	100 Tons
Day Light	Min. 200 mm Max. 400 mm
Dist. B/W Tiebars	360 mm

B.

Make	Toshiba (Japan)
Model	Is 80
Shot Weight	80 Gm.
Clamp. Force	100 Tons
Day Light	Min. 50 mm Max. 400 mm
Dist. B/W Tiebars	370 mm

7. BLOWN FILM

A.

Make	Axon (Sweden)
Model	Bx – 25
Plasticizing Capacity	Up to 20 Kg/Hr
Film Width	325 mm
No. of Screws	Three
Diameter of Screw	25 mm
Length of Screw	2.5 X D
Driving Unit Power	2.5 KW

B.

Make	Toshiba (Japan)
Model	Mk 85
Plasticizing Capacity	25 Kg/Hr
Film Width	500 mm
Screw Dia	40 mm
Screw speed	25 to 65 Rpm

8. COMPRESSION MOULDING

Make	Karl Kolb (Germany)
Model	348-010
Capacity	20 Tons
Temperature	250°C Max
Distance B/W. Platen	140 mm
Platen Size	150 mm
Elec. Load	2.5 KW

9. TORQUE RHEOMETER

Make	Brabender (Germany)
Model	Pld - 331(Plastocorder & Datarecorder)
Aux. Equipment	- Measuring Extruder - Mixer Measuring Head - Printer

TESTING EQUIPMENT

1. Universal Testing Machine

Make	INSTRON Ltd. Coronation Road, High
Wycombe,	Bucks, England
Model	4302
Capacity	10 KN
Full Scale load Range	0.5 N to 10 KN
Cross head speed Range	0.5 to 500 mm/min
Load cell available.	1KN, 5KN 10KN
Grips available, Action	Self tightening, Pneumatic Action, Wedge
	Compression plates, flexural strength jigs,
Aux Equipment	Temperature cabnet (upto 200°C)

2. Hardness: Tester

Make	Coats Machine Tool Co. Ltd. Watjord, Aearts
England.	
Model	*D Coats Durometer.*
Range	0-100
Scale graduation	1 short hardness unit
Accuracy	+Short hardness unit.
1. Application	harder elastomers & Plastics

3. Elemendorf Tear Tester

Make	DAVENTEST LTD; ENGLAND.
Model	Serial No. E 350/132"

Capacity	3200 gf.

Specimen cutting templates according to ASTM-D- 1922-67 B.S; ,Method 308 B.

4. Melt Flow Index (M.F.I.) Apparatus Melt Flow Rate (M.F.R.)

Make	Daventest Ltd; Tewin Road, Hertfordshire, England
Model	Utility MK-2
Load Available:	2.16 kg
Temperature range:	0-400°C
Diameter of Die:	0.0825

5. Viscometer

Make	OGAWA SEIKI CO. LTD. Tokyo Central P.O. Box 1618, Tokyo, Japan.
Spindles	1,2,3 & 4.
Capacity	1000 Poise

6. K-Value (Apparatus)

WATER BATH

Make	Townsen & Mered, England
Model	Series IV
Temperature	10-120°C

STOP WATCH

Make	Electronic, Germany
Model	RS 331-382
Accuracy	0.01 Sec
Display	LCD

VISCOMETER

Make	Ryren, England.
Model	UBBLOHDE-Viscometer with Holder & Stand

7. Haze Meter

Make	Daventest Ltd; Tewin Road, Hertfordshire, England
	SPHERICAL HAZE METER
Model	D-S. Model 75 Digital read out unit

8. Gloss Meter

Make	Daventest Ltd; Tewin Road Hertfordshire England
Model	HG 686/15 DS 29 DS Highspec gloss - head Digital read out unit

9. Refractive Index Apparatus

Make	Schmidt & Haensch, Germany
Model	DUR Refractometer
Voltage	190-260 Volts
Cycles	47-65 Hz
Cooling Water	0.3 Mpa (Max)
Working Temperature	10-40°C

10.Colour Meter

Make	Nippon Denshoku Kogyo Co; Ltd; Tokyo, Japan
Model	NR-3000

Measurement Values xrz, Yxy, L*a*b*
Hunter-lab, W, WB, YI

ΔXYZ, ΔYxy, ΔL*a*b*
ΔE* Δ1* C* H* , Hunter
ΔLab, ΔEh, ΔW, ΔYI

11.Microscope

Make:	ZEISS (Germany)
Model	Stereomicroscope SV8
Zoom system:	1:8

12.Carbon Black Content Tester

Make	IPT Schulstrasse, D 8901, Todtenweis, Germany.
Model	1398
Temperature range:	0-950°C
Temperature resolution	upto 200°C+0.1°C over 200°C C+1°C 0.3%
Accuracy:	1.0 KW

13.Vicat Softening Point Apparatus:

Make	Daventest, Hertfordshire, England
Model	POB 695/102P 6 Station instrument to determine Vicat point of thermoplastic
Temperature range:	Upto 300°C

14.Stress Cracking Apparatus

Make	H. W Wallance & Co; Croydon, England
Specimen size	38 x 12.7 mm
Notch depth	ASTM D1693 Conditioning

Apparatus Consists of Nicking jig, Bending clamp and Transfer tool.
Dimension Nicking jig, Bending clamp Transfer tool.

(Approximately)	30(W) 282 (L) 55(H)mm	25 (W) 165 (L) 70(H)mm	11(W) 365 (L) 65(H)mm

15.MISCELLANEOUS

1. Notching Machine.
2. PH meter.
3. Water baths.
4. Stop watches.
5. Thickness gauges.
6. Vernier Calipers.
7. Micro meter screw gauges.
8. Balances.
9. Profile cutter.
10. Oven.
11. Wet and Dry bulb thermometers.
12. Max. and Min. Thermometer.
13. Thermo Hydrograph, Deluxe model.
14. Falling Dart Impact Tester.
15. Densimeter.
16. Melting Point Apparatus.

LIST OF WORKSHOP EQUIPMENT

- Lather Machines 1
- Drill Machines 2
- Electric Welding Plants 1
- Bench Vices 4
- Pipe Vice 1

Annexure-III(c)

COMPUTING FACILITIES

CAD Lab.

1. **Computers**

Pentium-III	:	*13 Nos.*

2. **Printers**

Laser	:	*3 Nos.*

3. ***Scanners*** : *02 Nos.*

Information Technology Lab.

1. **Computers**

Pentium	:	*07 Nos.*
486 Machines	:	*06 Nos.*

2. **Printers**

Laser	:	*01 Nos.*
Dot Matrix	:	*02 Nos.*

Two Internet connections are available for students. Through networking 10 Computers are interlinked.

PROCESSING EQUIPMENT

1. GRANULATOR

Make	BLACK FRIARS (England)
Model	23/20
Speed	35 Rpm
Elec. Load	3.5 KW

2. TWO ROLL MILL

Make	Francis Shaw (U.K.)
Capacity	150*300 Mm
Back Roll Speed	26 Rpm
Front Roll Speed	20-30 Rpm
Mechanical Drive	Variable Pulleys
Elec. Load	7.5 KW

3. OIL HEATING UNIT

Make	Churchill (U.K)
Model	9-250
Heating Capacity	250 Deg. C
Elec. Load	10 KW

4. EXTRUSION

Make	Toshiba (Japan)
Model	Se 40 A9-250
Screw Dia	42 mm
Plasticizing Capacity	45 Kg/Hr.

MINUTES OF DISCUSSIONS
PRELIMINARY STUDY ON THE PROJECT FOR THE UP GRADATION OF PLASTICS TECHNOLOGY CENTER IN THE ISLAMIC REPUBLIC OF PAKISTAN

In response to a request from the Government of the Islamic Republic of Pakistan (hereinafter referred to as "the Pakistan"), the Government of Japan decided to conduct a preliminary study on the Project for the Up Gradation of Plastics Technology Center (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Pakistan the Preliminary Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Tomiaki Ito, Deputy Director of First Contract Division, Procurement Department, JICA, and is scheduled to stay in the country from 18 November to 14 December, 2002.

The Team held discussions with the officials concerned of the Government of Pakistan and conducted a field survey at the study area.

As a result of discussions and field survey, both parties confirmed the outline of the discussions as attached herewith.

Islamabad, November 26, 2002

Mr. Tomiaki Ito
Leader
Preliminary Study Team
Japan International Cooperation Agency

Mr. Ahsan Siddiqi
General Manager
Plastics Technology Center
The Islamic Republic of Pakistan

Mr. Syed Ijaz Waqar Akbar Naqvi
Senior Joint Secretary
Ministry of Industries and Production
The Islamic Republic of Pakistan

ATTACHMENT

1. Background and Objectives of the Project

Currently, there are approximately 5,000 plastics manufacturing firms in Pakistan. Due to their low processing technology, however, the country relies heavily on the import of plastic products even for the ones which require only simple technology. Upgrading the quality of plastic products is deemed important as it is used in almost every industrial sector. Moreover, demand for the plastics used in construction materials, packaging, automobiles, pipes used in water supply and drainage is likely to rise in the near future as the substitute of asbestos pipes and upgrading of plastic processing technology is urgently needed.

