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

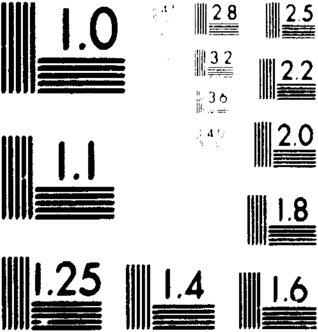
FAIR USE POLICY

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



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU [illegible]

10116 7

EXECUTIVE SUMMARY

HUNGARIAN LINEN INDUSTRY

UNIDO Contract No. 76/41

Project No. IS/HUN/95/013

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

EXECUTIVE SUMMARY

HUNGARIAN LINEN INDUSTRY

Submitted to:
THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:
Werner International
New York - Brussels

May 1977.

WERNER ASSOCIATES INC | 1450 BROADWAY NEW YORK, NEW YORK 10018 | TELEPHONE (212) 565-1220 | TELEX 223399 CABLE: WERNERCONS

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
1.1.	Objectives	2
1.1.1.	Production and Productivity	2
1.1.2.	Planning and Marketing	2
1.2.	Scope	3
1.2.1.	Specific objectives	4
1.2.2.	Recommendations	5
1.3.	Methodology Used	5
2.0	THE FACTS TO DO WITH LENFONO	8
2.1.	Production 1975	8
2.1.1.	Lenfono Grand Total	8
2.2.	Plants, Machines and Production	8
2.2.1.	Weaving	8
2.2.2.	Spinning	9
2.2.3.	Finishing	9
2.3.	Labour Complement	10
2.4.	Operation Locations	11
2.5.	Major Products of Lenfono	12
2.6.	Type of Raw Material Input	13
2.7.	Product Mix and Quantities	13
2.8.	Summary of Quantities by Grading and Plants	14
2.8.1.	Export Promotion Measures to be taken by Lenfono	15
3.0	PLANNING AND SCHEDULING	16
3.1.	Sales and Production Planning	18

		Page
4.0	PRODUCTION ANALYSIS:	19
4.1.	Weaving	20
4.1.1.	Weave Room Efficiencies	20
4.1.2.	Machine Efficiency	21
4.1.3.	Machine Efficiency Comparison	22
4.1.4.	Recommendations	23
4.1.5.	Machinery Maintenance	24
4.1.6.	Operator Efficiency	25
4.1.7.	Plant Efficiency	27
4.1.8.	Weave Room Production	28
4.1.8.1.	Recommendations	29
4.1.9.	Labour Complement	31
4.1.10.	Productivity	33
4.1.11.	Running Performance	35
4.1.12.	Loom Assignments	37
4.2.	Spinning	39
4.2.1.	Spindle RPM	39
4.2.2.	Spinning Room Efficiency	39
4.2.3.	Machine Improvements	41
4.2.4.	Spinning Room Production	42
4.2.5.	Endbreaks	44
4.2.6.	Levels of Endbreaks	45
4.2.7.	Obtainable Endbreaks Level for the Hungarian Linen Industry	47
4.2.8.	Yield Recommendation	47
4.2.9.	Data on the West European Flax Industry	48
4.2.10.	Labour Complement	55
4.2.11.	Spinning Room Productivity	56
4.3.	Finishing	58
4.3.1.	General Comments on the three Finishing Plants as a Group operation	58
4.3.2.	Type of Cloth Comparison processed by the three plants	59
4.3.3.	Comparison of Productivity	61
4.3.4.	Comparison of Actual Productivity with European Standards	61

Page

4.4.	Clerical and Non-Production Personnel	62
4.4.1.	Clerical Staff	62
4.4.2.	Non-Production Personnel	62
4.5.	Executive Summary	64
4.5.1.	Efficiency and Productivity	66
5.0	TRAINING	69
5.1.	Labour Training	70
5.2.	Supervisory Staff Training	71
5.3.	Recommended Training Programs	72
6.0	PRODUCTION PLANNING AND SCHEDULING	73
6.1.	Reorganization of the various Production Planning Functions within the Group	74
6.2.	Installation of a proper Production Planning System for the Finishing Plants	76
7.0	WASTE CONTROL	77
8.0	QUALITY CONTROL	78
9.0	MILL MANAGEMENT CONTROL - INCENTIVE SYSTEMS	80
9.1.	Incentives	83
10.0	ACTION PLANS	84
10.1.	Corporate Action Catalogue	84
10.2.	Technical Action Catalogue	85
10.3.	Action Plan to improve the Performance of the existing Facilities	86

Page

APPENDICES

WEAVING

TABLE	28 :	Machine Park 1975 - 1977 / Budakalasz	87
	29 :	Machine Park 1975 - 1977 / Györ	88
	30 :	Machine Park 1975 - 1977 / Csillaghegy	89
	31 :	Machine Park 1975 - 1977 / Komaron	89
	32 :	Summary of Mill Balance / Budakalasz - Weaving	90
	33 :	Summary of Mill Balance / Györ - Weaving	91
	34 :	Summary of Mill Balance / Cooperation Pocsaj - Weaving	92
	35 :	Summary of Mill Balance / Csillaghegy - Weaving	93
	36 :	Summary of Mill Balance / Cooperation Szebszard, Bebest - Weaving	94
	37 :	Summary of Mill Balance / Komaron - Weaving	95
	38 :	Summary of Yarn Consumption / Budakalasz - Weaving	96
	39 :	Summary of Yarn Consumption / Györ - Weaving	97
	40 :	Summary of Yarn Consumption / Csillaghegy - Weaving	98
	41 :	Summary of Yarn Consumption / Komaron - Weaving	99

SPINNING

TABLE	42 :	Summary of Mill Balance / Komaron - Dry Spinning	100
	43 :	Summary of Mill Balance / Komaron - Wet Spinning	101
	44 :	Summary of Mill Balance / Komaron - Wet & Dry Spinning	102
	45 :	Summary of Mill Balance / Budapest - Dry Spinning	103
	46 :	Summary of Mill Balance / Budapest - Wet Spinning	104
	47 :	Summary of Mill Balance / Budapest - Gill Spinning	105
	48 :	Summary of Mill Balance / Budapest - Wet & Dry Spin.	106
	49 :	Spinning Production / Komaron	107
	50 :	Spinning Production / Budapest	108

Page

TABLE	1 -	Quantities Greige Cloth/Finished Cloth	15
	2 -	Machine Efficiency in %	22
	3 -	Machine Downtime in %	22
	4 -	Operator Efficiency in %	25
	5 -	Plant Efficiency in %	27
	6 -	Weaving Production in Running Metres/Year	28
	7 -	Weaving Production in Square Metres/Year	28
	8 -	Plan/Werner Variance in %	29
	9 -	Actual/Werner Variance in %	29
	10 -	Labour Complement	32
	11 -	Productivity in Metres per Working Hour	33
	12 -	Number of Warp Stops per M ends/10^4 Picks	35
	13 -	Number of Weft Stops per 10^4 Picks	35
	14 -	Number of Mechanical Stops per 10^4 Picks	36
	15 -	Number of Looms/Weaver , Actual/Werner	38
	16 -	Spindle RPM	39
	17 -	Spinning Room Efficiency in %	40
	18 -	Quantities in Tons per Year	42
	19 -	Production Comparison in %	43
	20 -	Number of Endbreaks per M Spindle Hour	44
	21 -	Yield of Long Fiber and Tow	54
	22 -	Labour Complement - Number of People	55
	23 -	Productivity in Kg/man hour (Plan 75 = 100%)	56
	24 -	Productivity in Kg/man hour (Plan 75 = 100%)	56
	25 -	Meters produced	60
	26a -	Productivity - meters/man hour	61
	26b -	Comparison of Productivity	61
	27 -	International Labour Cost Comparison	68

1.0 INTRODUCTION

UNIDO contracted WERNER INTERNATIONAL to evaluate the Hungarian Linen Industry.

The WERNER INTERNATIONAL team and their LENFONO counterparts started this project on November 1, 1976.

The report consists of two parts :

- Part 1 - Executive Summary

- Part 2 - Evaluation of the Individual Plants

  . Volume 1 - Budakalasz
  . Volume 2 - Györ
  . Volume 3 - Csillaghegy
  . Volume 4 - Komaron
  . Volume 5 - Budapest
  . Volume 6 - Planning and Marketing

1.1. Objectives

The agreed objectives of this evaluation are as follows :

1.1.1. Production and Productivity

- Analysis of actual conditions.
- Evaluation of productivity.

1.1.2. Planning and Marketing

- Evaluation of the present systems.
- Providing specific recommendations for changes and improvements in the marketing organisation and sales methods.
- Evaluating the possibilities to expand export to the E.E.C. based on our knowledge of those markets.
- Identify the material required to fulfil the marketing recommendations.

1.2. Scope

Our studies include a review of the following items :

- PRODUCTION : program, diversifications.
- FACILITIES : site, condition of buildings, installations and machines.
- MANUFACTURING : process engineering, work standards, process layout, material handling, transport.
- PLANT ENGINEERING: plant layout, maintenance of buildings, installations and machines, spare parts.
- MILL BALANCE : balance of capacities, machinery utilisation, mill efficiency.
- LABOUR : labour complement, experience, training.
- PRODUCTIVITY : productivity per man-hour in spinning, weaving and finishing (Györ) WERNER performance data compared with LENFONO figures for equipment efficiency, equipment utilisation, productivity.

- QUALITY CONTROL : laboratory testing, including raw material, yarn and fabric
  production control of yarn, grey cloth and finished fabrics.

- PLANNING + SCHEDULING: scheduling of orders, allocation of capacities, flexibility, plant utilisation, interplant relation.

- WASTE-CONTROL : waste evaluation and rentability

- PLANNING + MARKETING :
  - overview of present production scheduling and planning
  - analysis of planning and results achieved
  - products and construction
  - design and product development
  - pricing and profitability
  - export to Western countries
  - major obstacles to increasing export.

1.2.1. Specific objectives

To recommend appropriate measures to improve the performance of the existing facilities as well as to create favourable conditions for future investment.

1.2.2. Recommendations

- General conclusions from the analysis of the present situation.
- Future concept of LENFONO.
- Short and long term alternative strategies.

1.3. Methodology Used

Basically the contract called only for an evaluation of "Production Scheduling and Marketing".

After our first visit, we felt the need to probe deeper into the manufacturing areas because we saw that not only the production scheduling was a problem but more so the machine and labour utilization.

On our visits we saw too many idle machines. The given reason was "no labour available". In our opinion this was not and cannot be the sole reason. Therefore, we carried through a classical analysis based on data from the year 1975.

In order to obtain the necessary data we submitted prepared forms to each departmental head. Based on these data, a complete mill balance was calculated for each individual plant and the necessary labour force was specified.

The projected production and productivities WERNER 1 and 2 are based on standards which are common in the Western flax and linen industry. No provisions have been made for any special situation in Hungary. Of course, all calculations are based on the existing machine equipment.

Because of basic changes in loom equipment from 1975 to 1977 we calculated an additional mill balance based on the 1977 machine park
(see WERNER proposal 2).

In the report this has been differentiated in :

- <u>WERNER proposal 1</u> (actual 1975 to proposed 1975)

- <u>WERNER proposal 2</u> (actual 1975 to proposed 1977)

All individual plants are dealt with in the same manner.

The evaluation points are :

- Location
- Buildings and layouts
- Process flow and material handling
- Machine obsolescence
- Machine improvement
- Machine park 1975-1977 (for weaving only)
- Summary of mill balance
- Summary of labour complement
- Summary of yarn consumption in weaving

The executive part contains the summary of the above data for :

- 2 spinning mills
- 3 weaving mills
- 3 finishing and dye plants.

Seeing the vast improvement possibilities, we felt the need to incorporate a short and mid-term

Action Plan

in order to give LENFONO a professional view on what should be done first and in what sequence.

Basis for all calculations is 268 production days per year at 24 hours a day.

All prime departments are laid out on a three shift basis and 44 hour week.

2.0 THE FACTS TO DO WITH LENFONO

2.1. Production 1975

2.1.1. LENFONO Grand-total

1975 LENFONO's actual achieved finished production was :

28.120.000 square metres.

2.2. Plants, Machines and Production

2.2.1. Weaving

The production of greige cloth 1975 in the main weave mills (excl. cooperatives) was as follows :

	Budakalasz*	Györ*	Csillaghegy*	Komaron	Total
No. of looms	335 + 28	453	176 + 58	100	1.150
Looms in operation	236 + 28	408	162 + 50	85	969
Run. metres/year	5.149.000	11.859.000	5.075.000	2.035.000	24.118.000
Running metres/day	19.213	44.250	18.936	7.593	89.992
Square metres/year	5.755.000	11.559.000	5.833.000	2.571.000	25.718.000
Square metres/day	21.474	43.130	21.765	9.593	95.962
Ø picks/cm	13.98	17.05	17.03	14.05	-

* without cooperatives

2.2.2. Spinning

The 1975 yarn production was as follows :

	Komaron	Budapest	Total
No. of spindles	7.704	6.350	14.054
Spindles in operation	7.604	4.160	11.764
Production kg/year	2.247.652	1.865.524	4.113.176
Kg/day	8.387	6.961	15.348
Ø Nm	10,6	9,7	-

2.2.3. Finishing

The 1975 finished cloth production was as follows :

	Budakalasz	Györ	Csillaghegy	Total
Square metres/year	9.280.000	11.303.900	7.536.106	28.120.000
Square metres/day	34.627	42.179	28.120	104.926

2.3. Labour Complement

The following summary shows the total labour complement which was given to us during our visits and through additional telexes. Due to translation problems, there could be some mistakes in some single indirect departments. But the totals for each plant should be correct.

	Buda-kalasz	Györ	Csilla-ghegy	Komaron	Buda-pest	Total
Packing, shipping	53	5	-	-	-	58
Sampling department	22	-	-	-	-	22
General maintenance	112	62	158	114	57	503
Technical services	-	-	-	-	-	-
Various helpers	64	47	-	14	17	142
Non-industrial	27	36	-	18	13	94
MEO	-	16	48	-	12	76
Juveniles/army	-	-	-	74	-	74
Technical Management	37	18	135	36	54	280
General administration	91	61	-	-	50	202
Sub-Total	406	245	341	256	203	1.451
Spinning department	-	-	-	602	259	861
Weaving department	374	320	708	174	-	1.576
Finishing department	80	38	109	-	-	227
Printing department	35	-	-	-	-	35
Sewing department	32	-	-	-	-	32
Sub-Total	521	358	817	776	259	2.731
Grand-Total	927	603	1.158	1.032	462	4.182

2.4. Operation Locations

LENFONO operates in various geographical areas. The main production units are not strategically located.

In addition to the present locations and due to the labour shortage, various operations have been transferred to different geographical locations called "Cooperations".

The following table illustrates that :

- Spinning	= Budapest	-Cooperatives:	Videk
	= Komaron		
- Weaving	= Budakalasz	-Cooperatives:	Pocsaj
	= Györ	-Cooperatives:	Tèt
	= Csillaghegy	-Cooperatives:	Bekes
	= Komaron	-Cooperatives:	Kefe-Seprii
- Finishing	= Budakalasz		
	= Györ		
	= Csillaghegy		

Of course, production done in so many different geographical locations adds considerable difficulties to :

- Production planning
- Product control
- Delivery schedules
- Transport.

Besides the above negative points, this set-up increases not only the fixed but also the variable costs. Of course, all these negative points are known to LENFONO, and due to the presumed labour shortage the tendency for additional cooperations exists.

We do not feel that the production can be increased or stabilized by splitting all the present production units into new cooperatives.

It is our feeling that the existing production units <u>first</u> should be optimized.

2.5. Major Products of LENFONO

- Cotton type : - Apparel
  - Furnishing
  - Tarpaulins
  - Technical

- Linen type : - Apparel
  - Furnishing
  - Bed sheetings
  - Table linen
  - Furnishing-household
  - Ticking
  - Tarpaulins
  - Technical

- Technical : - Hoses

2.6. Type of Raw Material Input

- Cotton and cotton blends	=	62%
- Linen and linen blends	=	18%
- Tow and tow blends	=	14%
- Synthetics	=	6%

2.7. Product Mix and Quantities 1975

As the analysis shows, the product mix consists of a large variety of articles, and the different widths increase even more the number of items processed through the weaving plants. Not only does this create detailed planning difficulties, it also prohibits efficient production.

Although the number of articles (1975 = 283) has been decreased during 1976 in the course of price/cost decisions, we feel the reduction is not sufficient. Therefore, based on marketing policies, the following decision should be made :

- Reduction of articles by approximately 30% through :
  - . Cost/price decision
  - . Collection streamlining
  - . Elimination of low volume quantities.

The 30% reduction is based on a short marketing survey and could only be substantiated through an in-depth study.

Our recommendation is :

- Carry through an in-depth study in order to streamline article programme per plant.

In addition to the broad variety of articles, the various widths per article should be reduced through :

- Determining market demands
- Fixed greige width and various finished widths
- Determining optimum width per article.

2.8. Summary of Quantities by Grading and Plants

The following quantities were given to us for the three main weaving plants, including the cooperations.

The production of Komaron was split-up for Budakalasz, Györ and Csillaghegy. Therefore, the totals do not agree with 2.2.1. and 2.2.3., but the main interest of this table is the percentage of :

- Export and first quality.
- All other qualities.

TABLE I : QUANTITIES GREIGE CLOTH/FINISHED CLOTH

Plant	Greige Cloth			Finished Cloth								
				Total			Split-up in					
							Exp. & I. qual.			All oth. qual.		
	m 10^3	sqm	%	m 10^3	sqm	%	m 10^3	sqm	%	m 10^3	sqm	%
Csillaghegy*	6.222	7.263	100	6.447	7.128	98	5.349	5.903	83	1.098	1.225	17
Budakalasz*	8.112	9.421	100	8.304	9.280	99	6.723	7.317	29	1.581	1.963	21
Györ*	11.859	11.559	100	12.280	11.304	98	10.800	9.965	88	1.480	1.339	12
Total	26.193	28.243	100	27.031	27.712	98	22.872	23.185	84	4.159	4.527	16

* without cooperatives

14% to 20% of all fabrics are not of first class quality.
33% of cotton type apparel fabrics are rejected.
These percentages are so high that efficient marketing is very difficult.

2.8.1. Export promotion measures to be taken by LENFONO Quality Control Safeguards

Internationally recognized quality standards must be accepted voluntarily by the Hungarian Linen Industry and made compulsory for textiles produced in Hungary and destined for export.

The control itself of textiles will have to be done by agents of the purchasers before the merchandise leaves Hungary. This would be the safest way to establish and retain high prestige and avoid justified claims. No control can be too painstaking. A good reputation is worth the utmost effort. Once the prestige would be lost, it would be extremely difficult to regain it.

3.0 PLANNING AND SCHEDULING

From the analysis, it has been determined that the present planning and production coordination system at the integrated textile company of LENFONO is cumbersome and inefficient.

The manufacturing facilities embrace 5 factories including a number of cooperatives containing the processes of

- Spinning
- Weaving
- Fabric dyeing/finishing
- Printing.

The product mix is extremely diversified for a company producing 28 million square metres of fabric. The products include :

- Cotton type : . Apparel
  . Furnishing
  . Tarpaulins
  . Technical.
- Linen type : . Apparel
  . Linings
  . Bed sheetings
  . Table linen
  . Furnishing-household.
  . Ticking
  . Tarpaulins
  . Technical.
- Technical : . Hoses.

The production volume is grouped as follows :

- 60% linen type
- 40% cotton type.

The scheduling of orders and allocation of capacities involve three different groups in the organisation :

- Export department
- Control planning office
- Planning offices in each manufacturing unit.

The main factors contributing to the state of affairs are :

- Lack of flexibility
- Manual handling of information and calculations
- Present organisation structure
- Lack of market feedback
- Missing controls on late deliveries
- Missing links in the system
- Interest conflict weaving-finishing.

3.1. Sales and production planning

In many mills unnecessary machine down-time has been observed, caused by inadequate planning.

Managerial and supervisory personnel ought to be trained in the important planning activity.

Setting up management performance standards including the means of comparing actual performance to the standards.

This way effective controls will be possible and lead to improved business results.

4.0 PRODUCTION ANALYSIS

In order to obtain a judgement on the present situation at LENFONO and to specify the steps to be taken to achieve optimal processing conditions, we evaluated each individual plant and calculated a complete MILL-BALANCE.

To overcome the problem of wrong interpretation of the requested information, we designed and submitted prepared forms to LENFONO, specified the terminology and the procedure.

Based on these data, we evaluated the information, calculated the MILL-BALANCE and at the same time proposed in WERNER PROPOSAL 1 (and 2 only for weaving) production and productivity based on standards which are common in the Western flax and linen industry.

No provisions have been made at that time for any special situation in Hungary and we worked under the assumption that the given data were correct.

In calculating the MILL-BALANCE all production figures are based upon geometrical averages rather than the normal arithmetical average.
Therefore, the possibility of having taken some wrong figures from the submitted forms has been greatly reduced.

4.1. Weaving

4.1.1. Weave Room Efficiencies

Standard procedure for WERNER requires in weaving a split up in three different types of efficiencies:

1. Machine efficiency

   A loom is available 24 hours a day on a three shift basis which equals a 100% machine efficiency.

   Whenever the loom is stopped for any other than weaver interferences, the stopped hours are called "downtime hours" and reduce the machine efficiency accordingly.

2. Operator efficiency

   100% hours minus downtime hours are the machine hours available to the weaver which is 100% for the weaver.

   Actual picks compared to the possible picks in that time gives operator efficiency.

3. Plant efficiency

   This gives the net efficiency of a weave-room and is calculated either by multiplying

   - machine efficieny x operator efficiency, or
   - the relation of actual picks to theoretical picks in 24 hours.

WERNER practice does not distinguish a difference between downtime hours of less or more than 8 hours a day.

All efficiencies mentioned in "Summary Mill Balance" are based on 24 hours per day, 288 working days per year as an absolute 100%.

Based on the above definitions and through historical calculation with average picks per loom, number of looms in operation and actual picks inserted, we established our efficiencies for the plants.

4.1.2. Machine efficiency

In determining the machinery requirements for WERNER Proposal 1 and 2, the following considerations were made :

- All of the calculations have been based on the premise that the existing equipment should be brought up to efficiencies of international standards, and that the mills operate approximately 268 days per year, with 24 hours a day, and all prime departments are laid out on a three shift basis and 44 hour week.

4.1.3. Machine efficiency comparison

TABLE 2 : MACHINE EFFICIENCY IN %

	Budakalasz	Györ	Csillaghegy	Komaron
Plan 75	-	-	93	-
Actual 75	60,8	85	93	94
WERNER 1	94	95	94	94
WERNER 2	94	95	94	94

The low machine efficiency in Budakalasz is mainly caused by labour shortage because individual downtime losses were given to us as :

TABLE 3 : MACHINE DOWNTIME IN %

	Budakalasz	Györ	Csillaghegy	Komaron
	%	%	%	%
Warp changing	1.45	2.1	3.8	3.2
Repair	1.22	1.6	1.1	1.8
Missing Material	.45	.2	1.5	.3
Various	3.25	1.4	.5	.5
Total	6.37	5.3	6.9	5.8

This indicates a potential of machine efficiency from :

	93.6	94.7	93.1	94.2

which in our opinion is a good result.

The difference in Budakalasz between 93.6% and 60.8% (= 32.8%) accounts for labour shortages.

Of course by taking into consideration the total number of looms "installed", the downtime for labour shortages would have been

51%

compared to 60.8%.

But in all our calculations and in WERNER Proposal 1, we recognized only the number of looms in "operation" stated in Form W-103 (Weaving production calculation).

The number of looms in WERNER Proposal 2 is based on the 1977 loom complement.

4.1.4. Recommendations

- Labour shortage (see manpower utilisation)

- A basic concept regarding the purchase of new equipment is that money spent in the initial phases should be mainly for additional equipment which will therefore yield the highest production return for the money spent.

This concept serves two purposes :

- It satisfies the demand for additional production to the maximum degree for the money spent.

- It requires the mills to improve the efficiency of the existing equipment to the maximum degree before receiving replacement equipment.

  If the new equipment were installed for replacement purposes at the outset, maximum productivity from the new equipment might not be achieved since the adjacent equipment might still be operating at lower than optimum efficiency.

4.1.5. Machinery maintenance

Machinery ranges in most departments from antiquated to very modern (GS 162 - Mayer - winding).

In general, the condition of the machinery is fair. Virtually every mill has a preventive maintenance system, but the results are not satisfactory.

The recommendation is made to give those important factors more attention and a higher priority of importance.

4.1.6. Operator efficiency

Operator efficiency varies in the four plants between

61% and 81%.

The following table shows the variance in comparison to the WERNER expected operator efficiency :

TABLE 4 : OPERATOR EFFICIENCY IN %

	Budakalasz	Györ	Csillagtegy	Komaron
Plan 75	-	-	81	-
Actual 75	76	81	81	61
WERNER 1	86	90	86	86
WERNER 2	86	90	86	-

There is no reason why the operator efficiency cannot be improved to an average between

86% and 90%.

Particularly in the Komaron plant, the operator efficiency should be improved, if LENFONO management decides to keep this plant alive.

Our opinion is that by introducing the following programmes, the goal set at WERNER 1 and WERNER 2 can be accomplished.

- Establishing correct methods and based upon that, job load criteria involving quantitative and qualitative factors.

  In conjunction with it, an incentive system for operators and supervision.

- Training of operators and establishing a system whereby in future the correct methods will be practiced at each operation step.

- Improving running conditions of the raw material.

- Rigid maintenance program for the looms.

4.1.7. Plant efficiency

TABLE 5 : PLANT EFFICIENCY IN %

	Budakalasz	Györ	Csillaghegy	Komaron
Plan 75	68.9	74	75.4	63
Actual 75	46.2	69	75.4	57
WERNER 1	80.8	85.5	80.8	80.8
WERNER 2	80.8	85.5	80.8	80.8

A comparison of plant efficiency shows that the plan made by LENFONO management is a realistic plan.

The variance to WERNER 1 and 2 is approximately :

5 - 13%

with the exception of Komaron.

But if we compare ACTUAL 75 to WERNER 1 or 2, the improvement possibilities are :

- Budakalasz + 34.6%
- Györ + 16.5%
- Csillaghegy + 5.4%
- Komaron + 23.8%

As mentioned under Machine Efficiency, part of this improvement is the availability of labour.

4.1.8. Weave room production

A comparison based on LENFONO's PLAN 1975 (=100%), the ACTUAL production 75 and WERNER projection.

TABLE 6 : WEAVING PRODUCTION IN RUNNING METRES/YEAR

	Budakalasz		Györ		Csillaghegy		Komaron		Total	
	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%
Plan 75	7.681	100	12.587	100	5.075	100	2.185	100	27.528	100
Actual 75	5.149	67	11.859	94	5.075	100	2.035	93	24.118	88
WERNER 1	9.009	117	14.565	116	5.437	107	2.811	129	31.822	116
WERNER 2	7.180	94	17.371	138	3.958	78	3.625	166	32.134	117

TABLE 7 : WEAVING PRODUCTION IN SQUARE METRES/YEAR

	Budakalasz		Györ		Csillaghegy		Komaron		Total	
	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%	$m \times 10^3$	%
Plan 75	8.585	100	12.220	100	5.833	100	2.752	100	29.390	100
Actual 75	5.755	67	11.559	94	5.833	100	2.571	93	25.718	88
WERNER 1	10.069	117	14.187	116	6.252	107	3.542	129	34.050	116
WERNER 2	8.042	94	16.919	138	4.552	78	4.568	166	34.081	117

By comparing only PLAN 75 to WERNER 1, one can see that with the exception of Komaron, LENFONO's projection is realistic.

The variance between PLAN and WERNER 1 is :

TABLE 8 : PLAN/WERNER VARIANCE IN %

	Budakalasz	Györ	Csillaghegy	Komaron	Total
Plan 75	100	100	100	100	100
WERNER	117	116	107	129	116
VARIANCE	+17	+16	+ 7	+29	+16

But comparing ACTUAL 75 to WERNER 1, a lot of work is left to be done, in order to accomplish the projection of WERNER.

TABLE 9 : ACTUAL/WERNER VARIANCE IN %

	Budakalasz	Györ	Csillaghegy	Komaron	Total
Actual 75	67	94	100	93	88
WERNER	117	116	107	129	116
VARIANCE	+50	+22	+ 7	+36	+28

4.1.8.1. Recommendation

The main effort has to be put into the Budakalasz weaving plant.

In the case of Komaron the decision has to be made, if this weaving mill should stay in operation.

Csillaghegy can be increased by approximately 7%, whereby Györ without major investment can be streamlined.

In order to achieve the WERNER projection, we recommend a 2 step action plan :

- Step No. 1 - meet PLAN OF LENFONO
- Step No. 2 - meet WERNER PROJECTION.

Meeting the LENFONO PLAN to ACTUAL 75 would mean an additional production of

approximately 3.672.000 square metres.

Meeting WERNER PROJECTION 1 to LENFONO's PLAN a production increase of

approximately 4.660.000 square metres.

If we compare the Actual 75 production to WERNER 1, the production increase would be

5.322.000 square metres

OR + 28%

4.1.9. Labour Complement

In order to specify the productivity, it was necessary to analyse the Labour Complement.

In doing so, we were unable to get any information in regards to PLAN-LABOUR complement, and therefore we can only compare Actual 75 to WERNER 1 and 2.

By working out the Labour Complement for Proposal 1 and 2, we included a reserve of 15% to off-set absenteeism for all direct personnel and all key functions.

Since WERNER's opinion on what is direct or indirect, which indirect personnel belongs to which department, might differ from the actual Labour Complement, not too much weight should be placed on a departmental comparison, but rather on the total complement.

In order to have a fair comparison to Actual 75 we specified in WERNER 1 only the number of people necessary to operate the machines in "operation".

Labour Complement of WERNER 2 is based on the number of looms in 1977, which was given to us by telex.

TABLE 10 - Labour Complement

	Budakalasz	Györ	Csillaghegy	Komaron	Total
Plan	-	-	-	-	-
Actual	374	708	320	174	1.576
WERNER 1	349	536	244	126	1.255
WERNER 2	294	643	198	151	1.286

As one can see, the number of people necessary to produce the production in WERNER 1 is available in all factories.

Therefore Lenfono's main problem is not labour shortage but more so correct labour utilization as well as correct job distribution.

Of course we realize the fluctuation problems; however with the available manpower, we have enough reserves in order to select, train and distribute correctly.

4.1.10. Productivity

After analysing the production figures and labour complement, we are now in a position to show the productivity of each plant.

Here again, plan figures in productivity were not available; therefore we can only compare

Actual 75 to WERNER 1 and 2,

whereby we see the Actual productivity 75 as 100%.

TABLE 11 - Productivity in m/working hour

	Budakalasz		Györ		Csillaghegy		Komaron	
	m/w.h.	%	m/w.h.	%	m/w.h.	%	m/w.h.	%
Plan	-	-	-	-	-	-	-	-
Actual	6.42	100	7.81	100	7.40	100	5.45	100
WERNER 1	12.03	188	12.67	162	10.39	140	10.41	191
WERNER 2	11.24	175	12.60	162	9.3	126	11.20	205

By rating the individual weaving plants, Budakalasz shows productivity improvements of

approx. 88% ,

Györ can be improved by approx. 62% and Csillaghegy by approx. 40%.

The weaving outlet of Komaron shows improvements in productivity of approx. 91%.

The figures listed above show immense improvements.
However we have not considered any adjustments for eventual special circumstances which may influence the production possibilities in Hungary.

As a first step, we would aim at obtaining

50%

of the shown improvements.

4.1.11. Running Performance

By analysing the running performance of the yarn, we feel confident in making the statement, that this is one of the main reasons for the low productivity.

Although the number of looms per weaver is very low, under the present conditions he will not be able to accept a much larger loom assignment.

Not only by analysing the actual loom stops and comparing those with our projections in WERNER 1, but by walking through the weave-rooms, one can see that the weaver is preparing one loom after another and that patrolling time is not available. Some of the looms are always standing.

TABLE 12 - Number of warp stops per M ends & 10^4 picks

	Budakalasz	Györ	Csillaghegy	Komaron
Actual	3	1.05	.86	3.9
WERNER	1	.4	.4	1.0

TABLE 13 - Number of weft stops per 10^4 picks

	Budakalasz	Györ	Csillaghegy	Komaron
Actual	3.9	4.12	2.08	3.9
WERNER	1.3	1.2	1.0	1.3

TABLE 14 - Number of mechanical stops per 10^4 picks

	Budakalasz	Györ	Csillaghegy	Komaron
Actual	4.3	4.38	1.51	4.3
WERNER	.5	.6	1.2	.5

The exact reasons for LENFONO's high breakage rate were not pointed out since time did not allow for an analysis of the machine/material combination.

Part of the high breakage rate is to be found in the yarn quality as it was shown in the spinning process data. But it is also partly due to the running conditions ofthe looms, such as:

- shuttle control
- cleanliness
- preventive maintenance.

A clear breakdown of mechanical stops was not available. By applying WERNER standard procedure as far as correct job distribution and maintenance schedules are concerned, there is no justification for this value being higher than

.5 to 1.2 pev 10^4 picks

4.1.12. Loom Assignments

As stated before the aim should be to increase the number of looms per weaver, however this cannot be done before major "leg-work" has been done.

But we feel confident, if LENFONO follows the following suggestions, that loom assignments can be changed without giving the weaver higher workload.

It is very important to note, that we, as a consultant company, recommend a change of loom assignment only after the weaver interventions are reduced and the weaver is able to cope with a larger loom assignment without increasing the workload.

In addition we feel that the weaver should be given ample patrolling time in order to solve "the problem", before the loom comes to a stop.

This implies the execution of several improvement programs:

- Machine condition (preventive maintenance program)
- Running condition of yarn
- Correct bonus system
- Operator training program
- New machine lay-out
- Handling procedure
- Inspection procedures.

The following table shows, by plant, the number of looms per weaver as actual distribution 1975 and how many looms WERNER proposes if conditions are changed:

TABLE 15 - Number of looms/ Weaver - Actual 75/WERNER

	Budakalasz	Györ	Csillaghegy	Komaron
Actual 75	5.3	7.6	7.2	4.9
WERNER 1	13	12	12	12
Increase	+ 6.7	+ 4.4	+ 4.8	+ 7.1

Assessment of fair workloads for every job.

This, in connection with job evaluation, will lead to a correct incentive system and will stimulate performance for all evaluated and properly assigned jobs to acceptable levels of labour productivity.
The result will be greatly improved efficiency and fair rewards for skill and effort.

4.2 SPINNING

4.2.1. Spindle RPM

By analysing the two spinning plants, we noticed that the maximum spindle speed in both plants is not fully utilized.

Based on our experience in the flax and linen industry, we are proposing to increase the average spindle speed as follows:

TABLE 16 - Spindle RPM

	KOMARON		BUDAPEST	
	DRY	WET	DRY	WET
Actual 75	2450	3890	4800	4500
WERNER	2600	4300	5500	4900
Increase	+ 150	+ 410	+ 700	+ 400

4.2.2. Spinning Room Efficiency

We took the liberty to calculate the MILL-BALANCE with the increased spindle speed.

TABLE 17 - Spinning Room Efficiency in %

	KOMARON		BUDAPEST	
	DRY	WET	DRY	WET
Plan 75	74	81	76.6	83.2
Actual 75	64	73.2	72.6	43
WERNER	78	84	80.0	86

The low efficiency is mostly due to labour shortage and in the BUDAPEST plant in addition to a high fluctuation.

In order to improve the efficiency, we suggest the following action plan:

- New up-to-date bonus system
- Standard working procedures
- Operator training program
- Improving running condition of material
- Rigid maintenance program for the spinning frames
- Correct job distribution.

4.2.3. Machine Improvement

On two different visits, we noticed a definite lack of correctly carried out machine maintenance programs for instance:

- In preparation:
  - Poor combs,
  - Nicked teeth,
  - Teeth missing,
  - Nicked flyer arms.

- In spinning:
  - Beards around guide bars,
  - Deep roller cuts,
  - Worn out rollers,
  - Blocked travellers,
  - Suction devices out of place (dry spinning).

