OCCASION

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

DISCLAIMER

FAIR USE POLICY

CONTACT

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

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

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

ID

Distr.
LIMITED

UNIDO/IPPD.150
May 1974

ORIGINAL: ENGLISH

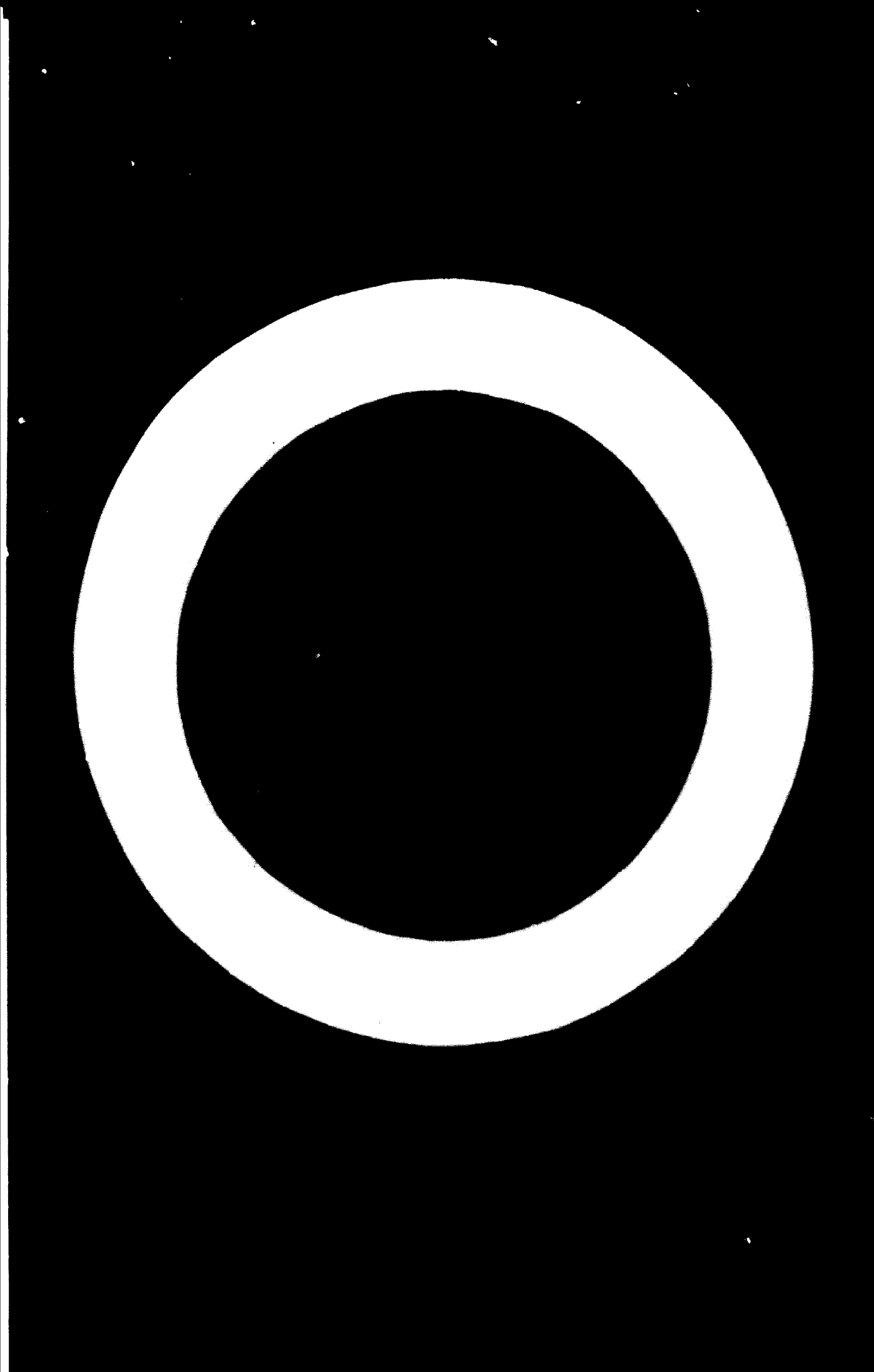
United Nations Industrial Development Organization

INDUSTRIAL PERFORMANCE EVALUATION PROFILES STANDARD QUESTIONNAIRE FOR THE GLASS INDUSTRY[1]

(with Explanatory Notes)

1/ This document has been reproduced without formal editing.

id 74-1726



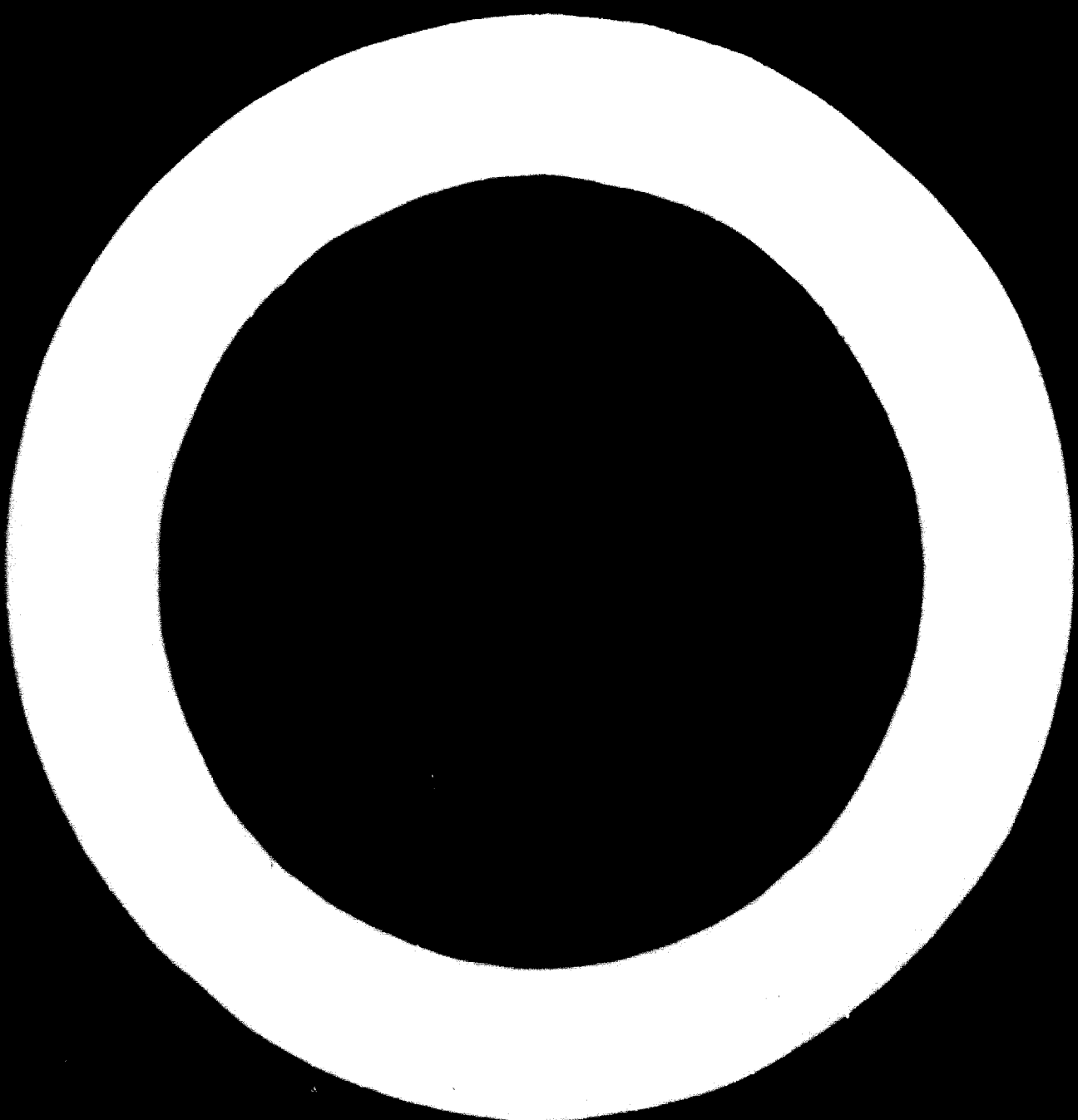
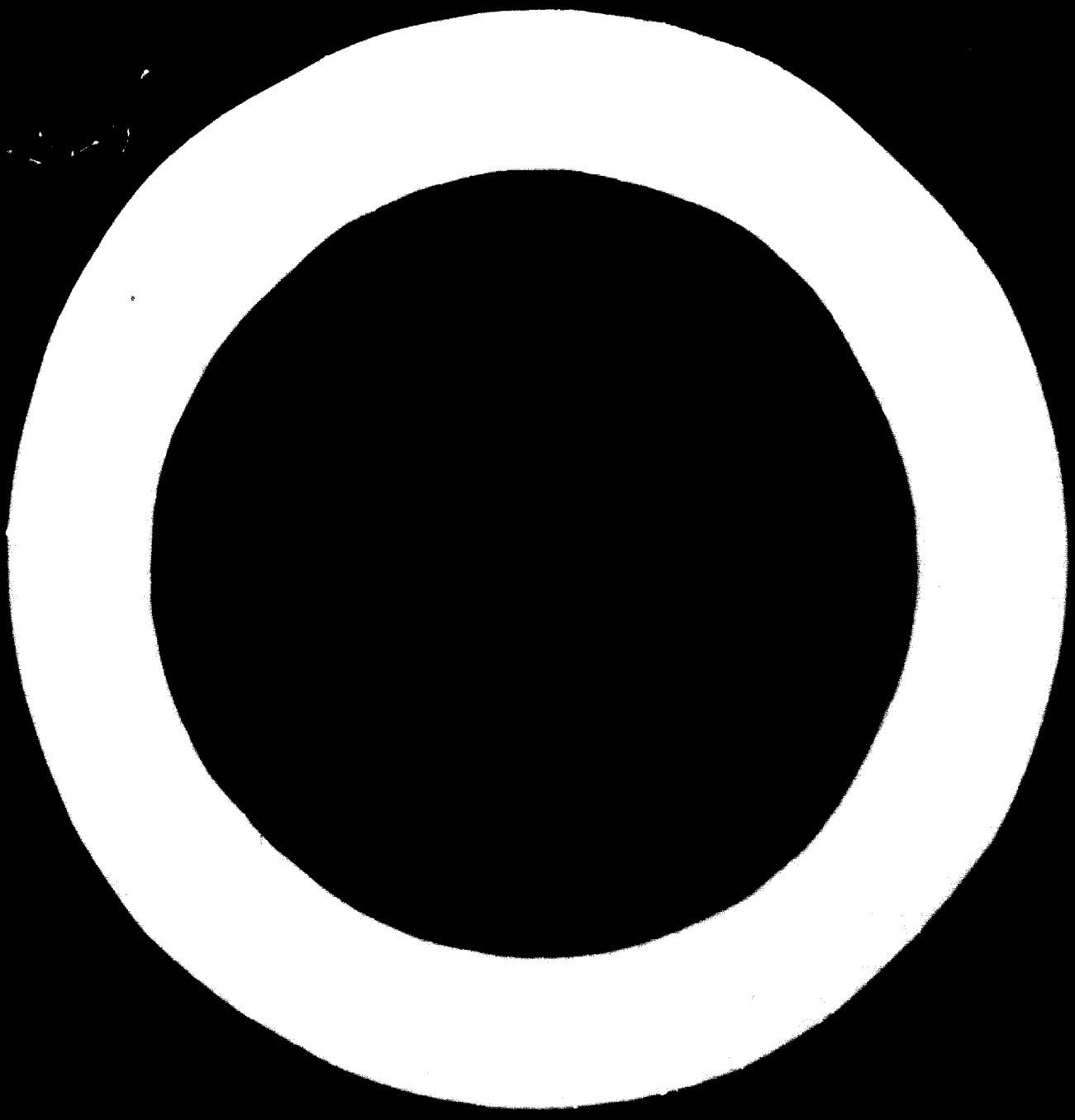


TABLE OF CONTENTS



INTRODUCTION

The Industrial Performance Evaluation Profiles (IPEP) was designed by the Industrial Development Centre for Arab States (IDCAS) in co-operation with the United Nations Industrial Development Organization (UNIDO) in order to provide management with a comprehensive diagnostic system for evaluating the economic and technical performance of the establishment reviewed and to create a scheme for interfirm comparison for those establishments participating in the programme.

It has been noted in the past that management frequently evaluates the performance of an industrial establishment either from an engineering or from an economic point of view. The IPEP tries to overcome this shortcoming by closely joining the economic and technical aspects of performance evluation.

The IPEP questionnaire is divided into:

- Part A - : Economic and financial description of the establishment
- Part B - : Technical description of the establishment
- Part C - : Performance evaluation

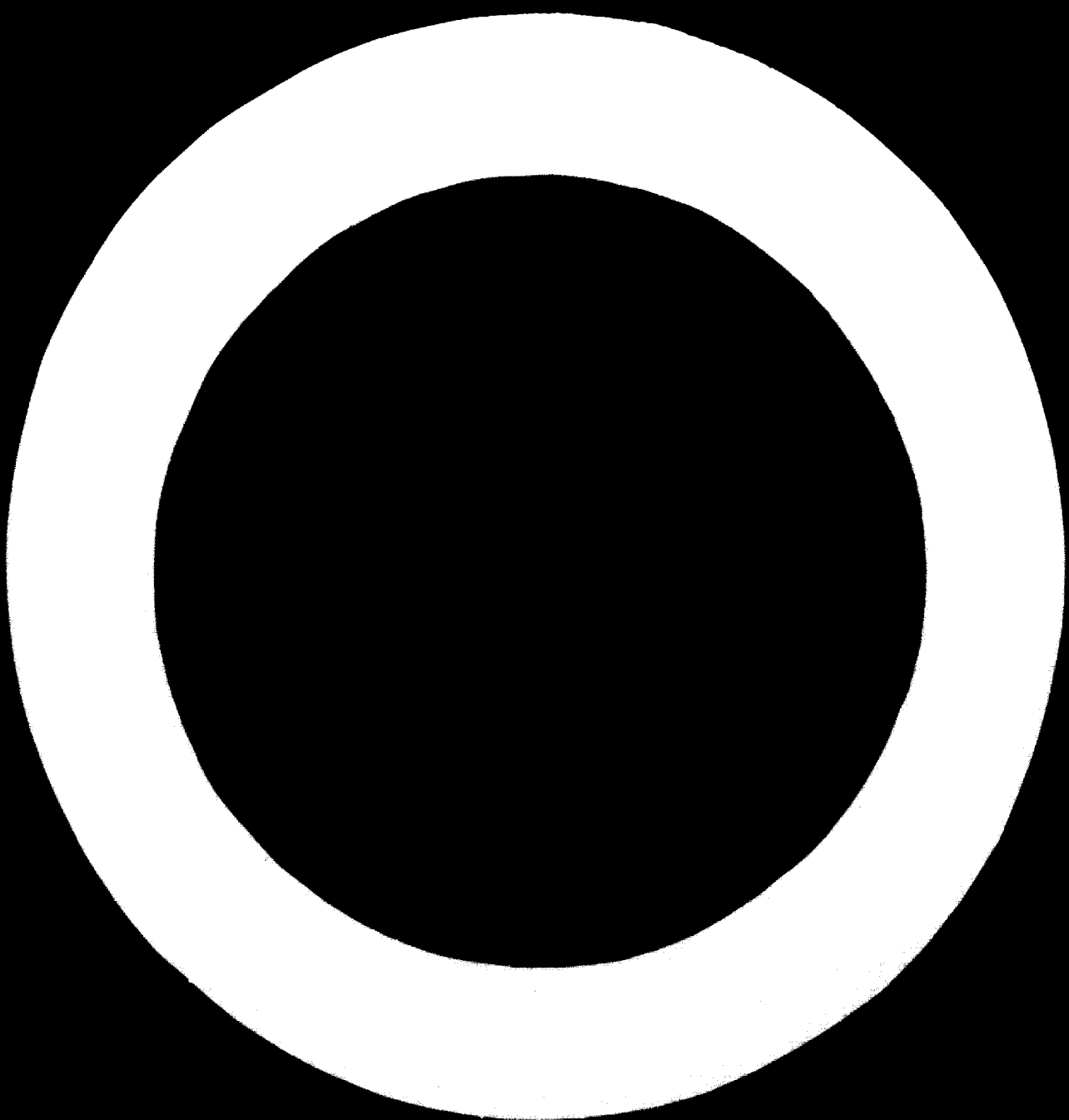
Although the suggested questionnaire is divided into three parts, it should always be kept in mind that they have to be read and filled as one unit. Since the requested data are frequently not available at one central point of the company, close working relationships will have to prevail between the various technical, economic and accounting departments.

Some companies might not be in a position to supply all the information asked for in the standard questionnaire at the very beginning due to non-availability of data. However, management should feel that the IPEP will in the future prove useful to solve many managerial problems and that, therefore, measures should be taken to initiate improvements in the collection of technical and accounting data. It should also be recognized that the collected data could be of great importance for industrial planning.

It should be understood by the user of the IPEP questionnaire that this proposed version is only one way of looking at the problem of economic and technical performance evaluation. Many of the attached forms may have to be adapted to the conditions prevailing in the plant under study, since it is not possible to prepare a rigid questionnaire which can generally be applied to all firms.

The IPEP questionnaire for the glass industry is only one of a series which will gradually cover all major industries. The cement, vegetable oil and grain milling industries have already been covered and work is progressing for the food canning and fertilizer (nitrogenous and phosphorous) industries. Steel making, sugar refining, and tobacco and cigarette manufacturing will follow soon.

IDCAS intends to make wide use of the IPEP questionnaire in Arab countries through the General Organization of Industry, Industrial Unions or Federations, Management Development and Productivity Centres or Institutes and Industrial Development and Studies Centres.



PART A

ECONOMIC AND FINANCIAL DESCRIPTION OF THE ESTABLISHMENT

This part gives details about the overall economic, financial and cost structure of the establishment under review. It shows the history of investment, the products manufactured and sold in the reporting year, the required material inputs as well as contract and commission work since many industries may need this particular service. Value added should obtain the attention of the experts collecting the data for the standard questionnaire in the field. Fixed assets should be given in as much detail as possible focussing especially on the process equipment leaving, however, the information about existing capacities to Part B, the technical description of the establishment. The calculation of the desired working capital should take account of the actual requirements of the company which are frequently underestimated thus leading to severe liquidity problems during the daily operation of the company.

Of particular significance for a careful analysis of the economic performance are cost accounting data. Even if the establishment uses only financial accounting, efforts should be made to fill in the departmental cost sheet for the production and service cost centres as well as for the general overhead cost centres.

A summary presentation of the cost of production, the profit and loss account as well as of the financial statement should make it possible to obtain sufficient data which are not only needed for the economic performance evaluation but also for interfirm comparison.

Supplementary information on future plans of the establishments and governmental policies close this part.

Data indicated in Part A will not be repeated in the following parts even if required at each individual stage of the performance evaluation.

EXPLANATORY NOTES

Ad.I.A.: Kind of activity: Indicate the primary product group or the industry under which the establishment (or firm) is classifiable (e.g. in terms of the National Industrial Classification Code)

Year of reference: the year of 19.. is preferred; the years of 19.. and 19.. are acceptable. The business year, not necessarily confirming to the calendar year, is acceptable. Please note that the same year of reference should be maintained throughout the different sections of this study.

I. GENERAL DESCRIPTION

I.A. COUNTRY:

KIND OF ACTIVITY:

YEAR OF REFERENCE: from 19 to 19

OWNERSHIP:

( ) Wholly privately owned enterprise

( ) Wholly government-owned enterprise

( ) Semi-governmental enterprise (mixed ownership)

- governmental .....%
- private .....%

If it is a joint venture of foreign and domestic capital indicate the share of each party in the total capital stock:

Domestic .....%

- governmental .....%
- private .....%

Foreign .....%

EXPLANATORY NOTES

Ad. I.: Those business transactions which are not connected with the current productive activities should be excluded (revenue from re-sales, capital gains on investment, inventory revaluation, etc.).

Ad.II.A.: The classification of products in specific products (or group of products) should be given in order of importance of their outputs and in enough detail for a precise indication of the product-mix.
If the establishment (or firm) has a very extensive product-mix, use an additional sheet, if necessary, or classify the products by groups of products.
The following items should be specified under other sales (II.A.2.):

- marketable by-products
- marketable processing wastes
- contract and commission work done by subcontractors (see Part A, III.D.)

However, the following items should be excluded from the annual output:

- scales of scrapped capital assets
- revenue from re-sales (goods purchased from outside and resold without receiving any further fabrication)

- The nominal capacity corresponds to the output which can be achieved under normal operating conditions. The nominal capacity is sometimes also referred to as the economic capacity since the costs of production reach their optimum. The technological capacity corresponds to the maximum physical output as e.g. guaranteed by the produces of equipment. Production at the technological capacity level is frequently not the most profitable one, since it can only be reached at very high costs. Disturbances in the supply of raw materials or fluctuations of the labor force normally prevent management from reaching the technological capacity.

- Nominal capacity output may not be exactly identifiable for all individual products especially when the product-mix of the basic production processes is flexible. For the latter case, indicate approximate capacity output levels achievable with the same pattern of product-mix as the actual.

- Goods produced is defined as the amount of final and intermediate products produced for sale.

- Sales price (per unit e.g. ton) exclusive sales tax refers to the market price applicable to the delivery at factory, excluding any sales tax, no matter whether the latter is actually collected by the establishment (or firm) considered.

- Total value of goods produced is the value of all products which are produced for sale during the 12-month period. Sales tax should be excluded.

- Total value of goods sold: the value of goods actually sold during the 12-month period partly accrues from annual production and partly from changes in inventories.

Ad.II.B.: Exports are to be listed as part of total sales as mentioned under II.A.

II. PRODUCTS, ANNUAL OUTPUT AND SALES

II. A. QUANTITY AND VALUE OF ANNUAL PRODUCTION AND SALES:

Specific product (or group of products) (1)	Nominal capacity output (2)	Goods produced (tons) (3)	Goods sold (tons) (4)	Sales price per ton (excl. sales tax) (5)	Total value of goods produced (6)=(3)x(5)	Total value of goods sold (7)=(4)x(5)
1. Main products						
a – Glass containers						
b – Sheet glass						
c – Tableware (autom. produced)						
d – Hand-gathered ware						
e – Rolled glass						
.....						
2. Other sales						
.....						
.....						
.....						
.....						
.....						
Total						

II. B. EXPORTS:

Total exports within the year of reference [ ] (000)

Major export products	Unit price f.o.b. for export	Quantity exported	Total value

EXPLANATORY NOTES

Ad.III.: The information considered in this section relates to the material, energy and business service inputs required for the 12-month period considered. Of course, materials purchased on capital account, mainly investment expenditures especially the material used for production of own equipment within the establishment, if any, should not be included here.

Ad.III.A.: - Specific production materials should be listed in terms of normal commercial usage. In the event of particular industry involves packaging as a major process (i.e. food canning and bottling industry), packaging material should be treated as direct production materials. The same applies to petroleum and coal in the petro-chemical and coal chemical industries.
Fees paid for contract and commission work should be entered in III.D and not here.

- Unit of weight or measurement should be expressed in terms of the metric system. When various products are shown as a group, an approximation of the total weight or value is desired.
- Quantity consumed stands for the amount of material consumed within the year of reference, irrespective of whether it was purchased in that period or taken from stocks.
- Information on internal supply is requested only for those materials or semi-finished products which are partly acquired from outside and partly produced by the establishment.
- Unit price as paid by the establishment (or firm) is the price inclusive of freight and insurance costs plus import duties and taxes.
- Total value of purchase C.I.F. corresponds to that part of quantity consumed which has been purchased from external suppliers, excluding the value of internally supplied material (if any).

Ad.III.B.: - Ad.1: Describe in parentheses the major elements of packaging material involved. See also explanations under III.A.

Ad.2: Parts and supplies used for regular maintenance of production equipment (including misoellaneous hand tools not considered as capital assets) are distinguished from production materials and entered here.

Ad.3: Other materials and supplies used for non-manufacturing activities refer primarily to those used in administrative work.

Ad.III.C.: - For the column headings, see the notes for III.A.

Ad.III.D.: - If there is any <u>contract and commission work</u> performed by subcontractors on the materials supplied by you, enter the total fee paid during the year considered.

Ad.III.E.: - Ad.2: Of this item, <u>other business services purchased</u> may <u>include</u>:

- legal and consulting costs
- insurance fees (other than those included in the c.i.f. costs of production materials)
- expenses for training services purchased
- executive expenses (e.g. business entertainment, staff travel allowances, etc.)

however, the following items should be <u>excluded</u> from this sub-section:

- non-wage, non-salary payments to workers (e.g. subsidies for housing, transportation, cafeteria and other welfare activities (IV. 4.)
- rentals (IV. 5.)
- royalties paid (IV. 6.)
- sales taxes and other indirect business taxes (IV. 7.and 8.)
- income taxes withheld and to be paid
- dividends.

III. ANNUAL CONSUMPTION OF MATERIALS AND ENERGY

III. A. DIRECT PRODUCTION MATERIALS:

Specific production material	Unit	Quantity consumed		Unit price (000)	Total value of purchase c.i.f. (000)	% imported	Import duties (000)
		Purchase	Internal supply				
Total value							

III. B. OTHER MATERIALS AND SUPPLIES:

1. Auxiliary material (_____)
2. Factory supplies
3. Other materials and supplies for non-manufacturing activities (e.g. office supply)

Total value

III. C. ENERGY AND WATER:

Running materials	Unit	Quantity consumed		Unit price (000)	Total value of purchase c.i.f. (000)	% imported	Import duties (000)
		Purchase	Internal supply				
1. Electricity	000 kWh						
2. Solid fuels:							
- _____	t						
- _____	t						
- _____	t						
3. Liquid fuels and lubricants:							
- _____	t						
- _____	t						
- _____	t						
4. Gas	000 m3						X
5. Steam	000 t						
6. Water	000 m3						
Total value							

III. D. CONTRACT AND COMMISSION WORK:

Total fee for commission and contract work performed by subcontractors

III. E. BUSINESS SERVICES PURCHASED:

1. Transport, storage, insurance
2. Communications (e.g. postal fees), advertisements and other business service purchased

Total value of business services purchased:

EXPLANATORY NOTES

Ad.IV.: In case the establishment is a branch of a larger enterprise and is dependent on the central office for some of the cost and financial data, it may not have adequate branch accounts on all the items in this section. Rents, interests, royalties, corporate income, etc. would then be estimated only on an imputation basis. But even such estimates, if crude, are important for the purpose of this study, i.e. to grasp the value added generated by the productive activities of the establishment.

Ad.IV. – Ad.1: The classification of workers and employees according to primary and secondary production cost centres as well as the service cost centres is given in part B of the questionnaire. Salaries and wages should be shown inclusive of income tax but exclusive of social security contributions.

Ad.3: All the social security contribution, whether they are wholly or partly included in the nominal gross wages and salaries, should be isolated here.

Ad.4: Non-wage, non-salary payments to workers and employees are payments for expenditures such as:
- Working clothes and similar supplies to workers
- Enterprise's subsidies on housing
- Transportation
- Other welfare activities

Ad.7: Sales tax normally includes:
- tax that accrues when sales take place, and
- tax that accrues as production takes place

In the event raw material taxes are charged as a part of production tax (or production tax is calculated on the basis of materials used or purchased), indicate this kind of tax accrual, if these values are not yet included in the purchase value, c.i.f. of the material (see III.A. and III.C.). It is particularly important that these taxes be adjusted to reflect the annual accrual over the year considered instead of the taxes actually paid during the year.

Ad.8: Other indirect business taxes include those that reflect neither current production nor profit as actually reported in the firm's profit and loss statement. But this study needs the figure representing the profitability of the firm's or establishment's productive activities, properly adjusted by excluding from the estimates of annual productive revenue and cost
- capital gains on investment
- re-sale of goods
- inventory revaluation, etc.

Ad.13: If there is any particular depreciation policy being followed (either to accelerate or to defer depreciation), please describe it in the footnote space at the bottom.

IV. VALUE ADDED

	Value in 000
1. Annual wages and salaries of (for ☐ persons) workers and employees of primary and secondary production cost centres	+
2. Annual salaries and wages of (for ☐ persons) employees and workers of service cost and general overhead cost centres	+
3. Social security contributions	+
4. Non-wage, non-salary payments to workers	+
5. Rents payable or borrowed capital assets	+
6. Interests on loans and royalties paid	+
7. Sales tax	+
8. Other indirect business taxes:	+
- _____	+
- _____	+
- _____	+
9. Corporate income before tax Subtotal	=
10. (-) Subsidies	-
11. **Net value added**	=
12. Annual depreciation:	
- Machinery and equipment	+
- Factory and office facilities	+
- Buildings	+
- Non physical capital assets	+
	=
Gross value added	+
	=

EXPLANATORY NOTES

Ad.V.: The section relates to the existing physical fixed capital assets in the establishment (or firm) whether purchased new or second hand or produced by the establishments on facilities.

- In the case of a branch establishment, which is dependent on the control office for the book-keeping of the data on assets, attempts should be made to produce the best estimates possible on the basis of the branches inventory as well as the records as may be kept at the firm's central office.

- Both total original and replacement value of each specific type of fixed capital assets should be given.

- The original purchase is defined here so as to provide an idea as to how much it would cost if the existing asset were replaced by new functional equivalent. The age of the asset and the speed at which the wholesale price of similar assets have been rising in the past will thus be the major factors responsible for the gap between the original purchase and replacement value. In some cases the fire insurance value may provide a basis for arriving at a sensible estimate for the replacement value. Even rough estimates are acceptable for our purposes. If the physical asset is so old that its functional equivalent can no longer be found in today's market write simply "Obsolete" under replacement value. If a given type of equipment involves two or more units of different age, indicate the average age.

Ad.V.A.: Land improvements are e.g. the levelling of the ground, clearing away of nettles, filling of holes, etc.

Ad.V.B.: The value of building should be accounted together with construction work involved but exclude insofar as possible:
- value of land (V.A.)
- value of operative auxiliary facilities (V.D.)

Ad.V.C.: For the purpose of this study each major process equipment should be itemized with a view to indicating the core processing equipment that is crucial in determining the capacity of each proceeding shop, and the quality of the products processed. For this purpose, it is advisable to select and list major items in order of the primary and secondary production cost centres as described in Part B. Such listing will be facilitated by distinguishing specialized processing equipment (to be listed under C.2.)
Note that the capitalized value of process equipment would include:
- duties and taxes paid at the time of its purchase
- transport and installation service costs. It is desirable to separate, if only by approximation, the transport and installation costs from the purchase price of the equipment and indicate it in V.C.4.

Ad.1: Specialized machines and equipment are those which are designed specifically for the use in a particular industry and are typical for the manufacturing of the group of products considered.

V. FIXED CAPITAL ASSETS

	Number	Total original purchase value in 000	Total replacement value in 000	Average age
V.A. LAND:				
1. Land (Total acreage: ____ m2)				X
2. Land improvements				X
V.B. BUILDINGS:				
1. Primary industrial buildings (Total floor space: ____ m2)				
2. Auxiliary buildings (power plant, laboratory, mechanical shops and garages etc.				
3. Warehouses				
4. Office and administration buildings				
5. Housing				
Total value of land and buildings:				X
V.C. PROCESS EQUIPMENT:				
1. Specialized machines and equipment:				
Subtotal				X

EXPLANATORY NOTES

Ad.V.C.- Ad.2: - Common type of machines and equipment, no matter if custom made, the type which can be widely used in many industries with limited modifications, such as:
- transporting solids (cranes, conveyors, hoists, etc.)
- power-drivers purchased separately
- industrial pumps, compressors, blowers, etc. of general types
- dressed lumber, tanks and other containers
- weighing, cleaning, packing equipment of general types
- machines and equipment in auxiliary facilities (e.g. power-driven hand tools, metal working, welding, cleaning machines for repair and maintenance shops)

- It is preferable to group major types of common equipment for each production cost centre

Ad.3: - Hand tools and small apparatuses refer here only to those which are considered as capitalized assets; miscellaneous hand tools and machine accessories treated similarly to consumable supplies should be excluded here (see III.B.2)

Ad.4: - Cost of installation relates to the part of the capitalized cost of equipment that occurred at the installation phase of machinery and equipment. It consists of the cost of labour and technical services as well as transportation and installation materials. These costs may not be readily available in older establishment. However, please attempt to provide an estimate of these costs wherever possible, and especially when such installation costs are believed to be an important part of the equipment value.

Ad.V.E.: Other fixed assets include all remaining items which are nowhere else listed (intangible capital assets; firms organizational costs, capitalized patents, etc.)

	Number	Total original purchase value in 000	Total replacement value in 000	Average age
Carry over				
2. Common type of machines and equipment:				
3. Hand tools and small apparatuses:	X			X
4. Cost of installation (if separable):	X			X
Total value of process equipment:				X
V.D. AUXILIARY FACILITIES:				
1. Internal power equipment (excluding building) (Water, steam and/or electricity)				
2. Laboratory facilities (excluding building)				
3. Means of transportation				
Trucks and similar vehicles (Total load: [ ] t)				
Other vehicles (Total load: [ ] t)				
4. Office equipment (e.g. office furniture)				
V.E. OTHER FIXED CAPITAL ASSETS			X	X
Total V.A. to E.				

EXPLANATORY NOTES

Ad.VI. A. and B.: The annual average of inventories and liquid assets may be estimated from the records of the plant relating two or more points of time during the year (monthly, quarterly or half-yearly). If the records are available only for a particular date in the year considered, strike out "average" and indicate the date.

Ad.VI.C.: - Total working capital requirements may or may not deviate much from the total value of actual inventories and liquid assets. What is asked here is a diagnostic review of what ought to be considered as the normal working capital requirements for the current scale of production under the normally expected conditions of market in the country or region considered.

- The equivalent number of months refers to the magnitude of the desired working capital relative to the normal monthly allowances for respective items.

