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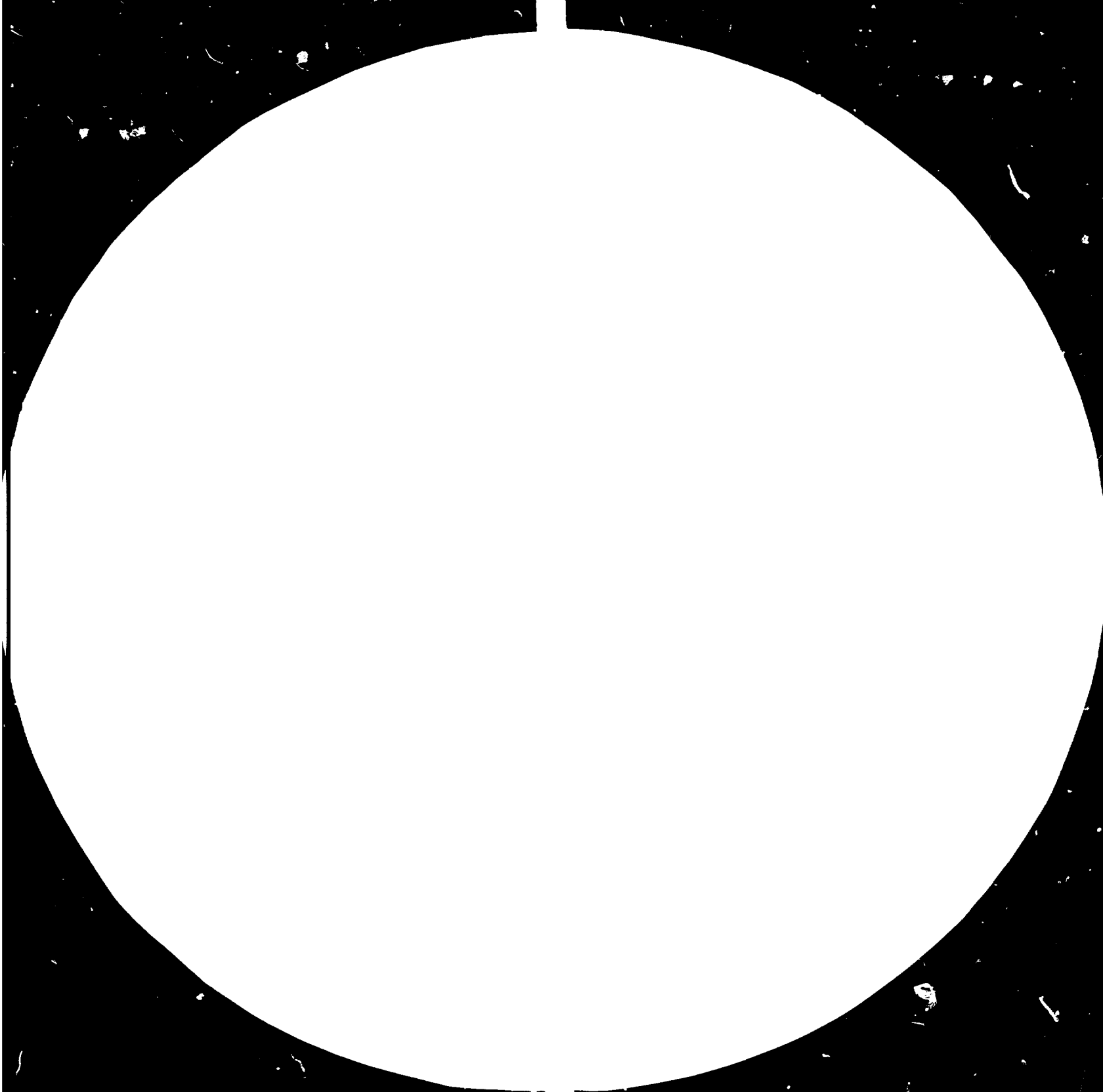
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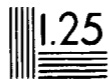
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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

China.

Report on the Mission
to the Textile Academy, Beijing

DG/CFR/82/004/11-01

by

Prof. Dr. Heinz HERLINGER

11/12/84 mw

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Between November, 16 and November, 25 the standing Technical Committee held its annual meeting and the Tripartite Review at the Textile Academy in Beijing.

1. REPORTS

- 1.1 A project report was given by Mr. Liu Zhen Zhong, Vice-Director of the Textile Academy.

As the subjects are discussed in detail in this written report, this report mainly concentrates on findings and recommendations.

