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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

TEXTILE DEVELOPMENT CENTRE*

DP/EGY/73/020

DP/EGY/77/008

EGYPT

Mission report

Prepared for the Government of Egypt by the
United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Roy Nield, project manager designate

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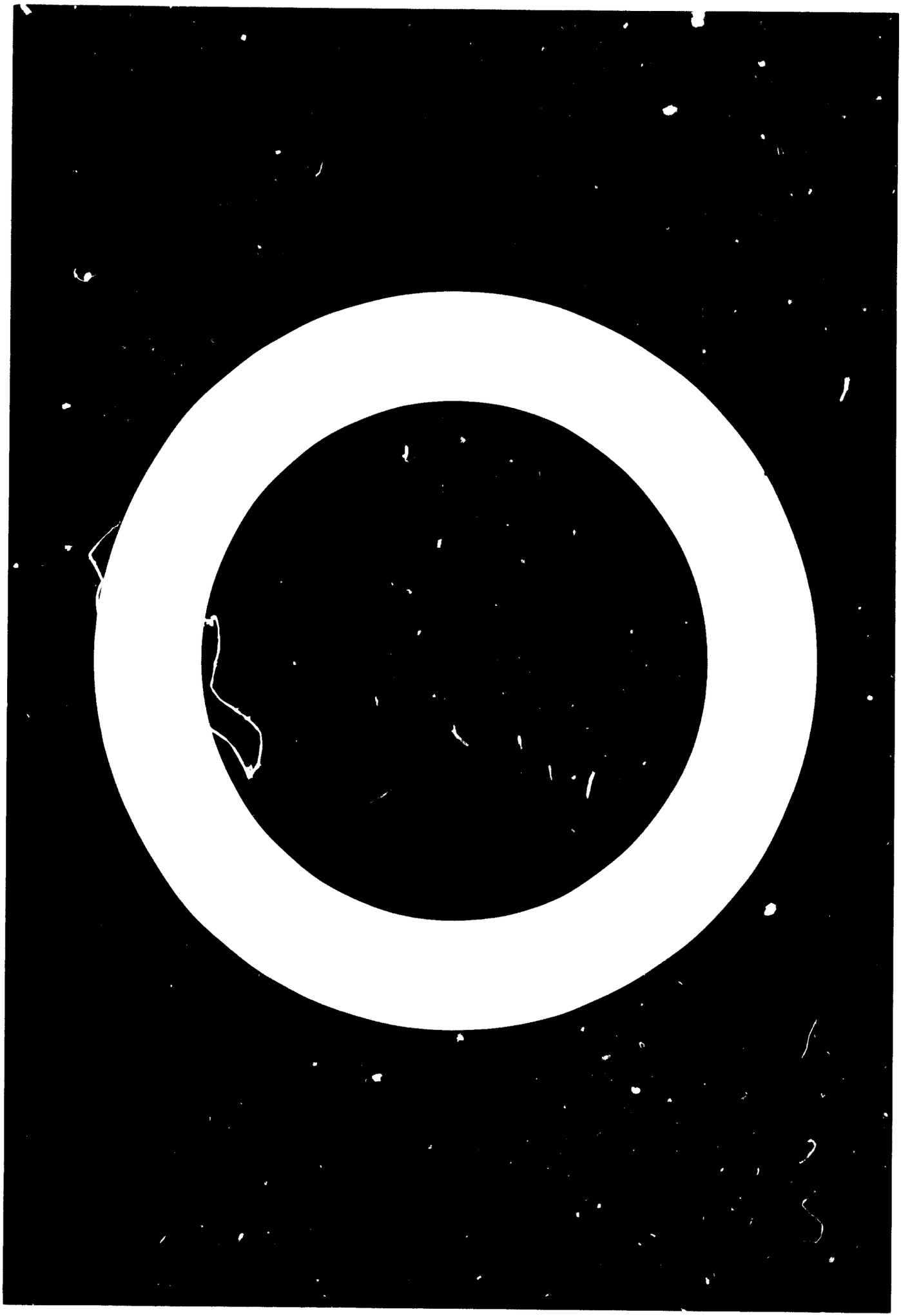


CONTENTS

Annexes

Purpose of the Mission

The mission was proposed by the Government of Egypt and UNDP, Cairo, as a follow-up to previous missions in order to review the present position and to formulate future plans now that the Project Document for Phase II has been signed; paying special attention to the following aspects :

I) Progress of the construction of the buildings.

II) Required qualifications and job descriptions of International experts.

III) Specifications for the weaving, knitting, dyeing, finishing and garment manufacturing machinery.

IV) Appointment of counterpart staff.

V) Starting date of Project Manager.

Itinerary

9 - 10 September	Cairo
10 - 29 September	Alexandria
29 Sept. - 3 Oct.	Cairo
2 October	Tripartite meeting
3 - 5 October	Vienna

Tripartite Meeting

A tripartite meeting was held in Cairo on October 2nd 1978. The expert's report to that meeting forms part of this report. It covers the items listed under "Purpose of Mission" and indicates the urgent action required. Minutes will be issued by UNDP.

Construction of Buildings

Considerable steps have been taken in recent months and progress is now good. The general situation and various outstanding points were discussed on site with the architect Mr. Ahmed Ibrahim Kamel on September 12th (see annex I) and at subsequent meetings and with the SIDFA, Mr. S. J. Szivos, on September 14th. It was estimated that, barring unforseeable problems, the ground floor area (which will house the spinning, weaving and knitting equipment) will be ready for machinery erection to start in February 1979, although work on the upper floors of the 3-storey main building and the separate single-storey, wet-processing laboratory will continue for 4 to 6 months longer.

International Staff

The qualifications and job description of the International experts are set out in annex II. Estimated dates for their assignments are as follows :-

	Duration (m/m)	Starting Date
Spinning Expert	12	June 1979
Dyeing Expert	12	April 1980
Finishing Expert	12	April 1980
Weaving Expert	12	June 1980
Knitting Expert	12	October 1980
Garment Expert (woven)	6	June 1981
Garment Expert (knitted)	6	June 1981
Unspecified consultants	6	--

Counterpart Staff

To assist recruitment, the following incentives are now being given to counterparts.