One reason for the high end-breakage rate which not only incurs higher labour force than necessary but also produces bad yarn quality (high breakage rate throughout all the following process stages, which incurs an even higher labour force) lies surely in the bad condition of the rollers.

It is our opinion that for replacement material of rollers, only first class and suitable material should be used and accordingly maintained while in use.

The present condition of rollers is not up to the standards required.

4.2.4. Spinning Room Production

If the plant efficiency is changed, the production outcome will change and the following table shows a comparison based on LENFONO's PLAN 75, the Actual achieved Production and WERNER's projection.

TABLE 18 - Quantities in tons/year

	KOMARON		BUDAPEST	
	DRY	WET	DRY	WET
	ø Nm 2.75	ø Nm 12.26	ø Nm 7.0	ø Nm 14.39
PLAN 75	440	2.064	1.229	1.327
ACTUAL 75	382	1.866	1.165	685
WERNER	490	2.366	1.467	1.453

As one can see LENFONO's PLAN in comparison to WERNER target is realistic.

Nevertheless, we should try to improve the production output by:

608 to. / year

in total.

The production comparison shows percentage wise:

TABLE 19 - Production comparison in %

	KOMARON		BUDAPEST	
	DRY	WET	DRY	WET
	ø Nm 2.75	ø Nm 12.26	ø Nm 7.0	ø Nm 14.39
PLAN 75	100	100	100	100
ACTUAL 75	87	90	95	52
WERNER	111	115	119	109

The above table shows that the LENFONO plan as well as the WERNER projected production are higher than the actual 1975 production.

4.2.5. Endbreaks

Running performance of the material, expressed in end-breaks per M spindle hour, is extremely bad.

We identified an end-break rate of:

TABLE 20 - Number of end-breaks per M spindle hour

	KOMARON	BUDAPEST
Dry Spinning	1142	1465
Wet Spinning	682	992

This exceeds any conditions which would be regarded as "normal". Obviously, running a spinning room with this high rate of end-breaks requires a high labour input.
It also decreases the running conditions in all subsequent stages.

4.2.6. Levels of End-Breaks

The following figures show the allowable end-break levels in the flax and linen industry.

The end-breaks per 100 spindle-hours in the ring frames are (for a good mill):

1) Wet spinning (Counts Ne 18 to 30) (Nm 10 to 18)

1.1 Grey flax (unbleached)

1.1.1 Carded tow

- the highest rate equals the Ne (English flax count) and the normal rate is half of the Ne.

- remark: these figures come from the best spinner in Belgium. An average mill has the following rules:

normal	: number of end-breaks = Ne	= 1.7 Nm
very good	: number of end-breaks = 3/4 Ne	= 1.3 Nm
bad	: number of end-breaks = 2 x Ne	= 3.4 Nm

1.1.2 Long fiber

The normal rate = 0,30 Ne = 0.5 Nm

1.2 Pre-bleached flax

1.2.1 For carded tow : max. rate of breaks = 1/2 Ne = 0.8 Nm
normal rate = 1/4 Ne = 0.4 Nm

1.2.2 For long fiber : max. rate of breaks = 1/4 Ne = 0.4 Nm
normal rate = 0,15 Ne = 114 Nm

2) <u>Dry spinning</u> (counts Ne 6 to 20) (Nm 3 - 12)

For dry spinning the above standards can be increased by 25%.
As said, these figures apply to a very good mill.
For an average mill, the end-breaks figures for grey flax are:

normal	: 2 x Ne	: 3.4 Nm
very good	: 1 x Ne	: 1.7 Nm
bad	: 3 x Ne	: 5.1 Nm

It must be added that these figures apply to 100% flax.
From the moment the flax is blended, since the R.P.M. has to be maintained low (6000 RPM), the number of end-breaks decreases very sharply.

For a blend 70% flax
30% polyester
the rate is only 2 or 3 breaks per 100 spindle hours.

4.2.7. Obtainable End-Breaks Level for the Hungarian Linen Industry

WERNER proposes an intermediate step to achieve the following results in end-breaks/1000 sph:

- Wet spinning 20 x Nm
- Dry spinning 40 x Nm

4.2.8. Yield Recommendation

These results are conservatively estimated and can be achieved by the following course of action through the program outlined:

- Setting an optimum overall fibre yield in respect to raw flax. LENFONO achieves a yield of:

  - ca. 10% long fibre
  - ca. 17% short fibre

  ca. 27% Total

  which, in our opinion, is too high for quality yarn and optimal running conditions. The percentage of long fibre to short fibre should be reversed.

- Setting an optimum rejection rate at the threshing process in respect to high yield and good running conditions/good quality yarn.

- Setting, controlling and maintaining standard quality procedures in all preparatory stages.

- Rigid maintenance control on all equipment (standard routines, sequences, responsibilities, follow-up procedures).

4.2.9. Data on the West European Flax Industry

I. The growing of flax

The yield of raw flax varies greatly from year to year: 7,500 kg/hectare is a fair production, 5,000 kg/ha are obtained in a bad year (like 1976) and 10,000 kg/ha and more are reached in the best years.

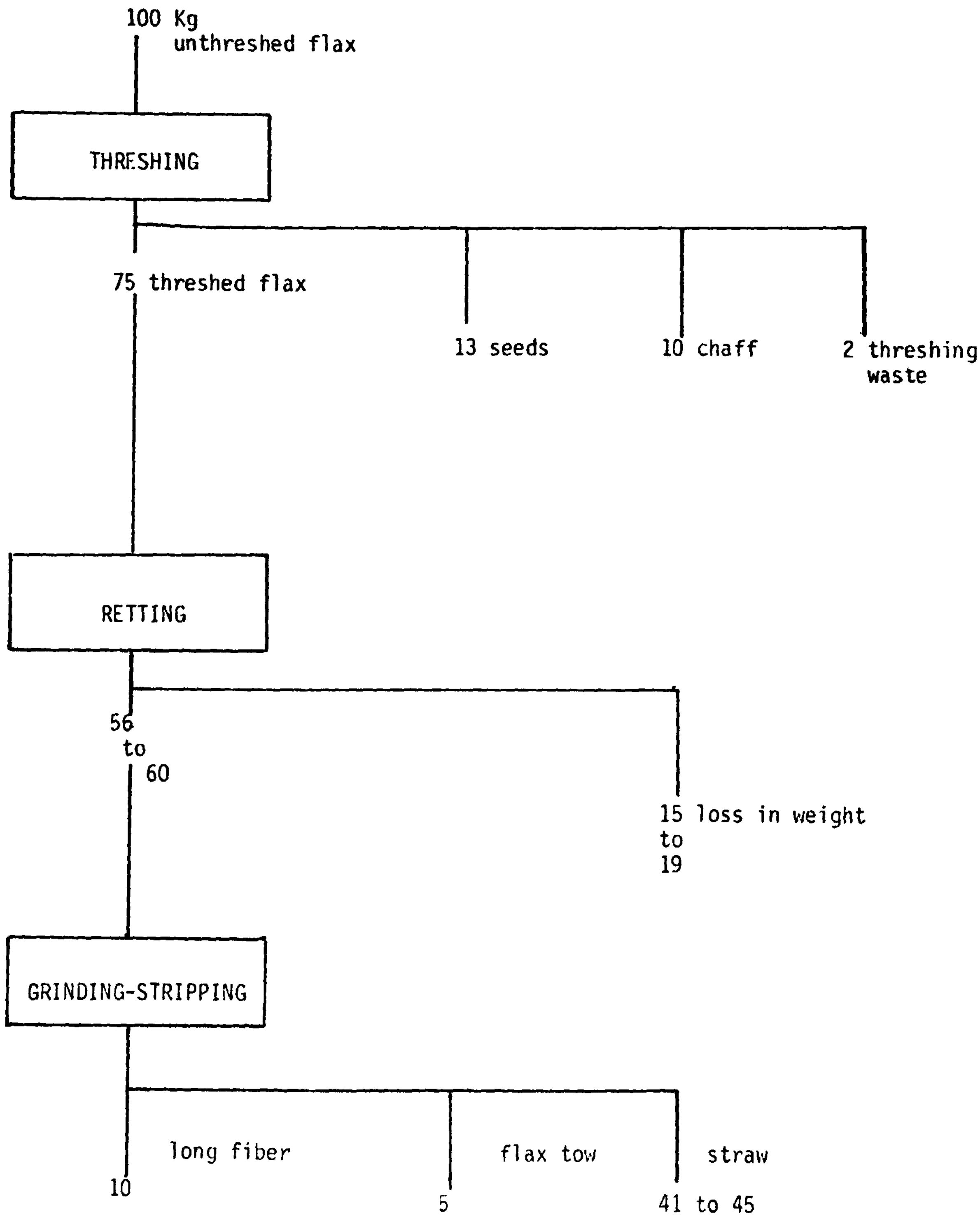
II. The overall fiber yield

The overall fiber yield varies from one year to the other as well. Following are three different yields, which each corresponds to a different rate of rejection at the threshing process:

a) for 25% rejection, the yield for 100 kg of raw unthreshed flax is:

10 kg of long fiber	(60 to 90 cm)
5 kg of tow	(10 to 15 cm)
15 kg of total fiber	

FLAX PROCESSING



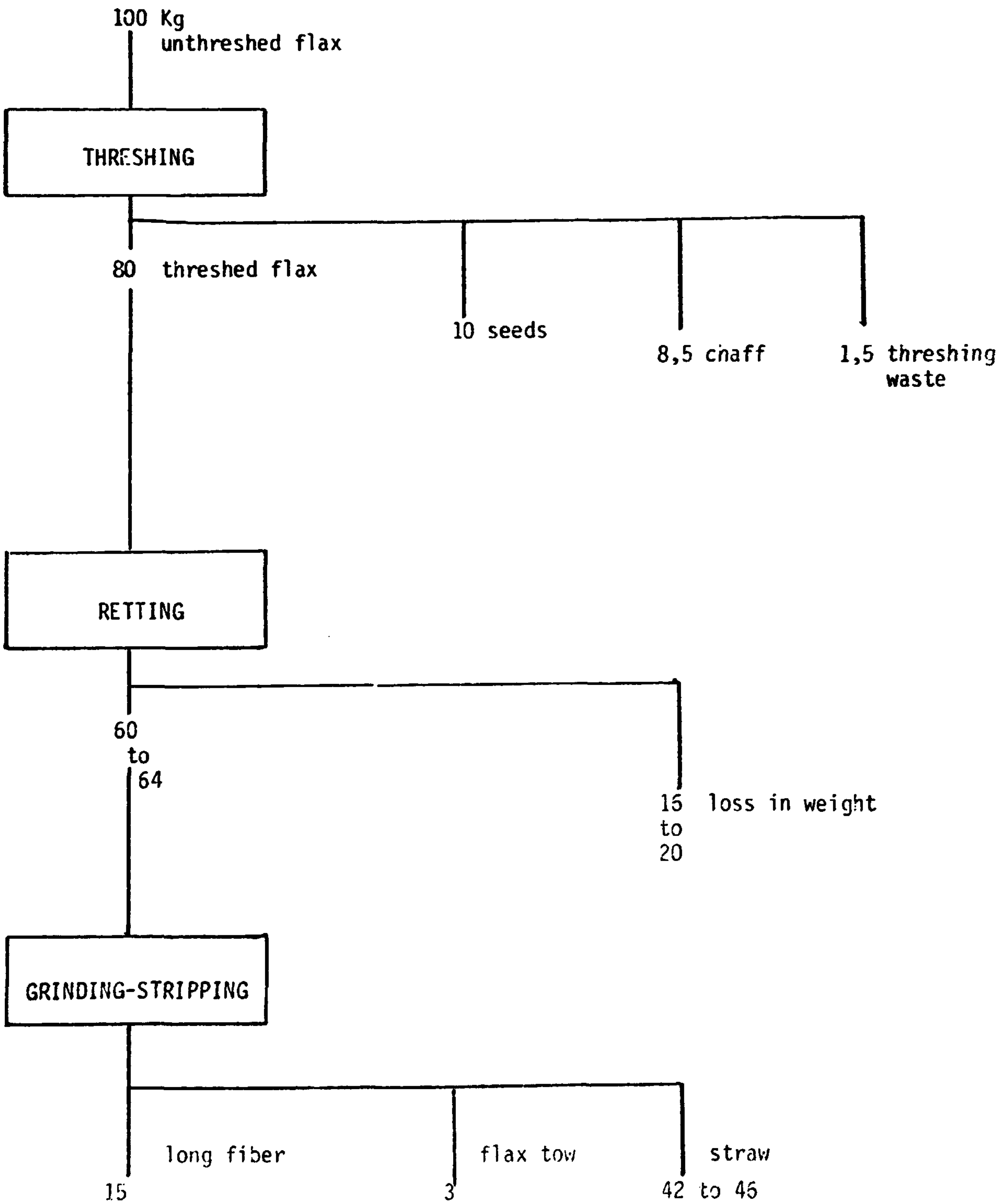
- for a 20% rejection, the yield is:

15 Kg of long fiber
3 Kg of two
18 Kg of total fiber

This yield which is obtained in the best years is illustrated as:

(see following table)

FLAX PROCESSING

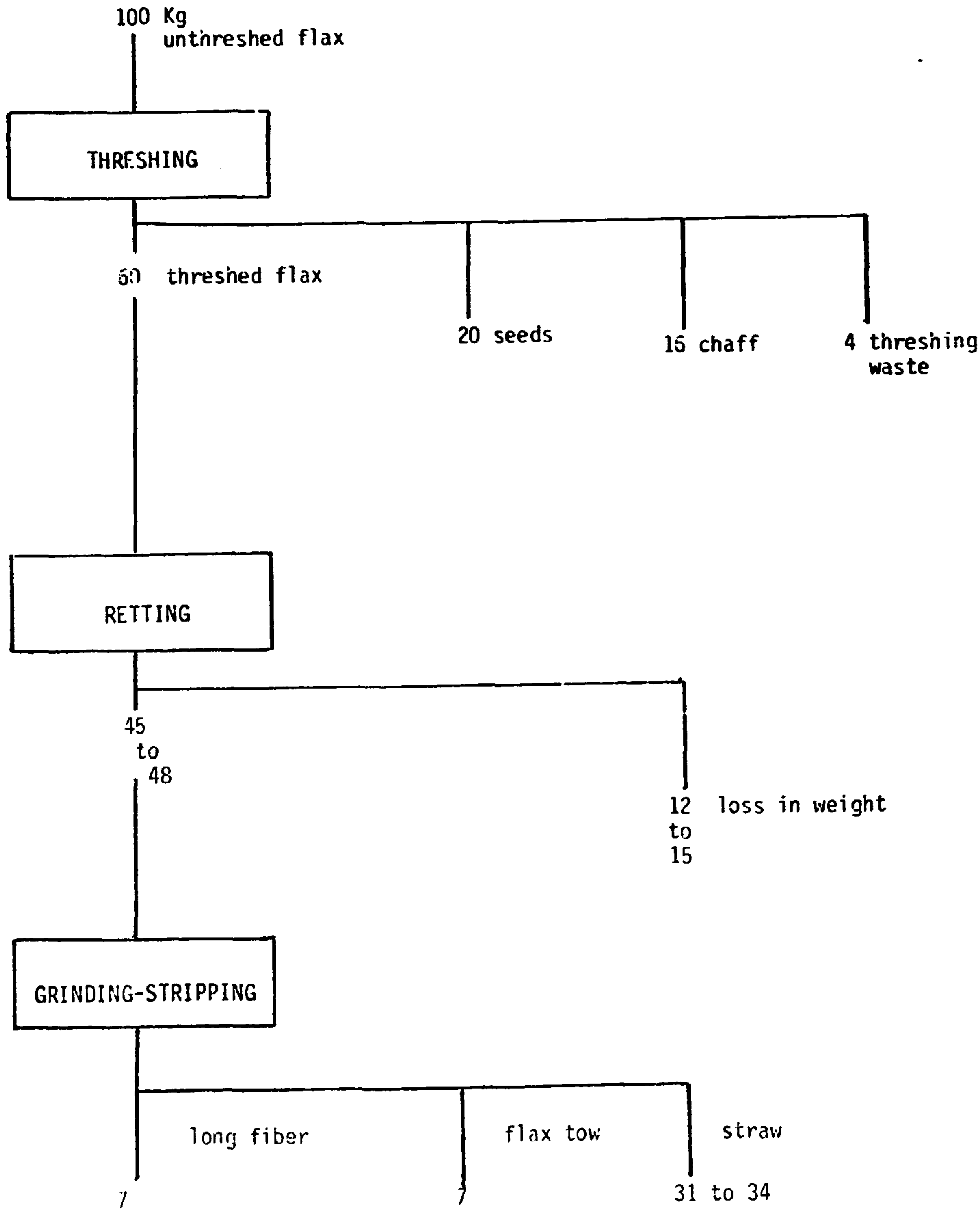


- with a 4% rejection, the yield of long fiber reaches its minimum:

  7 Kg of long fiber
  7 Kg of tow
  ___
  14 Kg of total fiber per 100 Kg of unthreshed flax

(see following table)

FLAX PROCESSING



The total fiber yield of, for instance, the Belgian flax crop thus varies from 14 to 18 Kg per 100 Kg of raw material. The higher the percentage of threshed flax obtained of the stage of the threshing, the higher the yield of long fiber and of the total fiber, and the lower the yield of tow.

TABLE 21 - Yield of long fiber + tow

THRESHING - % OF SCUTCHED FLAX	YIELD OF		
	LONG FIBER	TOW	TOTAL FIBER
60	7	7	14
75	10	5	15
80	15	3	18

4.2.10. Labour Complement

The basis for productivity besides production output, is the Labour Complement which should rather be seen in total than as a departmental comparison.

The reason is that our opinion differs from LENFONO's concerning the definition of direct and indirect as well as their departmental allocation.

All personnel figures incorporate a 15% reserve to off-set absenteeism.

The information and the calculation show, that in the Budapest plant labour shortage is critical, especially if LENFONO accepts our plan for improvement at this plant.

In KOMARON, the situation is reverse, too many people are available for the proposed production.

The following table shows the number of people by plant.

Table: 22 Labour Complement - Number of People

	Komaron	Budapest	Total
Plan	602	259	861
Actual	602	259	861
WERNER	444	255	699

4.2.11. Spinning Room Productivity

The productivity is calculated in

kg per man hour

and % comparison shows the improvement possibilities, if LENFONO decides to follow our recommendations:

Table: 23 Productivity in kg/man hour (Plan 75 = 100%)

	Komaron		Budapest	
	kg	%	kg	%
Plan 75	1,94	100	4,85	100
Actual 75	1,74	90	3,36	69
WERNER	3,00	155	5,53	114

Table: 24 Productivity in kg/man hour (Actual 75 = 100%)

Actual 75	1,74	100	3,36	100
WERNER	3,00	172	5,53	165

When we compare the productivity from KOMARON and BUDAPEST we notice that both spinning rooms have the potential of a major improvement without substantial investments.

Implementing the following recommendations will achieve the WERNER target with the LENFONO plan as an intermediate step:

- Correct job distribution
- Applied job responsibilities
- Correct working methods
- Training program (also to lessen the impact of high labour fluctuation)
- Retraining of all skilled operators
- Correct bonus systems, based on individual performance (part of the large savings could be passed on to the labour force to off-set the higher wage rates in neighbouring industry)
- All machines in good working conditions (application of a tight controlled preventive maintenance system)
- Correct auxiliary equipment to make the most use of handling procedures
- Bringing all processing stages and raw material input to the optimum, in order to achieve an average end-break level of:
  - wet spinning : 20 x Nm
  - dry spinning : 40 x Nm

  expressed in EDPMSPH.

If this programme is carried out, our estimate in spindle allocation ranges from 200 to 500 spindles per spinner (wet/dry).

4.3 FINISHING

4.3.1. General Comments on the three Finishing Plants as a Group Operation

The fact that all finishing plants are preparing cloth for dyeing on jigs indicates that they are operating with processes established many years past.

Moreover, cloth preparation in modern plants for dyeing is carried out on highly productive and efficient preparation machines, and the cloth arrives at the dyehouse ready for dyeing.

Dyeing machines are not used for preparation.

In order to maximize the capacity of the plants, based upon the data submitted, one must conclude that they should be combined into one finishing unit (long term plan). A modern preparation machine could be purchased to supplement the bleaching machines already existing at BUDAKALASZ.

The combined three plants would then have to dye lots of sufficient size to allow the economical dyeing of cloth by the pad-steam continuous Dyeing Process.

All three plants, preparing and dyeing cloth on jiggers with dyeing times of 8 - 14 hrs. must have tremendous problems with shade variations within a dye lot from end to end and side to center. It is unimaginable that a dye lot can stay on a jigger 10 hrs. without telescoping and causing severe side to center shading.

The only cloth being mercerised or treated with caustic soda is the print cloth. Cloth dyed with Indanthrene, Reactive, and Indigosol dyes should also be mercerised before dyeing in order to cut down the quantity and cost of dyestuffs by

30 - 40%

and at the same time to cover the dead cotton.

The pad-steam continuous dyeing machine is equivalent to 30 dye jiggers. Lot sizes of 4.000 meters or more can be economically dyed without shade variation.

4.3.2. Type of Cloth Comparison processed by the three plants

The breakdown of the type of production and amounts processed by each plant is shown in table 25.

The types of goods produced by GYOR and CSILLAGHEGY are similar, while BUDAKALASZ is a printing plant.

Table 25: Meters Produced

PLANT	WHITE	DYED	PRINTED	COATED	OTHER	TOTAL
GYÖR	1,017,400	7,751,000	-	-	1,951,600	11,720,000
CSILLAGHEGY	271,465	4,958,600	-	-	1,064,589	6,294,654
BUDAKALASZ	1,496,100	1,242,520	3,332,650	689,000	1,449,790 *	8,210,060 *
TOTAL	2,784,965	13,952,120	3,332,650	689,000	5,465,979	26,224,714

Table 25 does not include 797.460 meters of greige cloth that is measured only at BUDAKALASZ .

4.3.3. Comparison of Productivity

A Comparison of Productivity in meters/man hour is shown in table 26.

The CSILLAGHEGY plant is the most productive of the three plants. However, to get a more exact comparison, a detailed labour complement is required for each plant to make sure all indirect personnel are included.

Table 26: Productivity - meters/man hour
a)

PLANT	1975 PRODUCTION (Linear Meters)	NUMBER OF EMPLOYEES	PRODUCTIVITY METERS/MAN-HOUR
GYOR	11,720,000 m.	109	50.15
CSILLAGHEGY	6,294,650 m.	38	77.26
BUDAKALASZ	8,210,060 m.	147	26.05

4.3.4. Comparison of Actual Productivity with European Standards

A Comparison of Actual Productivity with European standards is shown in table 26.

Table 26: Comparison of Productivity - Meters/man hour
b)

PLANT	ACTUAL	SHOULD BE
GYOR	50.15	65.00
CSILLAGHEGY	77.26	80.00
BUDAKALASZ	26.05	40.00

4.4. CLERICAL AND NON-PRODUCTION PERSONNEL

4.4.1. Clerical Staff

There are virtually multitudes of persons involved in the processing of information and the creation of records.

Much of the recording which is related to complex payroll and quality demerit systems could easily be reduced in volume.

Many of the clerical assignments appear to be a "make work" project.

This preponderance of clerical staff personnel is a major deterrent to the companies in the achievement of competitive costs. Since these people are working at a very low efficiency, it is psychologically difficult to convince the productive personnel to achieve a high productivity.

4.4.2. Non-Production Personnel

The employee group other than the production personnel and the "in-plant" machinery personnel are excessive. Among these employees are:

- Social service
- Guards
- Fire fighting department
- Machine shop
- Carpenters
- Electricians
- Garage
- Warehouse etc.

Particular circumstances and Government policies dictate the necessity of some of these employees, which brings higher costs than competitive companies in many other countries have to carry.

However, the jobs which are being over-loaded by a tremendous number of employees have not been analysed.

It is quite clear that the isolated mills are at a disadvantage as far as services, such as machining, automotive service etc. are concerned.Additional personnel must be employed for such services. However, even in these mills the manpower is excessive.

We strongly recommend that the work to be accomplished and the personnel required to fulfil these functions be thoroughly studied with a view to diminishing this excessive burden on the cost of the operations of each plant.

4.5. EXECUTIVE SUMMARY

The production programs are generally less complex than in comparative international companies. However, since the companies are all part of one large group, there could be an improvement in productivity through rationalisation of the production programs.

Clearly, it would be advantageous from a country-wide point of view to have some mills specialised on specific fabrics.

The basic problem which each company faces is, in order to meet particular targets of profit performance,the necessity to insert a degree of simplification.

It is recommended first that the criteria for measurement of performance of the mills be altered so that both the specialised and the streamlined mills have an equal opportunity to show attractive results.

Secondly it is recommended that a planning committee of two or three industrial engineers be assigned the task of allocating the products so that the mills can gradually, season by season, be more and more rational in their production program.

Our recommendation would be to divide the existing three weaving mills into

- two standard mills, producing standard goods with long production runs and subsequently on a very high productivity level

- one flexible mill, producing short cycled goods with short runs, servicing the cyclical fashion market with an appropriate productivity level.

The same thinking would apply to the spinning plants:

- one standard plant
- one flexible plant.

The two above mentioned recommendations can be accomplished on a short time basis (approx. 18 months) without having to make any major investments. Needless to say that part of the investment would go to relocating machinery.

Although we know from General Director Mr. Beck there is no money available at this time one should definitely consider to combine the three finishing plants into one unit. When short or long term investments have to be made in one of the finishing departments, the above should be considered.

Thirdly it is recommended to analyse the production program in each company in order to rationalise and produce the goods which are most advantageous to the company's productivity.

There are instances where five different yarns of virtually the same count and twist are being produced in the same spinning mill. No Western mill would entertain such a costly procedure.

In another instance, a mill is producing numerous fabrics which are not suitable for their machine park, when by producing heavier yarns and fabrics the mill would be in much better balance.

4.5.1. Efficiency and Productivity

With the wages in Hungary, (see Labour Cost Comparisons), the industry should be able to compete successfully, cost-wise, with any other developed or developing country. However, in order to do so, a high labour productivity must be achieved.

Furthermore, the axiom is repeated that only a high productivity, highly efficient industry can produce high quality goods. Excessive labour contributes to lower quality goods and generally lower efficiency of equipment.

The industry must be efficient from spinning through to making-up in order to compete in the markets which have been recommended.

There is no question that the Hungarian Linen Industry can become efficient and highly productive, but in order to do so, all employee management down to production works must be trained and attuned to the international competitive situation and the markets.

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

TABLE 27 - International Labour Cost Comparisons

LABOR COST COMPARISONS

ITEM	U.S.A.	CANADA	BELGIUM	HOLLAND	FRANCE - N.	FRANCE - S.	GERMANY - N.	GERMANY - S.	UNITED KINGDOM	IRELAND	ITALY	DENMARK	NORWAY	SWEDEN	FINLAND
1. AVG. COST PER OPERATOR HOUR (3 shift basis)															
without charges - local currency	3.65	4.22	173.5	10.61	11.98	11.56	11.06	9.92	1.49	1.33	1945	30.15	[illegible]	20.25	11.65
charges - local currency	.75	1.01	130	7.43	6.98	6.70	6.52	5.65	.33	.34	2380	9.01	8.5	10.37	5.59
total cost - local currency	4.40	5.23	303.5	18.04	18.96	18.26	17.58	15.57	1.82	1.67	4325	39.16	[illegible]	30.62	17.24
rate of exchange - US $ 1	-	1.06	36.7	2.50	4.95	4.95	2.40	2.40	.58	.58	840	5.8[illegible]	5.3	4.25	3.77
total cost - $ US	4.40	4.92	8.27	7.28	3.83	3.69	7.32	6.48	3.14	2.88	5.15	6.6[illegible]	6.21	7.20	4.57
2. OPERATOR HOURS															
normal operator hours per day	8	8	8 & 7.3	8	8	8	8	8	8	8	7.5	8	7.6	8	8
normal operator hours per week	40	40	40/ 36.5	40	40	40	40	40	37.5/ 40	40	37.5	40	38	40	40
planned operator days per year	247	234	230	241	234	234	227	227	236	237	225	230	[illegible]	233	236
planned operator hours per year	1976	1872	1840	1928	1872	1872	1816	1816	1888	1896	1687.5	1840	[illegible]	1864	1838
3. OVERTIME %															
over 8 hours	-	50	25/ 50	50	25	25	25	25	25	25	-	40	[illegible]	33	50
[illegible]	50	50		100	50	50	-	-	100	100	-	80	[illegible]	-	100
[illegible] and holidays	50	100	100	100	50	50	50/ 100	50/ 100	100	100	-	80	[illegible]	-	250
4. SHIFT PREMIUM %															
[illegible] %		2	6	12.5	-	-	15/ 20	15/ 20	11		-	9			
[illegible] %	[illegible]	4	20.8	18.3	30	30	25/ 30	25/ 30	20		40	15		-	[illegible]

SECTION 1

winter 1976-77

IRELAND	ITALY	DENMARK	NORWAY	SWEDEN	FINLAND	PORTUGAL	GREECE - N.	GREECE - S.	TURKEY
1.33	1945	30.15	[illegible]	20.25	11.65	29.77	41.7	59.81	16.10
.34	2380	9.01	8.5	10.37	5.59	15.26	22.8	38.69	7.31
1.67	4325	39.16	32.9	30.62	17.24	45.03	64.5	98.50	23.41
.58	840	5.86	5.3	4.25	3.77	31.10	36.6	36.6	16.00
2.88	5.15	6.68	6.21	7.20	4.57	1.45	1.76	2.69	1.46
8	7.5	8	7.6	8	8	7.5	7.5	8	8
40	37.5	40	38	40	40	40.8	48	48	45
237	225	230	234	233	236	275	291	300	300
1896	1687.5	1840	[illegible]	1864	1888	2062.5	2182.5	2400	2400
25	-	40	[illegible]	33	50	25	50	50	50
100	-	80	[illegible]	-	100	-	-	-	50
100	-	80	[illegible]	-	250	100	75	75	100
	-	9		[illegible]	[illegible]	6.24	-	-	-
	[illegible]	15		-	[illegible]	[illegible]	[illegible]	25	-

TUNISIA	EGYPT	BRAZIL - S. P.	BRAZIL - N.	BRAZIL - S.	VENEZUELA	MEXICO	KOREA	PAKISTAN
.282	.1250	10.50	4.30	4.78	6.48	26.1	-	1.46
.100	.275	7.19	2.94	3.29	4.39	18.1	-	1.31
.382	.1525	17.69	7.24	8.07	10.87	44.2	-	2.77
.43	.42	12	12	12	4.28	20	-	9.90
.89	.36	1.47	.61	.67	2.54	2.21	.45	.29
8	8	8	8	8	7.6	8	8/ 12	8
48	48	48	48	48	46	48	-	48
306	340	303	303	303	279	264	300	264
2448	2720	2424	2424	2424	2120.4	2304	-	2112
75	25	25	25	25	60	100	0	100
-	NA	100	100	100	60	-	-	100
-	100	100	100	100	100	100	-	100
-	-	-	-	-	10	14.3	-	-
50 night	25	38	38	38	20	25.7	-	-

SECTION 2

5.0 TRAINING

In order to progress rapidly, which the Hungarian linen industry should and can, the personnel requires additional training.

There are qualified persons scattered throughout the industry at all levels, but in an insufficient number to raise the level of efficiency, productivity, quality, marketing serviceability and management talent by their own efforts within a relatively short and vital period of time.

It must be recognised that the personnel in the industry have the capability and talent to achieve quality comparable to the industry in Western Europe.

The ability is latent, however, and must be developed. The development can only come from exposure to the methods and procedures of the competitive industry.

The manner in which to obtain these methods and procedures is to receive this exposure via training at home on the job.

The most urgent requirement of the Hungarian linen industry is training of personnel from top management down to the production workers. This requirement supersedes all others including equipment.

Proper employee training is a high priority recommendation. Such training should take place on the mill premises and be conducted by instructors who are themselves properly trained.

5.1. LABOUR TRAINING

In spite of the low labour productivity LENFONO has the capacity to learn and become as productive as the international competition.

The textile workers in Hungary are capable of achieving productivity ratings equivalent to other developed countries. In extenuating circumstances where employees are affected medically, the ratings would be rather lower. However, taking into account the various factors which affect the efficiency of the worker, the Hungarian textile worker can achieve a productivity level which would be comparable to the other Western countries.

5.2. SUPERVISORY STAFF TRAINING

Supervisory personnel who are an extremely important group in the operations of a mill have been almost completely neglected as far as training is concerned.

Supervisors are the vital link between management and production personnel.

The number of persons assigned to middle management supervision work is extremely high. If the addition of extra supervision resulted in high efficiency, high productivity of machines, high productivity of workers, high quality of product, then the extra supervision might be justified.

The reverse is actually the result. The productivity, efficiency and quality are low.

This unfortunate result is mainly due to lack of proper training of supervisors and also due to:

- the overlapping of authority and responsibilities
- too many supervisors
- lack of responsibility commensurate with the authority and vice versa.

<u>Supervisor training should be given a high priority.</u>

5.3. RECOMMENDED TRAINING PROGRAMS

These two groups, labour associated with production, and supervisors should receive special training. It is strongly recommended that qualified textile training professionals should be employed to set up:

- Modern scientific labour training systems in the mills, staff training officers should be trained to continue these systems

- Modern scientific training programmes for supervisors and to train selected staff engineers in the proper application for the continuance of these programs.

WERNER has developed an A.M.P.S. (Analytical Method Productivity System) training program for the training of textile operators and supervisors. This system has been tested and proven for many years in textile mills across the world, it is this exposure that supports our confidence in this service.

6.0. PRODUCTION PLANNING AND SCHEDULING

We recommend the implementation of a modern practical production planning and coordination technique which will give significicant improvement toward:

- Maintaining optimum plant utilization by means of coordinating balanced levels of production in all departments and a smooth flow of work within the individual factories and from factory to factory

- Keeping inventories at economic optimum levels

- Allowing internal flexibility for corrections and re-uses at minimum disturbance

- Processing economical lot quantities.

6.1. REORGANISATION OF THE VARIOUS PRODUCTION PLANNING FUNCTIONS WITHIN THE GROUP

The various planning and coordinating functions, the general planning department and the local factory planning departments should be reorganized. Specific attention must be given to a proper "top-down and bottom-up" distribution of responsibilities, feedback communications and coordination procedures.

A division of all tasks in terms of"capacity planning" as opposed to "machine scheduling" should be installed.

In order to allow the central planning department to pay full attention to coordination, capacity guidance and central controls, and to enable the local factory planning departments to process incoming orders in the best possible manner.

IMPLEMENTATION OF A DIRECT HORIZONTAL PRODUCTION PLANNING AND MATERIAL FLOW CONCEPT BETWEEN THE MAIN MANUFACTURING UNITS

It is absolutely essential for the personnel involved in production planning and coordination to have a clear understanding of the position, importance and function of the planning department, which has to become a "service department".

The information must flow horizontally between the departments and manufacturing units.

Due to the complex product mix and the various manufacturing units being far apart geographically, the direct communication system must contribute day-to-day adaptations of schedules, unexpected interferences and avoidance of bottlenecks.

6.2. INSTALLATION OF A PROPER PRODUCTION PLANNING SYSTEM FOR THE FINISHING PLANTS

Production planning in a finishing plant differs from spinning and weaving plants in many respects. Processing time periods are short and daily follow-up is more important.

We therefore strongly recommend to revise the local production planning system.

This should be preceded by the introduction of machine standards for the various processes involved. The application and control of machine standards will make it possible for LENFONO to decide on capacity potential per process and to derive the data needed for production planning.

The system itself should take advantage of simple but effective visual aids such as planning boards and graphs, particularly for those finishing processes which determine the bottleneck process steps.

Those visual aids will also serve the purpose of controlling late deliveries and will signal major deviations from expected output and efficiency.

7.0. WASTE CONTROL

With ever increasing raw material prices and since

ca. 50 - 60%

of the total product cost is taken up by raw material, we strongly recommend the installation of a

WASTE CONTROL PROGRAM.

Control over waste as is practised in the Western European and North American mills is unknown to LENFONO. The company is losing thousands of valuable fibre annually.

In other words, the excessive waste could supply the raw material for one entire product line.