Plastics Technology Center in Karachi(hereinafter referred to as "PTC") is the only institution in the field of plastics training, testing, and consultancy in Pakistan. The center, which is run under the control and management of National Fertilizer Corporation (NFC), an attached Department of the Ministry of Industries and Production, is to offer technical advisory service to private firms, technical information, and conduct testing of plastics and mould, as well as to provide short-term training courses for jobless people and private enterprises and academic courses for bachelor degree, diploma.

This Project is a part of the proposal prepared by Pakistan-Japan Business Forum (hereinafter referred to as "PJBF") upon the study conducted by PJBF in close consultation with related government agencies and public institutions and industrial groups concerned. The objectives of the Project aim at transferring the technological know-how, skills, and experiences from Japan to Pakistan effectively and efficiently, by means of which the Government of Japan procures PTC equipment mainly in injection molding and extrusion for upgrading the function of PTC.

2. Status of the Study

The Pakistani side understood that at the preliminary study stage, no commitment is made by the Japanese side concerning the implementation of the Project within the scheme of the Grant Aid Program. The result of this Study will be analyzed in Japan to determine the need of a following Basic Design Study, by which the Government of Japan will determine the feasibility of the proposed Project.

3. Objectives of the preliminary study

The objectives of the preliminary study are;

1)To identify and confirm the objectives and components of the requested Project,

2)To comprehend the background of the Project and the consistency and relevance of the Project with the policies and plans in the related sectors of Pakistan,

3)To investigate the present situation and problems in the related sectors,

4)To confirm the maintenance and administration system in the national, implementing and operation organs and the contents of activities of the PTC,

5)To verify fiscal capabilities of the organizations concerned,

6)To confirm the trend of assistance by other donors, and

7)To collect and analyze the data, information and materials related to the Project.

4. Project site

The site of the Project is Plastics Technology Center (PTC), in Karachi.

The drawings of PTC facilities are attached in ANNEX-1

5. Responsible and Implementing Agency

1)The responsible agency is the Ministry of Industries and Production.

2)The implementing agency is the Plastics Technology Center (PTC).

The organization chart of PTC are attached in ANNEX-2

6. Items requested by the Government of Pakistan

After discussions with the Team, the Pakistani side understood that the contents of the original requested items described in ANNEX-3 should be modified in terms of the use for training and the current market in the related sectors.

JICA will assess the appropriateness of the request and will report the findings to the Government of Japan.

7. Japan's Grant Aid Scheme

The Pakistani side understood the Japan's Grant Aid Scheme explained by the Team.

8. Schedule of the Study

Implementation of the Project will be decided based on the result of the preliminary study.

9. Other relevant issues

1) Both sides understood that the Project should be implemented for capacity building especially for small and medium enterprises in the related sectors, which leads to better employment opportunities and directly helping in "Poverty Reduction".

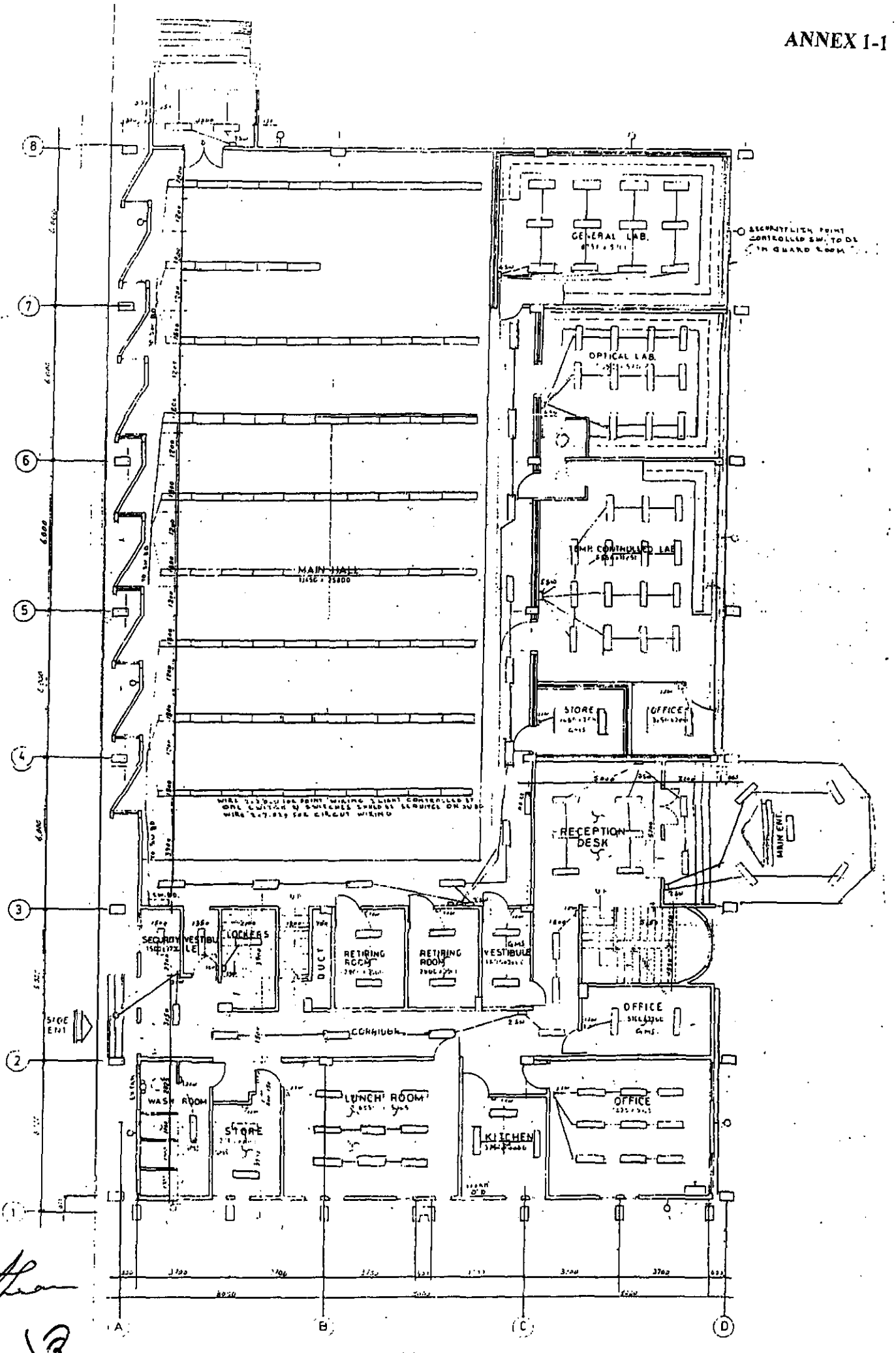
2) The Team observed through site survey that there is much room for improvement of the products qualities.

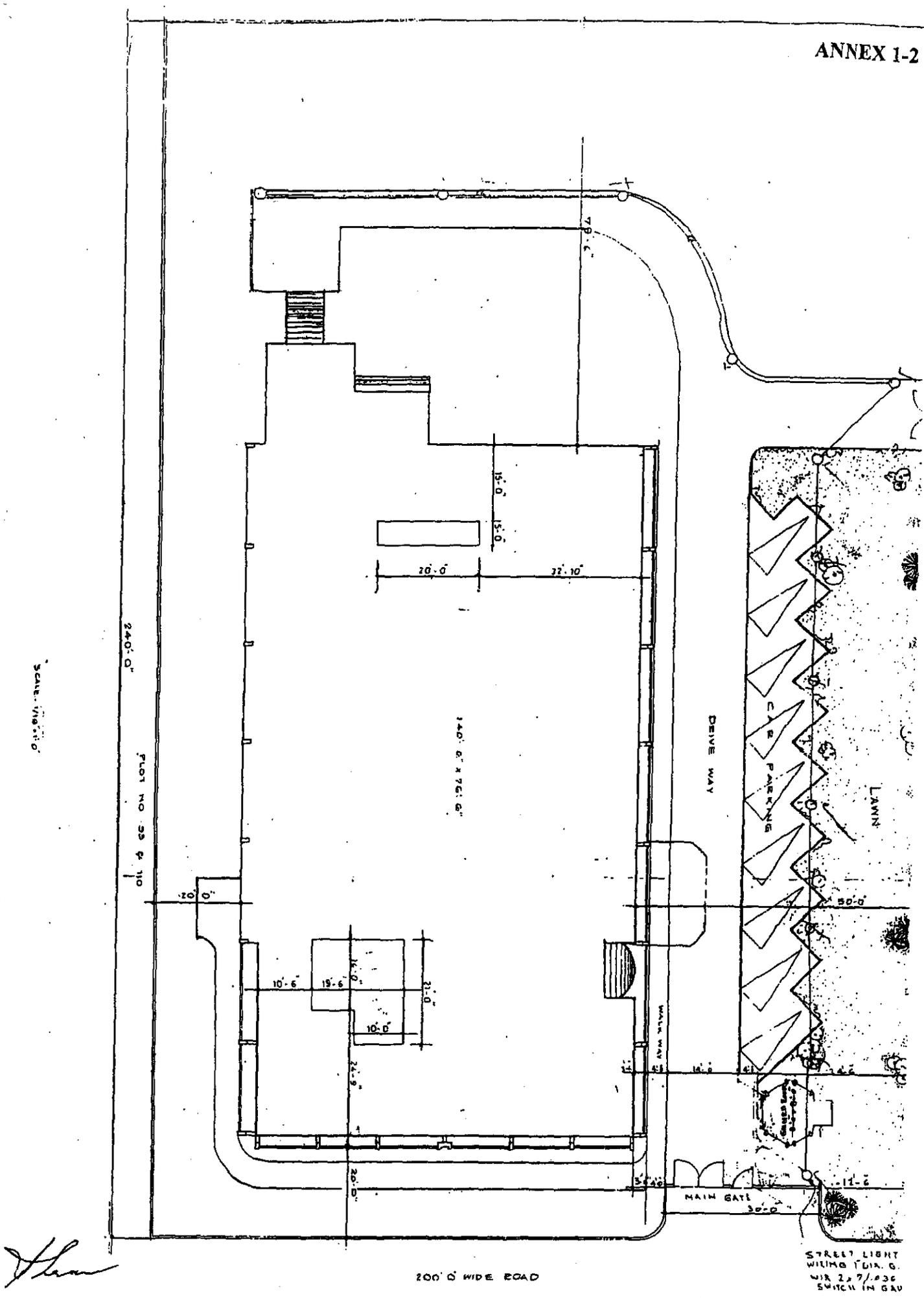
3) The Team also observed that the existence of various types of standards for plastics pipes and fittings (ex. PS, BS, ISO, JIS, DIN, ASTM) leads to an obstacle to progress in plastics industry.