(a) 30% higher salary than for equivalent work in the mill.

(b) Approx 5 months bonus payment (but mill people also get some bonuses).

(c) Fellowships - in most cases.

(d) Better opportunities of working for higher degrees.

Eng. Samy El-Meligui was interviewed for the post of Assistant Co-Manager for the project and appeared to be suitable.

One newly qualified PhD from Bradford will join the centre next month. Three counterparts have completed their fellowships in Manchester. Two have returned; the other is now working for his PhD in Leeds and is supporting himself.

One fellow will start in Manchester in October and two others will join her if arrangements can be complete in time. It is intended that most of the other fellowships should start in October 1979 and be completed by June 1980.

Candidates for counterpart jobs in various departments at the TDC were interviewed on September 23, 24 and 25. There were 53 applicants all together of whom 7 were selected as being suitable for spinning, weaving and knitting, 7 for dyeing and finishing and 2 for garment manufacture subject to receiving satisfactory references.

Several of these applicants are lacking in experience. It is therefore intended to start some of them in the TQCC and strengthen the team by transfering 2 or 3 of the more experienced engineers from the TQCC to the TDC for the first few years.

5 of the candidates interviewed were considered suitable to fill existing vacancies in the TQCC.

Machinery

It was intended that equipment experts should be appointed for 2 m/m to prepare machine specifications. However, to save time and minimise the effects of inflation, specifications suitable for quotation purposes for most of the equipment in the Project Document were prepared (see annex III) by the Project Manager and Co-Manager after consultation with Egyptian experts, namely :-

Weaving : Eng. Fathy Ahmed Ali
Director of Weaving, Misr Kafr El-Dawar
Member of Board of Management of TDC

Dyeing and Finishing :

Dr. Ahmed Hassan
General Manager, Cairo Dyeing and Finishing Mill

Mr. Abdel Hamid Kharella
Director of Mill Service Dept., TQCC.

Garment Manufacturing :

Mr. Mohi El Ayouti
Chairman, Arab-German Garment Mill

Knitting : Eng. Nigm Esmat Awad
Knitting Consultant

In view of the highly technical nature of the equipment and the widely different fields of application it is recommended either that independent equipment experts in the 5 fields be engaged to study the quotations received and assist in the final machinery selection, or that the Project Manager and Co-Manager visit Vienna for that purpose.

The machines relating to preparation for weaving and knitting have not been specified at this time and cannot be specified until the exact sizes and models of looms, etc. have been decided. This however, need not delay the ordering of the bulk of the equipment.

Project Manager

If things go according to plan, it should be possible to start erecting the spinning machinery in March 1979 and to complete in May 1979. However the position should be reviewed in December 1978 or January 1979 before requesting the suppliers to send their engineers.

On this basis a suitable date for the arrival of the Project Manager would be February 1979.

Action Required

Eng. Sami El-Meligui should be appointed Assistant Co-Manager as soon as possible.

As there may be difficulties in securing the release of the better condidates from their present jobs, the Government should take urgent steps to appoint them so that they may recieve some basic

training, pass their English examinations and return from their fellowships by the middle of 1980, i.e. to fit in with the arrival of the international experts.

The Government should also now appoint six mechanics with Technical High School education and practical mill experience as follows :-

Spinning	2
Weaving	1
Knitting	1
Dyeing & Finishing	1
Garment Manufacturing	1

Others should be added in the future when the volume of work increases.

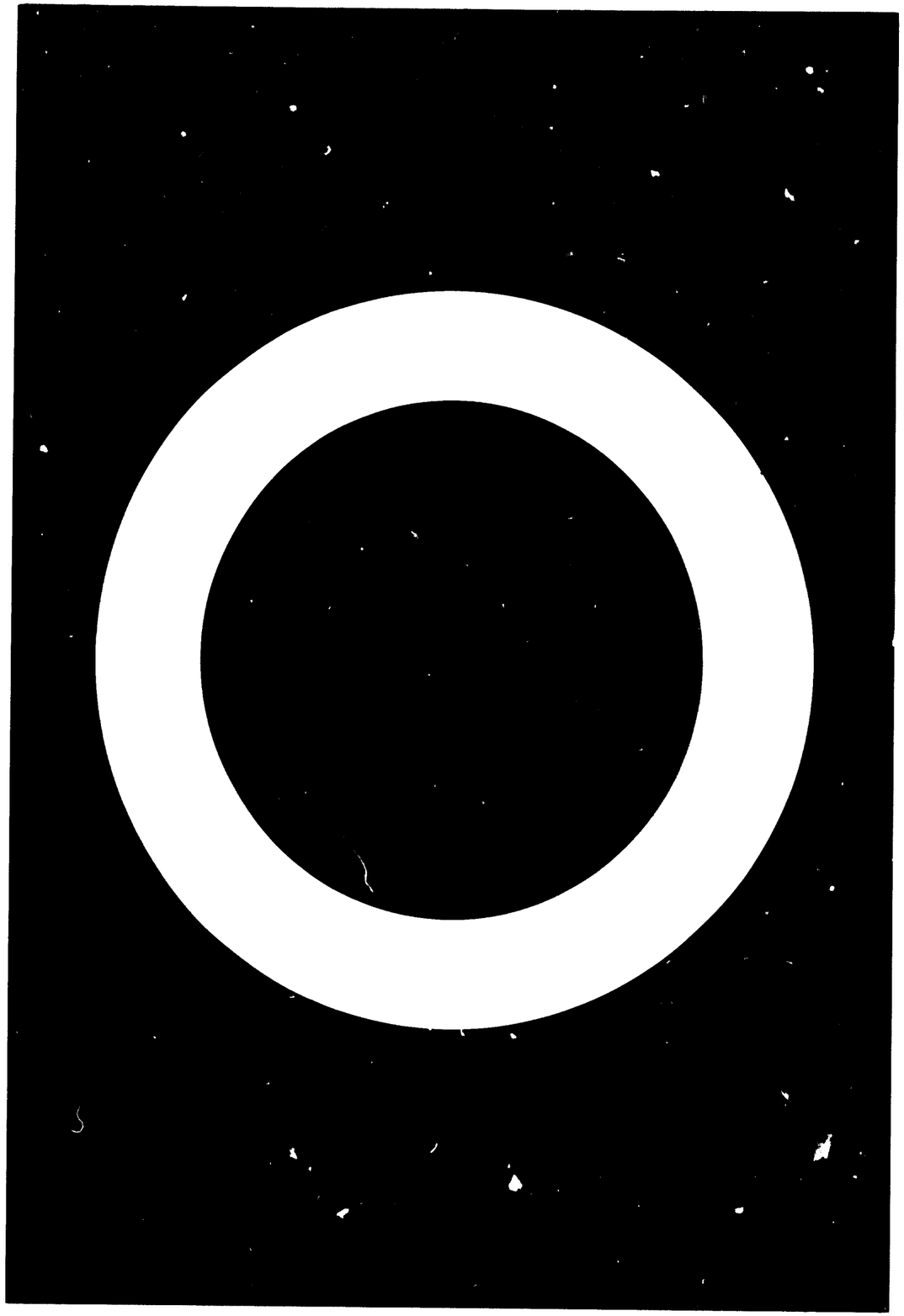
Urgent action is required from UNDP in respect of :-

