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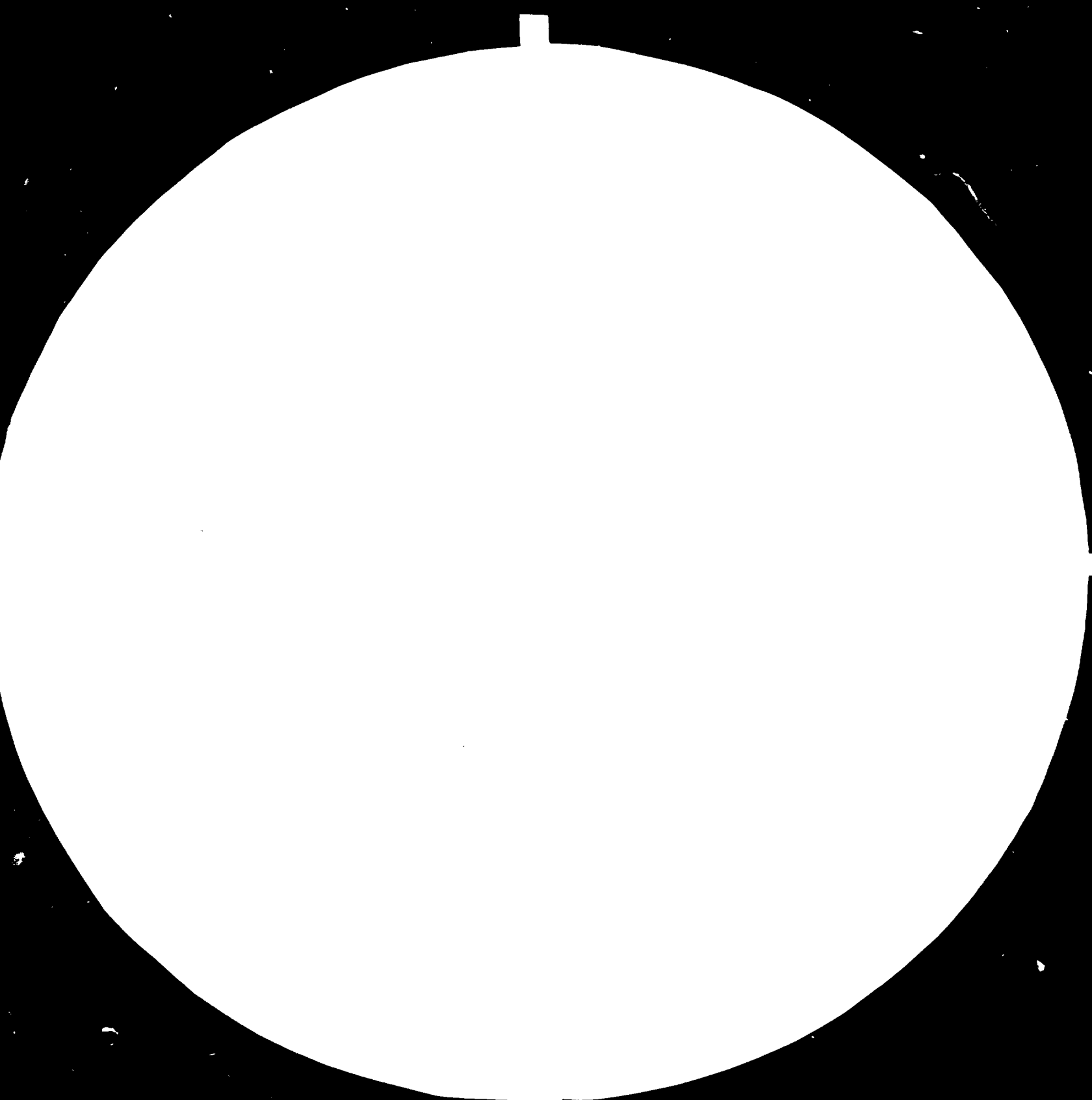

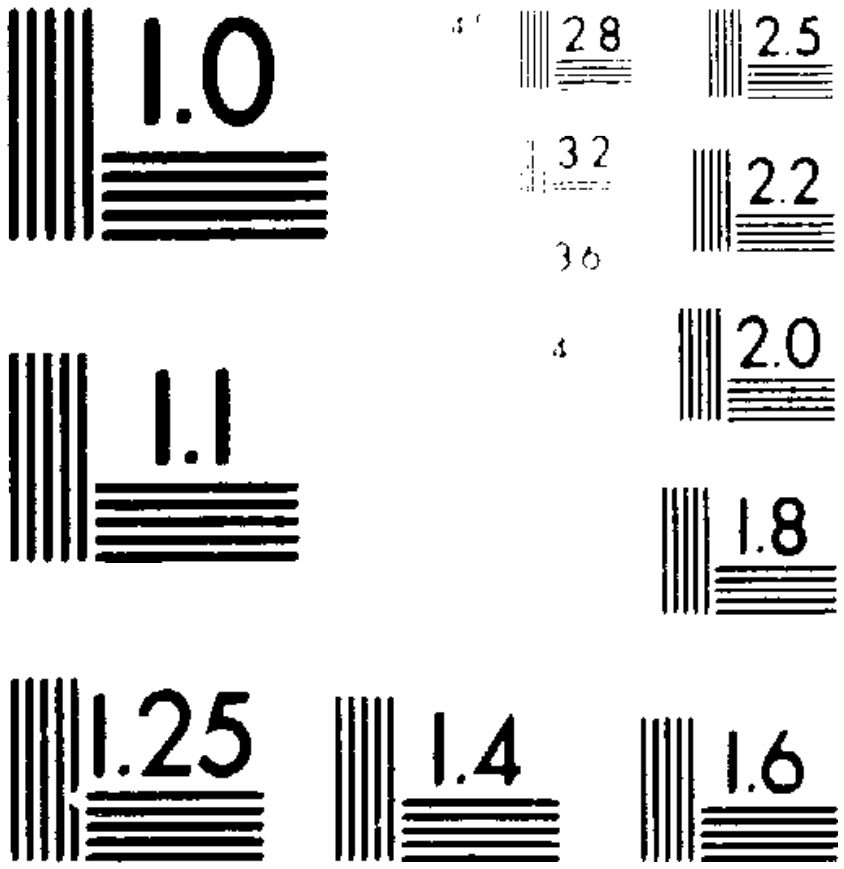

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Date: 1st October 1984

Plastics Materials & Product Testing Programme in India

(DP/IND/82/044)

One Year Mission Report

Prepared for the Government of India
By the
United Nations Industrial Development Organization
acting as executing agency for the
United Nations Development Programme

Based on the work of Dr. C.Brignone
Chief Technical Advisor

United Nations Industrial Development Organization
VIENNA

This report has not been cleared with the United Nations Industrial Development Organization which does not therefore necessarily share the views presented (1)

2948

(1) To be omitted after clearance by UNIDO.

CONTENT

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LIST OF ABBREVIATIONS

A/C.	-	Air-conditioning;
ASTM	-	Americal Standards;
BS	-	British Standards;
CIPET	-	Central Institute of Plastics Engineering and Tools;
CTA	-	Chief Technical Adviser;
DIN	-	German Standards;
ISI	-	Indian Standards;
ISO	-	International Standards;
PE	-	Polyethylene;
PS	-	Polystyrene;
PTC	-	Plastics Testing Centre;
PVC	-	Polyvinyl Chloride.

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S U M M A R Y

This is not a Terminal Report but only a one year mission final report. The Project DP/IND/82/044 is still to be brought to an end, and it will take atleast another year before it will be completed.

The main activity of my mission as the Chief Technical Adviser was to advise the Director/Project Co-ordinator about the implementation of the project by means of:-

- Organization of test laboratories, selection and recommendation of the equipments;
- Installation, Commissioning and Maintanance of the equipments;
- Training of the Staff/Personnel and industries people in the various aspects of quality control and testing;
- Organization of training courses, seminars etc;
- Advisory services and technical assistance to the plastic industries;
- Collection and dissemination of technical data related to the plastic industries;
- Formulation and supplementation of test standards;
- Co-ordination of the Expert/Consultants assignment as well as fellowships and study tours;
- Fabrication of simple test equipments;
- Establishing training and testing services in the CIPET Extension Centre of Ahmedabad;
- The target of the above detailed activities is to give the plastic industry in India the proper assistance in bringing about quality improvements to substain plastic applications in agriculture buildings, electronics, packaging etc. both for domestic market and for export.

