



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



5m
D02897



United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.87/5
17 August 1971

ORIGINAL: ENGLISH

Regional Seminar on Machine Tools
in Developing Countries of
Europe, Middle East and North Africa

Slatni Pjaseazi (Golden Sands) near
Varna, Bulgaria, 18 to 27 October 1971

WAYS AND MEANS OF CO-OPERATION ...
BETWEEN X
INDUSTRIALISED AND DEVELOPING COUNTRIES X
IN THE
SELECTION, DEVELOPMENT, MARKETING AND UTILIZATION
OF MACHINE TOOLS 1/

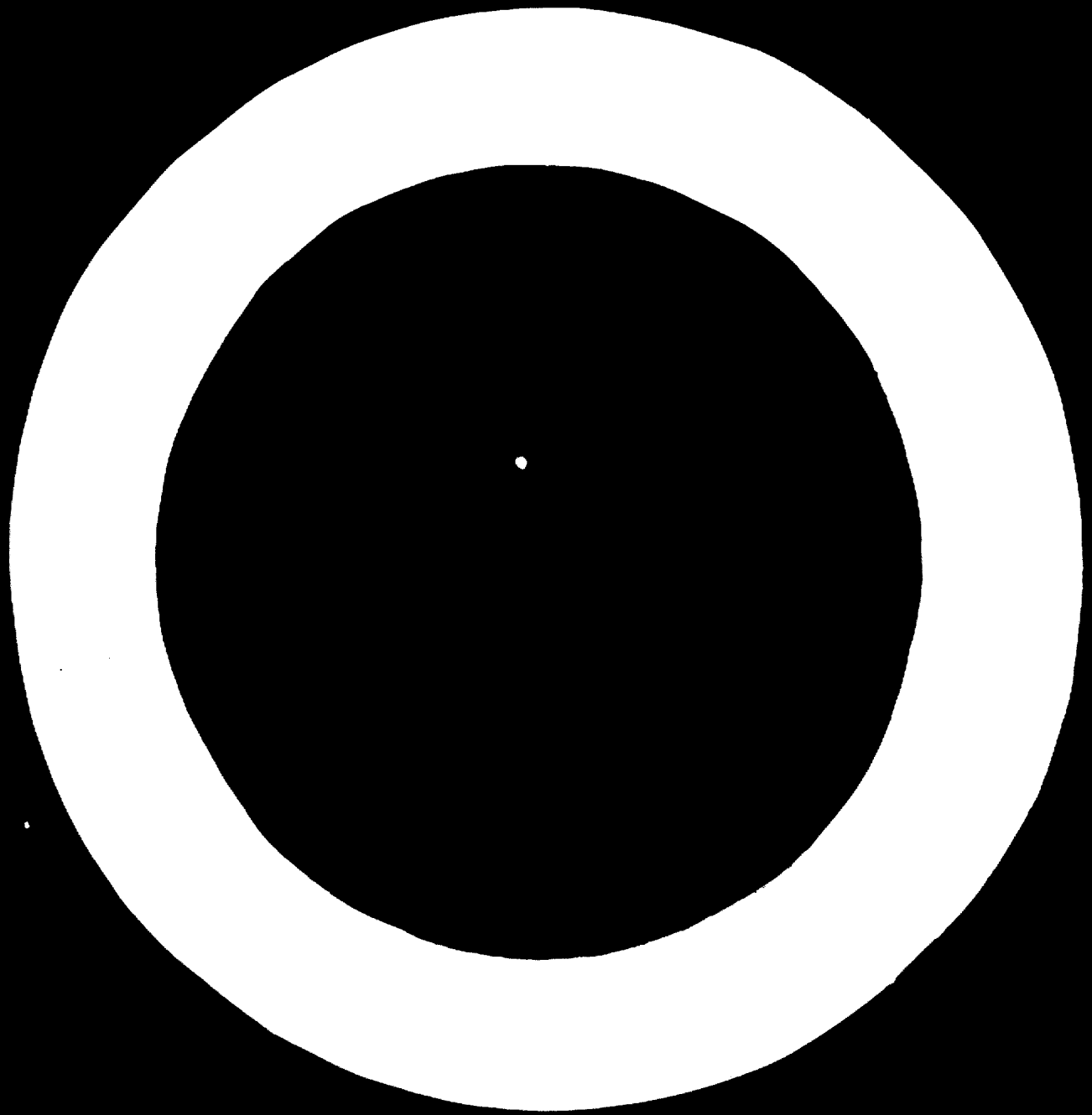
by

K. C. Berger
Vertriebsleiter
Friedrich Deckel
Präzisionsmechanik und Maschinenbau
8 München 25, Pflinganserstrasse 150
Federal Republic of Germany

1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

id.71-6538

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.