ANNEX-1 : Drawings of PTC facilities

ANNEX-2 : Organization chart of PTC

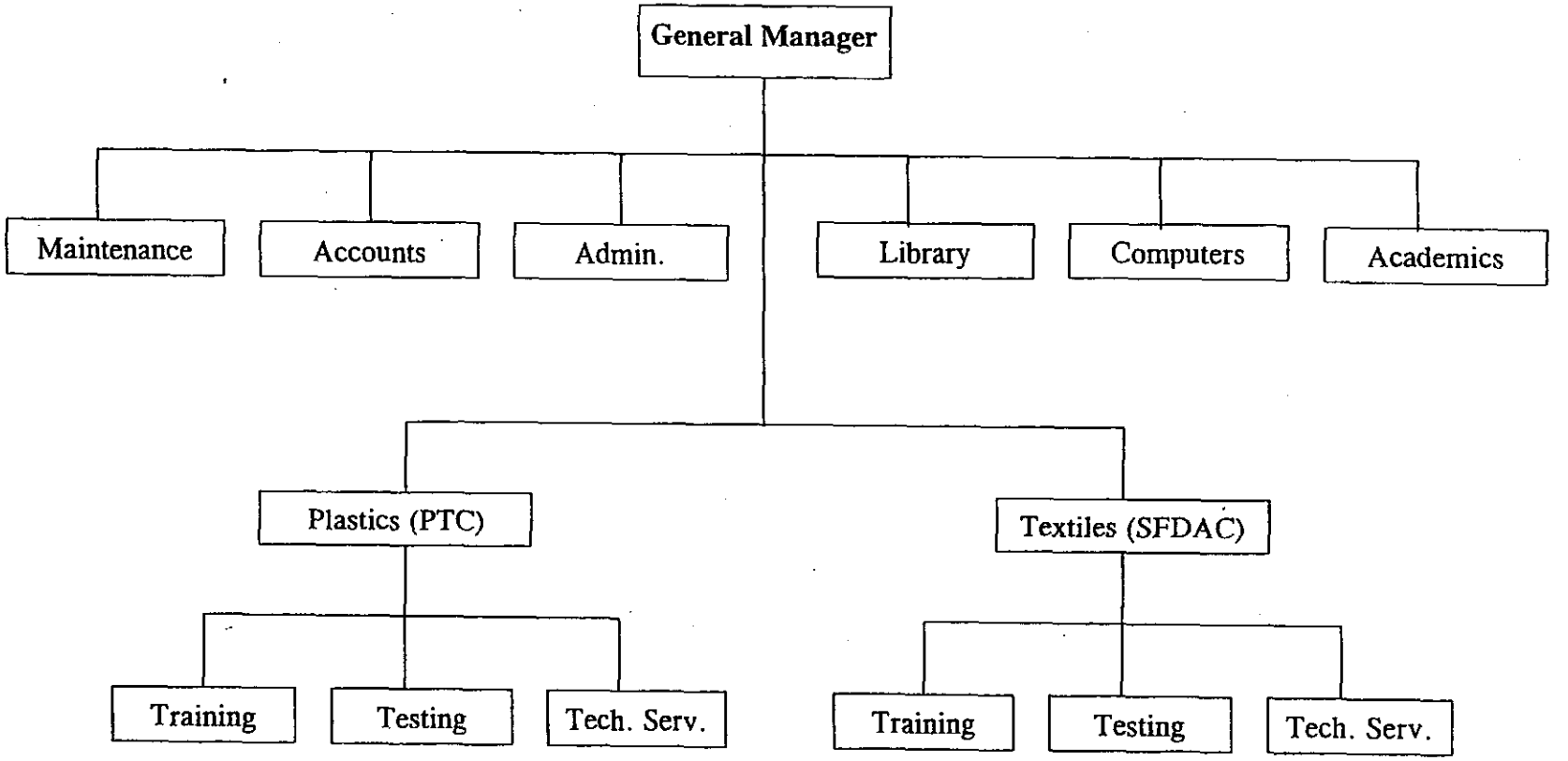
ANNEX-3 : Original equipment list requested by the Pakistan side


GENERAL LAB.
OPTICAL LAB.
MAIN HALL
STORE
OFFICE
RECEPTION DESK
MAIN ENT.
SECURITY VESTIBULE
LOCKERS
DUCT
RETIRING ROOM
RETIRING ROOM
VESTIBULE
SIDE ENT.
CORRIDOR
OFFICE
WASH ROOM
STORE
LUNCH ROOM
KITCHEN
OFFICE
8
7
6
5
4
3
2
1
A
B
C
D


240'-0"
PLOT NO 33 & 110
140' 0" x 76' 6"
DRIVE WAY
CAR PARKING
LAWN
MAIN GATE
30'-0
200' 0" WIDE ROAD
STREET LIGHT
WIRING DIA. 6
WIR 2 x 7/.036
SWITCH IN GAU

PLASTICS TECHNOLOGY CENTRE (PTC)

SYNTHETIC FIBRE DEVELOPMENT AND APPLICATION CENTRE (SFDAC)



ANNEX 2

SHOPPING LIST

PLASTICS PIPE MANUFACTURING EQUIPMENT

1.00	**Design Basis**	
1.01	Plastics(PVC) Pipes :1" to 24" dia	
1.02	Production output :750 Kgs/hours	
1.03	Pipe Standards :B.S. 3505 (1986)/ P.S. 3051 (1991)/ B.S. EN-1,2,3 (2000)	
1.04	Fittings :Pressure and soil, waste, vent (SWV) type	
1.00	**Raw Material handling and preparation.**	
2.01	PVC Bags emptying station with controls and dust filter	1Set
2.02	PVC conveying system with small silo and dust filter	1Set
2.03	High speed mixer with controls and chutes and valves. Pneumatic controls Capacity 1 Ton/hour.	1Set
2.04	Mixer/Cooler complete with control Capacity IT/hour	1Set
2.05	Discharge bin Capacity 500 liter	1Set
2.06	Weighing Scale 0--20 Kgs.	1Set
2.07	Weighing Scale 0--1 Kg	1Set
2.08	Special Maintenance Tools	1Set
2.09	Complete spares set for 2 year normal operation	1Set
3.00	**Extrusion Line I**	
3.01	Vacuum feeder for hopper Capacity 700 Kgs/hour	1Set
3.02	Extruder • Twin screw parallel/conical • Counter rotating screw • Control panels • Dosage feeder • Microprocessor control • Hopper • Output 500 Kgs/hour	1Set
3.03	Extrusion Dia head	1Set