Most of these objectiveswere achieved, but the great delay in the construction of the PTC Buildings in Madras and in the Extension Centre of Ahmedabad hinders the optimum utilization of the resourses provided by UNIDO/UNDP.

STATUS OF THE PROJECT ON OCTOBER 1983

As Chief Technical Adviser, I joined the project only on October 1983 notwithstanding my availability for October 1982. Therefore, I found that most of the requisition for purchasing the equipments were already done. Several equipments were already received and commissioned and good part of the technical staff already recruited and trained on the existing instruments.

Some Quality Control Seminars and Testing Courses were already performed. One Expert on Ageing of Polymers was completing his mission, but there was enough time to discuss with him about his findings and recommendations. (See Mr. H.Burns Report dated 28th October 1983).

Several meetings were held with the Senior Plastics Engineer revising the organigram, the laboratory lay-out, the specifications of the equipments still to be purchased and to organise work programme for the various Assistant Engineers.

The buildings to house the UNDP equipments and the staff of PTC, were not yet started and all the activity is carried out in old or temporary premises.

The UNDP Financial input amounting to $ 1,059,00 was increased on May 1984 for an amount of $ 202,550 to cover the cost excalation for fellowships and for procurement of remaining items of equipment, which purchase was stopped due to the cost increase of the same.

The Indian Government inputs amount to Rs.27,425,100. Upto the end of August the Indian Government input amounted to Rs.7,135,683 out of which Rs.1,462,200 for the new building.

OBJECTIVES AND LOGIC OF THE PROJECT

The Central Institute of Plastics Engineering & Tools (CIPET) has completed the project DP/IND/74/052 on December 1982.

A well equipped and modern laboratory has been organised, divided in 5 specialised sections. They have been installed 23 equipments and 15 additional accessories and spares supplied by UNIDO/UNDP. Another 56 equipments were supplied under Government of India assistance programme.

A group of technical personnel was selected based on their academic records and back-grounds and trained abroad by fellowship.

Several courses covering all the aspects of plastic technology were introduced at different levels of education and particular emphasis was given to "Quality Control & Testing of Plastics". A large number of testing assignment was carried out for adaptation/ application in various industries mainly of small and medium scale. Several free consultancy services were rendered related to selection/ substitution of materials in the packaging, building and electronic areas.

The Project DP/IND/82/044 which practically is complementary of the first one is intended to be implemented in two stages. The proposed duration for stage-I is two years and six months starting from October 1982. The IInd Stage will be taken up from April '85 after further reciew to assess the progress of the 1st stage of the project undertaken.

The 1st stage provides for strengthening the existing training and testing facilities in finished plastic products, while the 2nd stages envisages to meet the sophisticated needs of the plastic industry. During the first stage it is also proposed to establish training and testing facilities at Ahmedabad, Gujarat to serve the growing needs of Western Region of the country.

The Ahmedabad Extension Centre was planned by Government keeping in mind that 45% of processing capacity of plastic is located in the Western Region and there is a large demand of the service like CIPET for training and testing facilities.

ACTIVITIES CARRIED OUT AND OUTPUTS PRODUCED

MADRAS:

The construction of a new building of two floors with a floor area of 1000 m^2 on each floor was started at the end of January 1984 instead of October 1982 as planned. The building is expected to be operational probably on March 1985.

As soon as I arrived, I made several recommendations on the construction, mainly to avoid modifications during the constructions itself. Unfortunately several changes were made with unavoidable delay. I foresaw the utilisation of a consultant for planning and asked UNIDO for a proper person but the impossibility to reach him before the start of construction works compelled me to cancel this consultancy. The new building covers an area of about 1,000 sq.mt. on two floors each one of the same size. On the ground floor there will be the specimen preparation and the product testing lab plus the reception and offices (see Drawing No.1). The equipment are indicated in the attached list No.1. On the first floor there are the: Physico Mechanical Lab., the Electrical, Optical, Chemical, Thermal, Rheological and Characterization laboratories plus staff room, library and classes (see Drawing No.2). The equipments are indicated in the actached list No.2).

All the equipments to be purchased out of UNDP funds have been requisitioned. A delay in purchasing was caused by lack of funds, but on May 1985 an additional allocation of 202.550 dollars was granted, thus permitting the procurement of all the equipment indicated in the project.

Over 46 items 31 were received, of them 25 commissioned, 5 ordered but not yet received, 8 requisitioned but no offer received. Two items (No.12 & 22) cancelled as they will be made in CIPET Tool Room. (See Annexs X & XI - UNDP/Govt. Equipments)

The Weatherometer, requires a better cooling equipment, due to the Madras severe climatic conditions, and the requisition was already issued to UNIDO.

On the installed and commissioned equipments staff has been trained and equipments used for testing and training purposes. Until the new premises will be available will be very difficult to position any new equipment and to commission the same. The existing equipment was found in good working condition and the staff to be trained on it. As against 36 Government·test equipments 27 were received.

- The today's man-power is formed by the first group of Technical personnel with academic back-ground and practical experience and most of them were sent on fellowship abroad for specialised training in their specific area. Over a total of 32 persons foreseen by the project 24 are now in position (see Annex.I). For the other advertising will be made and recruitment is delayed untill march 1985 when the new premises will be ready. At present there is no room available for other people.

  I asked to change the designation of the Foremen which was not giving enough emphasis to these technical positions and since August 1984 the designation was changed from Foremen into that of Assistant Engineers. A job description was written for all the technical people in order to define their responsibilities. A letter was written to CIPET Chairman in order to improve the motivation of the Assistant Engineers. One of the Assistant Engineer after returning from fellowship did not show in any more.

- Of the total of 17 fellowship, 9 have been completed and the relative reports were already submitted to UNIDO/UNDP except for that one of the missing Asst. Engineer. Details are given in Annex.II).

- Only two UNIDO Experts over 6 have completed their assignments. Mr.H.Burns in Ageing of Polymers and Dr.Ing.G.Mennig on Flow Behaviour of Polymers. Reports on their missions were already submitted to UNIDO/UNDP, after discussing the findings with the writer. The local project authorities have still to decide about the nomination and the exact schedule for the other Experts and Study Tours.

  A new procedure was agreed with the Director of CIPET, in order to have the expert accomplishing in the best way their mission.

  The selected Experts, before their arrival, should contact the CTA and CIPET Director in order to find out if the equipments necessary for their mission are already on the site and properly working and whatever information is necessary to perform their job.

  UNIDO should be requested to provide the proper assistance in order to ensure good communication links.

- To be aware of the reasons of the scarce flow of testing samples and in order to have a better understanding of the feeling of the plastic industries about their quality conciousness, a questionaire was disseminated in the whole country. The 39% of the companies investigated answered to the questionaire; over these 91% were processors. 73% received complaints from their customers, but only 43% of those complaints involves financial problems. Most of the complaints are related to the mechanical properties and colour of the product. Only 19% receive from the raw material manufacturer a leaflet describing the analytical properties.

Only 24% are in the position to control essential properties of the product, 40% of the producers have some laboratory facilities to check raw materials and finished products. 30% are willing to set up a control laboratory. 88% are already aware of CIPET facilities and all of them declare they intend to use CIPET laboratories, also if in some cases they are making some remarks about the cost of analyses or about the difficulties due to the distance and poor communications.

To check the performance level of the instruments operator some industries and institutes were asked about availability of calibration samples. Only Polychem was able to send CIPET one sample of PS Crystal and one of High Impact. Satisfactory results were obtained. But the investigation is still going on in order to find other plastic grades and suppliers of the same.

Testing, Consultancy and Advisory Services to Plastic Industries:

The increase of work load is clearly shown by the attached graph. 1 The not steady increase of the slope can be explained with seasonal requirements by part of the industries.

- Some of the major testing and consultancy/advisory services undertaken during this first 21 months of the project are listed in Annex. III.
- Many Consultancy/Advisory services for selection of suitable materials, defect remedies and equipment selection were rendered though correspondance. In addition several consultancy were given to people visiting CIPET about identification and selection of materials and test equipments. An average of 50 people per month visited CIPET facilities having discussion with staff members.
- A test specimen mould was fabricated for Ahmedabad. Other equipment for industries are:-

  Dart Impact Tester; Carbon Black Determination Apparatus; & Specimen Notcher.