The control over waste could be developed in a relatively short period of time.

There is no other item by which LENFONO could save so much in an equal period of time.

According to our experience in the textile business, this program is relatively easy to install and very essential towards improving the overall cost situation of LENFONO.

8.0. QUALITY CONTROL

Elaborate quality control laboratories are installed and numerous quality checks are being made on yarn, fabric and finished goods in all the companies. However, their use to safeguard the quality is virtually non-existent in most companies. The concept of quality control is not fully appreciated or applied.

Export quality is checked at a point immediately prior to shipping, by the company's control department. This at least ensures that goods shipped meet the contracted standards, but the whole issue of quality control means to safeguard a much greater output of first class material in order to increase the export portion of LENFONO.

Efficiency and quality are inexorably bound together and it is a fact that currently both factors are too low to meet the standards of export markets.

Re-processing an order to meet a prescribed standard is bound to be time-wasting and in the event of a tight delivery schedule could well cause the order to be cancelled. The control which is exercised now is necessary but real control should be carried out during production, making final inspection virtually a formality.

Only when the Hungarian textiles are of high quality they will be sold in substantial volume in the E.E.C., with the exception of some selected production for the home market.

The present quality level throughout the mills is very low.

Suggested Program

- Installation of a strict yarn acceptance control. This control is to safeguard the characteristics of the yarn going to weaving as well as an information feedback to spinning.

- Cleaning up the plant and training towards good house-keeping.

- Installation of a Process Control System to ensure proper conditions during processing.

- Review of cloth-inspection procedures, physically as well as statistically.

9.0. MILL MANAGEMENT CONTROL - INCENTIVE SYSTEMS

To establish in LENFONO an improved system of

MANAGEMENT CONTROLS

which will form the basis for revised methods of performance measurement and incentive payment.

These controls should be used by LENFONO Management to achieve the improvements in productivity calculated in our mill balances.

The essential philosophy of this system is the generation of a minimum of effective information in the shortest possible time.

This information is intended to identify standard situations and initiate immediate corrective managerial action on the principle of management by exception.

The systematic recording of activity is also fundamental to this approach and this encourages a permanent effort for improvement based on a continuous monitoring of standards and trends.

This approach to the measurement and monitoring of performance provide a realistic basis for effective incentive applications.

In our opinion the object of an incentive scheme is to reward employees in proportion to their skill and effort. The scheme must be designed to accomodate variations in standards and conditions. These have to be identified and measured with compensating adjustments being implemented on a continuous basis.

We hope this meets the requirements of Mr. Beck and we feel that a well-designed and regulated incentive scheme will act as a stimulus to supervision in the maintenance of standard conditions and the control of off standards.

We recommend as a first stage, the development and implementation of the following controls:

- Daily production reports and variances for each operation
- Daily waste reporting by source
- Preventive maintenance scheduling and equipment standard rating procedures
- Quality controls on both incoming raw materials and products in progress.

Each of these controls would be set up to ensure that off standard situations are identified and corrective action initiated.

Comparative data for variances must be developed as necessary.

9.1. INCENTIVES

The initial stage of all incentive schemes is an evaluation of job loads - these are developed from frequency and time checks collected in the plant.

Measurement of performance is derived from the Management Controls.

10.0. ACTION PLANS

10.1 CORPORATE ACTION CATALOGUE

- Decisions on the future concept
- Team to develop detailed plans for implementation of a critical path method for reorganisation and reconstruction
- Budgeting the detailed reconstruction cash needs of a critical path method
- Decision on phases of reconstruction, its timing and timetable. New future planning of total concept. Assign task force to a corporate basis.

10.2. TECHNICAL ACTION CATALOGUE

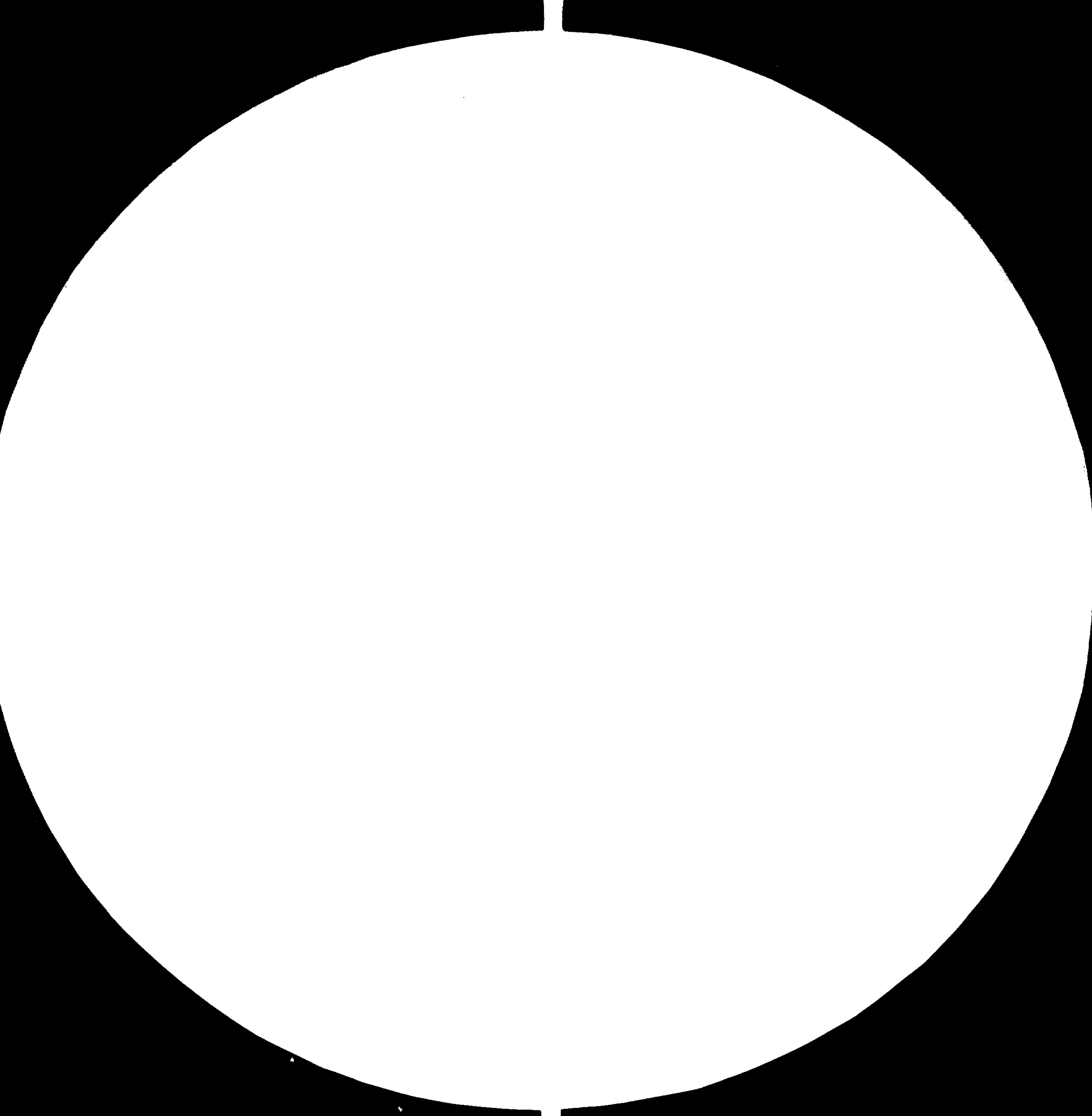
- Defining the new functional context of the organisation
- Specify product groups and lot sizes, machine park and location
- Developing the detailed plan for reorganising the plants, "stable" and "flexible" production units
- Preparation for the reorganisation of facilities
- Preparation for the optimization of product costs
- Preparation for the optimum staff utilization
- Preparation of all physical changes, timing and time schedules

10.3 ACTION PLAN TO IMPROVE THE PERFORMANCE OF THE EXISTING FACILITIES

- Instigate modern scientific training programs for the labour force
- Instigate modern scientific training programs for the supervisory personnel
- Install technical control, quality control, waste control and maintenance control programs and train selected engineering staff in the function and technique of these disciplines.
- Application of strict Mill Control Systems and standards to arrive at the proposed productivity increases
- Install systems for production planning and machine scheduling and machine loading
- Initiate compatible cloth-inspection procedures.

Most important, however, is intensive on the job training of personnel in key functions to ensure an adequate continuation of all programs and systems which will have to be built up.

APPENDICES



WEAVING

TABLE 28 - Machine Park 1975 - 1977 / Budakalasz

1975 Looms in Operation as stated in Mill Balance W-103				1977			
Name	No.	Width	ppm	Make	No.	Width	ppm
AT - 120	50.15	110	183		32	116	190
AT - 175	61.84	165	154		32	172	160
SzTB	49.56	206	200		34	154	205
Picanol S	8.04	172	176		19	172	170
Picanol S-2	1.78	172	164		1	172	180
4/4 rev.	14.94	95	132				
4/4 rev. jacq.	1.54	95	141				
AT - 175 jacq.	29.22	165	129		36	172	130
6/4 jacq.	6.30	160	127				
				SzTB Jacquard	16	154	205
Circ. weave	11.99	-	116		11	-	74
	1.08	-	288		4	-	90
TOTAL	236		171		185		174
Pocsay Cooper.	28		140		52	106-109	140

TABLE 29 - Machine Park 1975 - 1977 / Györ

1975 Looms in Operation as stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT - 100	207	95	203		240	95	200
AT - 175	39	165	148		40	172	160
Picanol	29	175	161		20	172	170
Raep	22	93	169				
Rascher	69	106	169.7		84	96	170
Rascher	42	96	175		48	96	170
				Sz TB-216	48	210	205
TOTAL	408	109	18447	TOTAL	480	116	187

TABLE 30 - Machine Park 1975 - 1977 / Csillaghegy

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT - 100	40	95	195	AT - 100	24	96	200
AT - 120	14	115	168				
AT - 175	18	165	147	AT - 175	12	172	160
Pic - 132	36	127	191				
Pic - 176	54	165	182	Pic - 176	82	172	180
	162	135	182		118	156	182

TABLE 31 - Machine Park 1975 - 1977 / Komaron

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT - 120	7.9	116	183		23	116	190
AT - 175	35.4	165	155		68	172	160
Mech.	22.4	-	120				
Mech.	18.9	130	160				
				Mech.	8	170	140
TOTAL	85		149	TOTAL	99	159	165

TABLE 32 - Summary of Mill Balance / Budakalasz - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine Hours/year	6432	6432	6432	6432
Total no. of looms	335	335	335	185
Looms in operation	236	236	236	185
Average ppm/loom	171.15	171.15	171.15	174
Picks/24 hrs. 100% (10^6)	58.164	58.164	58.164	46.354
Picks/24 hrs. actualx(10^6)	40.067	26.887	46.996	37.454
Plant efficiency %	68.9	46.2	80.8	80.8
Machine efficiency %	-	60.8	94	94
Operator efficiency %	-	76.0	86	86
Product mix Ø ppcm	13.98	13.98	13.98	13.98
Ø width cm	112	112	112	112
Production m x 10^3/year	7681	5149	9009	7180
sqm x 10^3/year	8585	5755	10.069	8042
Production comparison %	100	67	117	94
Loom stops: warp/M ends/10^4 p	1.2	1.2	.4	
weft/10^4 picks	2.6	2.6	1.3	
mech/10^4 picks	12.9	12.9	2.0	
Ca. loom stops/loom hour	-	9	3.7	
Avg. no. of looms/weaver	-	5.3	12	12
Loom beam length m Ø	-	656	656	-
Ends/beam Ø	-	2986	2986	
Warp changes/24 hrs. Ø	-	29	51	41
Piece length m Ø	-	86	86	
Pieces/24 hrs. Ø	-	223	391	312
Yarn consumption: warp to	-	1080	1866	1487
weft to	-	916	1575	1255
total to	-	1996	3441	2742
Labour complement tot. pers.	-	374	349	294
Productivity m/work. Hr.	-	6.42	12.3	11.24
comparison %	-	100	188	175

TABLE 33 - Summary of Mill Balance / Györ - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine Hours/year	6432	6432	6432	6432
Total no. of looms	453	453	453	480
Looms in operation	408	408	408	480
Average ppm/loom	184.47	184.47	184.47	187
Picks/24 hrs. 100% (10^6)	108.3798	108.3798	108.3798	129.2544
Picks/24 hrs. actual (10^6)	80.0777	74.7840	92.6647	110.5125
Plant efficiency %	74	69	85.5	85.5
Machine efficiency %	-	85	95	95
Operator efficiency %	-	81	90	90
Product mix Ø ppcm	17.05	17.05	17.05	17.05
Ø width cm	97.4	97.4	97.4	97.4
Production m x 10^3/year	12.587	11.859	14.565	17.371
sqm x 10^3/year	12.220	11.559	14.187	16.919
Production comparison %	100	94	116	138
Loom stops: warp/M ends/10^4 p	-	1.05	.4	-
weft/10^4 picks	-	4.12	1.2	-
mech/10^4 picks	-	4.38	.6	-
Ca. loom stops/loom hour	-	.8	2.7	-
Avg. no. of looms/weaver	-	7.6	12	12
Loom beam length m Ø	-	920	920	920
Ends/beam Ø	-	2528	2528	2528
Warp changes/24 hrs. Ø	-	48	59	71
Piece length m Ø	-	108	108	108
Pieces/24 hrs. Ø	-	410	503	600
Yarn consumption: warp to	-	1623	1993	2377
weft to	-	1423	1748	2085
total to	-	3046	3741	4462
Labour complement tot. pers.	-	708	536	643
Productivity m/work. Hr.	-	7.81	12.67	12.60
comparison %	-	100	162	162
				Short of 1000 ring spindles

TABLE 34 - Summary of Mill Balance / Cooperation Pocsaj - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
Looms in operation	28	28	28	52
Average ppm/loom	140	140	140	140
Picks/24 hrs. 100% (10^6)	5.6448	5.6448	5.6448	10.4832
Picks/24 hrs. actual (10^6)	-	1.4609	4.5610	8.4704
Plant efficiency %	-	26	80.8	80.8
Machine efficiency %	-	34	94	
Operator efficiency %	-	76	86	-
Product mix Ø ppcm	-	12.63	12.63	12.63
Ø width cm	-	134.5	134.5	134.5
Production m x 10^3/year		310	967	1797
sqm x 10^3/year		417	1302	2417
Production comparison %		100	312	580
Loom stops: warp/M ends/10^4 p		.9		
weft/10^4 picks		3.3		
mech/10^4 picks		14.6		
Ca. loom stops/loom hour		4.3		
Avg. no. of looms/weaver		-		
Loom beam length m Ø		630	630	
Ends/beam Ø		1816	1816	
Warp changes/24 hrs. Ø		2	6	11
Piece length m Ø		86	86	
Pieces/24 hrs. Ø		13	42	78
Yarn consumption: warp to		68	213	396
weft to		73	228	424
total to		141	441	820

TABLE 35 - Summary of Mill Balance / Csillaghegy - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine Hours/year	6432	6432	6432	6432
Total no. of looms	176	176	176	118
Looms in operation	162	162	162	118
Average ppm/loom	182	182	182	182
Picks/24 hrs. 100% (10^6)	42.482	42.482	42.482	30.925
Picks/24 hrs. actual (10^6)	32.047	32.047	34.325	24.988
Plant efficiency %	75.4	75.4	80.8	80.8
Machine efficiency %	93	93	94	94
Operator efficiency %	81	81	86	86
Product mix Ø ppcm	16.92	16.92	16.92	16.92
Ø width cm	115	115	115	115
Production m x 10^3/year	5075	5075	5437	3958
sqm x 10^3/year	5833	5833	6252	4552
Production comparison %	100	100	107	78
Loom stops: warp/M ends/10^4 p	-	.86	.4	-
weft/10^4 picks	-	2.08	1.0	-
mech/10^4 picks	-	1.51	1.2	-
Ca. loom stops/loom hour	-	5.0	3.0	-
Avg. no. of looms/weaver	-	7.2	13	13
Loom beam length m Ø	-	1057	1057	-
Ends/beam Ø	-	2960	2960	-
Warp changes/24 hrs. Ø	-	18	19	14
Piece length m Ø	-	72	72	-
Pieces/24 hrs. Ø	-	263	282	205
Yarn consumption: warp to	-	1073	1148	837
weft to	-	792	847	618
total to	-	1865	1995	1455
Labour complement tot. pers.	-	320	244	198
Productivity m/work. Hr.	-	7.40	10.39	9.3
comparison %	-	100	140	126

TABLE 36 - Summary of Mill Balance / Cooperation Szebszard, Bebest - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Total no. of looms	58	58	58	-
Looms in operation	50	50	50	-
Available loom hrs./day	944	944	944	-
Average ppm/loom	136	136	136	-
Picks/24 hours 100% x 10^6	7.803	7.803	7.803	-
Picks/24 hours actual c 10^6	2.340	2.340	4.994	-
Plant efficiency %	-	30	64	-
Machine efficiency %	-	-	85	-
Operator efficiency %	-	-	75	-
Product mix: ø ppcm	-	13.32	13.32	-
Ø width cm	-	138	138	-
Production: m x 10^3/year	-	472	1.005	-
sqm x 10^3/year	-	654	1.386	-
Production comparison %	-	100	213	-

TABLE 37 - Summary of Mill Balance / Komaron - Weaving

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine Hours/year	6432	6432	6432	6432
Total no. f looms	100	100	100	99
Looms in operation	85	85	85	99
Average ppm/loom	149	149	149	165
Picks/24 hrs. 100% (10^6)	18.2376	18.2376	18.2376	25.5224
Picks/24 hrs. actual (10^6)	11.4528	10.3250	14.7360	19.0061
Plant efficiency %	63	57	80.8	80.8
Machine efficiency %	-	94	94	-
Operator efficiency %	-	61	86	-
Product mix Ø ppcm	14.05	14.05	14.05	14.05
Ø width cm	126	126	126	126
Production m x 10^3/year	2185	2035	2811	3625
sqm x 10^3/year	2752	2571	3542	4568
Production comparison %	100	93	129	166
Loom stops: warp/M ends/10^4 p	-	3.0	1.0	-
weft/10^4 picks	-	3.9	1.3	-
mech/10^4 picks	-	4.3	.5	-
Ca. loom stops/loom hour	-	7	3	-
Avg. no. of looms/weaver	-	4.9	12	12
Warp beam length m Ø		736	736	-
Ends/beam Ø		2121	2121	-
Warp changes/24 hrs. Ø		10	14	18
Piece length m Ø		81	81	-
Piece doffs/24 hrs. Ø		94	129	167
Yarn consumption: warp to		360	496	641
weft to		394	544	702
total to		754	1040	1343
Prod. split: GYOR mx10^3		124	172	-
BUDAKAL. mx10^3		1831	2539	-
CSILLAG. mx10^3		80	111	-
Labour complement tot. pers.		174	126	151
Productivity: m/work. hours		5.45	10.41	11.20
comparison %		100	191	105

TABLE 38 - Summary of Yarn Consumption / Budakalasz - Weaving

	According to Mill Balance W-100 - 103	WERNER * Proposal 1	WERNER * Proposal 2
Warp			
- Cotton and Blends	859	1502	1198
- Linen	73	127	102
- Flax	27	47	38
- Synthetics	117	182	163
	1076	1858	1501
Weft			
- Cotton and Blends	91	160	127
- Linen and Blends	196	344	273
- Flax and Blends	263	459	367
- Synthetics	366	636	510
	917	1599	1277

* Without Pocsaj

TABLE 39 - Summary of Yarn Consumption / Györ - Weaving

	According to Mill Balance W-100 - W-103	WERNER Proposal 1	WERNER Proposal 2
Warp			
- Cotton and Blends	1554	1909	2276
- Linen	48	59	70
- Flax	21	25	31
- Synthetics	-	-	-
	1623	1993	2377
Weft			
- Cotton and Blends	367	451	538
- Linen	710	872	1040
- Flax	346	425	507
- Synthetics	-	-	-
	1423	1748	2085

TABLE 40 - Summary of Yarn Consumption / Csillaghegy - Weaving

		According to Mill Balance W-100 - W-103	WERNER * Proposal 1	WERNER * Proposal 2
Warp	- Synthetics	49.875	53.366	38.849
	- Cotton	1.022.706	1.094.296	796.620
	Total	1.072.581	1.147.662	835.469
Weft	- Synthetics	29.453	31.515	22.942
	- Cotton	511.[illegible]80	547.818	398.799
	- Linen	135.739	145.241	105.732
	- Tow	114.481	122.495	89.173
	Total	791.653	847.069	616.646

* Without cooperation

TABLE 41 - Summary of Yarn Consumption / Komaron - Weaving

		According to Mill Balance W-100 - W-103	WERNER Proposal 1	WERNER Proposal 2
Warp:	Linen and Blends	80.324	110.847	-
	Cotton and Blends	279.771	385.606	-
	Total	360.095	496.453	640.214
Weft:	Linen and Blends	83.096	114.671	-
	Tow	281.000	387.780	-
	Cotton	24.838	34.277	-
	Synthetics	5.350	7.383	-
	Total	394.284	544.111	701.674
Weft:	Own spun	364.096	502.452	647.950
Warp:	Own spun	80.324	110.847	142.946
	Total	444.420	613.299	790.896
Weft:	Bought	30.188	41.660	53.724
Warp:	Bought	279.771	385.606	497.268
	Total	309.959	427.266	550.992
	TOTAL	754.379	1.040.565	1.341.888

SPINNING

TABLE 42 - Summary of Mill Balance / Komaron - Dry Spinning

		Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames		3	3	3
No. of spindles		300	300	300
Spindle hours/year available		1.929.600	1.929.600	1.929.600
Machine:	Spindle RPM max.	3000	3000	3000
	Ø Speed	2450	2450	2600
Plant efficiency		74	64	78
Product mix:	Tow %	100	100	100
	Nm Ø	2.75	2.75	2.75
	hi-lo Nm	6-1.75	6-1.75	6 1.75
	T/M	174	174	174
	α m	105	105	105
Production:	tons/year	440	382	490
	comparison %	100	87	111
Ø cops weight in gr		-	203	203
Ø input weight in gr		-	2981	2981
Cops to doff/8 hours		-	2.340	3000
Input changes 8/hours		-	159	204
End-breaks/M spindles/hour		-	1142	400
Ø spindles/spinner		-	100	200

TABLE 43 - Summary of Mill Balance / Komaron - Wet Spinning

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of working days/year	268	268	268
Working hours/day	24	24	24
No. of spinning frames	32	32	32
No. of spindles	7304	7304	7304
Spindle hours/year available	46.979.328	46.979.328	46.979.328
Machine: Spindle RPM max.	6585	6585	6585
Ø Speed		3890	4300
Plant Eff. %	81	73.2	84
Product mix: Linen %	48	48	48
Linen/Synth. %	27	27	27
Tow	25	25	25
Nm Ø	12.26	12.26	12.26
Hi-lo	21-6	21-6	21-6
T/M	351	351	351
α_m	100	100	100
Production: tons/year	2064	1866	2366
comparison %	100	90	115
Ø cops weight in gr	159	159	159
Ø bobbin weight in gr	1320	1320	1320
Cops to doff/8 hours	-	14.600	18.508
Bobbin to creel/8 hours	-	1.760	2.229
End break/M spindles/hour	-	682	300
Ø spindles/operator	-	166	600

TABLE 44 - Summary of Mill Balance / Komaron - Wet + Dry Spinning

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames	35	35	35
No. of spindles	7604	7604	7604
Spindle hours/year available	48.910	48.910	48.910
Expected gr/spindle hour	-	-	-
Average Nm	10.7	10.6	10.6
Production: tons/year	2504	2248	2856
comparison %	100	90	114
Labour complement persons	602	602	444
Productivity: Kg/work. hour	1.94	1.74	3.00
comparison %	100	90	155
" %	-	100	172

TABLE 45 - Summary of Mill Balance / Budapest - Dry Spinning

	Prod. Acc. To Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames	8	8	8
No. of spindles	1554	1554	1554
Spindle hours/year available	9.995.328	9.995.328	9.995.328
Machine: Spl - RPM max.	8000	8000	8000
Ø/run.	4800	4800	5500
Plant efficiency %	76.6	72.6	80.0
Product Mix: Linen/Synth. %	1	1	1
Tow %	43	43	43
Tow/Synth. %	8	8	8
Synthetics %	48	48	48
Nm average	7.0	7.0	7.0
High-low	15-5	15-5	15-5
T/M	257	257	257
αm	97	97	97
Production: Tons/year	1229	1165	1467
Comparison in %	100	95	119
Ø cops weight in gr	350	-	350
Ø bobbin weight in gr	12.000	-	12.000
Cops to doff/8 hours	-	-	5.213
(Bobbin) to creel/8 hours	-	-	152
EDP M SPH	-	992	300
Ø spindles/spinner	-	205	650

TABLE 46 - Summary of Mill Balance / Budapest - Wet Spinning

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of working days/year	268	268	268
Working hours/day	24	24	24
No. of spinning frames	22	22	22
No. of spindles	4.796	4.796	4.796
Spindle hours/year available	30.847.872	30.847.872	30.847.872
Machine: Spl - RPM max.	-	5.472	5.472
Ø run.	-	4.500	4.900
Plant efficiency in %	83.2	43	86
Product Mix: Linen %	19	19	19
Linen/Synth. %	62	62	62
Tow	17	17	17
Tow/Synth. %	2	2	2
Nm average	14.39	14.39	14.39
High-low	30-8	30-8	30-8
T/M Ø	373	373	373
α m	98	98	98
Production: tons/year	1327	685	1453
compared in %	100	52	109
Ø cops weight in gr	-	139	139
Ø bobbin weight in gr	-	1303	1303
Cops to doff/8 hours	-	6130	13.000
Bobbins to creel/ 8 hours	-	654	1[illegible]7
EDP M SPH	-	1465	300
Ø spindle/spinner	-	135	600

TABLE 47 - Summary of Mill Balance / Budapest - Gill Spinning

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of frames	1	1	1
No. of spindles	80	80	80
Spindle hours available	514.600	514.600	514.600
Expected gr/spindle	265	-	-
Average Nm	1.3	1.3	1.3
Production: tons/year	136.5	15.6	104
comparison in %	100	11	76

TABLE 48 - Summary of Mill Balance / Budapest - Wet + Dry Spinning

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spindles No. of frames	6.430 31	6.430 31	6.430 31
Spindle hours avail. x (10^3)	41.358	41.358	41.358
Expected gr/spindle hour	65.1	45.1	73.6
Average Nm	10.4	9.7	10.3
Production: tons/year comparison in %	2.692 100	1865,6 69	3.024 112
Labour complement of person	259	259	255
Productivity: kg/work. hour comparison %	4.85 100	3.36 69 100	5.53 114 165

TABLE 49 - Spinning Production / Komaron

Wet Spinning	Plan = 100% = 2.064 tons Actual 1975 = 90% = 1.866 tons, Nm 12.26 WERNER 1 = 115% = 2.366 tons, Nm 12.26
Dry Spinning	Plan = 100% = 440 tons Actual 1975 = 87% = 382 tons, Nm 2.75 WERNER 1 = 111% = 490 tons, Nm 2.75
Summary	Plan = 100% = 2.504 tons, Nm 10.7 Actual 1975 = 90% = 2.248 tons, Nm 10.6 WERNER 1 = 114% = 2.856 tons, Nm 10.6

TABLE 50 - Spinning Production / Budapest

Wet Spinning	Plan	= 100%	=	1327 tons
	Actual 1975	= 52%	=	685 tons, Nm 14.39
	WERNER 1	= 109%	=	1453 tons, Nm 14.39
Dry Spinning	Plan	= 100%	=	1229 tons
	Actual 1975	= 95%	=	1165 tons, Nm 7.0
	WERNER 1	= 119%	=	1467 tons, Nm 7.0
Gill Spinning	Plan	= 100%	=	136,5 tons
	Actual 1975	= 11%	=	15,6 tons, Nm 1.3
	WERNER 1	= 76%	=	104.0 tons, Nm 1.3
Summary	Plan	= 100%	=	2692 tons, Nm 10.4
	Actual 1975	= 69%	=	1866 tons, Nm 9.7
	WERNER 1	= 112%	=	3024 tons, Nm 10.3

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME I OF VI

B U D A K A L A S Z

1.1 Weaving

1.2 Finishing

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL
Brussels - New York

1977

WERNER ASSOCIATES INC. 1450 BROADWAY NEW YORK, NEW YORK 1001? TELEPHONE (212) 565-1760 TELEX 2233?? CABLE: WERNERCONS

TABLE OF CONTENTS

		Page
1.0	BUDAKALASZ	1.
1.1	Weaving	1.
1.1.1	Location	1.
1.1.2	Buildings and Lay-out	1.
1.1.3	Process Flow and Material Handling	1.
1.1.4	Machine Obsolescence	2.
1.1.5	Machine Improvements	2.
1.1.6	Machine Park 1975-1977	3.
1.1.7	Summary Mill Balance	4.
1.1.8	Summary of Labour Complement	7.
1.1.9	Notes and Explanations to Substantiate the Summary of Mill Balance and Labour Complement	8.
1.1.9.1	General	8.
1.1.9.2	Number of Looms	8.
1.1.9.3	Efficiencies	9.
1.1.9.4	BUDAKALASZ Weave-Room Efficiency	10.
1.1.9.5	Operator Efficiency	11.
1.1.9.6	Plant Efficiency	11.
1.1.9.7	Production	12.
1.1.9.8	WERNER Proposal 2	12.
1.1.9.9	Loom Assignemnt	13.
1.1.9.10	Estimation of Number of Looms per Weaver	14.
1.1.9.11	Preparation Department	14.
1.1.9.12	Greige Cloth Inspection	16.
1.1.9.13	Summary of Yarn Consumption	16.

TABLES

I	Machine Park 1975-1977	3.
II	Summary Mill Balance - BUDAKALASZ	4.
III	Summary Mill Balance - POCSAJ	6.
IV	Summary of Labour Complement	7.
V	Summary of Yarn Consumption	16.

TABLE OF CONTENTS

		Page
1.0	BUDAKALASZ	17.
1.2	Finishing	17.
1.2.1	Location	17.
1.2.2	Buildings and Lay-outs	17.
1.2.3	Process Flow and Material Handling	18.
1.2.4	Machine Obsolescence	18.
1.2.5	Machine Improvements	18.
1.2.6	Mill Balance	18.
1.2.7	General Comments	19.

APPENDIX - WEAVING

Form A-100 Production Data Weaving

Form W-100 Weaving - Machine Specifications

Form W-101 Cloth Specifications, Quantities

Form W-102 Running Data, Productivity

Form W-103 Production Calculations, Comparisons

Form W-104 Sizing, Machine Specifications

Form W-105 Sizing,Production Data Comparison

Form W-106 Warp Preparation, Machine Specifications

Form W-107 Warp Preparation, Production Data, Comparison

Form W-108 Winding, Quilling, Production Data, Comparison

Form S-103 Twisting, Production Data Comparison

1.1 WEAVING

1.0 BUDAKALASZ

1.1 Weaving

1.1.1 Location

The weaving mill BUDAKALASZ consists of the main works in Budakalasz and the Cooperative POCSAY.

1.1.2 Buildings and Lay-out

Considering the age of the buildings, we feel that they are suitable. As far as lay-out is concerned, we would strongly recommend a weave room lay-out which does not contain portioned sections of looms. Sectional lay-out curtails efficient weaver and loom fixer assignments.

Room climate: temperature and humidity should be controlled more precisely and continuously recorded.

1.2.3 Process Flow and Material Handling

The process flow is not at its optimum. In conjunction with a more adequate lay-out of the looms, the preparatory processes should be streamlined too.

In our opinion it is necessary to improve and invest in material handling equipment, not only to make it easier for the transport personnel but also to do it more efficiently.

1.1.4 Machine Obsolescence

The modernisation of the loom park is already under way. Old looms are going out and already 50 SzTB have been ordered or installed.

Although, as is well known, more modern equipment is available for the preparatory departments, we feel that with a rigid preventive maintenance program the existing machines can fulfil the present need.

This, of course, does not prevent a gradual modernisation of machinery.

1.1.5 Machine Improvements

As wenoticed during our visits to the production departments, there is a definite lack of low cost machine attachments which would greatly improve the running condition of the material.

Short-term investment should not only be made for prime equipment but more immediately and effectively for:

- Machine attachments
- Auxiliary equipment.

1.1.6 Machine Park 1975-1977

Table I

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Name	No.	Width	ppm	Make	No.	Width	ppm
AT - 120	50.15	110	183		32	116	190
AT - 175	61.84	165	154		32	172	160
SzTB	49.56	206	200		34	154	205
Picanol S	8.04	172	176		19	172	170
Picanol S-2	1.78	172	164		1	172	180
4/4 rev.	14.94	95	132				
4/4 rev. jacq.	1.54	95	141				
AT - 175 jacq.	29.22	165	129		36	172	130
6/4 jacq.	6.30	160	127				
				SzTB jacquard	16	154	205
Circ. weave	11.99	-	116		11	-	74
	1.08	-	288		4	-	90
TOTAL	236		171		185		174
Pocsay Cooper.	28		140		52	106-109	140

As one can see in the table, the same loom type is sometimes quoted with different widths and speeds. Due to translation problems, the exact reason could not be identified. Therefore, we listed the machine specifications as it was given to us in both cases.

1.1.7 Summary Mill Balance

Table II - BUDAKALASZ

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine hours/year	6432	6432	6432	6432
Total no. of looms	335	335	335	185
Looms in operation	236	236	236	185
Average ppm/loom	171.15	171.15	171.15	174
Picks/24 hrs. 100% (10^6)	58.164	58.164	58.164	46.354
Picks/24 hrs. actual x (10^6)	40.067	26.887	46.996	37.454
Plant efficiency %	68.9	46.2	80.8	80.8
Machine efficiency %	-	60.8	94	94
Operator efficiency %	-	76.0	86	86
Product mix Ø pp cm	13.98	13.98	13.98	13.98
Ø width cm	112	112	112	112
Production m x 10^3/year	7681	5149	9009	7180
sqm x 10^3/year	8585	5755	10.069	8042
Production comparison %	100	67	117	94
Loom stops: warp/M ends/10^4 p	1.2	1.2	.4	
weft/10^4 picks	2.6	2.6	1.3	
mech/10^4 picks	12.9	12.9	2.0	
Loom stops/loom hr.	-	9	3.7	
Looms/weaver Ø	-	5.3	12	12

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
Ø loom beam length m	-	656	656	-
Ø ends/beam	-	2986	2986	
Ø warp changes/24 hrs.	-	29	51	41
Ø piece length m	-	86	86	
Ø pieces/24 hrs.	-	223	391	312
Yarn consumption warp to	-	1080	1866	1487
weft to	-	916	1575	1255
total to	-	1996	3441	2742
Labour complem. tot. persons	-	374	349	294
Productivity m/work. hr.	-	6.42	12.3	11.24
comparison %	-	100	188	175

Table III - COOPERATIVE POCSAJ

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of looms	28	28	28	52
Average ppm/loom	140	140	140	140
Picks/24 hrs. 100% x 10^6	5.6448	5.6448	5.6448	10.4832
Picks/24 hrs. actual x 10^6	-	1.4609	4.5610	8.4704
Plant efficiency %	-	26	80.8	80.8
Machine efficiency %	-	34	94	
Operator efficiency %	-	76	86	-
Product mix: Ø pp cm	-	12.63	12.63	12.63
Ø width cm	-	134.5	134.5	134.5
Production m x 10^3/year		310	967	1797
sqm x 10^3/year		417	1302	2417
comparison %		100	312	580
Ø loom stops: warp/M ends/10^4 p		.9		
weft/10^4 p		3.3		
mech/10^4 p		14.6		
Ø looms/weaver		-		
ca. loom stops/loom hour		4.3		
Ø loom beam length m		630	630	
Ø ends/beam		1816	1816	
Ø warp changes/24 hr.		2	6	11
Ø piece length m		86	86	
Ø pieces/24 hrs.		13	42	78
Yarn consumption warp to		68	213	396
weft to		73	228	424
total		141	441	820

1.1.8 Summary of Labour Complement

Table IV

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

	Actual 1975				WERNER Proposal 1				WERNER Proposal 2			
	Admn.	Dir.	Ind.	Sum.	Admn.	Dir.	Ind.	Sum.	Admn.	Dir.	Ind.	Sum.
Winding	3	13	5	21	3	15	12	30	3	12	10	25
Quilling	3	17	12	32	2	16	16	34	2	13	13	28
Warp preparation	3	17	7	27	3	5	7	15	3	5	5	13
Sizing	2	6	3	11	-	1	4	5	-	1	4	5
Warp store	-	-	-	-	1	-	2	3	1	-	2	3
Sub-total	11	53	27	91	9	37	41	87	9	31	34	74
Drawing-in	-	18	2	20	1	16	3	20	1	14	2	17
Weaving	31	101	54	186	4	60	111	175	4	48	89	141
Shearing inspection	1	18	20	39	2	20	7	29	2	17	5	24
Hose weaving	4	28	6	38	4	28	6	38	4	28	6	38
Sub-total	36	165	82	283	11	124	127	262	11	107	102	220
Grand-total	47	218	109	374	20	161	168	349	20	138	136	294

Since WERNER's opinion on what is direct or indirect, which indirect personnel belongs to which department, might differ from the actual labour complement, not too much weight should be placed on a departmental comparison, but rather on the total complement.