Ordering of a motor car.

Appointment of a driver

Appointment of a well-qualified and experienced secretary for the Project Manager.

Urgent action is required from UNIDO (through the British Council) in placing the 2 fellows (Alaa and Salah) for training in Manchester in October 1978.



Annex I

B U I L D I N G S

Meeting with, Architect 12/9/1978.

Present :	Mr. Ahmed Ibrahim Kamel	Architect
	Mr. Nabil El-Nozahy	Gen. Manager TCF
	Eng. Magdi Elaref	Co. Manager TDC
	Dr. Roy Nield	Project Manager UNIDO

MAIN BUILDING

Mr. Ibrahim Kamel was of the opinion that the ground floor laboratory (Spinning, Weaving & Knitting) would be completed during Janury 1979. This would include :-

- Floor with all necessary channels in place and tiled.
- Walls with glazed tiles to a height of approximately 2 meters.
- Air conditioning ducting in place.
- All doors and windows fitted.
- Electricity laid on with many input points for 3 phase and single phase supplies.
- Lighting completed.
- Internal partitions in place.

In this case, erection of the spinning machinery could begin in February 1979 although the air-conditioning plant may not be completed until April 1979.

Work on the 2 upper floors would continue for a further 4 or 6 months but this should not disturb the work on the ground floor.

Internal partitions are necessary because it is essential to have different air conditions in the different laboratories. These partitions will be solid to a height of 1m 20, then glass for about 2m and then solid to the ceiling.

WET PROCESSING LABORATORY

It was estimated that the separate wet-processing laboratory for the dyeing and finishing plant would be completed by June 1979. The following points were agreed :-

Walls : The walls will be tiled to a height of 2m. The upper walls and ceiling will be painted with steam-resistant paint.

Air Conditioning : Not required

Ventilation : Heavy-duty extraction fans are required to exhaust steam and vapours, preferably away from the main buildings.

Electricity : Power points for both single and 3-phase supply will be provided at frequent points along the length of the room.

Water Supply : The water main will run the whole length of the building and there will be frequent take-off points. Connecting pipes to each machine will be underfloor and covered by removable plates for maintenance purposes. These channels may have to be made after the machines are installed.

Drainage : There will be one or two main drainage channels running the full length of the building. Each will be 20cm wide and 10 to 20cm deep with just sufficient inclination to facilitate the flow of water. At the outlet end of each channel there will be a filter and a sump to collect any solids. Each machine will be connected to a main channel by a branch channel, which may have to be made after the machine is installed.

All channels will be of the open-drain type with removable, perforated iron cover-plates which can be removed to clear blockages and which will permit water to escape when the floor is washed (at least once a day).

Steam Supply : The machines are specified with individual electric heaters so that it will be possible to operate each machine individually. However a separate boiler is required for efficient and economical operation of certain processes such as kier boiling. Lagged steam pipes will run the length of the building with overhead connections to individual machines.

AIR CONDITIONING PLANT FOR MAIN BUILDING

The under-floor, return-air ducting is almost complete. The over-ceiling air-distribution system should be completed by December 1978, although the whole system may not be operational until April 1979.

AIR CONDITIONS REQUIRED

Different humidities are required in the different departments and different humidities are required within a given department according to the material being processed. The r.h. in each room must therefore be adjustable and, when set, must be constant with ± 3%.

Department	Range of adjustment for r.h.
Blow room	50 - 60%
Spinning	35 - 70%
Weaving	55 - 85%
Knitting	50 - 60%

The temperature showed be maintained at $27^{0}C \pm 2^{o}C$.

Note I. Large volumes of air are discharged from the blowroom. It is important that this should not upset the conditions in the other departments.

Note 2. For reasons of economy it should be possible to switch off the air-conditioning to separate departments when there are no tests in progress.

Note 3. Humidifying sprays or auxillary air-conditioning units may be installed in the weaving department to acheive the high levels of r.h. required.

STAND-BY ELECTRICITY GENERATORS

In view of the frequent power-cuts which could seriously interrupt and might completely ruin experiments, it is recommended that stand-by electricity generator (s) for the TDC and the TQCC be provided.

Annex II

JOB DESCRIPTIONS FOR

INTERNATIONAL STAFF

Spinning Expert (cotton and blends)

Weaving Expert

Knitting Expert

Dyeing Expert

Finishing Expert

Garment Manufacturing Expert (knitted garments)

Garment Manufacturing Expert (woven garments)

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Spinning Expert (Cotton & Blends).