The most important visits paid to Industries/Institutes are listed below:-

Period	Name of the Industry/Institute	Place
21.12.1983	M/s. Polychem Ltd.,	Bombay
23.12.1983	Indian Petrochemicals Corpn. Ltd.,	Baroda
24.12.1983	National Organic Chemical Inds. Ltd.	Bombay
19.01.1984	M/s. Polyene General Inds.(P) Ltd.,	Madras
20.01.1984	M/s. Eagle Flask Pvt. Ltd.,	Madras
08.02.1984	M/s. Toshniwals' Exhibition	Madras
09.02.1984	Indian Institute of Packaging	Madras
13.02.1984	M/s. Mettur Beardsell Ltd.,	Madras
14.02.1984	FAO Fishing Ship-yard	Madras
20.02.1984	M/s. Wavin India Ltd.,	Madras
02.03.1984	M/s. Govel Plastics Pvt. Ltd.,	Madras
09.03.1984	M/s. Vadhyar Boats	Madras
04.04.1984	The Plastic & Rubber Institute	Hyderabad (Ann.IV)
05.04.1984	M/s. U-Foam Pvt. Ltd.,	Hyderabad
05.04.1984	M/s. Bakelite Hylam Ltd.,	Hyderabad
06.04.1984	M/s. Indian Telephone Industries	Bangalore
23.08.1984	M/s. Riviera Polymers (P) Ltd.,	Ahmedabad
27.08.1984	The Indian Plastics Federation	Calcutta (Ann.V)
28.08.1984	The National Test House	Calcutta

In addition to these visits several Managers or Technical people from plastic industries of all India were met at CIPET during their visits to the PTC to discuss technical problems or request of consultancy.

Courses & Seminars:

The Courses in Plastic Materials, Quality Control & Testing of Plastics are conducted by the Centre, but its technical personnel is actively associated in the courses conducted by other divisions of the Institute. (See Annex: XII, XIII & IVX)

These courses are attended by a wide selection of producers, Managers & Technicians engaged in the plastic industries. The course lectures are integrated with discussion, practical exercises, demonstrations and industrial visits.

The PTC Staff participate also to external short-term courses organised by other Institutes.

CIPET is conducting also a training activity for the benefit of foreign students, with the endorsement of UNIDO/UNDP. In 82/84 the following trainings were made about 21 (See Annex: VI).

UTILIZATION OF PROJECT RESULTS

The results obtained under Project IND/74/052 were upgraded including Quality Control & Testing of Plastic Materials in the sillary of the already offered courses in Plastic Material Testing etc. The equipments untill now received provided new facilities in quality control testing and advisory services in the specialised areas of finished products like Pipes, Films, Sheets etc.

With the fabrication of simple test equipments, small scale industries were put in condition to fulfill their quality control requirements.

Data collection on raw materials and processing equipment was quite often utilised in the advisory/consultancy services.

ACHIEVEMENT OF IMMEDIATE OBJECTIVES

(a) The existing plastic testing laboratories were strengthened upto the extent of the equipment received untill August 1984. They have the capacity to provide plastic product testing services to Small Scale Industry thus ensuring that their products are in conformity with appropriate national standards.

(b) CIPET acquired enough capability in supplementation of the existing standards. Compilation of comparison of the various standards (ASTM, ISO, BS, ISI, DIN) has been completed. CIPET participation to ISI Standards compilation and revision is continuous.

(c) It was prepared in July 1984 a syllabus for One year diploma course on "Plastics Testing & Quality Control".

(d) The technical information service appropriate to the needs of the plastic industries was established and it is in continuous development.

(e) Already three simple testing devices were designed and fabricated.

(f) The Extension Centre of Ahmedabad in the Western Region was established in temporary premises and some training and testing services were rendered.

-:oOo:-

F I N D I N G S

1. - Plastic testing service continued its activities in both training and testing services;

   - The testing equipments procured by UNIDO/UNDP and by the Indian Government were set up and commissioned;

   - A booklet was compiled for every instrument containing all the relative information, sample sheet for data collection and instructions for evaluation of results;

   - A revised volume on training programme on "Quality Control & Testing of Plastics"was issued on October 1983;

2. - Testing & Advisory services has been rendered to a great number of companies to determine the various properties, like Mechanical Thermal, Physical, Electrical on both indigeneous and imported raw materials. Several were the requests for identification of polymers, mainly for the substitution of imported raw materials with indigeneous ones.

3. - All the International and National standards, like ASTM, ISO, BS, IS & DIN are available at PTC. An excellent work of comparison among them was made by PTC Staff.

   PTC is taking part of the current activities of the Indian Institute of Standardization. With this background CIPET is in the position to reach the status of a National Test House. During the last Project Advisory Committee Meeting/Tripartite Review Meeting held on June 28/29, it was again asked the Advisory Committee to speed up the necessary steps to reach this status.

4. - To the already established training courses it was just added a one year course for a Post-graduate diploma in Plastic Testing and Quality Control.

5. - A report was prepared by CIPET management and submitted to the proper Govt. authorities for the establishment of other Four Extension Centres.

In general I found CIPET well prepared to meet its institutional duties in all the activities concerned; it is Tool Making, Mould Making, Drawings of Tools & Moulds, Testing and Research works. But a better co-ordination is necessary among the various department in order to avoid unnecessary conflicts and consequent delays in the assignment and delivery of works.

Staff needs to acquire a self motivation and the feelings of team work.

On July 1984 a Director was appointed for the Madras Centre and a Deputy Director for the Extension Centre of Ahmedabad. These appointments will fill the gap in the management of the two centres.

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RECOMMENDATIONS

- In view of the establishment of CIPET as National Test House and due to its international activity as a centre of data collections and dissemination, it is necessary to improve the communication system by means of a new Telephone Switch-board and a Telex.
- To improve the knowledges of the last developments in plastic technology, processing, testing etc., it is necessary that the Technical Magazines will arrive by air and not after several months by regular mail as it is now.
- Temporary arrangement should be avoided in case New Extension Centres will be authorised.
- A modular type of construction should be selected and approved, thus avoiding discussion and consequent delays.
- No equipments should be purchased untill the building construction has been initiated and the Director appointed.
- Use Mr. Sekhar Rajamanickam to prepare a Pert network for Ahmedabad Building and when necessary for the other Extension Centres buildings.

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AHMEDABAD CENTRE

The Ahmedabad Extension Centre, in the Western Region was planned by Government, keeping in mind that 45% of the Processing Capacity of Plastic is located in that region, mainly PVC & PE Processors. Therefore the need of services like CIPET for training and testing facilities to support the small scale industries.

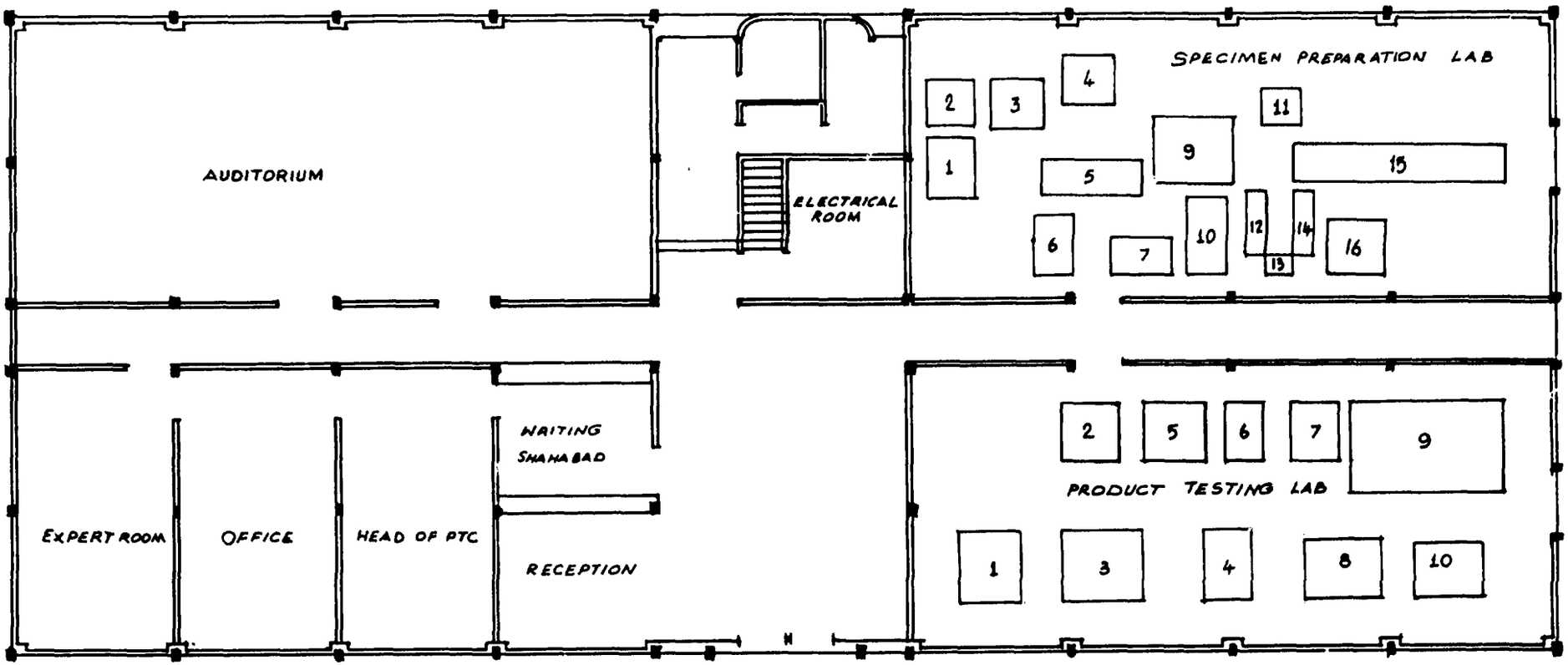
A Tool Room, a Processing Shop & Design facilities were being set up in Ahmedabad in temporary premises. To these facilities was added a testing laboratory through the acquisition of equipments supplied by UNIDO/UNDP and the Indian Government.

