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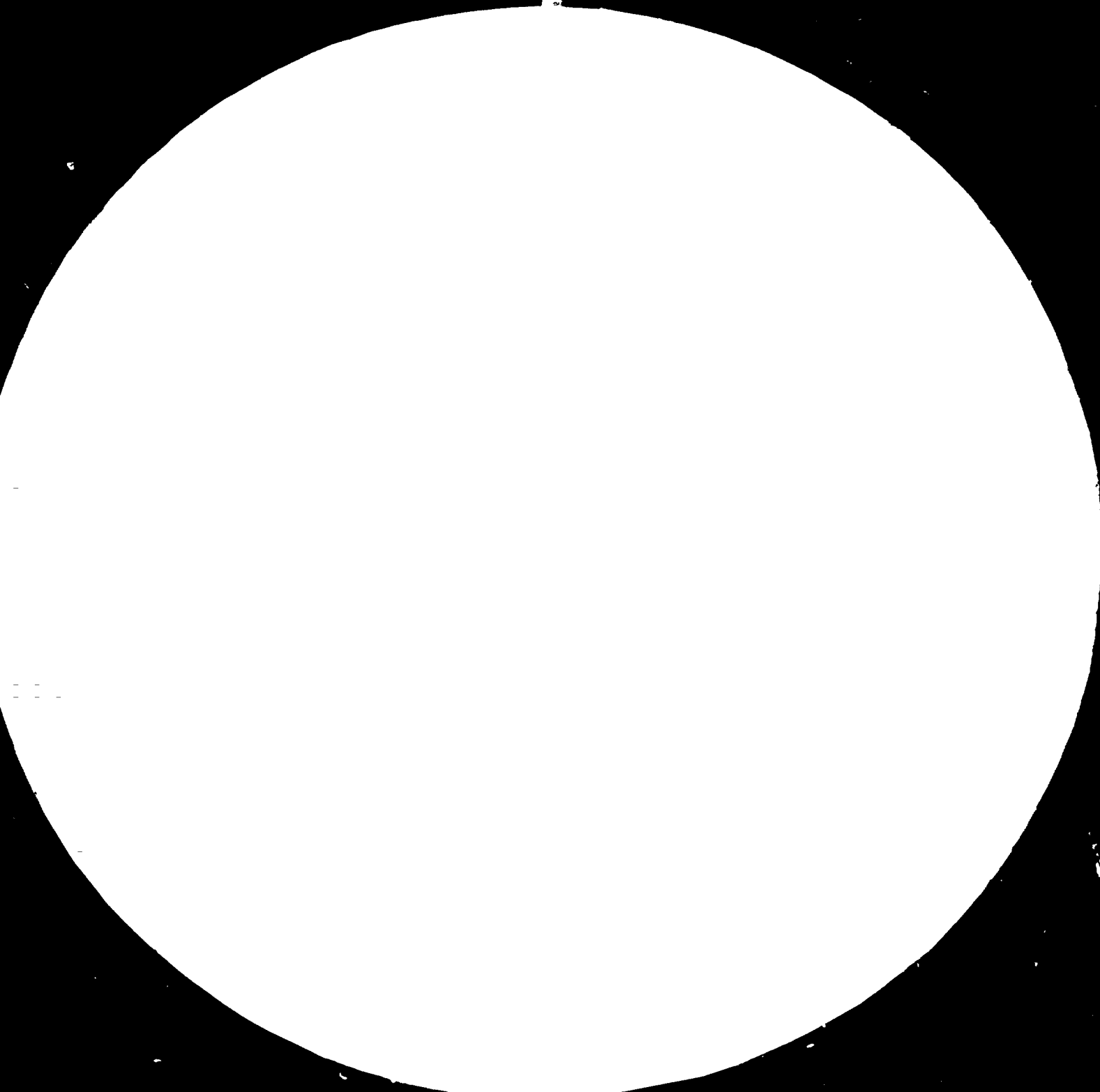