1. Introduction

The present paper represents the experience of a company which

- exports into more than 90 countries
- manufactures machine tools utilised in all metal working industries

It can therefore be considered as generally applicable. It does not represent a special case of narrow band application.

Premises of the paper:

- emphasising the concept "Co-operation between industrialised and developing countries" as being a long term proposition
- no autonomy for the sake of it, considering the short term interests through only one country
- considering the industrialisation under its important economic point of view on the international market place; only enterprises able to operate under economically sound conditions can survive in the long run
- the basic problem of the "make-or-buy-decision", applicable to developing as well as to industrialised countries
- the inherently different motivations from developing and industrialised countries; necessity and possibility of their reconciliation
- an industry of sophisticated products in a country can only survive if a local market of sufficient size (either today or in a foreseeable future) justifies an economically sound manufacturing operation.

2. Basic possibilities of supply to a market

Import:

Criteria: the product is required

it is not-or insufficiently manufactured
in the country

there is foreign currency available for it

Disadvantages: dependence on external suppliers
availability of foreign currency

Advantages: unlimited possibilities of procurement
as to origin
quantity
technology

Conclusion: in case of supply to a basically limited
market with very differentiated requirements,
the import gives highest flexibility as
to selection of the most suitable product
also in smallest quantities. No concession
from part of the end users has to be made
to adapt to a limited manufacturing programme
of local origin.

Own manufacture :

Criteria: the product is required in a quantity such that
an economically sound manufacturing is justified
the required skilled personnel must be available
or be made available

the design and development capability must be
available to keep the acquired know-how con-
tinuously on the latest state of the art
(special consideration of shortening life cycle
of technical products)