The first group of building, which will house the above said facilities, seems to be finally in the construction stage (see general lay-out enclosure) and the appointment of a Deputy Director should improve all the operations connected. Whilst the Tool, Processing and Design Sections already started some activities, the laboratory facilities were able to start operation only on August 1984 when A/C was supplied and a Mould for Test Specimen was provided from Madras.

Two long-term courses on "Mould Design & Mould Making" and one short-term course on Plastics Processing were given. The attendance to these courses is quite good.

Twenty technical and supporting staff are assigned against the 53 foreseen. The hiring will progress according to the availability of the premises and the work requirements. (Seen Annex: VIII) 35 Government provided equipments for the Tool Room and Processing have been received. 19 UNIDO/UNDP test equipments were also received and partly commissioned (See Annex: IX).

As far as outputs produced and utilization of project results, we can just say that all the activities started but the settlement in temporary premises, will not permit the full utilization of all the facilities provided.



DRAWING NO. 1

CIPET - PRODUCT TESTING CENTRE - GROUND FLOOR PLAN - SCALE :- 1" : 60'0".

DRAWN :- D. SOLOMON

List of Drawing No.1

INDEX FOR LAB EQUIPMENTS (Ground Floor)

PRODUCT TESTING LAB:

1. Universal Tester
2. Falling Weight Impact Tester
3. Long-term Testing of Products
4. Dynamic & Fatique Testing of Products
5. Drop Impact Tester
6. High Speed Mixer
7. Lab. Blender
8. Weather-o-meter
9. Pipe Testing Machine
10. Place for Technical Assistante

SPECIMEN PREPARATION LAB:

1. Place for Technical Assistant
2. Contour Cutter
3. Strip Cutter
4. Oven
5. Nuchem Press
6. Three Role Mill
7. Hydraulic Press
8. Mould Bench
9. Thermoset Injection Moulding Machine
10. Lab. Calender
11. Scrap Grinder
12. Working Bench
13. Drilling Machine
14. Working Bench
15. Special Injection Moulding Machine
16. Band Saw Machine
17. Mould Bench.

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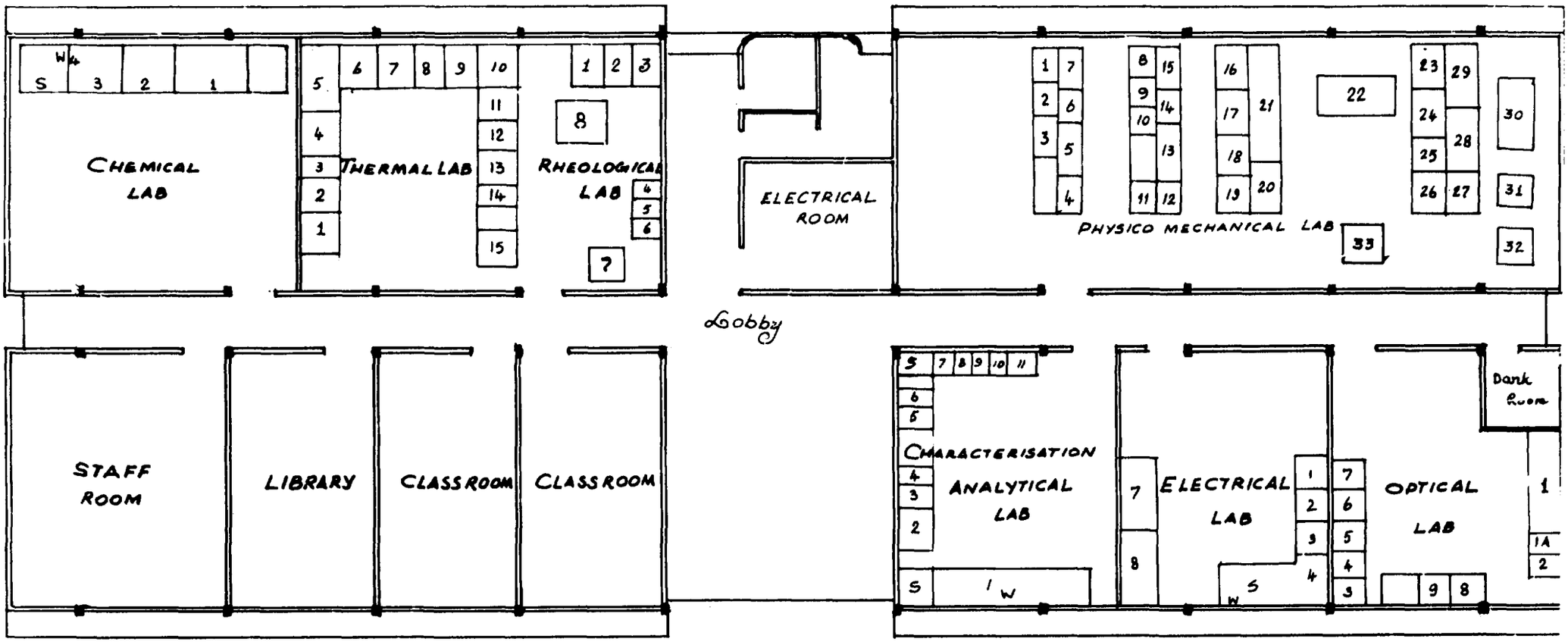


DRAWING NO. 11

CIPET

PRODUCT TESTING CENTRE FIRST FLOOR PLAN

SCALE: 1":16'0", DATE: 17·9·84, DRAWN: D. Solomon.

List of Drawing No.2

INDEX FOR LAB EQUIPMENTS (First Floor)

OPTICAL LAB:

1. Haze/Gloss/Clarity
1-A Thickness Gauge
2. Perfractometer
3. Stereomicroscope
4. Polarising Microscope with Hot Stage
5. Universal Phase Contrast Microscope
6. Polariscope
7. Colour Difference Meter
8. Optical Stress Bench
9. Calorimeter (Yellowishness Index Tester)

ELECTRICAL LAB:

1. Comparative Tracking Index Tester
2. Arc Resistance Tester
3. Electrostatic Meter
4. Volume & Surface Resistivity Tester
5. Power Factor Permitiority Tester
6. Dielectric Break Down Voltage Tester
7. Dielectric Constant Tester

CHARACTERISATION/ANALYTICAL LAB:

1. Thermal Analyser (DSC/TGA/DTA)
2. Rheovibran Viscometer
3. Hopper Viscometer
4. Brookfield Viscometer
5. Ubblehold Viscometer
6. Centrifuge
7. Conductometric Titration
8. Potentiometric Titration
9. pH Meter
10. Polarograph
11. Thin Layer Chromatography.