1.1.9 Notes and explanations to substantiate the summary of Mill Balance and Labour Complement.

1.1.9.1 General

Basis for all calculated data was the submitted WERNER form A-100, W-100 - W-109, which can be found in the appendix.

We had to work under the assumption that the given data were correct. In calculating the mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average.

Therefore, the possibility of having taken some wrong figures from the submitted forms has been greatly reduced.

1.1.9.2 Number of Looms

Form W-100 gave a total of 335 looms. Form W-103 (Weaving Production Calculation) stated 236 running looms.

Despite being told that the difference of 90 looms were idle due to labour shortages, we did not take tehm into account in our production calculation.

WERNER proposal 1 is based on 236 looms in operation.

WERNER proposal 2 is based on 185 looms which was given to us as the 1977 loom complement.

1.1.9.3 Efficiencies

Standard procedure for WERNER requires a split up in three different types of efficiencies:

1. Machine Efficiency

   A loom is available 24 hours a day on a three shift basis which equals a 100% machine efficiency.

   Whenever the loom is stopped for any other than weaver interferences, the stopped hours are called "downtime hours" and reduce the machine efficiency accordingly.

2. Operator Efficiency

   100% hours minus downtime hours are the machine hours available to the weaver which is 100% for the weaver.

   Actual picks compared to the possible picks in that time gives operator efficiency.

3. Plant Efficiency

   This gives the net efficiency of a weave-room and is calculated either by multiplying
   - machine efficiency x operator efficiency, or
   - the relation of actual picks to positive picks in 24 hours.

   WERNER practice does not distinguish a difference between downtime hours of less or more than 8 hours a day.

   All efficiencies mentioned in "Summary Mill Balance" are based on 24 hours per day, 288 working days per year as an absolute 100%.

1.1.9.4 BUDAKALASZ Weave-Room Efficiency

Based on above definitions (in section 1.1.9.3), and through historical calculation with average picks per loom, 236 looms in operation, and actual picks inserted, we derived the following efficiencies for the plant:

- Plant efficiency - 46.2% (actual 1975)
- Machine efficiency - 60.8% (actual 1975)
- Operator efficiency - 76 % (actual 1975)

The low machine efficiency is mainly caused by labour shortage because individual downtime losses were given to us as:

- Warp changing	- 1.45%
- Repair	- 1.22%
- Missing material	- 0.45%
- Various	- 3.25%
Total	6.37%

This indicates a potential of 93.63% machine efficiency.

This is, in our opinion, a good result and we based the calculations on a:

94%

machine efficiency.

The difference between 93.63% and 60.8% (= 32.83) is accounted for by labour shortages on the 236 looms.

By taking into consideration 335 looms, the downtime for labour shortages would have been:

51%

compared with 60.8%.

1.1.9.5 Operator Efficiency

Actual 1975 was: 76%.

There is no reason why this 76% cannot be improved to 86% through:

- New up-to-date bonus system.
- Standard working procedure.
- Operator training program.
- Improving running condition of raw material.
- Rigid maintenance program for the looms.
- Correct job distribution.

1.1.9.6 Plant Efficiency

LENFONO's 1975 plan called for:

7.681.000 running meters; 8.585.000 sqm

with a product mix giving an average of:

13.98 picks per cm,

and an average picks per loom of:

171.15 per min.,

which, with 236 looms, would have given a plant efficiency of:

68.9%.

In comparison :	Actual	-	46.2%
	WERNER proposal 1	-	80.8%

1.1.9.7 Production

A comparison based on LENFONO's plan 1975, the actual achievement, and WERNER proposal 1 shows:

- Plan = 100% - 8.585 x 10^3 sqm
- Actual 75 = 67% - 5.755 x 10^3 sqm
- WERNER 1 = 117% - 10.069 x 10^3 sqm

Comparing these figures one notes a realistic plan made by LENFONO management which we can, nevertheless, improve by

17%

and by 50% compared with "Actual 1975".

1.1.9.8 WERNER Proposal 2

In order to also get an up-to-date evaluation of the weaving mill, we asked for the 1977 loom complement and calculated a mill balance on this basis.

As far as production goes, WERNER would expect an output from the 185 looms which would amount to:

8.042.000 sqm

1.1.9.9 Loom Assignments

The running conditions of the raw material expressed in loom stops (the data given does not necessarily show the actual stops since the figures have been taken from their time study evaluation) show:

- Warp: Actual - 1.2 / M ends/10^4 picks
  WERNER - .4 / M ends/10^4 picks.

We cannot point out the exact reasons for LENFONO's high breakage rate since we did not analyse the machine/material combination. But by comparing the warp material with our experience in this field, we feel that a value of .4 is obtainable.

- Weft: Actual - 2.6 per 10^4 picks
  WERNER - 1.3 per 10^4 picks.

Part of the high breakage rate lies in the yarn quality as we can see in the spinning process data. But it is also in part due to the running condition of the loom:

Shuttle control,cleanliness;

- Mechanical Stops per 10^4 picks.

The figure was given at:

12.9

We were not able to receive a clear breakdown of this value. By applying WERNER standard procedures as far as correct job distribution and maintenance schedules are concerned, there is no justification for this value being higher than:

2.0

as far as weaver interferences are concerned.

1.1.9.10 Estimation of Number of Looms per Weaver

- Actual : 5.3 looms per weaver
- WERNER : 12 looms per weaver.

This implies the execution of several improvement programs:

- Machine condition (preventive maintenance program)
- Running condition of yarn
- Correct premium system
- Operator training program
- New machine lay-out
- Handling procedure.

1.1.9.11 Preparation Department

The relation of sectional beaming to warping (for sizing) has been taken from the actual conditions, and the proposed personnel loading is based on the weaving demands of WERNER proposal 1 respectively WERNER proposal 2.

The same is valid for the relation of warp changing to tying-in. The same distribution as in 1975 was applied also for the 1977 proposal.

In the course of our analysis, we found several problem areas on which we would like to comment:

1. Sectional Beaming

   1975 breakage rate expressed in breaks per 1 million end metres:

   - Cotton = 27
   - Flax = 100
   - Linen = 50
   - Viscose = 15

   Under normal circumstances, these values should be at:

   - Cotton = 4
   - Flax = 30 - 40
   - Linen = 10 - 20
   - Viscose = 2

   Action to obtain these figures:

   - Better yarn quality,
   - Correct tension control on creels,
   - Creel cleanliness (extraction fan),
   - Beamer in proper condition.

2. Warping

   End-breaks per 1 million end metres:

   - cotton, cotton/blends : Actual = 15
     WERNER = 4

   Same improvement points as above.

1.1.9.12 Greige Cloth Inspection

Basis for proposed labour complement:

- Normal quality and grading standards.
- Vertical inspection tables with positive drive and back-lighting.
- Large input size (sewing ends together).
- Standardisation of fault analysis.
- Setting up a grading system according to market demands.

1.1.9.13 Summary of Yarn Consumption

Table V - Units = to

	According to Mill Balance W-100 - 103	WERNER * Proposal 1	WERNER * Proposal 2
Warp			
- Cotton and blends	859	1502	1198
- Linen	73	127	102
- Flax	27	47	38
- Synthetics	117	182	163
	1076	1858	1501
Weft			
- Cotton and blends	91	160	127
- Linen and blends	196	344	273
- Flax and blends	263	459	367
- Synthetics	366	636	510
	917	1599	1277

* without POCSAY

APPENDIX

PLANT
WERK BUDAKALASZ

PRODUCTION DATA WEAVING

WERNER

FORM-Nr. A-100

STYLE - GROUP	produced at Budakalasz m x 10^3	1975 GREIGE METERS x10^3			FINISHED FABRICS 1975 TOTAL m x 10^3			SPLIT-UP IN EXPORT & 1.QUALITY			ALL OTHER QUALITIES			LOSS greige to finish		REMARKS
		Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Sq.Meters	%	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
73 - 21	1.265	1.346	1.895	100	1.378	1.870	93	761	1.024	55	617	846	45			
73 - 25	533	654	845	100	652	810	96	542	680	84	110	130	16			
73 - 27	131	293	285	100	283	257	90	229	201	78	54	56	22			
73 - 29	93	99	93	100	97	89	96	97	89	100						
73 - 31	105	254	338	100	237	319	94	211	288	90	24	31	10			
73 - 32	121	121	99	100	115	92	93	115	92	100						
73 - 33	25	81	121	100	78	114	94	72	106	93	6	8	7			
73 - 34	./.	6	5	100	6	5	100	6	5	100						
73 - 35	439	1.523	2.031	100	1.700	2.142	105	1.427	1.796	84	273	346	16			
73 - 36	20	387	501	100	392	488	97	366	452	93	26	36	7			
73 - 39	435	577	827	100	487	732	89	447	674	92	40	58	8			
73 - 52	9	58	76	100	53	70	92	49	66	94	4	4	6			
74 - 44	622	662	128	100	579	109	85	573	108	99	6	1	1			
75 - 11	52	165	222	100	163	206	93	123	154	75	40	52	25			
75 - 12	41	41	59	100	38	50	85	32	42	84	6	8	16			
75 - 14	21	71	63	100	74	61	97	54	44	72	20	17	28			
75 - 21	169	302	302	100	322	297	98	281	257	87	41	40	13			
75 - 22	556	801	629	100	923	663	105	795	571	86	127	92	14			
75 - 23	340	654	872	100	688	854	98	506	621	73	182	233	27			
Various	15	17	30	100	39	52		36	47		3	5				
TOTAL	5.149	8.112	9.421	100	8.304	9.280	99	6.723	7.317	79	1.581	1.963	21			

PLANT WERK BUDAKALASZ

WEAVING MACHINE SPECIFICATION

WERNER — FORM-No. W-100

PLANT GROUP	STYLE / STYLE GROUP	MACHINE PARK: MACHINE TYPE	WARP MOTION	WEFT INPUT	WIDTH	WARP STOP MOTION	WEFT INSERT	AVAIL LOOMS	LOOMS in OPERAT.	PRODUCTION DATA; EFFICIENCIES: % AVAIL TO RUN	PPM	LOOM-HRS per 24 hrs 100%	DOWNTIME in %: Warp chang	Rep	Miss. Mat.	Miss. Pers.	Var.	Total	LOOM-HRS per 24 hrs net	M/C eff %	PICKS PRODUCED 1975: Picks per 24 hrs in Millions 100 %	ACTUAL	PLANT EFF %	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
		AT - 100	exc	pirn	90	mech	conv.	16	16	100	200	384						37,50	240	62,50	4.608	2.144	46.53	
		AT - 120	exc	pirn	110	mech	conv.	22	22	100	183	768						36.59	487	63.41	8.433	4.250	50.40	
		AT- 120	dob	pirn	110	mech	conv.	10	10	100	183													
		AT - 175	exc	pirn	165	mech	conv.	89	89	100	154	2136						43,49	1207	56,51	19,737	8,120	41.14	
		SzTB	exc	cone	200	elec	proj.	4	4	100	200	96						42,71	55	57,29	1,152	456	39.56	
		Picanol S	dob	pirn	172	mech	conv.	19	19	100	176	456						43.86	256	56,14	4.815	1,587	41.16	
		Picanol S2	dob	pirn	172	mech	conv.	20	20	100	164	480						44,38	267	55.62	4,723	1,650	34,94	
		4/4 rev	exc	pirn	95	mech	conv.	28	28	100	132	672						60,42	266	39,58	5,322	1,385	26,02	
		8/4 rev	exc	pirn		mech	conv.	3	3	100	138	72						44,44	40	55,56	595	162	27,18	
		4/4 rev	jacqu	pirn	95	mech	conv.	21	21	100	141	504						84,72	77	15,28	4,264	392	9,19	
		AT - 175	jacqu	pirn	165	mech	conv.	20	20	100	129	480						42,29	277	57,71	3,715	1.865	50,20	
		7/4, 8/4	jacqu	pirn	180	mech	conv.	35	35	100	117	840						67,26	275	32,74	5.897	1.401	23,76	
		6/4	jacqu	pirn	160	mech	conv.	28	28	100	127	672						80,51	131	19,49	5,121	643	12,56	
	Subtotal							315	315	100		7560	1,49	1,10	,45	46,42	3,21	52,67	3576	47,13	68,363	24,450	39,75	
	Tubular weaving							15	15	100	116	360						40,83	213	59,17	2,506	1,065	42,50	
								5	5	100	208	120						11.67	106	88,33	2,074	1,372	66,15	
	Subtotal							20	20	100		480	,83	3,12	,42	25,42	4,75	33,54	319	66,46	4,580	2,437	53,21	
BUDAKALASZ	GRAND TOTAL							335	335	100	151	8040	1,45	1,22	,45	45,10	3,25	51,53	3897	48,47	72,903	26,887	36,85	
PCCSAJ			exc			mech		28	28	100	140	672						63,64	243	36,10	5,645	1,429	25,31	

PLANT / WERK	BUDAKALASZ	WEAVING	CLOTH SPECIFICATIONS ; QUANTITIES	WERNER	FORM-No W-101

PLANT	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP Mix	MATERIAL WEFT Nm	MATERIAL WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT gr/sq.m. Weft	WEIGHT gr/sq.m. Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	∅ PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in str x 10^3 I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	220 - 12	3:1 Twill	145	34/2	Cotton	50/2	Cotton/Line	27	15			340	22	2,2	3416	480		60					6
	229 - 03	"	84	34/2	Cotton	10	PAN	26	14			323	16	2,3	2224	500		100					87
		"	103	34/2	Cotton	10	PAN	27	14			330	16	2,8	2780	500		100					106
		"	145	34/2	Cotton	10	PAN	27	14			333	18	2,0	3916	480		80					679
		"	153	34/2	Cotton	10	PAN	27	14			326	16	3,2	4614	720		80					231
		"	155	34/2	Cotton	10	PAN	27	14			326	16	1,9	4,170	500		80					124
		"	162	34/2	Cotton	10	PAN	27	14			326	16	1,9	4170	500		80					51
	229 - 03	"	145	34/2	Cotton	10	PAN	27	15			325	19	2,0	3916	720		80					8
	229 - 12	plain weave	84	27/1	Cotton	18	Line 67 PE	24	17			198	18	2,2	2064	1000		100					27
		"	150	27/1	Cotton	18	Line 67 PE	24	17			190	18	2,6	3620	800		100					1
	229 - 14	3:1 twill	145	34/2	Cotton	15	PAN	27	18,5			308	14	2,0	3916	480		60					19
	229 - 15	plain weave	84	27/1	Cotton	18	Line 67 PE	25	16,5			196	18	2,3	2064	700		100					6
	300 - 58	"	82	27/1	Cotton	9	Tow	15	10			175	14	2,4	1200	1500		100					121
	302 - 11	"	146	20/1	Cotton	15	Line	17	17			206	22	1,4	2520	800		100					8
		"	159	20/1	Cotton	15	Line	17	17			216	16	1,9	2600	800		100					4
	306 - 05	"	128	40/2	Cotton	15	Line 16 PE	21	19			249	18	2,3	2750	800		100					6
	306 - 11	"	150	27/1	Cotton	15	Line 16 PE	23	15,5			200	16	1,3	3430	800		100					35
	306 - 55	"	148	40/2	Cotton	15	Line 16 PE	21	19			251	18	1,3	3190	490		70					9
	306 - 56	"	147	50/2	Cotton	24	Line 16 PE	31	27,5			260	18	2,0	4480	700		100					7
	316 - 51	patterned	142	27/1	Cotton	24	Line 16 PE	26	21			204	16	5,3	3702	1100		100					4
	306 - 56	plain weave	167	50/2	Cotton	24	Line 16 PE	31	27,5			240	18	1,0	5124	750		75					7
	316 - 56	Atlas	126	50/2	Cotton	24	Line 16 PE	29	27,5			245	18	3,1	3708	1000		100					6
	316 - 82	Jacquard	59	34/1	Cotton	30	Line 33 PE	30	28			180	20	3,3	1770	500		100					5
		"	146	34/1	Cotton	30	Line 33 PE	29	25			153	12	2,7	4282	800		100					33
	316 - 83	"	98	34/1	Cotton	30	Line 33 PE	28	28			185	18	2,0	2880	500		100					10
	326 - 84	"	112	50/2	Cotton	24	Line 16 PE	28	26			216	7	2,6	3144	700		100					7
		"	159	50/2	Cotton	24	Line 16 PE	28	27			215	10	1,9	4528	700		100					12
		"	169	50/2	Cotton	24	Line 16 PE	29	27,5			229	10	2,0	4824	700		100					20
	326 - 87	"	148	34/1	Cotton	18	Line 16 PE	39	20			224	8	1,4	5700	700		100					32
	326 - 89	"	139	27/1	Cotton	21	Line 16 PE	24	22			190	9	2,8	3318	700		100					63
		"	145	27/1	Cotton	21	Line 16 PE	25	21,5			195	8	3,0	3610	700		100					3
	326 - 90	"	59	27/1	Cotton	21	Line 16 PE	28	20			204	7	4,9	1608	700		100					7
		"	164	27/1	Cotton	21	Line 16 PE	26	20			197	7	1,8	4650	700		100					7
	332 - 51	3:1 twill	162	17/1	Cotton	8,5	Tow	14	12,5			230	8	1,8	2116								
		"		34/1	Cotton										88	720		103					14
	332 - 63	"	162	20/1	Cotton	8,5	Tow	14	12			217	8	1,8	2116								
				34/1	Cotton										88	720		103					1
	335 - 86	Jacquard	139	27/1	Cotton	21	Line 16 PE	24	22			191	9	2,8	2458								
				50/2	Cotton	50/2	Cotton								860	600		100					19
		"	162	50/2	Cotton	50/2	Cotton	25	22			193	9	1,8	3042	600		100					2
	342 - 05	plain weave	55	17/1	Cotton	15	Line								1030								
				27/2	Cotton	27/2	Cotton	14	15			209	15	5,2	768	480		60					25
		"	169	27/2	Cotton	27/2	Cotton	14	15			209	15	5,2	2398	824		103					61
	342 - 34	"	70	27/1	Cotton	10	Tow	14	14			197	12	2,8	854	460		60					7
				50/2	Cotton	27/2	Cotton								88								

PLANT / WERK: BUDAKALASZ

WEAVING CLOTH SPECIFICATIONS

WERNER — FORM-No W-101

PLANT / KOOP	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP Mix	MATERIAL WEFT Nm	MATERIAL WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in mtr x 10^3 I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	343 - 01	plain weave	57	10	Tow	10	Tow								588								
				27/2	Cotton	27/2	Cotton	13	12,5			270	14	5,2	152	480		60					0
	343 - 10	"	56	10	Tow	10	Tow								412								
				50/2	Cotton	27/2	Cotton	24	12,6			287	16	5,5	852	480		60					61
	343 - 55	"	51	10	Tow	10	Tow								524								
				27/2	Cotton	27/2	Cotton	19	12,5			283	15	5,5	150	480		60					20
		"	56	10	Tow	10	Tow								600								
				27/2	Cotton	27/2	Cotton	19	13			282	16	3,4	150	400		60					58
	352 - 04	"	169	17/1	Cotton	15	Line								1066								
				27/2	Cotton	27/2	Cotton	14	15			214	15	2,3	1276	720		102					13
	306 - 81	jacquard	59	40/2	Cotton	18	Line 16PE	25	21			240	9	4,9	1452	520		65					7
		jacquard	164	40/2	Cotton	18	Line 16PE	28	20			250	7	1,8	4050	520		65					4
	372 - 18	plain weave	107	10	Tow										856								
				50/2	Cotton	10	Tow	13,4	12,5			280	16	2,7	1332	800		100					72
	372 - 24	"	169,5	27/2	Cotton										604								
				17/1	Cotton	15	Line	14	15			206	15	2,1	1564	800		100					12
	373 - 58	"	60	10	Tow										560								
				27/2	Cotton	10	Tow	15	13			292	18	3,2	282	600		100					57
	401 - 01	jacquard	143	34/1	Cotton	34/1	Cotton	40	16			175	7	3,4	5700	800		100					153
	401 - 54	plain weave	143	27/1	Cotton	27/1	Cotton	26	18			174	7	5,9	3792	800		100					40
	405 - 61	"	111	27/2	Cotton	9	Tow 16V	16	11			270	15	1,8	2000	500		100					60
		"	131	27/2	Cotton	9	Tow 16V	18	11			276	15	1,5	2343	500		100					20
	421 - 06	"	2x66,5	34/2	Cotton	20/2	Cotton	25	14,5			320	20	2,2	3320	500		80					133
		"	2x83	34/2	Cotton	20/2	Cotton	25	14,5			325	20	2,4	4160	500		50					11
	471 - 02	jacquard	140	40/2	C 16V	40/2	C 16V	31	27,5			305	6	4,1	4392	640		60					11
	476 - 08	jacquard	126	50/2	Viscose	10	PAN	39	12,5			300	10	3,1	4920	560		60					63
		jacquard	146	50/2	Viscose	10	PAN	39	12,5			300	10	2,7	5700	800		60					42
	506 - 02	plain weave	66	27/1	C 16V	20/1	Cotton	35	17			232	10	5,5	2974	600		100					64
		"	101	27/1	C 16V	20/1	Cotton	35	17			230	10	3,8	3500	600		100					26
		"	147	27/1	C 16V	20/1	Cotton	34	17			229	10	3,3	5074	600		100					7
	501 - 02	"	75	34/1	Cotton	20/1	Cotton	21	17			165	20	8,5	1610	1500		100					46
		"	105	34/1	Cotton	20/1	Cotton	21	17			163	20	7,9	1400	1400		100					32
	592 - 03	"	96	50/2	Cotton	10	Tow	19	15			238	15	2,1	2250	540		90					16
		"	133	50/2	Cotton	10	Tow	19	15			239	15	2,1	2550	450		45					22
	592 - 07	"	81	20/2	Cotton	6	Tow	13	12			350	16	2,4	1012	670		84					30
		"	133	20/2	Cotton	6	Tow	13	12			345	16	1,5	1074	660		65					74
		"	140	20/2	Cotton	6	Tow	13	12			350	16	1,4	1754	700		70					16
		"	150	20/2	Cotton	6	Tow	13	12			350	16	1,9	1890	600		50					47
		"	160	20/2	Cotton	6	Tow	13	13			350	16	2,4	2024	490		70					135
	592 - 13	"	86	27/1	Cotton	15	Line	28	14,5			220	12	2,3	2400	840		84					53
	592 - 14	"	142	20/2	Cotton	10	Tow	14	12,2			291	16	1,4	2030	480		60					53
	592 - 26	"	131	20/2	Cotton	6	Line spectr	12	13			370	22	2,5	1600	640		80					59
	592 - 38	"	80	34/2	Cotton	10	Tow	10	12,5			242	18	1,2	1538	700		100					21
	592 - 54	"	145	20/1	Cotton	5	Line	37	8,5			302	14	2,0	5470	504		84					57
		"	150	20/1	Cotton	6	Line	38	8,5			360	14	2,0	5740	480		70					33
	592 - 56	2:2 twill	144	20/1	Cotton	3	Tow	39	8			490	14	1,4	5600	600		100					1

PLANT WERK	BUDAKALASZ		WEAVING CLOTH SPECIFICATIONS ; QUANTITIES																			WERNER	FORM-No W-101
PLANT	STYLE / STYLE GROUP	CONSTRUKTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP Mix	MATERIAL WEFT Nm	MATERIAL WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in mtr x 10^3 I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	592 - 57	plain weave	131	20/1	Cotton	6	Line	34	9			350	16	1.5	4480	600		100					96
		"	137	20/1	Cotton	6	Line	34	9			352	16	2.1	4680	490		70					43
	592 - 60	"	138	20/1	Cotton	6	Line	24	13			361	22	1.4	3240	420		60					33
	592 - 61	"	135	20/1	Cotton	10	Line	29	13			300	18	1.5	3816	420		60					7
	593 - 40	"	76	10	Line	10	Tow	13	13.5			284	15	3.8	1000	700		100					133
		"	79	10	Line	10	Tow	13	13.5			285	15	3.7	1050	700		100					61
		"	86	10	Line	10	Tow	13	13.5			288	15	3.4	1140	700		100					42
		"	96	10	Line	10	Tow	13	13.5			286	15	3.0	1260	800		100					22
		"	113	10	Line	10	Tow	13	13.5			292	18	2.5	1400	700		100					18
		"	139	10	Line	10	Tow	13	13.5			288	15	2.1	1844	700		100					67
		"	160	10	Line	10	Tow	13	13.5			268	15	1.9	2112	720		60					93
	595 - 12	"	142	50/2	Cotton	15	Line 33 PE	21	16			203	12	2.1	3000	1600		100					34
	596 - 14	patterned	135	27/1	Cotton	8.5	Tow 16 V	36	9.5			256	10	1.5	4810	800		100					1
	599 - 20	"	150	50/2	Cotton	30	Line 67 PE	20	20			160	18	2.5	3080	1000		100					15
	599 - 22	3:1 twill	135	27/1	Cotton	15	PAN	31	18			254	15	2.2	4186	900		100					1
	599 - 05	"	135	50/2	Viscose	27/3	Viscose	23	13			252	12	1.5	3120	800		100					2
	801 - 01	plain weave	105	50/2	Cotton	27/1	Cotton	28	23			318	14	3.7	3060	800		100					103
	801 - 07	"	86	50/2	Cotton	27/1	Cotton	28	19			199	14	3.4	2400	800		100					40
		"	108	50/2	Cotton	27/1	Cotton	28	19			199	14	2.7	3000	600		100					38
	873 - 04	tube-plain	2x85	5/7	L/Kender 32	5/7	L/Kender 32	22-44	4.6-9.2			1000	26		372								24
	879 - 09	"	2x87	3000	Trevira	8000	Trevira	18-36	8.3-10.6			1290	30		308								405
	879 - 10	"	2x124	3000	Trevira	10000	Trevira	17.5-35	5-10			1310	24										193
	Various																						30
BUDAKALASZ	TOTAL																		1,384	1,328	1,277	1,160	5,149
	592 - 07	plain weave	133	20/2	Cotton	6	Tow	13	12			346	16	1.5	1674	660		66					85
		"	140	20/2	Cotton	6	Tow	13	12			350	16	1.4	1754	700		70					30
	592 - 23	"	131	20/2	Cotton	6	Line	12	13			370	22	1.5	1600	640		80					30
	592 - 52	"	135	20/2	Cotton	10	Line	14	13			300	18	1.5	1940	600		100					165
[illegible]	TOTAL																						310

PLANT WERK	BUDAKALASZ	WEAVING RUNNING DATA ; PRODUCTIVITY																WERNER FORM-No W-102
	PLANT KOOP	STYLE / STYLE GROUP	LOOM TYPE	LOOM STOPS			% WASTE			LOOMS per WEAVER	PRODUCTION 1975 $m \times 10^3$	LABOR HOURS 1975			PRODUCTIVITY in MTR/WORK.HOUR			REMARKS
				Warp N ends 10.000p	Weft 10.000 picks	Mech 10.000 picks	Warp	Weft	Total			DIRECT	INDIRECT	TOTAL	Direct	Indirect	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1		226 - 12 145		1.1	3.0	10.73				3.9	6							
2		229 - 03 84		1.1	2.6	9.72				8	82							
3		103		1-1	3-0	10.73				6.8	100							
4		145		.1.1	3.0	10.73				3.9	679							
5		153	sztb	.7	1.6	3.61				7	231							
6		155	sztb	1.1	3.7	9.03				3.8	124							
7		161.5		1.1	3.7	9.03				6.9	51							
8		229 - 09 145		1.5	1.8	10.14				4.6	8							
9		229 - 12 84		1,2	1.4	6.03				9.7	27							
10		150		1.5	2.0	10.19				6.3	1							
1		229 - 14 145		1.1	2.3	6.66				4.6	19							
2		229 -15 54		1.2	1.4	6.02				8.8	5							
3		266 - 58 87	AT	1.5	2.7	9.62				8.3	121							
4		302 - 11 146		1.2	2,4	13.52				5.5	8							
5		159		1.2	3.0	13.43				5	4							
6		306 - 06 128	AT	1.2	2,5	10,02				7.8	6							
7		306 - 11 150	AT	1.5	2.4	13.10				4.6	35							
8		306 -55 148		1.2	2.5	12.70				4.9	9							
9		306 - 56 147		1.0	1.0	6.89				5.9	7							
20		316 - 51 148		1.2	1.0	6.94				6.1	4							
1		306 - 56 167		1.0	1.0	7.46				5.4	7							
2		316 - 56 125	Picanol	1.0	1.0	5.41				6	6							
3		316 - 82 59		2.0	1.5	16.81				5.2	5							
4		306 - 82 146		1.2	2.0	9.92				4.4	38							
5		316 - 83 98		2.0	1.5	27.49				4.6	10							
6		326 - 84 112		1.0	1.5	32,17				4.4	7							
7		159		.8	2.0	10.41				5.0	12							
8		169		.8	2.0	10,68				5.0	20							
9		326 - 87 146		.8	2.0	11,09				5.1	32							
30		326 - 89 139		1.0	2.0	10.33				5.1	63							
1		145		1.0	2.0	10.63				5.0	3							
2		[illegible] 59		1.2	1.0	11.85				7.3	2							
3		164		1.0	1.9	11.34				4.8	7							
4		332 - 51 162		1.5	2.3	10.55				5.7	14							
5		332 - 63 162		1.5	2.3	11.75				4.6	1							
6		336 - 86 139		1.5	1.5	35.49				3.8	19							
7		102		1.5	1.5	37.49				3.5	2							
8		342 - 06 55		3.0	1.5	25.94				5.7	25							
9		109		2.0	2.0	10.04				5.6	61							
40		342 - 34 70		2.0	1.5	32,33				4.7	7							
1		343 - 01 57		6.0	2.0	30.53				4.1	78							
2		343 - 10 56		6.0	1.5	31.08				3.6	61							
3		343 - 55 51		6.0	1.5	28.74				4.2	20							
4		56		6.0	1.5	28.74				4.2	68							
5		352 - 04 160		2.5	2.0	10.05				5.8	13							
6		306 - 81 154		1.0	2.2	12.09				4.8	4							

PLANT WERK	BUDAKALASZ	WEAVING RUNNING DATA ; PRODUCTIVITY														WERNER	FORM-No W-102
PLANT	STYLE / STYLE GROUP	LOOM TYPE	LOOM STOPS			% WASTE			LOOMS per WEAVER	PRODUCTION 1975 m x 10^3	LABOR HOURS 1975			PRODUCTIVITY in MTR/Work.Hour			REMARKS
			Warp N ends 10,000	Weft 10,000 picks	Mech 10,000 picks	Warp	Weft	Total			DIRECT	INDIRECT	TOTAL	Direct	Indirect	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	368 - 31 59		1.5	1.5	8.57				5.5	7							
	372 - 19 107		2.0	1.5	9.05				5.4	72							
	372 - 24 109.5		2.0	1.4	8.57				5.2	12							
	373 - 58 60		6.0	1.0	28.93				4.1	57							
	401 - 01 143		1.1	1.0	9.52				5.1	153							
	401 - 54 143		1.3	1.5	8.93				5.2	40							
	406 - 61 111	AT	1.2	3.0	11.37				7.6	60							
	131	AT	1.5	3.4	16.31				4.3	20							
	421 - 06 2 x 66.5		1.5	3.1	15.58				4.2	133							
	2 x 83		1.5	3.9	20.16				3.4	11							
	171 - 02 140		1.2	3.0	13.62				4.6	11							
	475 - 02 126		0.6	3.0	14.55				4.7	63							
	140		0.6	3.5	16.52				4.2	42							
	508 - 02 86		1.0	1.3	6.03				8.8	34							
	101		1.0	1.5	7.02				7.7	28							
	147		1.0	2.0	9.60				5.8	7							
	591 - 02 75		1.2	1.5	5.75				9.8	48							
	105		1.2	1.5	6.57				8.4	32							
	592 - 03 56		1.0	3.4	11.76				7.8	18							
	136	AT	1.0	3.3	11.05				7.6	22							
	592 - 07 61		1.1	3.9	12.79				8.1	30							
	133	AT	0.6	3.5	13.35				4.1	74							
	140	AT	0.8	3.5	13.35				4.1	18							
	150	AT	0.8	3.5	19.18				3.8	47							
	160		0.8	3.5	21.10				3.6	135							
	592 - 13 85		1.0	1.7	5.69				9.3	53							
	592 - 14 142		1.5	3.4	15.72				4.7	53							
	592 - 28 131	AT	1.0	3.4	18.10				4.1	93							
	592 - 32 83		1.2	2.4	9.05				6.3	21							
	592 - 54 145	AT	0.6	5.8	25.58				3.4	62							
	150	AT	0.6	5.8	25.35				3.4	33							
	592 - 56 144	Picanol	1.0	5.0	22.70					1							
	592 - 57 131	AT	0.3	3.0	18.89				3.7	96							
	137	AT	0.8	3.0	17.99				3.7	43							
	592 - 60 138		1.0	5.4	23.50				3.7	33							
	592 - 61 135		1.0	3.2	13.0				4.8	7							
	593 - 40 70		3.5	2.3	9.69				7.3	133							
	79	AT	3.5	2.3	9.89				7.3	61							
	186	AT	3.5	2.6	11.58				6.6	42							
	190		3.0	2.8	12.0				6.3	26							
	113		3.5	3.4	14.14				5.5	18							
	139	AT	3.0	3.4	17.52				4.1	67							
	160	AT	3.0	3.8	10.91				3.7	93							
	596 - 12 142	PICANOL	1.2	2.0	9.37				5.0	34							
	596 - 17 135	PICANOL	1.0	2.5	10.67				5.0	1							
	596 - 21 150	PICANOL	1.5	1.5	9.50				5.6	15							

PLANT WERK	BUDAKALASZ		WEAVING RUNNING DATA ; PRODUCTIVITY															WERNER FORM-No W-102
PLANT WERK	STYLE / STYLE GROUP		LOOM TYPE	LOOM STOPS Warp N ends 10.000	LOOM STOPS Weft 10.000 picks	LOOM STOPS Mech 10.000 picks	Σ WASTE warp	Σ WASTE weft	Σ WASTE Total	LOOMS per WEAVER	PRODUCTION 1975 $m \times 10^3$	LABOR HOURS 1975 DIRECT	LABOR HOURS 1975 INDIRECT	LABOR HOURS 1975 TOTAL	PRODUCTIVITY in MTR/WORK.HOUR DIRECT	PRODUCTIVITY in MTR/WORK.HOUR INDIRECT	PRODUCTIVITY in MTR/WORK.HOUR TOTAL	REMARKS
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	598 - 22	135	PICANOL	1.2	1.5	8.0				5.5	1							
	599 - 05	135	PICANOL	1.5	2.0	9.84				5.2	2							
	801 - 01	105		1.6	1.2	6.95				6.3	103							
	801 - 07	65		1.6	1.0	5.7				7.4	40							
		108		1.6	1.2	6.95				6.3	38							
	873 - C4	95		20.0	./.	57.47				13	24							
	879 - 09	87			.1	3.15				3	405							
	879 - 10	124			.1					2.8	193							
	Various										30							
BUDAKALASZ	TOTAL										5.149	360.394	66.464	426.858	14.29	77.47	12.06	
	592 - 07	133		.8	3.5	13.35					85							
		140		.8	3.5	13.35					70							
	592 - 28	131		1.0	3.4	16.10					30							
	592 - 52	135		1.0	3.2	14.86					165							
[illegible]	TOTAL										310							