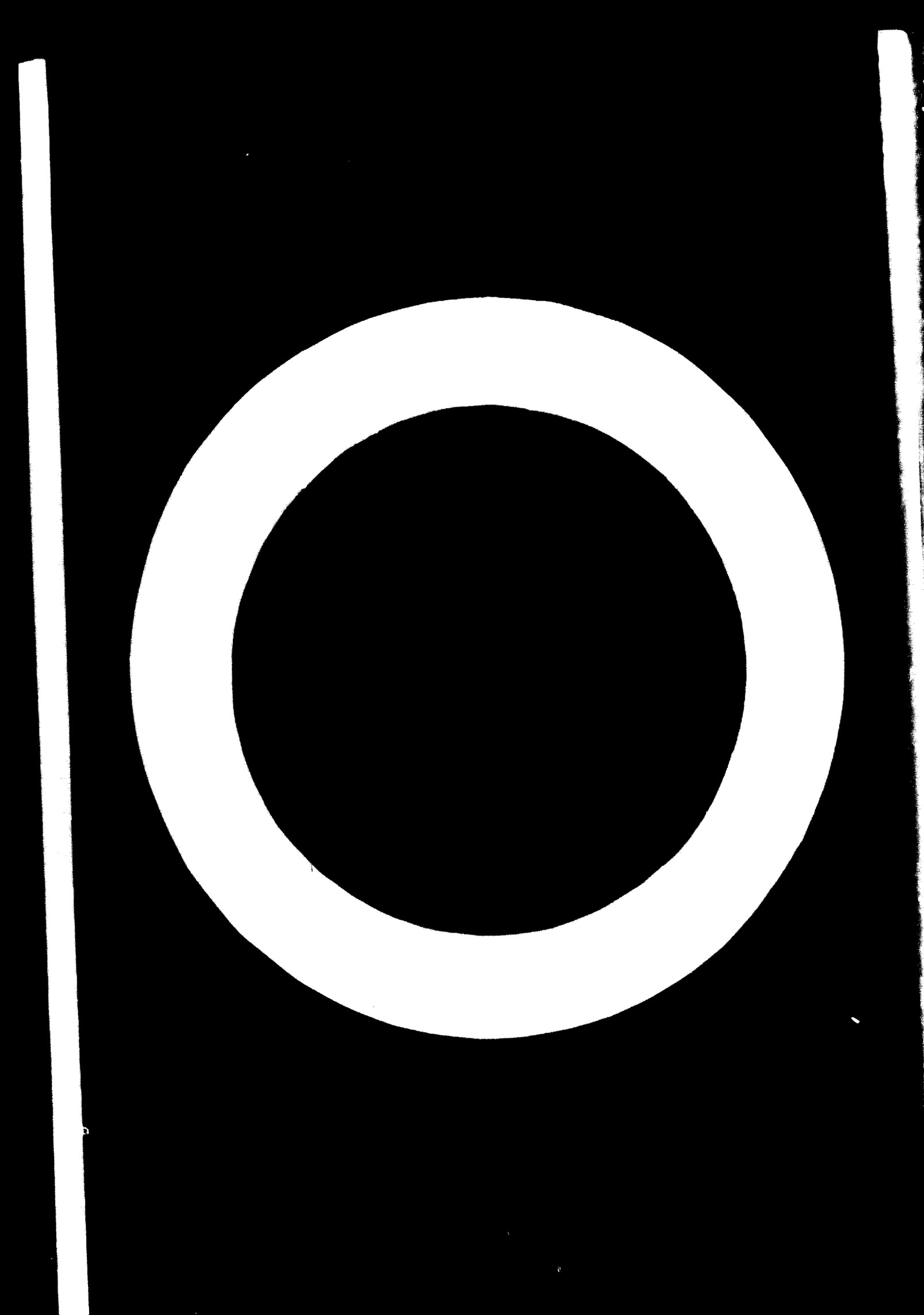
VI. WORKING CAPITAL

	Value in (000)
VI.A. INVENTORIES (average):	
- Production materials	.....
- Other materials and supplies	.....
- Work-in-progress	.....
- Finished products	.....
Total average inventories	.....
VI.B. LIQUID ASSETS (average):	
- Cash on hand and in bank	.....
- Marketable securities and bonds	.....
- Accounts receivable from delivery of goods and services	.....
- Other accounts receivable	.....
- Prepaid expenses	.....
Total average liquid assets	.....

VI.C. DESIRED WORKING CAPITAL:

Working capital requirements to be considered under current business conditions are as follows:

	Value in (000)	Equivalent number of months
- Production materials	.....	.....
- Other materials and supplies	.....	.....
- Finished products	.....	.....
- Wages for primary operative workers	.....	.....
- Other wages and salaries	.....	.....
- Training costs	.....	.....
- Administrative costs, sales costs and contingencies	.....	.....
- Other special items	.....	.....
_____	.....	.....
_____	.....	
Total desired working capital	.....	



VII. SALES AND OUTPUT MIX

A. TONNAGE MADE

1) Computed tonnage (tons) (i.e. weight of glass drawn from tank)

2) Good tonnage (tons)

3) Good tonnage lost through:
   i) furnace repairs
   ii) holiday shut downs
   iii) furnaces (or feeders) idle due to lack of demand and/or planned machine overhauls and for labour shortages

4) Maximum tonnage (VII.A.2 minus VII.A.3.)

Container	Automatic produced tableware	Sheet glass	Rolled glass	Hand-gathered ware	Others

EXPLANATORY NOTES

1. DEPARTMENTAL COST CENTRES: Table 1

The production process should be broken down into the various production departments and auxiliary departments which for accounting purposes should correspond to production and service cost centres.

The example of the departmental cost sheet might not always correspond to the conditions prevailing in each plant and should, therefore, be changed accordingly, particularly with regard to the break down into production and service cost centres. The situation might occur where proper cost accounting data are not available in the company but only data from the financial accounts. In this case it is suggested to first fill in the "total amount column" based on the financial accounting data. An attempt should then be undertaken to estimate the distribution of the different material, labour and overhead cost items on the production and service cost centres, distribution, selling, administration and finance existing in the plant. As a guide to this suggested distribution all those cost centres which should be charged with a proportion of the total amount of the various cost items are marked with "x". If this guide is followed it will be possible to distribute all cost items directly and to obtain a picture about the total costs accrued in each production cost centre, service cost centre, in the distribution, selling and marketing department as well as in the administration and finance department during the accounting period.

The attached proposal of a departmental cost sheet has been designed along the following lines:

- Horizontally: Table 1 lists the different cost centres which are responsible for production, services, sales and delivery, administration and finance.

- Vertically: Table 1 shows the cost items related to material, wages and overheads.

EXPLANATORY NOTES

(VIII. Table 1)

NOTES REGARDING COST ITEMS LISTED IN TABLE 1

1. The cost of materials (item I: 1,2) issued to cost centres should be based on the "net invoice price" for local purchases and c.i.f. for imports plus custom duties and transport inwards.

2. Heat, light and power as well as water (item I: 4,5) purchased from local authorities should be charged to the respective cost centres at the actual prices charged by such authorities.

3. Temporary labour (item II: 1) is usually compensated on the basis of global rates to which no labour-related costs are attached. Temporary labour cost should be stated separately for managerial purposes.

4. Expenses incurred for contractual maintenance (item III: 1) work may be directly charged to the specific cost centre with which it can be clearly identified. Otherwise, such expenses may be charged to the maintenance cost centre for subsequent apportionment.

5. Contractual freight expenses (item III: 2) incurred for the transport of raw materials should be included in the purchasing price of this commodity. Contractual freight expenses incurred for the delivery of the final product should be charged to the distribution cost centre.

6. Insurance premium (item III: 3) should be apportioned to the various cost centres on the basis of the total value of assets insured in each centre. For simplicity reason they may be charged to administration.

7. Depreciation (item III: 4) should be calculated on the basis of the original value of fixed assets according to the methods and rates adopted by management. Such methods and rates should be stated in a footnote.

8. Travelling expenses (item III: 5) may be allocated to "Selling and marketing" and "Administration and finance" according to the nature of the assignment.

9. Rent (item III: 6) is normally limited to the rent of warehouses and offices and should accordingly be charged to these cost centres. In rare instances, however, the entire factory may be rented.

10. Other expenses (item III: 11) comprise all items not previously mentioned. These should be analyzed and charged to the proper cost centres.

EXPLANATORY NOTES

(VIII. Table 1)

1. Production Cost Centres are those areas of activity within the glass factory where industrial operations are performed with the purpose of producing glass. These cost centres are:

   a - Batch house
   b - Melting
   c - Forming and annealing
   d - Sorting and packing
   e - Secondary purposes

2. Service Cost Centres are those areas of activity which render the various services necessary for the smooth running of the plant.
   The following service cost centres are commonly found in a glass factory:

a - Social services: including housing, health service, cantine, transport, company food stores, etc.

b - Plant management: of production workshops

c - Off-site transport: all transport activities which are not related to connected production processes

d - Purchasing: of raw material, spare parts and other supplies

e - Stores: for purchased raw materials, spare parts, packing materials, supplies and equipment

f - Repair and maintenance: of machinery and equipment, buildings, vehicles, etc.

g - Power, heat and light: for productive and general use

h - Research and development

i - Water supply: in case of company's own supply

j - Mould shop

k - Laboratory: process control

Changes may be made according to the actual organizational structure of the factory under study.

3. Warehouse and distribution, selling and marketing are responsible for all distributional activities from the time the glass products have been placed in a salable condition until they are converted into cash.

4. Administration and finance comprise all activities related to managerial planning, control, and performance evaluation. Again, practice varies with respect to the number of centres to which these activities are actually assigned. Larger factories maintain specialized centres for planning, budgeting, costing, statistics, personnel training, accounting and finance. Smaller factories have a fewer number of such centres. Hence, it is suggested to accumulate all expenses related to administration and finance in one centre under this designation.

NOTE: Warehouse and distribution, selling and marketing, as well as administration and finance may be considered as General Overhead Cost Centres.

PLAN FOR ... - ...

... DEPARTMENTAL COST CENTRES

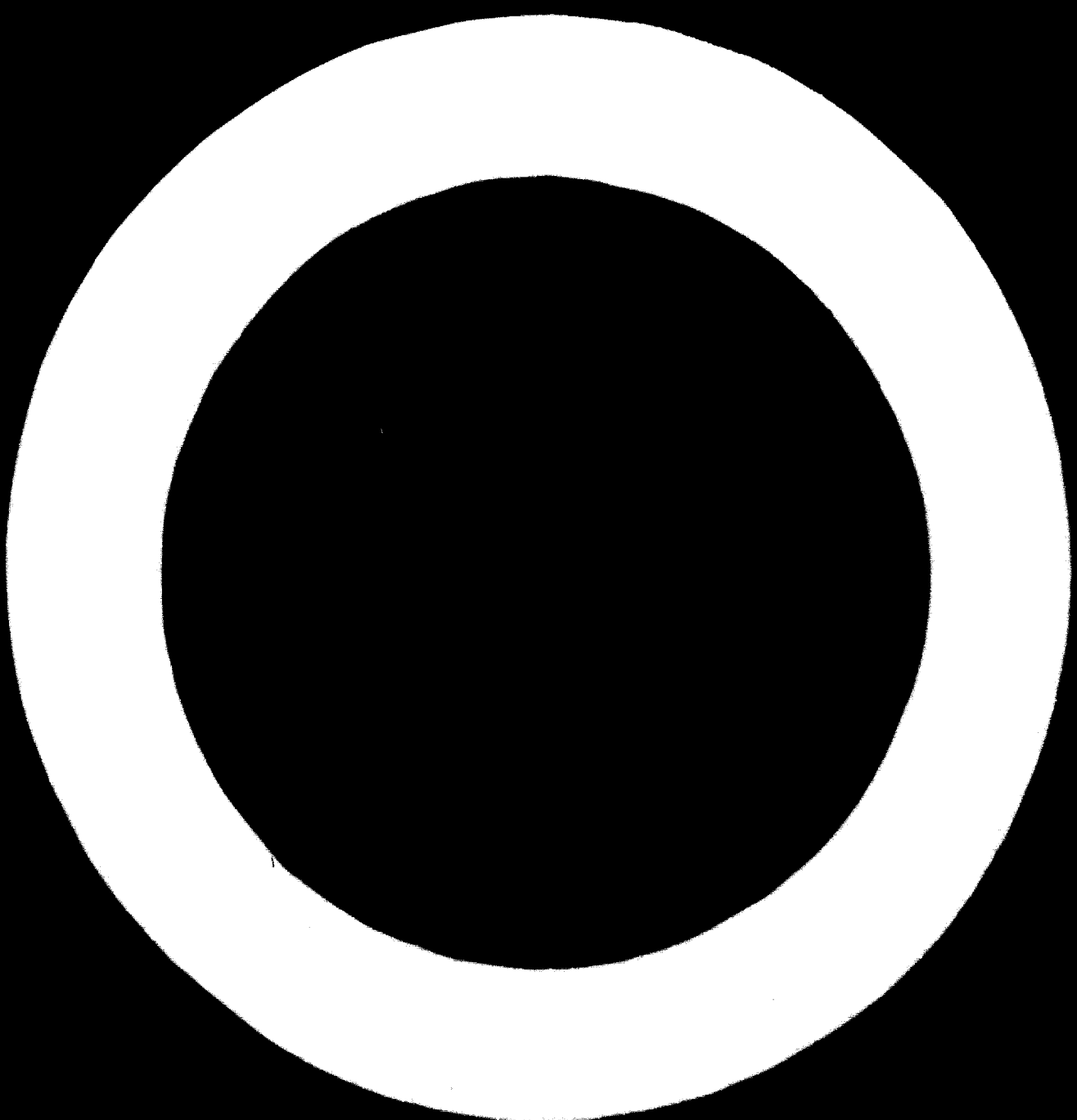
...	PRODUCTION COST CENTRES						SERVICE COST CENTRES										SOCIAL ...
...	Batch house (a)	Melting (b)	Moulding, coremaking (c)	Fettling, packing + ware (d)	Secondary processes (e)	Total prod. cost centres (a)-(e)	Social services (1)	Plant management (2)	Off-site transport (3)	Pur-chasing (4)	Stores (5)	Repair + maintenance (6)	Power, heat + light (7)	Research + development (8)	Water supply (9)	Laboratories (pro-cess con-trol) (10)	Total service centres (1)-(10)	Wages ...	Planning and packing	Admini-stration and finance	Total ... centres
I. MATERIALS																					
1. Direct prod. mat.																					
Batch materials	x																				
2. Moulds + mould mat.			x													x					
4. Factory supplies																					
Lubricants	x		x		x							x	x	x	x	x	x				
Spare parts	x	x	x	x	x							x	x	x	x	x	x				
Maintenance	x	x	x	x	x							x	x	x	x	x	x				
Other fact. supplies	x	x	x	x	x																
4. Heat, light + power																					
Fuel	x	x	x	x	x				x			x	x	x	x		x	x	x	x	
Electricity	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5. Water supply	x	x	x		x		x	x								x	x				
6. Packing material																					
Non-returnab. pack.				x	x																
Returnable packing				x	x																
7. Other material																					
Office supply								x										x	x	x	
II. LABOUR																					
1. Production wages + salaries																					
Basic wages																					
Social security																					
Health insurance	x	x	x		x																
Prod. bonuses																					
Overtime																					
Temporary labour																					
2. Services, sales + admin. wages+salaries																					
Basic							x	x	x	x	x	x	x	x	x	x	x				
Social security							x	x										x	x	x	
Health insurance																					
Bonuses									x			x	x			x					
Overtime																					
III. OVERHEAD												x									
1. Maintenance (contr.)																		x			
2. Freight (contractual)																				x	
3. Insurance																					
4. Depreciation																					
Buildings	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Machinery + equipm.	x	x	x		x							x	x		x	x	x	x			
Furnaces		x			x																
Moulds			x		x																
Vehicles									x												
Office equipment																				x	
5. Admin. expenses																					
Communication										x										x	
Travel											x									x	
Others																				x	
6. Rent																				x	
Taxes																					
Sales tax																				x	
Property tax																				x	
Indir. business tax																				x	
Licences + fees										x										x	
Water rights tax																				x	
Wage tax																				x	
Church tax																					
Car tax																				x	
Insurance										x											
Other taxes																				x	

VIII. DEPARTMENTAL COST CENTRES - Table 2: "DISTRIBUTION OF SERVICE COST CENTRES"

The amounts accumulated in each of the columns shown in the departmental cost sheet indicate the "directly allocated costs" for each centre. Such totals, however, do not represent the full cost of operations as performed by these centres.

Service cost centres do not take part in production, but only provide essential services to those centres performing the main functions of the plant. Consequently, the expenses incurred for the operation of service centres must first be distributed to those centres benefitting from their services. For this purpose Table 2 "Distribution of Service Cost Centres" should be used. The basis of distribution is indicated in the last column of this table.

Table 2 "Distribution of Service Cost Centres" is only an example, and will have to be changed according to the answers in section B trying to follow the principles laid down on page 1, part B and page 1, part C.

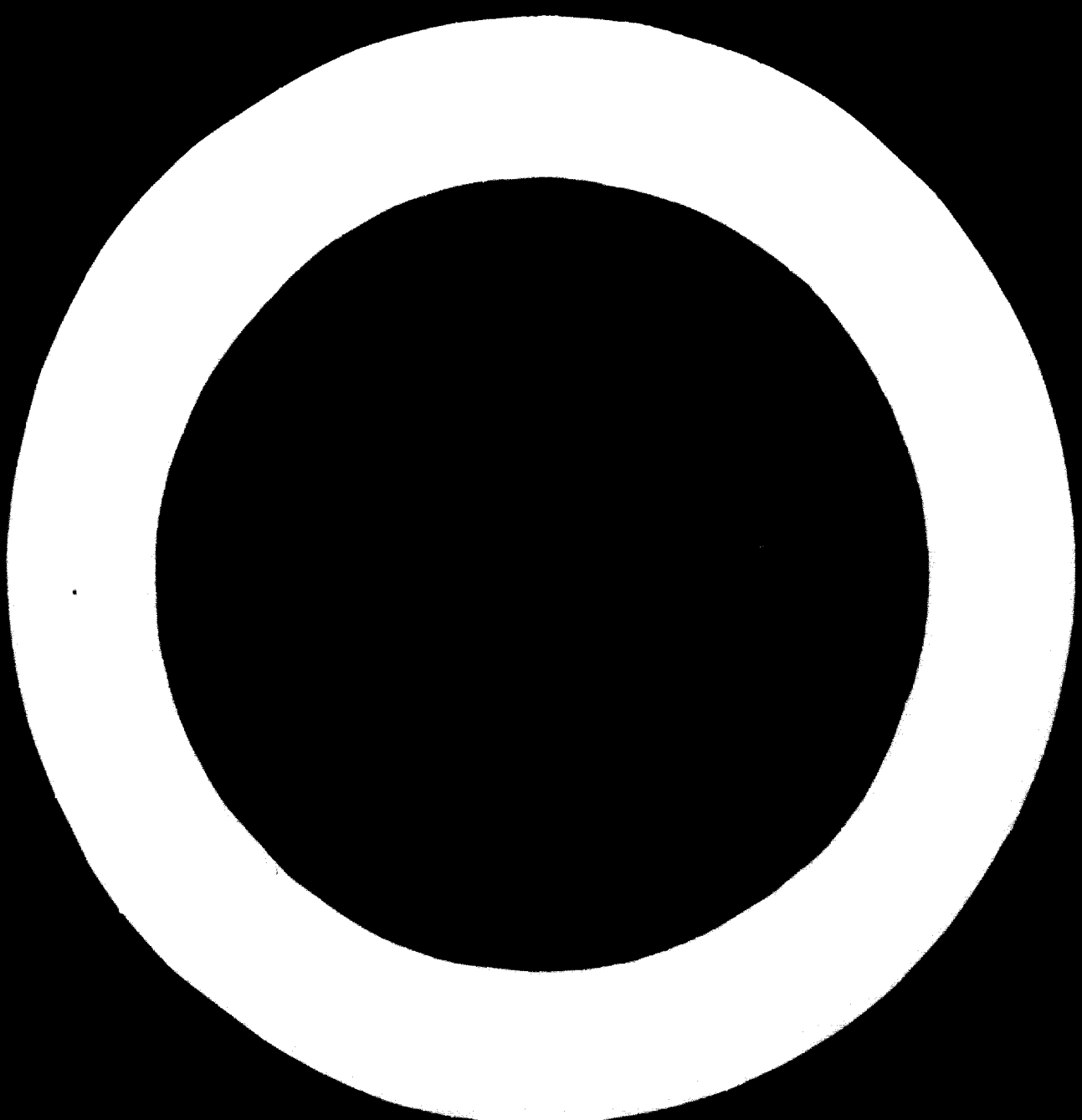


Period from..... to.....

(GLASS INDUSTRY)

"DEPARTMENTAL COST SHEET - Table 2: DISTRIBUTION OF SERVICE COST CENTRES"

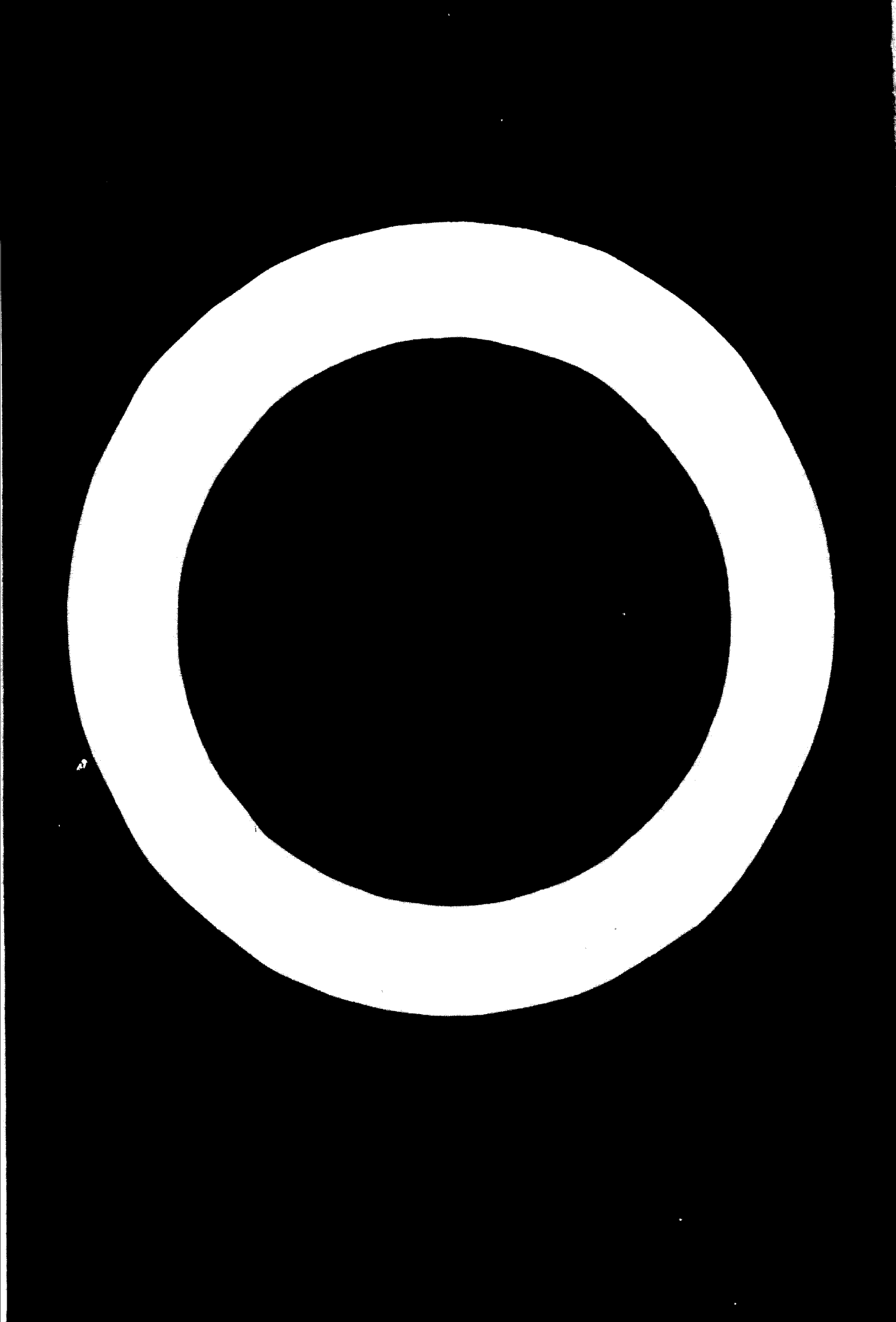
	SERVICE CENTRES										PRODUCTION COST CENTRES					GENERAL OVERHEAD COST CENTRES			Distribution basis
	Social services	Plant management	Off-site transport	Purchasing	Stores	[illegible]	Power, heat + light	Research + development	Water supply	Mould shop	Laboratories (process control)	Batch house	[illegible]	[illegible]	Sorting, packing + storage	Secondary processes	Warehouse + distribution	Selling and marketing	Administration + finance	
	(1)	(2)	(3)	(4)	(5)	[illegible]	(7)	(8)	(9)	(10)	(11)	(a)	(b)	(c)	(d)	(e)	(I)	(II)	(III)	
Directly allocated costs																	x	x	x	Number of employees
Apportionment of service c. centres																				
Social services	---	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				Number of employees
Plant management		---	x	x	x	x	x	x	x	x	x	x	x	x			x	x		Ton - kilometers
Off-site transport			---	x								x					x			Value of purchases
Purchasing				---	x			x		x	x	x	x	x	x	x				
Stores					---		x	x	x	x	x	x	x	x	x	x	x	x	x	Value of issued materials
Repair + mainten.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	Mainten. man-hours
Power, heat + light						x		---		x		x	x	x	x	x	x	x	x	kWh
Research + developm.									---	x	x	x	x	x	x	x				tons
Water supply										---		x	x	x		x				Quantity consumed
Mould shop											---			x	x	x				----
Laboratories (process control)												x	x	x	x	x				Number of specimens examined



IX. COST OF PRODUCTION

(see Part A.VIII.Table 1, columns a-e and Table 2, columns a-e)

		Value in 000
1.	Batch house cost	+
2.	Melting cost	+
3.	Forming, annealing and decorating cost	+
4.	Sorting and packing cost	+
5.	Cost of secondary processes	+
6.	Total production cost (1+2+...5)	=
7.	Add inventory of finished goods at beginning of period	+
8.	Subtotal (6 + 7)	=
9.	Subtract inventory of finished goods at end of period	-
10.	Production cost of goods sold	=

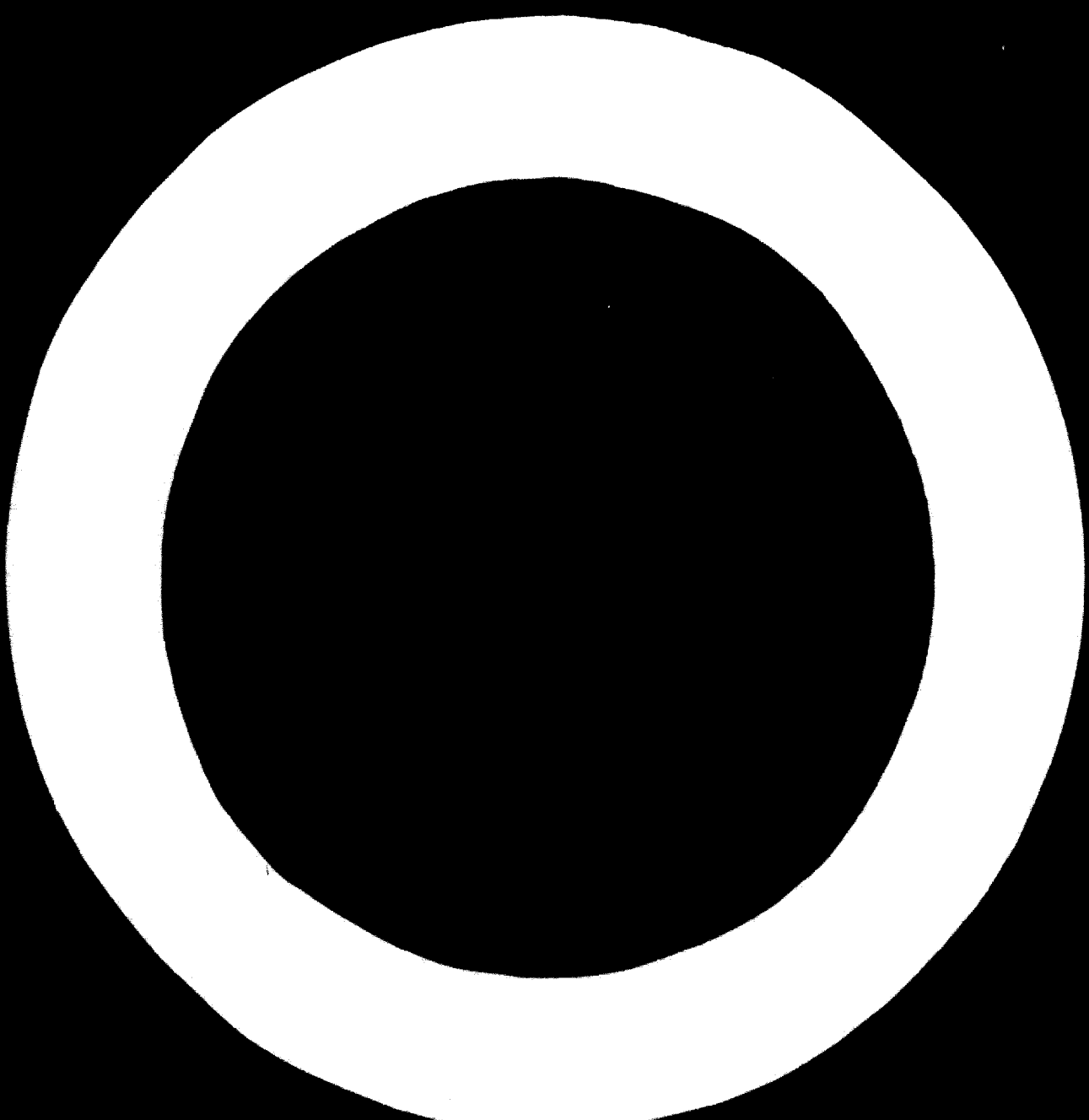


X. SUMMARY PROFIT AND LOSS ACCOUNT

		Value in 000
1.	Sales	+
2.	Subtract production cost of goods sold (see Part A.IX.10.)	-
3.	Gross profit (1 - 2)	=
4.	Subtract warehousing and distribution cost	+
5.	Subtract selling and marketing cost	+
6.	Subtract administration and finance cost	+
7.	Subtotal (4+5+6)	=
8.	Trading profit (3 - 7)	-
9.	Subtract financial expenses	=
10.	Subtotal (8 - 9)	-
11.	Add non-trading income	=
12.	Net profit before taxes (10 + 11)	+
13.	Subtract taxes	=
14.	Net profit after taxes (12 + 13)	-
		=

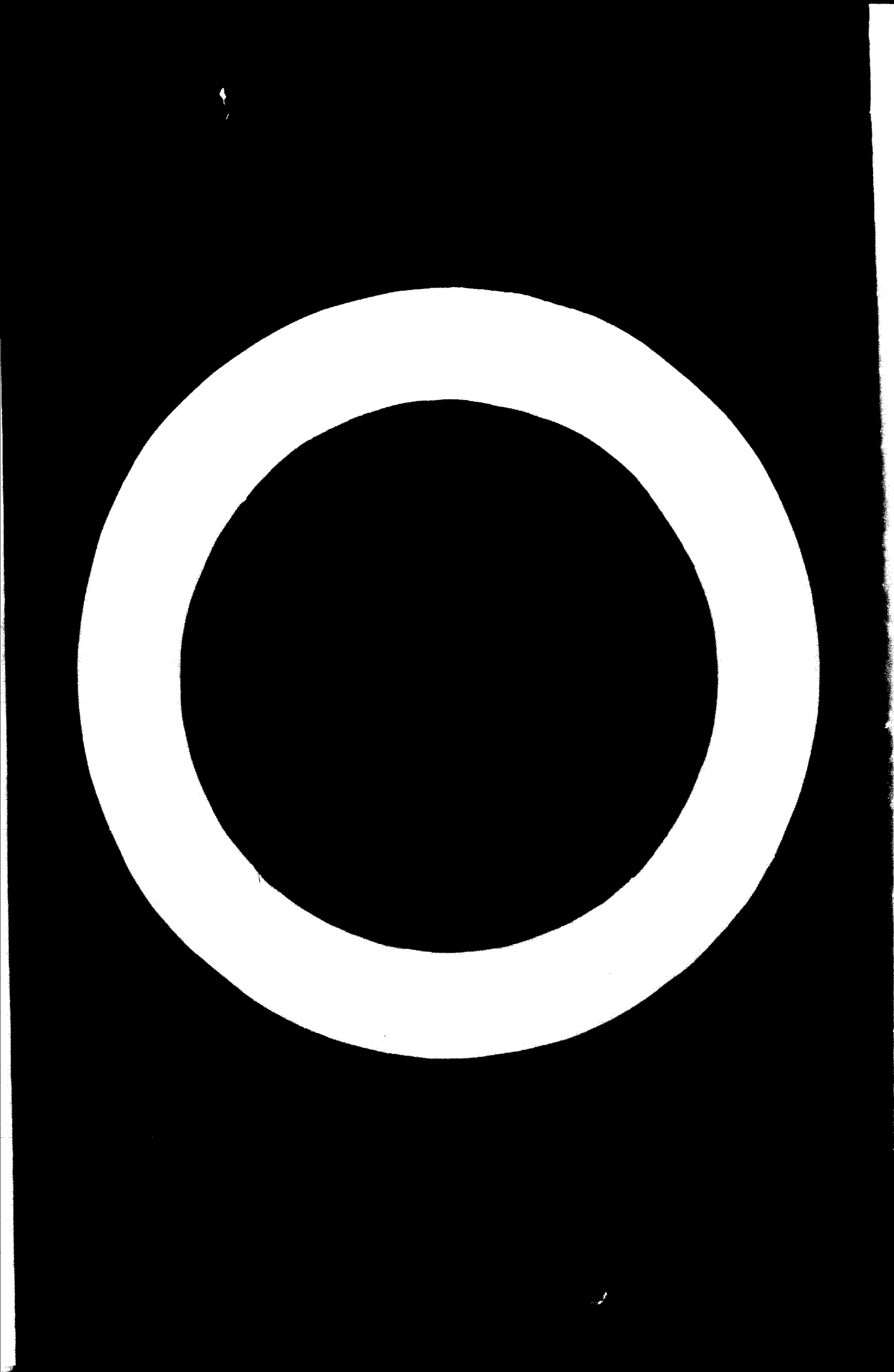
Value in 000

NOTE: For 4., 5., 6.,: see Part A.VIII. Table 1, columns I-III and Table 2, columns I-III



XI. SUMMARY FINANCIAL STATEMENT

	Value in 000
ASSETS	
1. Current assets	
a) Material inventory	+
b) Work-in-progress	+
c) Finished goods stocks	+
d) Debtors (i.e. receivables)	+
e) Others	+
2. Fixed assets	
a) Land and building	+
b) Furnaces	+
c) Moulds	+
d) Machinery and equipment	+
e) Vehicles and other fixed assets	+
3. Non-trading assets	+
4. Total assets	=
SOURCES OF FINANCE	
1. Creditors	+
2. All other current liabilities	+
3. Long-term debts	+
4. Net worth (i.e. owners' capital and reserves)	+
5. Total capital	=



XI. OTHER INFORMATION

XI. A. FUTURE PLAN:

Are major capital investments planned in the next five years? ( ) yes ( ) no

1. If yes; proposed investment period: [-]

2. Approximate amount of investment: [ ] (000)

3. Type of investment: (Check the relevant cell)

	Product mix	Process machinery and equipment	Other primary production facilities	Auxiliary production facilities	Administrative and welfare facilities
Replacement investment for		( )	( )	( )	( )
New additions to	( )	( )	( )	( )	( )
Technological improvement of	( )	( )	( )	( )	( )

4. Are these investments likely to be accompanied by an increase or decrease in man-years? ( ) yes ( ) no

a. If yes; how many man-years?