the local supply from external auxiliary indus-
tries must be available

Disadvantages: the risks combined with the fulfilment of above
criteria

the dependence on one product and one know-how
supplier

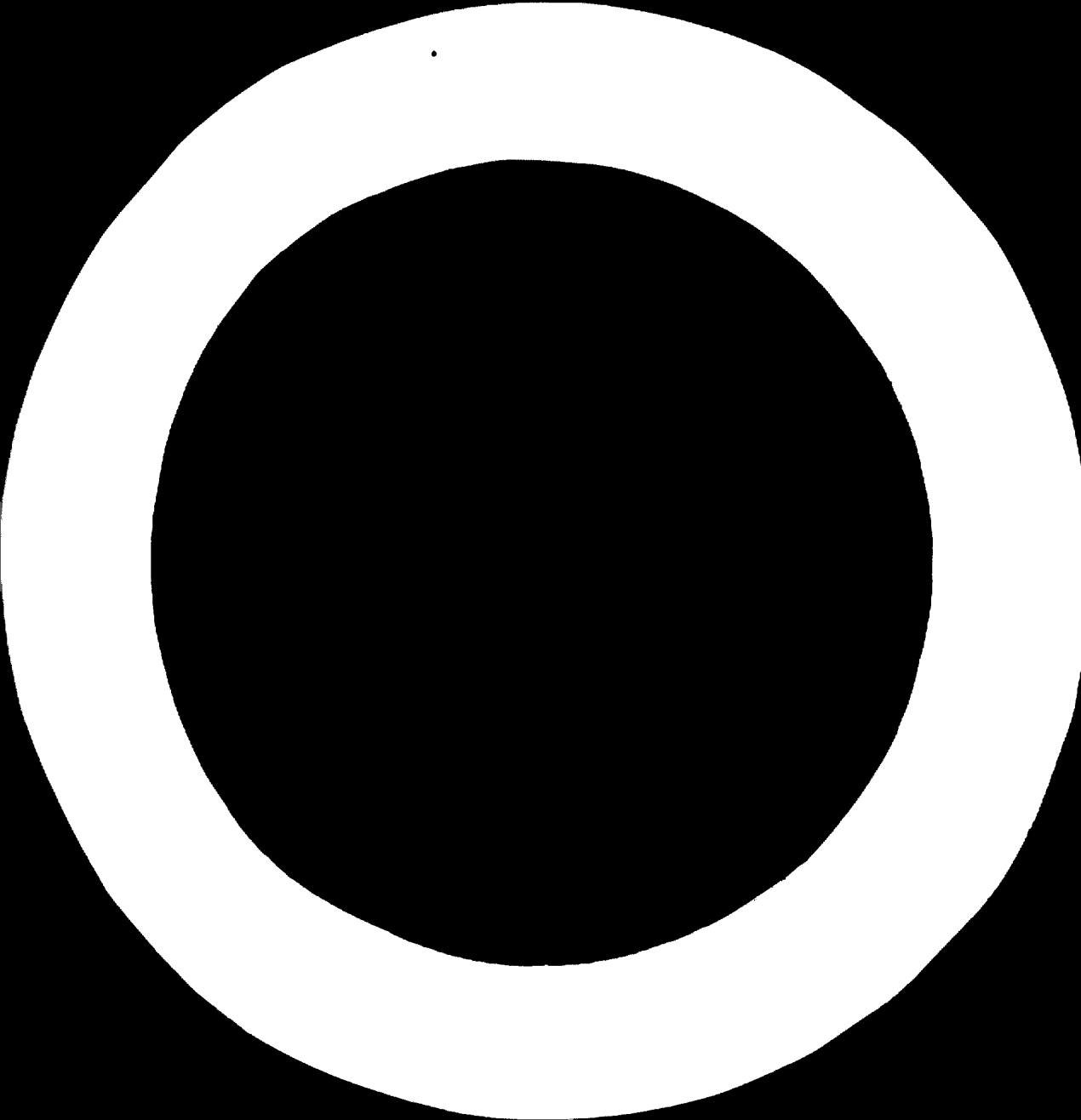
the volume of investment

Advantages: the independence of external supply sources

the local procurement of labour

the possibility to compensate at a later stage
the current foreign currency expenditures
with exports

Conclusion: in case there is a locally to be supplied market of sufficient size and light differentiation, the local manufacture offers the possibility to reduce foreign currency expenditure with simultaneous utilisation of local labour. The necessary concessions as to the range of products and the dependence on only one know-how source must be accepted.



Assembly:

Criteria: logical intermediate stage between import and local manufacture

only to be recommended if local manufacture can realistically be envisaged

Disadvantages: in reduced form combines disadvantages of both import and local manufacture

Advantages: in reduced form combines advantages of import and local manufacture

Conclusion: as every compromise it combines the disadvantages of both extremes without fully utilising their advantages. In certain cases and after detailed analysis it can be the optimal solution, which in any case should only be temporary; i.e. it should be only selected if local manufacture can be envisaged.

This solution is not a single one but a full range of them, reaching from one extreme to the other via varying degrees of manufacturing or assembly depth.

3. The machine tool industry in its key role to industrialisation

Characteristics:

- the machine tool is the only product which is in a position to reproduce itself
- the machine tool is never an end product per se but the vehicle to manufacture end products
- the quality of a finished product can never be better than the quality of the machine tool on which it has been made i.e. the machine tool defines and limits the quality of the end product

Conclusions:

- experiments in the field of machine tools can have serious repercussions on the total industry of a country which uses them
- the machine tool industry of a country is never an export intensive industry a priori for the direct procurement of foreign currency
- the machine tool outfit of a country is decisive for the export capability of the goods manufactured in this country

4. In which way can the machine tool industry of an industrialised country support the industrialising efforts of developing countries

- supply of equipment and application know-how

continuous modernisation of existing manufacturing plants with which their end product will be kept up to date with newest technological standards and with that on the level of international competitiveness

consultancy and hardware supply for the planning of new industries as third partner to the know-how supplier and the know-how receiver

- supply of complete industrial units (plant and equipment)

in the form of complete industries e.g. centralised mold and die production units for the supply to a central plastic or glass industry of a country

in form of autonomous plant sections e.g. tool rooms for automotive factories or other industries

in form of training and education centres for metal working; one of the most important functions to build up a roster of qualified skilled labour

- supply of complete machine tool building industries

definition of the economics of the project

analysis of the industrial structure of the markets to be supplied

future tendencies

recommendations about the basic economic soundness and selection of types

planning of the project and definition of the auxiliary conditions

suppliers and their pre-requisites

planning and time scale

realisation of the project

procurement and installation

training of personnel

putting in operation

5. Arriving at the economically feasible solution; pre-requisite;
total requirement of machine tools of a country

- some characteristic comparison figures (1969)

country	local consumption	production	export	coverage of local consumption through local production	import
Switzerland	100 %	280 %	225 %	55 %	45 %
FRO	100 %	190 %	111 %	77 %	23 %
Japan	100 %	95 %	8,5 %	85 %	15,1 %
Brasil	100 %	33 %	4 %	29 %	71 %