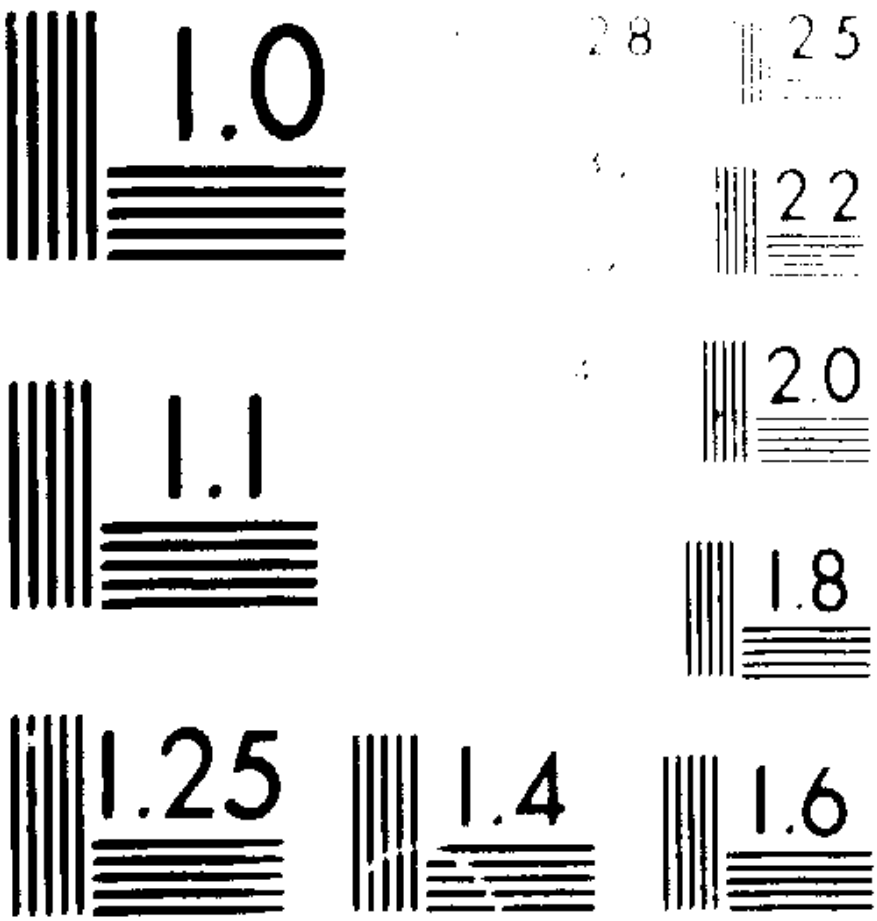
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DP/EGY/77/004 ENGLISH

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The Plastics Industry in The Arab Republic of Egypt

The provision of Technical Assistance to the PDC and Processors in the Industry .

November 1982.

K.E. Andrews

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SUMMARY

The objective of the mission was to offer direct assistance to the Egyptian Plastics Industry through consultation at plant level. The main topic was to be in injection moulding. This was achieved by twelve plant visits covering Alexandria and Cairo. A wide range of topis were discussed covering all the technologies used in the plastics industry and in almost every case specific problems were raised and satisfactorily dealt with. In one case the Plastic Development Centre was able to offer test facilities in the solving of material problems.

Discussion has shown that estimates of the consumption of raw materials used by the plastics industry are probably significantly understated and suggestions have been made on the action required to correct this situation. Recommendations are also made on action required by the Plastics Development Centre to prepare itself for a more broadly based programme of training and assistant to the Plastics Processing Sector once the initial"Plastics in agriculture" work is well in hand.

A lecture was given on plastics processing targeted to give the agriculturists associated with the Centre a broad brush introduction to the principles employed in plastics processing equipment and the materials and their formulations.

1 Introduction

The main purpose of the mission was to make contact with various sections of the plastics industry as set out in the job description (a copy of this is appendixed to this report). Having made that contact it was intended that we should identify and assist in solving specific problems. A detailed programme has already been prepared and some 15 factory visits laid on covering both private and public sectors in Cairo and Alexandria. Some modifications proved necessary and additional visits were added but I would like to state at this early stage that my thanks and appreciation are due to Dr. Osman Abuzeid and Mrs. Nadia Nosseir for making sure that the mission got off to an early start with the minimum of delays which are often associated with many of these activities.