	12" to 24" dia with die die trolley complete	
3.04	Die sets one each For 12", 14", 16", 18", 20", 24" Class C and D	1Set
3.05	Vacuum calibration sleeves One each for 12", 14", 16", 18", 20", 24" dia pipe	1Set
3.06	Vacuum spray bath 12" to 24 dia	1Set
3.07	Water spray bath For 12" to 24" dia pipes • Spray nozzles • Seals	1Set
3.08	Haul off 12" to 24" dia with measuring and auto thickening device	1Set
3.09	Laser printer jet	1 Set
3.10	Pipe Saw 12" to 24" dia • Chamfering option	1 Set
3.11	Pipe belling machine • Complete with controls • Tooling suitable for rubber ring joints 12" to 24" • Tooling for Solvent Cement joints 12" to 18" dia	1Set
3.12	Pipe trolleys for handling pipes	3Set
4.00	**Pipe Crushing equipment**	
4.01	PVC pipe crusher • Mouth dimension 750 x 750 mm • Output 400 Kgs/hour	1Set
4.02	Granule conveyor • Blower • Pipeline	1Set
4.03	Storage tank • 2 M^3 Capacity • Cyclone • Dust collector	1Set
5.00	**QC/Testing Laboratory**	
5.01	Short term (1 hour) Hydrostatic testing bath (20° C test) 5 station type • Control system • Testing bungs • 1" to 24" dia	1Set
5.02	Long term Hydrostatic test • 5 Station type • Control system	1Set

5.03	Long term Hydrostatic test 60° C bath • 5 Station type • Control system	
5.04	Methylene Chloride Test Equipment 15° C control Upto 24" dia	1Set
5.05	Glycerine test -- Heat reversion test equipment at 150° C Suitable for upto 24" dia pipe	1Set
5.06	Falling ball/weight Impact test equipment • Auto control • Suitable for 1" to 24" dia • Complete set of weights	1Set
5.07	Softening point test machine VICAT type	1Set
5.08	Fracture toughness test equipment 3" to 24" dia Complete with clamps	1Set
5.09	Water quality test lab	1Set
5.10	Opacity test equipment	1Set
6.00	***Slotting Machine suitable for producing Well Screens*** • Out of line type • Suitable for 1 1/2" to 24" dia • Computerized control for setting and slotting. • Complete with cutting/slotting blade sets	1Set
7.00	**Pastic Injection Moulding Machine I**	
7.01	Injection moulding machine Pipe fitting • Capacity 40--50 Kgs/hour • Clamping force 3500 -- 4000 KN • Shot Capacity 50 -- 50 Ounces • Suitable for dry blend operation • Microprocessor control and PV loop control for injection • Hydraulic core puller • Quality monitory package • Startup circuit • Other recommended features	1 Set
7.02	Hopper	
7.03	Hooper loader 100 Kgs/hour	

8.00	**Injection Moulding Machine II**	
8.01	Capacity 15--20 Kgs/hour • Clamp force 1500 – 2000 KN • Shot capacity 15 ounces • Suitable for dry blend operation • Microprocessor and PV loop control • Start up circuit • Other recommended features.	
8.02	Hooper Stainless Steel	1 Set
8.03	Hooper loader 50 Kgs/hour	1 Set
9.00	**Injection Moulds pressure type fitting**	
9.01	Injection Moulds for solvent type pressure fitting B.S.4346/B.S (EN) 2000 One each for: • 1/2" (90 ° elbow, Tees, Valve Socket)	3 Sets
	3/4" (90 ° elbow, Tees, Valve Socket)	3 Sets
	1" (90 ° elbow, Tees, Valve Socket)	3 Sets
	11/4" (90 ° elbow, Tees, Valve Socket)	3 Sets
	1 1/2" (90 ° elbow, Tees, Valve Socket)	3 Sets
	2" (90 ° elbow, Tees, Valve Socket)	3 Sets
	• Option inserts for producing faucet fittings	1 Set
9.02	Injection Moulds for solvent type pressure fitting B.S. 4346/B.S (EN) 2000 One each for:	
	• 3" dia (90 ° elbow, Tees, Valve Socket)	3 Sets
	• 4" dia (90 ° elbow, Tees, Valve Socket)	3 Sets
	• 6" dia (90 ° elbow, Tees, Valve Socket)	3 Sets
9.03	Injection moulds for SWV fitting One each for: • 32 mm, 40 mm, 50 mm	6 Sets
	(90 ° 45 ° elbows)	
	• Reducer 40 x 50 50 x 75 mm	2 Sets
	• Inserts for M/F	1 Set
9.04	Injection Mould fitting for SWV System	
	B.S 4515/equivalent ISO • 3" 92 1/2 ° sweep bend	1 Set
	• 4" 92 1/2 ° sweep bend	1 Set
	• 3" 92 1/2 ° sweep branch	1 Set
	• 4" 92 1/2 ° sweep bend	1 Set
	• 3" 135 ° bend	1 Set
	• 4" 135 ° bend	1 Set
	• 4" 135 ° branch	1 Set
	• 3" 135 ° branch	1 Set

9.05	• I/O and M/F INSERTS For above fitting	16 Inserts
9.06	Gully trap moulds 50 mm x 110 mm 50 mm x 75 mm	1Set
9.07	Cowl mould 50 mm	1 Set
9.08	P-Trap Moulds (4: dia)	1 Set
10.00	**Measurement Equipment**	
10.01	Outside dia measurement gauges 1" -- 24"	1 Set
12.02	Pipe wall thickness measurement gauges	1 Set
10.03	Groove dia and internal dia measurement gauges • Grooves of rubber ring jont 3" – 24" dia	1 Set
10.04	• Fittings internal dia measurement gauge sets 1/2" to 2" dia 3" to 6" dia	2 Sets
10.05	• Pipe Minimum and Maximum outside dia Measurement system 1" to 24" dia	2 Set
11.	**Miscellaneous**	
11.01	Crane Gantry for injection area (10 Ton) with 10 Ton Hoist	1 Unit
11.02	Crane Gantry for test lab. 2 Tons with hoist	1 Unit
11.03	500KVA Diesel Generator	1 Unit
11.04	250KVA Diesel Generator	1 Unit
11.05	Air conditioner for Laboratory	1 Unit
11.06	Software & Training Aids as specified in Annex-2, Attachment IV	

SHOPPING LIST

EQUIPMENT LIST FOR COMPOUNDING PLANT
CAPACITY 3000 T/Y
PRODUCT : SOFT / RIGID PVC COMPOUND

S.NO.	EQUIPMENT	SPECIFICATION	QTY
1.	HIGH SPEED MIXER	600 LITER MATERIAL ASI 321 500– 1000 RPM	1
2.	LOW SPEED COOLER	MATERIAL SS 321 MAX. JACKET PRESS – 0.8 BAR 1200 –– 1500 LITER	1
3.	EXTRUSION FEED HOPPER	700 KG	1
4.	EXT. FEED CONVEYOR	1000 KG/HR	1
5.	TWIN SCREW EXTRUDER	700 KG/HR	1
6.	HOT CUT PALLETIZER	700 KG/HR	1
7.	PNEUMA BLOWER	———	1
8.	COOLER STIRRER	800 KG/HR	1
9.	COOLER FAN	———	1
10.	PNEUMA BLOWER	800 KG/HR	1
11.	CONVEYOR	BELT-- ROLLER TYPE	1
12.	STITCHING HEAD	———	1
13.	METAL DETECTOR	———	1
14.	BAG FILTER	20 FILTER	1

15.	VIBRATOR MOTOR	———	1
16.	EXHAUST FAN	———	1
17.	DOP CHARGING PUMP	3000 LTR/HR	1
18.	DINP CHARGING PUMP	3000 LTR/HR	1
19.	DIDP CHARGING PUMP	3000 LTR/HR	1
20.	DINP/DIDP TRANSFER	AIR PUMP	2

PROCESSING & TESTING EQUIPMENT REQUIREMENT

PROCESSING EQUIPMENT

1 INJECTION MOULDING MACHINE (LSR)
2 INJECTION MOULDING MACHINE (THERMOSET)
3 VACUUM FORMING
4 DOWN STREAM EQUIPMENT FOR SHEET FORMING
5 BLOW MOULDING (IBM TYPE)
6 PLASTOGRAPH
7 COMPRESSION MOULDING
8 VACUUM DEHUMIDIFIER
9 RUBBER EXTRUDER
10 BANBU8RY MIXER
11 POLY MERIZER

TESTING EQUIPMENT

LIST OF SOFTWARE FOR POLYMER ENGINEERING

Softare

1. Unigraphics Solutions (Mold/Die Design)
2. Processing/Piping Training
3. ANSYS (Product Development Software)

Training Aids

1. Multimedias
2. Overhead Projectors
3. Dedicated Workstations and Peripherals
4. White Boards
5. Books & Journals
6. Testing and Production Standards