List of Drawing No.2

PHYSICO MECHANICAL LAB:

1. Peel Strength Tester
2. Adhesion Tester
3. Ultrasonic Tester
4. & 5. Balance
6. Specific Gravity
7. Density Gradient Column
8. Tear Tester
9. Slip & Friction Tester
10. Thickness Gauge
11. Gas Permeability Tester
12. Rockwell Hardness Tester
13. Shore Hardness Tester
14. Barcol Hardness Tester
15. Micro Hardness Tester
16. Taber Abrasion
17. Surface Resistance Tester
18. Abrasion Tester for Flexible Materials
19. Mar Resistance Tester
20. Bend Tester
21. Tensometer
22. Instron
23. & 24. Impact Tester
25. Notch Cutter
26. Fatigue Tester
27. Folding Endurance Tester
28. Dynamic Ball Burst Tester
29. Burst Strength Tester
30. Long-term Static Tester
31. Dart Impact Tester
32. Blue Star Testing Machine
33. Place for Technical Assistant

THERMAL LAB:

1. Marten Heat Stability Tester
2. Vicat Softening Point (Local)
3. Heat Distortion Temp./Vicat Softening Point
4. Koffler Hot Bench
5. Air Oven
6. Oil Ageing Bath
7. Crystalline Melting Point
8. Thermal Conductivity (Local)
9. Thermal Conductivity
10. Dialtometer
11. Clash & Berg Apparatus
12. Specific Heat Apparatus
13. Low Temp. Brittleness Apparatus
14. Balance (Electronic)
15. Vaccum Oven
16.

CHEMICAL LAB:

1. Identification
2. Constant Temp. Water Bath
3. Resin Preparation
4. Fume Champer
5. Hot Water Bath
6. Sohxlet Extractor Assembly
7. Distillation Assembly
8. Environmental Stress Cracking
9. Melting Point Apparatus
10. Hot Plate Cum Magnetic Stirrer - 2 Nos.
11. Nitrogen Estimation
12. Balances
13. Resin Kettle
14. Blender
15. 'U' Tube Viscometer
16. Ovens
17. Nitrogen/Oxygen Gas Cylinders
18. Racks for Chemicals
19. Refrigerator

List of Drawing No.2

RHEOLOGICAL LAB:

1. Malt Flow Index
2. Hakke Viscometer
3. 'U' Tube/Brook Field/Falling Ball Viscometer
4. Extrusion Plastometer
5. Cone & Plate Viscometer
6. Future Expansion
7. Capillary Rheometer
8. Brabender

ANNEX: I

GOVERNMENT PERSONNEL

Madras Centre:

S.No.	Designation	Name of the Person	Time
1.	Sr. Plastics Engineer	Dr. K.Ramamurthy	Full
2.	Assistant Engineer	Mr. C.S.Rajamanickam	-do-
3.	Assistant Engineer	Mr. S.K.Sharma	-do-
4.	Assistant Engineer	Dr. D.Sudhakar	-do-
5.	Assistant Engineer	Dr. Vijai Kumar	-do-
6.	Assistant Engineer	Mr. R.P.Singh/ ***	-do-
7.	Assistant Engineer	Mr. P.Poomalai	-do-
8.	Chargeman	Mr. Sanjay Kumar	-do-
9.	Chargeman	Mr. A.K.Gupta	-do-
10.	Technical Asstt.(Trainee)	Mr. R.Baascaran	-do-
11.	Technical Asstt.(Trainee)	Mr. R.Rajagopal	-do-
12.	Technical Asstt.(Trainee)	Mr. L.Jawahar	-do-
13.	Technical Asstt.(Trainee)	Mr. N.Mohan Kumar	-do-
14.	Technical Asstt.(Trainee)	Mr. D.Baskaran	-do-
15.	Machine Operator(Trainee)	Mr. K.Thiruvalluvan	-do-
16.	Machine Operator(Trainee)	Mr. N.Karthikeyan	-do-
17.	Machine Operator(Trainee)	Mr. G.Suresh	-do-
18.	Fitter	Mr. G.Karunanidhi	-do-
19.	Typist/Clerk	Mr. G.Kuppuswamy	-do-
20.	Asst. Grade-II	Mrs. R.Shyamala	-do-
21.	Messenger	Mr. K.Vadivel	-do-
22.	Attender	Mr. M.Gnanam	-do-
23.	Typist/Clerk	Mr. P.Ramamoorthy	Part

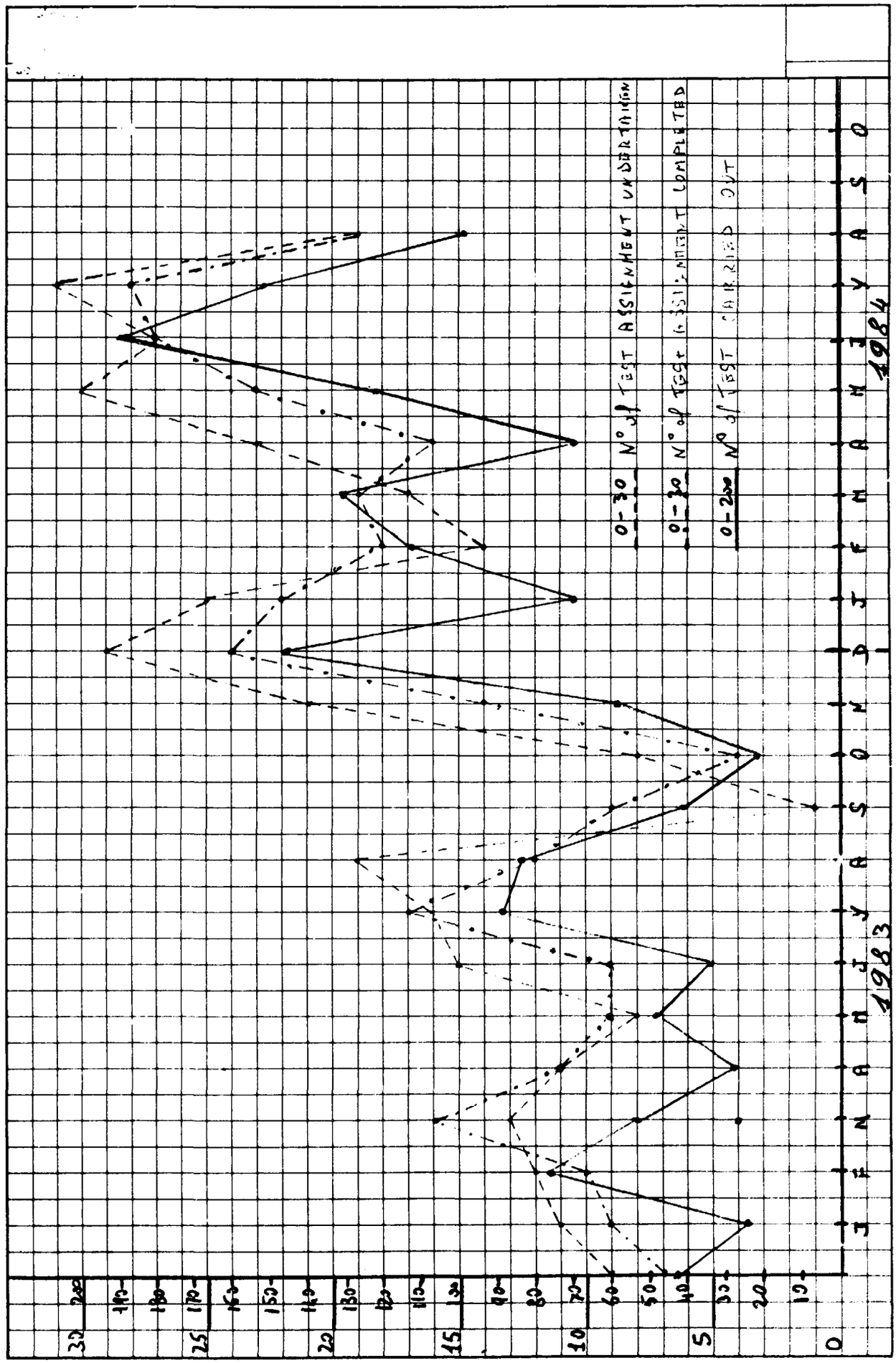
/ *** At present assigned to Processing Section.