The following subjects have been discussed:

- (1) Consultants
- (2) Study tours
- (3) Training
- (4) Equipment
- (5) Government Inputs

Workplan for 1935

Construction work
Study tours
Consultants
Training
General recommendations

1.2 A general plan of SFRC was given by Mr. Wei Dongzou.

Subjects:

- (1) Basic tasks of SFRC (Synthetic Fibre Research Centre)
- (2) Organization
- (3) Equipment
- (4) Plan layout for construction work
- (5) Existing defects (additional activities)
 - 5.1 Staple fibres
 - 5.2 Non-wovens

1.3 A report on scientific projects have been given by Mrs. Zhang Xi Wei.

REMARKS AND RECOMMENDATIONS TO THE REPORTS

The organisation of SFRC of course has to be seen on the local existing conditions, personnel situation etc. It should be considered if the following organization could be suitable for SFRC.

1. Polymer division:

- 1.1 Polymer synthesis by different processes
polymerisation, polycondensation
- 1.2 Polymer analysis
chemical and physical analysis

2. Spinning division:

- 2.1 Meltspinning,
Wet spinning
Dry spinning
- 2.2 Filament processing
Texturing
Staple fibre
(non-wovens)

3. Polymer Analysis

- 3.1 Physical chemistry of polymers, fibres and auxiliaries
- 3.2 Chemical analysis
- 3.3 Surface research,
spinfinish etc.

4. Pilot plant

Scaling up of laboratory results till industrial application

Construction layout

The layout plans given to STA by Mr. Wei Dongzow will be discussed with pilot plant specialists in Germany and additional information will be given to the Synthetic Fibres Research Centre.

In the report No 3 given by Mrs. Zhong Xi Wei interesting scientific technical results are given.

Technical services

Most important is the fact that an intensive discussion with industry has started and agreements have been signed.

Developments

Developments have been made in the following fields:

- (1) Solid phase polycondensation of PET
- (2) Flame retardant cotton
- (3) Cotexturising
- (4) Fine denier PET (0,5 dm) by high speed spinning
- (5) Polypropylene by high speed spinning
- (6) Split fibres
- (7) Spin finish (first steps only)
- (8) Synthetic leather; polyurethane - PET - coating
- (9) PET-modifications
- (10) Metastatic effects by grafting

The results showed that products can be developed, that the technical know-how is present. But some of this work is only a development of already existing technology. It is absolutely necessary to get own experience with all these products in the Research Centre, but it has to be recognized, that in an international market provisions have to be made not to hurt existing patents.

To avoid any mistakes in this field it is necessary that the Textile Academy improves its documentation system. All research work starts with an analysis of the present state of knowledge in science and technology.

For this reason the following recommendations are given:

(1) Library

1.1 Journals:

The library of the Textile Academy contains an excellent collection of international journals, but many volumes from 1968 to 1978 are missing. The STA will find out how the missing journals can be bought.

1.1 Books:

There is a small collection of international books, but many standard books are missing. The PSA will prepare recommendations for the most important books.

1.3 Information system:

There is a serious lack of information for the scientific working groups.

1.3.1 Information on specific subjects

Before any work starts a complete literature survey has to be made on:

- (i) General publications
- (ii) Patents
- (iii) Technical data
- (iv) Product information from existing products
(see also chapter "internal training")

1.3.2 Information system for members of the Research Centre.

A review information system has to be worked out by the Textile Academy

- (i) Translations of titles of important international publications
- (ii) Provide a translation and copy-service on the demands of research personnel and industry

- (iii) Installation of an internal computer literature research system
- (iv) Connections to the international literature service systems
- (v) Editing a monthly review journal on important subjects
examples: Spinning technology
New patents
Spin finish literature
Polyurethanes
Aramides
etc.
- (vi) "Information system of the Synthetic Fibre Research Centre for the Fibre industry"
eventually combined with basic information for the workers in the plants
Example: Man-made fibre in India published by
SASMIRA, Bombay

(2) Internal further training of SFRC members

Recommendations:

A high percentage of the technical staff of the SFRC has not enough professional experience in research work. A further internal programme is highly recommended.

- 2.1 Information on instruments and methods existing in the Synthetic Fibre Research Centre. A short description of all existing methods, theory, practice, instrument description, possible results should be edited. This information should be given to members of SFRC and industry. (Help of University personnel would be useful).
- 2.2 SFRC staff should be trained as broad as possible on the existing facilities.
- 2.3 Training how to find existing literature
 - monographies,
 - journals - translation
 - special card index
 - patent literature
 - product information

2.4 Use of computers

A series of personnel computers (PC) should be installed.

Courses for computer use should be given in:

programming

interfere construction

on-line -computers in research

literature indexes on computers.