	First shift	Second shift	Third shift	
Primary operatives				man-years
Auxiliary operatives				man-years
Management and administration				man-years

XI. B. EXTERNAL CONDITIONS:

1. Use the following key to describe external conditions:

(a) excellent
(b) fair
(c) poor
(d) insignificant

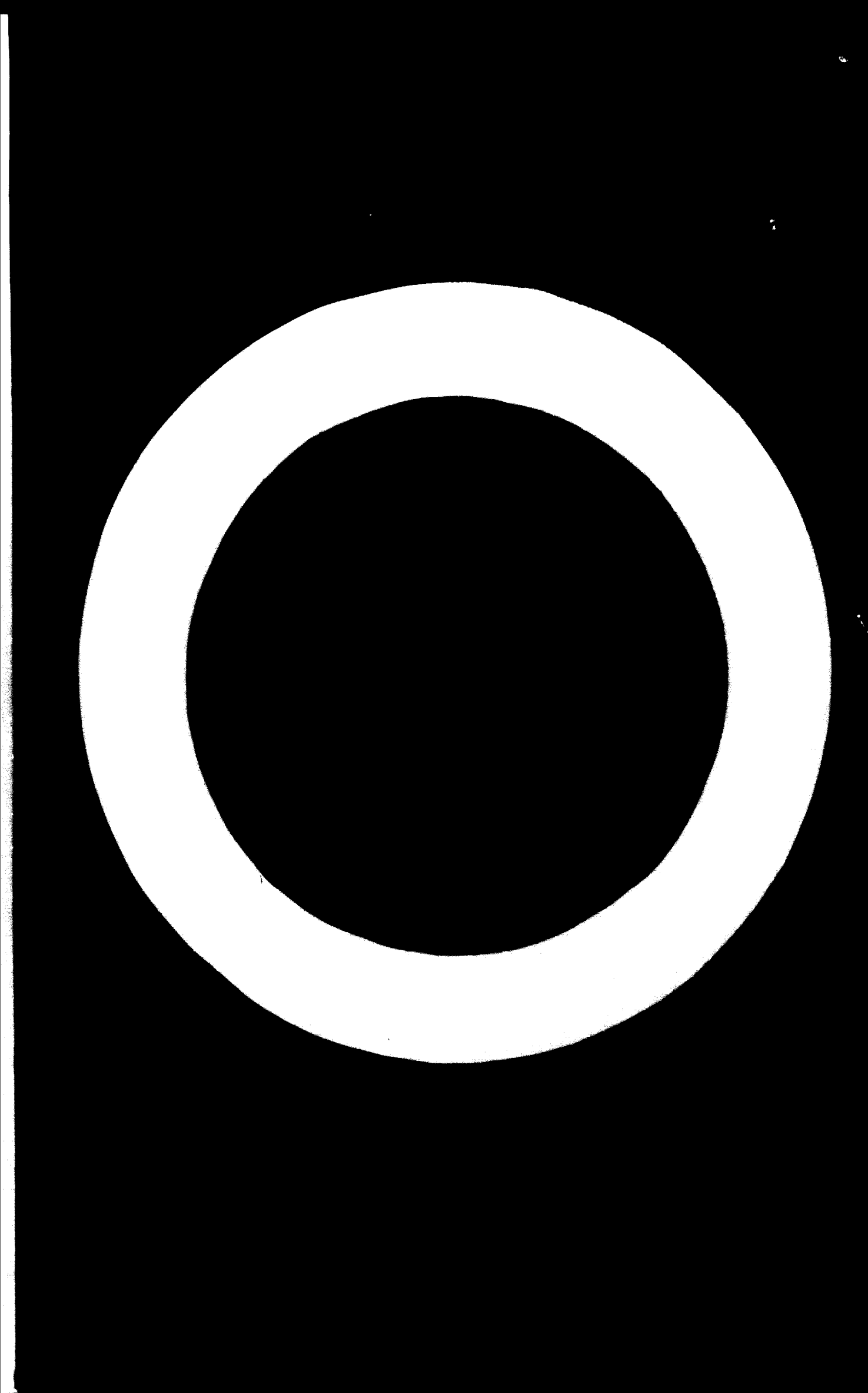
Transport		Outlets		Community	
External long distance	( )	Electricity	( )	Residents	( )
Internal long distance	( )	Water	( )	Health and recreation	( )
Local and city	( )	Gas	( )	Education	( )

2. If any of the above is rated "poor" describe the extent to which it adds to the enterprise's current operating costs: _____

XI. C. GOVERNMENTAL POLICIES:

1. Specific governmental policy measures, federal or local, particularly affecting the profitability of the enterprise: _____

2. Desirable and reasonable policy measures which, if effected, would affect more favourably the viability of your enterprise and related activities: _____



PART B

TECHNICAL DESCRIPTION OF THE ESTABLISHMENT

This part of the questionnaire is prepared for the collection of technological data on the plant. Keeping in mind that no two glass plants are identical, one should delete, add or amend the various columns or lines of the questionnaire in order to provide a complete picture of the plant. In addition, management is encouraged to add any supplementary information which might further explain the technological characteristics of the plant.

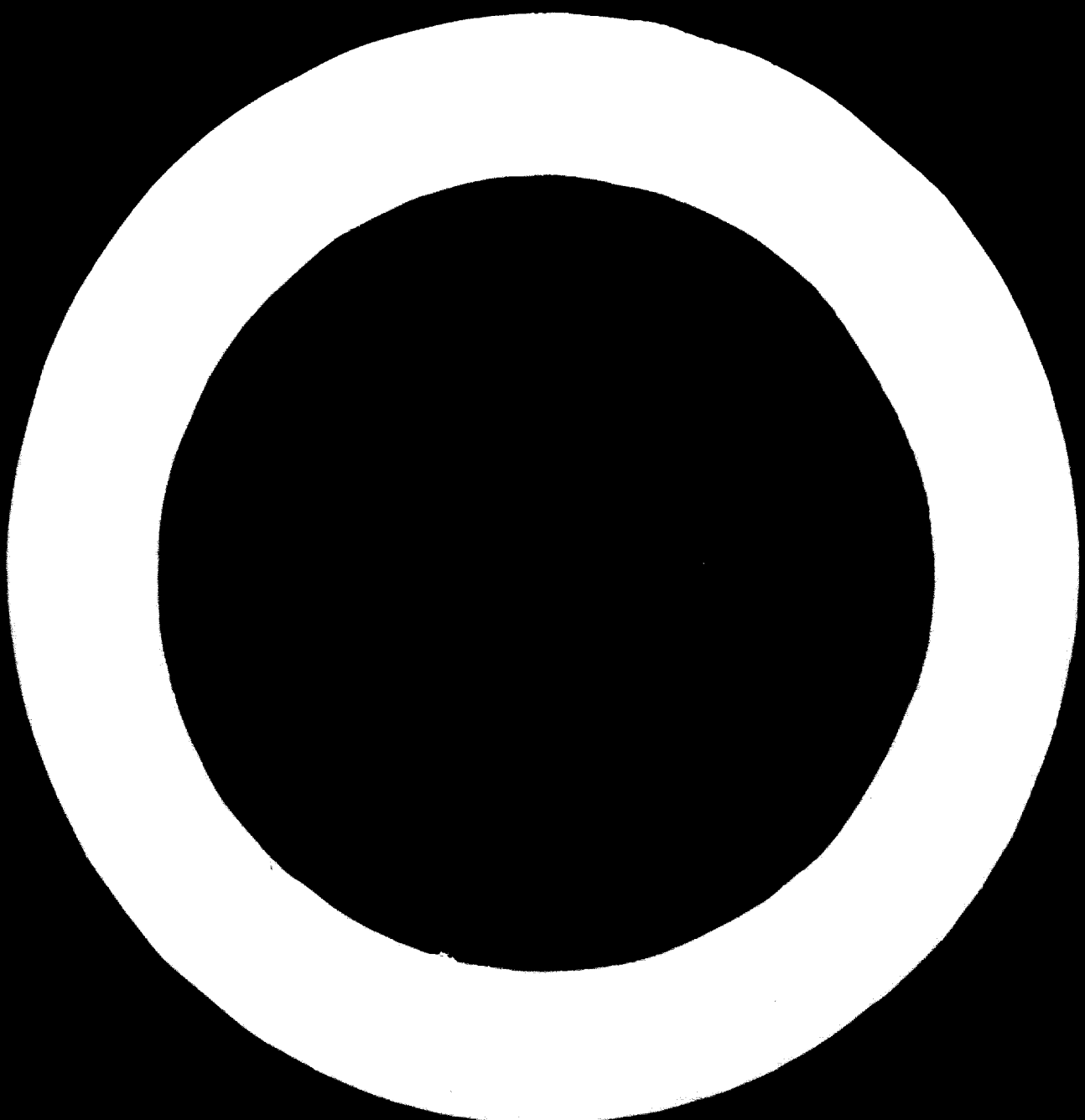
Four different ways of manufacturing glass are commonly distinguished:

- Containers and sometimes pressed ware are produced by automatic feeders;
- Sheet glass is drawn from the melt and does not receive any further grinding and polishing;
- Rolled glass has similar applications like sheet glass. It is, however, made by rolling the molten glass between rollers;
- Hand-gathered glass covers a wide range of products which may be formed by semi-automatic or hand tools. The glass is in both cases gathered by hand from the melt.

All these activities have common features: raw materials are weighed and mixed (batch house), molten (in a continuous tank furnace, day tank furnace or pot), and the molten glass is formed into primary products. These stages are consequently referred to as the primary production processes which together form one production line.

Some primary products or part of them are further processed such as by screen printing, grinding or polishing. These processes are referred to as secondary production processes.

The design of the questionnaire takes account of the flow of the production process breaking it down into cost centres, service cost centres and general overhad cost centres. Since this part of the questionnaire is only dealing with technological problems it is expected that no difficulties will be encountered in obtaining the desired data as it might perhaps be the case with the accounting data asked for in Part A.



I. GENERAL DESCRIPTION OF THE PLANT

Give here a general summary of major products, actual output, production process (automatic feeder glass, rolled glass, sheet glass,etc.), numbers of melting furnaces and their nominal capacities, type of fuel (coal, oil, gas, etc.), power supply (power generation or outside supply), raw materials and markets supplied. This general description is required to give only a first comprehensive impression about the plant under study.

GENERAL DESCRIPTION:

II. GENERAL INFORMATION

II.A. SITE OF THE FACTORY

1. Location of plant in relation to major consumption areas: -

2. Is the factory close to a main road? What is the distance between the factory and the nearest main highway?: -

3. Is the factory connected to a railway system?: -

4. Distance between the factory and water way: -

5. Distance between the factory and the nearest harbour: -

6. Distance between the factory and raw material sources: -

7. Source of power supply: -

EXPLANATORY NOTES

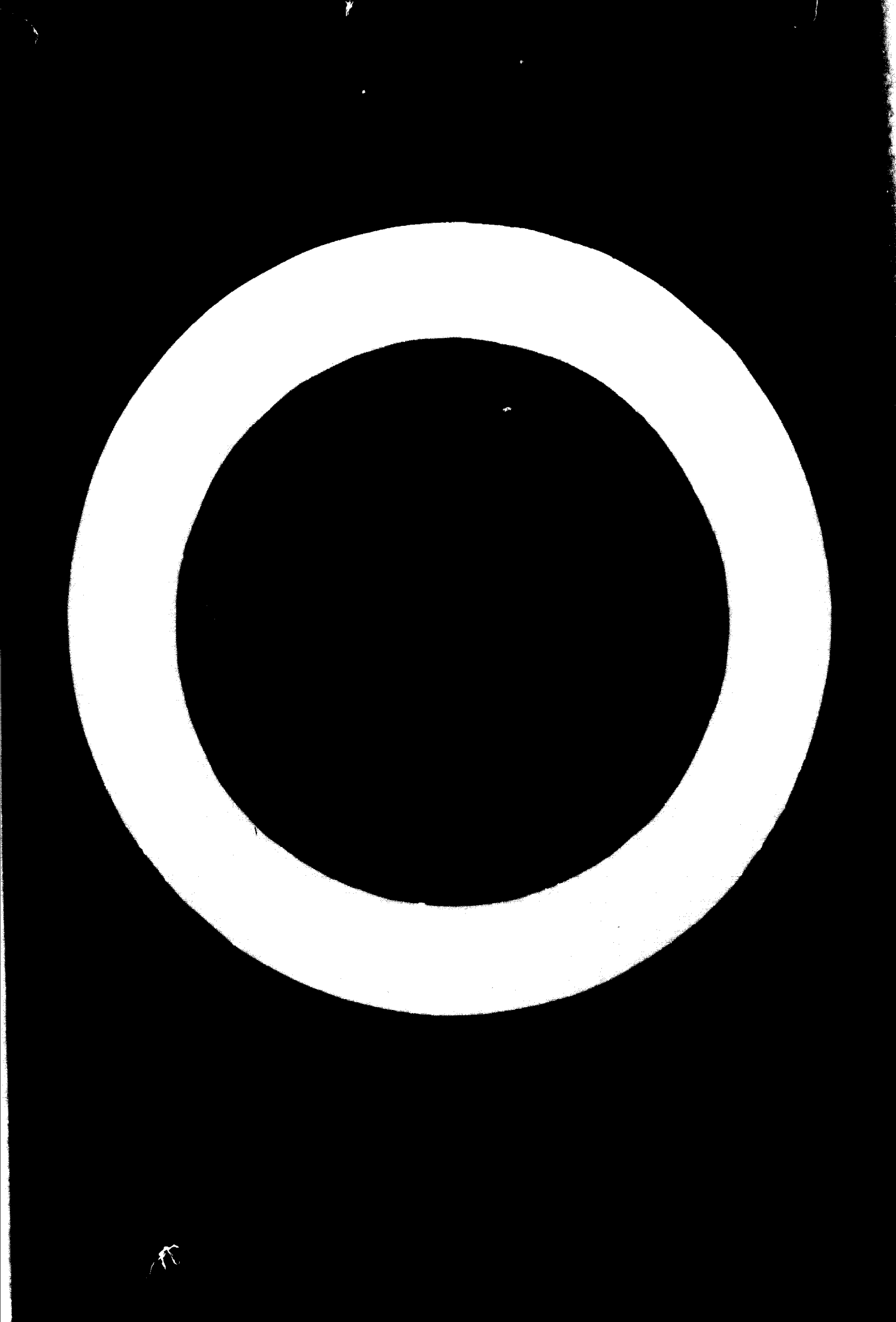
The nominal capacity corresponds to the output which can be achieved under normal operating conditions. The nominal capacity is sometimes also referred to as the economic capacity since the costs of production reach their optimum. The technological capacity corresponds to the maximum physical output as e.g. guaranteed by the produces of equipment. Production at the technological capacity level is frequently not the most profitable one, since it can only be reached at very high costs. Disturbances in the supply of raw materials or fluctuations of the labor force normally prevent management from reaching the technological capacity.

Nominal capacity output may not be exactly identifiable for all individual products especially when the product-mix of the basic production processes is flexible. For the latter case, indicate approximate capacity output levels achievable with the same pattern of product-mix as the actual.

III. PRODUCTION OF GLASS

III.A. NOMINAL CAPACITY AND PRODUCTION (see Part A, II.A. and VII.A.)

Products	Nominal capacity and production in tons (000) for the past 3 years								
	19..			19..			19..		
	Nominal capacity	Pro-duction	Capacity utili-zation:%	Nominal capacity	Pro-duction	Capacity utili-zation:%	Nominal capacity	Pro-duction	Capacity utili-zation:%
Glass containers									
Sheet glass									
Tableware, automatic produced									
Rolled glass									
Hand-gathered glass									
Others: specify									



III.B. COLOUR OF PRODUCED GLASS

State the colours produced and use the term expressed here when completing the questionnaire:

a) Colourless

Fe_2O_3 0.1%

Semi-colourless

Fe_2O_3 0.1%

b) Amber

base: C-S-Fe

Amber

Other base:

c) Dark green mild green faint green

base: C-S-Fe

d) Emerald dark green mild faint

base: Cr

e) Dark green mild faint

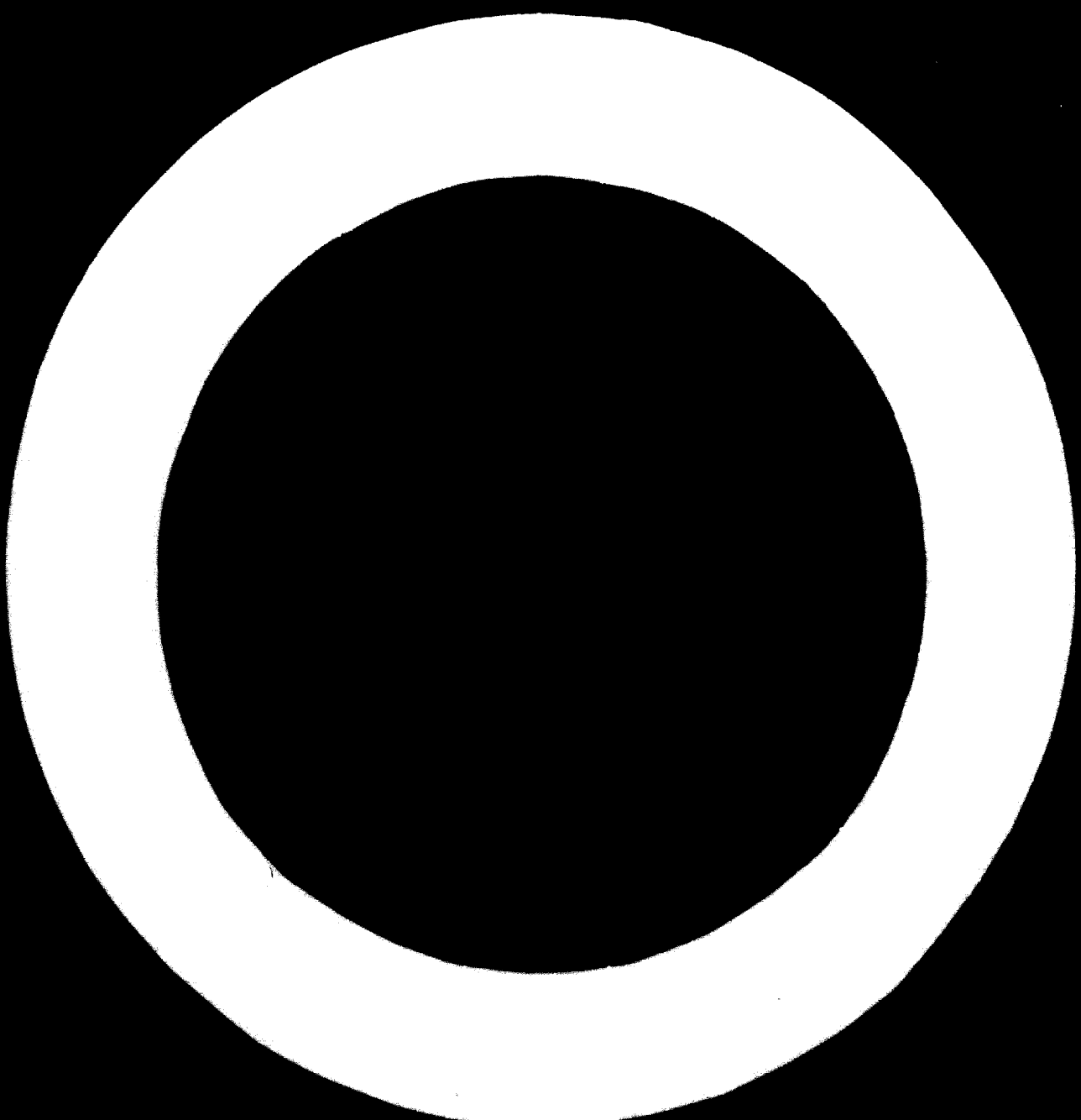
base: Fe-Mn

f) Cobalt blue

g) Other colours: state the colouring materials used

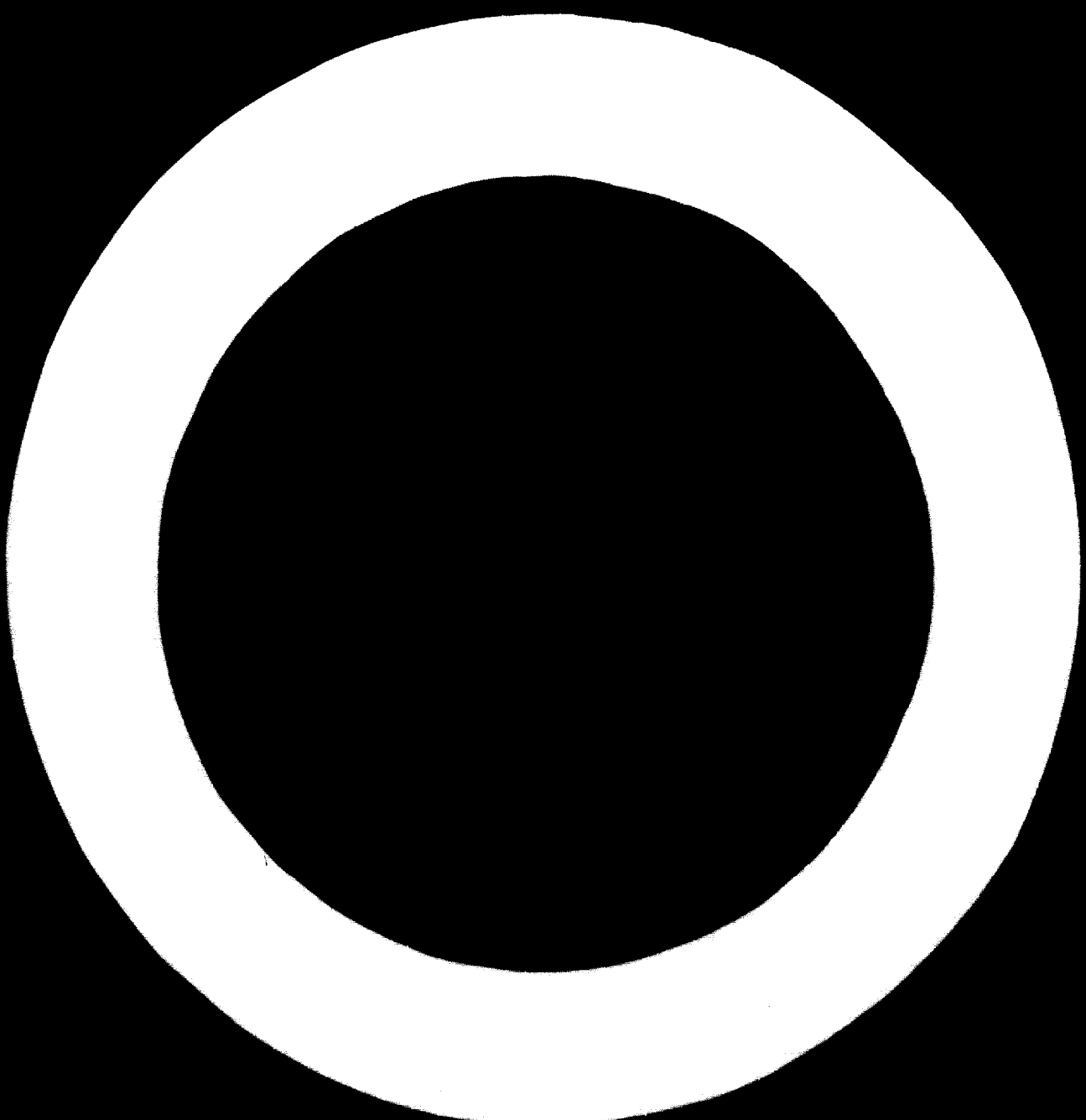
III.C. GLASS TYPES

State the type of glass that is produced, e.g. soda lime, borosilicate, lead, etc.



III.D. CHEMICAL COMPOSITIONS OF PRODUCED GLASS

Chemical symbol	Material	Colour	Colour	Colour	Colour	Colour	Colour
SiO_2	Silica						
CaO	Calcium oxide						
MgO	Magnesium oxide						
BaO	Barium oxide						
Na_2O	Sodium oxide						
K_2O	Potassium oxide						
SO_4	Sulphate						
CaF_2	Fluorspar						
Al_2O_3	Aluminium oxide						
Fe_2O_3	Iron oxide						
As_2O_3	Arsenic oxide						
	Others						

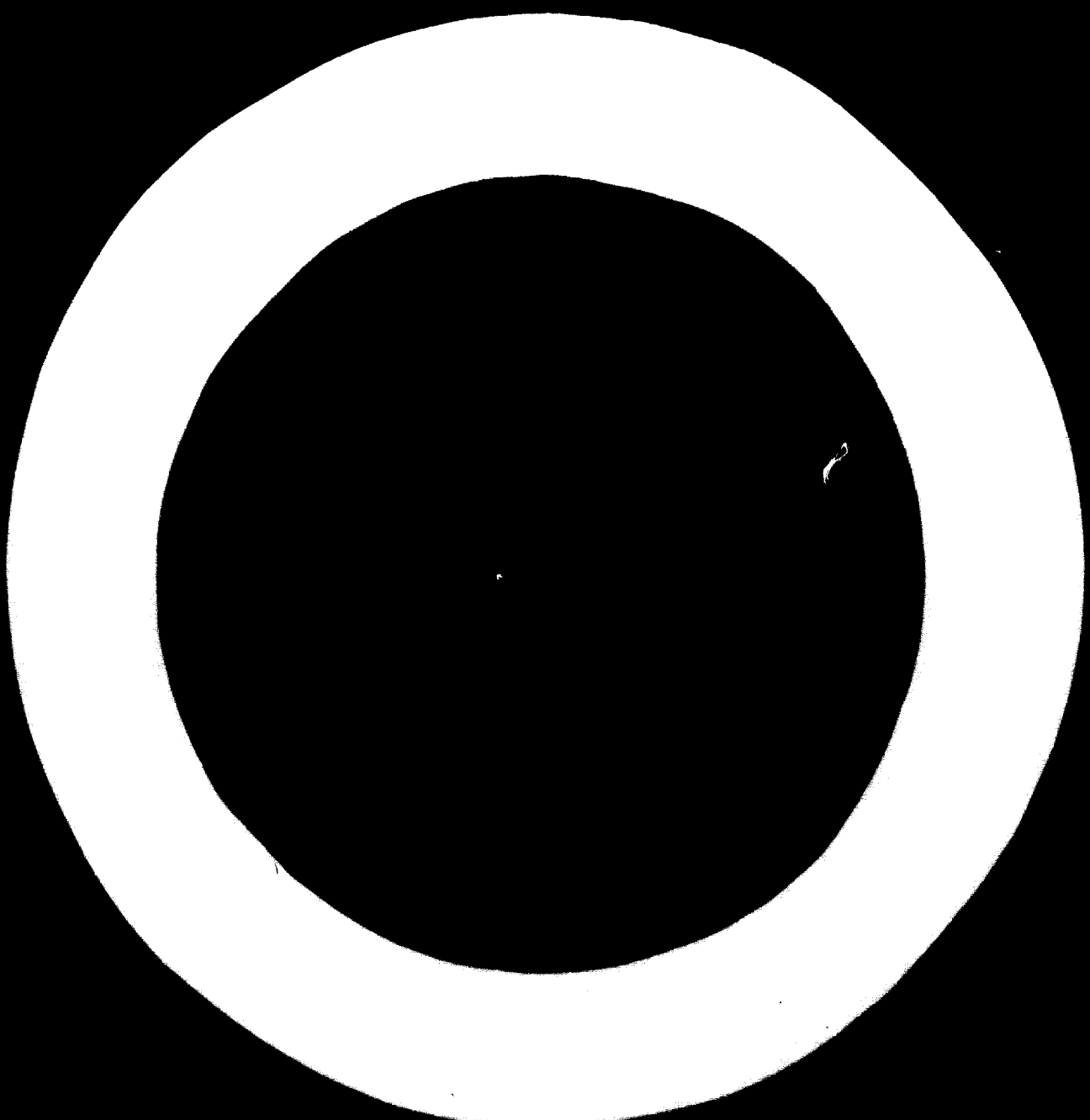


III.E. TYPE OF RAW MATERIALS UTILIZED

MATERIAL	Origin (1)	Annual quantity (tons)	Important specifications (2)
Sand .....(1) .....(2) Limestone Dolomite Soda ash: light heavy			
Feldspar Fluorspar Syanite			
Sodium sulphate Barium sulphate Sodium nitrate Arsenic			
Iron oxide Selenium Cobalt Chromite Bichromate Manganese Sulphur Carbon			
Others			

1) State country of origin of not local

2) Ingredients which determine the quality - e.g. iron content, particle size, main impurities, etc.



IV. PROCESS FLOW CHART

Draw the Process Flow Chart (Flow Sheet) of the factory taking into consideration the flow of materials from "raw status" to "final product".

Mention the relevant capacities of the production and sorting equipment of each section. The following Process Flow Chart should be considered only as an example, leaving it up to the management of the establishment to design the Process Flow Chart according to the existing organizational arrangement.

EXAMPLE

A. Batch house
- handling of incoming material
- transport to mixing section
- mixing
- transport to storage bins
- storage before melting

B. Melting
- transport of batch material
- melting
- transport by feed-lines to forming machines

C. Forming, decorating and annealing
- continuous feeding of molten glass
- forming
- conveying to decoration machines
- annealing

D. Secondary processes
- cutting
- grinding
- fire polishing
- engraving, etc.

E. Sorting, packing and storage
- control of finished products
- packing
- transport to warehouse
- storage

EXPLANATORY NOTES

V. PRODUCTION DEPARTMENTS (COST CENTRES)

These explanatory notes apply to all production departments.

In line with the Flow Process Chart it is suggested to present further technical details of the establishment. The production process, which is divided into a number of production departments and which should be identical with production cost centres has to be made transparent. As an example it could be envisaged to have four or five major production departments, depending whether the establishment has any Secondary Production Processes.

a - Batch house

b - Melting

c - Forming, decorating and annealing

d - Sorting, packing and storage

e - Secondary processes (if any)

The same breakdown into production cost centres has also been utilized in Part A. VII. Table 1, for the Departmental Cost Sheet.

For each production department (cost centre) give a general description of the process and machinery applied. If possible, also quantify the major inputs used during this production stage as well as the total output in order to be able to calculate the production costs accrued at each stage, thus facilitating interfirm comparison. For this purpose, also refer to the Departmental Cost Sheet in Part A, VII. Table 1. Hence, it should be possible to calculate, e.g. figures on power consumption per ton produced, consumed wear and tear parts per ton produced, labour cost per ton produced, etc. Through this approach, one can compare the performance of one plant with another without having to compare the total overall results which are strongly influenced by the special circumstances prevailing in each establishment.

The data on machine specifications and efficiency should reveal:

- the available equipment and its origin;
- the nominal capacity and the actual production of each equipment item in order to define the operational efficiency;
- the nominal capacity and the actual production of each production phase (department) in order to spot and diagnose any existing bottleneck;
- compare the actual production with the available (rated tonnage, good tonnage, maximum tonnage) capacity in order to define the losses in the working capacities;
- analyze the different stoppages and the reasons for each in order to find improvements.

V. PRODUCTION DEPARTMENTS (COST CENTRES)

V.A. BATCH HOUSE

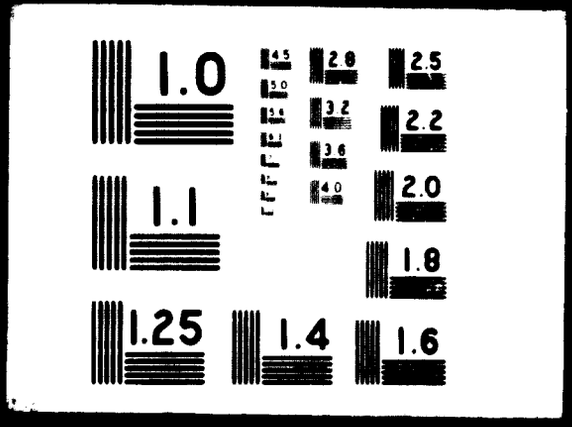
The Batch House Department covers the handling of incoming raw materials, the mixing to standard glass formulae and the storage of mixtures in silos or batch hoppers before melting.

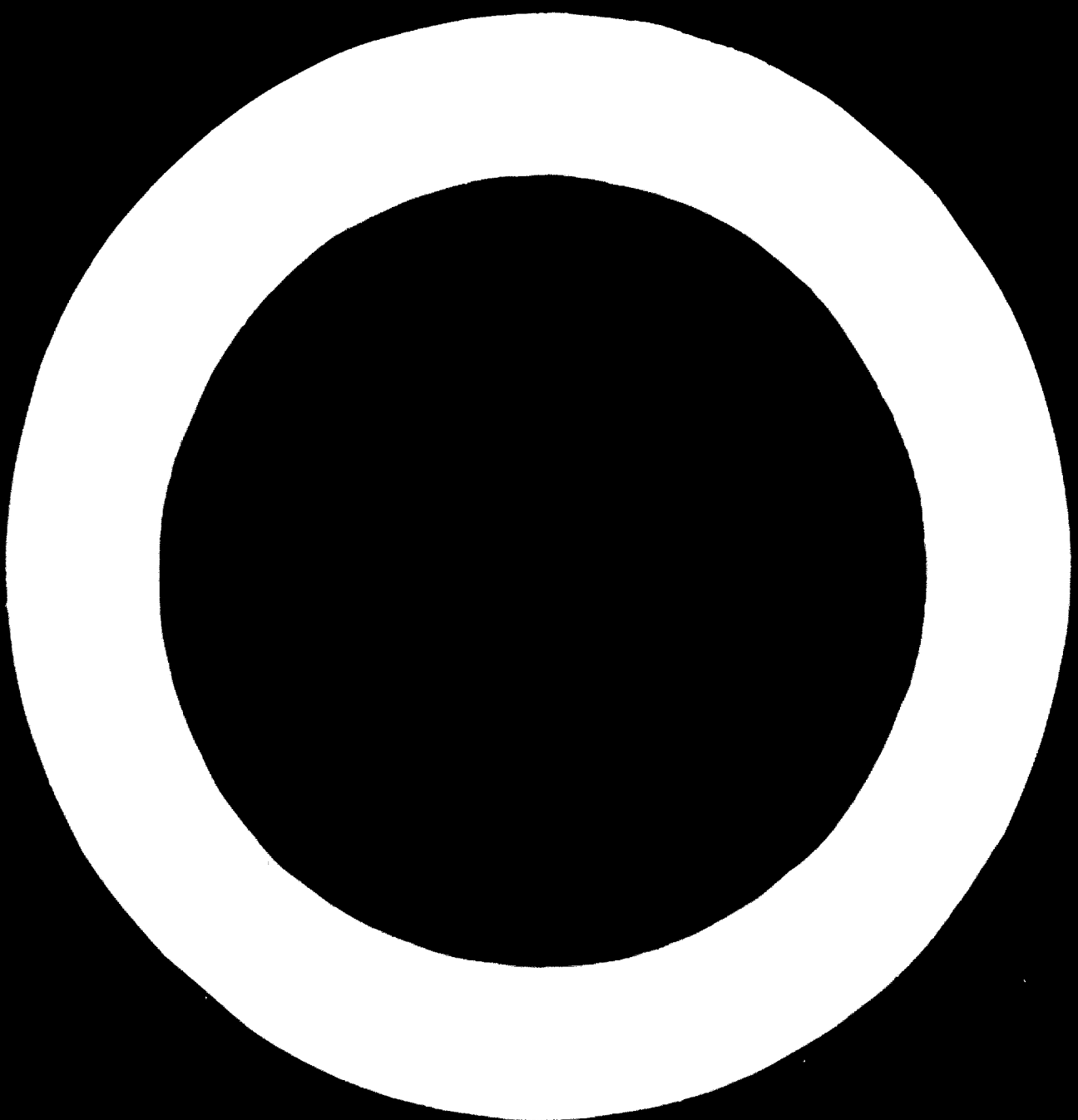
For example:

- handling of incoming material
- transport to mixing section
- mixing
- transport to storage bins
- storage before melting

V.A.1. General description of the raw material handling operation, the machinery and equipment as well as the inputs and outputs (see Explanatory Notes to Part B.V.) of this production stage.