ANNEX: II

FELLOWSHIP PROGRAMMES:

S.No.	Name of the Staff	Place of Visit	Duration
1.	Mr. Sanjay Kumar	Europe & Egypt	05.10.1982 to 08.01.1983
2.	Mr. A.K. Gupta	- do -	- do -
3.	Mr. P.Poomalai	Europe & USA	10.09.1983 to 14.12.1983
4.	Mr. R.P.Singh	Europe	14.09.1983 to 26.12.1983
5.	Mr. Fredric Moses	Europe	27.08.1983 to 14.11.1983
6.	Mr. Mohamed Nainar	Europe	17.09.1983 to 18.12.1983
7.	Mr. K.P.Govindan	Europe	-do-
8.	Dr. D.Sudhakar	Europe & USA	15.03.1984 to 04.06.1984
9.	Dr. Vijai Kumar	- do -	- do -

GRAPH NO.I


0-30 N° of Test Assignment undertaken
0-30 N° of Test Assignment completed
0-250 N° of Test carried out
JANUARY 1983
JANUARY 1984
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ANNEX: III

Industry sponsored projects and consultancy/advisory services are being undertaken by PTC and the important assignments are mentioned below:-

(a) Successfully completed the developmental project work on "Development of Particle Board Using Starch" for M/s. Bush Boake Allen (India) Ltd., Madras.

(b) Completion of work related to "Nutrient Film Technology" - CIPET NOCIL Project Work.

(c) Erected 45° Outdoor Exposure Rack for Natural Weathering.

(d) Development Project Work on "Evaluation of Epoxy System" for M/s. Southern Industrial Polymers (P) Ltd., Madras - Under Progress.

(e) Collection of literature and follow up action initiated on "Plastics in Agriculture".

(f) Development work on "Compression Mold of Thermoplastics for Sheet Moulding".

(g) Development Project Work on "Weathering of Evaluation & Testing of Plastic Materials & Moulded Specimens in various properties" for M/s. TIPCO, Ahmedabad - Under Progress.

(h) Completed the Developmental Project Work on "Melt Mixing of Low Density Polyethylene with different concentration of Antioxidants" for M/s. Hindustan Cables Ltd., Hyderabad.

(i) Setting up of a miniature testing laboratory for M/s. Shanthi Engineering Works, Madras - Completed.

(j) Development of High Heat & Pressure Resistant Plastic lining material and fixing to hydraulic piston for Combat Vehicles Research & Development Establishment, Madras - 600 054.

(k) Completed the consultancy/project work on "Wet to pulp to determine the degree of polymerization" for M/s. South India Viscose Ltd., Coimbatore.

Contd/.. Annex: III

(l) Completed the development & consultancy work in "Solving the problems on Heat Sealing of HDPE Containers used for Packaging of Pesticides" for M/s. Tropical Agro-systems (P) Ltd., Madras.

(m) Completed the project work on" Quality improvement - Indigeneous development of plastics component used in textile machinery" for M/s. Lakshmi Automatic Looms Works Ltd., Hosur.

(n) Completed the consultancy work on "Evaluation of application possibility of High Molecular Low-MFI HDPE Black Compound" for M/s. Orissa Plastics, Balasore (Orissa).

(o) Completed the testing and material selection on Kopper Rider Ring of material K30 M filled TFE for M/s. L&T Mc. Neil Ltd., Madras.

(p) Additional data collection for "Plastics Industries in India"

(q) Development of New Techniques for Milk Pouch Crates;

(r) Mutual assistance for IIT, Dental College, A.C. College & University of Madras etc. for testing and advisory services in the field of plastics.

Newstime dated 2nd April 1984

THE PLASTICS AND RUBBER INSTITUTE
INDIAN SECTION (PLASTICS)
HYDERABAD CENTRE

C/o M/s.U-Foam Pvt. Ltd., Hyderabad – 18.

A Technical Lecture by

Dr. C. Brignone,

Chief Technical Adviser, Unido Expert

Topic : QUALITY CONTROL IN PLASTIC INDUSTRIES

Time : 5.30 P.M.

Venue : Administrative Staff College of India,
Bella Vista,
Somajiguda,
Hyderabad.

Date : 4.4.1984

All are cordially invited for the Lecture

For futher details please contact:

Mr. M. Sarangpani,

Tel.No. 262951 - 54 (4 lines)

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Deccan Chronicle dt 2-4-1984

THE PLASTICS AND RUBBER INSTITUTE INDIAN SECTION
(PLASTICS)
HYDERABAD CENTRE
C/o M/s U-Foam Pvt. Ltd.,
Hyderabad - 18.

A TECHNICAL LECTURE BY
DR. C. BRIGNONE, CHIEF TECHNICAL ADVISER,
UNIDO EXPERT.
Topic : QUALITY CONTROL IN PLASTIC INDUSTRIES
Time : 5.30 P.M.
Venue : Administrative Staff College of India,
Bella Vista,
Somajiguda,
Hyderabad.
Date : 4.4.1984

ALL ARE CORDIALLY INVITED FOR THE LECTURE

For further details please contact :
Mr. M. Saravagopani,
Tel.No. 282861 - 64 (4 lines)

ANNEX: IV

ANNEX: V

SILVER JUBILEE YEAR 1959-1984
25
ipf

PHONE : 23-0765, 23-7127
CABLE : 'INDPLASFED'

13/A, GOVERNMENT PLACE EAST
CALCUTTA-700 069

Indian Plastics Federation

PROGRAMME FOR TECHNICAL SEMINAR ON 27-8-1984.
Venue:-ICI Auditorium,34,Chowringhee,Calcutta.

9-45 hrs. : Assemble at the Auditorium

10-00 hrs. : Welcome Address by Shri S. C. Bhutoria, President,IPF

10-15 hrs. : Lecture on "QUALITY CONTROL ON PLASTICS"

11-30 hrs. : Lecture on "TESTING & EVALUATION of PLASTICS MATERIALS AND PRODUCTS ".

13-00 hrs. : L U N C H R E C E S S
(Lunch packets will be served)

14-00 hrs. : Lecture on "DESIGN CONSIDERATIONS FOR QUALITY PRODUCTION"

15-30 hrs. : Vote of thanks by Shri N.K.Tibrewala, Hony.Secretary,IPF.

: T E A & D I S P E R S A L

Faculty Members: 1) Dr. C.Brignone, Chief Technical Adviser from UNIDO

2) Dr. A. Ramamurthy from CIPET

3) Mr. A. Kuppuswamy from CIPET

NOTE: Each lecture will be followed by a question & answer session.

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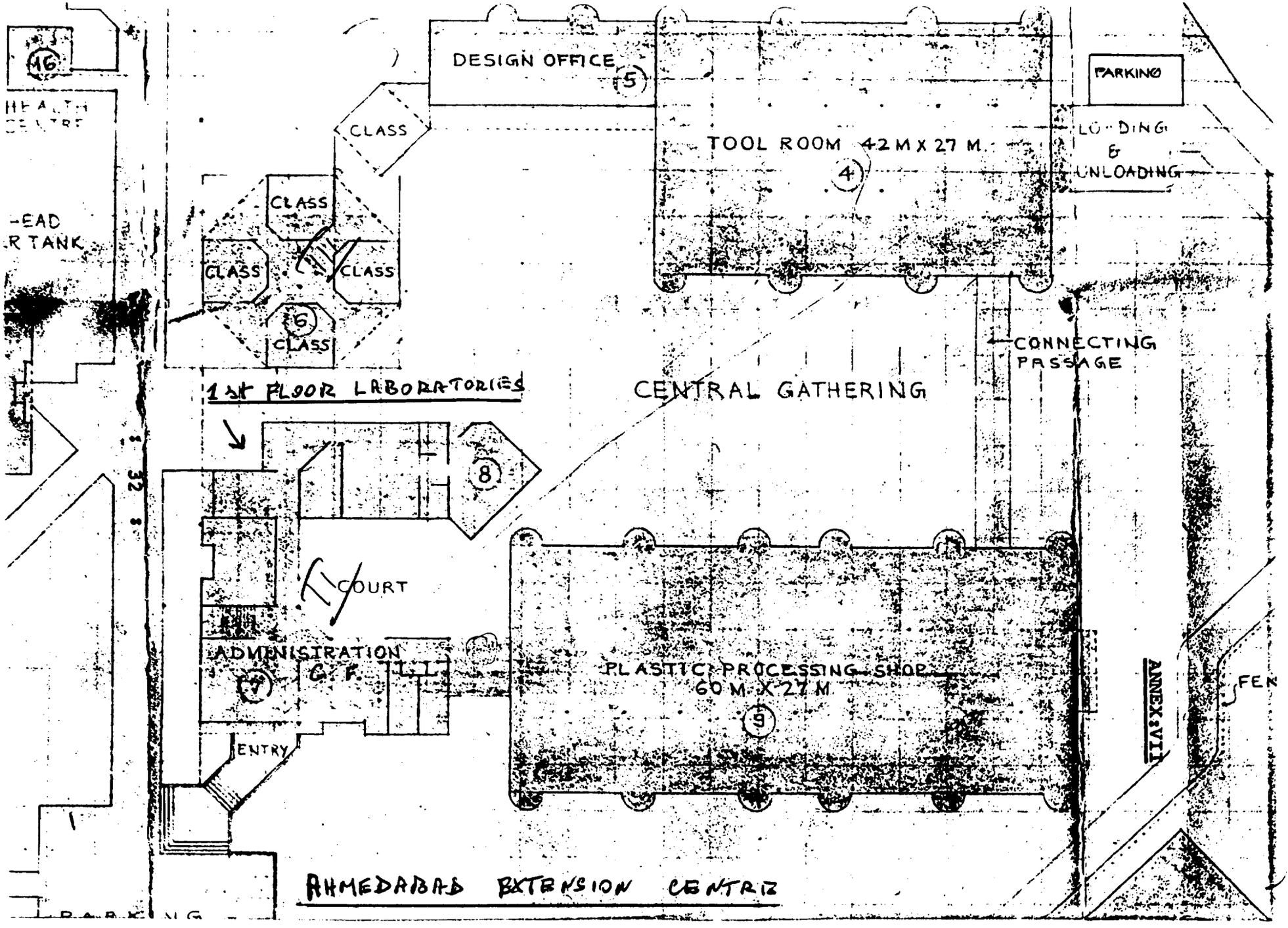
ANNEX: VI

