



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

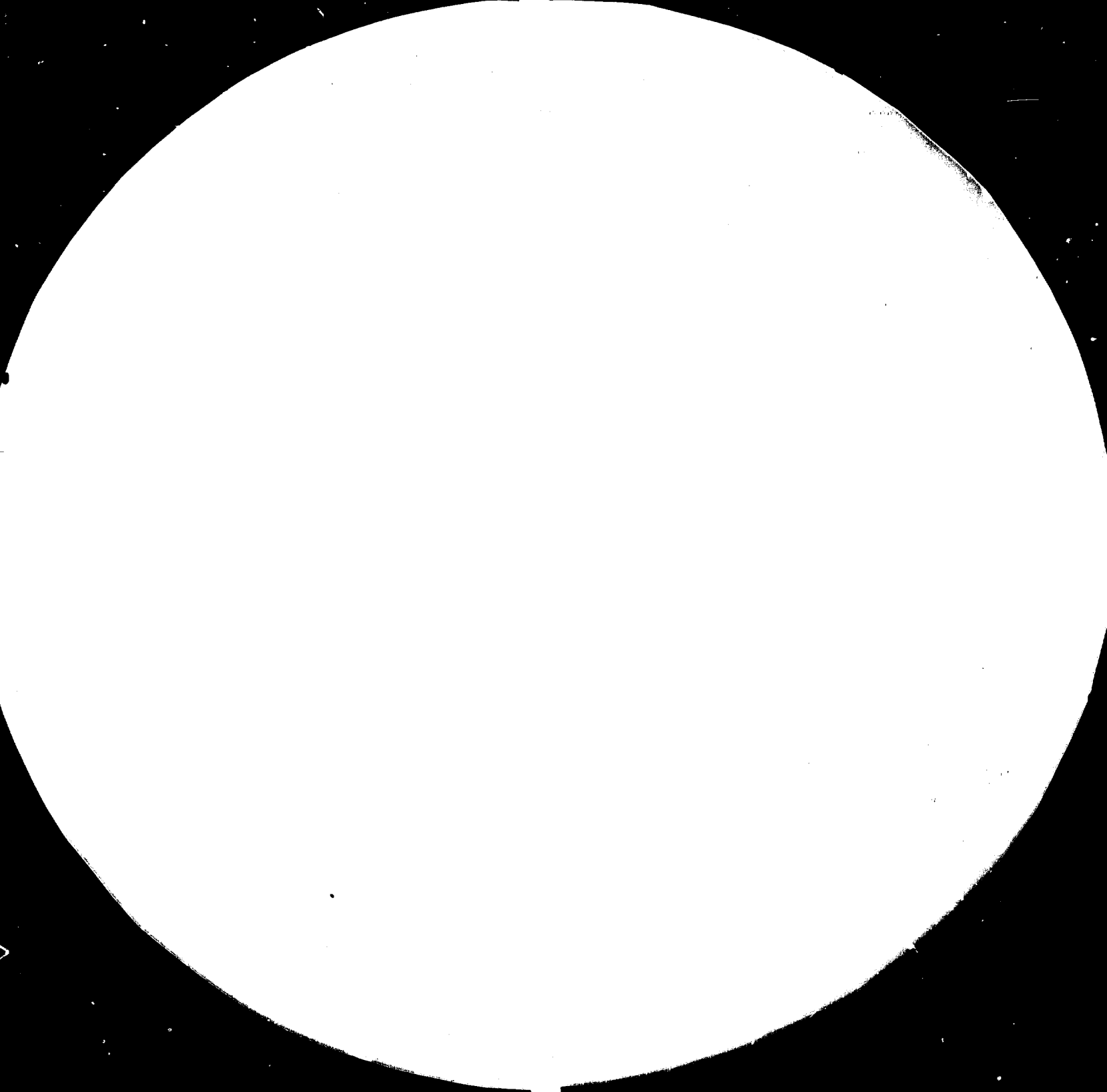
FAIR USE POLICY

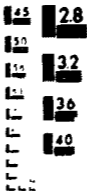
Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

RESTRICTED

5 September 1984
English

14405

Vietnam. CERAMIC INSULATORS
DP/VIE/80/026

Technical Report*

Prepared for the Government of Viet Nam
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Bernarda Bartakova

Based on the work of Ms. R. Bartakova
Consultant on Ceramic Insulators

United Nations Industrial Development Organization
Vienna

* This document has been reproduced without formal editing.