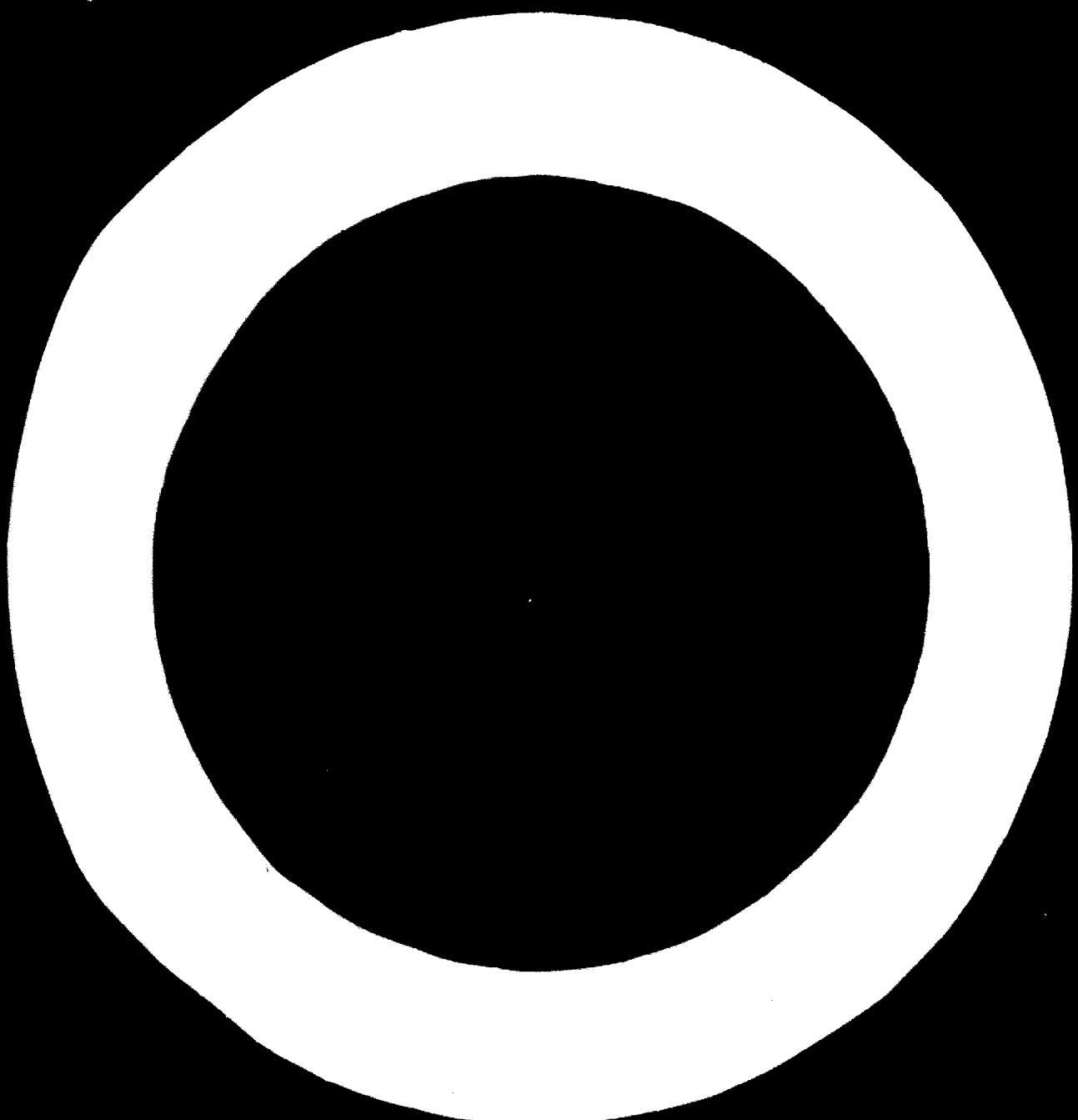
74.11.27





V.A.2. STORAGE FACILITIES FOR INCOMING RAW MATERIALS

Silos	Number	Capacity of each silo (in tons)
Sand		
Soda ash		
Limestone		
Dolomite		
Other materials: - sodium sulphate - sodium nitrate - sodium chloride - feldspar - alumina - basic acid		



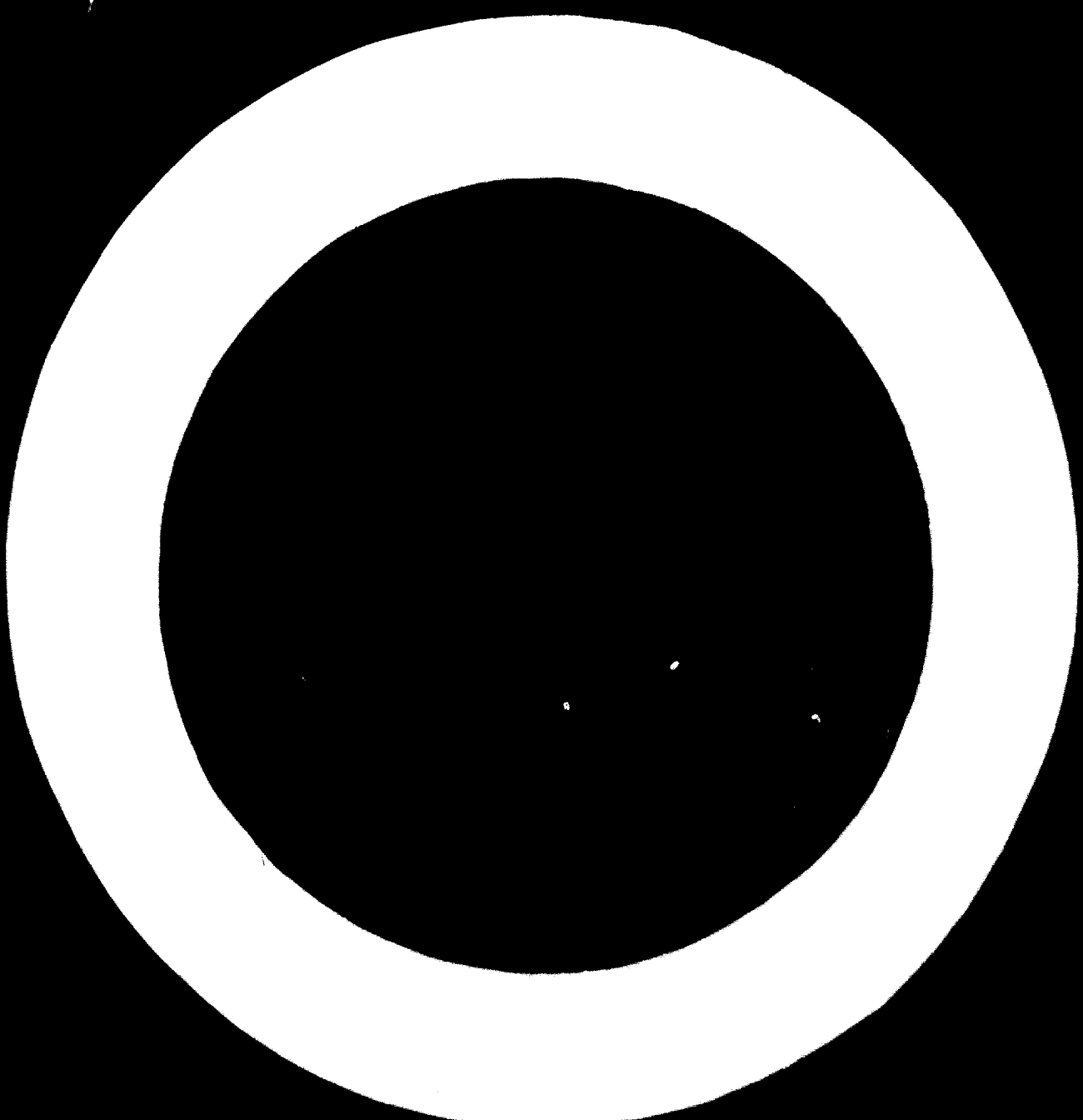
V.A.3. PREPARATION OF RAW MATERIALS

a) Equipment

EQUIPMENT	Number of machines	Type and supplier	Capacity		Annual working hours in (000)		
			Nominal	Actual	19	19	19
Crushers							
Mills							
Washers							
Dryers							
Screens							
Others							

b) Used for (check: x)

EQUIPMENT	Sand	Limestone	Dolomite	Soda ash	Sodium sulphate	Others
Crushers						
Mills						
Washers						
Dryers						
Screens						
Others						



V.A.4. RAW MATERIAL TRANSPORTATION EQUIPMENT

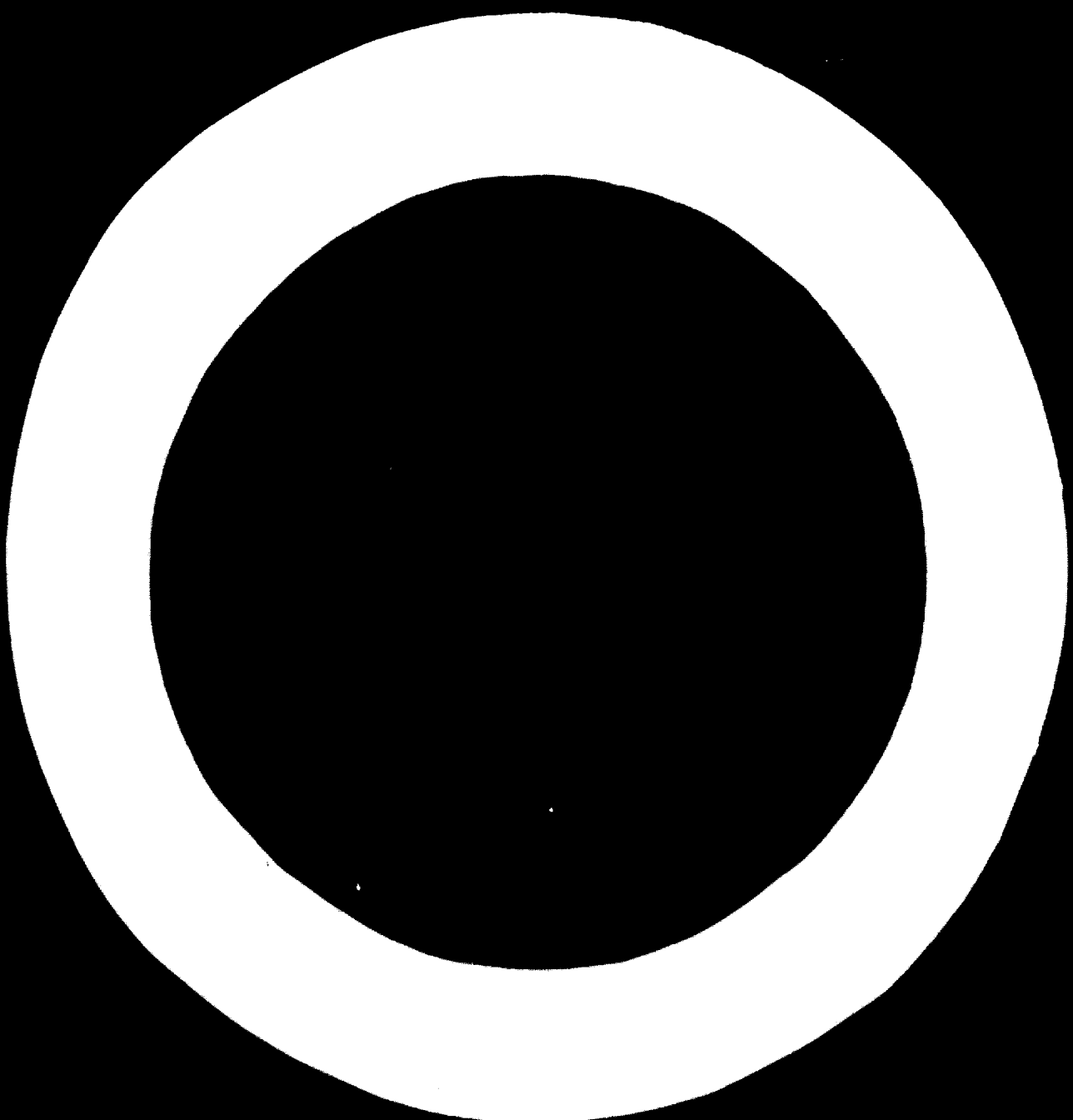
a) Transport equipment from receipt of raw materials to intermediate storage

EQUIPMENT	Number	Raw materials transported *	Type and supplier	Capacity		Annual working hours in (000)		
				Nominal	Actual	19	19	19
Pneumatic conveyors								
Normal conveyors								
Hoppers								
Others								

* Use the following abbreviations:

Limestone	L	Dolomite	D	Sodium sulphate	SS
Sand	S	Soda ash	SA	Others	O

COMMENTS:



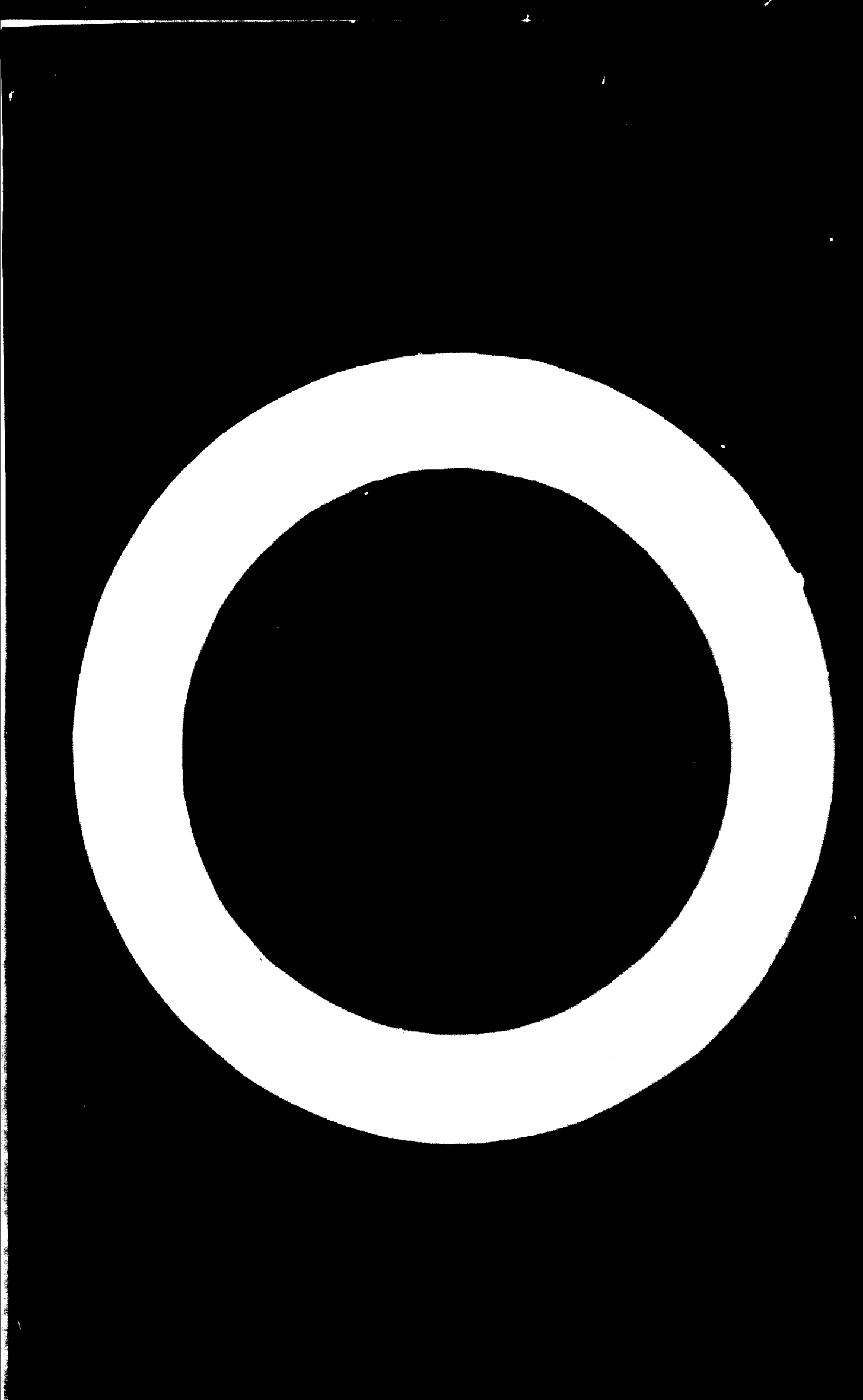
V.A.4. b) Transport equipment from intermediate storage to mixing section and prepared material storage

EQUIPMENT	Number	Raw materials transported	Type and supplier	Capacity		Annual working hours in (000)		
				Nominal	Actual	19	19	19
Normal conveyors								
Way hoppers								
Weighing devices								
Pneumatic conveyors								
Automatic batching								
Automatic conveyors to smelters								
Others								

* Use the following abbreviations:

Limestone	L	Dolomite	D	Sodium sulphate	SS
Sand	S	Soda ash	SA	Others	O

COMMENTS:

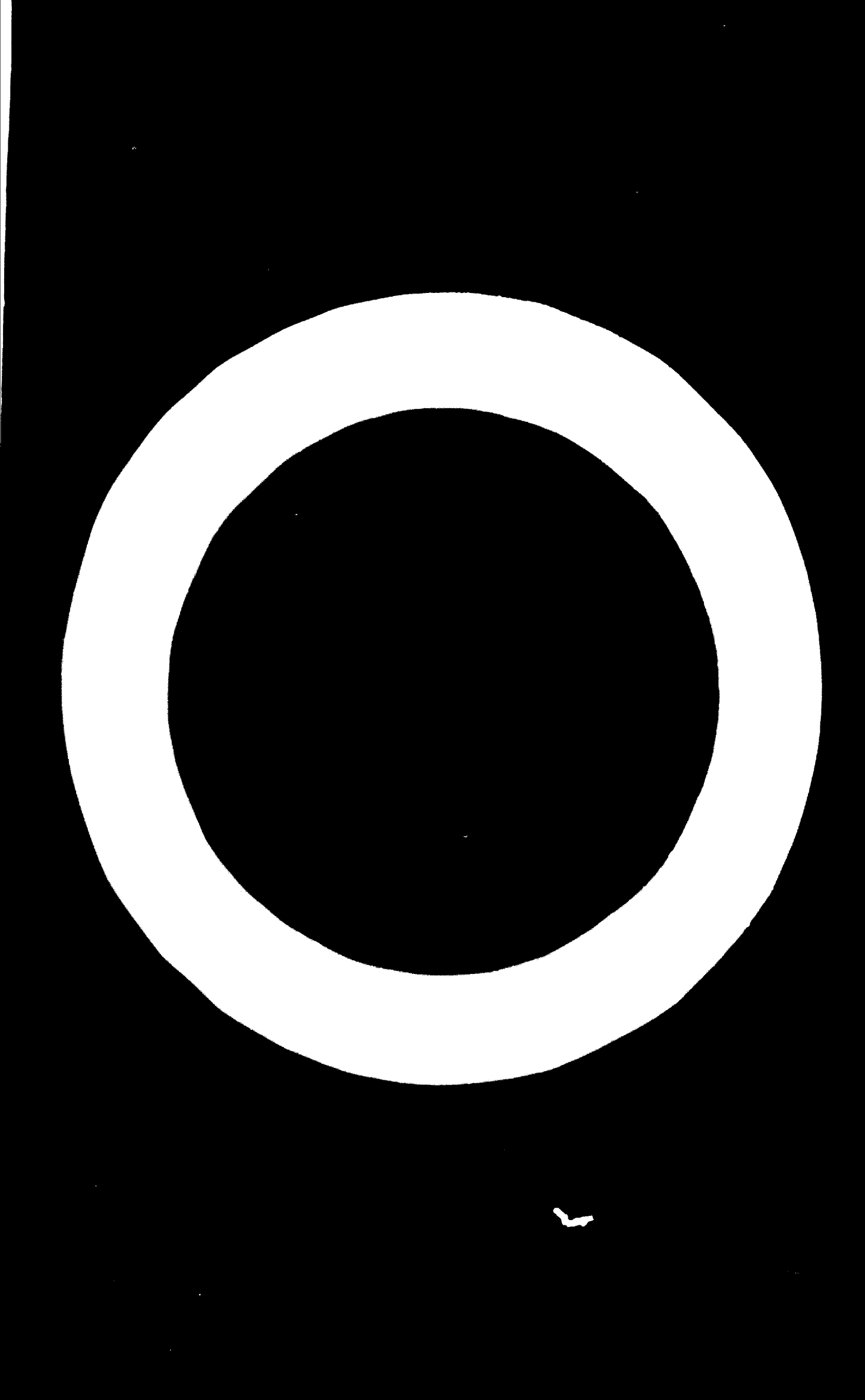


V.A.5. STORAGE FACILITIES FOR PREPARED GLASS MIXTURES

Form of storage	Number of storage containers	Capacities of each storage container (t)	Number of batches stored	Way of transport to smelter
Silos Batch hoppers (manual feeding of furnace) Continuous feeding to furnace - automatic - semi-autom.				

V.A.6. GEOGRAPHIC LOCATION OF RAW MATERIALS (sand, dolomite, limestone, feldspar, fluorspar)

Type of raw material	Location	State of access roads	Quarrying difficulties		Maximum daily production capacity (t)
			Kind	Duration	

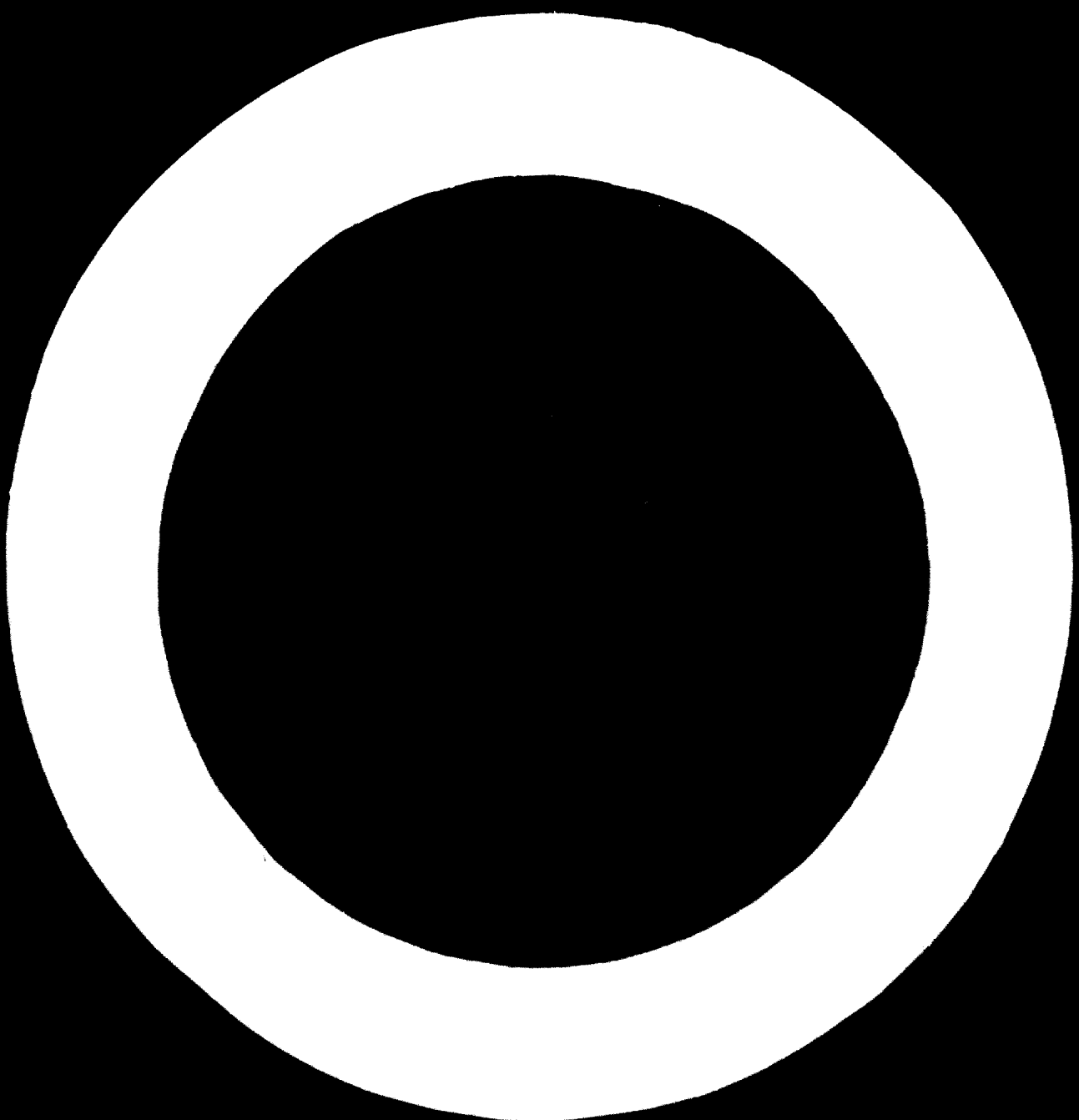


V.A.7. CHEMICAL COMPOSITION AND DAILY CONSUMPTION OF RAW MATERIALS

Chemical composition	Raw material	Cost/ton at factory	Batch composition (in tons) by type of glass				Total batches per day
			flint	amber	green	others	
SiO_2	Sand						
Na_2CO_3	Soda ash						
$MgCO_3$ + $CaCO_3$	Dolomite						
$CaCO_3$	Calcium carbonate						
NaCl	Sodium chloride						
$NaNO_3$	Sodium nitrate						
Na_2SO_4	Sodium sulphate						
KCl	Potassium chloride						
KNO_3	Potassium nitrate						
K_2SO_4	Potassium sulphate						
$BaCO_3$	Barium carbonate						
$Ba(NO_3)_2$	Barium nitrate						
$BaSO_4$	Barium sulphate						
HBO_3	Boric acid						
K_2O Na_2O + Al_2O_3 $6SiO_2$	Feldspar						
CaF_2	Fluorspar						
As_2O_3	Arsenic oxide						
Al_2O_3	Aluminium oxide						
Se_2O_3	Selenium oxide						
Co_2O_3	Cobalt oxide						
C	Carbon						
PbO	Litharge						
Total							

V.A.?. RAW MATERIAL SPECIFICATIONS (in percentages) FOR SAND, DOLOMITE, LIMESTONE, FELDSPAR, FLUORSPAR, METALLOXIDE - SCREEN ANALYSIS DESIRABLE

Raw material	Chemical formulae	Moisture	Loss of ignition	SiO_2 Silicium oxide	Al_2O_3 Aluminium oxide	TiO_2 Titan. oxide	Fe_2O_3 Iron oxide	Combined Fe magnetic non-magnetic	MgO Magnes. oxide	R_2O_3 Combined alkalies	Na_2O Sodium oxide	K_2O Potass. oxide	CaO Calc. oxide	BaO Barium oxide	NO_3^- Nitrate	F_2^- Fluor	SO_4^{--} Sulphate	CoO Cobalt oxide	NiO Nickel oxide	MnO_2 Mangan. oxide	SAn_{--} S_{--} SO_4 Sulphur oxide	Pb Lead oxide	Se Selenium	As_2O_3 Arsenic oxide	B_2O_3 Boric oxide
Sand	SiO_2																								
Soda ash	Na_2CO_3																								
Dolomite	$MgCO_3 + CaCO_3$																								
Calcium carbonate	$CaCO_3$																								
Sodium chloride	NaCl																								
Sodium nitrate	$NaNO_3$																								
Sodium sulphate	Na_2SO_4																								
Potassium chloride	KCl																								
Potassium nitrate	KNO_3																								
Potassium sulphate	K_2SO_4																								
Barium carbonate	$BaCO_3$																								
Barium nitrate	$Ba(NO_3)_2$																								
Barium sulphate	$BaSO_4$																								
Boric acid	HBO_3																								
Feldspar	$K_2O \cdot Na_2O \cdot Al_2O_3 6SiO_2$																								
Fluorspar	CaF_2																								
Arsenic oxide	As_2O_3																								
Aluminium oxide	Al_2O_3																								
Selenium oxide	Se_2O_3																								
Cobalt oxide	Co_2O_3																								
Carbon	C																								
Litharge	PbO																								



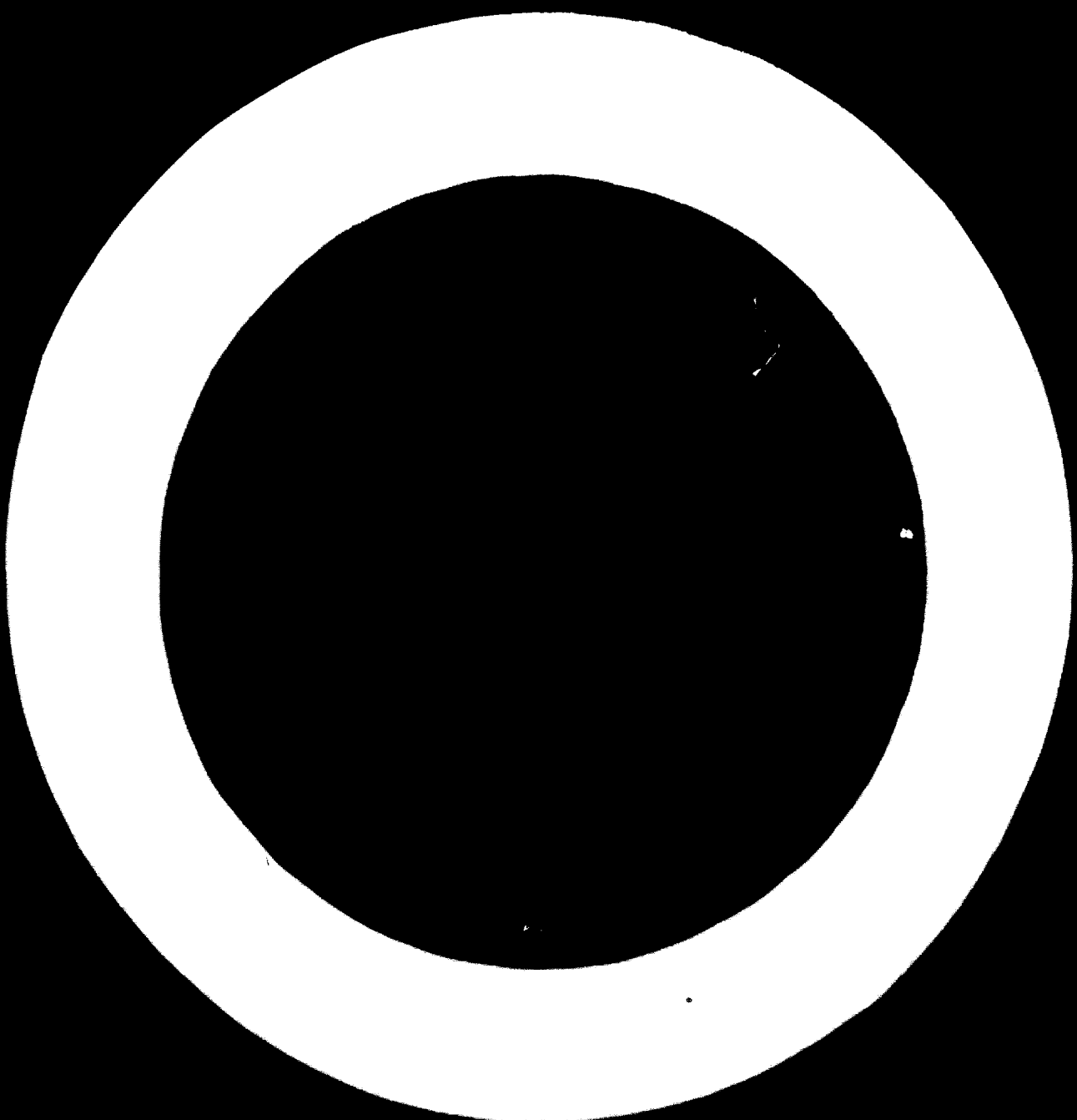
V.A.9. PHYSICAL AND MICROSCOPIC DATA *

Sand No. Properties	(1)	(2)	(3)
Colour at quarry			
Colour after firing			
Ferric oxide magnetism			
Physical nature: - necessity of:			
milling			
sieving			
other treatments			
Microscopic nature			

V.A.10. MECHANICAL ANALYSIS * GRAIN SIZE: (ASTM)

	Sieve No.	Mesh per inch	Diameter of mesh micron	Diameter of particle mm.	Per-centage	Added %	Remarks
1	16	16	1000	0.597			
2	32	32	500	0.300			
3	48	48	297	0.234			
4	100	100	149	0.107			
5	170	170	88	0.061			
6	325	325	43	0.036			
7	325	-	-	-			
8	Loss	-	-				

* To be repeated for every sand as well as for dolomite, limestone, feldspar and fluorspar.



V.B. MELTING DEPARTMENT

The melting process comprises the transport (automatic or manual) of batch material from the storage bins or hoppers into the furnace (continuously or batchwise) and from there as liquid glass through feed-lines to the forming, decorating and annealing department.