RECOMMENDATIONS TO IMPROVE INDUSTRIAL CONTACTS

I. "Scientific-technical advisory board of the fibre industry to the Synthetic Fibre Research Centre" - STAB

(1) Each Fibre Plant or Fibre Pilot Plant should nominate one delegate for the Scientific Technical Advisory Board (STAB)

(2) In two meetings per year the STAB shows the problems to the research staff of the Academy. The research staff reports on research work and results. Discussions of introduction of results in the industry follow

(3) A yearly report on results is given to the fibre and textile industry.

(4) Provisions should be organised that the Synthetic Fibre Research Centre personnel can visit plants and discuss actual problems.

(5) Industrial managers should be encouraged by Government (Textile Ministry) to ask the Research Centre for assistance and keep contacts.

(6) A list of existing research and development groups in the fibre field should be collected.

II. Discussions on scientific work

(i) Spin finish group

The work in this important field just only started. It is recommended to install:

- (1) an analytical group for analysis of spin finish
- (2) to collect data on all products and raw materials for spin finishes available in China

- (3) to start work on surface properties of fibres eventually with the help of a physico chemist of PhD-level
- (4) to send people for training on properties of spin-finish to become acquainted with product properties
- (5) to collect products, analytical data and performance data
- (6) to collect literature and patents on spin-finish , documentation of data
- (7) to instal. the necessary equipment for spin-finish research and train staff on all necessary research methods.

(ii) Textile coating group

Discussions on polyurethane synthesis have been held

Recommendation:

- (1) Documentation of patent literature
- (2) Catalysis of extension-reaction
- (3) Install possibilities for pre-tests in the laboratory for polymer synthesis

(iii) Antistatic group

Polyether-methacrylates have been grafted on Polyether by Peroxides, problems arose on dyeability, antistatic effects persisted 20 washings.

(iv) Non-wovens

Research should be extended in this new promising field.

III. International Conference

Discussions have been held on hosting an "International Conference on Synthetic Fibres for Developing Countries - Science and Technology".

A Conference of this type has been held in India at SASMRIA, Bombay in 1982. It was decided to ask Prof. Dr. W. Albrecht who organises the Dornbirn Conferences to assist in planning the Conference.

<u>Time schedule:</u>	18 - 24 November 1985
<u>Place:</u>	International Centre
<u>Invitations:</u>	8 - 10 International Experts
	10 Chinese experts
	10 Representatives from developing countries
	10 Companies (selected from 25) on their own expenses

Further details will be discussed between Project Scientific Advisor and Prof. Albrecht who is invited to China in January 1985 to hold also lectures on non-wovens.

IV. International Co-operation

The possibilities on international co-operation have been discussed. In technical fields the co-operation between research groups is rather difficult because of the interests of the national industries. A way to start is the co-operation on a personal basis; exchange of scientific staff. Co-operation between University Institutes is also often possible, but University institutes often work only in academic fields.

International co-operation also is only possible if the partners are of equivalent level.

A start could be:

Co-operation in a very specific field. There exists an enormous research potential in China. Co-operation between national research centres, universities, industrial laboratories, pilot plants have to be organised as soon as possible.

International co-operation perhaps could be started in the field of ecological problems. From such projects automatically further co-operation results.

Present problems which can be solved:

- (1) The contracts for delivery of equipment sometimes contain not enough conditions for improvements. After installation it is found that some improvements should be made; or that spare part delivery is not enough. Also fulfillment of contracts can only be made by keeping about 10% of payment in reserve till performance tests are fulfilled. Many of these problems can be avoided by the use of the UNIDO purchase department.
- (2) Training :
In some special cases training of personnel should be possible for a longer period, for instance 12 - 24 months. Much time can be saved by starting studies already in China on the same subject and continue only for additional training.
- (3) Technical Meetings:
It is absolutely necessary for the research staff to attend international meetings on synthetic fibres and also equipment expositions.

Examples: Dornbirn "International Conference on
Chemical Fibres"

ITMA

ATME

ACHEMA

and others

(4) General training:

It is absolutely necessary that all personnel which works in the fibre field is familiar with the downstream technologies for the production of textiles and for textile finishing.

A collection of training subjects which already have taken place should be indexed.

RESUME

The results of the Synthetic Fibres Research Centre on scientific technological development are very promising. Main efforts should be made according to the recommendations.

Besides specific research work the following tasks exist:

- (1) Further internal training of personnel
- (2) Improvement on information systems, internal and external
- (3) Industrial - scientific advisory board
- (4) International contacts, Meetings etc.
- (5) Organisation of national Meetings