Duty Station : Alexandria with travel within Egypt.

Duration : 12 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 20 years experience in the textile industry with practical mill experience in the preparation and spinning of cotton and blends of cotton and man-made fibres.
- First-hand knowledge of the latest techniques and methods of manufacture of staple fibre yarns, e.g. open-end spinning.
- Experience of research work would be an asset.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research activities in the field of spinning, particularly of blended yarns.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the production of blended yarns from Egyptian cotton and various types of man-made fibres.

   - The best use of imported cottons.

   - How to increase efficiency and productivity.

   - How to reduce waste and second quality yarns.

3) To render direct assistance to mills through technical consultancy e.g.

   - To assist in setting and maintaining standards.

   - To assist in the introduction of new techniques.

   - To assist in the introduction of new fibres.

4) To make qualitative and operational studies in spinning.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Weaving Expert

Duty Station : Alexandria with travel within Egypt.

Duration : 12 months.

Starting Date :

Language : English

Qualifications :

- University degree in apprpriate discipline.
- At least 20 years experience in the textile industry with practical mill experience in the weaving of cotton and blended cotton and man-made fibre yarns.
- First-hand knowledge of the latest techniques in weaving.
- Experience of research work would be an asset.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research activities in the field of weaving, particularly of blended yarns.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the weaving of Egyptian cotton and blended yarns.
   - The best use of imported cottons in woven fabrics.
   - How to increase efficiency and productivity.
   - How to reduce waste and second quality cloth.

3) To render direct assistance to mills through technical consultancy e.g.

   - To assist in setting and maintaining standards.
   - To assist in the introduction of new techniques in weaving.
   - To assist in the introduction of new fibres.

4) To make qualitative and operational studies in weaving.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Knitting Expert

Duty Station : Alexandria with travel within Egypt.

Duration : 12 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 20 years experience in the knitting industry with practical mill experience in circular, flat and warp knitting.
- First-hand knowledge of the latest knitting technologies.
- Experience in research work would be an asset.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research activities in the field of knitting.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions of knitting machines for processing Egyptian cotton and various types of man-made fibre.

   - How to increase efficiency and productivity in knitting.

   - How to reduce waste and second quality knitted fabrics.

3) To render direct assistance to mills through technical consultancy, e.g.

   - To assist in setting and maintaining standards.

   - To assist in the introduction of new techniques in knitting.

4) To make qualitative and operational studies in knitting.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Dyeing Expert.

Duty Station : Alexandria with travel within Egypt.

Duration : 12 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 20 years experience in the textile industry with practical mill experience in the dying of cotton and cotton/man-made fibre blended yarns and fabrics.
- First-hand knowledge of the latest techniques and methods of dying cotton and blends.
- Experience in textile printing would be an asset.
- Experience in research work would be an asset.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research activities in the field of dyeing, particularly of blended yarns and fabrics.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the dyeing of yarns and fabrics made from Egyptian cotton and various types of man-made fibres.

   - The best ways of dyeing imported cottons, singly or in blends.

   - How to increase efficiency and productivity.

   - How to reduce waste and second quality fabrics.

3) To render direct assistance to mills through technical consultancy e.g.

   - To assist in setting and maintaining standards.

   - To assist in the introduction of new techniques in dyeing.

   - To assist in the introduction of new fibres.

4) To make qualitative and operational studies in dyeing.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Finishing Expert.

Duty Station : Alexandria with travel within Egypt.

Duration : 12 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 20 years experience in the textile industry with practical mill experience in the finishing of cotton and cotton/man-made fibre blended woven and knitted fabrics.
- First-hand knowledge of the latest techniques and methods of finishing cotton and cotton/man-made fibre blended fabrics.
- Experience in textile printing would be an asset.
- Experience of research work would be an asset.

Responsible to: Project Manager.

Duties:

1) To assist the Egyptian textile industry to extend its applied research activities in the field of finishing, particularly of blended fabrics.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the finishing of fabrics made from Egyptian cotton and various types of man-made fibres.

   - The best ways of finishing imported cottons, singly or in blends.

   - How to increase efficiency and productivity.

   - How to reduce waste and second quality fabrics.

3) To render direct assistance to mills through technical consultancy e.g.

   - To assist in setting and maintaining standards.

   - To assist in the introduction of new techniques of finishing.

   - To assist in the introduction of new fibres.

4) To make qualitative and operational studies in finishing.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian Textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Garment Manufacturing Expert (Knitted Garments)

Duty Station : Alexandria with travel within Egypt.

Duration : 6 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 15 years experience in the ready-made garment industry with practical experience in knitted garment factory organisation and management.
- First-hand knowledge of the latest techniques and methods of manufacture of ready-made knitted garments.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research acticities in the field of ready-made knitted garments made from cotton and man-made fibres.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the manufacture of knitwear etc from Egyptian cotton and various types of man-made fibre.

   - How to increase efficiency and productivity of garment processes.

   - How to reduce waste and second quality in garment processes.

3) To render direct assistance to mills through technical consultancy e.g.

   - To assist in setting and maintaining standards.

   - To assist in the modernisation of garment making technologies.

4) To make qualitative and operational studies in garment manufacture.

5) To communicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.

Job Description

Project : Textile Development Centre, Egypt.

Objectives : The Textile Development Centre (TDC) is designed to render assistance to the textile industry in Egypt, and possibly to other Arab states, through applied research activities. It is intended to cover all aspects of textile manufacture from fibres to finished garments.

Post Title : Garment Manufacturing Expert (woven garments).

Duty Station : Alexandria with travel within Egypt.

Duration : 6 months.

Starting Date :

Language : English

Qualifications :

- University degree in appropriate discipline.
- At least 15 years experience in the ready-made garment industry with practical experience in garment factory organisation and management.
- First-hand knowledge of the latest techniques and methods of manufacture of ready-made woven garments.