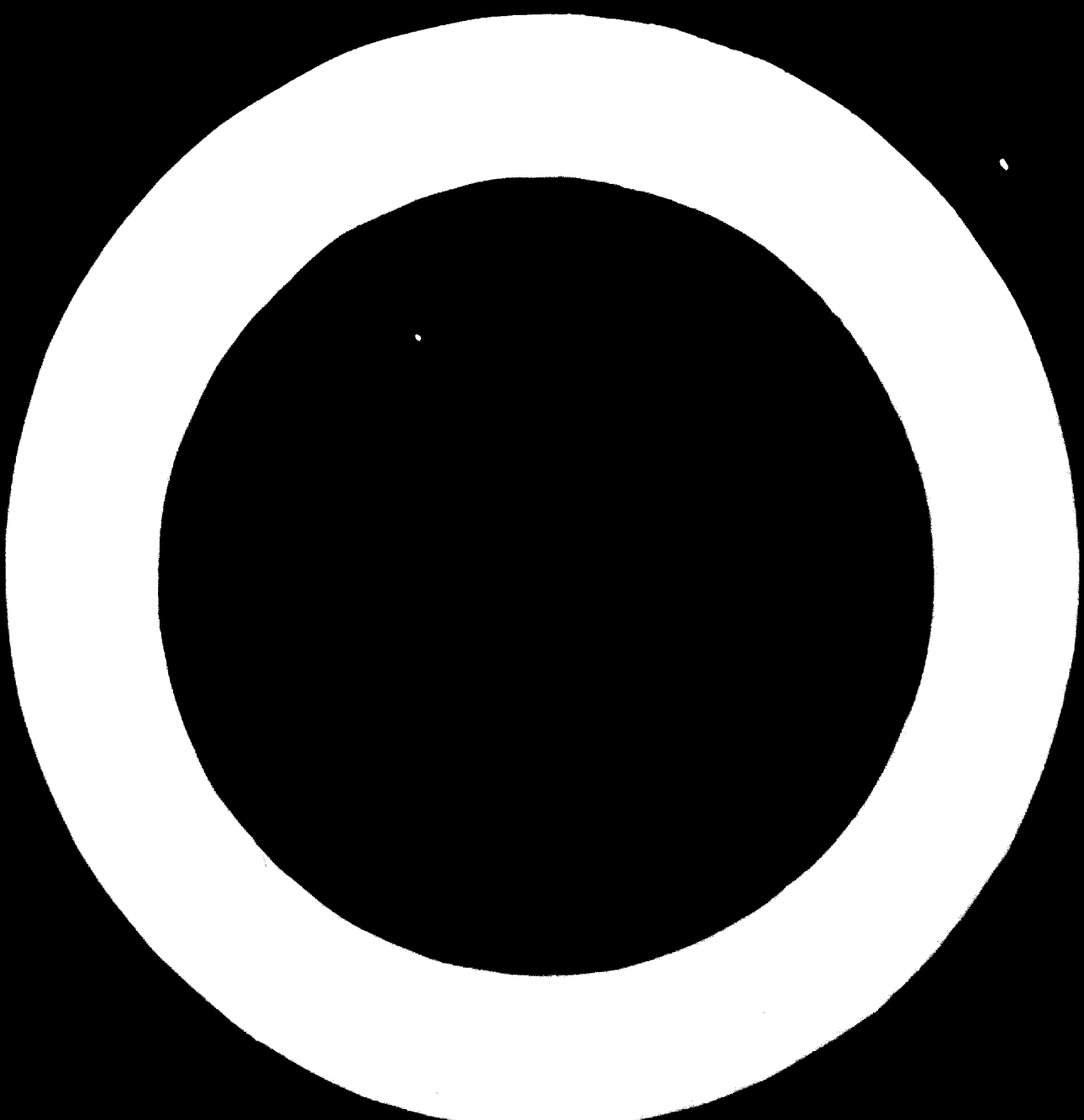
For example:

- transport of batch material
- melting
- transport by feed-lines to forming machines

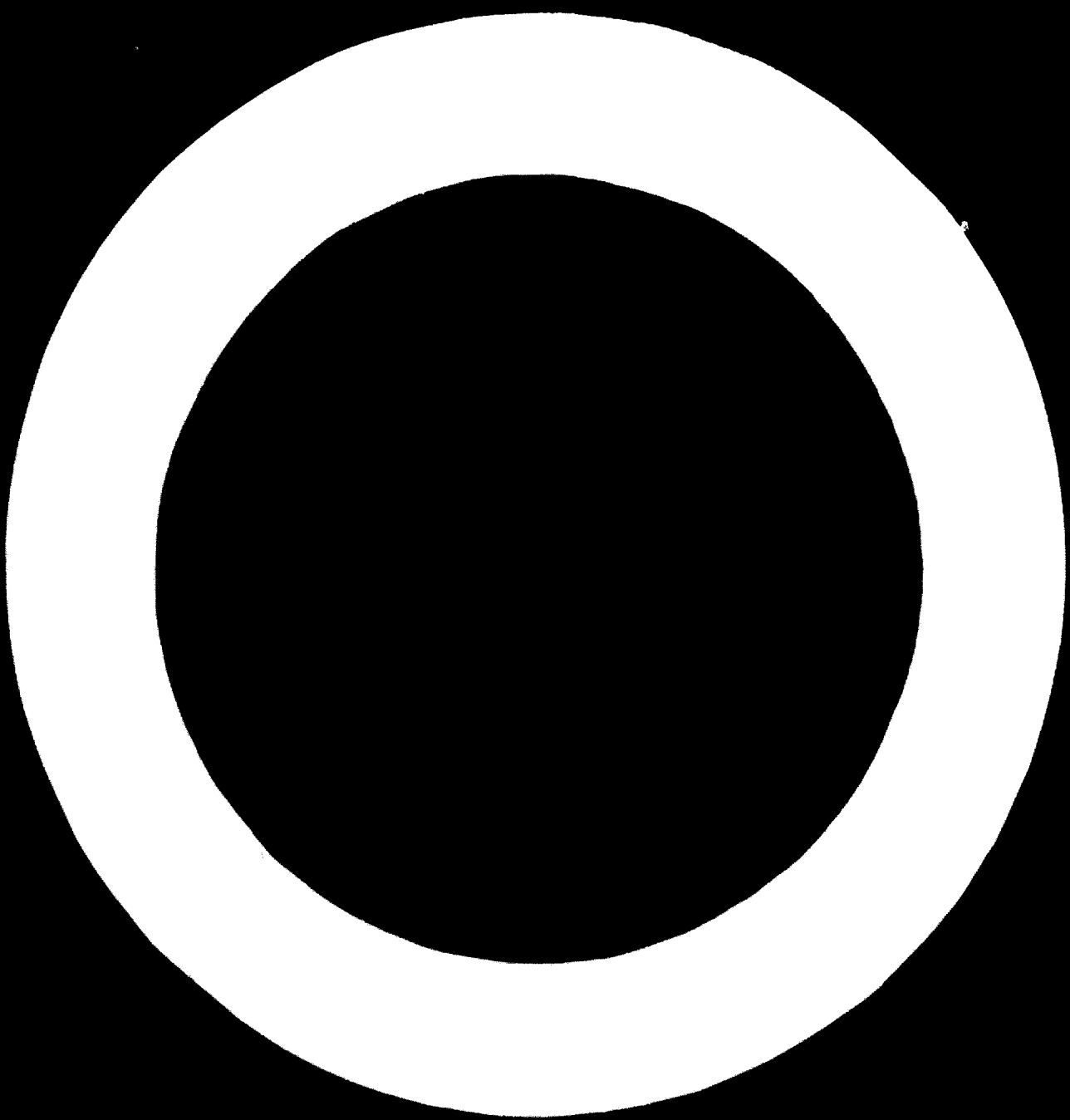
V.B.1. General description of all melting operations as outlined above, of the melting furnace and other equipment as well as of all inputs and outputs of this production stage (see explanatory notes on Part B.V.).

V.E.2. MELTING FURNACES (specify if company is operating several furnaces and or utilizing one furnace for different kinds of glass

	Number of furnaces			
	1	2	3	4
a) Method of feeding:				
- automatic				
- manual				
b) Types of furnaces:				
- regenerative				
- recuperative				
- unit smelter				
- day tank				
- pot furnace				
- electric furnace				
- others				
c) Furnace capacity and life period:				
- melting area (m^2)				
- working area (m^2)				
- total furnace holding capacity (tons)				
- max. expected pull/day (tons)				
- average pull/day (tons)				
- deviation range from average daily pull (... tons)				
- expected life-time of furnaces (... years)				
- expected campaign (month)				
- last campaign (month)				
- do you undertake mid-life repairs? hot or cold?)				
- where done usually?				



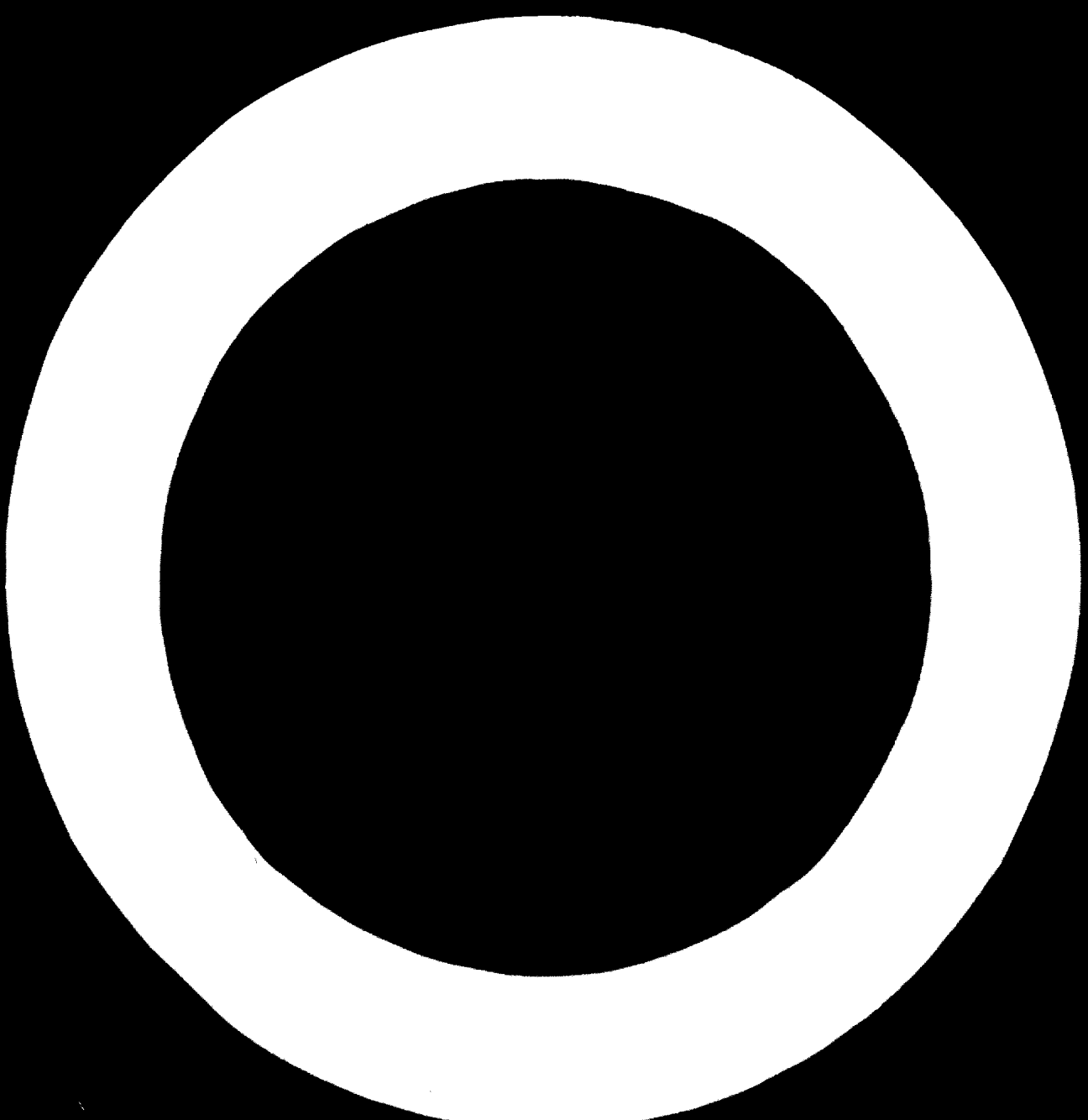
	Number of furnaces			
	1	2	3	4
d) Furnace equipment:				
- max. temperature of furnace °C				
- temperature at bridge wall °C				
- temperature at working end crown °C				
- what is the principle means of furnace control?				
automatic?				
semi-automatic?				
manual?				
- what is controlled?				
temperature?				
air, burners and fuel?				
atmospheric control?				
furnace pressure?				
- max. deviation of temperature ± °C				
- do you have glass level control?				
- max. deviation of glass level ± mm.				
- max. change of pressure ± mm.				
e) Use of fuel:				
- Heavy oil:				
kcal/kg/24h.				
is heavy oil pre-heated?				
- Light oil:				
kcal/kg/24h.				
- Natural gas:				
kcal/m^3/24h.				
- Town gas:				
kcal/m^3/24h.				
- Max. electricity consumption (kVA)				
- Average electricity consumption (kVA)				



V.B.3. REFRACTORIES

	Local		Imported		Origin
	Tons	Price	Tons	Price	
Fusion cast					
Monofrax					
ZAC					
Korvisit					
Alumino-silicate					
28% Al_2O_3					
30/32 % "					
38/40 % "					
40/42 % "					
50% "					
60% "					
80% "					
Sliminite					
Silica					
Chrome-magnesite					
Magnesite					
Carborundum					
Zircon					
Insulation					

Prices are to be given per ton and expressed in local currency.



V.C. FORMING DECORATING AND ANNEALING

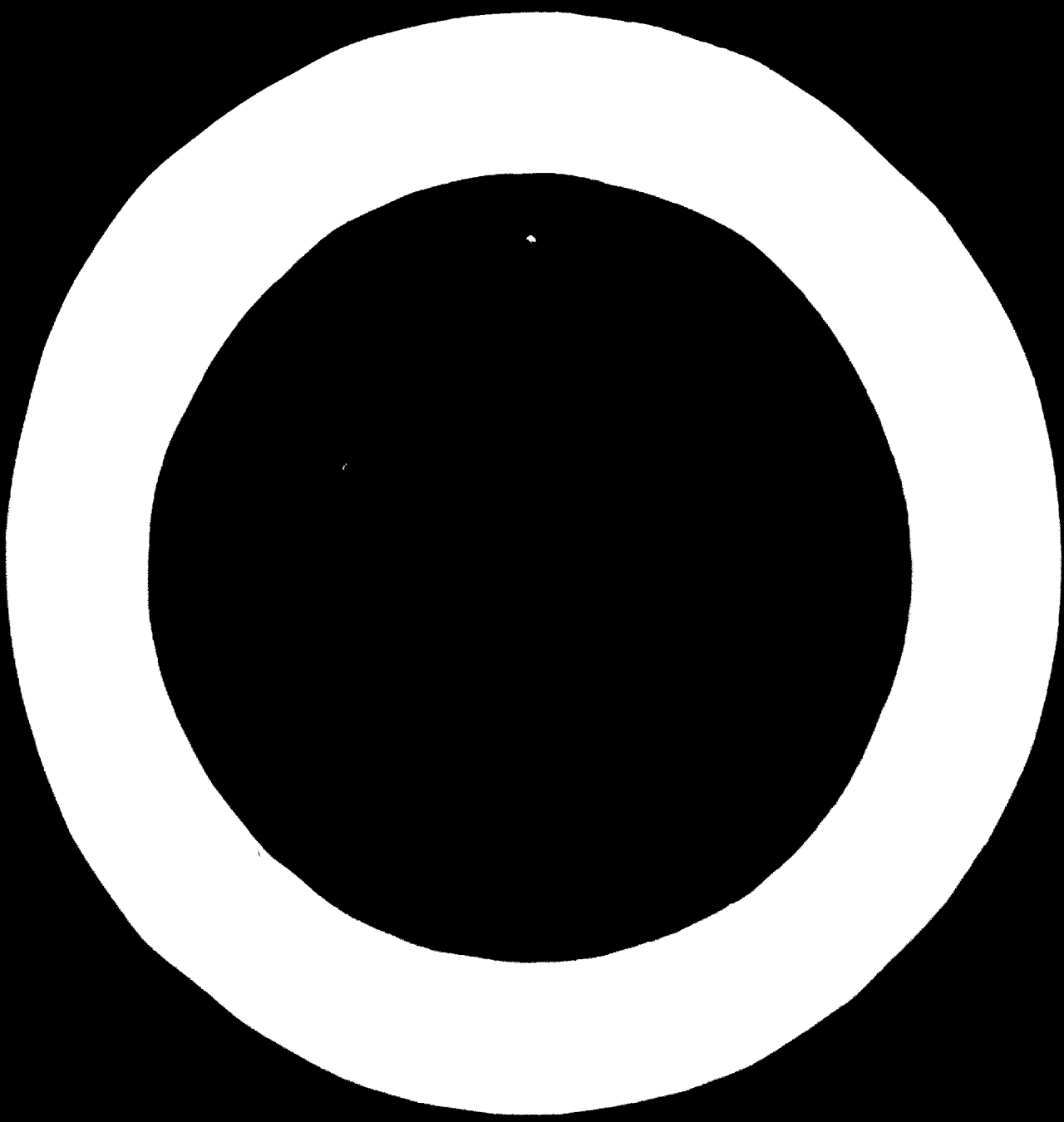
The molten glass is fed continuously into the different types of forming machines with varying moulds or forms. The formed glass is conveyed either directly to annealing or to decorating prior to annealing.

Flat and sheet glass is annealed immediately after forming and cut to different sizes and thicknesses.

For example:

- continuous feeding of molten glass
- forming
- conveying to decoration machines
- annealing

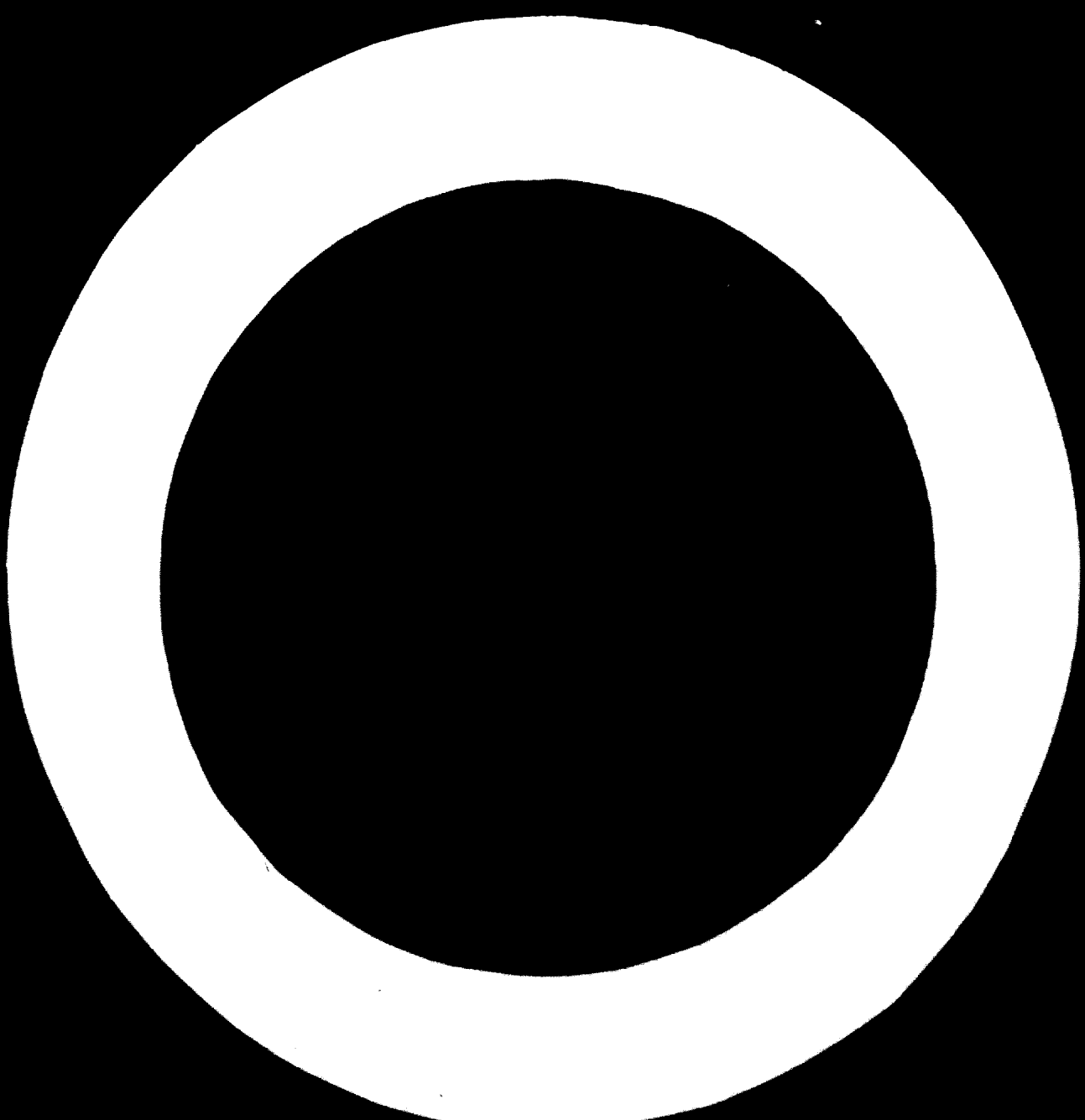
V.C.1. General description of the forming, decorating and annealing operations as outlines above, of the machinery and equipment utilised as well as of all inputs and outputs of this production stage (see explanatory notes on Part B.V.).



V.C.2. MACHINE FEEDERS (indicate units of measurements)

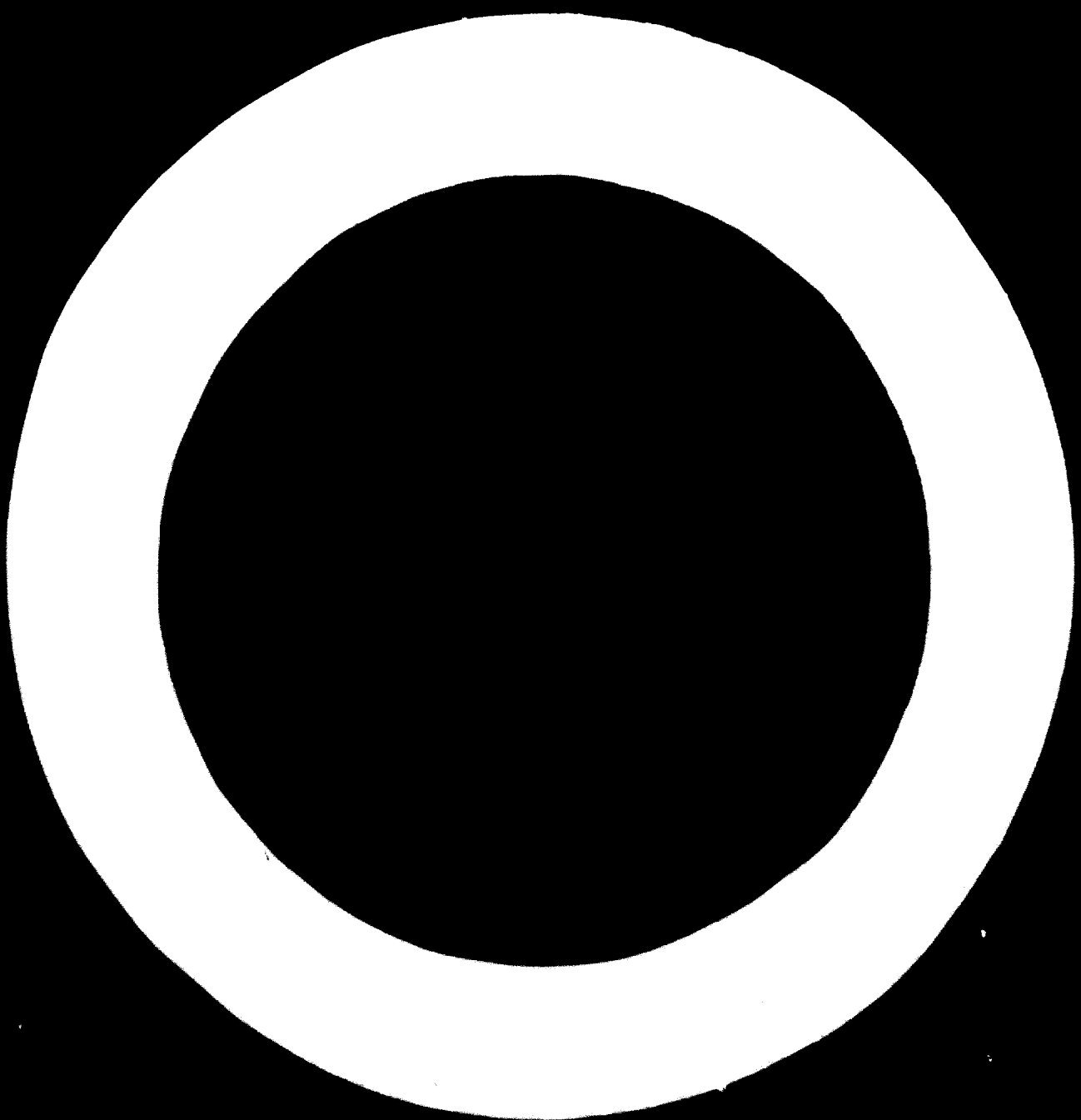
Manufacturer type	Cooling length breadth	Length of canal	Glass depth	Heating gas or oil	Auxiliary equipment *	Automatic temperature control	Cooling equipment	Forming machine served

* Mixers, stirrers, etc.



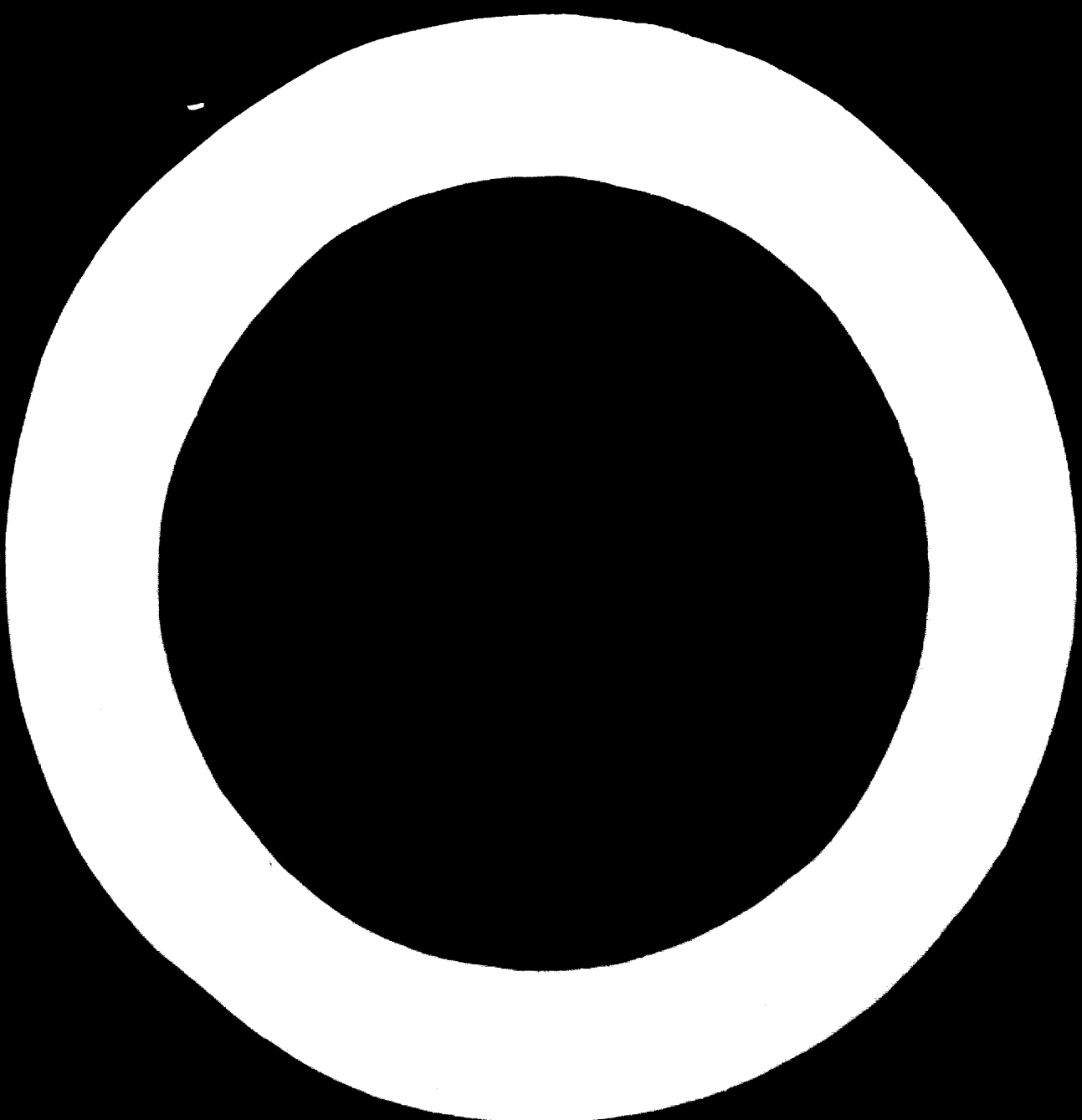
V.C.3. FORMING MACHINES (container and tableware)

Number of moulds			Double or single gob	Max. speed for 400 g ware gob/min	Additional equipment	Electricity consumed kWh	Loss time for mould change and maintenance
parison	final	pressed					



V.C.4. DRAWING MACHINES (sheet glass)

Type	Height (in m)	Width of drawn sheet (in cm)	Thickness of glass	If temper. is measured in machine	Method of cutting



V.C.5. PERFORMANCE OF SHEET GLASS PULLING MACHINE

- Usual temperature of the onion:
- Glass temperature in the machine:
- Usual machine speed for 2mm thickness: cm/min
- 3mm
- 4mm
- 5mm
- 6mm
- 7mm
- 8mm

- Usual production period of the machine: hours

- State how the drawing pit is cleaned after every production period:

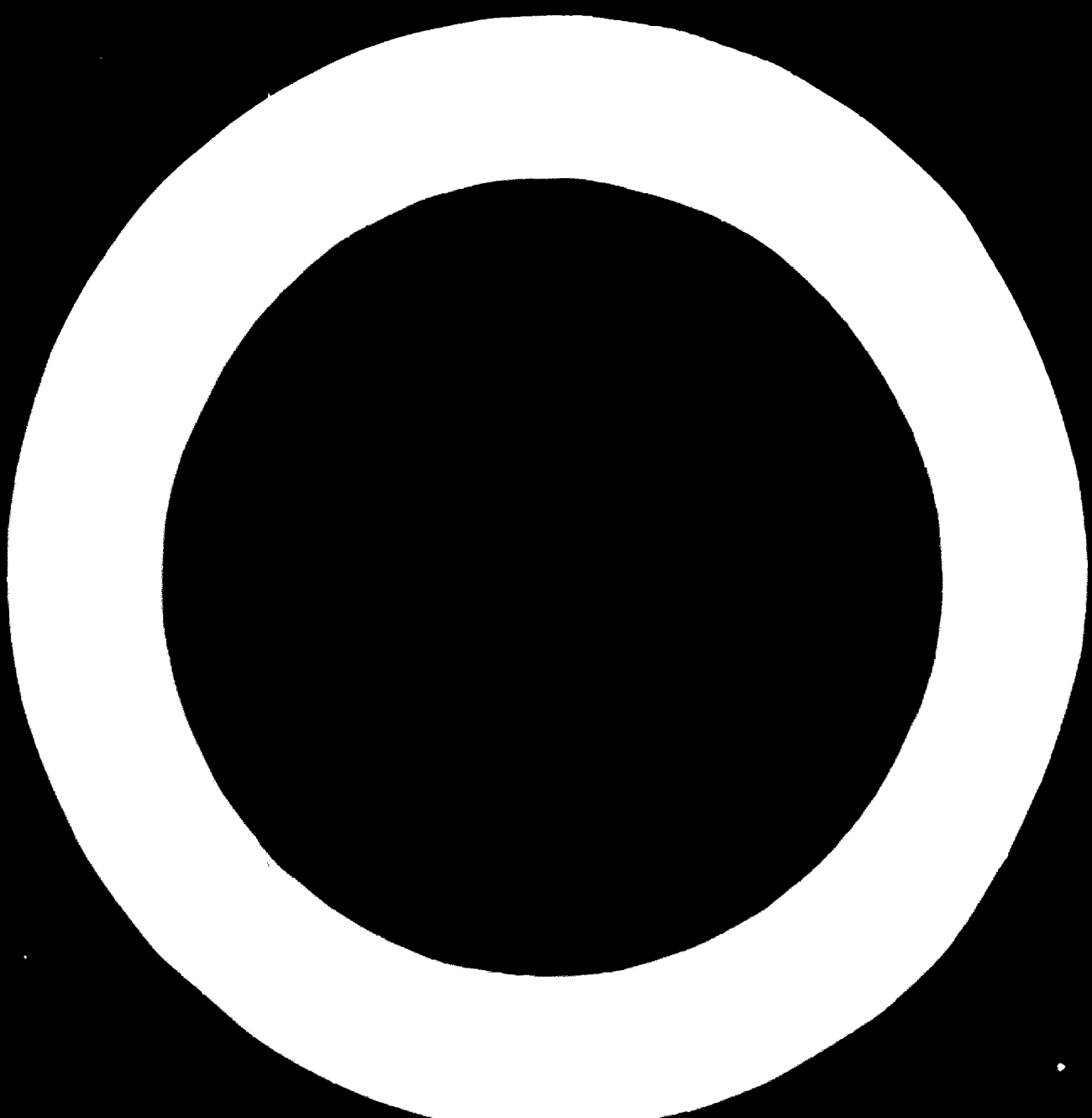
- Average time from the start of drawing until normal production:

- How are breakages during production dealt with?:

- Average period for debiteuse: days

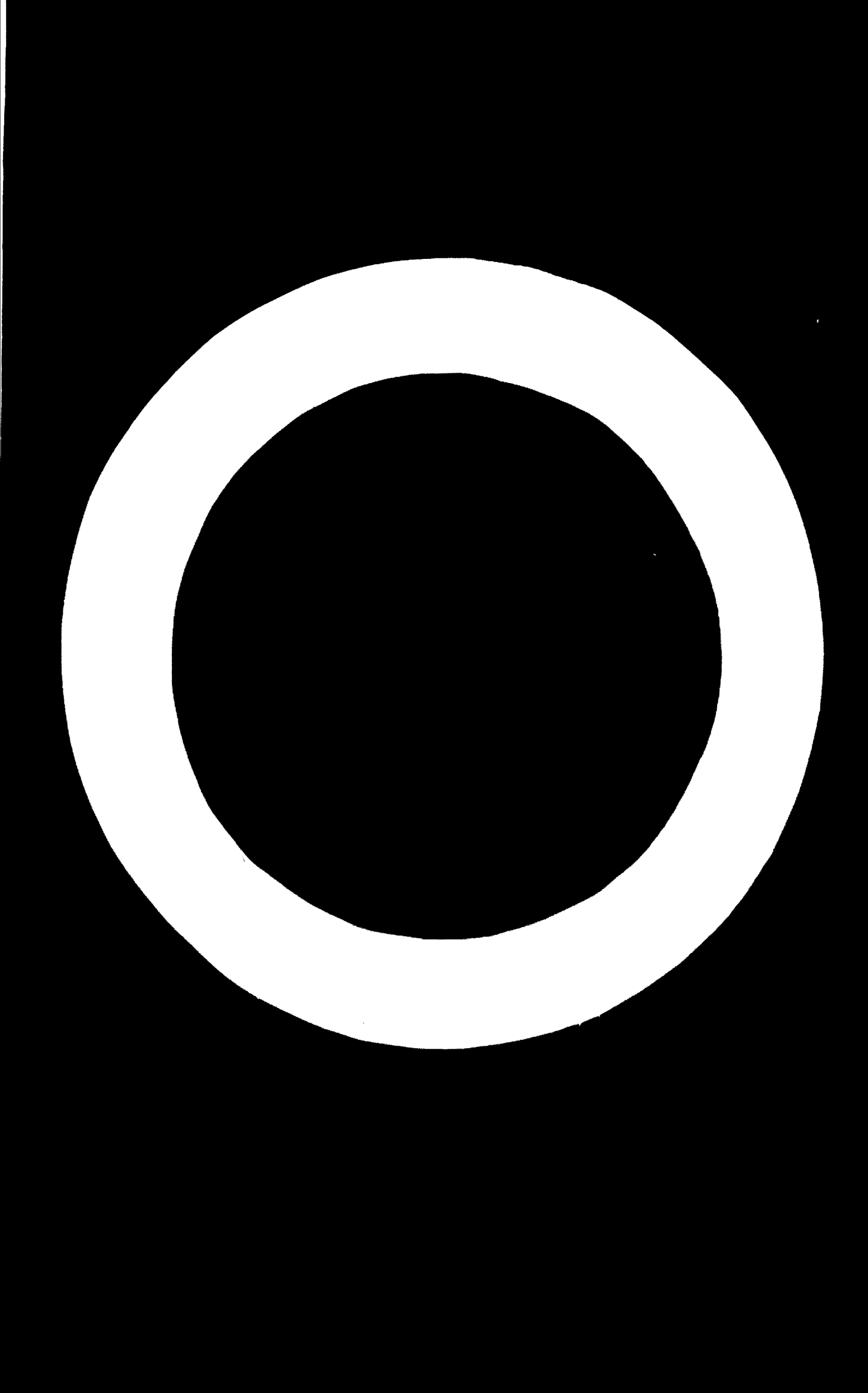
- Is heating applied in drawing pit?:

- How is heating effected?:



4.C.6. ANNEALING LEHRS

	Number of annealing lehrs		
Types of annealing lehrs: open-fired			
convection-fired			
Are the lehrs supplied by one or several forming machines?			
Method of stacking: manual or automatic?			
Dimensions: internal height mm			
internal width mm			
length of covered area mm			
length of uncovered area mm			
Firing: gas, oil, electricity			
How is heating controlled:			
automatically or manually?			
Nominal capacity: ton/24h			
Fuel consumption at nominal capacity utilization kcal/kg/24h			
Other information			



V.2.4. DECORATION

a) Is any decoration used?