別添資料4

EQUIPMENT LIST

PLASTICS PIPE MANUFACTURING EQUIPMENT

A.	EQUIPMENT NAME	Qty
1.01	High speed mixer with controls and chutes and valves. Pneumatic controls, Capacity 100 Kg/hour.	1Set
1.02	Mixer/Cooler complete with control, Capacity 100 Kg/hour	1Set
1.03	Discharge bin, Capacity 500 liter	1Set
1.04	Weighing Scale, 0--20 Kgs.	1Set
1.05	Weighing Scale, 0--1 Kg	1Set
2.00	**Extrusion Line I**	
2.01	Vacuum feeder for hopper, Capacity 25 Kgs/hour	1Set
2.02	Extruder, Twin screw parallel/conical, Dosage feeder , Upto 6" diameter pipes	1Set
2.03	Extrusion Die head, upto6" dia with die trolley complete	1Set
2.04	Die set, For upto 6" Class C and D	1Set
2.05	Vacuum calibration sleeves, Vacuum sizer	1Set
2.06	Water spray bath, for upto 6" dia pipe	1 Set
2.07	Water Spray Bath, For upto 6" dia pipes	1Set
2.08	Haul off, for upto 6" dia, with measuring and auto thickening device	1Set
2.09	Laser printer jet for pipes	1 Set
2.10	Pipe Saw, upto 6" dia, with Chamfering option	1 Set
2.11	Pipe belling machine, Tooling suitable for rubber ring joints upto 6" dia Tooling for Solvent Cement joints upto 6" dia	1Set
3.00	**Extrusion Line II**	
3.01	Single screw line for small diameter pipes especially for medical purposes	1 Set
4.00	**Plastic Injection Moulding Machine**	
4.01	Injection moulding machine (Electric Type), For Pipe fittings Capacity 40--50 Kgs/hour, Clamping force 350 -- 450 Tons	1 Set
4.02	Hooper loader Floor Type, 50 and 75 Kg/hr	2 Sets
5.00	**Injection Moulds pressure type fitting**	
5.01	Injection Moulds for solvent type pressure fitting B.S.4346/B.S (EN) 2000 One each for: ▪ (90° elbow, Tees, Valve Socket) 1/2" 1 each ▪ (90° elbow, Tees, Valve Socket) 3/4" 1 each ▪ (90° elbow, Tees, Valve Socket) 1" 1 each ▪ (90° elbow, Tees, Valve Socket) 11/4" 1 each ▪ (90° elbow, Tees, Valve Socket) 1 ½" 1 each ▪ (90° elbow, Tees, Valve Socket) 2" 1 each	1 Set
	Option inserts for producing faucet fittings	1 Set
5.02	Injection Moulds for solvent type pressure fitting B.S. 4346/B.S (EN) 2000 One each for: ▪ (90° elbow, Tees, Valve Socket) 3" dia, 1 each ▪ (90° elbow, Tees, Valve Socket) 4" dia, 1 each ▪ (90° elbow, Tees, Valve Socket) 6" dia, 1 each	1 Set
5.03	Injection moulds for SWV fitting, One each for:	2 Sets

	32 mm, 40 mm, 50 mm, (90°45° elbows) 1 each	
	Reducer 40 x 50, 50 x 75 mm	2 Sets
	Inserts for M/F	1 Set
5.04	Injection Mould fitting for SWV System, B.S 4515/equivalent ISO sweep bend 92 1/2° (3", 4"), sweep branch 92 1/2° (3", 4") bend 135° (3", 4"), branch 135° (3", 4")	1 Set
5.05	I/O and M/F INSERTS, For above fittings	16 Inserts
5.06	Gully trap moulds, 50 mm x 110 mm, 50 mm x 75 mm	1Set
5.07	Cowl mould 50 mm	1 Set
5.08	P-Trap Moulds (4" dia)	1 Set

COMPOUNDING WORKSHOP

B.	EQUIPMENT NAME	QTY
1.00	High Speed Mixer, 200 Ltr	1 Set
2.00	Low Speed Cooler, 200 Ltr	1 Set
3.00	Extrusion Feed Hopper, 25 Kg	1 Set
4.00	Twin Screw Extruder, 50 Kg/Hr	1 Set
5.00	Hot Cut Palletizer, 50 Kg/Hr	1 Set
6.00	Metal Detector	1 Set
7.00	Vibrator Motor	1 Set
8.00	Exhaust Fan	1 Set
9.00	DOP Charging Pump, 15 Ltr/Hr	1 Set
10.00	DIOP Charging Pump, 15 Ltr/Hr	1 Set
11.00	DINP/DIDP Transfer pumps	2 Sets

SUPPORT FACILITY

C.	EQUIPMENT NAME	Qty
1.00	**Pipe Crushing equipment**	
1.01	PVC pipe crusher, Mouth dimension 750 x 750 mm • Output 100 Kg/hour, Cyclone, Dust collector	1Set
2.00	Storage tank, 2 M^3 Capacity	1Set
3.00	Crane Gantry for injection area, (10 Ton) with 10 Ton Hoist	1 Unit
4.00	350 KVA Diesel/Furnace oil Generator	2 Units
5.00	Air conditioner for Laboratory	1 Unit
6.00	Recycling Unit, 15 Kg/hr	1 Unit
7.00	Incinerator, Double Burner Type	1 Unit
8.00	Compressor	2 Units
9.00	Hydraulic Fork Lifter (Hand Type), 1 Ton and 2 Tons, 1 each	1 Unit
10.00	Trolley, 200 Kg	2 Units
11.00	Mould Temperature Cooling	1 Unit
12.00	Mould Temperature Heating	1 Unit
13.00	Material Dryer, 100 Kg	1 Unit
14.00	Auto Color Mixing Unit	1 Unit
15.00	Vacuum Gas Cleaning	1 Unit
16.00	Water and Sewerage Pumps (2 each)	1 Set

PROCESSING MACHINES

D.	EQUIPMENT NAME	Qty
1.00	Injection Moulding Machine (Liquid Silicone Rubber), Small Unit	1 Unit
2.00	Injection Moulding Machine (Thermoset), Small Unit	1 Unit
3.00	Vacuum Forming, Small Unit	1 Unit
4.00	Sheet Forming With Single Screw Extruder Double Type (Co-Extrusion), Small Unit	1 Unit
5.00	Blow Moulding (Intermittent Type), Small Unit	1 Unit
6.00	Compression Moulding, Medium Unit	1 Unit
7.00	Rubber Extruder, 15 Kg/Hr	1 Unit
8.00	Banbu8ry Mixer, 30 Kg/Hr	1 Unit
9.00	Polymerizer, Lab. Scale Unit	1 Unit
10.00	Calendering Machine, Small Unit	1 Unit

QUALITY CONTROL & TESTING LAB. EQUIPMENT

E.	EQUIPMENT NAME	Qty
1.00	Short term (1 hour) Hydrostatic testing bath, (20° C test) 5 station type Upto 12" dia	1Set
2.00	Long term Hydrostatic test, 20-23° C5 Station type	1Set
3.00	Long term Hydrostatic test, 60° C bath, 5 Station type	1 Set
4.00	Methylene Chloride Test	1Set
5.00	Glycerine test – Heat reversion test	1Set
6.00	Falling ball/weight Impact test equipment, Auto control	1Set
7.00	Softening point test machine, HDT/VICAT type	1Set
8.00	Fracture toughness test equipment, 3" to 12" dia	1Set
9.00	Water quality test lab	1Set
10.00	Opacity test equipment	1set
11.00	Outside dia measurement gauges	1 Set
12.00	Pipe wall thickness measurement gauges	1 Set
13.00	Groove dia and internal dia measurement gauges	1 Set
14.00	Fittings internal dia measurement gauge sets	2 Sets
15.00	Pipe Minimum and Maximum outside dia, Measurement system	2 Sets
16.00	Deionize water unit	1set
17.00	Distillation Apparatus with demineralizer,1.8 Lts/hr	1 Set
18.00	Universal Testing Machine, 10 Tons	1 Set
19.00	DigitalHardness Tester: Shore A & D, Rockwell Hardness with Stand	1 Set
20.00	Fume Hood(Draft Chamber), 1.2 m wide	1 Set
21.00	Profile Measurement for Extrusion	1 Set
22.00	Thickness Gauge: ASTM-D 374, ASTM-D 5199	1Set
23.00	Circumference Measurement for Pipe	1 Set
24.00	Graves Tear Test, ASTM-D 1004	1 Set
25.00	Water Extraction, ASTM-D 3083	1 Set
26.00	Water Vapor Transmission, ASTM-D 814	1 Set
27.00	Torque Tear, ASTM-D 751-B	1 Set
28.00	PPT Resistance, ASTM-D 2582	1 Set
29.00	Trapezoidal Tear, ASTM-D 4533	1 Set
30.00	Puncture Resistance, ASTM-D 4833	1Set
31.00	Humidity Chamber for Testing	1 Set