Responsible to : Project Manager.

Duties :

1) To assist the Egyptian textile industry to extend its applied research activities in the field of woven garment manufacture made from cotton and man-made fibres.

2) To assist in devising and implementing applied research programmes within the TDC and in mills, including studies of :-

   - The optimum processing conditions for the manufacture of woven garments from Egyptian cotton and various types of man-made fibre.

   - How to increase efficiency and productivity in garment processes.

   - How to reduce waste and second quality in garment processes.

3) To render direct assistance to mills through technical consultancy, e.g.

   - To assist in setting and maintaining standards.

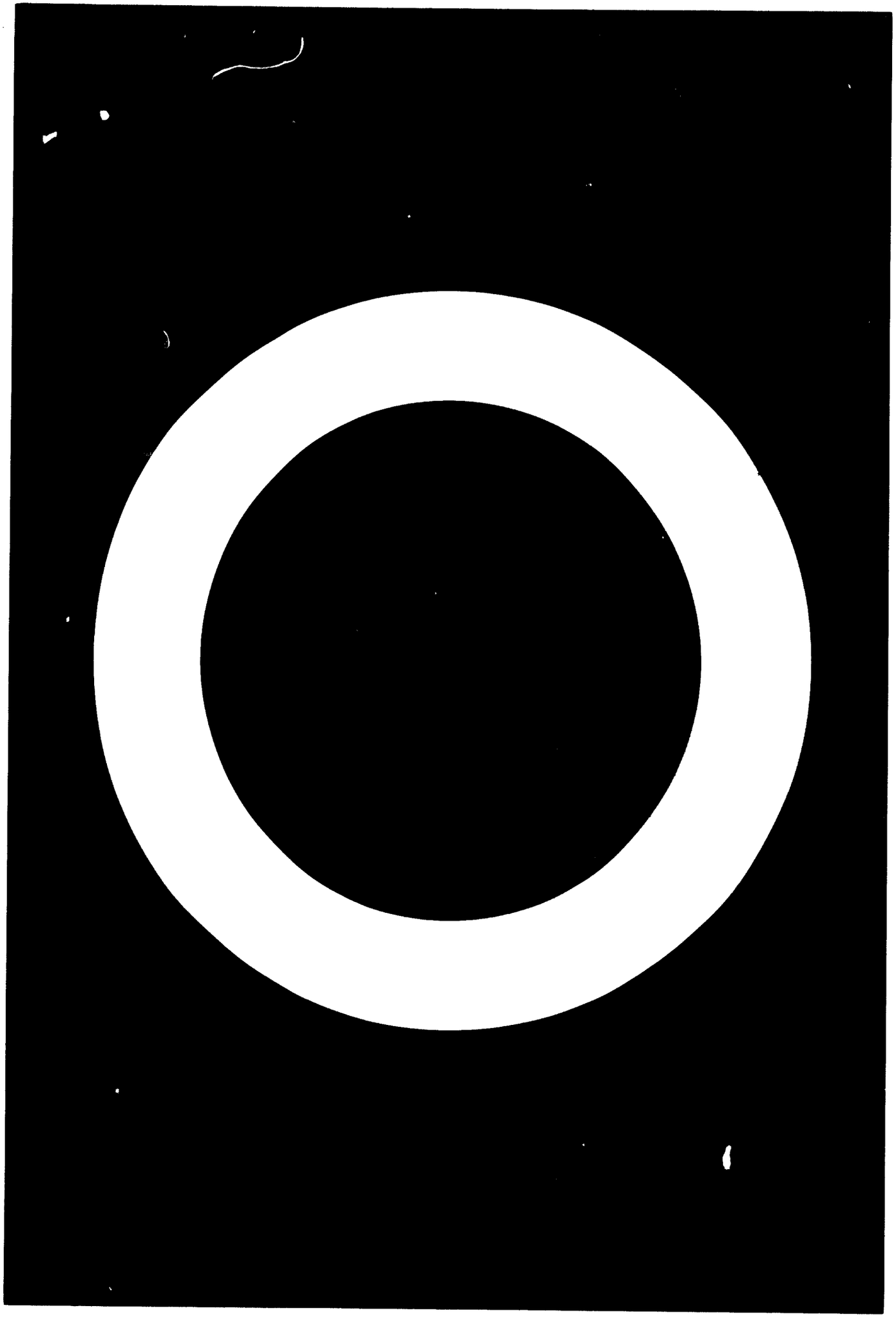
   - To assist in the modernisation of garment processing technologies with particular reference to the introduction of new types of fibre and fabric.

4) To make qualitative and operational studies in garment manufacture.

5) To cummunicate at all levels with the industry by helping to organise (and participating in) conferences, seminars, discussion groups and training courses.

6) To train his Egyptian counterparts to such a standard that they will be capable of taking over and continuing the work at the end of his assignment.

7) To suggest possible future developments of the TDC and its activities for the ultimate benefit of the Egyptian textile industry.



Annex III

MACHINERY SPECIFICATIONS

Weaving: ref. no. 1 - 6

Knitting: ref. no. 7 - 9

Dyeing and finishing: ref. no. 10 - 21

Control of chemical processing: ref. no. 22 - 32

Infrared Spectrometer: ref. no. 33

Pilot plant for ready-made garments: ref. no. 34

Reference No. 1

Machine : AUTOMATIC LOOM (SINGLE SHUTTLE) WITH UNIFIL

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Cotton
	Man-made fibres
	Cotton/Man-made fibre blends
	Continuous filament yarns.
Yarn count :	As wide as possible
Nominal width :	Minimum
Shed formation :	Tappet or Dobby
Picks/Minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion
	Electronic weft stop-motion

Minimum loom beam diameter.