What kind of decoration?

If decorated, where is the equipment installed? before annealing or in separate section?

b) Is the decoration performed manually, semi-automatically or automatically?

Decorating equipment:

Type of machines	Automatic semi-autom. manual *	Single or multiple colour application	Capacity (in tons of glass)		Annual working hours in (000)		
			Nominal	Actual	19	19	19

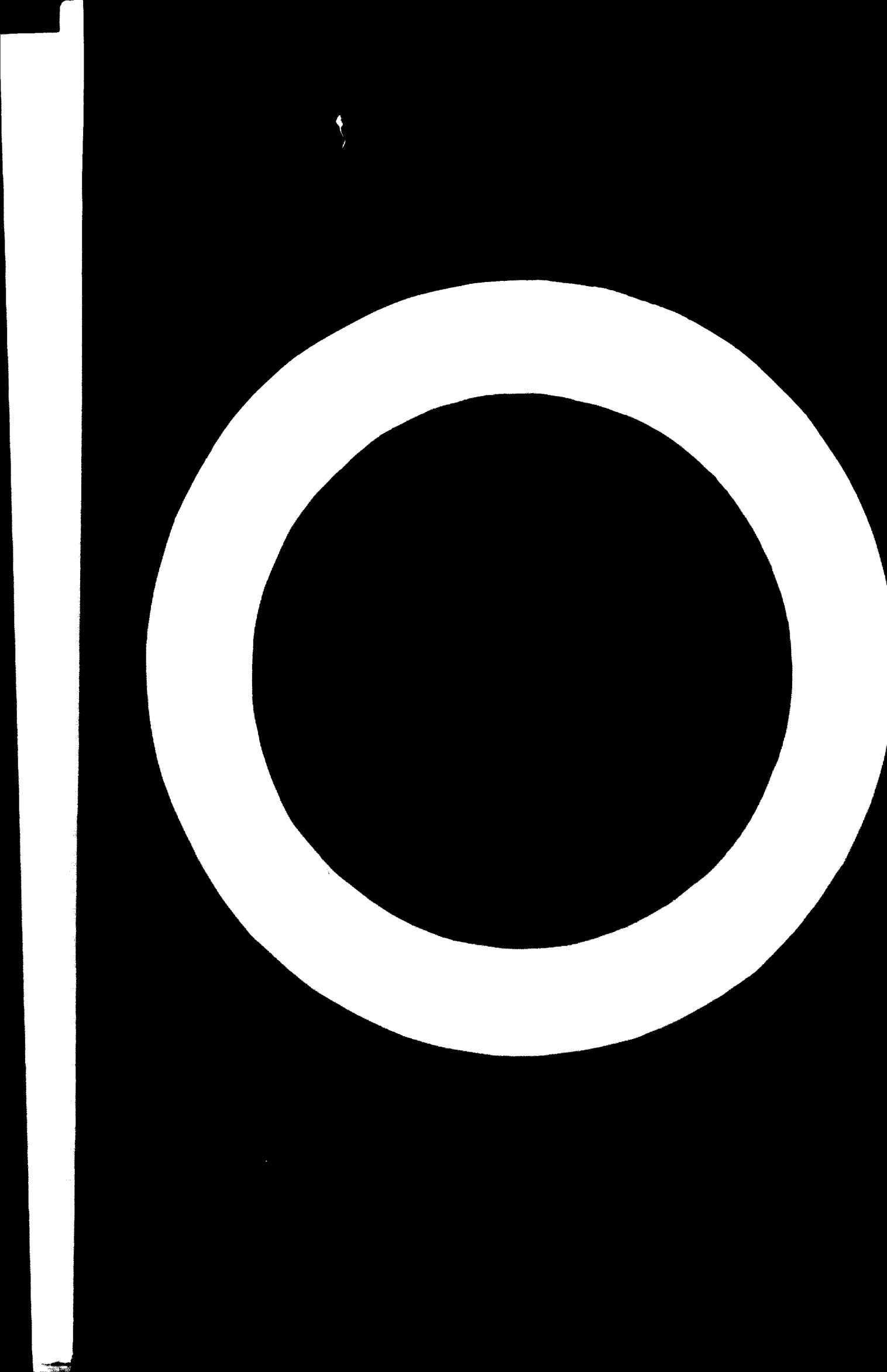
* Automatic: A; semi-automatic: S-A; manual: M

c) Are screens for decorating machines made by you, locally or foreign?

d) Are the colours prepared by you, locally or foreign?

If prepared by you, are they composed to a special company pattern of colours?

If so, how?



e) Is the quality of the colours controlled regularly?

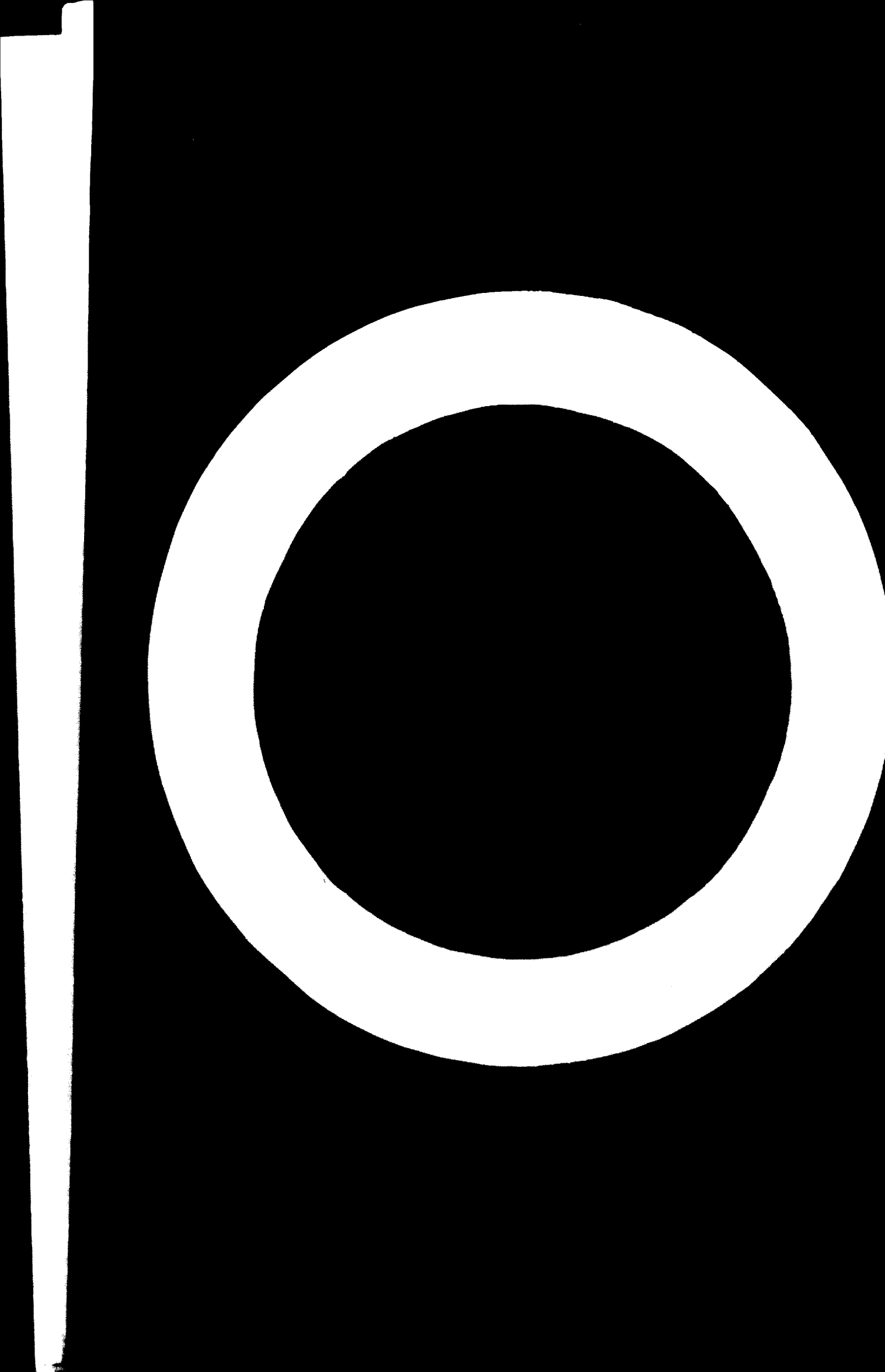
If so, how?

f) Do you use inorganic and organic colour application?

If so, in what percentage?

g) Do you use precious metal application?

If so, are they locally produced?



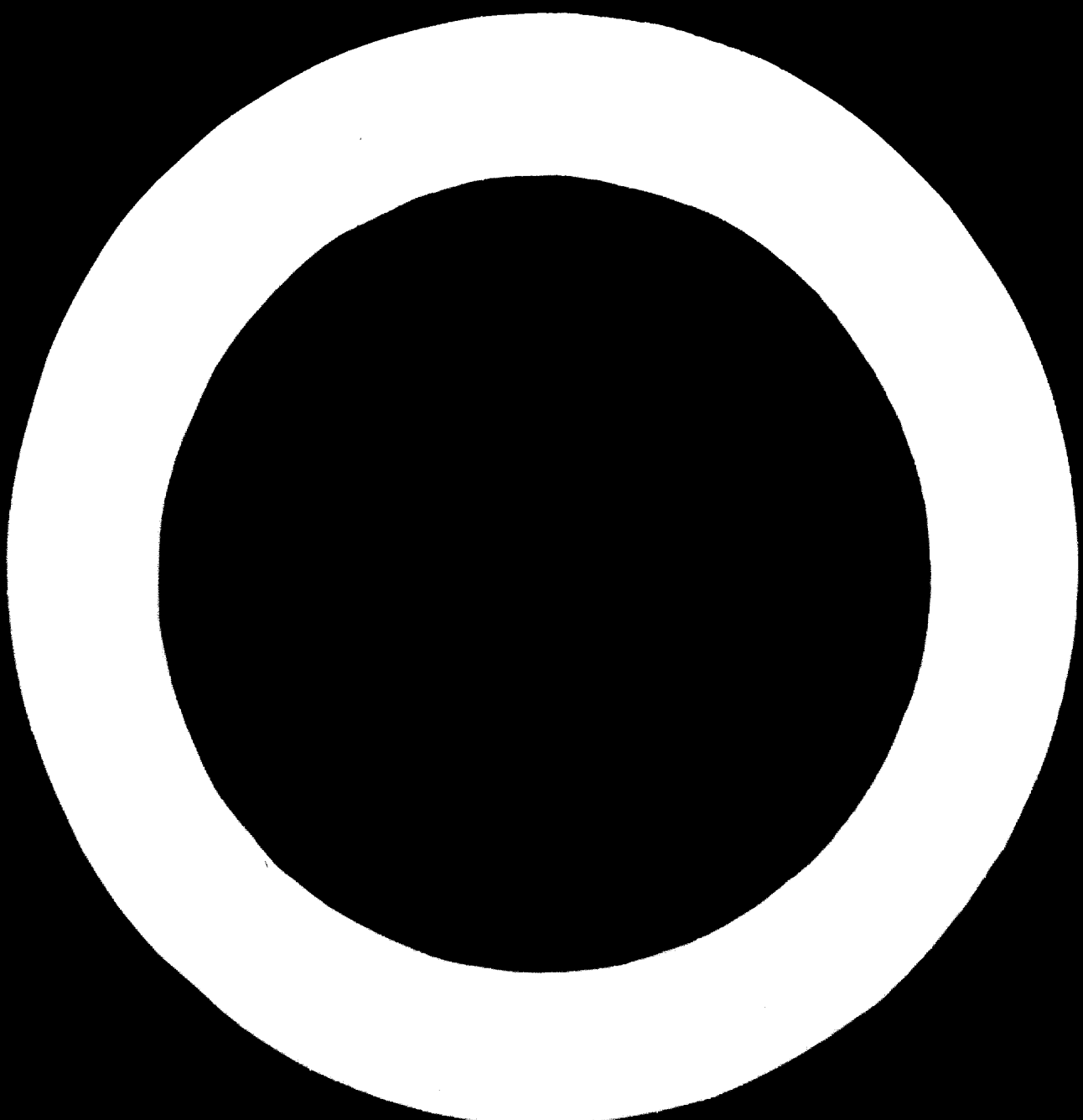
V.D. SECONDARY PROCESSES

Secondary processes include a variety of activities such as cutting, grinding, fire polishing, engraving, etc. which are undertaken after forming and annealing the intermediate glass product.

For example:

- cutting
- grinding
- fire polishing
- engraving, etc.

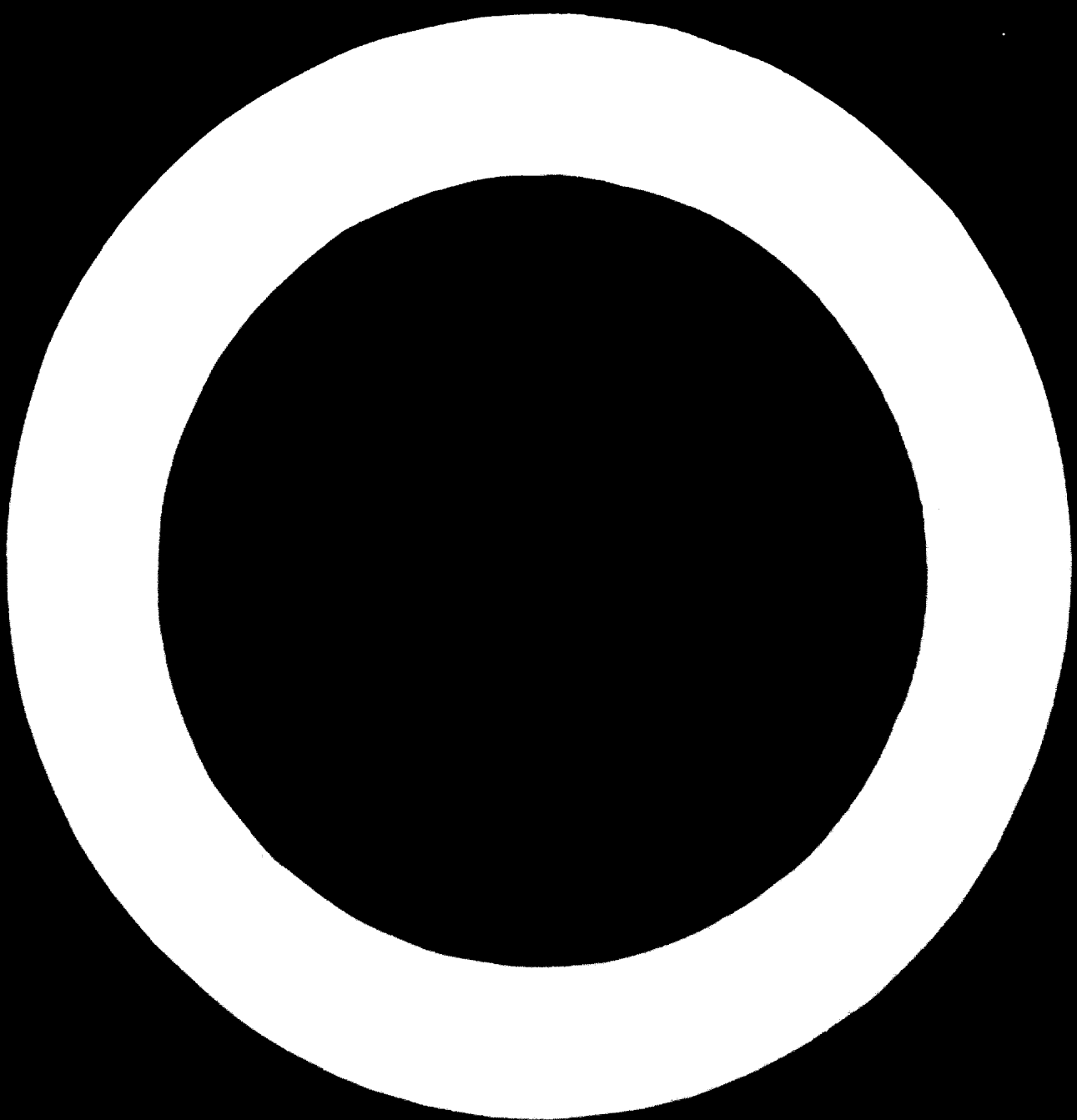
V.D.1. General description of the secondary processes applied, of the machinery and equipment utilized as well as of all inputs and outputs of this production stage (see explanatory notes on Part B.V.).



V.D.2. SECONDARY PROCESSES

Percentage (%) of production treated: bottles, tableware, sheet glass.

Process	Articles treated	Capacity (tons)	
		Nominal	Actual
Cutting			
Grinding			
Fire polishing			
Engraving			
Etching			
Gold lining			
Transfers			
Colour spraying			
Sand blasting			
Others			



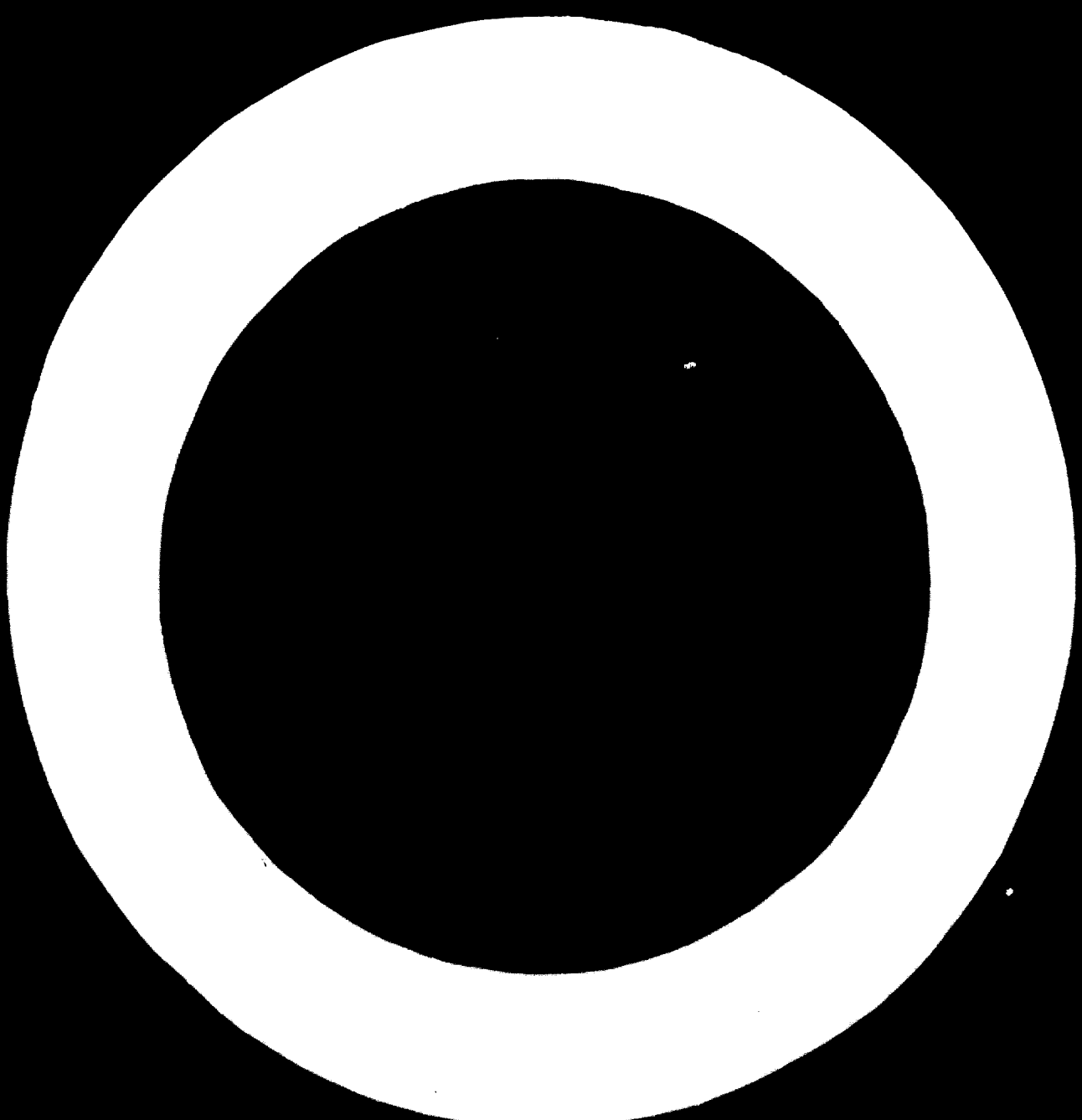
V.E. SORTING, PACKING AND STORAGE

This comprises the control of finished products (quantity and quality) at the lehr site after which the sorted glass products are packed and moved to the warehouse.

For example:

- control of finished products
- packing
- transport to warehouse
- storage

V.E.1. General description of the sorting, packing and storage activities as outlined above, of the machinery and equipment utilized as well as of all inputs and outputs of this production stage (see explanatory notes on Part B.V.).



V.E.2. SORTING AND PACKING

Methods	Number	Make
Choke testers Packing machines Turn tables Others		

a) Is sorting done at the end of the annealing lehr?
and/or at the end of the sheet glass machine?

b) Are single liners and conveyors used?

c) Is "single lining" utilized in order to make use of inspection and packing machinery?

d) Do you utilize visual inspection? in what form?

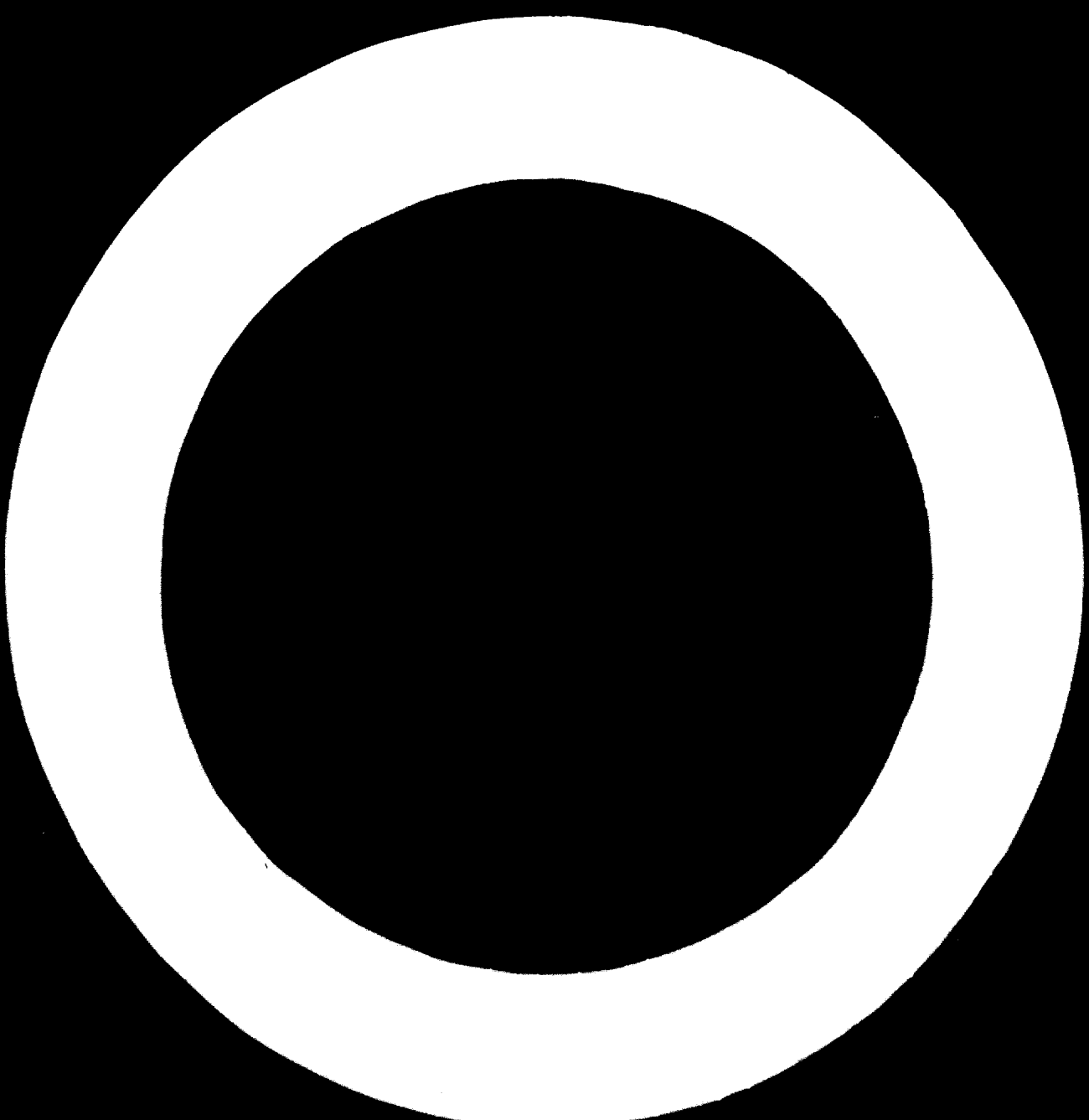
V.E.3. REJECTS

Final product	Rejects		Utilization of rejects		
	(tons)	%	Recycling	Cullet	Waste
Container glass Sheet glass Tableware, automatic produced Rolled glass Hand-gathered glass Others					

For sheet glass: percentage weight of side cuts from drawn sheet

Reasons for rejects: %

- glass fault
- machine fault
- lehr breakage
- faulty decoration



V.E.4. PACKING MATERIAL

Packing material	Local	Imported	Total cost
Wooden cases			
Plastic cases			
Cartons			
Paper bags			
Jute bags			
Shrink wrapping			
Others			

a) Is palletizing being used?

b) Do you produce your own packing cases or cartons?

V.E.5. WAREHOUSING

a) What is the average total amount of stocks?

Finished product	Value	Tonnage
Container glass		
Sheet glass		
Tableware, automatic produced		
Rolled glass		
Hand-gathered glass		
Others		

EXPLANATORY NOTES

Ad.VI.A.: Production Cost Centres

The heading supervisory staff and foremen includes the technical personnel (engineers or similar) who are attached to the production cost centres for most of the year. This Profile study is interested in assessing the skill requirements for each specific production cost centre. Only those engineers who engage in managerial desk work and research and development may be classified in VI.B.

If a significant portion of the establishment's work is operated seasonally, report the number of employed persons separately for each cost centre indicating their number in parenthesis to signify that it is included in the total.

VI. MANNING TABLE

A) PRODUCTION COST CENTRES	NUMBER OF EMPLOYEES AND WORKERS (annual average)									Total
	Supervisory staff and foremen	Day shift skilled	Day shift unskilled	First shift skilled	First shift unskilled	Second shift skilled	Second shift unskilled	Third shift skilled	Third shift unskilled	
1. Batch house										
2. Melting										
3. Forming, decor, + annealing										
4. Secondary processes										
5. Sorting, packing and storage										
SUBTOTAL A)										

continued

EXPLANATORY [illegible]

[illegible] [illegible] Management includes executive and managerial staff, department heads, and general plant supervision not classified under [illegible].

[illegible] General Overhead Cost Centres includes the salaried staff of warehousing and distribution, selling and marketing, administration and finance.

VI. MANNING TABLE (continued)

B) SERVICE COST CENTRES		NUMBER OF EMPLOYEES AND WORKERS (annual average								
	Supervisory staff and foremen	Day shift skilled	Day shift unskilled	First shift skilled	First shift unskilled	Second shift skilled	Second shift unskilled	Third shift skilled	Third shift unskilled	Total
1. Social services										
2. Plant management										
3. Off-site transp.										
4. Purchasing										
5. Stores										
6. Repair+mainten.										
7. Power,heat+light										
8. Research+develop.										
9. Water supply										
10. Mould shop										
11. Laboratories										
SUBTOTAL B)										
TOTAL A) + B)										
TOTAL GEN.OVERHEAD COST CENTRES	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL	-	-	-	-	-	-	-	-	-	-

EXPLANATORY NOTES

Ad.VII.: Production workers in this context include those skilled workers classified in VI.A.1-5

Ad.1. Normal work-hours include short resting periods and other occasional idle time but exclude lunch hours.

Ad.2. Normal (actual) average work-hours per skilled worker can be affected by overtime, seasonal labor, part-time labor and the number of shifts.

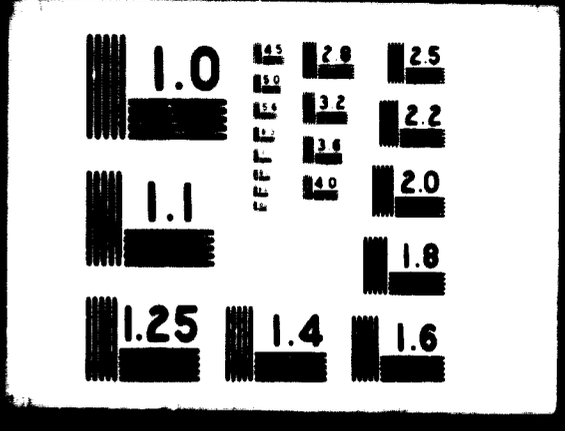
VII. WORKING TIME

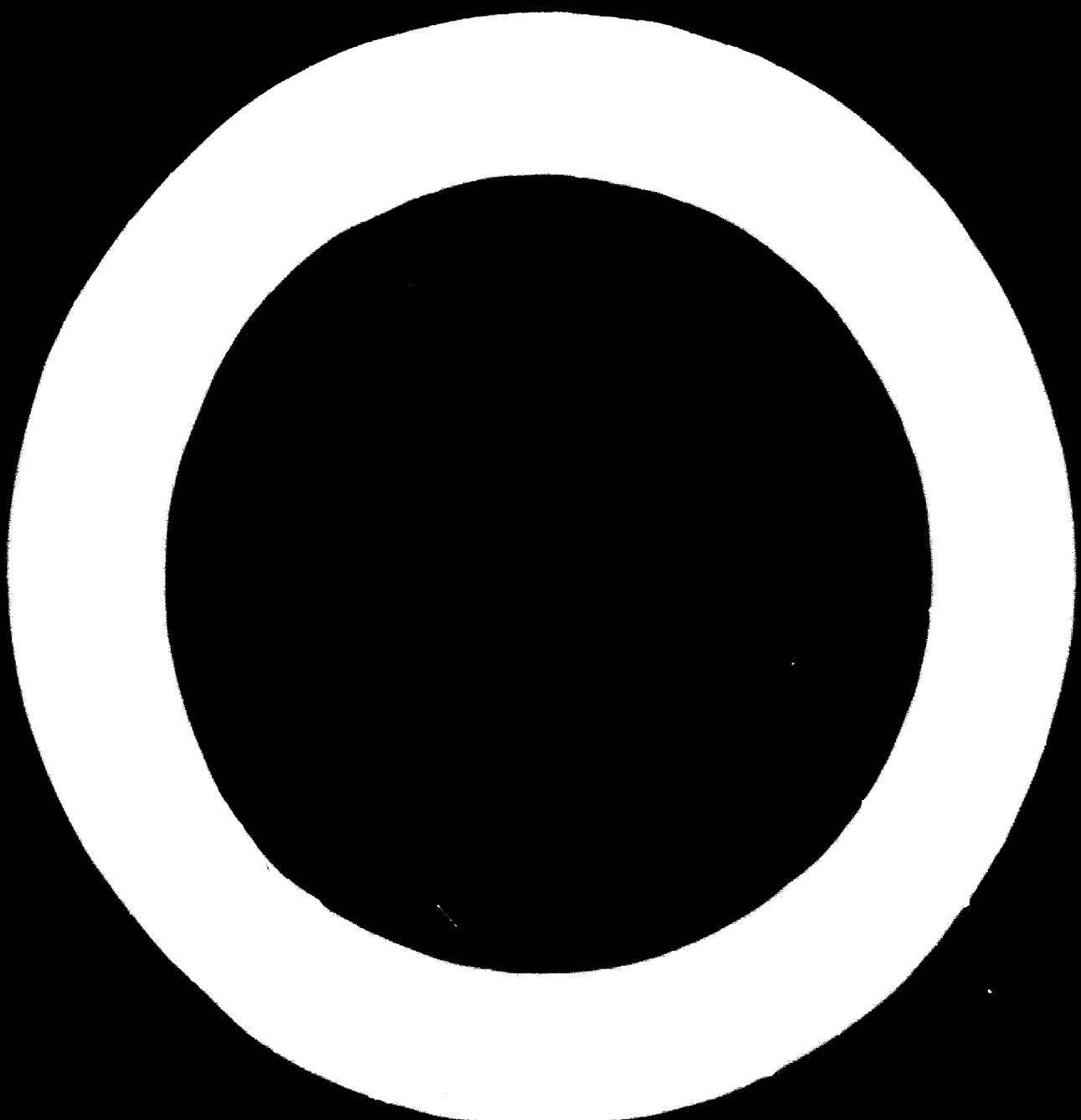
	Day shift	First shift	Second shift	Third shift	
1. Normal daily work-hours per production worker					Hours
2. Normal annual work days per production worker					Days
3. Annual ( ) actual ( ) average work-hours per production worker					Hours

74.11.27

3 OF 3

05802



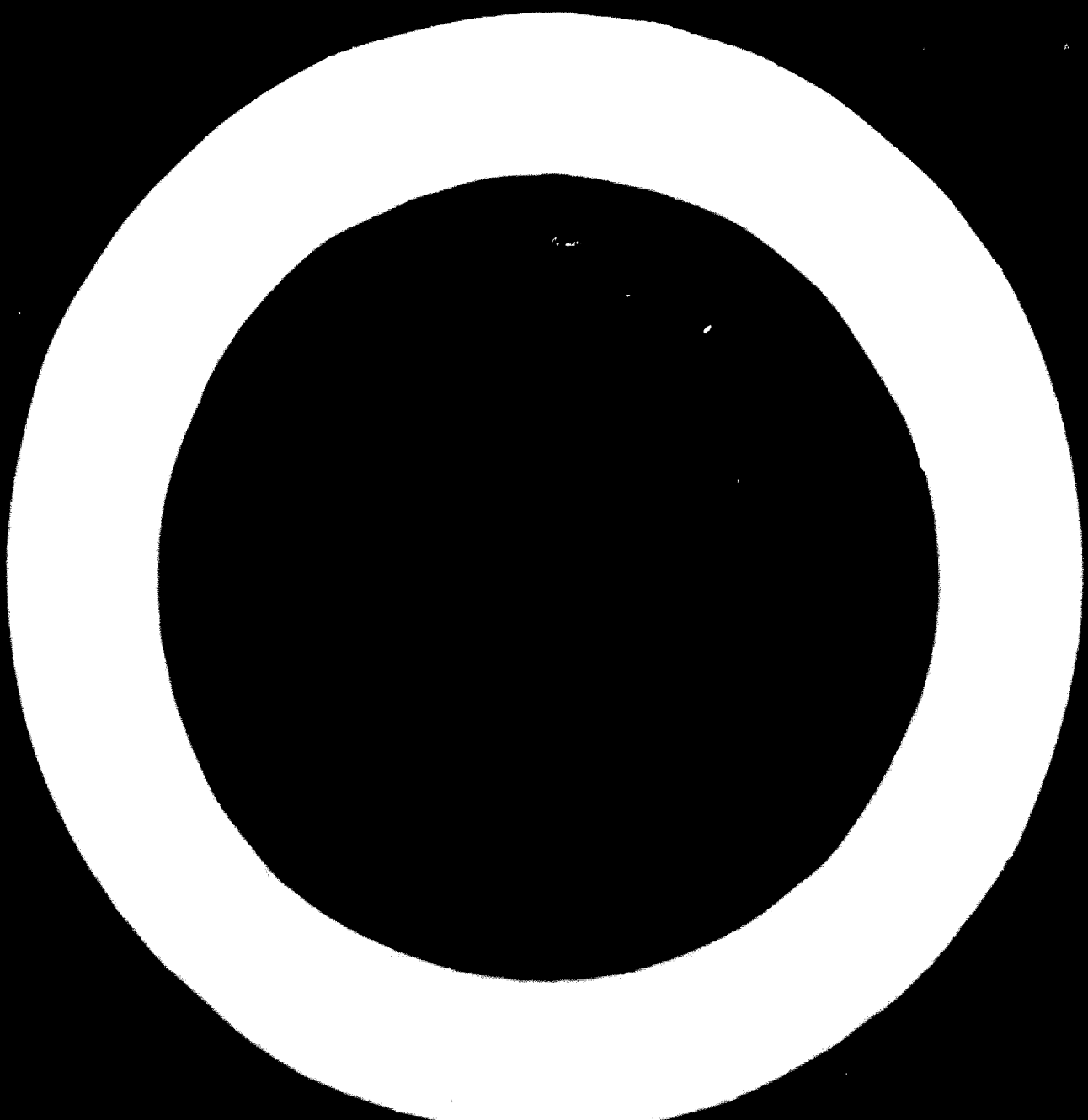


VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(First year) 19..