In addition to the factory visits a number of discussion periods had been prepared as well as time allocated for the lecture. This was targeted for those of the staff who are more agriculturally oriented rather than plastics oriented. The objective was to give them some broad brush appreciation of the problems and technology associated with processing plastics materials. A copy of the lecture that was delivered is appendixed to this report.

2 The Status of Industry

2.1 Total consumption of polymers

In a report prepared by UNIDO Expert C.A. Brighton in March 81 it was stated that the volume of all plastics consumed would reach 4.0 kgs. per head of population by 1982. This is equivalent to around 170,000 tonnes on the last available population figures.

A latter report by Dr. F. Garrana offers a similar figure for per capita consumption but puts total consumption including thermosets at no more than around 100,000 tonnes per anum spread between 500 processors. Some 60% was reported to be in the hands of 10 of these and if the remaining 40% is averaged over 490 processors the consumption comes out at about 80 tons per anum each. This figure suggests no more than one machine each and such an average is most unlikely.

During the course of the work carried out during this mission we visited the following companies :-

Company	Estimated consumption of polymers
Middle East Co.	8 - 9000 tpa (tonnes per anum)
Walter Egypt Co.	4 - 500 tpa
Egyptian Plastics Co.	12,000 tpa
Abu Keer Industries	500 - 1000 tpa
National Plastics Co.	12,000 tpa
Medical Packaging Co.	11,600 tpa
Shoe Industry Bata	4,000 tpa
Misr Petroleum Co.	800 - 1000 tpa
El Sherief Co.	15,000 tpa
Total	63,500 tpa

In addition to this discussion suggested that around 20-25,000 tpa are consumed by the wire and cable industry. At least 2,500 tonnes is used in polypropylene woven fabric and some 9,000 tonnes by another sizable company, El Shanti. Altogether these figures yield nearly 100,000 without considering the mass of smaller operators. Work carried out by consultants on behalf of Egyptian Petrochemicals puts the consumption of PVC resin in 1981 at around 40,000 tpa and polyethylene at around 60,000 tpa making a total of 100,000 in these polymers alone which tends to support a much higher figure than other sources suggested. There is no doubt that there is an urgent need to identify precisely what the current consumption of polymeric materials is within the country to assist not only with planning of the Plastics Development Centre but also to aid government in its planning for the industry. Dr. Abuzeid the PDC Project Director, is aware of the problem and agrees that the available estimates are too low. I understand the person responsible for the Petrochemicals Project is in the process of carrying out some parts of the survey but this is mainly targeted to yield data on polyethylene and PVC not the overall picture. All I am able to do is to emphasise the importance this information as a planning tool. I suggest that present consumption of plastics raw materials is probably nearer 200,000 tonnes than 100,000 tonnes. A detailed breakdown by polymer and end use is an urgent need.

One other general factor emerged during the visits many finished plastics products are imported. Perhaps the most significant example is the bumper of fender and grill for the Fiat motor car. Volumes are in the 100's of thousands and weight per auto is excess of 8 - 10 kilos. The average modern automobile contains between 60 -80 kgs. of plastics per vehicle and this is not the only consumer of imported plastics products. Although time did not permit extensive

enquiry it is obvious that imported plastics products must be in the tens of thousands of tonnes per anum. A second study in addition to that of consumption of raw materials to provide detail of the current levels of imports of products which could be manufactured by local industry would greatly assist in planning the forward work for the Plastics Development Centre once the initial agricultural projects are established.

2.2 Levels of Present Technology

Although levels of control and quality within the parts of the industry that we saw were variable, these related much more to the need for management training than the quality of the equipment. Generally the standard of equipment installed within the industry is high and compares favourably with those found elsewhere in the world particularly in Europe. Many of the machines come from quality producers such as Cincinnati Milacron, Krauss Maffei, Battenfeld, Windsor, Amut etc. Much of it is no more than two to five years old and well maintained. Injection and blow moulding tools are extensively imported and whilst some companies have the technology and equipment to manufacture themselves, they are hampered by the availability of skilled staff as well as availability of base metals and parts. In such a short mission it was impossible to put any reliable numbers on the requirements of the industry in the form of moulds purchased per anum, standard plate needs, ejector pins, pillars etc. Mrs. Nosseir suggested this might be a good area for a joint venture company and whilst I fully subscribe to this view it requires a good deal of market research to acertain "in depth" the industry needs followed by a feasibility study of the possible options.