Reference No. 2

Machine : MULTI-SHUTTLE AUTOMATIC LOOM (4x1)
OR MULTI-COLOUR SHUTTLELESS LOOM

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Cotton
	Man-made fibre
	Cotton/Man-made fibre blends
	Continuous filament yarns
Yarn count range :	Widest possible
Nominal reed space :	Minimum
Shed Formation :	Dobby
Picks/minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion
	Electronic weft stop-motion

Minimum loom beam diameter.

Reference No. 3

Machine : AUTOMATIC "SHUTTLELESS" LOOM

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Cotton Man-made fibres Cotton/Man-made fibre blends Continuous filament yarns
Yarn count range :	As wide as possible
Nominal width :	Minimum
Shed formation :	Tappet
No. of weft colours :	1
Picks/Minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion Electronic weft stop-motion
Weft supply packages :	
Minimum loom beam diameter.	

Machine : RAPIER LOOM

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Cotton
	Man-made fibre
	Cotton/Man-made fibre blends
	Continuous filament yarns
Yarn count range :	Widest possible
Nominal reed space :	Minimum
Shed formation :	Tappet or Dobby
Picks/Minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion
	Electronic weft stop-motion

Minimum loom beam diameter.

Reference No. 5

Machine : AIR JET LOOM

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Cotton
	Man-made fibres
	Cotton/Man-made fibre blends
	Continuous Filament yarns
Yarn count range :	As wide as possible
Nominal width :	Minimum
Shed formation :	Tappet or Dobby
Picks/Minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion
	Electronic weft stop-motion

Weft supply packages :

Minimum loom beam diameter.

Price to include compresser and pipe connections.

Reference No. 6

Machine : WATER JET LOOM

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Supplier :

Materials to be processed :	Continuous filament yarns
Yarn count range :	As wide as possible
Nominal width :	Minimum
Shed formation :	Tappet or Dobby
Picks/Minute :	As commercial practice
Stop-motions :	Electrical warp stop-motion
	Electronic weft stop-motion

Minimum loom beam diameter.

Price to include pump and pipe connections.

Reference No. 7

Machine : CIRCULAR KNITTING MACHINE - DOUBLE JERSEY TYPE

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Gauge : 18

Diameter : 30 inches

Supplier :

- Yarn to be processed : Cotton or Man-Made fibre
- Creel : Overhead with automatic stop motion and lint removal.
- Speed : According to commercial practice
- Patterning device :
- Feeding device : Individually adjustable positive yarn feeding device with stop-motion.
- Delivery device : 3-roller fabric take-down device
- Camfeeders : 3-position (knit, tuck, welt).
- Closed race-warp for needle butts.
- Needle detector system with stop motion in case of holes in fabric.
- Air blowing at needles and feeders.
- Variable speed A.C. motor.
- Automatic lubrication to all moving parts including needles.
- Push button control (stop, start, inch) and hand wheel.

Machine : WARP KNITTING MACHINE - TRICOT TYPE

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Gauge : 28 (28 needles/inch)

No. of Guide Bars : 4

Supplier :

Working Width :	Minimum.
Speed :	As commercial practice.
Let-off :	Positive, infinitely variable, individual let-off to regulate yarn consumption.
Take up :	
Stop motions :	Electronic with fabric inspection lamp.
Beams :	Sectional
Patterning device :	Chain links
Length meter :	Yes
Needle bars :	Separate needle replacement
Lubrication :	Automatic

Please quote also for suitable narrow-width warping machine and beams.

Machine : WARP KNITTING MACHINE - RASCHEL TYPE

No. of machines required : One

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hs.
4 wire distribution with earth
220 v, 1 phase, 50 Hs
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Gauge : 36 (18 needles/inch)

No. of Guide Bars : 8

Supplier :

Working Width :	Minimum
Speed :	As commercial practice.
Let-off :	Positive, infinitely variable, individual let-off motion to regulate yarn consumption.
Stop motions :	Electronic with fabric inspection lamp.
Beams :	Sectional
Patterning device:	Chain links
Needle bars :	Seperate needle replacement
Lubrication :	Automatic

Please quote also for suitable, narrow-width warping machine and beams.

Reference No. 10-21

Machine : VARIOUS LABORATORY MACHINES FOR DYEING & FINISHING

No. of machines required : One of each

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

Laboratory Merceriser

Supplier :

Uses :	Mercerising cotton hanks.
Specifications :	Fully automatic Variable speeds Adjustable liquor circulation Adjustable hank tension Reversable direction of rotation Self cooling system.
Source of power :	Electric
Connections :	Inlet & outlet terminals for water and liquors.
Mounting :	To be fixed on the floor.

Laboratory Jigger

Supplier :

Uses :	Dyeing fabrics in open width.
Sample Width :	35 cm.
Specifications :	Fully automatic - also manual Constant adjustable fabric speed 1.0 - 12.0 M/min. with reversible direction of winding. Fabric tension adjustable. Electric heating up to 100°C with automatic temperature control. Made of stainless stell V.4A type. Perspex on windowed cover on the dyebath.
Sources of power :	Electric
Connections :	Inlet and outlet terminals for water and liquor only.
Mounting :	Table model, stainless steel.

Laboratory Winch - Open Type

Supplier :

Uses :	Dyeing all kinds of textile fibres in an endless rope form.
Type of Operation :	Fully automatic - also manual Variable speed Variable temperature
Source of Power :	Electric Self-heating No external steam is required
Connections :	Inlet & outlet terminals for water or liquor only.
Mounting :	To be fixed on the floor

Laboratory High Temperature Pressure Dyeing Machine

Supplier :

Uses :	Universal dyeing machine for normal and high temperature conditions up to 140°C.
Sample :	For fibres, yarn on fabrics of any nature.
Specifications :	With 6 independantly operating dyeing positions of closed-type dye cylinders.
	All parts coming in contact with dyeing liquor made of stainless steel V4A type.
	Material holders for cheese, yarn and fabric.
	Liquor ratio down to 1 : 5.
	Variable stroke speed.
	Variable temperature and pressure.
	Rapid cooling system.
	Supplied with lock system for additions under high temperature.
Sources of power :	Electric
	Self heating
	No external pressure required.
Connections :	Outlets and inlets for water.
Mounting :	Table model, stainless steel.