32.00	Weather Stress Machine	1 Set
33.00	Color Meter for Plastics	1 Set
34.00	Freezer, Chest Type, -30° C	1 Set
35.00	3-D Measuring Machine (3-D MM)	1 Set
36.00	F T N I R with solid and liquid sample preparation accessories, software with DRS, ATR and IR microscopy accessory	1 Set
37.00	Gas Chromatograph with accessories including software and autosampler ▪ Head Space Injector for GC ▪ Molecular Sieve glass and SS columns for GC, 1/8" and ¼" ▪ Capillary columns for GC and GC-MS	1 Set 1 Set 3 Sets 3 Sets
38.00	Thermal conductivity detector	1 Set
39.00	Thermal Analyzer with TGA and DSC, 1 each	1 Set
40.00	HPLC: ▪ Octadecyl (RP column) for HPLC ▪ Refractive Index detector for HPLC ▪ Gel permeation columns for HPLC ▪ Packed column injector for HPLC	 3 Sets 1 Set 3 Sets 1 Set
41.00	Digital Impact Tester, ASTM-D 1822	1 Set
42.00	Creep Tester, ISO- 889	1 Set
43.00	Mullen Type Bursting Strength Tester, Upto 2000 KPa	1 Set
44.00	Oxygen Index Tester, ASTM-D 2863	1 Set
45.00	Ozone Ageing Tester, ASTM-D 1149	1 Set
46.00	Automatic Gas Permeability Tester, ASTM-D 1434	1 Set
47.00	Digital Thickness Tester, JIS-K 6250	1 Set
48.00	Thermally Simulated Current Tester, JIS-K 7131	1 Set
49.00	Ultrasonic Flaw Detector	1 Set

SECOND PLASTIC PROCESSING

F.	EQUIPMENT NAME	Qty
1.00	Slotting Machine suitable for producing Well Screens	1Set
2.00	Belling Machine, 'O' Rubber Ring	1 Set
3.00	High Frequency Welder	1 Set
4.00	Ultrasonic Welder with accessories	1 Set
5.00	Impact Welder	1 Set
6.00	Chamfering Machine	1 Set
7.00	Threading Machine for inner and outer threading	1 Set
8.00	Drilling Machine	1 Set
9.00	Plumbing Tools for 10 students (Several Types)	1 Set
10.00	Bending Machine	1 Set
11.00	Milling Machine	1 Set
12.00	Wire Coating Machine	1 Set
13.00	Printing Machine for plastic packaging	1 Set

PLASTICS DESIGN LABORATORY

G.	EQUIPMENT NAME	Qty
1.00	**Hardware**	
1.01	Computers Pentium 4 for students with one server	25 Sets
1.02	Pentium 4 for teachers	2 Sets
1.03	Laptop Pentium 4 with printer	2 Sets
1.03	Laser Printer, A4	3 Sets
1.04	Laser Printer, A3	1 Set
1.05	Scanner, A3	2 Sets
1.06	Plotter, A1	1 Set
1.07	HUB (with accessories for Network Setup)	2 Sets
2.00	**Software:** ▪ Plascam ▪ Mould Flow, 3-D Analysis ▪ Unigraphics Solutions (Mold/Die Design) ▪ Processing/Piping Training ▪ ANSYS (Product Development Software) ▪ Material Selection ▪ Training Software for Extrusion, Injection Moulding, Blow Moulding and Health and Safety in Plastic Processing	1 Set

TRAINING AIDS

H.	EQUIPMENT NAME	Qty
1.00	Multimedia	2 Sets
2.00	Video player and T.V 32", 2 each	1 Set
3.00	Digital Camera with Zoom	1 Set
4.00	Digital Video Camera with portable recorder	1 Set
5.00	Mobile Stand for Camera	1 Set
6.00	DVD player with T.V	1 Set
7.00	Projector for projection of samples	1 Set
8.00	Books, Journals, Videos and CD-Rom (Please see attachment sheet)	
9.00	Testing and Production Standards: JIS, ASTM, BSS, DIN, ISO, 1 each	1 Set

MAINTENANCE EQUIPMENT

I.	EQUIPMENT NAME	Qty
1.00	Mechanical Tools for maintenance	1 Lot
2.00	Electric and Electronic Tools for maintenance	1 Lot
3.00	Multimeter	1 Set
4.00	Oscilloscope	1 Set
5.00	DC Generator	1 Set
6.00	IC Tester	1 Set
7.00	Circuit Tester	1 Set
8.00	Revolution Counter	1 Set
9.00	Repairing instruments for Computerized equipment	1 Lot
10.00	Special Maintenance Tools for Machines	1Set
11.00	Complete spares set for 2 year normal operation for Machines	1Set

AHSAN SIDDIQI
General Manager Incharge

3.12.2002
PTC - Karachi
Pakistan

企業訪問記録

訪問日	2002/11/20(水)	2002/11/20(水)	2002/11/21(木)
企業名	A.T.S. SYNTHETIC (Pvt) Ltd.	PITAC(Pakistan Indus. Technical Assistance Centre)	Engro Asahi Polymer & Chemicals Ltd.
設立	1970 年	1962 年	PVC ﾌﾟﾗﾝﾄ稼動:1997 年
所在地	Kacha Road, Kahna Nau Lahore	Ferozepur Road, Lahore	Bahria Complex-1 24, M.T. Khan Road Karachi
TEL	042-5271436	042-583-1610	021-561-0619
FAX	042-5271439	042-586-2381	021-5611690
面談者	Mian Sohail Nisar (Director) Mian Anjum Nisar	Jabaid Iqbal Sheikh (Senior Manager) Numan Siddiqui (Senior Manager)	志賀良夫(副社長) 安藤公秀, M. Ali Rizwan 宮崎雅之(工場長)
資本金	ローカル 100%	――――――	ｴﾝｸﾞﾛ 50/旭硝子 30 三菱商事 20
社員数 企業規模	約 600 名(技術者:20) 8000 ﾄﾝ/年(大規模)	275 名	85000 ﾄﾝ/年(大規模) 最大ｷｬﾊﾟ:100kﾄﾝ/年
業種	PVC 製/PE 製ｼｰﾄ 用途:ｼｭｰｽﾞ、鞄、床材 ｻｯｶｰﾎﾞｰﾙ	工業産業省傘下の 機械加工技術支援センタ	PVC 素材生産 用途:ｼｰﾄ、管・継手 靴、建材、他
主要設備	ｼｰﾄ成形機 ｶﾚﾝﾀﾞｰ成形機 ﾊﾞﾝﾌﾞﾘｰﾐｷｻ 乾式混練機 発電機、材料再生ｼｽﾃﾑ	工作機械、CAD 鍛造設備 熱処理設備 標準管理用機材 簡易自動化教育機材	PVC 素材ﾌﾟﾗﾝﾄ 廃液処理ﾌﾟﾗﾝﾄ 発電ﾌﾟﾗﾝﾄ 材料分析 Lab.
企業の特徴等	・ｼｰﾄ成形分野に 32 年の歴史を持つ。主要設備は輸入だが、ﾛｰﾙﾕﾆｯﾄなど主要箇所は独自設計で独製とするなど高度の技術蓄積を有す。 ・ﾎﾞｰﾀﾞﾚｽでの競争意識を有す少数の大企業	・Industrial Eng. Div. を新設し、産業界の課題を収集し、PITAC 内部機能に繋ぐように体制を変えていた。 ・Preventive Maintenance Calibration Center 部門が開設され、UNDP 支援設備類が移設されていた	・PVC ﾊﾟｲﾌﾟ業界に対し施工指導を含めたｻﾎﾟｰﾄを実施しているが、1民間企業の限界がある。 ・ﾌﾟﾗﾝﾄは排水処理なども PES(環境規格)に準じて処理がなされている。
PTC への要望等	①材料分析調査法の指導と技術ｻﾎﾟｰﾄ ②企業対応のﾌﾚｷｼﾋﾞﾘﾃｨ ③外部私企業との友好関係	PITAC は金型技術分野で PTC はﾌﾟﾗｽﾃｨｯｸ加工と材料工学分野に棲み分け協力関係を築きたい	①ﾌﾟﾗｽﾃｨｯｸ加工技術と製品評価技術で産業界を支援 ②PVC ﾊﾟｲﾌﾟ継手の基本技術の支援
面談所感	94 年完成の工場は省ｴﾈ、環境対策、停電対策まで手がけており自社保有技経営感覚含めハイレベル	2000 年の訪問時に比較してﾏｼﾝｼｮｯﾌﾟで外部人材を指導している場面が多く見られた	PVC 生産ﾌﾟﾗﾝﾄは日本の指導により管理レベルも高く外部依存の姿勢はない。中小企業の適正化を希望
評価 技術・設備	B	C～D	A
評価 ﾏﾈｰｼﾞﾒﾝﾄ等	A	C	A