One of the constant problems raised by management during our visits was the lack of technically trained local staff. Even when efforts are made to train people there appears to a steady drain to other Arab countries on account of the higher renumeration that can be obtained. Whilst this is a complex social and political problem on which I have no wish to comment, recognition of its impact on the plastics industry where skill is a major element of sucess, is important. In addition consideration should be given to the setting up of part time courses for industry personnel. Probably through the good offices of the local university coupled with the PDC. The former could perhaps offer the theoratical element, whilst the latter could provide pilot plant training. The availability of such training courses has played a major role in the development of Western Industry and also in such area as

Hong Kong, Singapore and Korea to quote but a few examples. Detailed study of such training courses is another urgent need for the plastics industry in Egypt.

2.3 New Technologies being Introduced

There is no lack of inovation and entrepreneirial spirit in the Egyptian plastics industry and the following are but a few of the new ventures being undertaken. A new line to produce 8.0 metre blown film for agricultural applications. The equipment is already delivered and awaiting installation.

A line for the production of direct injection polystyrene foam for the thermoforming of trays and egg boxes has been ordered and is expected in 1983.

A complete re equipment of plant for a mould making shop is planned for 1983.

There are a selection.Clearly the industry is making strides and is not afraid to make sizable investment in complex technology. We also found evidence of a willingness to employ foreign experts on short term contacts to import skills and up lift productivity in local factories in the private sector.

3. Specific Assistance offered during Visits

3.1 Evaluation of a polymer sample

At a company manufacturing tooth brushes ,and a variety of packaging products two samples of material were taken. The first polyethylene repeutedly high density,was clearly behaving in an unsatisfactory manner. Evaluation of its properties suggested it was not high density PE at all and this information was passed on to the company.

The second sample was cellulose acetate and moisture determinations were made.

3.2 Discussion of dip tube for aerosol cans

Discussion of the important properties of these materials took place and the equipment list of the PDC was modified to provide dies to make samples in the course of time. The company was made aware of tne ability of the PDC to do stress crack resistance tests, the key property for this application.

3.3 Reclaiming Weather damaged material

The company was made aware of the specialist equipment available from European sources for dealing with this problem.

3.4 Manufacture of containers caps

Discussions took place on the use of multi start threads in screw caps which enable simple dies to be used instead of complex unscrewing dies.

These examples are no more than illustrative of the type of specific technical enquiries which were encountered and dealt with during the mission. They do serve to illustrate the importance of technical service as an on going activity in the PDC's future programme.

4. The Status of the PDC

Work is progressing on completion of installation of the equipment and there is good reason to believe that the bulk of the pilot plant will be operational by the end of the year. Studytours of some of the staff are in progress but the very recent loss of one of the most experienced men during his training at RAPRA will be a considerable blow. Replacement and retraining will inevetably cause a delay and I would like to make it clear that UNIDO will be requested to provide an additional fellowship over and above present budget provisions to cover this unfortunate loss.

I am confident that the management of the Plastics Development Centre are aware of the need for continuing pressure to maximise the impact on the plastics industry as a whole. Now that the experimental farm is beginning to operate, I would like to express the view that programmes designed to identify and attack the problems of other sectors of the industry should be accorded increasing priority.
It is clear from the work carried out during the mission that the processing sector of the plastics industry is progressive and alive to its opportunities. At the same time it has significant problems perhaps the biggest of which is trained personnel.
The immediate need is for the PDC to begin the task of identification of these problems so as to have the base data to hand when staff and equipment are ready. Data assembly is a time consuming exercise and in my view it is never too early to start.