3475

from: Mr. Biering

	Page
1) Summary of consultant's activity in VIETTRONINS HoChiMinh City	3
2) Introduction	4
3) The existing Facilities of VIETTRONINS	5
4) The present activity of VIETTRONINS	6
5) The material resources in Vietnam and the possibility of their utilization for electronic components manufacturing	7
6) The future work of VIETTRONINS	8
7) The present situation in material and electronic component production	9
8) The situation in electronic component production after project realization	10
9) Main example of economic effect of project realization for Vietnamese national Economy	11
Annex 1 Results of ceramic material analysis	
Annex 2 Main raw materials used for electronic component's production	
Annex 3 Pilot production effect after project realization	
Annex 4 Scheme of VIETTRONINS structure organization	
10) Draft of Project Document for realization of the Project DP/VIE/80/026 United Nations Development Programme Project of the Government of Vietnam Development of electronic and electrical ceramic materials and components including pilot production	

1-15 pages

12 Annexes

1) Summary of consultant's activity in VIETTRONINS
HoChiMinh City

Mrs. Bartakova arrived to HoChiMinh City on 19/7/1984

After the briefing by Mr. NGUYEN NGOC NGOAN VICE DIRECTOR OF ELECTRONIC COMPANY and Mr. NGUYEN HUY SAN Director of VIETTRONINS (Vietnamese Institute for Electronics) the work has been started in laboratories of VIETTRONINS.

The collected documents and result of ceramic raw materials analyses have been studied. Two factories manufacturing the passive components (BLIM HOA VIETTRONICS and TANBINH VIETTRONICS) in HoChiMinh City and the main deposit of kaolin in Dalat area have been visited.

After all necessary discussions and consultations the draft of the project document was elaborated in close cooperation between staff of VIETTRONINS and consultant B. Bartakova.

The plan of consultant's activity was thoroughly prepared by Mr. NGUYEN HUY SAN after the agreement with Mr. HUYNH NGOC RANG so that the consultant's activity might be optimally utilized for elaboration of both project documents: DP/VIE/80/026 and DP/VIE/84/002

The work in VIETTRONINS was finished on 14/8.

Mrs. Bartakova and Mr. NGUYEN HUY SAN left for Hanoi on 15/8 for finalizing discussion with UNDP. Mrs. Bartakova left Hanoi for Vienna on 24/8.

2) Introduction

The Socialist Republic of Vietnam has an urgent need to build up the national industry and to reduce its dependence on imported materials. The geological investigations show that there are many possibilities to substitute the imported raw materials by materials from local resources in Vietnam and save so the foreign currency. The country is rich in raw materials. Suitable for production of many kinds of ceramics, especially ceramics for electronic components.

Therefore the government of Vietnam asked of UNDP - assistance to provide necessary facilities for development and pilot production of ceramic materials and components for electronic and electrical industry.

The proposal has been accepted and input of 650,000 US \$ was reserved for this purpose.

The government already provided laboratory rooms partly repaired and equipped. The construction of pilot building will start within short time. Besides the government is providing all of facilities available in Vietnam.

The government signed the bilateral contract with CSSR in order to support this perspective branch of development. In the frame of this contract considerable part of equipment necessary for development on a relatively broad basis will be supplied. Part of this equipment have been delivered during consultant-stay (laboratory glass microscopes etc.)

Mrs. Bartakova has been appointed for elaboration of the project document within her one month mission in Vietnam.

3) The existing facilities of VIETTRONICS

The institute VIETTRONICS is located on the outskirts of HoChiMinh City close to the factory VIETTRONICS BINH HOA for passive components.

Address of management : 74 - 76 Nguyen Hue Q.I HoChiMinh City

Address of laboratories : 204 Ho Trang Long C. Binh Thanh HoChiMinh City

The total laboratory area for project realization in present time is 1.900 m². Laboratories of 600 m² are already equipped for simple analysis and are fully prepared for acceptance of new equipment. Remaining laboratory area of 1.300 m² is going to be repaired (water electricity pressure air) laboratory furniture is about 50 % of necessary on spot.