PLANT WERK | B U D A K A L A S Z | W E A V I N G P R O D U C T I O N C A L C U L A T I O N S ; C O M P A R I S O N | WERNER | FORM-No W-103

PLANT	STYLE / STYLE GROUP	LOOM TYPE	LOOM PERFORMANCE PPM	Picks/hour 100 %	eff %	Picks/hour exp	Meter hour exp	PRODUCTION acc. to act.eff. No of looms	Meter year exp	Sq.Meter year exp	ACTUAL PRODUCTION 1975 $m \times 10^3$ No of looms	Meter/year	Sq.Meter/year	PLAN PRODUCTION $\times 10^3$ Meter/year	Sq.Meter/year	WERNER-PROD in $m \times 10^3$ eff %	No of Looms	Meters/year	Sq.Meters year	COMP: Prod.acc.to actual efficiency = 100 PROD. 1975	PLAN 1975	WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	226 - 12 145	AT - 175	154	9240	65,7	6071	4,04	0,35	9	13	0,35	6	8									
	229 - 03 84	AT - 120	183	10980	74,5	8180	5,84	3,27	123	103	3,27	82	69									
	103	SZTB	183	10980	74,5	8180	5,34	4,21	158	163	4,21	106	109									
	145	"	200	12000	65,0	7800	5,57	28,44	1,019	1,478	28,44	679	983									
	153	"	200	12000	65,0	7800	5,57	9,67	346	529	9,67	231	354									
	155	"	200	12000	65,0	7800	5,57	5,21	186	286	5,21	124	192									
	161.5	"	200	12000	65,0	7800	5,57	2,13	76	123	2,13	51	82									
	229 - 03 145	AT - 175	154	9240	65,7	6071	4,05	0,46	12	17	0,46	8	11									
	229 - 12 84	AT - 120	183	10980	74,5	8180	4,81	1,31	40	34	1,31	27	23									
	150	AT - 175	154	9240	65,7	6071	3,57	0,08	2	3	0,08	1	2									
	229 - 14 145	"	154	9240	65,7	6071	3,28	1,35	28	41	1,35	19	27									
	229 - 15 84	AT - 120	183	10980	74,5	8180	4,95	0,23	7	6	0,23	5	4									
	256 - 56 92	"	183	10980	74,5	8180	3,18	3,44	101	140	3,44	121	99									
	302 - 11 143	AT - 175	154	9240	65,7	6071	3,57	0,50	11	16	0,50	8	11									
	159	"	154	9240	65,7	6071	3,47	0,27	6	10	0,27	4	6									
	306 - 06 128	"	154	9240	65,7	6071	3,20	0,42	9	12	0,42	6	8									
	306 - 11 150	"	154	9240	65,7	6071	3,92	2,12	53	19	2,12	35	52									
	306 - 55 148	"	154	9240	65,7	6071	3,20	0,65	13	19	0,65	9	13									
	306 - 56 147	"	154	9240	65,7	6071	2,21	0,73	10	15	0,73	7	10									
	167	"	154	9240	65,7	6071	2,21	0,73	10	17	0,73	7	12									
	316 - 51 148	PICANOL SZ	164	9840	88,6	5766	2,75	0,32	6	9	0,32	4	5									
	316 - 55 126	"	164	9840	58,6	5766	2,10	0,69	9	11	0,69	6	8									
	316 - 62 59	4/4	141	8460	59,1	5000	1,79	0,65	7	4	0,65	5	3									
	146	AT - 175	129	7740	80,1	6200	2,48	3,56	57	83	3,56	38	55									
	316 - 83 98	6 / 4	127	7620	61,0	4648	1,66	1,40	15	15	1,40	10	10									
	326 - 84 112	Jacquard	127	7620	61,0	4648	1,75	0,95	11	14	0,95	7	8									
	159	AT - 175	129	7740	80,1	6200	2,33	1,20	18	23	1,20	12	23									
	169	"	129	7740	80,1	6200	2,25	2,06	30	39	2,06	20	33									
	325 - 87 146	"	129	7740	80,1	6200	3,10	2,40	48	62	2,40	32	40									
	325 - 89 139	"	129	7740	80,1	6200	2,62	5,14	93	120	5,14	63	80									
	145	"	129	7740	80,1	6200	2,08	0,23	4	5	0,23	3	5									
	325 - 90 58	4/4	141	8460	59,1	5000	2,50	0,19	3	4	0,19	2	1									
	164	AT - 175	129	7740	80,1	6200	3,10	0,53	11	14	0,53	7	12									
	332 - 51 162	PICANOL	164	9840	58,6	5766	4,01	0,73	22	30	0,73	14	22									
	332 - 63 162	"	164	9840	58,6	5766	4,81	0,04	1	2	0,04	1	2									
	336 - 85 139	AT - 175	129	7740	80,1	6200	2,62	1,35	24	31	1,35	19	26									
	335 - 86 162	"	129	7740	80,1	6200	2,82	0,15	3	4	0,15	2	4									
	342 - 06 55	4/4 Rev.	132	7920	63,9	5061	3,37	1,76	38	50	1,76	25	14									
	159	PICANOL	164	9840	58,6	5766	3,84	3,72	92	151	3,72	61	103									
	342 - 34 70	4/4 Rev.	132	7920	63,9	5061	3,62	0,46	11	15	0,46	7	5									
	343 - 01 57	"	132	7920	63,9	5061	4,05	0,46	12	16	0,46	78	44									
	343 - 10 55	"	132	7920	63,9	5061	4,05	3,56	93	123	3,56	61	34									
	343 - 55 51	"	132	7920	63,9	5061	4,05	1,16	30	40	1,16	20	10									
	56	"	132	7920	63,9	5061	3,89	4,07	102	135	4,07	68	38									
	352 - 04 69	PICANOL	164	9840	58,6	5766	3,64	0,77	19	31	0,77	13	22									
	3[illegible] - 61 59	4/4	141	8460	59,1	5000	2,39	0,70	11	16	0,70	7	4									

PLANT WERK: BUDAKALASZ | WEAVING PRODUCTION CALCULATION ; COMPARISON | WERNER | FORM-No W-103

PLANT KOOP	STYLE / STYLE GROUP	LOOM TYPE	LOOM PERFORMANCE: PPM	Picks per hr 100%	eff %	Picks per hr exp	Meter per hr exp	PRODUCTION acc. to act. eff.: No of Looms	Meter/ year exp	Sq.Meter/ year exp	ACTUAL PRODUCTION 1975 ax10^3: No of Looms	Meter/ year act	Sq.Meter/ year act	PLAN PRODUCTION ax10^3: Meter/ year	Sq.Meter/ year	WERNER-PROD in a x 10^3: eff %	No of Looms	Meters/ year	Sq.Meters/ year	COMP: Prod. acc. to actual efficiency = 100: PROD. 1975	PLAN 1975	WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	366 - 51 154	AT	129	7740	80.1	6200	3.10	.3	6	8	.3	4	7									
	372 - 18 107	AT 120	183	10980	74.5	8180	6.54	2.56	108	198	2.56	72	77									
	372 - 24 169.5	AT 175	154	9240	65.7	6071	4.04	0.69	18	28	0.69	12	20									
	373 - 56 60	4/4 Rev.	132	7920	63.9	5061	3.89	3.47	87	115	3.47	57	34									
	401 - 01 143	AT 175 J	129	7740	80.1	6200	3.87	9.19	229	295	9.19	153	219									
	401 - 54 143	AT 175	154	9240	65.7	6071	3.37	2.77	60	86	2.77	40	57									
	405 - 61 111	AT 120	183	10980	74.5	8180	7.44	1.87	89	99	1.87	60	67									
	131	AT 175	154	9240	65.7	6071	5.52	0.85	30	39	0.85	20	26									
	471 - 06 2x65/83	AT 175	154	9240	65.7	6071	4.19	8.05	217	294	8.05	144	195									
	471 - 02 140	AT 175 J	129	7740	80.1	6200	2.25	1.13	16	23	1.13	11	15									
	476 - 08 120	6/4 J	127	7620	61.0	4648	3.72	3.95	95	119	3.95	63	79									
	146	AT 175 J	129	7740	80.1	6200	4.95	1.99	63	93	1.99	42	62									
	509 - 02 66/101	AT 120	183	10980	74.5	8180	4.81	4.49	139	125	4.49	92	83									
	147	AT 175	154	9240	65.7	6071	3.57	0.46	11	16	0.46	7	10									
	591 - 02 75/105	AT 120	183	10980	74.5	8180	4.81	3.87	130	104	3.87	80	70									
	592 - 03 96	AT 120	183	10980	74.5	8180	5.45	0.77	27	26	0.77	18	17									
	138	AT 175	157	9240	65.7	6071	4.05	1.27	33	46	1.27	22	31									
	597 - 07 81	AT 120	183	10980	74.5	8180	6.82	1.0	44	36	1.0	30	25									
	592 - 07 133/140	AT 175	154	9240	65.7	6071	5.06	4.27	139	186	4.27	92	125									
	592 - 07 150/160	AT 175	154	9240	65.7	6071	5.06	8.40	273	430	8.40	182	286									
	592 - 13 85	AT 120	183	10980	74.5	8180	5.64	2.19	79	68	2.19	53	46									
	592 - 14 142	AT 175	154	9240	65.7	6071	4.65	2.54	79	112	2.54	53	76									
	592 - 23 131	AT 175	154	9240	65.7	6071	4.57	4.97	149	195	4.97	99	129									
	592 - 38 80	AT 120 Ny	183	10980	74.5	8180	6.54	3.58	151	121	3.58	21	17									
	592 - 54 145/150	AT 175	154	9240	65.7	6071	7.14	3.08	142	208	3.08	95	141									
	592 - 55 144	AT 175	154	9240	65.7	6071	7.59	0.04	2	3	0.04	1	1									
	592 - 57 131/137	AT 175	154	9240	65.7	6071	6.75	1.50	7	10	1.50	43	59									
	592 - 50 138	AT 175	154	9240	65.7	6071	4.67	1.66	50	77	1.66	33	45									
	592 - 61 135	AT 175	154	9240	65.7	6071	4.67	0.35	10	15	0.35	7	9									
	593 - 40 60/ 79	AT 120	183	10980	74.5	8180	6.00	7.45	290	531	7.45	194	149									
	593 - 40 86/ 95	AT 120	183	10980	74.5	8180	6.06	2.59	101	104	2.59	68	61									
	113	AT 120	183	10980	74.5	8180	6.06	0.68	26	48	0.68	18	20									
	593 - 40 130/160	AT 175	154	9240	65.7	6071	4.50	8.27	239	368	8.27	160	244									
	598 - 12 147	Picanol	164	9840	58.6	5770	3.60	2.22	51	84	2.22	34	48									
	598 - 17 135	"	164	9840	58.6	5766	6.06	0.04	2	3	0.04	1	2									
	598 - 20 150	"	164	9840	58.6	5766	2.89	1.21	22	36	1.21	15	23									
	596 - 22 135	AT 175	154	9240	65.7	6071	3.37	0.08	2	3	0.08	1	1									
	599 - 05 135	Picanol	164	9840	58.6	5765	4.44	0.08	2	3	0.08	2	3									
	601 - 01 105	AT 120	183	10980	74.5	8180	3.55	6.74	154	22	5.74	103	108									
	601 - 07 85/109	AT 120	183	10980	74.5	8180	4.31	4.21	117	214	4.21	78	70									
	673 - 04 2x 85	Tub.weave	116	6960	67.8	4719	6.13	1.08	36	42	1.08	24	4									
	679 - 09 2x 97		288	17280	70.9	12252	11.56	0.25	613		8.25	405	70									
	679 - 10 2x124		288	17280	70.9	12252	12.25	3.74	295		3.74	1.3	47									
		AT 175	154	9240	65.7	6071	4.34	1.62	45	69	1.62	30	46									
												5.149	5.755									

PLANT WERK 12 BUDAKALASZ	SIZING MACHINE SPECIFICATIONS	WERNER	FORM-No W-104

1	PLANT	KOOP.	Budakalasz				
2	SIZE COOKING	Type Size-cooker	autoclav				
3		Viscosity-meter	yes				
4		Storage tanks No					
5		Storage tanks Content					
6		Water flow meter	1800 l/ 8 hours				
7							
8							
9							
10	SIZING	Machine maker	Kaev-Sucker				
1		Creel Max No of beams	20				
2		Creel Beam brake	yes				
3		Creel spare creel					
4		Creel Yarn accumulator					
5		No of size pans					
6		No of sqeez.rollers	4				
7		Type sqeezing rollers					
8		Max pressure sq.rolls	800 kp				
9		Size level control	yes				
20		wet to dry section gen					
1		wet to dry section not					
2		Drying Cylinders No.	9				
3		Drying Cylinders Width cm	220				
4		Drying Cylinders Surface	4 teflon,5 steel				
5		Dry-capacity/Cyl	600-800kg/hr				
6		Steam Type					
7		Steam Pressure	3 atm				
8		Aut-press-regulation	yes				
9		Point of temp.taking					
30		Exhaust fan/system	yes				
1		Moisture control	Mahlo				
2		Point of m-control					
3		Length delivery sect.	3800 mm				
4		Beam Ø Disc cm	55-60				
5		Beam Ø Base cm	8,8-18				
6		Beam Width cm	76-162				
7		MAX.SPEED m/min	90				
8		Creeping speed m/min	40				
9							
40							
1							
2							

PLANT D U N A K A L A S Z

S I Z I N G   P R O D U C T I O N   D A T A ,   C O M P A R I S O N

WERNER

FORM-No W-105

[illegible]	MACHINE TYPE	STYLE	MATERIAL No	MATERIAL Quality	Width (cm)	No of ends	Beam length (m)	No of warp beams	Partie-length	Rest-hum	Refekto	Waxing	greige / colored / placing end/dent	WORK.MIN. per Loom branch	WORK.MIN. per Partie change	WORK.MIN. per Draw in ends	DELIVERY m/min 100%	DELIVERY eff %	DELIVERY m/min exp.	CAPACITY No M/C	CAPACITY M-hrs Year	PRODUCTION in m x 10^3 Exp.	PRODUCTION in m x 10^3 Actual	PRODUCTION in m x 10^3 Plan	WERNER-PROD. in m x 10^3 No of M/C	WERNER-PROD. in m x 10^3 M-hrs per Year	WERNER-PROD. in m x 10^3 eff %	WERNER-PROD. in m x 10^3 PROD.	COMP. Prod.acc.to act.eff.etc. ACT.	COMP. PLAN	COMP. WERN.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
		227 - 12	27/1	Cotton	84	2064	1180	4		8	6.0	no	Placing										32								
		227 - 12	27/1	"	150	3620	944	8		8	7.5	"											1								
		229 - 15	27/1	"	84	2064	026	4		8	7.5	"											6								
		[illegible]	27/1	C 16 V	92	1200	1710	3		8	5.0	"											130								
		[illegible] - 11	20/1	Cotton	146	2570	970	6		8		"											10								
		[illegible] - 11	20/1	Cotton	150	2030	926	6		8		"											5								
		[illegible] - 11	27/1	Cotton	150	3430	928	7		8	6.8	"											41								
		316 - 51	27/1	Cotton	148	3792	1276	8		8	7.5	"											5								
		316 - 62	34/1	Cotton	59	1770	600	4		8	6.5	"											6								
		316 - 92	34/1	Cotton	145	4202	695	8		8	7.6	"											43								
		316 - 83	34/1	Cotton	98	2880	590	6		8	6.5	"											12								
		326 - 87	34/1	Cotton	146	5700	756	12		8	8.2	"											35								
		326 - 97	27/1	Cotton	139	3319	703	7		8	6.8	"											69								
		326 - 97	27/1	Cotton	145	3610	703	7		8	6.8	"											3								
		326 - 90	27/1	Cotton	59	1508	749	4		8	6.5	"											2								
		326 - 90	27/1	Cotton	164	4650	749	10		8	6.8	"											7								
		332 - 51	17/1	Cotton	162	2116																									
			34/1	Cotton		86	778	5		8		"											15								
		332 - 63	20/1	Cotton	162	2116																									
			34/1	Cotton		86	778	5		8		"											1								
		336 - 56	27/1	Cotton	139	2458																									
			50/2	Cotton		600	654	8		8	6.8	"											21								
		336 - 86	27/1	Cotton	162	3042																									
			50/2	Cotton		1030	654	8		8	6.8	"											2								
		342 - 05	17/1	Cotton	55	700	552	3		8	4.0	"											29								
			27/2	Cotton																											
		342 - 06	17/1	Cotton	169	2398	948	7		8	6.8	"											70								
			27/2	Cotton																											
		342 - 35	27/1	Cotton	70	854																									
			50/2	Cotton		38	538	4		8	5.0	"											8								
		352 - 04	17/1	Cotton	169	1066																									
			27/2	Cotton		1270	822	9		8	5.8	"											15								
		372 - 24	17/1	Cotton	169.5	1564																									
			27/2	Cotton		604	920	10		9	6.9	"											14								
		401 - 01	34/1	Cotton	143	5700	850	10		8	8.5	"											164								
		401 - 54	27/1	Cotton	143	1024																									
			27/1	Cotton		2708	855	9		6	7.6	"											43								
		506 - 02	27/1	C 16 V	86	2974	660	6		8	6.8	"											70								
		506 - 02	27/1	C 16 V	101	3500	660	7		8	7.6	"											31								
		50[illegible] - 02	27/1	C 16 V	147	5074	660	11		8	7.6	"											8								
		591 - 02	34/1	Cotton	75	1610	1800	3		8	6.0	"											58								
		591 - 02	34/1	Cotton	105	2240	1080	5		8	6.5	"											38								
		592 - 13	27/1	Cotton	86	2400	941	5		6	5.6	"											59								
		592 - [illegible]	20/1	Cotton	145	5470	575	11		8	9.0	"											71								
		592 - 54	20/1	Cotton	150	5740	547	10		8	9.0	"											38								
		592 - 56	20/1	Cotton	144	5000	684	10		8	9.0	"											1								

PLANT WERK: BUDAKALASZ	SIZING	PRODUCTION DATA, COMPARISON	WERNER	FORM-No W-105

Plant Werk	Machine	Style	Material Nm	Material Quality	Width (cm)	No of ends	Beam length (m)	No of warp beams	Partie-length	Rest-hun	Refekto	Waxing	greige / colored / placing end/dent	Work.min. per Loom beam	Work.min. per Partie change	Work.min. per Draw/N ends	Delivery m/min 100%	Delivery eff %	Delivery m/min exp.	Capacity No M/C	Capacity M-hrs Year	Production in m x 10^3 Expect.	Production Actual	Production Plan	Werner-Prod. in m x 10^3 No of M/C	Werner-Prod. M-hrs per Year	Werner-Prod. eff %	Werner-Prod. PROD.	Comp: Prod.acc.to act.eff. x 100 ACT.	PLAN	WERN.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
		592 - 57	20/1	Cotton	131	4430	696	8		8	8.4	no	Placing										111								
		592 - 57	20/1	Cotton	137	4080	558	10		7	8.4	"											50								
		592 - 60	20/1	Cotton	138	3240	512	7		8	6.8	"											40								
		592 - 61	20/1	Cotton	135	3816	496	8		8	6.8	"											8								
		596 - 17	27/1	Cotton	135	4810	880	10		8	7.5	"											1								
		596 - 22	27/1	Cotton	135	4186	1035	9		8	7.5	"											1								
		801 - 01	50/2	Cotton	105	3000	912	7		8		"											117								
		801 - 07	50/2	Cotton	85	2400	912	5		8		"											46								
		801 - 07	50/2	Cotton	108	3050	912	6		8		"											43								
		405 - 01	27/2	Cotton	111	1300																									
			27/2	Cotton		700	575	8		8													69								
		406 - 01	27/2	Cotton	131	1516																									
			27/2	Cotton		825	575	11		8		"											23								
		223 - 03	34/2	Cotton	153	4104	835	10		8	2.5	"											194								
Budakalasz														3.00	20.00	23.00 per 1000end							1.874								
		229 - 03	34/2	Cotton	145	3916	557	10				no											403								
		421 - 06	34/2	Cotton	2x66	3320	672	6				"											160								
		471 - 02	40/2	C 15 V	140	4392	691	9				"											12								
		592 - 28	20/2	Cotton	131	1600	780	3				"											45								
		592 - 38	34/2	Cotton	90	1538	826	3				"											25								
Pomáz														3.00	20.00	23.00 per 1000ends							645								
GRAND TOTAL														3.00	20.00	23.00 per 1000end	50	19.4	9.7	1	6432	3.743	2.519	2.770							

PLANT WERK	BUDAKALASZ	WARP PREPARATION MACHINE SPECIFICATION	WERNER	FORM-No W-106

No								
1	PLANT KOOP.			Budakalasz	Budakalasz	Budakalasz	Budakalasz	Budakalasz
2	PROCESS			Sect.beaming	Sect.beaming	Warping	Warping	Warping
3	MACHINE MAKE			Textima	Textima4126	Totex	Schlafhorst	Textima
4	No of MACHINES			3	2	1	1	1
5	No of CREELS							
6	BEAMER		STOP MOTION	yes	yes	yes	yes	yes
7	BEAMER		BEAM BRAKE					
8	BEAMER		MAX METER / MINUTE	450	720	240	300	300
9	BEAMER		SPEED REGULATION	yes	no	no	yes	yes
10	BEAMER		DISTANCE BEAM-CREEL	370	320	360	480	590
1	BEAMER		MAX.SECTION WIDTH cm	38 - 50	40			
2	BEAMER		CONUS DEPTH	100 - 140	188 - 200			
3	BEAMER	BEAM	ø DISC cm	50 - 62	50 - 65	50 - 65	50 - 65	50,
4	BEAMER	BEAM	ø BASE cm	10.8-15-18	10.8-15-18	21.5-23-25	21.5-23-25	21.5
5	BEAMER	BEAM	WIDTH cm			140 - 163	140 - 163	140
6	BEAMER							
7	BEAMER							
8	BEAMER							
9	BEAMER		POWER NEED kW	6.1	6.5	1.4-5	1.4-5	3
20	BEAMER		NOISE LEVEL dB	83	83	83	83	83
1	CREEL		MAX CONES / CREEL	400 - 480	400 - 480	504	576	504
2	CREEL		GAUGE cm	22	22	32	24	30
3	CREEL		MAX CONE WEIGHT gr	1500	1500	1400	1400	1400
4	CREEL		TENSION CONTROL	yes	yes	yes	yes	yes
5	CREEL		CHANGEABLE CONECREELS			fixed		
6	CREEL		STOP MOTION ENDBREAK	electr	electr	electr	electr	electr
7	CREEL							
8	CREEL							
9	CREEL							
30	CREEL							
1	CREEL							
2								
3								
4								
5								
6								

PLANT WERK: BUDAKALASZ

WARP PREPARATION PRODUCTION DATA, COMPARISON

WERNER — FORM-No W-107

Plant Dep.	Type of warp prep.	Machine type	Quality	Material		ends per w.beam/band	end breaks/MM ends-m	beam length	cone weight (gr)	yarn rest on cone gr	beams/cone	Downtime in min/			Delivery			Capacity		Production in m x 10^3			Werner-Prod. in m x 10^3				Comp. Prod.acc.to act.eff.=100		
				Nm	Quality							end-break	beam change	creel change	m/min 100%	eff %	m/min exp.	No. of M/C	M-hrs/year	Expected 1975	Actual 1975	Plan 1975	No of M/C	M-hrs/year	eff %	Prod.	Act.	Plan	Werner
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	WARPING		229-03/153	34/2	Cotton	416	15	2500													1940								
			229-03/145	34/2	Cotton	392	15	5100													4030								
			229-12/ 84	27	Cotton	516	6	4250													120								
			229-12/150	27	Cotton	452	6	944													8								
			229-15/ 84	27	Cotton	516	6	2600													24								
			266-58/ 82	27	Cotton	400	6	6840													414								
			302-11/146	20	Cotton	420	15	1400													60								
			302-11/159	20	Cotton	447	15	1400													30								
			306-11/150	27	Cotton	490	6	4400													287								
			310-51/149	27	Cotton	474	6	2550													40								
			310-82/ 59	34	Cotton	442	10	2160													24								
			310-82/146	34	Cotton	535	10	4480													344								
			310-83/ 98	34	Cotton	480	10	1120													72								
			322-87/146	34	Cotton	475	10	3890													420								
			322-89/139	27	Cotton	474	6	2050													483								
			322-89/145	27	Cotton	516	6	930													21								
			326-30/ 59	27	Cotton	402	6	1490													8								
			326-30/164	27	Cotton	465	5	1500													70								
			332-51/162	17	Cotton																								
				34	Cotton	441	15	3240													75								
			332-53/162	20	Cotton		15																						
				34	Cotton	441	10	776													5								
			335-86/139	27	Cotton		6																						
				50/2	Cotton	415	20	2730													168								
			336-86/162	27	Cotton		6																						
				50/2	Cotton	509	20	218													16								
			342-06/ 55	17	Cotton																								
				27/2	Cotton	256	20	2760													87								
			342-06/169	17	Cotton																								
				27/2	Cotton	343	20	1950													450								
			342-34/ 70	27	Cotton		6																						
				50/2	Cotton	238	20	2690													32								
			352-04/169	17	Cotton																								
				27/2	Cotton	250	20	1900													135								
			372-24/169	17	Cotton																								
				27/2	Cotton	243	20	1840													140								
			401-01/143	34	Cotton	570	10	2600													1040								
			401-54/143	27	Cotton	421	6	2800													387								
			506-02/ 86	27	C 16 V	496	6	3300													420								
			506-02/101	27	C 16 V	502	6	3850													211								
			506-02/147	27	C 16 V	461	6	3300													88								
			591-02/ 75	34	Cotton	537	10	4680													174								
			591-02/105	34	Cotton	448	10	2520													190								
			592-13/ 86	27	Cotton	480	6	4320													295								
			592-54/145	20	Cotton	497	15	3200													781								
			592-54/150	20	Cotton	574	15	2850													300								

BUDAKALASZ			WARP PREPARATION PRODUCTION DATA, COMPARISON																								WERNER	FORM-No W-107	
PLANT NO.	TYPE OF WARP PREP.	MACHINE TYPE	QUALITY	MATERIAL Nm	MATERIAL Quality	ends per w.beam/band	end breaks/ MM ends-mtr	beam length	cone weight (gr)	yarn rest on cone gr	beams / cone	Downtime in min / end-break	Downtime in min / beam change	Downtime in min / creel change	DELIVERY m/min 100%	DELIVERY eff %	DELIVERY m/min exp.	CAPACITY No.of M/C	CAPACITY M-hrs/ year	PRODUCTION in m x 10^3 EXPECTED 1975	PRODUCTION in m x 10^3 ACTUAL 1975	PRODUCTION in m x 10^3 PLAN 1975							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	WARPING		592-56/144	20	Cotton	560	15	1368													10								
			592-57/131	20	Cotton	560	15	2050													808								
			592-57/131	20	Cotton	460	15	2640													500								
			592-60/138	20	Cotton	463	15	4620													280								
			592-61/135	20	Cotton	477	15	4720													64								
			593-17/135	27	Cotton	481	6	880													10								
			590-22/135	27	Cotton	465	6	1030													9								
			801-01/105	50/2	Cotton	437	20	4560													819								
			801-07/ 88	50/2	Cotton	480	20	4560													230								
			108	50/2	Cotton	500	20	4560													258								
			406-61/111	27/2	Cotton	250	20	2640													552								
			131	27/2	Cotton	213	20	4500													138								
			421-00/2x66	534/2	Cotton	474	15	2680													1120								
			471-02/140	40/2	C 16 f	493	27	860													108								
			592-28/131	20/2	Cotton	533	25	2340													135								
			592-38/ 63	34/2	Cotton	513	15	5000													75								
		TOTEX													240	12,0	39,-	1	6432	11,963									
		Schlafhorst													300	13,2	39,5	1	6432	15,244									
		TEXTIMA													300	12,6	37,9	1	6432	14,626									
									1400	200		1,00	./.	79,5						41,833	19,313	21,651							
														per 1000															
														cones															

PLANT WORK: BUDAKALASZ

WARP PREPARATION PRODUCTION DATA, COMPARISON

WERNER — FORM-No W-107

PLANT 4002	PROCESS	MACHINE MAKE	QUALITY	MATERIAL Nm	MATERIAL Mix	ends per section	end breaks/ MM ends-ctr	beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Downtime in min/ end-break	Downtime in min/ beam change	Downtime in min/ creel change	DELIVERY m/min 100%	DELIVERY eff %	DELIVERY m/min exp	CAPACITY No. of M/C	CAPACITY M-hrs/ year	PRODUCTION in m x 10^3 EXPECTED 1975	PRODUCTION in m x 10^3 ACTUAL 1975	PRODUCTION in m x 10^3 PLAN 1975	WERNER-PROD. in m x 10^3 No of M/C	WERNER-PROD. in m x 10^3 M-hrs/ year	WERNER-PROD. in m x 10^3 eff %	WERNER-PROD. in m x 10^3 PROD.	COMP: Prod.acc.to act.eff.x100 ACT.	COMP: Prod.acc.to act.eff.x100 PLAN	COMP: Prod.acc.to act.eff.x100 WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Sect. warping		226-12 145	34/2	Cotton	392	22	586													73								
			229-03 84	34/2	Cotton	370	22	580													571								
			103	34/2	Cotton	397	22	580													661								
			145	34/2	Cotton	392	22	557													3,850								
			153	34/2	Cotton	379	22	835													803								
			155	34/2	Cotton	380	22	650													1,582								
			151	34/2	Cotton	380	22	650													651								
			229-09 145	34/2	Cotton	390	22	857													85								
			229-14 145	34/2	Cotton	390	22	547													217								
			300-06 122	40/2	Cotton	393	27	944													49								
			300-55 148	40/2	Cotton	400	27	578													85								
			300-56 147	50/2	Cotton	440	20	826													83								
			107	50/2	Cotton	427	20	885													99								
			318-88 126	50/2	Cotton	412	20	1180													64								
			320-84 112	50/2	Cotton	393	20	749													60								
			159	50/2	Cotton	412	20	770													145								
			159	50/2	Cotton	402	20	770													264								
			343-01 57	10	Tow																								
				27/2	Cotton	250	100	547													267								
			343-10 56	10	Tow																								
				50/2	Cotton	316	100	557													283								
			343-55 51	10	Tow																								
				27/2	Cotton	225	100	557													70								
			56	10	Tow																								
				27/2	Cotton	250	100	557													237								
			365-81 59	40/2	Cotton	353	27	567													31								
			154	40/2	Cotton	350	27	555													82								
			372-12 107	10	Tow																								
				50/2	Cotton	358	100	928													501								
			373-58 60	10	Tow																								
				27/2	Cotton	280	100	708													202								
			421-06 2x63	34/2	Cotton	416	22	500													132								
			476-06 126	50/2	Visc	447	15	616													762								
			140	50/2	Visc	407	15	830													547								
			592-03 95	50/2	Visc	425	15	621													621								
			139	50/2	Cotton	425	20	517													152								
			592-07 81	20/2	Cotton	337	50	772													104								
			133	20/2	Cotton	418	50	756													343								
			140	20/2	Cotton	433	50	812													94								
			150	20/2	Cotton	378	50	606													273								
			160	20/2	Cotton	405	50	568													783								
			592-14 142	20/2	Cotton	406	50	557													307								
			592-28 131	20/2	Cotton	400	50	780													304								
			593-40 76	10	Line	333	50	905													450								
			79	10	Line	350	50	805													210								
			86	10	Line	320	50	805													145								

[illegible]DAFALASZ — WARP PREPARATION — PRODUCTION DATA, COMPARISON

WERNER — FORM-No W-107

[illegible]	PROCESS	MACHINE MAKE	QUALITY	MATERIAL Nm	MATERIAL N 1 x	ends per section	end breaks/ MM ends.mtr	beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Downtime in min/ end-break	beam change	creel change	DELIVERY m/min 100 %	eff %	m/min exp	CAPACITY No.of M/C	M-hrs/ year	PRODUCTION in m x 10^3 EXPECTED 1975	ACTUAL 1975	PLAN 1975	WERNER-PROD. in m x 10^3 No of M/C	M-hrs/ year	eff %	PROD.	COMP: Prod.acc.to act.eff.=100 ACT.	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Sect. warping		593-40 95	10	Lino	420	50	970													90								
			113	10	Lino	350	50	826													85								
			130	10	Lino	369	50	335													365								
			160	10	Lino	422	50	828													535								
			596-12 142	50/2	Cotton	375	20	1792													305								
			596-20 150	50/2	Cotton	385	20	1890													142								
			599-05 135	50/2	Viscose	390	15	898													16								
		Textima							1500						450	12,3	55,4	3	19.296	64.140									
		Textima							1500						720	12,3	88,6	2	12.864	68.385									
									1500	200		,60		63,8 per 1000 ends	558			5	32-160	132.525	17.911	21619					13,5	16,4	

PLANT BUDAKALASZ	WINDING; QUILLING PRODUCTION DATA, COMPARISON																				WERNER	FORM-No W-100
PLANT KOOP	PROCESS	MACHINE MAKE	MACHINES		SPINDLES			MATERIAL		DELIVERY				PRODUCTION in to/year			WERNER 1975			COMP: Expect.1975 = 100		
			Total	In Op	Total	In Op	%	Nm	Mix	m/min 100 %	gr/Sphr 100 %	off %	gr/Sphr exp	EXPECTED 1975	ACTUAL 1975	PLAN 1975	Spindl	% eff	Production	ACTUAL	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Winding	M - 150						17/1	Cotton						2							
								20/1	"						10							
								20/2	"						50							
								27/1	"						3							
								27/2	"						9							
								34/2	"						60							
								40/2	"						1							
								50/1	"						25							
								50/2	"						36							
								10	PAN						2							
								10	Line						10							
								15	Line						1							
								6	Tow sz						6							
								10	Tow ny						1							
			1	1	80	80	100	19,9		400	1210	65,19	789	406	216	330				59,3		
		Mettler						17/1	Cotton						2							
								20/1	"						19							
								20/2	"						42							
								27/1	"						3							
								27/2	"						5							
								34/1	"						6							
								34/2	"						40							
								40/2	"						3							
								50/1	"						4							
								50/2	"						16							
								50/2	Viscose						1							
								10	PAN						49							
								10	Line						1							
								15	Line						1							
								6	Tow sz						9							
			1	1	60	60	100	14,6		530	2260	31,75	718	277	201	250				38,1		
TOTAL	WINDING		2	2	140	140	200	17,4				45,22		683	417	580				61,6	74,4	
	Quilling	Schürer						20/1	Cotton						1							
								20/2	"						6							
								27/1	"						5							
								27/2	"						6							
								27/3	Viscose						1							
								10	PAN						238							
								15	PAN						4							
								6	Line						20							
								10	Line						3							
								15	Line / LineBlends						25							
								21	Line						2							

PLANT [illegible] D A K A L A S Z			W I N D I N G ; Q U I L L I N G						PRODUCTION DATA, COMPARISON											WERNER		FORM-No W-100
PLANT	PROCESS	MACHINE MAKE	MACHINES		SPINDLES			MATERIAL		DELIVERY				PRODUCTION in to/year						COMP: Expected 1975 = 100		
			Total	In Op	Total	In Op	%	Nm	Mix	m/min 100 %	gr/Sph 100 %	eff %	gr/Sph exp	EXPECTED 1975	ACTUAL 1975	PLAN 1975	WERNER 1975 Spindles	% eff	Production	ACTUAL	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
								24	Line						3							
								3,5	Tow						1							
								6	Tow						72							
								8,5	Tow						6							
								10	Tow						17							
			5	5	50	50	100	9,9		600	3640	50,11	1824	586	412					70,3		
		UA-300						20/1	Cotton						17							
								20/2	"						26							
								27/1	"						22							
								34/1	"						17							
								40/2	" /15% dye						3							
								10	PAN						60							
								6	Line						23							
								10	Line						10							
								15	Line						11							
								18	Line						9							
								21	Line						13							
								24	Line						7							
								30	Line						9							
								6	Tow						32							
								8,5	Tow						20							
								9	Tow						15							
								10	Tow						71							
								50/21	Pan/len						1							
			10	10	120	120	100	13,4		400	1790	45,03	817	631	374					59,3		
		Schweiter						27/2	Cotton						2							
		tub.quill						50/2	Cotton						1							
								6	Line						15							
								18	Line						7							
								21	Line						4							
								6	Tow						3							
								9	Tow						2							
								10	Tow						30							
			4	4	48	48	100	10,1		180	1070	47,11	504	155	59					38,1		
TOTAL	QUILLING		19	19			100	11,45				47,82		1372	845	1021				41,6	74,4	

1.2 FINISHING

1.0 BUDAKALASZ

1.2 Finishing

1.2.1 Location

The BUDAKALASZ plant is located in a good labour market. Also, its close proximity to Csillaghegy makes the transport of cloth between the two plants economical.