Unit	Annual production	Capacity ton/hour	Annual working hours	Hours of stoppages			
				Mechanical maintenance	Electrical maintenance	Lack of spare-parts	Others
Crushers 1							
2							
3							
Mills 1							
2							
3							
Washers 1							
2							
3							
Dryers 1							
2							
3							
Screens 1							
2							
3							
Hoppers 1							
2							
3							
Weighing equipment							
Transport equipment 1							
2							
3							
Automatic batching							
Furnaces 1							
2							
3							
Blowers, air compressors 1							
2							
Instrumentation of furnaces							
Blungers + mixers 1							
2							
3							
Forming machines 1							
2							
3							
Decorating machines 1							
2							
3							
Lehrs 1							
2							
3							
Packing eq.							
Quality control equip.							
Rolling material handling equip.							

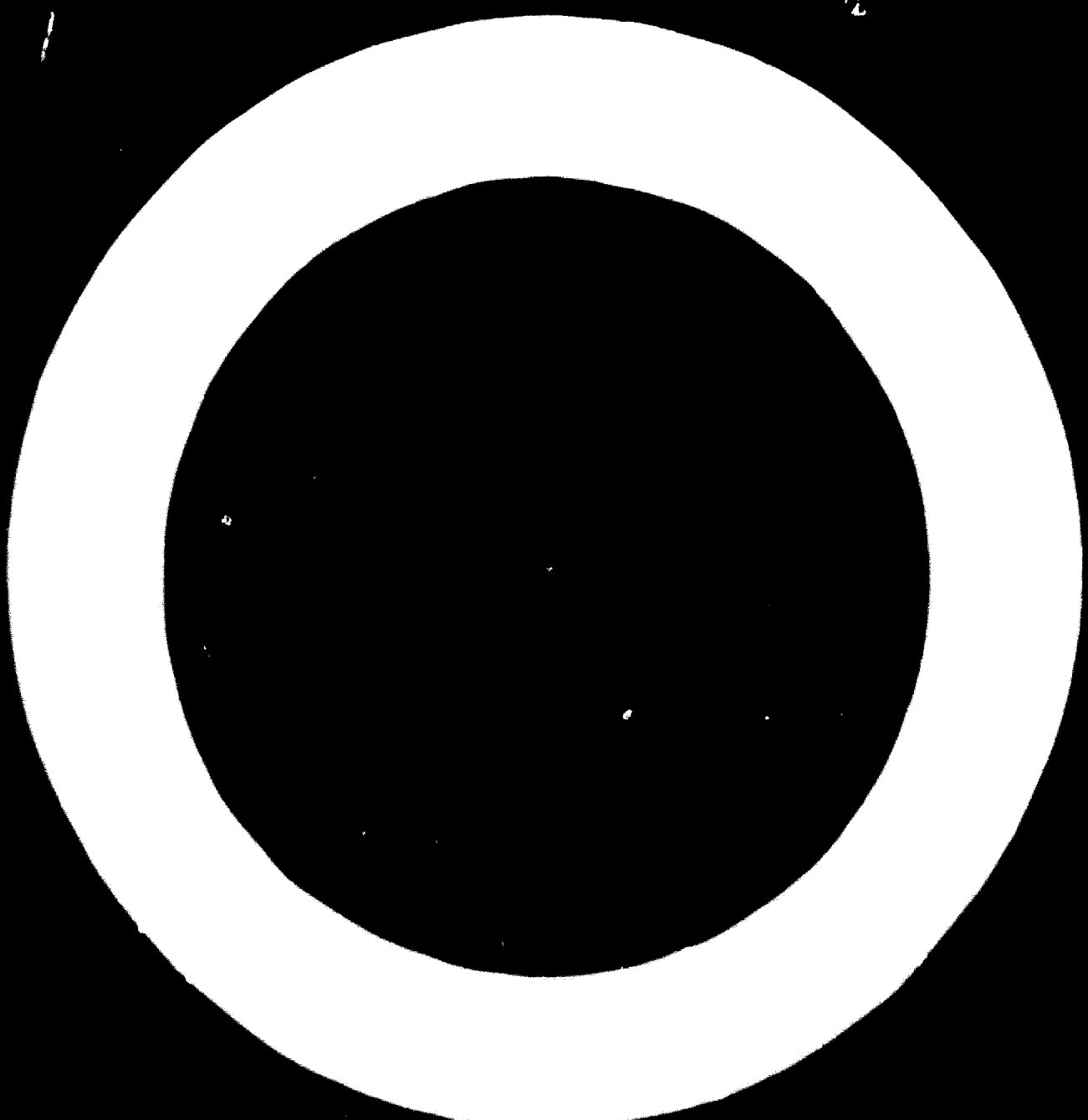
NOTE: This table should be filled in for 3 years.



VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(second year)			19..				
Unit	Annual production	Capacity ton/hour	Annual working hours	Hours of stoppages			
				Mechanical maintenance	Electrical maintenance	Lack of spare-parts	others
Crushers 1							
2							
3							
Mills 1							
2							
3							
Washers 1							
2							
3							
Dryers 1							
2							
3							
Screens 1							
2							
3							
Hoppers 1							
2							
3							
Weighing equipment							
Transport equipment 1							
2							
3							
Automatic batching							
Furnaces 1							
2							
3							
Blowers, air compressors 1							
2							
Instrumentation of furnaces							
Blungers + mixers 1							
2							
3							
Forming machines 1							
2							
3							
Decorating machines 1							
2							
3							
Lehrs 1							
2							
3							
Packing eq.							
Quality control equip.							
Rolling material handling equip.							

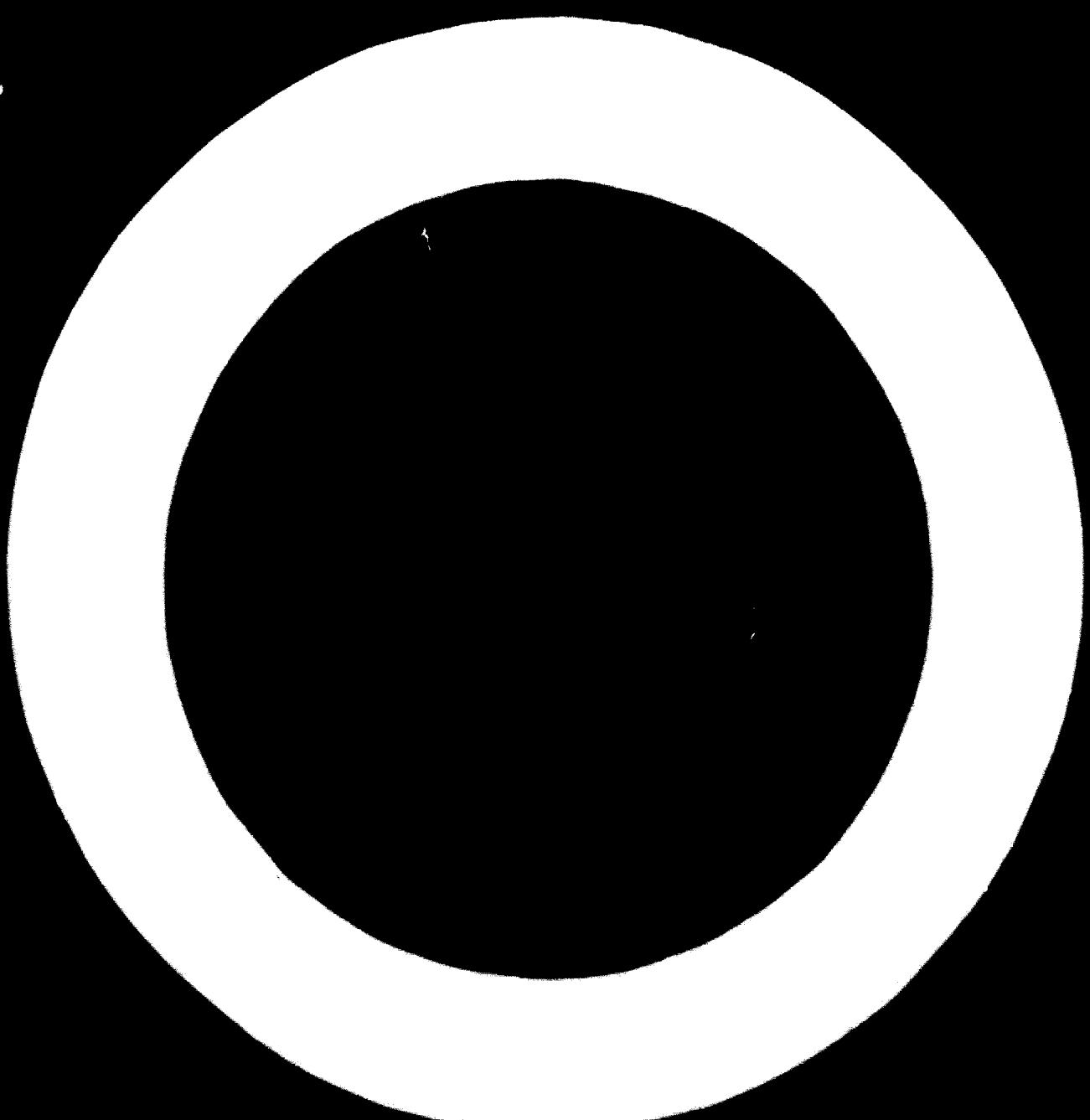
NOTE: This table should be filled in for 3 years.



VIII. PRODUCTION AND WORKING HOURS OF PRINCIPAL MACHINES

(third year)		19..						
Unit		Annual production	Capacity ton/hour	Annual working hours	Hours of stoppages:			
					Mechanical maintenance	Electrical maintenance	Lack of spare-parts	Others
Crushers	1							
	2							
	3							
Mills	1							
	2							
	3							
Washers	1							
	2							
	3							
Dryers	1							
	2							
	3							
Screens	1							
	2							
	3							
Hoppers	1							
	2							
	3							
Weighing equipment								
Transport equipment	1							
	2							
	3							
Automatic batching								
Furnaces	1							
	2							
	3							
Blowers, air compressors	1							
	2							
Instrumentation of furnaces								
Blungers + mixers	1							
	2							
	3							
Forming machines	1							
	2							
	3							
Decorating machines	1							
	2							
	3							
Lehrs	1							
	2							
	3							
Packing eq.								
Quality control equip.								
Rolling material handling equip.								

NOTE: This table should be filled in for 3 years.



IX. QUALITY CONTROL

1) Do you have a quality control department, i.e. other control than that at the sorting department?

2) What are the measurements done for control?

- Do you have:

a) at the machine:

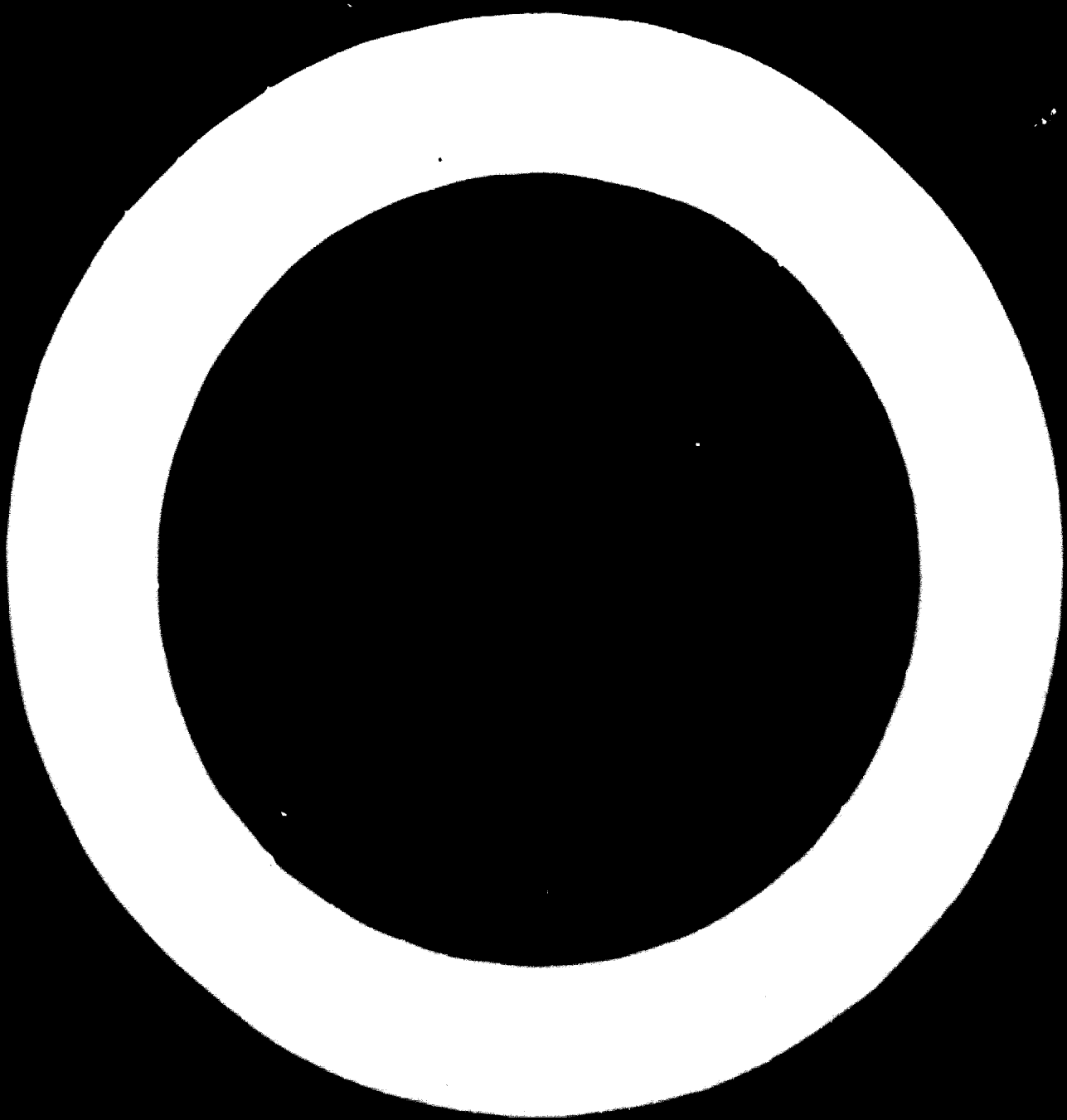
- standard rulers:
- turn tables for collapsible products:
- scales:
- special gauge according to article (height, diameter):

b) in quality control department (state range or accepted results):

- internal pressure test:
- falling weight test:
- thermal shock test:
- polariscope with strain discs:
- sectioning equipment:
- general measurements equipment:
- stone recognition:
- density control:

c) What are the measurements done on sheet glass and the accepted range?

3) Do you have a system for the statistical quality control?



PART C

PERFORMANCE EVALUATION

The objective of this part of the Industrial Performance Evaluation Profiles is to indicate methods by which management can evaluate the performance of the firm.

The data used should be calculated for several accounting periods so that changes in performance can be identified: those moving adversely can therefore be investigated. The data used in Part A of the questionnaire contain the basic information necessary to complete Part C.

The performance evaluation should cover cost and productivity indices, financial ratios and the analysis of fixed and variable costs. Commercial profitability calculations are also suggested such as break-even analysis, pay-back period, simple rate of return and, if the data can be provided, also present value and/or internal rate of return.
A model of a cash-flow table is attached .

I. COST AND PRODUCTIVITY INDICES

The starting point in cost efficiency evaluation is the calculation of a cost index which represents the average cost of the production process performed, or the service rendered by each cost centre. Such indices should be calculated for successive accounting periods and compared over time in order to establish a cost trend for each centre. Changes in these trends reflect the cost variation and provide the basis for managerial action towards cost reduction. In addition, certain productivity and technical ratios can be divised which help to explain cost differences and to identify specific areas of inefficiency.

Besides, the availability of such indices facilitates the preparation of budgets and the implementation of budgetary control. For plants applying the advanced techniques of standard costing, the calculation of actual or historical cost averages is pre-requisite.

From the standpoint of the glass industry as a whole, the calculation of cost and productivity indices for each plant is the cornerstone of interfirm comparison within the industry.

1. PRODUCTION COST CENTRES

1.1. Cost of batch materials per good ton

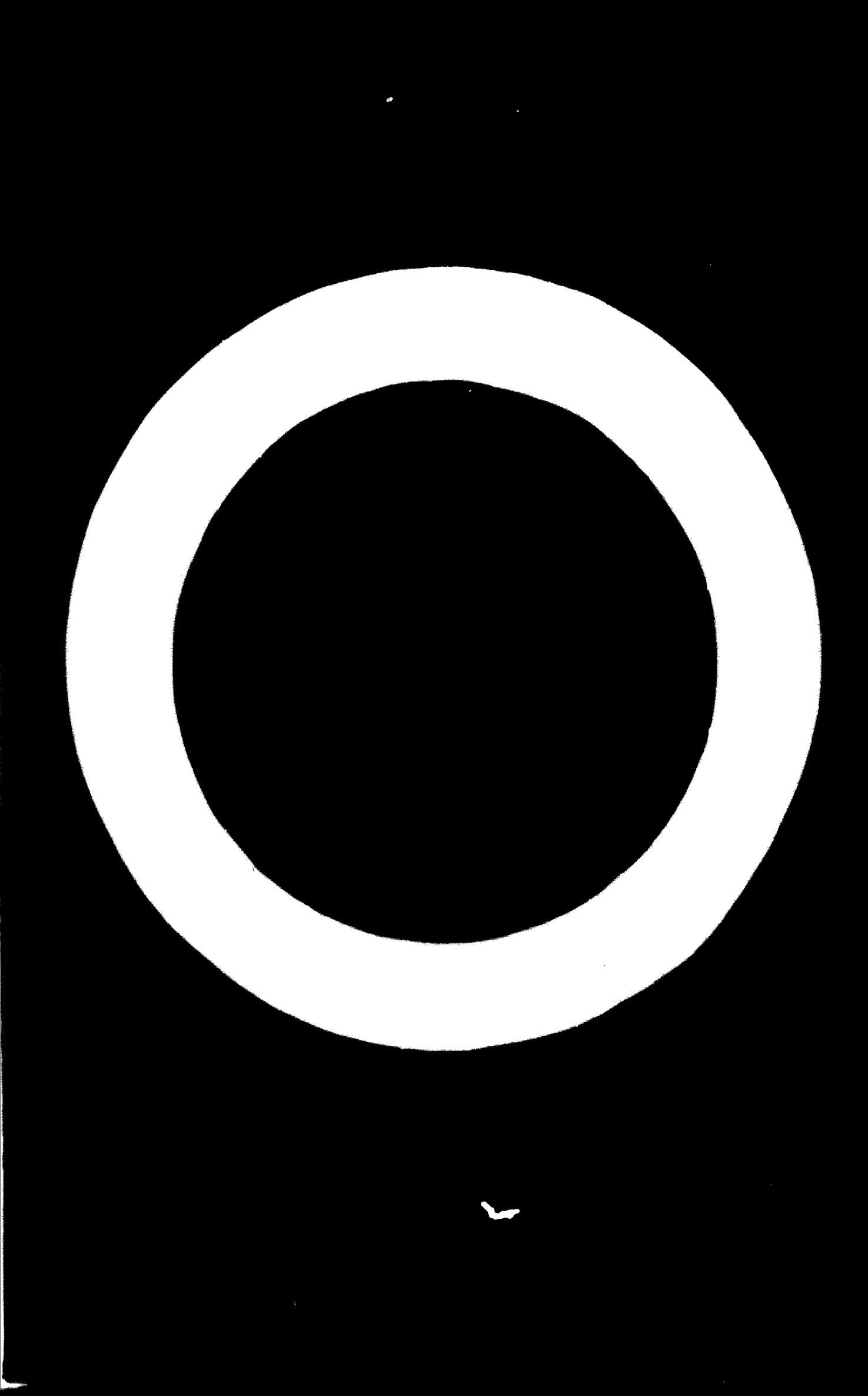
This index can be calculated by dividing the cost of batch materials by the good tonnage produced.

1.2. Cost of fuel and electricity per good ton

This index equals the total costs of fuel oil, gas and electricity divided by the good tonnage.

1.3. Cost of sorting and packing per good ton

This index is calculated by adding the cost of packing materials to the sorting and packing labour cost, and dividing this by the good tonnage.



1.4. Cost of moulds per good ton

The cost of moulds during the period will depend on the expected "life" of the mould. For example, if the mould is expected to last three years, then one-third of the total cost is considered to be "production cost", and two-thirds are treated as equipment which is to be depreciated in two years.

This index is calculated by taking the cost of moulds as calculated above, divided by the number of good ton produced.

1.5. Capacity utilization

This ratio indicates the difference between the nominal capacity of the plant and the actual output. It is calculated by using the ratio of

$$\frac{\text{Good tonnage}}{\text{Maximum tonnage}}$$

Maximum tonnage is equal to the total ouput which could have been achieved during the period (nominal capacity). The difference between maximum tonnage and good tonnage is the tonnage lost through furnace repairs, holiday shut-downs, planned machine overhauls, etc. This ratio is only relative and cannot reach 100%.

1.6. Forming efficiency

This ratio indicates the efficiency with which drawn glass is made salable. It is calculated by the ratio of

$$\frac{\text{Good tonnage}}{\text{Tonnage drawn}}$$

2. SERVICE COST CENTRES

2.1. Social services

The cost index for social services may be expressed as the cost per employee of such services or alternatively as a percentage of the total direct and indirect wages and salaries.

2.2. Plant management

The share per employee in both production and service cost centres is a significant index.

2.3. Transport

The cost per ton/kilometer of the goods transported should be compared periodically with the rate charged by independent carriers.

2.4. Purchasing

The cost index for purchasing may be expressed as the share per monetary unit of purchases during the accounting period.

2.5. Repair and maintenance

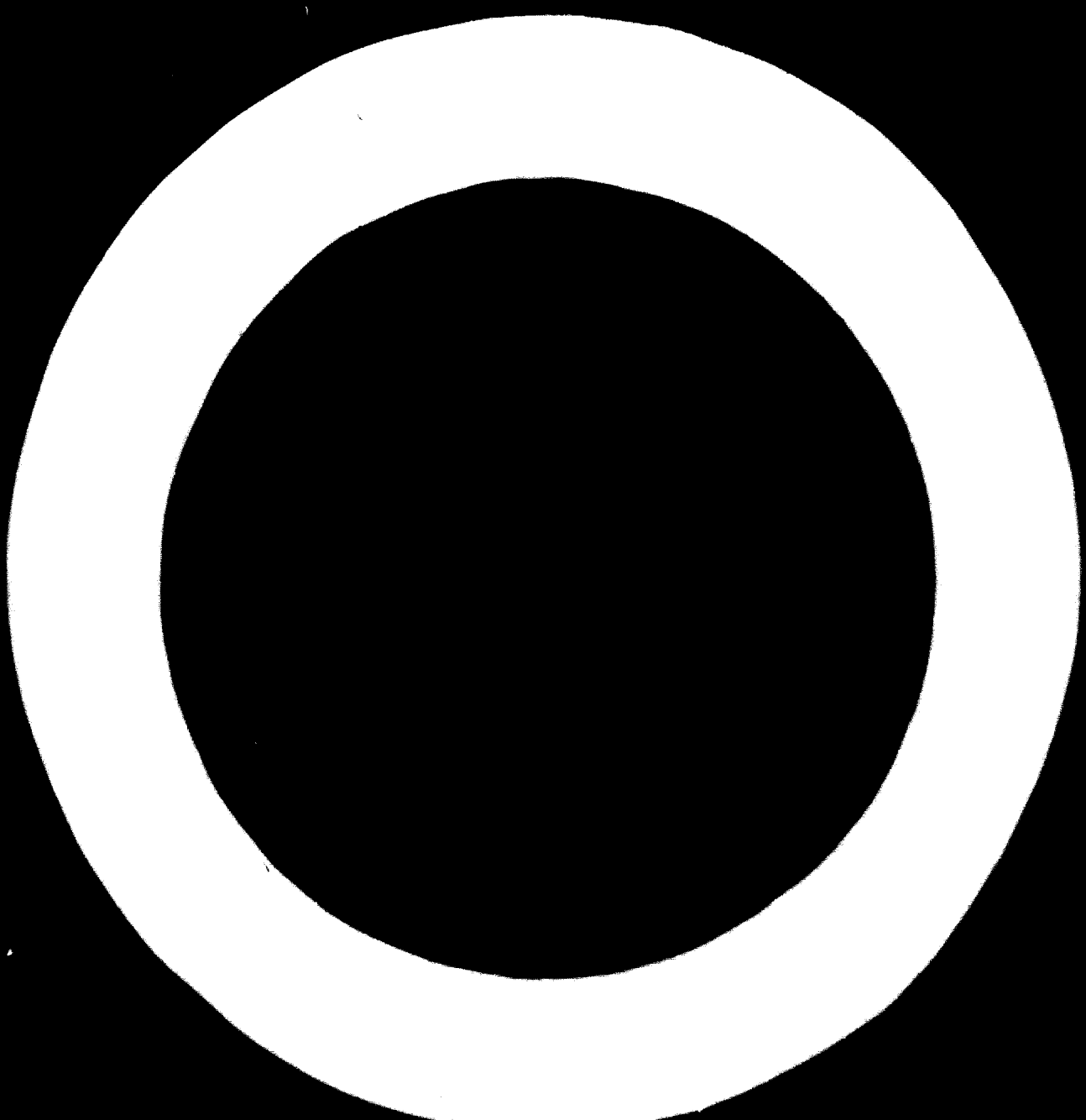
The cost index for maintenance work should be expressed in the form of maintenance cost per production hour for the period.

2.6. Electricity

The cost per kWh of electricity generated should be compared periodically with the cost of electricity purchased.

2.7. Water

The cost per m^3 of water supplied from own sources should be compared periodically with the cost of water purchased.



3. WAREHOUSE, DISTRIBUTION, SELLING AND MARKETING

The cost index may be expressed in one of the following forms:

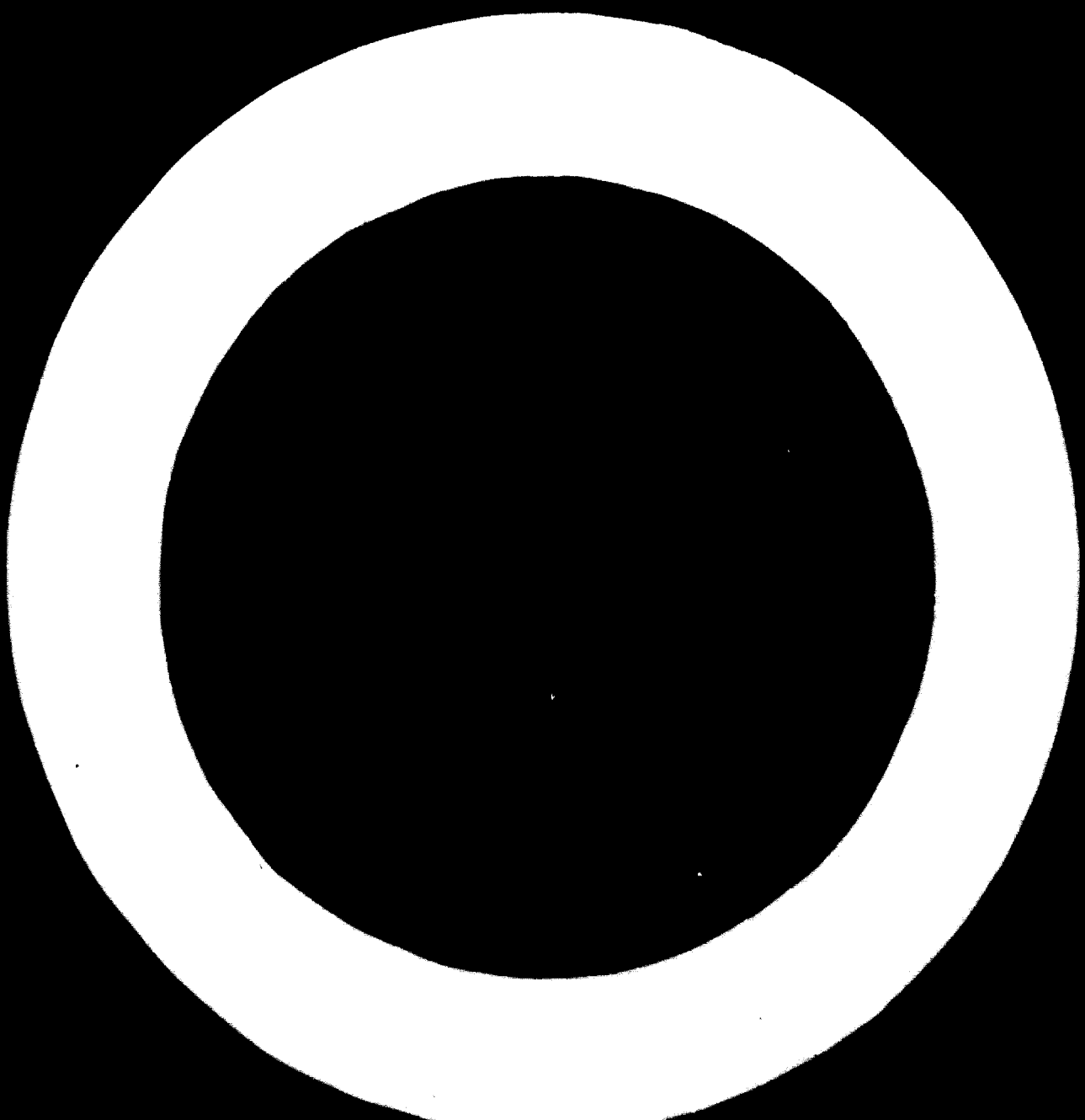
3.1. Warehousing and distribution cost per ton of final and by-products delivered

3.2. Sales and marketing cost per unit of sales

4. ADMINISTRATION AND FINANCE

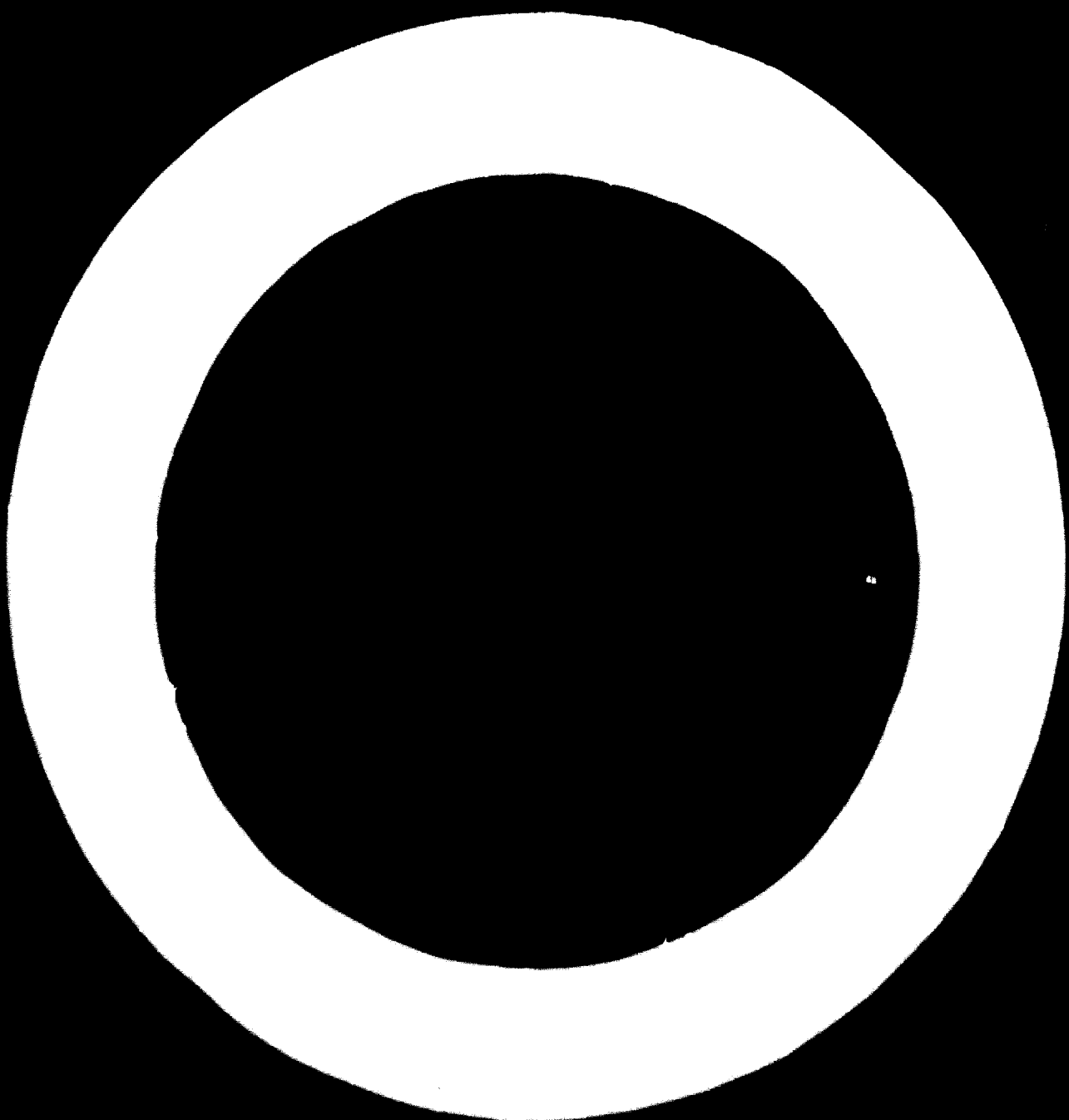
The cost of administration and finance should be expressed as a percentage of the total cost.