企業訪問記録

訪問日	2002/11/23(土)	2002/11/26(火)	2002/11/27(水)
企業名	Dadex Eternit Ltd.	パキスタン統計局	カラチ大学
設立	1959 年		
所在地	34-A/1, Block 6, PECHS Shahrah-E-Faisal	1-B,S.M.C.H. Society, Karachi	Karachi-75270
TEL	021-431-3680	021-452-6500	021-924-3224
FAX	021-431-5716	021-452-3004	021-924-3190
面談者	Sikander Dada (Managing Director) Tanveer Saleem (Senior Manager) その他3名	Syed Zawwar Haider Zaidi (Deputy Director General)	Prof. Najim Shams Prof. Saira Hameed Prof. Ichya Ninomiya Prof. Muhammad Iqbal Choudhary
資本金	ローカル 100%	――――	国立総合大学
社員数 企業規模	約 550 名 2500トン/年(大規模)	――――	――――
業種 管径	PVC/PE 製パイプ、継手 アスベストコンクリト(AC)パイプ 用途:上水道、排水下水管 灌漑用、電気配線管 ガス管(PE) PVC/PE:3/4"～8"	<訪問目的> パキスタンの統計情報の調査 入手可能な資料の調達	<訪問目的> PTC の関連機関として 両者関係を調査 <対象研究所> ①応用化学/化学工学研 ②国際化学研究センター
主要設備	PVC 用押出し機:1 台 PE 用押出し機:1 台数 高速空冷ミキサー:1 式 射出成形機:1 台(250t) 発電機システム AC パイプ生産ライン:1 本 パイプ評価機器 1 式完備	<調査結果> 種類のパ国統計資料調達	<調査結果> ①プラスティック加工の原理 実験用として学生製作の 簡易実験装置があるのみ (写真参照) ②日本の無償資金援助 ('88)の分析機器を保有
企業の特徴等	・PVC パイプは蘭国 Wavin 社、 PE パイプはベルギーの Eternit 社の技術を導入 ・工場管理は ISO9001 システムで忠実に運営されていた ・PVC:BS3505/PS3051 を取得 PE:API 認証工場 (世界で 4 社のみ)	――――	<PTC との関与> ①4 年生の卒業実習として 3 ヶ月間 PTC に学生派遣 20～30 名程度 (PTC の機材も古いため 企業実習も併せ計 50 名)
PTC への要望等	①PTC のレベルアップ ②中小企業の指導教育によるプラスティック製品品質の向上	――――	<本プロジェクトへの期待> ①最新鋭の機材で実践的 教育の可能性があること
面談所感	中小企業の劣悪品質により プラスティック産業が成長できない 状況に危機感を抱いていた	――――	入学時の半数を成績で振り 落とす程度に厳しく教育され ている
評価 技術・設備	B	――――	――――
評価 マネージメント等	A	――――	――――

企業訪問記録

訪問日	2002/11/28(木)	2002/11/28(木)	2002/11/29(金)
企業名	Acro Plast Inc.	防衛庁住宅供給公社 (DHA)	カラチ上下水道公社 (KWSB)
設立	2002 年	――――――	1957 年より施工実績
所在地	20-40/B, Sector 19, Korabgi Indus., Karachi	Karachi-75270	――――――
TEL	021-506-1122	021-588-6413	――――――
FAX	021-506-1122	021-588-6406	――――――
面談者	Muhammad Ali Shiraze (Managing Director) その他 2 名	Brigadier Asif Ghazail (Administrator) Albert Nasim (Director Engineers)	Mohamad Suleman Chandio (Managing Director) Shamid Saleem Hussain Bna Saleem
資本金	ローカル 100%	――――――	――――――
社員数 企業規模	約 25 名 (小規模)	――――――	――――――
業種	PVC 硬質/軟質ﾍﾟﾚｯﾄ生産	＜訪問目的＞ ｶﾗﾁ市の上水道の PVC 管使用実績と今後の計画調査	＜訪問目的＞ ｶﾗﾁ市の上水道管理 95%占有率の KWSB から PVC 管の現状・今後の計画調査
主要設備	PVC 用押出し機:1 台 PE 用押出し機:1 台 高速空冷ﾐｷｻｰ:1 式 射出成形機:1 台(250t) 発電機ｼｽﾃﾑ AC ﾊﾟｲﾌﾟ生産ライン:1 本 ﾊﾟｲﾌﾟ評価機器 1 式完備	＜調査結果＞ ・ｶﾗﾁは 2m 地下で塩水が出るため PVC ﾊﾟｲﾌﾟを使用したいが 3 年前にﾃｽﾄで失敗し断念 ・鉄管に PE ﾃｰﾌﾟを巻き内側にｺﾝｸﾘｰﾄﾊﾟｲﾌﾟを挿入して使用するが小穴が出来て錆が防げない状況、価格高い (鉄管φ15" 管厚 8～10mm ｺﾝｸﾘｰﾄ管厚 3～5mm) ・Dadex の 12"PVC も失敗 ・失敗内容:水漏れ、割れ接着時に砂をまきこみ接着信頼性低下、異種材料接着も問題あり ・DHA のｶﾗﾁ占有率は 5% ・家庭内配管:3/4"ｻｲｽﾞ	＜調査結果＞ ・PVC 管の施工実績 0.01%以下。使用計画したが、水漏れ等の問題と、破損時のﾒﾝﾃ技術がないため断念 ・現状使用管: AC 管(ｱｽﾍﾞｽﾄｺﾝｸﾘｰﾄ)90 鉄管 10 の比率 (鉄管は鋳鉄管、軟鉄管) ・上水道管:5000 ﾏｲﾙ (ｶﾗﾁ市内が全体の 70%) 管径:3"～84"まで使用 ・下水管:3500 ﾏｲﾙ 管径:6"～62" ・管寿命:32～50 年必要 ・AC 管の欠点も PVC 管の利点も理解しているが採用出来ていない ・ﾎﾟﾝﾌﾟｼｽﾃﾑ:500M ｶﾞﾛﾝ/日
企業の特徴等	・PVC ﾊﾟｲﾌﾟは蘭国 Wavin 社、 PE ﾊﾟｲﾌﾟはﾍﾞﾙｷﾞｰの Eternit 社の技術を導入 ・工場管理は ISO9001 ｼｽﾃﾑで忠実に運営されていた ・PVC:BS3505/PS3051 を取得 PE:API 認証工場 (世界で 4 社のみ)		
PTC への要望等	①PTC のﾚﾍﾞﾙｱｯﾌﾟ ②中小企業の指導教育によるﾌﾟﾗｽﾃｨｯｸ製品品質向上支援	①PVC ﾊﾟｲﾌﾟ信頼性技術向上 ②ﾊﾟｲﾌﾟ性能評価 ③民間企業のﾚﾍﾞﾙｱｯﾌﾟ	①PVC ﾊﾟｲﾌﾟの信頼性向上の支援
面談所感	中小企業の劣悪品質により ﾌﾟﾗｽﾃｨｯｸ産業が低迷することを危惧している	・PVC ﾊﾟｲﾌﾟの施工に関する総合技術と検査体制(ｿﾌﾄ)の両面からの対処が必要	左記に同じ
評価 技術・設備	B	――――――	――――――
評価 ﾏﾈｰｼﾞﾒﾝﾄ等	A	――――――	――――――

企業訪問記録

訪問日	2002/11/29(金)	2002/12/02(月)	2002/12/02(月)
企業名	Prince u. PVC Pipe	PCSIR-Material Science Lab.	Galco (Pvt) Ltd.
設立	1975 年	1953 年	1969 年
所在地	355/C, Mujahid Colony, Sector 4-F, Metrovil	University Road, Karachi-75280	Bank House No1, Habib Square, MA Jinnah Road
TEL	021-665-3038	021-814-1832	021-65-8826
FAX	021-669-6922	021-814-1847	021-693-4660
面談者	Sabir Hussain (Managing Director) その他 3 名	Dr. Kausar Ali Syed Dr. Mohammed Yaqub	Ajaz Mahmood (Chairman)
資本金	ローカル 100%	――――	ローカル 100%
社員数 企業規模	約 40 名 約 500 トン/年(小規模)	全体 176 名 材料科学研 39 名	約 90 名 (中規模)
業種 管径	PVC ﾊﾟｲﾌﾟ 用途:上水道/排水下水管 電気配線管、灌漑用 PVC:1/2"～14"(対応 16"	＜訪問目的＞ ・ﾌﾟﾗｽﾃｨｯｸ材料分析機能確認 ・保有設備ﾚﾍﾞﾙの確認 ・PTC との関連性の考察情報	PVC ﾊﾟｲﾌﾟ/継手 用途:上水道/排水下水管 灌漑用、電気配管用 圧力管:1/2～4"、他:～8"
主要設備	押出し機:2 台(独製～8") (伊製～4") ﾐｷｻｰ:2 台(ｽﾍﾟｱ用) ｲﾝｸｼﾞｪｯﾄ印刷機 発電機(330KWA) 旋盤:1 台、ﾎﾞｰﾙ盤:1 台 (金型内製対応)	＜調査結果＞ ・PTC の上位機関工業産業省とは異なる科学技術省傘下 ・現政権による予算強化により最新鋭分析装置を配備中 ・産業界の分析依頼も受託するが有料(500～1000Rs)では件数わずか ・PTC との関係は所長ﾚﾍﾞﾙでの人材交流のみ ・研究対象はﾀｲﾔ、繊維などが主で、耐久性/耐候性など評価 10 名強の専門ﾒﾝﾃﾅﾝｽ部門を育成しており、精密分析機器の保全維持を実現している	押出し機:2 台 継手用射出成形機:4 台 ﾐｷｻｰ、 旋盤:3 台 } 継手金型 ｼｪｰﾊﾞ:1 台 } 内製 4 名
企業の特徴等	・押出し機、評価機器、金型内製まで対応 ・材料はｴﾝｸﾞﾛと添加剤はｼﾝｶﾞﾎﾟｰﾙから輸入 ・BS3505、PSI3051 を取得 ・作業者教育等に懸念あり		・1967 年のｱﾛｹﾐｶﾙ(日本企業との合弁)から業界関与しており、多くのﾌﾟ業界協会形成実行 ・PVC ﾊﾟｲﾌﾟｸﾞﾙｰﾌﾟも初代代表。実質機能はない ・継手市場の占有率 85%と発言あり
PTC への要望等	①ｵﾍﾟﾚｰﾀ、技術者教育 ②材料分析の支援 ③大口径生産技術指導 ④生産性、品質改善の向上支援 ⑤ｽｸﾘｭｰ等のﾒﾝﾃﾅﾝｽ指導	①対象産業が多少異なるため補強を強く希望していた ②ﾌﾟﾗｽﾃｨｯｸ加工技術では PTC が唯一機関であるとのことで人材開発等に期待	①実質的ｽﾀﾝﾀﾞｰﾄﾞ機能実現 ②小規模企業のﾚﾍﾞﾙｱｯﾌﾟ
面談所感	設備構成はどの企業もほぼ同じ、材料技術と作業者教育、ﾒﾝﾃがﾎﾟｲﾝﾄ	・50 百万 Rs の低金利融資政策を政府発表とのことで PTC も活用すべきと提言あり	・ﾊﾟｲﾌﾟ業界の実情に詳しく実態に危機感を持っている ・品質保証できるのは同社と Dadex の 2 社のみと発言
評価 技術・設備	C―	――――	B
評価 ﾏﾈｰｼﾞﾒﾝﾄ等	C―	――――	B