Discussion:

Brasil: industrialisation strongly developing
measured versus local consumption: limited local production
minimum export
high import

Japan: highly industrialised country, starting with
stabilisation phase
measured versus local consumption: high local production
limited export
reduced import

West Germany: strongly industrialised country, longer
stabilization phase
measured versus local consumption: very high local prod.
high export
increasing import

Switzerland: highly industrialised country, stable
measured versus local consumption: very high local prod.
extremely high export
high import

Conclusion: there is a characteristic cycle depending on the
degree of industrialisation of a country:
import - import plus limited local production -
increasing local production and decreasing
imports (in percent!) - starting export -
increasing export at increasing import -
at constantly increasing local consumption

- the determination of total requirement of machine tools

existing industries: definition of the actual equipment of machine tools
timely replacement requirements
foreseeable increase in volume

planned industrialisation projects: actual status and development
requirement of machine tools for the
different stages of development

cross check: a rough cross check can be made through the
gross national product and the percentage of it
due to manufacturing industries. Comparison with
industrialised countries.

Purpose of the exercise is to define the requirement of machine tools broken down by types (families)/number of units/years. Only out of a detailed analysis of this kind can be deduced up to which point the import, from when to when local assembly, and from when onwards local manufacture presents the economically sound solution.

UNIDO/CECIMO/national organisations have experts to put at disposal of developing countries to carry out such analysis and to formulate recommendations which range according to machine type from pure import up to pure local manufacture.

Import is always required first step prior to local manufacture: product knowledge, experience etc.

The import: Requirements of the user vis-à-vis the manufacturer

- the selection of a suitable manufacturer
 - recommending function of UNIDO/CECLID/local organisations;
 - international documentation

- the product information by the manufacturer
 - product documentation
 - fairs and exhibitions
 - application

- the competitiveness of the product
 - technology
 - delivery
 - price

- the availability of the product and its manufacturer
 - the sales and marketing organisation, locally and in the country of origin

- the service organisation
 - consultancy
 - personnell development in the application of the product
 - installation and putting into operation
 - maintaining in operation (maintenance, repair, spare parts)

7. The local manufacturing unit

- The concept of the depth of manufacture

continuous development between assembly and manufacture;
extremes; the dependence of the depth of manufacture of
the produced number of units from an economical view point.

- The selection of the know-how source (manufacturer)

based on import experience: necessary pre-requisite
based on a consultancy by UNIDO/CECIMO/local organisations

- The possibilities of co-operation

the know-how agreement:

take over of the actual state of the art from the
know-how source

installation and taking into operation of the
manufacturing unit by the know-how source

possible timely limited management contract with
the know-how source

one off-payment to the know-how source

licencing agreement

taking over of the actual state of the art from
the know-how source

installation and putting into operation of manufacturing
unit by the know-how source

continuous adaptation of the product to the latest state
of the art by the know-how source is possible

continuous payment, usually in dependence of the manufacturing
output

local participation

participation of the know-how source in the project
in form of know-how, plant and equipment, training of
personnel, capital

installation and taking in operation by the know-how source

maintenance of the latest state of the art for the product

- The problem of the sub-supplying industry
 - the smaller the output of the factory the smaller is the economically feasible manufacturing depth
 - the smaller the manufacturing depth the higher the sub-supply portion
 - the quality of the sub-supplies decides on the quality of the finished product

main sub-supplies:

- foundry
- norm piece parts
- steel
- electric and electronic
- plastics
- tools

possibility of procurement:

import: should be restricted to critical parts which can be procured optimally from the know-how source

advantages: guarantee of function
participation on big production batches

local sources: must correspond in type and quality to minimum requirements specified, which depend on the type of manufactured machines and must be defined from case to case

The contribution of the know-how source

Finished products to cover the continuous market requirements up to the starting of the new local enterprise

Establishment of a project plan:

Manufacturing depth as function of the market requirements and manufacturing possibilities (sub-suppliers, qualified personnel, etc)

Supply of know-how (one off or continuous)

Financial participation in accordance to typ of co-operation

Procurement of plant and equipment

Checking and selection of sub-suppliers (locally and imported)