NOTE: The data required for the calculation of the foregoing indices can be obtained from the "Departmental Cost Sheet", Table 1 and Table 2. These indices should be computed for, at least, three years.



COST INDICES TABLE

	Period		
	19..	19..	19..
1. PRODUCTION COST CENTRES			
Cost of batch materials per good ton			
Cost of fuel and electricity per good ton			
Cost of sorting and packing per good ton			
Cost of moulds per good ton			
Capacity utilization			
Forming efficiency			
2. SERVICE COST CENTRES			
Social services cost per employee			
Plant management as percentage of total production and service costs			
Transport cost per ton/km			
Purchasing cost per monetary unit			
Maintenance cost per operating hour			
Cost of self-generated kWh			
3. WAREHOUSE, DISTRIBUTION, SELLING AND MARKETING			
Warehousing and distribution cost per ton of final and by-products delivered			
Sales and marketing cost per monetary unit of sales			
4. ADMINISTRATION AND FINANCE			
Ratio of administrative and financial cost to total cost			



II. FINANCIAL RATIOS

The ratios included in this table have been selected for the presentation and analysis of the following aspects of financial operation:

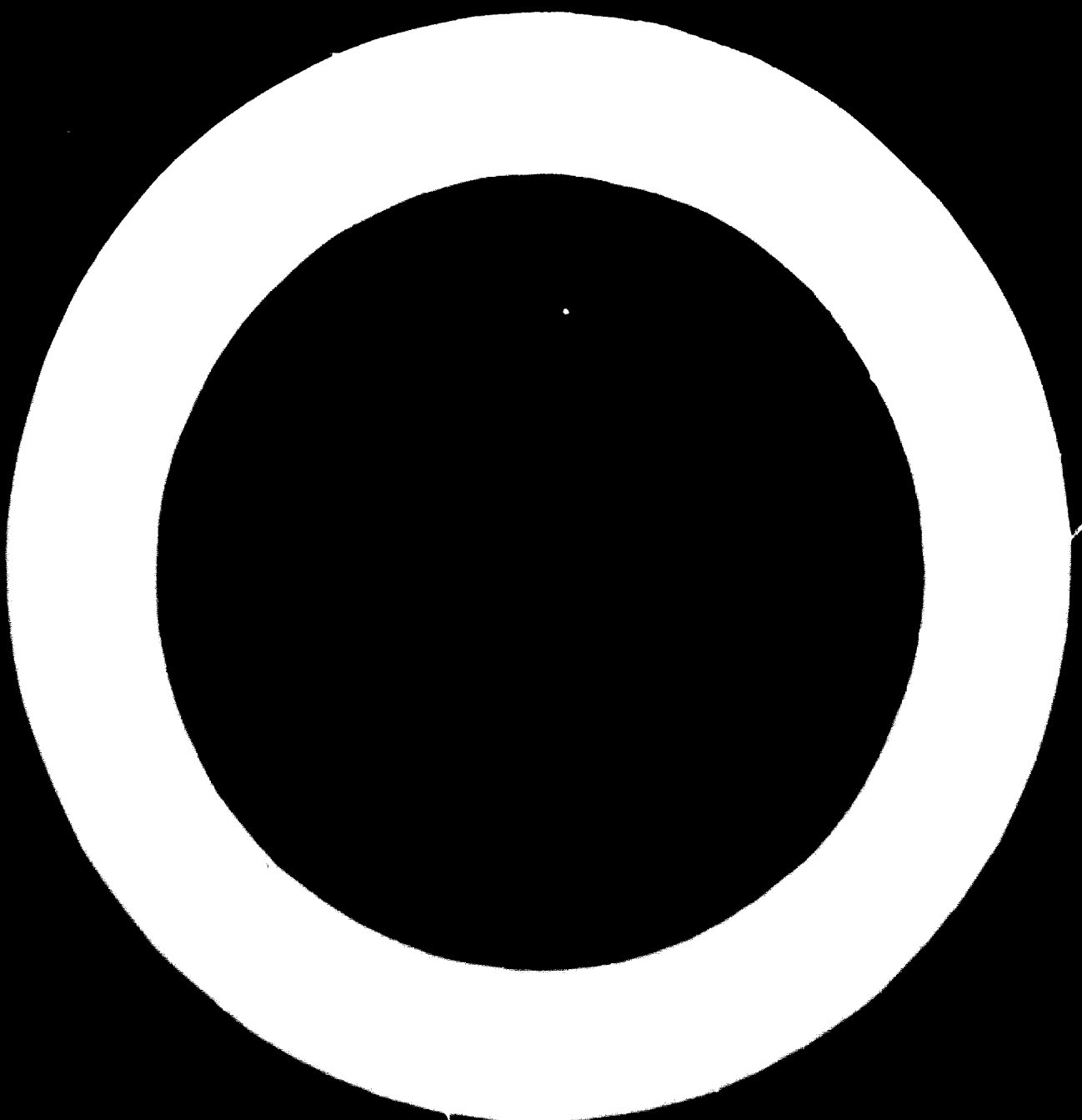
1) Ability to pay current debt

2) Asset utilization

3) Return on investment

4) Operating results

Financial Ratios	Period of Comparison		
	19	19	19
1. Ability to pay current debt			
a) Current assets: Current liabilities			
b) Quick assets: Current liabilities (quick assets = current assets - inventory)			
c) Inventory turnover rate = Cost of goods sold: inventory of finished products			
d) Turnover of receivables = Net sales: receivables			
2. Asset utilization			
a) Turnover of operating assets			
Fixed assets: sales			
Current assets: sales			
Total assets: sales			
b) Current asset utilization			
Debtors: sales			
Inventory: sales			
3. Return on investment			
Net profit: total operating assets			
4. Operating results			
a) Net profit: sales			
b) Production cost of sales: sales			
c) Cost of wareh.,distr.,selling + marketing: sales			
d) Administrative expenses: sales			
e) Financial expenses (inc. interest): sales			



III. CLASSIFICATION OF COST ITEMS: VARIABLE AND FIXED COSTS

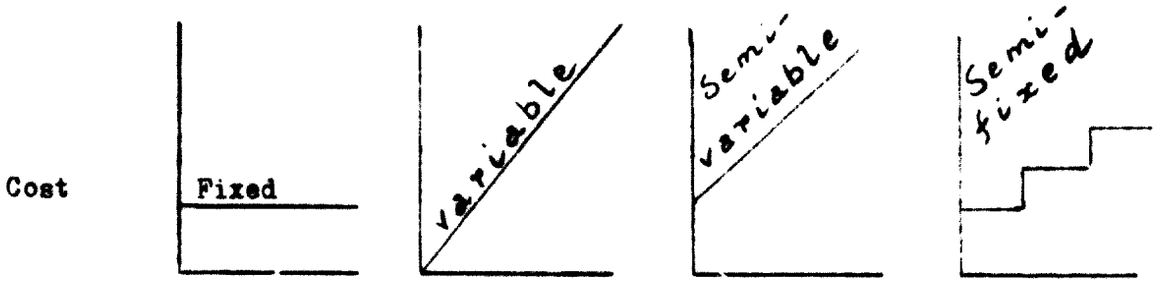
There are four main patterns of cost behaviour into which all cost items can be grouped:

1) Fixed costs: These costs remain unchanged regardless of changes in the level of activity. They are usually incurred on a time basis (examples: long-term contractual services, rents, admin. salaries)

2) Variable costs: These costs vary in direct proportion to the level of activity (examples: production materials, fuel, non-returnable containers)

3) Semi-variable costs: These vary with the level of activity but not in direct proportion (Maintenance costs are usually semi-variable since some maintenance work has to be done regardless of the level of activity, e.g. daily oiling of machines and periodical overhauling of plant and equipment)

4) Semi-fixed costs: These remain fixed within a certain range of the level of activity and increase by a given amount at a time, taking the form of a stepfunction (examples are: supervision, product inspection)



Segregation of cost items into the foregoing categories is based on the availability of actual cost data for each cost element over a fairly long period of time and for varying levels of activity.

Accurate classification of these costs should be done by statistical analysis of the recorded cost data after eliminating the distorting effects of changes due to other cost-determining factors (e.g. changes in the price level and managerial decision). The results of statistical analysis are usually supplemented by industrial engineering studies related to the variability of the various cost items in connection with the particular business conditions.

The presence of semi-variable and semi-fixed costs complicates the cost volume studies. To avoid such difficulties all cost items may, in practice, be only classified as fixed or variable.

EXPLANATORY NOTES

1. The cost of Lubricants is usually semi-variable, but has been classified as variable to avoid complexity of analysis.

2. The cost of Spare parts has been classified as a fixed cost based on the assumption that proper maintenance is continuously provided.

3. The cost of Maintenance work done by outside contractors depends upon several factors such as: management policy, the age and physical condition of the plant and equipment, and the availability of outside contractors rather than the volume of activity.
   Maintenance costs should be carefully analyzed by each firm and classified as variable or fixed costs according to the prevailing conditions.

4. It should be noted that Insurance on stocks is fixed for short-term periods only.

5. Depreciation: Assuming that the straight line method is used. However, if the accelerated method is applied, depreciation allowances will vary with the level of activity and should, consequently, be classified as a variable cost.

6. Royalties are usually fixed unless they are payable per ton of output produced.

Results obtained from the table can be usefully utilized by management for the following purposes:

1) Study of cost structure at the varying levels of activity.

2) Profit planning through the use of "break-even-charts" with its several variants, provided that the limitations of this technique are well realized.

This table presents a tentative classification of cost items into variable and fixed costs for the production of glass. It should be emphasized that the suggested classification is only tentative and should be subject to statistical and engineering studies to be conducted by each individual firm in the light of its own cost data.

Period:

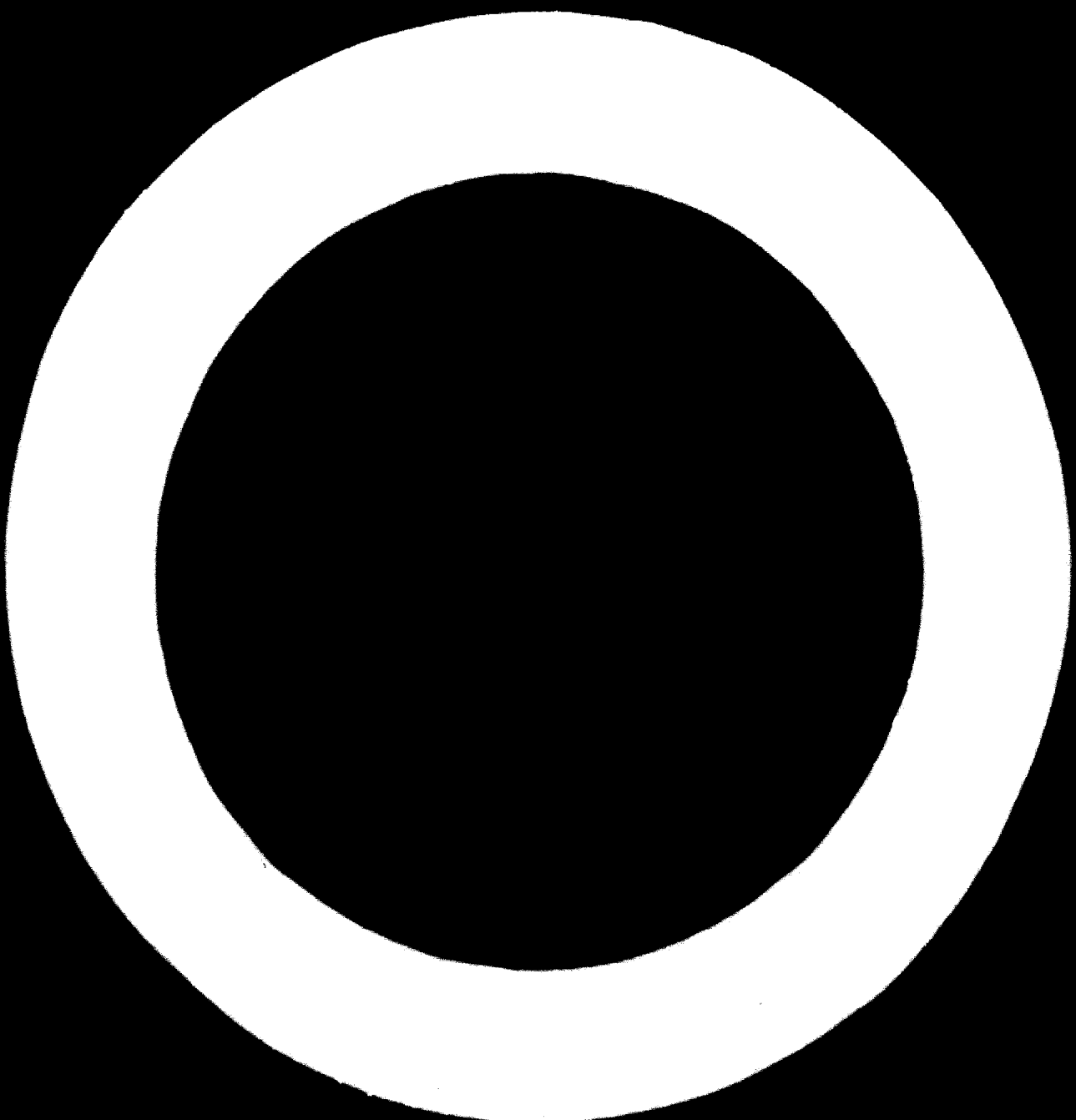
From:.....

To:.....

Level of Activity - Volume of Production .....
- Percentage of Capacity Utilized .....
- Number of Operating Hours.....

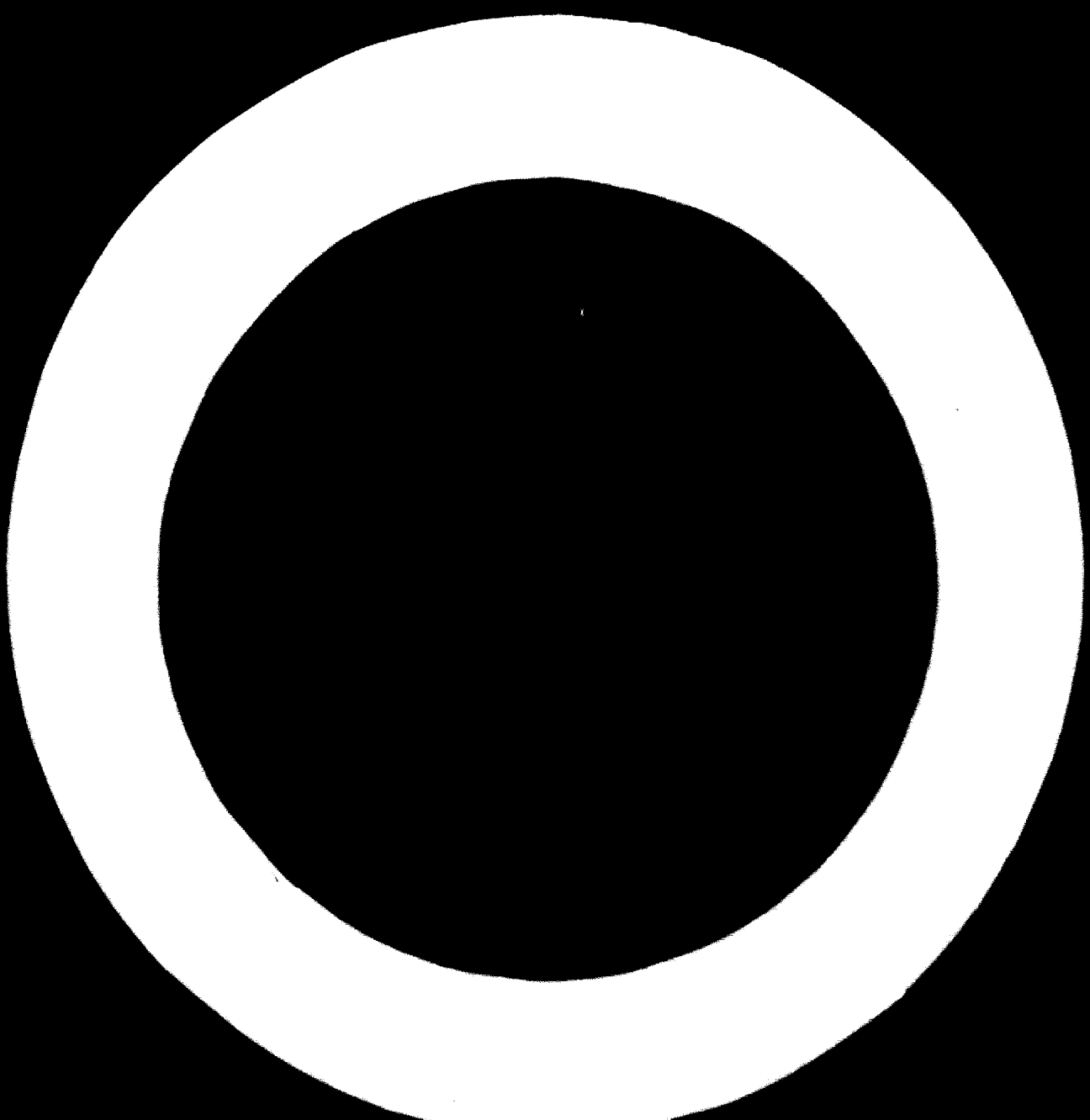
	£	£	£
Variable costs:			
Batch materials			
Lubricants			
Non-returnable packing			
Returnable packing			
Fuel			
Electricity			
Water			
Production bonuses			
Overtime wages			
Temporary labour wages			
Freight			
Sales taxes			
Business taxes			
Sales commissions			
Purchasing commissions			
Total variable costs			
Fixed costs:			
Moulds			
Spare parts			
Maintenance supplies			
Office supplies			
Other factory supplies			
Production wages and salaries:			
Basic wages			
Social security contributions			
Health insurance			

(cont.)



(continued)

(Fixed costs)	£	£	£
Service wages and salaries:			
Basic wages			
Social security contributions			
Health insurance			
Distribution, selling and marketing wages:			
Basic wages			
Social security contributions			
Health insurance			
Maintenance			
Insurance			
Depreciation - Buildings			
Depreciation - Machin. and equipment			
Depreciation - Transport equipment			
Amortization of non-physical assets			
Communication expenses			
Travel			
Other admin. expenses			
Rent			
Property tax			
Interest			
Financial expenses			
Royalties			
Total fixed costs			
Total costs			



IV. COMMERCIAL PROFITABILITY CALCULATIONS

Although the IPEP questionnaire is primarily designed to help existing companies in assessing their overall economic and technological performance, it is suggested in this final chapter that it may also be used as a pre-requisite to evaluate the viability of expansion investments.

The profitability calculations listed below may not all be applied by management since some of them are more suitable to assess new investment proposals. If different methods of profitability calculations are still presented, it should be kept in mind that pre-investment studies are not only prepared for the construction of new factories but also for the expansion of already operating establishments.

Since it is not only required to evaluate the commercial profitability but also the economic and technical performance of such establishments it is recommended to utilize the IPEP questionnaire for this purpose.

A. BREAK-EVEN POINT

$BE = \frac{100 \cdot F}{R - V}$ = the percentage of capacity utilization at which the sales revenue will equal production costs, where F = fixed costs, R = sales revenue, V = variable costs and BE = break-even point.

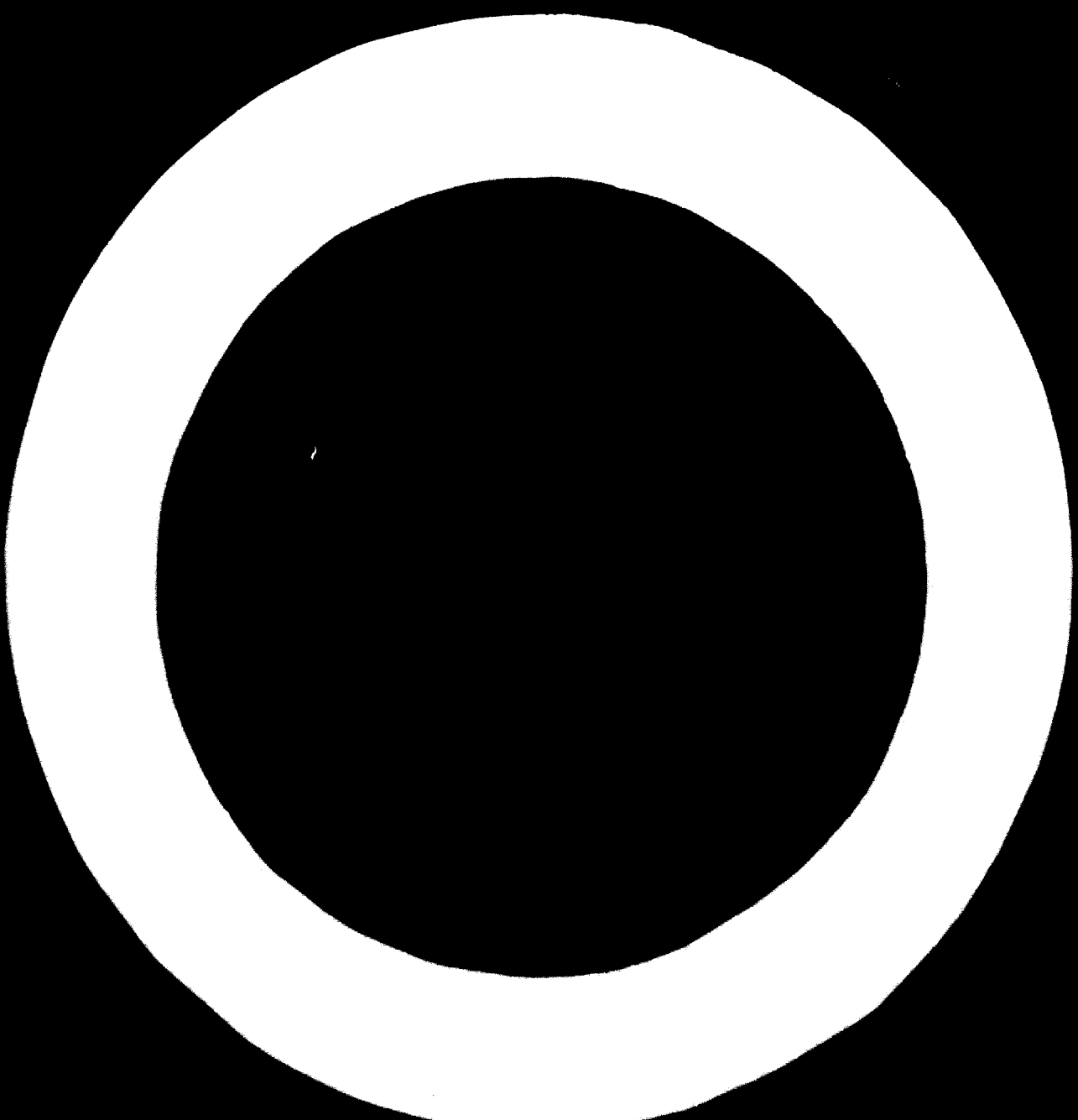
BE = _____ %

B. PAY-BACK METHOD

This method consists in computing the number of years over which the invested capital will be recovered from the profits and the depreciation. The value of land and of the working capital should not be included in the amount of the invested capital since both can be salvaged at the end of the project.

Pay-back period: $\frac{\text{Total assets - land - working capital}}{\text{Profit + depreciation}}$.

PAY-BACK PERIOD = _____ years



C. SIMPLE RATE OF RETURN

$$\frac{\text{Profit} \times 100}{\text{fixed assets + working capital}} = \frac{\quad}{\quad}\ \%$$

D. DISCOUNTING METHODS

The discounting methods take account of the life of the investment project as well as of the timing of its costs and benefits by discounting both to the present date.

1. PRESENT VALUE

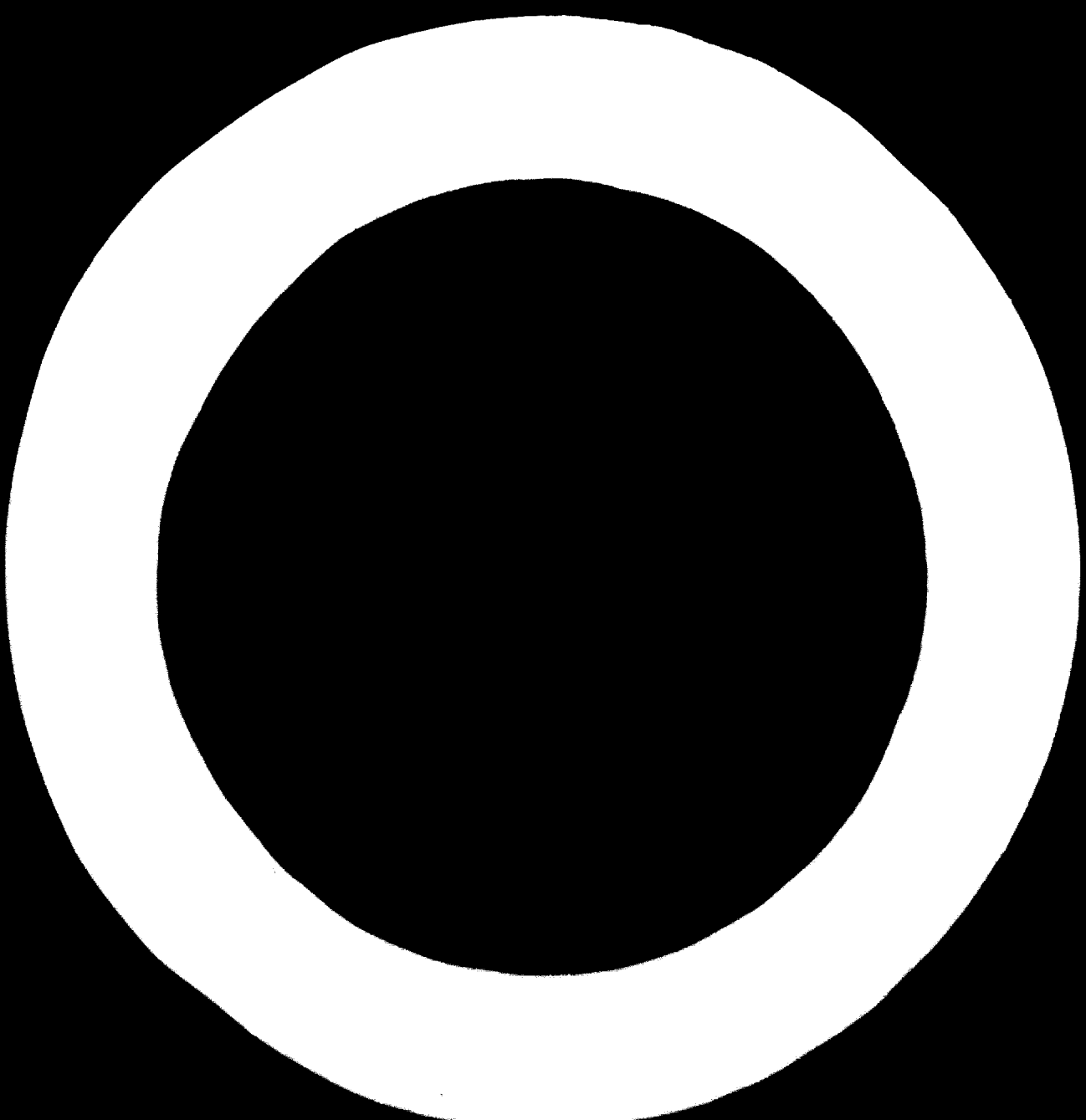
This method consists in discounting the costs and the benefits of the project to the present date at a fixed, pre-determined interest rate.

2. INTERNAL RATE OF RETURN

This method consists in finding the discount rate at which the present value of future benefits will be equal to the present value of investment.

3. CASH-FLOW TABLE

See next page for model of a cash-flow table.

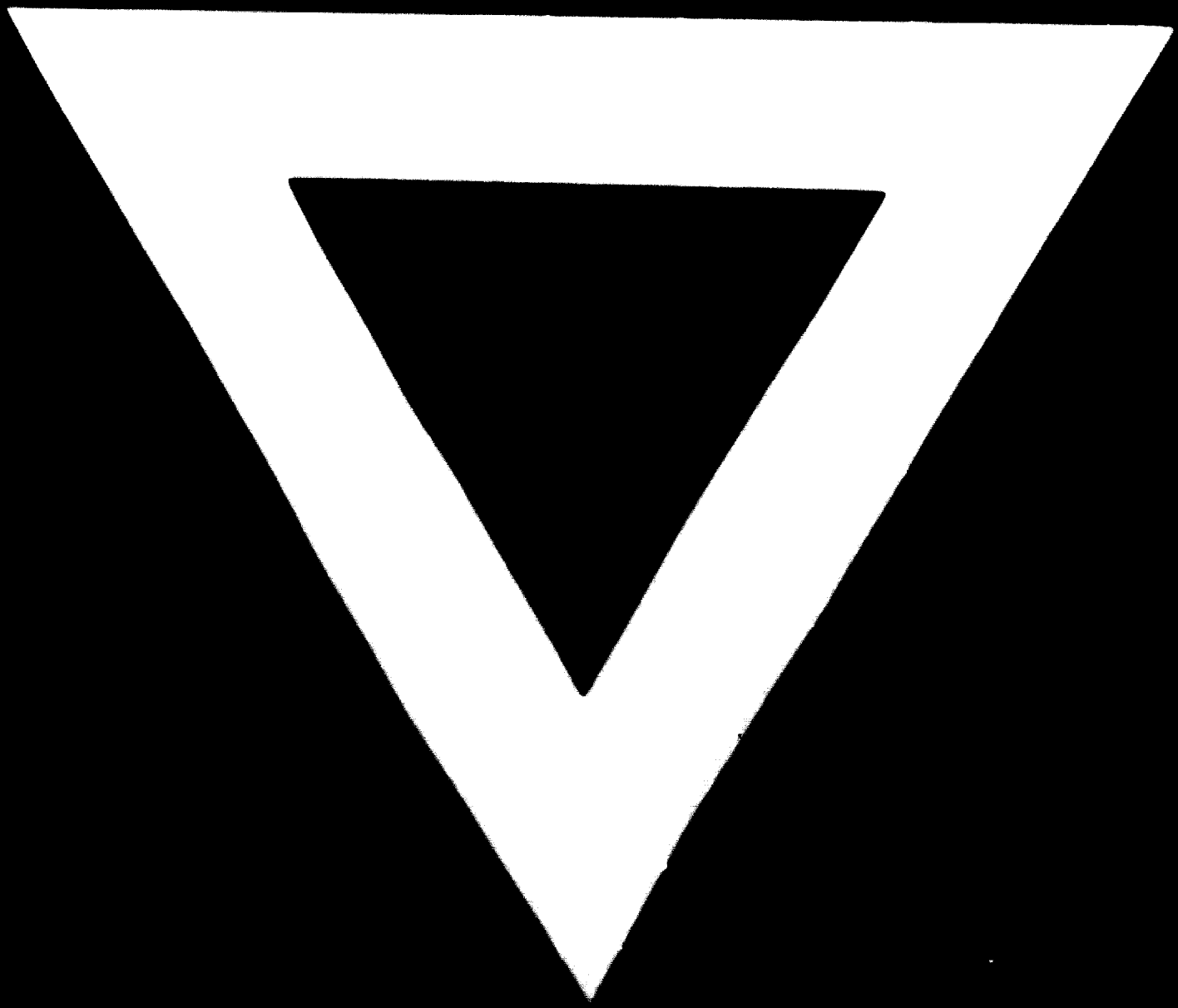


V. CASH-FLOW TABLE

	Year										Terminal value of assets
A. Source of cash											
1. Financial resources (total											
1.1 Loan[1]											
1.2. Equity											
1.3. Suppliers credits											
1.4 Subsidies											
2. Sales revenue[2]											
B. Uses of cash											
1. Fixed capital expenditure: (total											
1.1. Land, site improvements, & buildings											
1.2. Machinery & equipment (near installation)											
1.3. Machinery & equipment (replacement)											
2. Net working capital (total											
2.1. Stocks of materials											
2.2. Work-in-process[3]											
2.3. Stocks of finished products											
3. Pre-investment & start-up expenses[4]											
4. Production expenditure: (total											
4.1. Personnel expenditure											
4.2. Materials[5]											
4.3. Administrative expenditure											
4.4. Indirect taxes & royalties											
4.5. Other expenditure (rents, carriage/ins. etc.)											
5. Debt service: (total											
5.1. Interest on loans											
5.2. Repayment of loans & credits											
6. Dividends & profit taxes paid[6]											
C. Surplus/Deficit (A – B)											
SURPLUS/DEFICIT ACCUMULATED											

[1] Loans of different terms should be shown separately.
[2] Annual value of production of finished goods minus annual accumulation of finished goods inventory.
[3] Total production costs minus production costs of finished goods.
[4] Net building interest during construction.
[5] Annual purchases minus annual accumulation of materials inventory.
[6] This item stands for the part of profit which is to be paid out, namely profit tax, dividends, fees of the members of the executive board, managerial staff's share in profits, etc. Actually this sum will be established after allowances have been made for depreciations which are not included under item 4. (Production expenditure). The cash flow balance should be programmed, therefore, in such a way that all necessary replacement (B.1.3.) can be covered in any year by the accumulated surplus.

Comments:



74.11.27