企業訪問記録

訪問日	2002/12/04(水)	2002/12/04(水)	2002/12/05(木)
企業名	Shafisons Eng. (Pvt) Ltd.	ASCO Plastic Industries Works	AL-RAAI PVC Pipe
設立	1994 年	2001 年	1976 年
所在地	10-Saint Marry Park, Gulberg 111 Lahore	T-No4 Sanda Kalan, Near Pepsi Godown, Band Road Lahore	Rehman Road, Chaman Colony, Shahdra,Lahore
TEL	042-588-0151	042-721-4789	042-792-0094
FAX	042-585-0923	042-765-5369	
面談者	Laeeq Ahmad (Director) M. Abdul Shakoor (Co-Ordinator)	Asif Ali (Managing Director) 以下3名	Muneer Ahmad Sajid (Chief Executive) Ali Hassan (Poly Tech Eng. Pvt. Com.)
資本金	ローカル 100%	ローカル 100%	ローカル 100%
社員数 企業規模	約 40 名(2 直) 1000 トン/年(中規模)	約 20 名(2 直) 500 トン/年(小規模)	約 10 名 600 トン/年(小規模)
業種 管径	上水道用プレッシャパイプ サニタリ用 SWV パイプ 電気配線管、輸入継手販売 1/2～12" (24"対応可)	上下水道用プレッシャパイプ 灌漑用パイプ 化学薬品排水用管、継手 1/2～8"(計画:~12")	上下水道用プレッシャパイプ 灌漑用パイプ 電気配線管、他 1/2～20"(Die:24"保有)
主要設備	押出し機:4 台 (中古:独、英、蘭製、内製) ミキサー、大型旋盤:2 台 ＊評価 LAB.保有	押出し機:2 台 (中古:シンシナティー、他) 射出成形機(中古日本製) ＊評価 LAB なし(計画中)	押出し機:3 台 (中古:独、内製 2 台) 大型旋盤:3 台
企業の特徴等	・ISO9002 取得済み ・BETA PIPES 商標で主要新聞に PR 掲載 ・UNICEF の認証を得てアフガン/パキスタン水道管採用(生産の 40%) ・施工実験等まで実地評価 ・金型内製	・品質勝負で輸入品市場のシェア拡大を狙っている。 ・ISO、評価機器の整備を次期整備課題として計画中 ・作業者教育等課題認識有り	・1966 年に日本から技術導入して操業開始したアロケケミカルから独立して設立。同国のパイプ産業の創設に関与したと誇っていた ・金型内製技術、機械化技術高いが材料混練が手作業等で懸念有り
PTC への要望等	①作業者、エンジニア、マネージャ対象の教育研修コース ②パイプ金型の材料、加工技術、情報のサポート	①最新装置の性能を知りたい ②教育研修コース ③パイプ標準化の実現	①教育研修コース
面談所感	自社 PR も含め熱意ある姿勢がうかがえた。 自社保有技術にプライドを持って説明受けた	新しい経営による競争力あるパイプ事業の形成意欲がうかがえたが、作業者、技術者教育、品質など課題あり	予約なしの訪問にもかかわらず全てオープンで歓迎を受けた。機械系に強みを有すが化学系に弱い
評価 技術・設備	B	C	B
評価 マネージメント等	B	C~D	C~D(品質管理等)

企業訪問記録

訪問日	2002/12/05(水)	2002/12/11(水)	2002/12/11(水)
企業名	POLY TECH ENGINEERING	AKBAR & ZIKRIA PIPES (Pvt.) Ltd.	Telecom Foundation (Pipes) Ltd.
設立	————	1980 年　　2002 年	1996 年
所在地	Chaman Colony Rehman Road Shahdara, Lahore	Street-2,1-9/3, Industrial Area,Islamabad	————
TEL	042-792-8404	051-443-7401	051-443-1146
FAX		051-443-7403	051-443-1145
面談者	Ali Hassan Imran Hassan	Sh. Muhammad Arshad (Managing Director)	Syed Mahmood Ahmad (Managing Director) Muhammad Ghani (Manager,Prod&Mktg.) その他4名
資本金	ローカル　100%	ローカル　100%	Telecom Foundation:60 PTCL:40
社員数 企業規模	約 7 名 (小規模)	約 35 名(含化学:1 電気:1) 生産計画中(中規模)	約 70 名 2500 トン/年(大規模)
業種 管径	ﾊﾟｲﾌﾟ用押出し機 周辺機器1式 ﾊﾟｲﾌﾟ用金型 対応金型 24"まで可能	上下水道用圧力管 灌漑用ﾊﾟｲﾌﾟ 化学薬品排水用管 1/2～14"(~16"まで対応可)	ﾊﾟｷｽﾀﾝ Telecom への ｹｰﾌﾞﾙ/ﾌｧｲﾊﾞ独占供給 上下水道用圧力管(～6") 導管(～6")
主要設備	大型旋盤:3 台 ボール盤	押出し機:2 台 (中古:ｵﾗﾝﾀﾞ Rolleparl 製) 自動ﾊﾟｲﾌﾟｶｯﾀｰ 高速ﾐｷｻｰ 1 台、 旋盤 1 台 評価試験機 1 式	押出し機:3 台 (中古:ｼﾝｼﾅﾃｨ 3 台) 高速ﾐｷｻｰ:2 台 評価試験機 1 式
企業の特徴等	・PVC ﾊﾟｲﾌﾟ生産設備 1 式の製作が可能 ・ﾌｨﾙﾀ用ﾊﾟｲﾌﾟの溝加工機の設計はここがｵﾘｼﾞﾅﾙ ・大型(～24")まで対応可とPR ・金型用鋼材が入手不可と発言(船廃材利用)	・'02 に会社再生 ・'80 設立当初は蘭国ｳｫｰﾍﾞﾝ社の技術導入 ・ISO9001、ISO1401 取得 ・現時点で 14"ｻｲｽﾞﾊﾟｲﾌﾟ生産出来るのはここのみとのこと ・ｽｰﾊﾟｰﾊﾞｲｻﾞ:30 年経歴 ・保有設備は省人化	・国営通信関連企業から独立した経緯がありｹｰﾌﾞﾙ/ﾌｧｲﾊﾞは独占 ・UNICEF 向けに上水動用圧力管を供給 ・ISO9002 取得 ・現状 PVC のみだが PE も計画中
PTC への要望等	①金型に関する情報提供 ②金型材料情報 ③ﾊﾟｲﾌﾟ標準化の実現	①現地を訪問し実地ｻﾎﾟｰﾄを望む ②PVC ﾊﾟｲﾌﾟとその他のﾊﾟｲﾌﾟの特徴比較と啓蒙期待	①通信用途管の評価試験機材の整備追加 ②PVC 材料費安定化の政策支援 ③PVC 以外の材料指導
面談所感	・ﾊﾟｲﾌﾟ生産設備の供給が可能であることを初めて知った。限られた加工機で工夫して対応、ﾂｲﾝｽｸﾘｭｰも製作	・ﾊﾟｲﾌﾟ業界で 22 年間の営業経験者と MTG が持て、同国全体の環境が把握できた。 ・熱意ある企業であった。	・通信関連からの創業で圧力管等の評価機材も保有設備の割りに非力。 ・ﾏﾈｰｼﾞﾒﾝﾄ体制は良
評価 技術・設備	B	B+	B
評価 ﾏﾈｰｼﾞﾒﾝﾄ等	C	未知数(未稼働)	B+