LIST OF INTERNATIONAL CANDIDATES UNDERGONE TRAINING DURING DEC. 82 TO AUG.84

S.No.	Name of the Course	Country	No. of Candidates
1.	Plastics Mould Design	Bangladesh (UNIDO Sponsored)	3
2.	Plastics Mould Making	- do -	11
3.	Plastics Mould Design	Tanzania (CFTC Sponsored)	2
4.	Plastics Processing Tech.	- do -	3
5.	Plastics Technology & Testing	Bhutan (UNIDO Sponsored)	2
	Total persons enrolled		21


16
DESIGN OFFICE
5
CLASS
TOOL ROOM 42 M X 27 M.
4
PARKING
LOADING
&
UNLOADING
CLASS
CLASS
CLASS
6
CLASS
CONNECTING
PASSAGE
1st FLOOR LABORATORIES
CENTRAL GATHERING
8
COURT
ADMINISTRATION
7
G. F.
L. L.
PLASTIC PROCESSING SHOP
60 M X 27 M
9
ENTRY
ANNEX VII
AHMEDABAD EXTENSION CENTRE

ANNEX: VIII

GOVERNMENT PERSONNEL

Ahmedabad Centre:

S.No.	Designation	Name of the Person	Time
1.	Deputy Director	Mr. Hemand V.Mehta	Full
2.	Plastic Engineer(P)	Mr. G.Lalchandani	-do-
3.	Asstt. Engineer	Dr. A.B.Mathur	-do-
4.	Asstt. Engineer	Mr. B.M.Patel	-do-
5.	Asst. Engineer	Mr. A.L.Vadhiya	-do-
6.	Supervisor	Mr. Sheikh U.Hussein A.	-do-
7.	Draughtsman	Mr. A.C.Parmar	-do-
8.	Draughtsman	Mr. K.Dharmaraj	-do-
9.	Technical Asstt.	Mr. Bhadnish R.Boja Raj	-do-
10.	Machinist	Mr. R.A.Makwana	-do-
11.	Machinist	Mr. Hari Shankar	-do-
12.	Machine Operator	Mr. Shah Suryakanth Mangaldoss	-do-
13.	Machine Operator	Mr. A.K.Ashok	-do-
14.	Accounts/Administr. Officer	Mr. R.Srinivasan	-do-
15.	Accounts Assistant	Mr. Bhadresh M.Raval	-do-
16.	Librarian	Mr. Trilok K.Dave	-do-
17.	Asstt. Stores	Mr. K.Anandhakrishnan	-do-
18.	Typist/Clerk	Mr. S.Seshadri	-do-
19.	Driver	Mr. R.K.Patel	-do-
20.	Helper	Mr. T.G.Mukesh	-do-

ANNEX: IX

LIST OF UNDP EQUIPMENTS

AHMEDABAD CENTRE:

S.No.	Name of the Equipment	Arrived on
1.	Analytical Balance	06.05.83
2.	Haze, Clarity, & Gloss Meter	12.05.83
3.	Polar-o-scope	23.05.83
4.	Combi Tester	23.05.83
5.	Contour Cutter	04.06.83
6.	Instron (Universal Tester)	04.06.83
7.	Meghommeter	09.07.83
8.	Heat/Distortion/Softening Point Apparatus	15.07.83
9.	Electronic Plasti-corder	29.07.83
10.	Melt Flow Indexer	19.08.83
11.	Density Measuring Apparatus	19.08.83
12.	Water Vapour Permeability Apparatus(MVTR)	30.08.83
13.	Flammability Tester	30.08.83
14.	Gas Permeability Apparatus	14.12.83
15.	Elemndrof Tear Tester	14.12.83
16.	Burst Strength Testdr	14.12.83
17.	Projectina Micro Macro Projector	23.04.84
18.	Fracotscope "Universal Digital Pendulum"	23.04.84

ANNEX: X

LIST OF UNDP EQUIPMENTS/SPARES RECEIVED: (MADRAS CENTRE)

S.No.	Name of the Equipment		Arrived on
	(a) UNDP Equipments:		
1.	Strip Cutter/TMI Precision Adjustable Cutter	-	05.04.1983
2.	Water Vapour Permeability Apparatus	-	05.04.1983
3.	Contour Cutter	-	08.04.1983
4.	Dilatometer	-	04.05.1983
5.	Extrusion Plastometer	-	04.05.1983
6.	Combi/Slip & Friction Tester	-	25.05.1983
7.	Barcol Hardness Tester	-	25.05.1983
8.	Folding Endurance Tester	-	25.05.1983
9.	Torsion Stiffness Tester/Clash & Berg Apparatus	-	02.06.1983
10.	Thermal Analyser	-	28.06.1983
11.	Micro Hardness/Indentation Tester	-	18.07.1983
12.	Polarising Microscope (Projectina)	-	10.08.1983
13.	Rotoviscometer (Haake)		25.08.1983
14.	High Speed/Henschel Fluidizing Mixer	-	15.09.1983
15.	Low Temperature Brittleness Apparatus	-	28.11.1983
16.	Electrostatic Field Meter	-	28.11.1983
17.	Carbon Black Content Apparatus	-	28.11.1983
18.	Falling Weight Impact Tester	-	28.11.1983
19.	Rheovibran Dynamic Viscoelastomet2	-	19.12.1983
20.	Microtome - Autocut 1150	-	05.03.1984
21.	Capillary Rheometer System	-	08.03.1984
22.	El. Analytical Balance	-	23.03.1984
23.	Jay Jay Tensile Testing Machine	-	06.06.1984
24.	Melting Point Meter	-	26.06.1984
25.	Ultracryostat - Circulator	-	04.07.1984
26.	Canon Plain Paper Copier	-	21.08.1984
27.	Ultrasonic Flaw Detector		

ANNEX: X(A)

(b) UNDP Spares/Accessories: (MADRAS CENTRE)

S.No.	Name of the Spare/Accs.	Arrived on
1.	Film Blowing Die Assembly & Strand Cutter (Spares for Brabender Plasticorder)	12.09.1983
2.	Veeder Root Counter & ON/OFF Switch (Spares for Filding End.Tester)	09.11.1983
3.	Test Fixture JH (Spares for Dielectric B.Tester)	21.02.1984

ANNEX: XI

LIST OF INDIAN EQUIPMENTS

S.No.	Name of the Equipment	Arrived on
1.	Soxhalt Extraction Apparatus	06.81
2.	Recording Oscilloscope	03.82
3.	Deioniser for Atlas Weather-o-meter	03.82
4.	Voltage Stabiliser	03.82
5.	Fire Extinguisher	03.82
6.	Temp. Indicating Controller	03.82
7.	Research Centriguge	06.82
8.	Temperature Indicator	03.82
9.	Hydraulic Test Pump	03.82
10.	Lab. Drier	03.82
11.	Digital Balance	03.82
12.	Ph Meters	05.82
13.	Lab. Muffle Furnace	05.82
14.	Variable Auto-Transformer	05.82
15.	Hydraulic Lifting Table	11.82
16.	Nuchem - Hydraulic Press	12.82
17.	Burst Strength Tester	12.82
18.	Circulator for Weather-o-meter	10.83
19.	SP 130 Injection Moulding Machine	07.83
20.	Refrigerator	03.84
21.	Digital Multimeter	03.84
22.	Weighing Balance	04.84
23.	Opacity Tester	07.84
24.	Reversion Tester	07.84
25.	Scrap Grinder/Blender	08.84

CIPET

Offers

Introductory Course

on

Weathering of Plastics

Course Director

H. BURNS

UNIDO Expert

CENTRAL INSTITUTE OF PLASTICS
ENGINEERING AND TOOLS
Guindy, Madras-600 032

Grams : CIPET Tel : 432371

Title :

INTRODUCTORY COURSE
ON
"WEATHERING OF PLASTICS"

Venue :

CIPET, Madras

Date :

24th October 1983 between 09.00 a
17-00 hours

Objectives :

To introduce the concept of weathering and stability of Plastics.