1.2.2 Buildings and Lay-outs

The building containing the preparation and finishing departments is old with many supporting columns. The machines just fit in the various sections, and there appears to be a lack of working space at the entrance and exit ends of machines, and insufficient space for storage of cloth in process.

The building containing the printing department is new. There appears to be ample space for working and cloth storage.

The lay-out of the buildings containing the preparation and finishing departments are very poor. Too much transport is required to move the cloth through the departments to the following process.

The lay-out of the printing department is good. The cloth flows in a good U-shape, and no extra transport is required.

1.2.3 Process Flow and Material Handling

The process flow is not too good in the preparation department. The singe-ing machine is badly located, and the cloth flow direction of the Goller bleaching or the mercerising machine is not correct.

The material handling equipment should be modernised.

1.2.4 Machine Obsolescence

The machines at BUDAKALASZ are getting old, but are not obsolete. Old machinery, if properly maintained, can perform almost as well as new machinery. The only machines truly obsolescent are the two Donath jiggers. The two print steamers could be replaced by one modern loom steamer. The remaining equipment should be adequate to process the cloth economically.

1.2.5 Machine Improvements

The existing equipment can be improved by installing modern electronic process control instruments to increase the productivity and improve the quality.

Some of the existing equipment can be made productive by modifications which can be made by the plant maintenance department.

1.2.6 Mill-Balance

An accurate mill balance could not be calculated for the BUDAKALASZ plant. The data supplied was much too general. However, certain comments can be made about dyeing times and machine speeds.

The speed of 0.7 m/min. for the jig dyeing department is much too low. A jig roll of 600 metres would require 857 minutes or 14,5 hours.

Processing speeds on several machines are too low. Utilisation of machinery is very poor.

A breakdown of the BUDAKALASZ production is as follows:

-	Bleaching for white	=	1.196.160 metres
-	Calender and/or measure	=	1.734.220 metres
-	Finish only	=	392.650 metres
-	Dyed	=	1.242.520 metres
-	Printed	=	3.397.460 metres
-	Coated	=	629.000 metres
	Total yearly production	=	8.592.000 metres

The processing of the cloth is not complicated, cloth for printing or for white is prepared on the Goller bleaching machine. Cloth for dyeing is prepared and dyed on the jiggers.

The printing consists of flat bed screen printing which is done at a very slow speed. Since both the steamer and the curing oven follow the printing stage, it is assumed that both pigment and reactive colours are used.

1.2.7 General Comments

Although an accurate mill balance could not be calculated due to the lack of proper data, the labour complement of 147 people to produce the 8.592 metres is much too high. The labour complement can be drastically reduced.

The planning system, preventive maintenance system, process control systems, quality control systems, and bleaching, dyeing, and finishing recipes should be reviewed and improved.

10116

VOLUME II OF VI

GYÖR

U.N.I.D.O.

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME II OF VI

G Y Ö R

2.1 Weaving

2.2 Finishing

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL
Brussels - New York

1977

TABLE OF CONTENTS

		Page
2.0	GYOR	1.
2.1	Weaving	1.
2.1.1	Location	1.
2.1.2	Buildings and Lay-out	1.
2.1.3	Process Flow and Material Handling	1.
2.1.4	Machine Obsolescence	2.
2.1.5	Machine Improvements	2.
2.1.6	Machine Park 1975-1977	3.
2.1.7	Summary Mill Balance	4.
2.1.8	Summary of Labour Complement	6.
2.1.9	Notes and Explanations to Substantiate the Summary of the Mill Balance and Labour Complement	7.
2.1.9.1	General	7.
2.1.9.2	Number of Looms	7.
2.1.9.3	Efficiencies	8.
2.1.9.4	GYOR Weave-Room Efficiency	9.
2.1.9.5	Operator Efficiency	10.
2.1.9.6	Plant Efficiency	10.
2.1.9.7	Production	11.
2.1.9.8	WERNER Proposal 2	11.
2.1.9.9.	Loom Assignments	12.
2.1.9.10	Estimated Number of Looms per Weaver	13.
2.1.9.11	Preparation Departments	14.
2.1.9.12	Ring Twisting	15.
2.1.9.13	Greige Cloth Inspection	15.
2.1.9.14	Summary of Yarn Consumption	16.

TABLE OF CONTENTS

		Page
TABLES		
I	Machine Park 1975-1977	3.
II	Summary Mill Balance - GYOR	4.
III	Summary of Labour Complement	6.
IV	Summary of Yarn Consumption	16.

APPENDIX - WEAVING

Form A-100 Production Data Weaving
Form W-100 Weaving - Machine Specifications
Form W-101 Cloth Specifications, Quantities
Form W-102 Running Data, Productivity
Form W-103 Production Calculations, Comparisons
Form W-104 Sizing, Machine Specifications
Form W-105 Sizing, Production Data Comparison
Form W-106 Warp Preparation, Machine Specifications
Form W-107 Warp Preparation, Production Data, Comparison
Form W-108 Winding, Quilling, Production Data, Comparison
Form S-103 Twisting, Production Data Comparison

TABLE OF CONTENTS

		Page
2.0	GYOR	17.
2.2	Finishing	17.
2.2.1	Location	17.
2.2.2	Buildings and lay-out	17.
2.2.3	Process Flow and Material Handling	17.
2.2.4	Machine Obsolescence	18.
2.2.5	Machine Improvements	18.
2.2.6	Summary of Mill Balance	18.

APPENDIX

Form V-100 Dyeing and Finishing Comparisons: Summary

Form V-100 Dyeing and Finishing Comparisons: Linen/Synthetics Range

Form V-100 Dyeing and Finishing Comparisons: Cotton/Syntehtics Range

Form V-100 Dyeing and Finishing Comparisons: Cotton/Linen Range

Form V-100 Dyeing and Finishing Comparisons: 100% Linen Range

Form V-100 Dyeing and Finishing Comparisons: 100% Cotton Range

Form V-100 Dyeing and Finishing Comparisons: Cotton/Linen/Synthetics Range

1.2 WEAVING

2.0 GYOR

2.1 Weaving

2.1.1 Location

The weaving mill GYOR consists of the main works in GYOR and the cooperative Tèt.

2.1.2 Buildings and Lay-out

Buildings and lay-outs are suitable. The weave-room of GYOR, as far as lay-out is concerned, meets our requirements in regard to an economical unit.

Details, like:

- Space of working alleys,
- Transport routes,
- Lighting,
- Working environment,

have to be further analysed in order to quantify the optimal working conditions to reach our proposed targets as outlined later on the mill balance.

2.1.3 Process Flow and Material Handling

Although the process flow is acceptable, it can, nevertheless, be improved. Our recommendations would be to improve and invest in material handling equipment, the more so in this particular unit to make the best use of the modern looms (SzTB).

Thought for improvement should be given to:

- Storing of loom beams,
- Storing of warps,
- Weft material transport,
- Weft reserves on the loom,
- Piece collecting and handling,
- Spare parts availability.

2.1.4 Machine Obsolescence

The modernisation of the loom park is already on the way, having added 48 Sz TB looms, and in the winding department with the installation of 1 CS 162 - Meyer winding equipment.

2.1.5 Machine Improvements

As we noticed during our visits to the production departments, there is a definite lack of machine attachments which could be added at low cost and would greatly improve the running conditions of the material.

In the short term, investment should not be made only for prime equipment but also in:

- Machine attachments,
- Auxiliary equipment.

2.1.6 Machine Park 1975-1977

Table I

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT-100	207	95	203		240	95	200
AT-175	39	165	148		40	172	160
Picanol	29	175	161		20	172	170
Raep	22	93	169				
Rascher	69	106	169.7		84	96	170
Rascher	42	96	175		48	96	170
				Sz TB-216	48	210	205
Total	408	109	184.7	Total	480	116	187

As one can see in the table, the same loom type is sometimes quoted with different widths and speeds. Due to transmission problems, the exact reasons could not be identified. Therefore, we listed the machine specifications as it was given to us in both cases.

2.1.7 Summary Mill Balance

Table II

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine hours/year	6432	6432	6432	6432
Total no. of looms	453	453	453	480
Looms in operation	408	408	408	480
Average ppm/loom	184.47	184.47	184.47	187
Picks/24 hrs. 100% (10^6)	108.3798	108.3798	108.3798	129.2544
Picks/24 hrs. actual (10^6)	80.0777	74.7840	92.6647	110.5125
Plant efficiency %	74	69	85.5	85.5
Machine efficiency %	-	85	95	95
Operator efficiency %	-	81	90	90
Product mix Ø ppcm	17.05	17.05	17.05	17.05
Ø width cm	97.4	97.4	97.4	97.4
Production m x 10^3/year	12.587	11.859	14.565	17.371
sqm x 10^3/year	12.220	11.559	14.187	16.919
Production comparison %	100	94	116	138
Loom stops: warp/M ends/10^4 p	-	1.05	.4	-
weft/10^4 picks	-	4.12	1.2	-
mech/10^4 picks	-	4.38	.6	-
Ca. Loom stops/Loom hr.	-	8.0	2.7	-
Avg. no. of looms/weaver	-	7.6	12	12

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
Loom beam length m Ø	-	920	920	920
Ends/beam Ø	-	2528	2528	2528
Warp changes/24 hrs. Ø	-	48	59	71
Piece length m Ø	-	108	108	108
Pieces/24 hrs. Ø	-	410	503	600
Yarn consumption: warp to	-	1623	1993	2377
weft to	-	1423	1748	2085
total to	-	3046	3741	4462
Labour complement tot. pers.	-	708	536	643
Productivity m/work. Hr.	-	7.81	12.67	12.60
comparison %	-	100	162	162
				Short of 1000 twist spindles

2.1.8 Summary of Labour Complement

Table III

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

	Actual 1975				WERNER Proposal 1				WERNER Proposal 2			
	Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.
Winding	4	-	59	63	4	50	22	76	4	60	30	94
Twisting	4	-	60	64	3	24	13	40	3	30	15	48
Quilling	6	-	72	78	2	28	20	50	3	37	25	65
Warp preparation	4	-	32	36	3	6	15	24	3	8	19	30
Sizing	-	-	6	6	-	3	8	11	-	3	9	12
Warp store	-	-	-	-	1	-	3	4	1	-	4	5
Sub-total prep.	18	-	229	247	13	111	81	205	14	138	102	253
Drawing-in	-	-	41	41	1	11	3	15	2	13	4	19
Weaving	44	-	328	372	4	102	164	270	4	120	192	316
Shear., inspect.	2	-	46	48	2	33	11	46	2	39	13	54
Sub-total weave	46	-	415	461	7	146	178	331	8	172	209	389
Grand total	64	-	644	708	20	257	259	536	22	310	311	643

Since WERNER's opinion of what is direct or indirect, which indirect personnel belong to which department, might differ from the actual labour complement, not too much weight should be laid on a departmental comparison, but rather on the total complement.

2.1.9 Notes and explanations to substantiate the summary of the mill balance and labour complement.

2.1.9.1 General

Basis for all calculated data was the submitted WERNER form A-100, W-100 to W-109, which can be found in the appendix.

We had to work on the assumption that the given data were correct. In calculating a mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average. Therefore, the probability of having used some incorrect figures from the completed forms has been greatly reduced.

2.1.9.2 Number of Looms

Form W-100 gave a total of 453 looms. Form W-103 (weaving production calculation) stated 408 running looms.

Despite being told that the difference of 45 looms were idle due to labour shortages, we did not take them into account in our production calculation.

WERNER proposal 1 is based on 408 looms in operation.

WERNER proposal 2 is based on 480 looms which was given to us as the 1977 loom complement.

2.1.9.3 Efficiencies

Standard procedure for WERNER requires mill efficiency to be split up in three different types of efficiency.

1. Machine Efficiency

   A loom is available 24 hours a day on a three shift basis which equals a 100% machine efficiency.

   Whenever the loom is stopped for any reason other than weaver interference, the stopped hours are called "downtime hours" and reduce the machine efficiency accordingly.

2. Operator Efficiency

   100% hours minus downtime hours are the machine hours available to the wever which is 100% for the weaver. Actual picks compared to the possible picks in that time gives the operator efficiency.

3. Plant Efficiency

   This indicates the net-efficiency of a weave-room and is calculated either by multiplying:

   - machine efficiency x operator efficiency, or
   - the relation of actual picks to possible picks in 24 hours.

   WERNER practice does not distinguish a difference between downtime hours of less or more than 8 hours a day.

   All efficiencies mentioned in "Summary Mill Balance" are compared to a 24 hour day, 268 working days per year as an absolute 100% efficiency.

2.1.9.4 GYOR Weave-Room Efficiency

Based on above definitions in section 2.1.9.3 and by calculating against historical records, with average picks per loom, 408 looms in operation, actual picks achieved, we derived at the following efficiencies for the plant:

- Plant efficiency - 69%
- Machine efficiency - 85%
- Operator efficiency - 81%

Individual downtime losses per item were given to us as:

- Warp changing - 2.1%
- Repair - 1.6%
- Missing material - .2%
- Various - 1.4%

which represents:

94.7%.

machine efficiency.

This, in our opinion, is a good result and we based our calculation on 95%. The difference between 94.7% and 85% (-9.3%) accounts for labour shortages on the 408 looms.

By taking into consideration 453 looms, the downtime for labour shortage would have been:

17.9%.

As we understood from the LENFONO management, above downtime percentages have been taken from the norm-sheets for job allocations. Therefore, these figures do not necessarily represent the actual conditions, but they do indicate efficiencies lower than they ought to be in a modern plant.

2.1.9.5 Operator Efficiency

Actual 1975 was:

81%.

There is no reason why this 81% cannot be improved to 90% through:

- New up-to-date bonus sytem
- Standard working procedure
- Operator training program
- Improving running conditions of material
- Rigid maintenance program for the looms
- Correct job distribution.

2.1.9.6 Plant Efficiency

LENFONO's 1975 plan called for:

12,587,000 running metres,
12,220,000 square metres,

with a product mix giving an average of:

17.05 picks/cm,

and an average picks per loom of:

184.47 per min.,

and with 408 looms this would have given a plant efficiency of:

74%.

In comparison:	Actual	: 69%
	WERNER proposal 1	: 85.5%.

2.1.9.7 <u>Production</u>

Comparison based on LENFONO plan 1975, actual achieved, and WERNER proposal 1.

The comparison shows:

- Plan = 100% - 12.220 sqm (10^3)
- Actual 75 = 94% - 11.559 sqm (10^3)
- WERNER 1 = 116% - 14.187 sqm (10^3)

Comparing these figures, one sees a realistic plan made by the LENFONO management which we can, nevertheless, improve by:

16%

and by 22% compared with actual 75.

2.1.9.8 <u>WERNER Proposal 2</u>

In order to get an up-to-date evaluation of the weaving mill, we asked for the 1977 loom complement and calculated a mill balance on this basis.

As far as production goes, WERNER expects an output from the 480 looms which would amount to:

16.919 sqm (10^3).

This would represent an improvement of:

38%

over the LENFONO plan.

2.1.9.9 Loom Assignments

Running condition of the material expressed in loom stops (the data given does not necessarily show the actual picture since the figures have been taken from their time evaluation):

- Warp = Actual : 1.05/M ends/10^4 picks
  WERNER : .4 /M ends/10^4 picks

We cannot point out the exact reasons for LENFONO's high breakage rate since we did not analyse the machine-material combination. But by comparing the warp material and our experience in this field,we feel that a value of:

.4

is obtainable.

- Weft = Actual : 4.12 per 10^4 picks
  WERNER : 1.2 per 10^4 picks.

Part of the high breakage rate lies in the yarn quality as we can see in the spinning process data. But also part is due to the running condition of the loom (shuttle control, cleanliness, etc.).

Mechanical stops per 10^4 picks

The figure was given at:

4.38.

We were not able to receive a clear breakdown of this value.

By applying WERNER standard procedures in regard to correct job distribution and maintenance schedules, this value should not be higher than:

.6

as far as weaver interferences are concerned.

2.1.9.10 Estimated Number of Looms per Weaver

- Actual : 7.6 looms per weaver
- WERNER 1 : 12 looms per weaver.

This implies the execution of several improvement programs:

- Machine condition (preventive maintenance program)
- Running condition of yarn
- Correct bonus system
- Operator training program
- New machine lay-out
- Improved handling procedure.

2.1.9.11 Preparation Departments

The relationship of sectional beaming to warping (for sizing) has been taken from the actual conditions and the proposed personnel loading is based on the weaving demands of WERNER proposal 1 and WERNER proposal 2 respectively.

The same is valid for the relationship of warp hanging to tying-in. The same distribution as in 1975 was applied also for the 1977 proposal.

In the course of our analysis, we found several problem areas on which we offer the following comments:

1. Sectional Beaming

   1975 breakage rate expressed in breaks per million end metres:

   - 2-ply cotton = 30
   - Linen/flax = 50

   Under normal circumstances these values should be:

   - 2-ply cotton = 4
   - Linen/flax = 10 - 20

   Action required to obtain these figures:

   - Better yarn quality
   - Correct tension control on creels
   - Creel cleanliness (fan, etc.)
   - Beamer in proper condition.

2. Warping

End-breaks per million end metres:

- Cotton and cotton blends	=	Actual :	10
		WERNER 1 :	4

Action required to obtain these figures:

- Better yarn quality
- Correct tension control on creels
- Creel cleanliness (fan, etc.)
- Beamer in proper condition.

2.1.9.12 Ring Twisting

The ring twisting capacity seems to be short of approximately 1000 spindles in order to accomplish WERNER proposal 2.

Our suggestion:

- To install the required capacity, or
- To purchase 2-ply cotton.

Only an exact cost evaluation can show which alternative is preferable.

2.1.9.13 Greige Cloth Inspection

Basis for proposed labour complement:

- Normal quality and grading standards
- Vertical inspection tables with positive drive and back-lighting
- Large input size (sewing ends together)
- Standardisation of fault analysis
- Setting up a grading system according to market demand.

2.1.9.14 Summary of Yarn Consumption

Table IV

	According to Mill Balance W-100 - W-103	WERNER * Proposal 1	WERNER * Proposal 2
Warp			
- Cotton and blends	1554	1909	2276
- Linen	48	59	70
- Flax	21	25	31
- Synthetics	-	-	-
	1623	1993	2377
Weft			
- Cotton and blends	367	451	538
- Linen	710	872	1040
- Flax	346	425	507
- Synthetics	-	-	-
	1423	1748	2085

* without Tėt

* têt

APPENDIX

WEAVING

PLANT WERK: CYCR

PRODUCTION DATA WEAVING

WERNER — FORM-No. A-100

PLANT, KORP.	STYLE	1975 GREIGE METERS 10^3: Meters	Sq.Meters	%	FINISHED FABRICS 1975 — TOTAL 10^3: Meters	Sq.Meters	%	SPLIT-UP IN — EXPORT & I.QUALITY 10^3: Meters	Sq.Meters	%	ALL OTHER QUALITIES 10^3: Meters	Sq.Meters	%	LOSS greige to finish: Sq.Meters	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	231-02/R	1.276	1.174		1.216	1.094		.992	.893		.224	.201			
	231-02/T	.205	.188		.197	.177		.161	.145		.036	.032			
	231-15	64	60		63	57		53	48		10	9			
	231-09	251	223		240	204		148	126		92	78			
		14	13		31	27		27	24		4	3			
		1.810	1.558	100	1.747	1.559	94	1.381	1.236	79	366	323	21		
	421-01	271	125		239	105		232	102		7	3			
	421-01	161	104		157	157		145	145		12	12			
		190	99		239	111		209	96		30	15			
		622	388	100	635	373	96	566	343	92	49	30	8		
	521-19	952	1.476		1.019	1.579		984	1.525		35	54			
	521-13	66	61		69	63		60	55		8	8			
		8	7		14	12		12	10		2	2			
		1.076	1.544	100	1.101	1.654	107	1.056	1.590	93	45	64	4		
	213-78	55	46		45	38		35	28		10	8			
	209-39	58	75		46	64		34	48		12	16			
	232-33	283	242		297	232		255	199		42	33			
	232-15	454	418		470	423		370	333		100	90			
	232-05	722	664		674	607		527	474		147	133			
	232-[illegible]	372	344		366	329		280	252		86	77			
	236-10	153	144		154	139		131	118		23	21			
	236-10	64	54		69	55		59	47		10	8			
	236-11	121	113		121	109		116	104		5	5			
	236-17	928	877		981	883		850	765		131	118			
	236-18	511	483		510	459		443	399		67	60			
	236-18	147	244												
	236-13	216	192		521	417		460	368		61	49			
	236-22	330	312		332	299		287	-258		45	41			
		282	237		275	250		224	202		51	48			
		4.579	4.435	100	4.661	4.302	97	4.071	3.595	84	790	707	16		
	255-01	578	471		556	434		532	415		24	19			
	255-01	414	360		387	348		369	332		18	16			
	256-01	6	9												
	256-01	182	234		160	224		145	203		15	21			
	262-01	62	59		66	59		64	56		2	1			
	276-01	74	62		81	65		65	52		16	13			
	266-09	95	89		101	91		99	88		3	3			
	266-10	65	118		61	109		56	101		5	8			
	263-06	164	133		152	136		131	118		21	18			
		1.620	1.555	100	1.564	1.466	94	1.460	1.367	93	104	99	7		

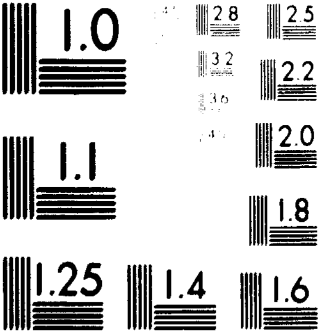
PLANT WERK GYOR

PRODUCTION DATA WEAVING

WERNER FORM-N. A-10C

PLANT, KOOP.	STYLE	1975 GREIGE METERS 10^3			FINISHED FABRICS 1975 TOTAL 10^3			SPLIT-UP IN EXPORT & I.QUALITY 10^3			ALL OTHER QUALITIES 10^3			LOSS greige to finish	
		Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Sq.Meters	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	300-11	156	234		158	221		136	191		22	30			
	30[illegible]-11	49	79		49	74		49	74						
		45	62		54	72		44	58		10	14			
		250	375	100	261	367	98	229	323	88	32	44	12		
	342-05	34	56		108	54		102	51		6	3			
	372-19	146	74		146	70		142	68		4	2			
		85	52		103	61		95	56		8	5			
		265	182	100	357	185	102	339	175	95	18	10	5		
		57	53		41	40		33	32		8	8			
	422-09	117	90		230	87		224	85		6	2			
	416-13	116	108		162	103		148	95		14	8			
		233	198		392	190		372	180		20	10			
	282-01	532	495		551	496		548	493		3	3			
	593-40	62	97		61	91		55	82		6	9			
	593-01	167	148		155	138		132	119		23	19			
		229	245		216	229		187	201		29	28			
	200-52	536	431		554	443		538	430		16	13			
	GRAND TOTAL	11,853	11,559	100	12,250	11,304	98	10,800	9,965	88	1,460	1,339	12		

81-12 30



MICROCOPY RESOLUTION TEST CHART

[illegible]

PLANT WERK: S Y C R

WEAVING MACHINE SPECIFICATION

WERNER — FORM-No W-100

PLANT ABT.	STYLE GROUP	MACHINE PARK: MACHINE TYPE	WARP MOTIO	WEFT INPUT	WIDTH	WARP STOP MOTION	WEFT INSERT	AVAIL LOOMS	LOOMS IN OPERAT.	PRODUCTION DATA, EFFICIENCIES: % AVAIL. TO RUN.	PPM	LOOM-HRS per 24 hrs 100 %	DOWNTIME IN %: Warp chang	Rep	Miss. Mat.	Miss Pers.	Var.	Total	LOOM-HRS 24 hrs net	M/C EFF. %	PICKS PRODUCED: Picks per 24 hrs in Millions 100 %	Actual	PLANT EFFIC. %	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
		AT 100 aut	dob/pl	pirn	95	mech	conv.	216	207	95,8	203,0	4,968						5,6	4,690	90,4	60.510	43.688	72,2	
		AT 175 aut	plain	pirn	165	mech	conv.	40	39	97,5	148,3	936						3,8	900	93,8	8.329	6.466	77,6	
		Picanol	dobby	pirn	175	elect	conv.	34	29	85,3	101,1	696						6,5	651	79,8	6.728	3.682	54,7	
		Raep.aut.	plain	pirn	93	mech	conv	24	22	91,7	169,4	528						5,4	499	86,7	5,367	4,414	82,2	
		Roscher	dob/pl	pirn	106	mech	conv.	91	69	75,8	169,7	1,656						4,9	1,575	72,1	16,861	10,564	62,6	
		Roscher	dob/pl	pirn	96	mech	conv.	48	42	87,5	175,0	1,008						5,9	949	82,3	10,584	5,970	56,4	
		TOTAL						453	408	90,1	184,5	9,702	2,1	1,6	0,2	0,1	1,4	5,4	9,264	85,2	108,379	74,784	69,0	

PLANT / WERK	S Y O R	WEAVING CLOTH SPECIFICATION, QUANTITIES	WERNER	FORM-No W-101

UNIT DEP.	STYLE/STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	WARP YARN	WEFT Nm	WEFT YARN	CLOTH SPEC Warp e/cm	Weft p/cm	WEIGHT gr/sq.m. Warp	Weft	Total	% CONTRACT. Warp	Weft	ENDS PER BEAM	BEAM LENGTH m	∅ PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in mtr x 10^3 I.QUART.	II.QUART.	III.QUART.	IV.QUART.	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	231-02/R	3:2 tuill	92	50/2	Cotton	17/1	Cotton	39,1	22,3	190	145	335	20	3,2	3600	680	106	85	364	338	224	350	1,276
	231-02/t	3:2 tuill	92	50/2	Cotton	17/1	Cotton	39,1	23,0	190	145	335	20	3,2	3602	683	17	85	94	87	24	-	205
	231-08	plain weave	89	50/2	Cotton	27/1	Cotton	28,7	23,5	125	95	220	20	4,7	2570	920	21	115	91	41	29	100	251
	231-15	2:2 tuill	94	50/2	Cotton	27/1	Cotton	38,3	23,0	175	80	255	20	2,8	3600	595	5	85	64				64
	231-16	2:2 tuill	91	40/2	C 16V	20/1	Cotton	27,7	19,3	160	100	260	18	4,6	2520	595	1	85				14	14
																			603	466	277	464	1,810
	421-01	plain weave	46	27/2	Cotton	27/2	Cotton	25,8	12,5	230	105	335	20	2,5	1186	580	23	145	93	49	18	111	271
	421-01		101,5	27/2	Cotton	27/2	Cotton	26,6	12,5	230	105	335	20	1,0	2700	440	13	110	4	52	56	49	161
	421-09		47	27/2	Cotton	27/2	Cotton	25,3	13,0	230	105	335	18	5,1	1182	480	16	120	45	4	27	114	190
																			142	105	101	274	622
	521-19	plain weave	155	34/1	Cotton	34/1	Cotton	22,5	18,0	70	55	125	14	4,9	3486	1150	75	170	238	248	248	218	952
	521-13	3:2 tuill	92	50/2	Cotton	20/1	Cotton	39,1	22,3	185	115	300	20	3,2	3602	680	6	85	4	60		2	66
	521-11	3:2 tuill	92	50/2	Cotton	17/1	Cotton	39,1	22,3	190	145	335	20	3,2	3600	680	1	85				8	8
																			242	308	248	228	1,026
	215-78		85	50/2	C 67PE	15	Line 67PE	18,8	17,5	85	125	210	16	3,4	1620	1380	5	115	33	22			55
	220-39	plain weave	151	30/2	Line 67PE	15	Line 67PE	14,8	15,5	110	105	215	10	2,9	2260	990	4	110		11	18	21	50
	222-03		84	40/2	Cotton	18	Line	19,5	16,0	115	95	210	16	2,3	1652	1120	24	140	67	67	97	57	226
	232-15	3:2 tuill	92	50/2	Cotton	18	Line 6V	30,1	18,5	185	125	310	18	1,8	3604	665	39	95	146	125	95	88	454
	232-05	3:2 tuill	92	50/2	Cotton	18	Line 6V	39,1	20,8	185	125	310	18	1,8	3602	665	60	95	216	185	143	178	722
	232-06	2:2 tuill	92,5	50/2	Cotton	15	Line	38,9	19,0	180	140	320	18	,4	3602	605	31	95	119	85	137	31	372
	236-10	2:2 tuill	94	20/1	Cotton	12	Line 16V	26,7	14,5	155	130	285	14	1,5	2522	665	13	95		59	56	38	153
	239-10	2:2 tuill	84	20/1	Cotton	12	Line 16V	26,7	14,5	155	130	285	14	2,3	2242	700	5	100	64				64
	239-11	2:2 tuill	93	40/2	C 16V	12	Line 16V	27,1	14,5	155	130	285	17	1,1	2524	760	10	95	50	34	35	2	121
	236-17	2:2 tuill	94,5	20/1	Cotton	15	Line 16V	26,5	19,3	145	135	280	14	,9	2520	665	77	95	255	317	216	140	928
	236-18	2:2 tuill	94,5	40/2	C 16V	15	Line 12PAN	26,7	18,8	155	130	285	17	,9	2520	760	43	95	104	122	114	171	511
	236-19	2:2 tuill	165	40/2	C 16V	15	Line 12PAN	27,0	18,8	155	130	285	17	1,2	4480	960	12	80	91	40	6	10	147
	239-18	2:2 tuill	84	40/2	C 16V	15	Line 12PAN	26,7	18,8	155	130	285	17	,9	2242	810	18	90	19	85	59	53	216
	239-22	2:2 tuill	94,5	20/1	Cotton	15	Line 12PAN	27,5	19,3	155	130	285	14	1,2	2624	630	29	90		2	176	152	330
	232-19	3:2 tuill	92	50/2	Cotton	15	Line	39,1	18,3	180	130	310	8	1,6	3600	665	22	95	30	70	50	116	266
																			1,154	1,274	1,1[illegible]	1,109	4,6[illegible]
	250-01	plain weave	91,5	27/2	C 16V	10	Tow	14,6	13,0	125	145	270	18	1,2	1202	560	48	120	170	180	150	122	576
	250-01		92	27/2	C 16V	10	tow	14,7	13,0	125	145	270	20	1,0	1366	920	35	115	110	115	105	60	414
	258-01		144	27/2	C 16V	10	Tow	14,6	13,0	125	145	270	18	1,4	2120	900	1	90			6		6
	259-01		144	27/2	C 16V	10	Tow	14,6	13,0	125	145	270	18	1,4	2120	900	14	90	41	49	52	20	162
																			327	344	317	272	1,160
	262-01	3:1 tuill	94	27/1	C 16V	18	Line 6V	28,7	17,5	120	110	230	14	2,8	2414	805	5	115		12	30	14	62
	270-01	plain weave	83	27/1	C 16V	18	Line 6V	15,5	13,5	65	80	145	12	2,2	1292	1650	6	165	45	29			74
	265-09	plain weave	93	20/1	Cotton	15	Line 16V	17,4	14,7	100	105	205	16	3,0	1628	900	8	100	20	25	40	10	95
	266-10		2x93	20/1	Cotton	15	Line 16PE	2x14	2x115	155	165	320	14	7,2	2520	630	5	90			65		65
	263-06	plain weave	80,5	18	Line	18	Line	17,8	15,5	110	95	205	12	3,0	1430	630	12	90		80	26	40	146
	263-06		80,5	18	Line	18	Line	17,8	15,5	110	96	205	12	3,0	1430	630	1	90	11			7	18
																			76	146	167	71	460

PLANT / WERK: G Y O R

W E A V I N G   C L O T H   S P E C I F I C A T I O N ,   Q U A N T I T I E S

WERNER — FORM-No W-101

[illegible]	STYLE / STYLE GROUP	CONSTRUKTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP YARN	MATERIAL WEFT Nm	MATERIAL WEFT YARN	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in m x 10³ I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	333 - 11	plain weave	150	27/1	Cotton	15	Line 16PE	22,9	15,0	95	105	200	16	1,0	3450	990	13	90	11	38	60	47	156
	333 - 11	"	159	27/1	Cotton	15	Line 16PE	23,1	15,0	95	105	200	16	1,2	3635	900	4	90				49	49
	333 - 07	"	140	10	Line	10	Tow	13,1	12,5	150	130	280	14	1,4	1840	855	1	95	11				11
	333 - 07	"	140	10	Line	10	Tow	13,1	12,5	150	130	280	14	1,4	1840	855	3	95		19	15		34
																			22	57	75	96	250
	342 - 08	"	164	17/1	Cotton	15	Line			60	65												
				27/2	Cotton	27/2	Cotton	14,3	14,5	45	45	215	18	4,1	2358	855	3	95		19	15		34
	372 - 19	"	52,5	17/1	Cotton			14,3															
				50/2	Cotton	10	Line	28,1	14,5	125	145	270	20	4,5	1146	1080	12	120	42	32	31	41	146
	382 - 65	patterned	81	20/1	Cotton	10	Tow	24,2	12,5	130	135	265	10	2,8	1476	855	7	95		27	27	31	85
																			42	78	73	72	265
	402 - 01	plain weave	93	27/2	Cotton	10	Line	16,1	13,0	140	135	275	20	,8	1501	920	5	115		4	25	28	57
																				4	25	28	57
	422 - 03	"	78	27/2	Cotton	15	Line	26,3	12,5	235	90	325	18	1,3	1026	525	9	105	36	47	22	7	112
	422 - 03	"	38,5	27/2	Cotton	15	Line	26,7	12,5	235	90	325	18	2,0	2048	525		105			5		5
	415 - 13	3:1 twill	93	50/2	Cotton	12	Line 16V	26,1	14,5	120	130	250	16	1,2	2430	665	8	95	2	20	35	47	104
	415 - 13	3:1 twill	93	50/2	Cotton	12	Line 16V	26,1	14,5	120	130	250	16	1,2	2430	665	1	95		12			12
																			38	67	62	54	221
	533 - 01	plain weave	93	27/1	Cotton	9	Tow	7,4	8,0	35	90	125	8	2,1	2970	695	44	165	32	84	222	194	532
																			32	84	222	194	532
	593 - 40	"	153	10	Line	10	Tow	13,3	12,5	150	135	265	14	2,3	2120	850	3	85			20	11	31
	593 - 40	"	158	10	Line	10	Tow	13,3	12,5	150	135	265	14	2,2	2120	850	3	85				31	31
																					20	42	62
	593 - 01	"	81	10	Tow	10	Tow	13,1	12,5	150	135	285	14	1,4	1072	525	11	105				136	136
	593 - 01	"	81	10	T..	10	Tow	13,1	12,5	150	135	285	14	1,4	1072	525	2	105				31	31
																						167	167
	[illegible] - 52	"	80,5	27/1	C 16V	6	Tow 16V	10,0	11,5	70	200	270	20	,6	1296	1500	45	100	113	159	107	157	536
																			113	159	107	157	536
	GRAND TOTAL																		2.831	3.004	2.644	3.176	11.859