Laboratory Pressure Yarn Dyeing Machine

Supplier :

Uses :	Normal and pressure dyeing of yarn package at temperatures up to 140° C.
Material :	Cotton, wool and man-made fibres in various forms (loose fibres, yarn and fabrics).
Sample weight :	From 100- 500 gms.
Specifications :	Made of stainless steel, V4A type.
	Supplied with yarn spindle and basket for loose fibres and fabrics.
	Can be used for kier-boiling experiments.
	Reversible liquor flow.
	Variable pressure and temperature up to 140° C.
	Electrically heated.
	Rapid cooling system.
Sources of power :	Electric
	Self water heating.
	Pressure unit included (compressor).
Mounting :	Table model.

Laboratory Dryer, Steamer, H.T.
Steamer and Baker

Supplier :

Uses :	Drying, steaming, H.T. steaming and baking (thermolising) for all kinds c textile fabrics.
Sample size :	Samples of 30 x 40 min.
Specifications :	Dwell time 8 sec. - 60 min.
	Adjustable moisture percentage from 10 - 100%.
	Steam with satinated steam up to 102° C.
	Curing, thermolising and high temperature steaming from 100 - 250° C.
	Pin frames to take up samples 30 x 40 cms appx. and to be adjustable in length and width for suitable tension.
Sources of power :	Electric.
Connections :	Inlet and outlet terminals for water.
	Outlet drain for condensed steam.
Mounting :	To be fixed on floor.

Laboratory Printing Machine Roller Type

Supplier :

Uses :	Printing piece samples of natural and synthetic fibres.
Sample Width :	30 - 50 cm (approx.)
Specifications :	Automatic & manual Equipped with a set of exchangable engraved rollers.
Source of Power :	Electric
Connections :	No external connections are needed
Mounting :	To be fixed on the floor

Laboratory Stirrer For Pastes

Supplier :

Uses :	Stirring of finishing and print pastes.
Specifications :	Variable speeds Changeable blades (if possible) Reversible direction of stirring.
Source of power :	Electric
Mounting :	To be fixed on the floor.

Two-Bowl Laboratory Padding Mangle

Vertical Type

Supplier :

Uses :	Simple dyeing of piece samples. Finishing and impregnating padder for all kinds of fibres.
Sample Width :	40 cm (approx.)
Specifications :	Motor driven
	Automatic feed and delivery
	Adjustable roller pressure
	Gauges for pressure and temperature
	Two directions of rolling (operation)
	Self heating trough.
Source of Power :	Electric
Connections :	Inlet & Outlet terminals for water
Mounting :	To be fixed on the floor

Laboratory Water Extractor

Centrifuge Type

Supplier :

Uses :	Squeezing of wet yarn or piece samples at high speed.
Capacity :	10 Kg (approx.)
Specifications :	Automatic Adjustable speed Adjustable squeezing intervals
Source of Power :	Electric
Connections :	Outlet for extracted water
Mounting :	To be fixed on the floor

Laboratory Calendering Machine

Supplier :

Uses :	Calendering of finished fabrics.
Sample width :	40 cm
Specifications :	Automatic feed and delivery.
	3 bowls, cotton, heated steel and paper about 20 cm diameter and 50 cm width.
	Variable speed and pressure.
	Possible to do friction calendering.
	Electrical heating of steel bowl.
Sources of power :	Electric
Mounting :	To be mounted on floor.

Reference No. 21

Laboratory Heat Transfer Press

Reference No. 22 - 32

Machine : VARIOUS INSTRUMENTS FOR CONTROL OF CHEMICAL PROCESSING

No. of machines required : One of each

Utilisation : For demonstration, teaching, experimental and research work.

To simulate mill conditions in Pilot Plant.

Location : Textile Development Centre, Alexandria.

Electrical Supply : 380 v, 3 phase, 50 Hz.
4 wire distribution with earth
220 v, 1 phase, 50 Hz
3 wire distribution with earth

Accessories : Accessories, attachments and change gears to provide maximum flexibility.

Spare Parts : Adequate for 3 years laboratory work.

Price : To include delivery, installation and any special training necessary.

Details : Supplier to suggest detailed specification and to state any special requirements.

ADDITIONAL EQUIPMENT REQUIRED FOR THE CONTROL OF CHEMICAL PROCESSING

Ref.

22 - Ulra-Violet Lamps (6)

23 - Melting point apparatus (automatic)

24 - Water Distillator with electrical heating; capacity 10 litre per hour (approx).

25 - Viscosimeter for pastes.

26 - Scrubbing tester with automatic cycle counter.

27 - Magnetic Stirrer hot plate (2 hot plates), complete with stands & clamps.

28 - Surface Softness Tester (Inclind plane type).

29 - Thin Layer Chromatography Equipment :-
(Glass plates - Applicators - Spreader - Micro pipettes - Silica Gel G.).

30 - Paper Chromatography Equipment :-
(Aquarium tanks - long glass rods - atomiser - capillary pipette - whatman No. 1 filter paper sheets).

31 - Kjeldahl's Glass apparatus & equipment (6)

32 - Box Muffle Furnace.

Reference No. 33

INFRA-RED SPECTROMETER

Supplier :

No. of instruments required :	One
Range of Application :	Medium I.R. range 4000 - 700 cm^{-1}
Utilisation :	For demonstration, teaching, experimental and research work in textiles.
Location :	Textile Development Centre, Alexandria.
Electrical Supply :	380 v, 3 phase, 50 Hz. 4 wire distribution with earth 220 v, 1 phase, 50 Hz. 3 wire distribution with earth
Accessories :	Mini grinder, mortar, pellet forming equipment and attachments to provide maximum flexibility.
Spare Parts :	Adequate for 3 years laboratory work.
Price :	To include delivery, installation and any special training necessary.
Note :	The supplier to suggest detailed specification and to state any special requirements.