To acquaint the factors that affect the Weathering of Plastics and the changes in properties.

To describe methods of natural and accelerated Weathering of Plastics and the tests to evaluate the property changes.

Tentative Scope :

Introduction to Weathering.
Natural Weathering.
Accelerated artificial Weathering.
Testing and evaluation of Plastics.
Laboratory observation and study.
Final discussion and evaluation.

Methodology :

Lectures, Practical demonstrations and discussions.

For Whom :

Quality Control Managers, Inspectors, Supervisors and Enterprenuers in Plastic Industry.

Eligibility :

University Degree, Diploma or Equivalent qualification in Science, Technology/ Engineering

Some experience in plastics/application of Plastics.

Preference will be given to sponsored candidates.

Course Fee :

Rs. 250/- (Non residential-includes course materials and lunch)

Intake Capacity :

15

Closing Date for Registration :

14th October 1983

Selected candidates will be intimated by

15th October 1983

Cheque/draft should be drawn in favour of The Director,
CIPET,
Guindy, Madras-600 032

CIPET

Offers

Training Programme

on

"Quality Control & Testing of Plastics"

Course Director

Dr. C. BRIGNONE

Chief Technical Adviser

Course Co-ordinator

Dr. K. RAMAMURTHY

SENIOR PLASTICS ENGINEER (TESTING)

Plastics Testing Centre

CENTRAL INSTITUTE OF PLASTICS ENGINEERING AND TOOLS
Guindy, Madras-600 032

Grams : CIPET Tel : 432371

Title :

TRAINING COURSE ON "QUALITY CONTROL & TESTING OF PLASTICS"

Course Code No. PTC/IX/84

Venue :

CIPET, Madras

Duration : 06.08.84 to 11.08.84

Objectives :

To induct Quality Control consciousness and importance of Testing.

To acquaint the factors that affect the quality of products and the way by which the desired quality may built into the products.

To import training on the quality control testing and evaluation of plastics.

Tentative Scope :

Introdction to Quality Ccntrol.

Quality control of plastics raw materials products

Statistical quality control.

Standardisation.

Identification analysis and characterisation of plastics.

Physical and chemical properties.

Tests and testing equipments.

Product Testing

Process and Processing machineries

Lab. observation and study

Final discussion and evaluation.

Methodology :

Lectures, Demonstrations, Practicals, Industrial visits and Discussions

For Whom :

Quality control Managers, Inspectors, Supervisors and Enterprenuers in Plastics Industry.

Eligibility :

University Degree, Diploma or Equivalent qualification in Science, Technology/ Engineering.

Some experience in plastics/application of plastics.

Preference will be given to sponsored candidates.

Course Fee :

Rs. 1000/- (*Non residential-includes course materials and industrial visits)

Intake Capacity : 15

Closing Date for Registration : 27.07.84

Selected candidates will be intimated by

30.07.84

Demand draft should be drawn in favour of The Director, CIPET Guindy, Madras-600 032

*Accommodation may be provided at extra cost if available.

CIPET

Offers

ONE DAY PROGRAMME

on

Selected aspects of

"FLOW BEHAVIOUR IN POLYMER PROCESSING"

by

Dr. Ing. G. MENNIG

UNIDO Expert

(Head of Plastics Processing & Testing Division German Plastics Institute, Darmstadt).

Course Director

Dr. C. BRIGNONE

Chief Technical Adviser

PLASTICS TESTING CENTRE
CENTRAL INSTITUTE OF PLASTICS
ENGINEERING AND TOOLS
Guindy, Madras-600 032

Grams : CIPET Tel : 432371

Dr. Ing. MENNIG

Bio-Data :

Dr. G. Mennig took his degree in Mechanical Engineering from the University of Stuttgart West Germany and his Ph. D under Prof. Dr. G. Schenkel from the Institute of Plastic Processing Stuttgart in 1969. He had an outstanding educatioal carrear. He was with the IIT Madras as Associate Prof in the Department of Chemical Engg. from 1970 to 1973 under the German exchange programme for setting up a High Polymer Engineering Lab Since then he is working in the German Plastic Institute at Darmstadt as Head of the Plastics Processing Division. He is now a professor and Deputy Director of the same Institute. He has vast experience in Processing and Testing of polymers and a number of technical papers to his credit.

One Day Programme

on

"FLOW BEHAVIOUR IN POLYMER PROCESSING"

Venue :

CIPET, Madras

Date :

12th January 1984

between 09-00 to 17-00 hrs.

Objectives :

The influence of wall slip on the flow behaviour of certain polymers is drawing the attention of many polymer processors in advanced countries for predicting the flow data in achieving better quality.

The growth of filled thermoplastics is taking place very rapidly in recent times necessiates the prediction of their flow behaviour for solving their processing problem.

These newer areas are being covered in this programme in order to acquaint the participants with certain important aspects of the influence of wall slip and flow behaviour of filled thermoplastics in polymer processing.

Tentative Scope :

Effect of wall slip on the flow of fluids.

Influence of wall slip on the extrusion of rigid PVC.

Rheolcgical behaviour of filled polymer materials

Phase separation of filled Thermoplastics in Injection Moulding

Course Fee :

Rs. 250/- (Non residential-includes course materials and lunch)

Cheque/draft should be drawn in favour of The Director, CIPET, Guindy, Madras-600 032

CIPET

Offers

Training Programme

on

"Quality Control & Testing of Plastics"

Course Director

Dr. C. BRIGNONE

Chief Technical Adviser

Course Co-ordinator

Dr. K. RAMAMURTHY

SENIOR PLASTICS ENGINEER (TESTING)

Plastics Testing Centre

CENTRAL INSTITUTE OF PLASTICS ENGINEERING AND TOOLS

Guindy, Madras-600 032

Grams : **CIPET** Tel : 432371

Title :

TRAINING COURSE ON "QUALITY CONTROL & TESTING OF PLASTICS"

Course Code No. PTC/VIII/83-84

Venue :

CIPET, Madras

Duration : 26.03.84 to 31.03.84

Objectives :

To induct Quality Control consciousness and importance of Testing.

To acquaint the factors that affect the quality of products and the way by which the desired quality may built into the products.

To import training on the quality control testing and evaluation of plastics.

Tentative Scope :

Introdction to Quality Control.

Quality control of plastics raw materials products

Statistical quality control.

Standardisation.

Identification analysis and characterisation of plastics.

Physical and chemical properties.

Tests and testing equipments.

Product Testing

Process and Processing machineries

Lab. observation and study

Final discussion and evaluation.

Methodology :

Lectures, Demonstrations, Practicals, Industrial visits and Discussions

For Whom :

Quality control Managers, Inspectors, Supervisors and Enterprenuers in Plastics Industry.

Eligibility :

University Degree, Diploma or Equivalent qualification in Science, Technology/ Engineering.

Some experience in plastics/application of plastics.

Preference will be given to sponsored candidates.

Course Fee :

Rs. 1000/- (*Non residential-includes course materials and industrial visits)

Intake Capacity : 20

Closing Date for Registration : 16.03.84

Selected candidates will be intimated by 19.03.84

Demand draft should be drawn in favour of The Director, CIPET Guindy, Madras-600 032

*Accommodation may be provided at extra cost if available.