CYOR	WEAVING RUNNING DATA , PRODUCTIVITY																WERNER FORM-No W-102
	STYLE / STYLE GROUP	LOOM TYPE	LOOM STOPS			% WASTE			LOOMS / WEAVER	PRODUCTION 1975 m x 10^3	LABOR HOURS 1975			PRODUCTIVITY in MTR/WORK.HOUR			REMARKS
			Warp / % ends 10,000p	Weft / 10,000 picks	Mech / 10,000 picks	Warp	Weft	Total			DIRECT	INDIRECT	TOTAL	Direct	Indirect	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	231 - [illegible] / R	AT - 100	.61	3.96	3.12				9.00	1,276							
	231 - [illegible] / T	AT - 100	.61	3.96	3.12				9.00	205							
	231 - 05	AT - 100	.92	3.96	3.16				8.72	751							
	231 - 15	AT - 100	.54	2.14	2.97				11.30	64							
	231 - 10	AT - 100	.61	3.96	3.12				9.00	14							
										1,070							
	421 - 01	Sima	.61	4.41	12.25				4.04	271							
	421 - 01	Sima	1.27	4.41	36.60				2.00	161							
	421 - 03	Sima	.61	4.41	12.25				4.04	[illegible]							
										622							
	521 - 19	AT - 175	.89	3.69	3.48				5.29	952							
	521 - 12	AT - 100	.61	3.96	3.12				9.00	56							
	541 - 11	AT - 100	0.61	3.96	3.12				9.00	8							
										1,076							
	219 - 73	AT - 100	.98	3.41	2.85				9.85	55							
	205 - 39	Picanol	1.50	1.87	5.83				4.04	50							
	227 - 03	AT - 100	.98	4.58	2.97				10.53	288							
	232 - 15	AT - 100	.72	4.10	3.26				8.78	454							
	232 - 05	AT - 100	.72	4.10	3.26				8.78	722							
	232 - 06	AT - 100	.70	4.20	3.37				7.93	372							
	236 - 10	AT - 100	1.10	4.80	2.85				7.74	153							
	236 - 10	AT - 100	1.10	4.20	2.71				8.50	64							
	236 - 11	AT - 100	.96	4.60	2.74				8.46	121							
	236 - 17	AT - 100	1.10	4.80	3.35				7.67	928							
	236 - 18	AT - 100	.93	4.80	3.22				8.10	511							
	236 - 19	Picanol	.95	5.30	11.36				5.02	147							
	235 - 16	Sima	.98	4.30	3.09				5.33	215							
	235 - 22	Sima	1.10	4.60	3.35				5.04	330							
	232 - 19	Sima	.72	4.80	3.35				5.33	269							
										4,079							
	250 - 01	Rueti	1.11	5.50	2.22				8.30	576							
	250 - 01	Rueti	1.11	5.70	2.31				7.56	414							
	256 - 01		1.11	2.34	2.70				5.20	6							
	256 - 01	Picanol	1.11	2.34	2.70				5.20	102							
										1,100							
	256 - 01	AT - 100	.78	5.05	3.10				8.00	62							
	270 - 01	AT - 100	1.53	4.25	2.54				9.42	74							
	265 - 09	Rueti	1.25	2.04	2.50				8.33	95							
	266 - 10	AT - 100	1.10	4.20	3.39				8.23	65							
	263 - 06	AT - 100	1.53	4.25	2.54				9.42	146							
	263 - 06		1.53	4.25	2.54				9.42	18							
										460							

PLANT WERK CYOR	WEAVING RUNNING DATA, PRODUCTIVITY																WERNER FORM-No W-107
	STYLE / STYLE GROUP	LOOM TYPE	LOOM STOPS			% WASTE			LOOMS per WEAVER	PRODUCTION 1975 m x 10^3	LABOR HOURS 1975			PRODUCTIVITY in MTR/WORK.HOUR			REMARKS
			Warp N ends 10.000p	Weft 10.000 picks	Mech 10.000 picks	Warp	Weft	Total			DIRECT	INDIRECT	TOTAL	Direct	Indirect	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	306 - 11	Picanol	1.15	3.75	7.73				4.78	156							
	306 - 11	Picanol	1.15	4.44	8.26				4.48	49							
	303 - 07	Picanol	4.43	5.63	13.00				4.55	11							
	303 - 07		4.43	5.63	13.00				4.55	34							
										250							
	342 - 06	Picanol	2.11	5.95	11.13				5.70	34							
	372 - 19	Sima	1.68	4.20	2.46				5.86	146							
	382 - 65	Sima	1.10	4.20	2.46				5.86	85							
										265							
	452 - 01	AT - 100	1.11	5.70	2.31				9.29	57							
										57							
	422 - 09	Sima	4.41	1.18	17.78				3.40	112							
	422 - 09	Sima	4.41	.55	9.73				4.71	5							
	416 - 13	Sima	.98	4.80	2.74				4.78	104							
	416 - 13		.98	4.80	2.74				4.78	12							
										233							
	282 - 01	Raepltett	1.17	1.81	2.01				7.90	532							
										532							
	593 - 40	Picanol	4.43	5.63	13.00				3.44	31							
	593 - 40		4.43	5.63	13.00				3.44	31							
										62							
	593 - 01	Sima	4.43	5.63	13.00				3.44	136							
	593 - 01		4.43	5.63	13.00				3.44	31							
										167							
	266 - 52	Raepltett	.89	1.64	2.14				6.84	536							
										536							
							1.75	1,75		11,850	763,933	87,058	070,991	14.96	134.70	13.45	

PLANT WERK C Y C R

W E A V I N G   P R O D U C T I O N   C A L C U L A T I O N S , C O M P A R I S O N

WERNER — FORM-NO W-103

PLANT	STYLE / STYLE GROUP	LOOM TYPE	LOOM PERFORMANCE					PRODUCTION acc. to act. eff.			ACTUAL PRODUCTION 1975 m x10³			PLAN-PRODUCTION x10³		PROD. acc. to WERNER-Eff. x10³				COMP: Prod. act. eff = 100 %		
			RPM	Picks/hour 100 %	eff %	Picks/hour expected	Meter/hour expect.	No of looms	Meter/Year expect	Sq.Meter/Year expected	No of looms	Meter/Year	Sq.Meter/Year	Meter/Year	Sq.Meter Year	eff %	No of Looms	Meters Year	Sq.Meters Year	PROD 1975	PLAN 1975	WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	231 - 02 / R	AT - 100	203	12,177	78,2	9,521	4,27				48	1,276	1,174	1,018	936							
	231 - 02 / T	AT - 100	203	12,177	77,8	9,474	4,12				8	205	188	258	237							
	231 - 08	AT - 100	203	12,177	69,2	8,426	3,59				11	251	223	217	193							
	231 - 15	AT - 100	203	12,177	73,6	8,959	3,89				3	64	60	59	55							
		AT - 100	203	12,177	75,0	9,135	4,73				1	14	13									
											71	1,810	1,658	1,552	1,421							
	421 - 01	Sima	169,7	10,182	60,5	6,160	4,93				5	271	125	389	182							
	421 - 01	Sima	169,7	10,182	45,8	4,665	3,73				7	161	164	172	175							
		Sima	175,0	10,500	56,2	5,901	4,54				7	190	99	47	26							
											21	622	388	608	383							
	521 - 19	AT - 175	149,3	8,898	78,8	7,011	3,90				39	952	1,476	952	1,476							
	521 - 13	AT - 100	203,0	12,177	74,6	9,090	4,07				3	66	61	96	89							
		AT - 100	203,0	12,177	75,0	9,135	4,10				-	8	7	2	2							
											42	1,026	1,544	1,050	1,566							
	215 - 79	AT - 100	203	12,177	80,9	9,856	5,63				2	55	46	147	125							
	209 - 33	Picanol	161,1	9,666	57,9	5,594	3,61				2	50	75	55	83							
	222 - 03	At - 100	203,	12,177	74,8	9,104	5,69				6	288	242	289	243							
	232 - 15	AT - 100	203,	12,177	69,5	8,466	4,07				18	454	418	422	388							
	232 - 05	AT - 100	203	12,177	69,9	8,506	4,09				28	722	664	679	675							
	2[illegible] - [illegible]	AT - 100	203	12,177	66,4	8,089	4,26				14	372	344	306	284							
	235 - 10	AT - 100	203	12,177	77,8	9,477	6,54				4	153	144	120	112							
	235 - 10	AT - 100	203	12,177	63,1	7,688	5,30				2	64	54	170	101							
	235 - 11	AT - 100	203	12,177	75,7	9,216	6,30				3	121	113	120	111							
	235 - 17	AT - 100	203	12,177	71,3	8,676	4,50				33	928	877	1,083	1,022							
	235 - 18	AT - 100	203	12,177	74,4	9,057	4,82				17	511	483	722	683							
	235 - 18	Picanol	161,1	9,666	58,7	5,687	3,02				8	147	244	154	256							
	236 - 18	Sima	169,7	10,182	69,3	7,061	3,76				9	216	187	-	-							
	235 - 22	Sima	169,7	10,182	80,0	8,149	4,22				13	333	312	252	239							
		Sima	169,7	10,152	67,7	6,891	3,77				11	268	237	377	366							
											172	4,679	4,435	4,846	4,578							
	250 - 01	Rueplitett	169,4	10,164	79,4	8,0 2	6,21				15	573	471	851	670							
	250 - 01	Rueplitett	169,4	10,164	79,3	8,055	6,20				11	414	380	54	49							
	256 - 01	Picanol	161,1	9,666	60,3	5,830	4,43				6	167	234	203	792							
	262 - 01	AT - 100	203	12,177	72,7	8,852	5,35				2	62	53	48	45							
	270 - 01	AT - 100	203	12,177	76,0	9,259	6,95				2	74	62	123	105							
	266 - 09	Rueplitett	169,4	10,164	73,6	7,480	5,09				3	95	89	103	96							
	266 - 10	AT - 100	203,0	12,177	70,9	8,636	3,75				3	65	118	12	22							
		AT - 100	203	12,177	75,0	9,135	5,89				4	146	111	170	161							
											46	1,596	1,174	1,504	1,449							
	309 - 11	Picanol	161,1	9,666	57,8	5,599	3,73				7	156	234	176	207							
	309 - 11	Picanol	161,1	9,668	60,9	5,891	3,93				2	49	79	-	-							
		Picanol	161,1	9,668	55,5	5,362	4,29				-	11	17	81	171							
											9	216	330	259	383							

D Y O R

W E A V I N G   P R O D U C T I O N   C A L C U L A T I O N S ,   C O M P A R I S O N

WERNER

FORM-No W-103

	STYLE / STYLE GROUP	LOOM TYPE	LOOM PERFORMANCE					PRODUCTION acc.to act.eff.			ACTUAL PRODUCTION 1975 mx10³			PLAN PRODUCTION x10³		PROD.acc.to WERNER-Eff. x 10³				COMP: Prod.act.eff.		
			PPM	Picks/ hour 100 %	eff %	Picks/ hour expect.	Meter/ hour expect	No of Looms	Meter/ Year expect	Sq.Meter/ Year expect	No of Looms	Meter/ Year	Sq.Meter/ Year	Meter/ Year	Sq.Meter Year	eff %	No of Looms	Meters/ Year	Sq.Meter./ Year	Prod 1975	Plan 1975	WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	342 - 06	Picanol	161.1	9.666	44.2	4.277	2.95				2	34	56	33	54							
	372 - 19	Sima	169.7	10.182	70.5	7.178	4.95				5	146	74	178	90							
		Sima	169.7	10.182	67.7	6.891	5.51				2	85	57	81	49							
											9	265	182	292	183							
		AT - 100	203.0	12.177	52.7	6.422	4.94				2	57	53	63	67							
	422 - 09	Sima	169.7	10.182	51.6	5.255	4.20				4	112	88	117	92							
	422 - 09	Sima	175.0	10.500	59.6	6.253	5.00				-	5	2	5	2							
		Sima	175.0	10.500	59.6	6.253	4.31				4	104	97	161	108							
											6	221	187	283	202							
	282 - 01	Raepltett	169.4	10.164	80.5	8.186	10.23				8	512	495	567	528							
											8	512	495	567	528							
	593 - 40	Picanol	161.1	9.655	37.8	3.651	2.92				2	31	50	-	-							
		Sima	169.7	10.182	67.7	6.891	5.51				4	136	109	105	97							
											6	167	158	106	93							
	235 - 52	Raepltett	169.4	10.164	83.6	8.495	7.39				12	536	431	519	418							
											12	536	431	519	418							
[illegible]				11.040	69.3	7.652	4.32	453	12.587	12.220	408	11.727	11 305	11.649	11.281							
Intern												132	174	131	179							
TOTAL												11.859	11.459	11.780	11.460							

PLANT WERK 10 GYOR | SIZING MACHINE SPECIFICATIONS | WERNER | FORM-No W-104

1		PLANT KOOP		Györ				
2	SIZE COOKING	Type size cooker						
3	SIZE COOKING	Viscosy-meter		no				
4	SIZE COOKING	Storage Tanks	No					
5	SIZE COOKING	Storage Tanks	Content	300 ltr				
6	SIZE COOKING	Water Flow meter						
7	SIZE COOKING							
8	SIZE COOKING							
9	SIZE COOKING							
10	SIZING	Machine Maker		SK-85/2 Szovjet				
1	SIZING	Creel	Max No of beams	9				
2	SIZING	Creel	Beam brake	yes				
3	SIZING	Creel	spare creel					
4	SIZING	Creel	yarn accumulator					
5	SIZING	No. of size pans		1				
6	SIZING	No.of sqeeze rollers		4				
7	SIZING	Type sqeezing rolls		1 rub,1 tefl,2ga				
8	SIZING	Max pressure sq.rolls		8 - 10 kg/qcm				
9	SIZING	Size level control		no				
20	SIZING	wet to dry section	genuine					
1	SIZING	wet to dry section	not					
2	SIZING	Drying Cylinders	No					
3	SIZING	Drying Cylinders	Width cm	196 / 216				
4	SIZING	Drying Cylinders	Surface					
5	SIZING	Dry Capacity / Cyl						
6	SIZING	Steam	Type					
7	SIZING	Steam	Pressure	0 - 3 atm				
8	SIZING	Aut.press.regulation		no				
9	SIZING	Point of temp.taking						
30	SIZING	Exhaust fan/system						
1	SIZING	Moisture control		no				
2	SIZING	Point of m.control						
3	SIZING	Length delivery sect.						
4	SIZING	Beam	Ø Disc cm	65 Pic,52 normal,	58 AT			
5	SIZING	Beam	Ø Base cm	12 12	12			
6	SIZING	Beam	Width cm	170				
7	SIZING	MAX.SPEED m/min		50				
8	SIZING	Creeping speed m/mir		10				
9	SIZING							
40	SIZING							
1	SIZING							
2	SIZING							

PLANT CYOR

SIZING PRODUCTION DATA, COMPARISON

WERNER — FORM-No W-105

	PLANT ROOM	MACHINE TYPE	STYLE	MATERIAL Nm	MATERIAL Quality	Width (cm)	No of ends	Beam length (m)	No of warp beams	Partie-length	Rest-hug	Refakto	Waxing	greige y.dyed / placing end/dent	WORK.MIN. PER Loss beaming	WORK.MIN. PER Partie change	WORK.MIN. PER Draw/m ends	DELIVERY m/min 100%	DELIVERY eff %	DELIVERY m/min exp.	CAPACITY No M/C	CAPACITY M-hrs Year	PRODUCTION in m x 10^3 Expect.	PRODUCTION in m x 10^3 Actual	PRODUCTION in m x 10^3 Plan	WERNER-PROD. in m x 10^3 No of M/C	WERNER-PROD. in m x 10^3 M-hrs per Year	WERNER-PROD. in m x 10^3 eff %	WERNER-PROD. in m x 10^3 PROD.	COMP: Prod.acc.to act.eff. =100 ACT.	COMP: PLAN	COMP: WERN.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1			521-19	34/1	Cotton	155	3486	1190	980				no	placing	3,59	56,19	23.14	22						1.140	1085							
2			236-10	20/1	Cotton	84	2242	700	78				no		3,59	51,44	14,92	23						77	137							
3			236-10	20/1	Cotton	94	2522	665	166				no		3,59	51,44	16,93	23						84	136							
4			23?-17	20/1	Cotton	94	2520	665	1140				no		3,59	51,44	16,93	23						1.110	1235							
5			2?6-22	20/1	Cotton	94	2624	630	420				no		3,59	51,44	26,01	23						395	269							
6			262-01	27/1	C - 16 V	94	2414	805	60				no		3,59	51,44	16,25	23						74	55							
7			266-09	20/1	Cotton	93	1628	900	92				no		3,59	41,58	13,64	36						116	120							
8			276-01	27/1	C - 16 V	93	1292	1650	27				no		3,59	36,64	13,00	23						87	130							
9			266-10	20/1	Cotton	2x93	2520	630	72				no		3,59	51,44	16,93	22						79	75							
10			306-11	27/1	Cotton	150	3450	900	30				no		3,59	71,10	23,09	22						60	-							
11			306-11	27/1	Cotton	159	3695	990	100				no		3,59	71,10	23,09	22						100	206							
12			342-06	17/1	Cotton	154	2358	855	66				no		3,59	51,44	43,12	29						42	19							
13			372-19	17/1	Cotton	505	1146	1060	95				no		3,59	36,64	16,50	22						184	214							
14			282-01	27/1	Cotton	93	637	2070	134				no		3,59	31,73	11,20	42						604	613							
15			266-52	27/1	Cotton	805	1296	1500	225				no		3,59	36,64	13,00	38						675	623							
16			302-65	20/1	Cotton	51	1476	700	330				no		3,59	41,58	11,52	23						276	173							
17									4156		5-8%		no					26	59,2	15,4	1	8.432	5.943	5.293	5137							

PLANT WERK GYOR 12	WARP PREPARATION MACHINE SPECIFICATION	WERNER	FORM-No W-106

1		PLANT KOOP.	GYOR	GYOR	GYOR	TET	
2		PROCESS	Sect.beaming	Sect.beaming	Sect.beaming	Sect.beaming	
3		MACHINE TYPE	Textima	Textima	Schnöck	Schlafhorst	
4		No of MACHINES	1	1	1	1	
5		No of CREELS	2	2	4	4	
6	BEAMER	STOP MOTION					
7	BEAMER	BEAM BRAKE					
8	BEAMER	MAX METER/MINUTE	345	380	125	180	
9	BEAMER	SPEED REGULATION	yes	yes	yes	no	
10	BEAMER	DISTANCE BEAM-CREEL	395	350	350	320	
1	BEAMER	MAX.SECTION WIDTH cm	40	70	55	22	
2	BEAMER	CONUS DEPTH	14	12	10	20	
3	BEAMER	BEAM Ø DISC	52,58,65	52,58,55	52,58,65	54	
4	BEAMER	BEAM Ø BASE	12,20	12,20	12,20	12,5	
5	BEAMER	BEAM WIDTH	96,110,165,170	96,110,165,170	96,110,165,170	170	
6	BEAMER						
7	BEAMER						
8	BEAMER						
9	BEAMER	POWER NEED kW	5,5	3,0	5	3,5	
20	BEAMER	NOISE LEVEL	25-30 dB	25-30 dB	25-30 dB	25-30 dB	
1	CREEL	MAX CONES/CREEL	480	400	336	336	
2	CREEL	GAUGE cm	23	22,5	22	21	
3	CREEL	MAX CONE WEIGHT gr	1600	1600	1600	1500	
4	CREEL	TENSION CONTROL	no	no	no	no	
5	CREEL	CHANGEABLE CONE CREEL	no	no	no	no	
6	CREEL	STOP MOTION ENDBREAK	electr	electr	electr	electr	
7	CREEL						
8	CREEL						
9	CREEL						
30	CREEL						
1	CREEL						
2							
3							
4							
5							
6							

PLANT WERK GYOR	WARP PREPARATION MACHINE SPECIFICATION	WERNER	FORM-No W-106

No							
1	PLANT KOOP	GYOR	GYOR	GYOR		
2	PROCESS	Warping	Warping	Warping		
3	MACHINE TYPE	Schlafhorst	Totex-Kovo	Totex		
4	No of MACHINES	1	1	1		
5	No of CREELS	4	4	4		
6	WARPER: STOP MOTION					
7	WARPER: BEAM BRAKE					
8	WARPER: MAX METER/MINUTE	385	380	215		
9	WARPER: SPEED REGULATION					
10	WARPER: DISTANCE BEAM-CREEL	360	360	360		
1	WARPER: MAX SECTION WIDTH cm	./.	./.	./.		
2	WARPER: CONUS DEPTH	./.	./.	./.		
3	WARPER: BEAM ø DISC	52,58,65	52,58,65	52,58,65		
4	WARPER: BEAM ø BASE	12,20	12,20	12,20		
5	WARPER: BEAM WIDTH	96,110,165,170	96,110,165,170	96,110,165,170		
6						
7						
8						
9	WARPER: POWER NEED kW	3,6	5,5	4,0		
20	WARPER: NOISE LEVEL	25-30 dB	25-30 dB	25-30 dB		
1	CREEL: MAX CONES / CREE	480	480	400		
2	CREEL: GAUGE cm	25	24	24		
3	CREEL: MAX CONE WEIGHT gr	1600	1600	1600		
4	CREEL: TENSION CONTROL	no	no	no		
5	CREEL: CHANGEABLE CONECREEL	no	no	no		
6	CREEL: STOP MOTION ENDBREAK	electr	electr	electr		
7						
8						
9						
30						
1						
2						
3						
4						
5						
6						

PLANT NR.	TYPE OF WARP PREP.	MACHINE TYPE	QUALITY	MATERIAL Km	MATERIAL Quality	ends per w.beam/band	end breaks/ MM ends-mtr	beam length	cone weight (gr)	yarn rest on cone gr	beams/cone	Downtime in min / end-break	beam change	creel change	DELIVERY m/min 100%	eff %	m/min exp.	CAPACITY No. of M/C	M-hrs/ year	PRODUCTION in m x 10^3 EXPECTED 1975	ACTUAL 1975	PLAN 1975	WERNER-PROD. in m x 10^3 No of M/C	M-hrs/ year	eff %	PROD.	COMP: Prod. acc. to act. eff. = 100 ACT.	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	SECT.		421-01 146	27/2	Cotton	1186	45					37,82	17,98	54,86															
	BEAMING		421-01 101	27/2	Cotton	2700	45					61,57	15,01	54,86															
			206-39 151	30/2	Line67PE	2260	45					103,28	22,81	77,16															
			236-19 165	40/2	C 16V	4430	16					74,59	30,31	32,83															
			256-01 81	27/2	C 16V	1202	22					30,45	23,35	77,96															
			256-01 92	27/2	C 16V	1366	22					33,10	24,78	71,96															
			256-01 144	27/2	C 16V	2120	22					53,60	25,58	77,95															
			593-40 153	10	Line	2120	53					117,90	28,33	73,04															
			422-09 173	27/2	Cotton	1026	45					44,70	14,64	58,86															
			422-03 38	27/2	Cotton	2048	45					29,60	17,41	64,10															
			216-79 60	50/2	C 67PE	1620	13.5					28,02	27,77	77,96															
				27/2	Cotton	2000	45					37,87	17,98	54,86															
		Textima													220	17.4	33.38	2	12,864	38,650	18,361	18653							
		Snäck													135			1	6,432										
		Schl[illegible]st													180	24.8	44.70	1	6,432	17,251	4,656	4200							
	GRAND TOTAL							1028	1170	130	14						36,86	4	25,728	56,901	23,017	22853							
	WARPING		231-02 92	50/2	Cotton	357	10					31,15		53,40															
			231-02T 92	50/2	Cotton	357	10					31-15		53,40															
			231-08 89	50/2	Cotton	368	10					48,75		54,33															
			231-15 94	50/2	Cotton	400	12,5					10,35		57,08															
			521-10 155	34/1	Cotton	436	11					34,10		55,10															
			521-13 92	50/2	Cotton	357	10					31,15		53,40															
			222-03 84	40/2	Cotton	393	9					18,97		42,00															
			232-15 92	50/2	Cotton	360	10					17,95		53,63															
			232-05 92	50/2	Cotton	360	10					17,95		53,63															
			232-06 92	50/2	Cotton	400	10					26,02		74,08															
			236-10 94	20/1	Cotton	369	11					18,03		56,69															
			236-10 84	20/1	Cotton	369	11					15,25		41,00															
			236-11 93	40/2	C 6V	420	9					24,50		40,70															
			236-17 94	20/1	Cotton	361	11					30,10		50,80															
			236-18 94	40/2	C 16V	420	9					24,90		58,79															
			236-19 84	40/2	C 16V	373	9					24,80		54,78															
			236-22 94	20/1	Cotton	433	11					23,22		43,60															
			262-01 94	27/1	C 16V	398	11,1					43,50		42,19															
			276-01 83	27/1	C 16V	438	10					35,80		43,69															
			266-09 93	20/1	Cotton	403	11					10,08		57,34															
			266-10 2x90	20/1	Cotton	415	11					27,42		47,02															
			305-11 150	27/1	Cotton	426	11,3					30,98		43,34															
			305-11 159	27/1	Cotton	379	11,3					28,60		53,60															
			342-06 164	27/2	Cotton	390	15					41,00		40,19															
			372-19 50	27/2	Cotton	350	20					47,29		40,14															
			282-01 93	27/1	Cotton	346	11,3					27,30		40,04															
			266-52 80	27/1	C 16V	426	11,3					33,61		43,37															
				50/2	Cotton	357	10					31,15		53,40															
GRAND TOTAL,	Schlafhorst,	2 Totex						7505	1170	130	4				350	23.1	80,85	3	19,296	93,605	72,046	70,000							

PLANT WORK GYOR

WINDING; QUILLING SPECIFICATIONS, PRODUCTIVITY

WERNER FORM-No W-108

[illegible]	PROCESS	MACHINE TYPE	DESCRIPTION	Spindles/ Machine	MATERIAL Nm	MATERIAL Mix	EOMSPH	% Waste	INPUT Form	INPUT gr	OUTPUT Form	OUTPUT gr	Spindles/ Operator	PRODUCTION 1975	WORKING HOURS 1975 DIRECT	WORKING HOURS 1975 INDIRECT	WORKING HOURS 1975 TOTAL	PRODUCTIVITY in kg/work.. DIRECT	PRODUCTIVITY INDIRECT	PRODUCTIVITY TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Winding	Klimovskij	manual	100	22,2	Cotton	1,331		Cops	100	Cone	1200	28	1,295						
		Autonck	automata	32	25,0	Cotton	1,330		Cops	130	Cone	1200	27	72						
		Najed		48	16,9	Cotton	472		Cops	95	Cone	900	36	174						
				44	13,7	Cotton	770		Cops	45	Cone	1200	17	25						
		Klimovskij		100	30,4	Cotton	707		Cops	95	Cone	1200	25	716						
				64	24,4		1,065	,31					27	2,282	133,089	9,164	142,253	17,2	249,0	16,0
	Quilling	Kovo	Aut	12	10,8	Line	8,220		Cone	1200	pirn	65	24	364						
		Szovjet	Aut	12	16,0	Line	5,530		Cone	1200	pirn	43	24	517						
		Schweiter	Aut	24	20,8	Cotton/Line	2510		Cone	1200	pirn	43	24	395						
		Schärer	Aut	10	13,5	Line	4,900		Cone	1200	pirn	50	20	141						
Tot		Kovo	Aut	12	11,6	Line/Cotton	8,220		Cone	1200	pirn	75	24	135						
				13	15,4		5,567						24	1,553	143,073	11,455	1[illegible]4,528	10,9	135,6	10,1

GYOR

WINDING ; QUILLING PRODUCTION DATA, COMPARISON

WERNER

PLANT	PROCESS	MACHINE TYPE	MACHINES		SPINDLES			MATERIAL		DELIVERY				PRODUCTION in to/year			WERNER 1975			COMP: expect.1975 = 100 %		
			Total	In Op.	Total	In Op.	%	Nm	Mix	m/min 100%	gr/Sph 100%	eff %	gr/Sph exp.	EXPECTED 1975	ACTUAL 1975	PLAN 1975	Spindles	% eff	Production	ACTUAL	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Winding	Klinovskij	2	2	200	162	81	22.2	Cotton	628.3	1,096	69.8	1.184	1.523	1.295	1.153						
		Autonek	1	1	32	9	28	28.1	Cotton	800.0	2,081	66.1	1.269	261	72	65						
		Najed	1	1	48	26	54	16.9	Cotton	355.0	1,264	60.1	1.013	317	174	154						
			1	1	44	12	27	13.7	Cotton	110.0	495	90.0	444	126	25	22						
		Klimovskij	2	2	200	143	72	30.4	Cotton	656.1	1,295	58.8	702	980	716	635						
			7	7	524	352	67	24.4		611.2	1,505	65.4	984	3,207	2,282	2,029				71.3	63.4	
	Quilling	Kovo	8	8	96	76	79	10.8	96%Line,4%Cot	185.3	1,033	69.3	716	442	364	331						
		Szovjet	10	10	120	101	84	16.0	94%Line,6%Cot	358.3	1,342	55.7	761	587	517	471						
		Schwelter	2	2	48	46	96	20.8	21%Line,79%Cot	619.7	1,790	71.5	1,280	395	396	360						
		Schärer	2	2	20	17	85	13.5	96%Line,4%Cot	631.6	2,812	44.2	1,243	160	141	129						
		Kovo	4	4	48	37	77	11.8	73%Line,27Cot	220.0	1.120	49.4	553	171	135	122						
			26	26	332	276	83	15.4		353.1	1,375	60.9	837	1,755	1,553	1,413				88.4	80.5	

GYOR

TWISTING PRODUCTION DATA ; COMPARISON

WERNER FORM-No S-103

KOOP	Proc. Type	Machine Type	Year	QUALITIES Name	Mix	Nm	Dr/m	SPEED RPM Spl	Del. m/min	DELIVERY gr/Sph 100%	eff %	Contr %	gr/Sph exp	IND.ENGINEERING DATA Input gr	Output gr	ECONSPH	Spl/Operat.	PRODUCTION acc.to act.eff in to No M/C	No Spl	Sp-hr year	PROD	ACT PROD 1975	PLAN PROD 1975	PRODUCTION acc.to WERNER No of Spdls	Sp-hrs year	tons	COMP: Prod.act.eff=100 ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Ring	Textima	1953	Cotton	100%	20.4	574	8.579	14.95	44	88.4		38.9	800	120	60.3	635	9	360	20.640	813	771	760						
		Magyar	63-71	Cotton	100%	21.6	532	7.905	14.87	41.3	86.3		35.6	800	120	60.3	699	4	360	9.262	333	118	117						
		Lengyel	1962	Cotton	100%	5.4	454	3.500	7.72	85.7	19.0		16.3	800	85	855	200	1	200	1.286	21								
		Szovjet	1962	Cotton	100%	23.3	588	8.175	13.83	35.8	88.2		31.6	800	120	72	574	2	324	4.168	133	40	40						
		Textima	69/53	Cotton	100%	19.2	543	7.595	13.98	43.7	82.0		35.9	800	110	62.7	454	3	296	5.712	206	188	185						
						20.4	565	8.313	14.71	43.3	87.1		37.7				596	19	338	41.268	1,506	1,117	1,102				74.2	73.2	

2.2 FINISHING

2.0 GYOR

2.2 Finishing

2.2.1 Locations

The finishing plant at GYOR is located in the proximity of the weaving plant. The location is ideal for that portion of cloth woven at GYOR Weaving and finished at GYOR Finishing.

2.2.2 Building and Lay-out

The building is not suitable for economic operation. Flexibility of labour utilisation and strict floor supervision of operating conditions are pre-requisites for a modern economic finishing unit. The various walls dividing the building do not allow those conditions.

The lay-out of the machinery is reasonably good, but from the lay-out blue-prints, there appears to be a lack of sufficient space. The machines are cramped inside the various small sections, and there does not appear to be sufficient space for storage of cloth in process.

2.2.3 Process Flow and Material Handling

The cloth process flow is acceptable since most cloth is prepared and dyed on the jigs. After preparation and dyeing, the cloth goes to the drying machines. The flow is very simple, most processes proceeding from greige cloth room → jigger → drying → finishing → calender and/or sanforising.

The material handling equipment should be modernised.

2.2.4 Machine Obsolescence

The jiggers, the newest being 1964 models, are becoming obsolete. The four Donath jiggers, built in 1934 and 1939, are particularly old and it must be assumed are not automatic or covered.

The singeing machine does not have a construction year listed, so it must be assumed to be very old and not suitable for singeing cloth containing polyester.

The finishing equipment is relatively new.

Modern equipment for the bleaching and dyeing departments is definitely required in the near future to reduce the amount of labour required per unit of production.

2.2.5 Machine Improvement

The existing equipment can be improved with modern electronic control instruments which permits the obtaining of maximum quality and productivity.

Some of the existing machines can be made more productive by modification. These modifications could be done by the plant maintenance departments.

2.2.6 Summary of Mill Balance

A mill balance was made based on the technical information supplied by GYOR. A comparison has been made of the processing times and machine speeds actually used by GYOR with standards existing in Europe.

A comparison sheet was made for each article or group of articles as supplied by GYOR. The obvious conclusion is that processing times on the jiggers are too long. It was not always clear whether the jig processing times included caustic boil-off, hypoclorite bleaching and/or peroxide bleaching before dyeing, but processing times were given by telex as 10 hours for jig rolls of 500-700 metres. We took 600 metres as the basis for our calculations.

The mill balance indicates that an overall reduction in machine processing time of:

21%

can be obtained.

GYOR did not supply a labour complement for the finishing plant. WERNER used the labour complement and machine processing efficiencies used in Europe as a basis for calculating the number of workers and employees required.

The machine hours required by GYOR were taken as 100% efficiencies. WERNER multiplied these hours by European standards for machine efficiencies and machine manning.

For example: 1 man for 3 jigs. Jig times were taken as 100% efficiency - 600 metres per jig every 10 hours.

The result of the comparison shows that GYOR required 75 people including 10% allowance for absenteeism. This indicates a theoretical saving of 34 people, compared with the existing labour force of 109 people.

The number of indirect labour (administration and laboratory, supervision, maintenance, etc.) was taken as a ratio of:

1 : 1

direct to indirect labour.

In America, the ratio is 1 indirect labourer for every 2 direct labourers.