The construction of building for pilot can be started being prepared all necessary building materials.

The electricity supply is permanent the current never cut of, being common with the electronic industry plant. The manufacturing process of this factory can not be stopped with regard to technology.

4) The present activity of the VIETTRONICS

The institute staff
in present time

1	research workers
10	engineers university degree
5	technicians
3	laboratory workers
2	craftsmen

The number of employees has to be increased to 50 people during the project implementation. The necessary agreement has been made between VIETTRONICS and Technical University in order to secure the necessary increasing of number of VIETTRONICS staff.

Although the present activity is limited by the very poor equipment, the staff has achieved some significant results in :

- Development and introduction in pilot of sockets for power electronic tubes used in amplifier's production
- ✓ - Development and introduction in pilot production of ferrite antennae
- ✓ - Development of ferrite for interfrequency transformer
- ✓ - Development of permanent ferrite for loud-speaker
- Development of resistors bodies for carbon resistors

The staff is very active and enthusiastic.

The working conditions are good thanks to perfect organization and flexibility of management endeavouring to improve by all possibilities also the living conditions for VIETTRONICS employees

5) The material resources in Vietnam and the possibility of their utilization for electronics components manufacturing

The survey of the main ceramic material deposits is attached to the draft of project document as Annex 1.

Annex 1 shows the results of analysis of main local material in comparison with those from France.

There is evident that the quality of Vietnamese raw material is suitable for development of electronic elements and that the Government and UNDP inputs will bring the considerable effect for national economy in the close future.

6) The future work of VIETPROTECH

In view of the fact, that the conditions for development of VIETPROTECH activity in development of electronic components are very favourable being ensured by local raw materials, existing and future facilities, manpower and considerable financial support from government and UNDP the establishment of following laboratories and pilot production is recommended.

Laboratory and pilot production of

Corundum Ceramics

High frequency Ceramics

Dielectric Ceramics

Piezoelectric Ceramics

Semiconductor Ceramics

Ceramics for heavy current electrical equipment

The Annex 2 shows which components will be developed from local material and for which imported materials are still needed.

The Annex 3 shows how the pilot production will cover the actual needs of electronic components in electronic industry.

The Annex 3 shows also estimated effect of pilot production in Dong.

The scheme in Annex 4 shows the organization structure of VIETPROTECH

7) The present situation in material and electronic component production

70 % of all electronic components are imported to Vietnam concerning passive as well as active components

51 % kinds of raw materials for manufacturing of these components are imported including 19 sorts of ceramic materials

80 % of all raw materials are imported for components production (in US \$)

8) The situation in electronic component production after project realization

After project realization the situation will be following :

30 % of electronic components will be still imported.

Amount of 40 % will be covered by VIETTRONICS pilot production for close future (only 5 years). The further development of electronic in Vietnam needs the introduction of developed components into the large scale production

12 kinds of ceramic materials for production and development must be still imported after project realization

55 % of all raw material must be still imported after project realization. The project realization will reduce the import of raw materials for electronic component production from 80 to 55 %

9) Main example of economic effect of project realization for Vietnamese national Economy (saving of foreign currency)

Several of the main examples of economic effects expected after the achievement of Development Objectives of Project DP/VIE/60/026

150.000 - 200.000 kg of kaolin is needed for the manufacturing of 150 mil ceramic resistors (yearly production)

The price of 100 kg of kaolin imported from France is 200 - FF (without transportation costs). The kaolin from France will be fully substituted by local kaolin being of the equal quality

Economic effect 20 000 FF

5 mil of ceramic chips must be imported for the yearly production of ceramic capacitor's manufacturing. This amount of semiproduct costs 290 000 Roubles

Economic effect 290 000 Roubles

(all of these capacitors are exported)

The amount of 420 000 US \$ is needed for purchasing of ferrite antenes and interfrequency transformers to cover the yearly radios' production in Vietnam. The pilot production will cover this need of radio production for about 10 years