I would list some of the areas where I would suggest study:-

a) To identify in detail, precise training needs of the industry by discussion with plastics fabricators and appropriate educational institutions. To what extent are the industry willing to release personal, for short courses, say of three weeks duratio or, on a day a week basis over six months, or what are the other alternatives.

To what extent is the industry willing to pay for such courses or participate in their funding. These are but some of the factors to be explored. Even if a start were made immediately no meaningfull course could be set up before late 83 or early 1984.

b) There is an urgent need to identify the detailed size of the Plastics industry both in consumption and conversion of plastics raw materials, and, imported plastics products so as to make government aware of the relative importance of this industry sector. This will aid the Centre in obtaining continuing support from Government and the industry itself. It will also broaden the PDC's interface with converters.

c) A small market research team is needed by the PDC in order to carry out the work suggested in (a) and (b) and whilst these personal require market research skills they also need an understanding of the industry in order to question and interpret the data intelligently. Consideration should be given to obtaining a UNIDO expert to assist in this process and carry out a pilot study as a training mechanism. A period of 2 - 3 months would be required to do this effectively.

5. Recommendations

5.1 Although plastics in agriculture is the priority task of the Plastics Development Centre, there is a need to broaden the activities into the plastics industry sector. It is suggested that a small market research team could play a vital role in identifying and defining the most important future objectives for the PDC.

5.2 It is recommended that the following be accorded priority for such a market research team :

5.2.1 To identify and quantify the industry's training needs so as to ensure that PDC training programmes fully meet the industry's requirements.

5.2.2 To identify and quantify consumption of plastics raw material in Egypt by polymer and end use so as to ensure that proper priority is accorded to the PDC's development programmes.

5.2.3 To identify and quantify imports of finished plastics products into Egypt, so as to assist government in planning and the industry in manufacture to aid the country to become more self sufficient.

5.2.4 To identify and quantify the demand for injection and blow moulding tools, as a base for making decisions of the kind and extent of assistance, the PDC should offer in this area of technology.

5.2.5 Consideration should be given to the provision of an international expert on a 2-3 month mission to train market research staff through the medium of a pilot market research project.

5.2.6 A programme of evaluation of locally produced products would provide practical experience for PDC staff and valuable knowledge of the current standards of industry's products.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO June 1980

PROJECT IN THE ARAB REPUBLIC OF EGYPT

INTERNAL

JOB DESCRIPTION

DP/EGY/77/004/ 11-02/F/32.1.H

Post Title: Plastics technologist - injection moulding

Duration: 1 m/m.

Date required: August 1981.

Duty station: Alexandria and travel within the country.

Purpose of the project: Establishment of a Plastics Development Centre (PDC) to undertake and provide technical support for both strengthening and expanding the Egyptian plastics industry. The need of trouble-shooting and advisory service to the injection moulding sector of the industry has already been identified.

Duties: The technologist in collaboration with the counterpart will be expected to :

1. Make initial contact with the injection moulders through the methodology of an industrial clinic where he will answer written questions in order to deal with many common problems. Subsequently individual consultations and visits to factories will be arranged.

2. Recommend to Government future work which may be required to follow up these activities by the PDC.

3. Prepare a report at the end of the mission.

Qualifications: Plastics technologist or engineer of graduate level or equivalent with extensive experience in the plastics injection moulding section of the industry relating to methods of operation and costing as well as mould design and mould making. He should be familar with a wide range of equipment and its control equipment. Previous experience in a developing country would be advantageous.

..../..

Applications and communications regarding this Job Description should be sent to:

Project Personnel Recruitment Section, Industrial Operations Division
UNIDO, P.O. Box 707, A-1010 Vienna, Austria

Language: English

Background information: There are more than 300 processors in the country using about 80,000 tons of plastics raw materials. The Government is planning to set up a petrochemical complex to produce annually 180,000 tons of polyethylene and 100,000 tons of pvc. However, a number of problems are encountered by the local plastics industry in their efforts to achieve an orderly and efficient and rapid expansion. Shortage of trained personnel, lack of quality control standards, good mould design and mould making facilities, knowledge of the requirements of plastics for the user, and of sufficient experience in application development are some of the immediate problems.