Reference No.34

PILOT PLANT FOR READY-MADE GARMENTS

A pilot plant is required for cutting and sewing garments of the following types :

(a) Knitted garments.

- Underwear
- Outerwear

(b) Woven garments.

- Shirts
- Pyjamas
- Overalls
- Dresses, etc.

Utilisation :	For teaching, experimental and research work. To simulate factory conditions in Pilot Plant.
Location :	Textile Development Centre, Alexandria.
Materials to be made-up :	Cotton, man-made fibre and blended fabrics; woven and knitted.
Price :	To include delivery installations and any special training that may be required.
Details :	The supplier to suggest detailed specifications and to state any special requirements.

Annex IV

PERSONS CONSULTED

Mr. Gian L. Pennacchic	Resident Representative, UNDP
* Mr. Stephen J. Szivos	SIDFA, UNIDO
Mr. Tharwat Sabri	Sen National Professional Officer
* Mr. Hamid El-Mamoun Habib	Chairman, TCF
* Mr. Nabil El-Nozahi	General Manager, TCF
* Eng. Magdi M. Elaref	Co-Manager, TDC
Mr. Mounier Megahed	Deputy Gen. Man. Admin., TCF
Mr. Ahmed Ibrahim Kamel	Architect
* Dr. Mohamed S. Dahmoush	Chairman, Arab & United
* Eng. Fathy Ahmed Aly	Gen. Man. Weaving, Kafr El Dawar
Mr. Mounier	Chairman, Cairo Dyeing and Finishing
Dr. Ahmed Hassan	Gen. Man. Cairo Dyeing & Finishing
Mr. Smith Worley	USDA Cotton Quality Labs (FAO Consultant)
Mr. Mohsen El-Nashar	CATGO
Eng.Samy El-Meligui	Kafr El Dawar
Mr. Abdel Hamid Kheirallah	TQCC
Eng. Nigm Esmat Awad	Knitting Consultant

* Member of the Board of Management of the TDC.

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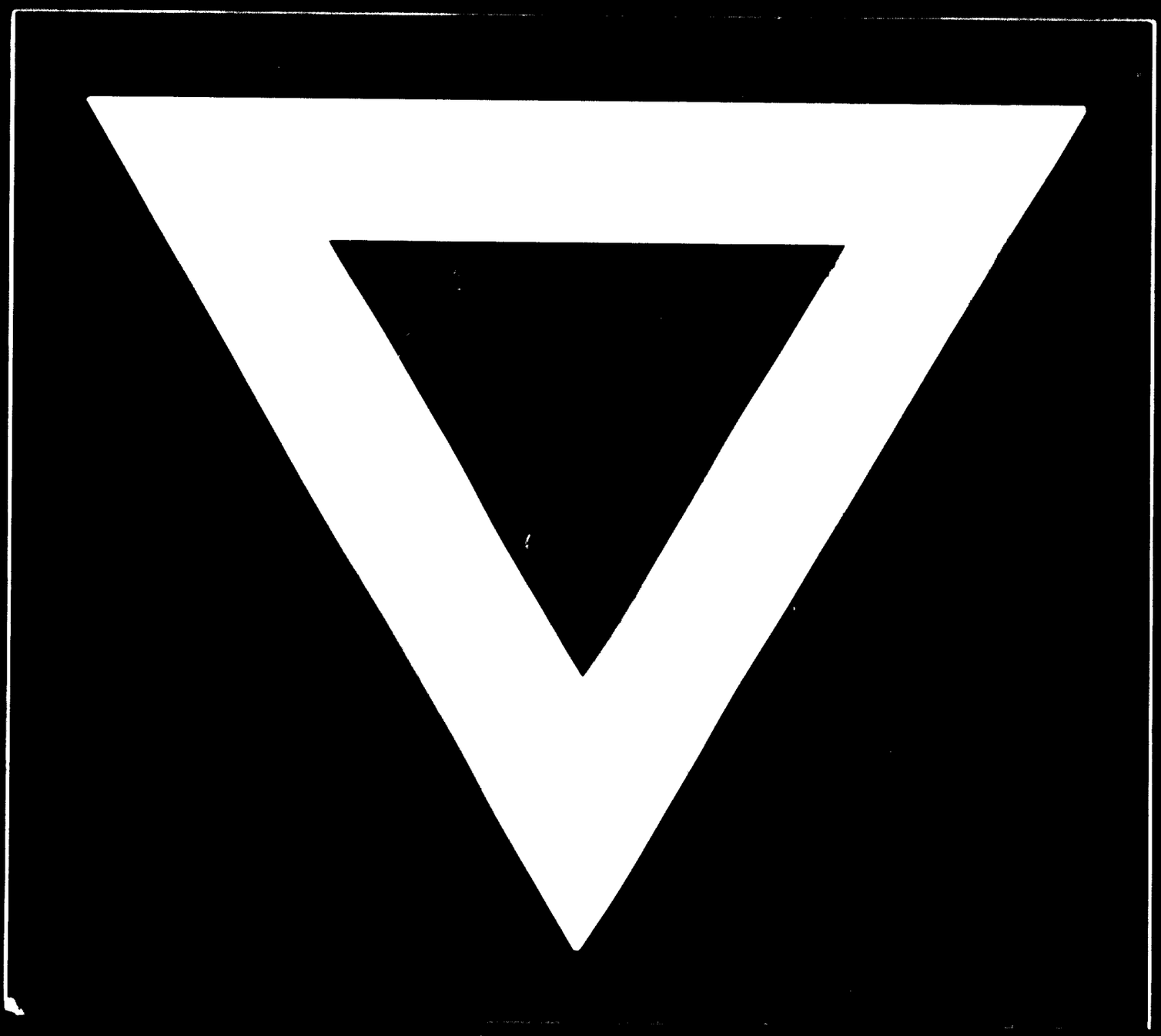

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