Selection and training of local personnel; training facilities

Selection and procurement of expatriate personnel (management roster) as per agreement

Installation, putting into operation and handing over of the manufacturing unit

- The contribution of the local partner

Clearance of legal requirements and formalities

Procurement of land, buildings etc. in accordance to specifications of the project plan

Availability of utilities (electricity, water, gas etc)

Procurement of local labour

Procurement of sub-supplies from local industry

Handling of import formalities for

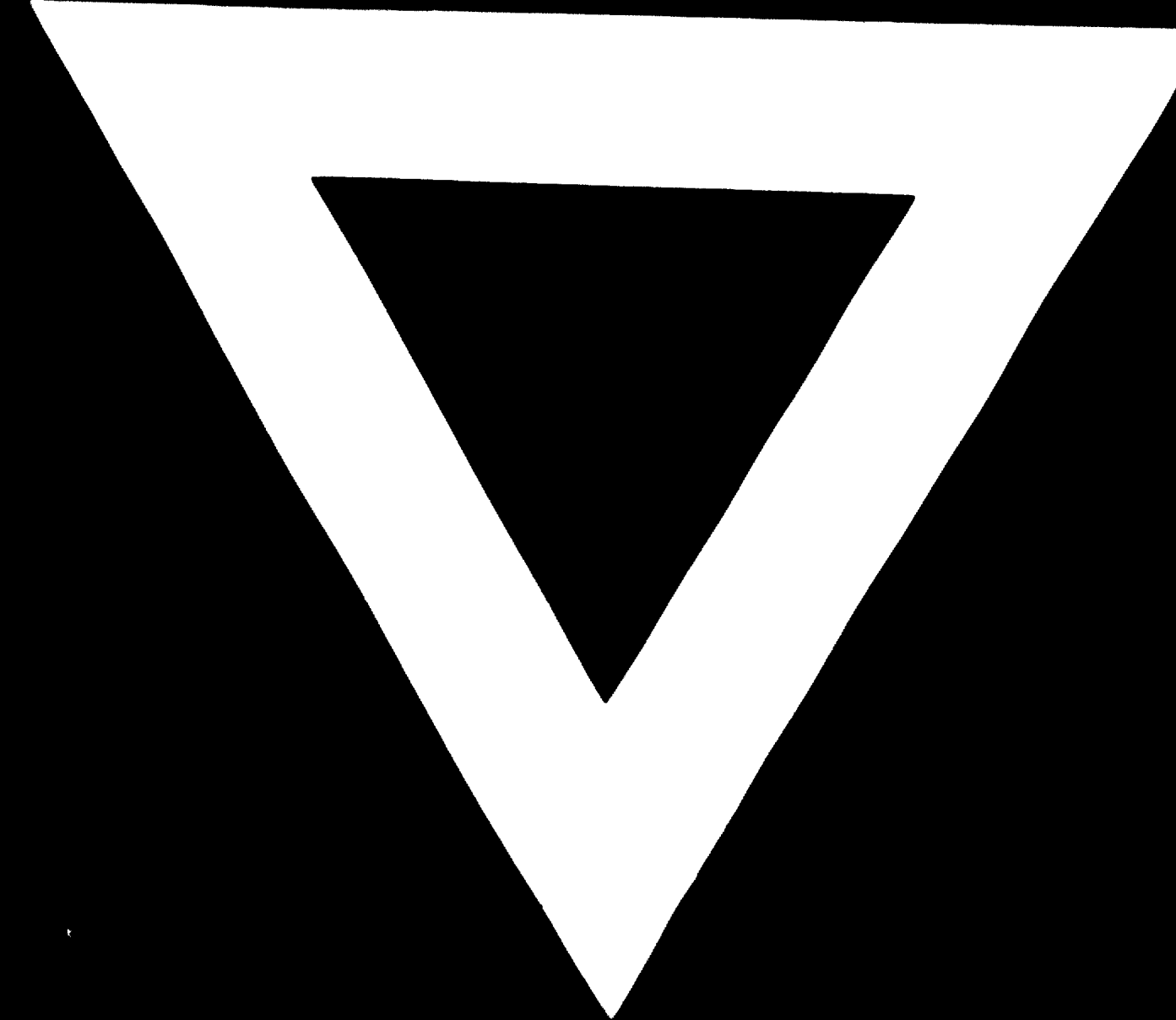
finished products

plant and equipment

continuous sub-supply imports

marketing and sales organisation based on experience of and agreements with the know-how source.





74.10.14