Economic effect 420 000 US \$

RESULTS OF CERAMIC MATERIAL ANALYSIS

ANNEX 1

expressed in volume reduction at 1 050°C

Compositions	Vietnamese Kaolin	French Kaolin	Vietnamese Clay	French Clay
Al ₂ O ₃	38,38	39,96	33,43	36,9
SiO ₂	46,46	45,62	52,34	43,64
TiO ₂	0	0,19	0,1	2,4
Fe ₂ O ₃	1,02	0,83	1,6	2,73
CaO	0	0,22	-	0
K ₂ O	0,45	0,05	0,96	0
Na ₂ O	0,04	0,13	0,12	0
MgO	0,04	0	0,26	0
MnO	13,29	12,63	10,99	14,33

MAIN RAW MATERIALS USED FOR ELECTRONIC COMPONENT'S PRODUCTION

Country : VIETNAM

Terminal Report

Project : DP/VIE/60/026

		Raw material resources	
Main compositions		Local	Import (Roubl
Ceramic materials : for electronic : high frequency :	Talc	X	
Dielectric :	Barium carbonat		X
:	Zirconium oxid ZrO_2		X
:	Carbonat Strontium		X
:	Clay	X	
:	Kaolin	X	
:	Calcium carbonat	X	
:	Magnesium Carbonat $MgCO_3$	X	
:	Zinc oxid	X	
:	Titanium oxid		X
Corundum :	Bauxit Al_2O_3	X	
Piezo electric :	Ferrum oxid Fe_2O_3	X	
:	Zinc oxid ZnO	X	
:	Plumbum oxid PbO	X	
:	Titanium oxid TiO_2		X
Semi conductor :	Ferrum oxid Fe_2O_3	X	
Ferrite :	Ferrum oxid Fe_2O_3	X	
:	Zinc oxid ZnO	X	
:	Nickel oxid NiO		X

: Ceramic materials : for electronic	Main compositions	Raw material resources	
		Local	Import (Koubler)
: Ceramics for	: Kaolin	: X	:
: heavy current and	: Clay	: X	:
: energetic	: Sand SiO_2	: X	:
: equipment	: Feld spar	: X	:

PILOT PRODUCTION EFFECT AFTER PROJECT REALIZATION

Country : VIETNAM

Project : DP/VIE/80/026

Terminal Report

Products	Quantity/year (pieces)	Financial Dong/year Effect (yearly)	Actual needs of industry covered %
High frequency Ceramics	100.000	1.000.000	30 %
Corrundum Ceramic	100.000	500.000	20 %
Dielectric Ceramics	50.000	50.000	20 %
Piezo electric Ceramics	10.000	500.000	50 %
Semiconductor Ceramics	10.000	100.000	20 %
Ferrites	300.000	2.000.000	50 %
High voltage Ceramics and heavy current Ceramics	10.000	1.000.000	20 %

SCHEME OF VIETTRONICS STRUCTURE ORGANIZATION DIRECTOR

Terminal Report

Country : VIETNAM

Director

Project : DP/VIE/80/026

Vice directors for

Administrative department

- Planning
- Finances
- Purchasing
- Personnel (labor-salaries)
- Documentation
- Library
- Internal service

Technical department

- Chemical Analyses Laboratory
- Laboratory for Technology Development
 - Sections
 - High frequency Ceramics
 - Dielectric Ceramics
 - Corundum Ceramics
 - Piezoelectric Ceramics
 - Semiconductor Ceramics
 - Ferrites
 - High Voltage Ceramics
 - Heavy Current Ceramics
- Testing Laboratory
 - Sections
 - Electrical Properties
 - Mechanical Properties
 - Reliability Testing
 - Burn in device
 - Reliability Testing
 - Environmental Testing
- Pilot
- Work shop

VIETNAMESE ELECTRONIC
INSTITUTE IN HOCHIMINH CITY
VIELTRONICS
VIETNAMESE SOCIALIST
REPUBLIC

DP/VIE/80/026

MISSION Report

Prepared for the Government of the VIE/80/026 by United Nations Industrial Development Organisation, executing agency for the United Nations Development Programme.

Based on work of B. Bartakova
Consultant in Ceramic materials and components development
and pilot production.

UNIDO - VIETNAM