APPENDIX

FINISHING

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100

[illegible] SUMMARY

[illegible]	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
[illegible]	Singer	1	1		1.372,5	464				1.372,5	464	772					
MERCERIZING	Mercerizer	2															
[illegible], Boil-off	Goller	3															
[illegible] Bleaching		4															
[illegible] BLEACHING	Jigger	5	15		976,9	12.274				976,9	10.088	3.397					
[illegible]	[illegible]	6															
[illegible]	Padder	7	1		3.418,5	2.078				3.418,5	1.883	2.675					
[illegible]	Pad Hotflue	8	1		39,9	28				39,9	28	37					
[illegible]	Jigger	9	15		6.931,9	73.767				6.931,9	58.790	19.599					
[illegible]	Thermosol	10															
[illegible]	Krantz, Vits, T	1	3		10.186,1	9.006				10.186,1	8.466	13.288					
[illegible]	Drum dryer	2	1		439,6	3.983				439,6	3.417	3.797					
[illegible] PRINT	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		3.354,3	1.818				3.354,3	1.457	1.825					
Polymerizing	Curing oven	6	1		1.551,4	2.044				1.551,4	1.436	1.596					
FINISHING	Fin. foulard	7	1		4.206,1	3.377				4.206,1	1.893	2.347					
CALANDERING	Kalander	8	1		2.153,9	1.500				2.153,9	1.500	1.876					
Sanforizing	Evaset	9	1		6.180,6	5.141				6.180,6	3.433	5.691					
Yarn dyeing	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
VARIOUS		2			2.396,9	2.044				2.396,9	1.815	2.687					
[illegible]		3			5.295,4	2.061				5.295,4	2.023	2.888					
[illegible]		4			5.944,9	9.993				5.944,9	6.178	8.825					
			TOTAL		11.319,4	129.578		TOTAL		11.319,4	102.871	71.300	TOTAL				
[illegible] direct operators (1 op = 2144 hrs/year)												33.25					
[illegible] indirect ops (1 op = 2144 hrs/year)												33					
TOTAL PERSONEL							109					67					
[illegible] comparison machinehours						100					79						
[illegible] comparison laborhours							100					61					

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100

[illegible] LINEN/SYNTHETICS RANGE

[illegible]	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
[illegible]	Singer	1	1		79.1	27				79.1	27	45					
[illegible]	Mercerizer	2															
[illegible] Roll-off	Coller	3															
[illegible] Bleaching		4															
[illegible]	Jigger	5															
[illegible]	Gigant	6															
[illegible]	Padder	7	1		60.6	33				60.6	33	44					
Pad [illegible] dry	Pad Hotflue	8	1		39.9	28				39.9	28	37					
[illegible]	Jigger	9	15		39.9	795				39.9	795	267					
[illegible]	Thermosol	10															
[illegible] Drying	Krantz, Vits, T	1	3		79.1	317				79.1	317	529					
[illegible]	Drum dryer	2															
FLAT SCR.PRINT	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		79.1	45				79.1	45	57					
[illegible]	Curing oven	6															
FINISHING	Fin. foulard	7	1		79.1	52				79.1	52	66					
CALANDERING	Kalander	8															
[illegible]	Evaset	9															
[illegible]	Dyeing Mach.	20															
[illegible]	Drying Mach.	1															
		2															
MEASURING		3															
ROLLING		4															
			TOTAL		79.1	1.297		TOTAL		79.1	1.297	1.045	TOTAL				

[illegible] direct operators (1 op = 2144 hrs/year)				.49	
[illegible] indirect ops (1 op = 2144 hrs/year)					
TOTAL PERSONEL					
[illegible] machinehours	100		100		
[illegible] laborhours		100			

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100
[illegible] STYLE GROUP	COTTON/SYNTHETICS RANGE		

PROCESS	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SINGEING	Singer	1	1		49	20				49	20	33					
MERCERIZING	Mercerizer	2															
Cont. Boil-off	Coller	3															
Cont. Bleaching		4															
JIG BLEACHING	Jigger	5															
[illegible] BLEACH	Gigant	6															
Pad dyeing	Padder	7															
Pad dye & dry	Pad Hotflue	8															
JIG DYEING	Jigger	9	15		49	628				49	544	181					
THERMOSOLING	Thermosol	10															
Tenter drying	Krantz,Vits,T	1	3		49	123				49	123	205					
Drum drying	Drum dryer	2															
[illegible]	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		49	32				49	32	40					
Polymerizing	Curing oven	6	1		49	33				49	33	37					
FINISHING	Fin.foulard	7	1		49	33				49	33	41					
KALANDERING	Kalander	8															
[illegible]	Evaset	9															
Yarn dyeing	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
		2															
MEASURING		3			49	18				49	18	26					
ROLLING		4															
			TOTAL		49	887		TOTAL		49	803	563	TOTAL				
Sum direct operators (1 op = 2144 hrs/year)												.26					
Sum indirect ops (1 op = 2144 hrs/year)																	
TOTAL PERSONEL																	
Comparison machinehours						100					90						
Comparison laborhours							100										

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100

[illegible] COTTON/LINEN RANGE

[illegible]	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
[illegible]	Singer	1															
[illegible]	Mercerizer	2															
[illegible]	Goller	3															
[illegible]		4															
[illegible]	Jigger	5	15		530,7	5.399				530,7	3.996	1.367					
[illegible]	Gigant	6															
[illegible]	Padder	7	1		138,5	72				138,5	72	94					
[illegible]	Pad Hotflue	8															
[illegible]	Jigger	9	15		2.699,9	32.635				2.699,9	25.067	8.356					
[illegible]	Thermosol	10															
[illegible]	Krantz,Vits,T	1	3		5.642	5.077				5.642	4.735	7.520					
[illegible]	Drum dryer	2															
[illegible]	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		1.247	398				1.247	346	434					
Polymerizing	Curing oven	6	1		904	1.226				904	886	985					
FINISHING	Fin.foulard	7	1		2.430,5	2.222				2.430,5	1.103	1.380					
CALANDERING	Kalander	8	1		1.737,6	1.207				1.737,6	1.207	1.509					
Sanforizing	Evaset	9	1		2.634,8	2.197				2.634,8	1.464	2.429					
Yarn dyeing	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
KLOTZ FOUL.	Wetting	2	1		1.473,9	701				1.473,9	701	874					
MEASURING		3			4.274,2	1.688				4.274,2	1.665	2.377					
ROLLING		4			1.649,8	2.732				1.649,8	1.911	2.730					
			TOTAL		5.924	55.554		TOTAL		5.924	43.153	30.055	TOTAL				
Sum direct operators (1 op = 2144 hrs/year)												14.02					
Sum indirect ops (1 op = 2144 hrs/year)																	
TOTAL PERSONEL																	
Comparison machinehours						100					78						
Comparison laborhours							100										

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100

[illegible] STYLE GROUP: 100% LINEN RANGE

PROCESS	MACHINE		ACTUAL 1975 M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	PROPOSAL 1 M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	PROPOSAL 2 M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
[illegible]	Singer	1															
[illegible]	Mercerizer	2															
[illegible]-off	Coller	3															
[illegible] Bleaching		4															
[illegible] BLEACHING	Jigger	5	15		167,8	2.331				167,8	1.864	621					
[illegible] BLEACH	Gigant	6															
[illegible]	Padder	7															
[illegible] dry	Pad Hotflue	8															
[illegible] DYEING	Jigger	9															
[illegible]	Thermosol	10															
[illegible] drying	Krantz, Vits, I	1	3		167,8	140				167,8	140	233					
[illegible] drying	Drum dryer	2															
[illegible] PRINT	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5															
Polymerizing	Curing oven	6															
FINISHING	Fin. foulard	7															
KALANDERING	Kalander	8	1		40,6	28				40,6	28	35					
[illegible]	Evaset	9															
[illegible]	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
HUMIDIFYING	Damping	2	1		40,6	14				40,6	14	18					
MEASURING		3			40,6	15				40,6	15	21					
FOLDING		4			167,8	466				167,8	233	333					
			TOTAL		208,4	2.994		TOTAL		208,4	2.294	1.261	TOTAL				
Sum direct operators (1 op = 2144 hrs/year)												.59					
Sum indirect ops (1 op = 2144 hrs/year)																	
TOTAL PERSONEL																	
Comparison machinehours						100					77						
Comparison laborhours							100										

PLANT GYOR	DYEING & FINISHING Comparisons	WERNER	Form No V-100

TYPE / STYLE GROUP: 100% COTTON RANGE

PROCESS	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SINGEING	Singer	1	1		1.194	249				1.194	249	414					
MERCERIZING	Mercerizer	2															
Cont. Boil-off	Goller	3															
Cont. Bleaching		4															
JIG BLEACHING	Jigger	5															
HASPEL BLEACH	Gigant	6															
Pad dyeing	Padder	7	1		1.633,6	1.165				1.633,6	970	1.387					
Pad dye & dry	Pad Hotflue	8															
JIG DYEING	Jigger	9	15		2.086,7	24.132				2.086,7	18.027	6.009					
THERMOSOLING	Thermosol	10															
Tenter drying	Krantz, Vits, T	1	3		1.647,1	1.964				1.647,1	1.766	2.493					
Drum drying	Drum dryer	2	1		439,6	3.983				439,6	3.417	3.797					
FLAT SCR.PRINT	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		213,1	263				213,1	121	152					
Polymerizing	Curing oven	6	1		453,1	688				453,1	420	466					
FINISHING	Fin.foulard	7	1		1.244,8	825				1.244,8	508	636					
KALANDERING	Kalander	8															
Sanforizing	Evaset	9	1		1.426,1	1.188				1.426,1	792	1.300					
Yarn dyeing	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
VARIOUS		2			757,7	1.282				757,7	1.053	1.736					
MEASURING		3			325,5	121				325,5	121	173					
ROLLING		4			2.457,8	3.953				2.132,3	1.817	2.595					
			TOTAL		2.457,8	39.813		TOTAL		2.457,8	29.261	21.158	TOTAL				
Sum direct operators (1 op = 2144 hrs/year)												9,87					
Sum indirect ops (1 op = 2144 hrs/year)																	
TOTAL PERSONEL																	
Comparison machinehours						100					73						
Comparison laborhours							100										

PLANT	DYEING & FINISHING Comparisons	WERNER	Form No
GYOR			V-100

[illegible] STYLE GROUP COTTON/LINEN/SYNTHETICS RANGE

[illegible]	MACHINE		ACTUAL 1975					PROPOSAL 1					PROPOSAL 2				
			M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs	M/C	m/min	Meter x 10^3	M/C-hrs	Labor-hrs
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
[illegible]	Singer	1	1		50,4	168				50,4	168	280					
[illegible]	Mercerizer	2															
[illegible]	Jeller	3															
[illegible]		4															
[illegible]	Jigger	5	15		278,4	4.544				278,4	4.228	1.409					
[illegible]	Gigant	6															
[illegible]	Padder	7	1		1.585,8	808				1.585,8	808	1.150					
[illegible]	Pad Hotflue	8															
[illegible]	Jigger	9			2.056,4	15.577				2.056,4	14.357	4.786					
[illegible]	Thermosol	10															
Tenter drying	Krantz,Vits,T	1	3		2.601,1	1.385				2.601,1	1.385	2.308					
Drum drying	Drum dryer	2															
[illegible]	Zimmer	3															
PRINT STEAMING	Büchner	4															
Print washing	Washer	5	1		1.766,1	1.080				1.766,1	913	1.142					
Polymerizing	Curing oven	6	1		145,3	97				145,3	97	108					
FINISHING	Fix.foulard	7	1		402,7	245				402,7	197	224					
KALANDERING	Kalander	8	1		375,7	265				375,7	265	332					
[illegible]	Evaset	9			2.119,7	1.756				2.119,7	1.177	1.962					
Yarn dyeing	Dyeing Mach.	20															
YARN DRYING	Drying Mach.	1															
VARIOUS		2			124,7	47				124,7	47	59					
MEASURING		3			606,1	219				606,1	204	291					
ROLLING		4			1.995	2.842				1.995	2.217	3.167					
			TOTAL		2.601,1	29.033		TOTAL		2.601,1	26.063	17.218	TOTAL				
Sum direct operators (1 op = 2144 hrs/year)												8.03					
Sum indirect ops (1 op = 2144 hrs/year)																	
TOTAL PERSONEL																	
Comparison machinehours						100					90						
Comparison laborhours							100										

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME III OF VI

C S I L L A G H E G Y

3.1 Weaving

3.2 Finishing

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL
Brussels - New York

1977

TABLE OF CONTENTS

		Page
3.0	CSILLAGHEGY	1.
3.1	Weaving	1.
3.1.1	Location	1.
3.1.2	Buildings and Lay-out	1.
3.1.3	Process Flow and Material Handling	1.
3.1.4	Machine Obsolescence	2.
3.1.5	Machine Improvements	2.
3.1.6	Machine Park 1975-1977	3.
3.1.7	Summary Mill Balance	4.
3.1.7.1	CSILLAGHEGY	4.
3.1.7.2	Weaving Mill CSILLAGHEGY, Cooperation SZEBSZARD, BEBEST	6.
3.1.8	Summary of Labour Complement	7.
3.1.9	Notes and Explanations to Substantiate the Summary	9.
	of the Mill Balance and Labour Complement	9.
3.1.9.1	General	9.
3.1.9.2	Number of Looms	9.
3.1.9.3	Efficiencies	9.
3.1.9.4	CSILLAGHEGY Weave-Room Efficiency	10.
3.1.9.5	Operator Efficiency	12.
3.1.9.6	Plant Efficiency	12.
3.1.9.10	Estimated Number of Looms per Weaver	15.
3.1.9.11	Preparation Departments	15.
3.1.9.12	Greige Cloth Inspection	16.
3.1.9.13	Summary of Yarn Consumption	16.

TABLES

I	Machine Park 1975-1977	3.
II	Summary Mill Balance - CSILLAGHEGY	4.
III	Summary Mill Balance - CSILLAGHEGY, Cooperation SZEBSZARD, BEBEST	6.
IV	Summary of Labour Complement	7.
V	Summary of Yarn Consumption	16.

TABLE OF CONTENTS

		Page
3.0	CSILLAGHEGY	16.
3.2	Finishing	16.
3.2.1	Location	16.
3.2.2	Buildings and Lay-out	16.
3.2.3	Process Flow and Material Handling	16.
3.2.4	Machine Obsolescence	17.
3.2.5	Machine Improvements	17.
3.2.6	Mill Balance	17.
3.2.7	General Comments	18.

APPENDIX

Form A-100 Production Data Weaving
Form W-100 Weaving, Machine Specifications
Form W-101 Weaving, Cloth Specification: Quantities
Form W-102 Weaving, Running Data, Productivity
Form W-103 Weaving, Production Calculations, Comparison
Form W-106 Warp Preparation, Machine Specifications
Form W-107 Warp Preparation, Production Data, Comparison
Form W-108 Winding, Specifications, Productivity
Form W-109 Quilling, Production Data, Comparison
Form S-103 Twisting, Production Data, Comparison

3.1 WEAVING

3.0 CSILLAGHEGY

3.1 Weaving

3.1.1 Location

The weaving mill CSILLAGHEGY consists of the main works in CSILLAGHEGY and the Cooperatives SZEBSZARD and BEBEST.

3.1.2 Buildings and Lay-out

Buildings are adequate. The weave-room of CSILLAGHEGY, as far as lay-out is concerned, meets our requirements in regard to an economical unit.

Details, like:

- Space of working alleys,
- Transport routes,
- Lighting,
- Working environment,

have to be further analysed in order to quantify the optimal working conditions to reach our proposed targets as outlined in the mill balance.

3.1.3 Process Flow and Material Handling

Although the process flow is acceptable, it can, nevertheless, be improved. Our recommendations would be to improve and invest in material handling equipment.

Thought for improvement should be given to:

- Storing of loom beams,
- Storing of warps,
- Weft material transport,
- Weft reserves on the loom,
- Piece collecting and handling,
- Spare parts availability.

3.1.4 Machine Obsolescence

Machines are old-fashioned, and a gradual modernisation program to replace aged machinery will be needed.

3.1.5 Machine Improvements

As we noticed during our visits to the production departments, there is a definite lack of machinery attachments which could be added at low cost and would greatly improve the running conditions of the material.

Short-term investment should not be made only for prime equipment but also in:

- Machine attachments,
- Auxiliary equipment.

3.1.6 Machine Park 1975-1977

Table I

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT-100	40	95	195	AT-100	24	96	200
AT-120	14	115	168				
AT-175	18	165	147	AT-175	12	172	160
Pic-132	36	127	191				
Pic-176	54	165	182	Pic-176	82	172	180
	162	135	182		118	156	182

As one can see in this table, the same loom type is sometimes quoted with different widths and speeds. Due to transmission problems, the exact reasons could not be identified. Therefore, we listed the machine specifications as it was given to us in both cases.

3.1.7 Summary Mill Balance

3.1.7.1 CSILLAGHEGY

Table II

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine hours/year	6432	6432	6432	6432
Total no. of looms	176	176	176	118
Looms in operation	162	162	162	118
Average ppm/loom	182	182	182	182
Picks/24 hours 100% x 10^6	42.482	42.482	42.482	30.925
Picks/24 hours actual x 10^6	32.047	32.047	34.325	24.988
Plant efficiency %	75.4	75.4	80.8	80.8
Machine efficiency %	93	93	94	94
Operator efficiency %	81	81	86	86
Product mix: Ø ppcm	16.92	16.92	16.92	16.92
Ø width cm	115	115	115	115
Production: m x 10^3/year	5075	5075	5437	3958
sqm x 10^3/year	5833	5833	6252	4552
Production comparison %	100	100	107	78
Loom stops: warp/M ends/10^4 p	-	.86	.4	-
weft/10^4 picks	-	2.08	1.0	-
mech./10^4 picks	-	1.51	1.2	-
Ca. looms stops/loom hour	-	5.0	3.0	-
Ø no. of looms/weaver	-	7.2	13	13

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
Ø loom beam length	-	1057	1057	-
Ø ends/beam	-	2960	2960	-
Ø warp changes/24 hours	-	18	19	14
Ø piece length	-	72	72	-
Ø pieces/24 hours	-	263	282	205
Yarn consumption: Warp to	-	1073	1148	837
Weft to	-	792	847	618
Total to	-	1865	1995	1455
Labour complement tot. pers.	-	320	244	198
Productivity: m/work. hour	-	7.40	10.39	9.3
comparison %	-	100	140	126

3.1.7.2 Weaving Mill CSILLAGHEGY, Cooperatives SZEBSZARD, BEBEST

Table III

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Total no. of looms	58	58	58	-
Looms in operation	50	50	50	-
Available loom hrs./day	944	944	944	-
Average ppm/loom	136	136	136	-
Picks/24 hours 100% $\times 10^6$	7.803	7.803	7.803	-
Picks/24 hours actual $\times 10^6$	2.340	2.340	4.994	-
Plant efficiency %	-	30	64	-
Machine efficiency %	-	-	85	-
Operator efficiency %	-	-	75	-
Product mix: Ø ppcm	-	13.32	13.32	-
Ø width cm	-	138	138	-
Production: m $\times 10^3$/year	-	472	1.005	-
sqm $\times 10^3$/year	-	654	1.386	-
Production comparison %	-	100	213	-

3.1.8 Summary of Labour Complement

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

Table IV

Weaving Preparation	Actual 1975 Adm.	Actual 1975 Dir.	Actual 1975 Ind.	Actual 1975 Sum.	WERNER Proposal 1 Adm.	WERNER Proposal 1 Dir.	WERNER Proposal 1 Ind.	WERNER Proposal 1 Sum.	WERNER Proposal 2 Adm.	WERNER Proposal 2 Dir.	WERNER Proposal 2 Ind.	WERNER Proposal 2 Sum.
Winding												
- Overseer	-	-	-	-	1	-	-	1	1	-	-	1
- Foremen	-	-	-	-	1	-	-	1	1	-	-	1
- Mechanic	-	-	-	-	-	-	1	1	-	-	1	1
- Transport	-	-	-	-	-	-	2	2	-	-	2	2
- Cleaner	-	-	-	-	-	-	1	1	-	-	1	1
- Winder	-	-	-	-	-	8	-	8	-	6	-	6
- Reserve	-	-	-	-	-	-	2	2	-	-	2	2
- Rest winder	-	-	-	-	-	-	2	2	-	-	2	2
- Various	-	-	-	-	-	-	1	1	-	-	1	1
	1	10	5	16	2	8	9	19	2	6	9	17
Twisting												
- Foremen	-	-	-	-	2	-	-	2	2	-	-	2
- Mat. admin.	-	-	-	-	-	-	1	1	-	-	1	1
- Transport	-	-	-	-	-	-	4	4	-	-	3	3
- Twister	-	-	-	-	-	6	-	6	-	5	-	5
- Reserve	-	-	-	-	-	-	3	3	-	-	2	2
	3	12	6	21	2	6	8	16	2	5	6	13
Quilling												
- Foremen/mechanic	-	-	-	-	3	-	-	3	2	-	-	2
- Transport	-	-	-	-	-	-	3	3	-	-	3	3
- Weft admin.	-	-	-	-	-	-	1	1	-	-	1	1
- Prin strip.+ sort.	-	-	-	-	-	-	1	1	-	-	1	1
- Pirn Collector	-	-	-	-	-	-	2	2	-	-	2	2
- Winder	-	-	-	-	-	15	-	15	-	10	-	10
- Reserve	-	-	-	-	-	-	2	2	-	-	2	2
- Steam relax	-	-	-	-	-	-	1	1	-	-	1	1
	2	15	8	25	3	15	10	28	2	10	10	22
Warp Preparation												
- Overseer	-	-	-	-	1	-	-	1	1	-	-	1
- Sect. beamer	-	-	-	-	-	5	-	5	-	3	-	3
- Helper	-	-	-	-	-	-	4	4	-	-	3	3
- Foremen	-	-	-	-	1	-	-	1	1	-	-	1
- Transport	-	-	-	-	-	-	1	1	-	-	1	1
- Reserve	-	-	-	-	-	-	1	1	-	-	1	1
	1	9	4	14	2	5	6	13	2	3	5	10
Doubling	1	4	2	7	1	4	2	7	1	4	2	7
Fonalmenő	-	6	3	9	-	6	3	9	-	6	3	9
	8	56	28	92	10	44	38	92	9	34	35	78

Weaving	Actual 1975 Adm.	Dir.	Ind.	Sum.	WERNER Proposal 1 Adm.	Dir.	Ind.	Sum.	WERNER Proposal 2 Adm.	Dir.	Ind.	Sum.
Drawing-in												
- Hands	-	-	-	-	-	6	-	6	-	4	-	4
- Harness cleaner	-	-	-	-	-	-	2	2	-	-	2	2
- Foremen	-	-	-	-	1	-	-	1	1	-	-	1
	2	15	7	24	1	6	2	9	1	4	2	7
Weaving												
- Overseer	-	-	-	-	4	-	-	4	4	-	-	4
- Loom fixer	-	-	-	-	-	-	18	18	-	-	13	13
- Loom Mechanic							2	2			2	2
- Weaver	-	-	-	-	-	39	-	39	-	27	-	27
- Helper	-	-	-	-	-	-	4	4	-	-	3	3
- Reserve	-	-	-	-	-	-	6	6	-	-	5	5
- Warp changer	-	-	-	-	-	-	4	4	-	-	3	3
- Knotter	-	-	-	-	-	-	2	2	-	-	2	2
- Battery filler	-	-	-	-	-	-	18	18	-	-	13	13
- Piece doffer	-	-	-	-	-	-	3	3	-	-	3	3
- Weft transport	-	-	-	-	-	-	3	3	-	-	3	3
- Warp transport	-	-	-	-	-	-	3	3	-	-	2	2
- Loom cleaner	-	-	-	-	-	-	3	3	-	-	2	2
- Oiler	-	-	-	-	-	-	2	2	-	-	2	2
- Cloth control	-	-	-	--	-	-	1	1	-	-	1	1
- Various	-	-	-	-	-	-	5	5	-	-	4	4
	22	62	92	176	4	39	74	117	4	27	58	89
Shearing Inspection												
- Foremen	-	-	-	-	1	-	-	1	1	-	-	1
- Shearing	-	-	-	-	-	1	-	1	-	1	-	1
- Inspecting	-	-	-	-	-	10	-	10	-	8	-	8
- Reserve	-	-	-	-	-	-	2	2	-	-	2	2
- Transport	-	-	-	-	-	-	2	2	-	-	2	2
	1	12	5	18	1	11	4	16	1	9	4	14
Malimo	1	6	3	10	1	6	3	10	1	6	3	10
	26	95	107	228	7	62	83	152	7	46	67	120
	34	151	135	320	17	106	121	244	16	80	102	198

Since WERNER's opinion of what is direct or indirect, which indirect personnel belongs to which department, might differ from the actual labour complement, not too much weight should be laid on a departmental comparison, but rather on the total complement.

3.1.9 Notes and explanations to substantiate the summary of mill balance and labour complement.

3.1.9.1 General

Basis for all calculated datawere the submitted WERNER form A-100, W-100 to W-109, which can be found in the appendix.

We had to work on the assumption that the given data were correct. In calculating a mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average. Therefore, the probability of having used incorrect figures from the completed forms has been greatly reduced.

3.1.9.2 Number ot Looms

WERNER proposal 1 is based on 162 looms in operation.

WERNER proposal 2 is based on 118 looms, which was given to us as the 1977 loom complement.

3.1.9.3 Efficiencies

Standard procedure for WERNER requires mill efficiency to be split up in three different types of efficiency.

1. Machine Efficiency

A loom is available 24 hours a day on a three shift basis which equals a 100% machine efficiency.

Whenever the loom is stopped for any reason other than weaver interference, the stopped hours are called "downtime hours" and reduce the machine efficiency accordingly.

2. Operator Efficiency

100% hours minus downtime hours are the machine hours available to the weaver which is 100% for the weaver. Actual picks compared to the possible picks in that time gives the operator efficiency.

3. Plant Efficiency

This indicates the net efficiency of a weave-room and is calculated either by multiplying:

- machine efficiency x operator efficiency, or
- the relation of actual picks to possible picks in 24 hours.

WERNER practice does not distinguish a difference between downtime hours of less or more than eight hours a day.

All efficiencies mentioned in "Summary Mill Balance" are compared to a 24 hour day, 268 working days per year as an absolute 100% efficiency.

3.1.9.4 CSILLAGHEGY Weave-Room Efficiency

Based on above definitions in section 3.1.9.3 and by calculating against historical records, achieved with average picks per loom, 162 looms in operation, actual picks, we derived at the following efficiencies for the plant:

- Plant efficiency - 75.4%
- Machine efficiency - 93 %
- Operator efficiency - 81 %

Individual downtime losses were given us at:

- Warp changing	-	3.8%
- Repair	-	1.1%
- Missing material	-	1.5%
- Various	-	.5%

which represents:

93.1%

machine efficiency.

This, in our opinion, is a fair result and we based our calculations on 94%. The difference between 93.1% and 93% (= .1%) accounts for labour shortage on the 162 looms.

By taking into consideration 176 looms, the downtime for labour shortage would have been:

.96%

As we understood from LENFONO management, above downtime percentages have been taken from the Norm sheets for job allocations. Therefore, these figures do not necessarily represent the actual conditions, but they do indicate efficiencies lower than they ought to be in a modern plant.

3.1.9.5 Operator Efficiency

Actual 1975 was:

81%

There is no reason why this 81% cannot be improved to 86% through:

- Installing the proper incentive system.
- Maintaining more stable running conditions.
- Reducing production interference.
- Operator training program.
- Intensifying floor supervision.
- Standardising job loads.
- Preventive maintenance program.
- Performance control in detail.

3.1.9.6 Plant Efficiency

LENFONO's 1975 plan called for:

5.075.000 running metres, or
5.833.000 square metres,

with a product mix giving an average of:

16.92 picks/cm

and an average picks per loom of:

182 per min.

and with 162 looms this would have given a plant efficiency of:

75.4%

In comparison: Actual : 75.4%
WERNER proposal 1 : 80.8%

3.1.9.7 Production

Comparison based on LENFONO plan 1975, actual achieved, and WERNER proposal 1.

The comparison shows:

- Plan = 100% - 5.833.000 sqm
- Actual 1975 = 100% - 5.833.000 sqm
- WERNER 1 = 107% - 6.252.000 sqm

Comparing these figures, one sees a realistic plan made by the LENFONO management which we can, nevertheless improve by:

7%

3.1.9.8 WERNER Proposal 2

In order to also get an up-to-date evaluation of the weaving mill, we asked for the 1977 loom complement and calculated a mill balance on this basis.

As far as production goes, WERNER expects an output from the 118 looms which amounts to:

4.552.000 sqm

3.1.9.9 Loom Assignments

Running condition of the material expressed in loom stops (the data given do not necessarily show the actual picture since the figures have been taken from their time evaluation):

- Warp : Actual - .86 M/ends/10^4 picks
  WERNER - .4 M/ends/10^4 picks

We cannot point out the exact reasons for LENFONO's high breakage rate since we did not analyse the machine material combination.

But by comparing the warp material and our experience in this field, we feel that a value of:

.4

is obtainable.

- Weft : Actual - 2.08 per 10^4 picks
  WERNER - 1.0 per 10^4 picks.

Part of the high breakage rate lies in the yarn quality as we can see in the spinning process data. But also part is due to the running condition of the loom (shuttle control, cleanliness, etc.).

Mechanical stops per 10^4 picks

This figure was given at:

1.51.

We were not able to receive a clear breakdown of this value.

By applying WERNER standard procedures in relation to correct job distribution and maintenance schedules, this value should not be higher than:

1.2

as far as weaver interferences are concerned.

3.1.9.10 Estimated Number of Looms per Weaver

- Actual : 7.2 looms per weaver
- WERNER 1 : 13 looms per weaver.

This implies the execution of several improvement programs:

- Machine condition (preventive maintenance program)
- Running condition of yarn
- Correct bonus system
- Operator training program
- New machine lay-out
- Improved handling procedures.

3.1.9.11 Preparation Departments

The relationship of sectional beaming to warping (for sizing) has been taken from the actual conditions and the proposed personnel loading is based on the weaving demands of WERNER proposal 1 and WERNER proposal 2 respectively.

The same is valid for the relationship of warp-hanging to tying-in. The same distribution as in 1975 was applied also for the 1977 proposal.

In the course of our analysis, we found several problem areas on which we offer the following comments:

- Warping - many dropped ends in weaving.
- Weft Winding - wrong bobbin formation,
  - reserve bunches unsufficiently controlled.

3.1.9.12 Greige Cloth Inspection

Basis for proposed labour complement:

- New lay-out
- Normal quality and grading standard
- Vertical inspection tables with positive drive and back-lighting
- Large input size (sewing ends together)
- Standardisation of fault analysis
- Setting up a grading system according to market demand.

3.1.9.13 Summary of Yarn Consumption

Table V

		According to Mill Balance W-100 - W-103	WERNER * Proposal 1	WERNER * Proposal 2
Warp	- Synthetics	49.875	53.366	38.849
	- Cotton	1.022.706	1.094.296	796.620
	Total	1.072.581	1.147.662	835.469
Weft	- Synthetics	29.453	31.515	22.942
	- Cotton	511.980	547.818	398.799
	- Linen	135.739	145.241	105.732
	- Tow	114.481	122.495	89.173
	Total	791.653	847.069	616.646

* withoutcooperatives

APPENDIX

WEAVING

PLANT WERK [illegible]LLASHECY

PRODUCTION DATA WEAVING

WERNER — FORM-No A-100

1.3 - Usillagiegy; 1.31 - Szebuzard; 1.32 - Conghad; 1.33 - Kofe S; 1.34 - Cokuezza	STYLE/STYLEGROUP	1975 GREIGE METERS: Meters	Sq.Meters	%	FINISHED FABRICS 1975 — TOTAL METERS: Meters	Sq.Meters	%	SPLIT-UP IN — EXPORT & I.QUALITY: Meters	Sq.Meters	%	ALL OTHER QUALITIES: Meters	Sq.Meters	%	LOSS greige to finish: Sq.Meters	%	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.3 73-31	232 - 05	189,631	177,312	100	202,624	182,363	103	162,708	146,438	80	39,916	35,925	20			
" "	232 - 08	33,389	30,511	100	35,556	32,000	105	32,320	29,088	91	3,236	2,912	9			
" "	236 - 04	99,333	91,385	100	107,263	96,537	106	91,924	82,732	85	15,339	13,805	14			
1.3 "	236 - 07		2,360													
1.33			244,838													
	Sum	257,241	247,198	100	283,173	254,856	103	244,944	220,450	87	38,229	34,406	13			
1.3 "	236 - 17	384,920	363,740	100	398,498	358,648	99	315,610	284,049	79	82,888	74,599	21			
" "	236 - 19	185,163	176,836	100	190,849	171,764	97	125,006	118,505	66	65,843	59,259	34			
1.3 "	236 - 20		9,628													
1.33			158,668													
	Sum	177,163	168,296	100	187,494	168,691	101	138,327	124,494	74	49,107	44,197	26			
1.3 73-21	239 - 01	155,847	140,496	100	150,111	132,098	90	118,438	104,225	79	31,673	27,873	21			
" 73-33	305 - 11		14,948													
1.34			45,523													
	Sum	40,471	60,471	100	39,339	55,074	91	24,902	34,862	63	14,437	20,212	37			
1.31 "	405 - 51	70,221	78,648	100	71,498	78,648	100	70,784	77,862	99	714	786	1			
1.3 "	406 - 61	2,411	2,675	100	2,432	2,675	100	2,407	2,648	99	25	27	1			
1.3 73-26	405 - 62		6,091													
1.31			35,521													
	Sum	37,155	41,612	100	115,845	127,430		114,803	126,283	99	1,042	1,147	1			
[illegible] "	406 - 63	7,955	11,296	100	8,146	11,404	101									
1.3 "	416 - 13	72,629	77,784	100	75,663	76,436	98	62,010	62,340	62	13,653	14,096	38			
1.3 73-25	421 - 01	96,847	139,818	100	91,690	131,644	94	87,296	126,423	96	4,394	5,221	4			
" "	421 - 06	143,826	115,016	100	155,781	115,644	100	134,797	100,500	87	20,984	15,144	13			
" "	421 - 23	6,155	4,647	100	7,296	5,253	113	6,078	4,376	83	1,218	877	17			
" 73-35	452 - 03	182,451	185,829	100	186,488	186,488	100	167,839	167,839	90	18,649	18,649	10			
" 73-25	471 - 01	20,044	22,450	100	20,409	22,450	100	17,552	19,307	86	2,857	3,143	14			
" 73-28	501 - 04	82,634	71,851	100	84,214	67,371	94	81,098	64,878	96	3,116	2,493	4			
" "	501 - 53	977	967	100	967	967	98	967	967	100						
" "	506 - 02	22,600	33,376	100	23,405	33,937	100	23,405	33,937	100						
" "	511 - 02	44,378	37,276	100	41,785	30,503	82	40,615	29,649	97	1,170	854	3			
" "	519 - 01	1,253	1,253	100	920	874	70	828	727	90	92	87	10			
" "	519 - 08	13,023	16,157	100	12,209	14,544	90	11,386	13,531	93	823	1,013	7			
" "	519 - 15	19,938	18,697	100	34,191	29,399	157	33,459	28,741	98	732	658	2			
" 73-28	519 - 20	2,571	3,539	100	2,529	3,541	100	1,181	1,654	47	1,348	1,937	53			
" 73-28	519 - 21	2,330	2,213	100	1,254	1,191	54	836	794	67	418	397	33			
" 73-33	519 - 25	3,670	5,204	100	3,776	5,204	100	3,527	4,861	93	249	343	7			
" [illegible]	[illegible] - 27	15,[illegible]4	20,557	[illegible]	15,273	19,029	93	14,[illegible]	18,382	97	517	647	3			

PLANT WERK CSILLAGHEGY	PRODUCTION DATA WEAVING															WERNER FORM-No A-100
1.3 - Csillaghegy 1.31 - Szekszard 1.32 - Sarybad 1.33 - Kefe S 1.34 - Bekesza	STYLE/STYLE GROUP	1975 GREIGE METERS			FINISHED FABRICS 1975 TOTAL METERS			SPLIT-UP IN Export & I.QUALITY			ALL OTHER QUALITIES			LOSS greige to finish		REMARKS
		Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Sq.Meters	%	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.3 73-25	521 - 03	16,386	23,760	100	15,666	22,716	96	15,666	22,716	100						
" "	521 - 06	9,695	15,027	100	12,198	17,077	114	12,198	17,077	100						
1.3 "	521 - 07		70,771													
1.32			34,806													
	Sum	70,385	105,577	100	69,159	103,739	98	68,952	103,428	99	207	311	1			
1.3 "	521 - 10	9,325	13,054	100	9,324	13,054	100	9,324	13,054	100						
1.3 "	521 - 12		1,128													
1.31			11,826													
	Sum	8,636	12,954	100	8,833	13,249		8,833	13,249	100						
1.3	521 - 22	3,766	3,427	100	3,654	3,289	96	3,654	3,289	100						
" "	521 - 24	17,522	17,333	100	17,562	16,543	95	16,861	15,855	96	701	688	4			
"	528 - 05	5,955	6,416	100	5,835	5,837	91	2,930	3,471	59	2,905	2,366	41			
" 73-33	529 - 06	6,654	6,122	100	7,212	6,491	106	7,104	6,394	93	108	97	2			
" "	529 - 16	6,781	6,103	100	5,790	5,211	85	5,651	5,086	93	139	125	2			
" 73-37	529 - 18	4,694	4,879	100	4,015	4,694	96	4,153	4,224	90	462	470	10			
" 73-25	541 - 51	54,786	50,024	100	56,665	49,229	98	53,037	46,010	93	3,628	3,219	7			
" 73-39	592 - 07	14,396	18,658	100	14,480	18,658	100	13,684	17,641	95	796	1,017	5			
1.3 "	592 - 07		125,460													
1.34			43,173													
	Sum	114,730	168,653	100	117,447	164,426	97	97,011	135,816	83	20,435	28,610	17			
1.3 "	592 - 07		170,356													
1.34			12,182													
1.31			65,799													
	Sum	168,752	248,337	100	166,677	243,349	98	137,342	200,519	82	29,335	42,830	18			
1.3 "	592 - 07		85,353													
1.34			1,860													
1.31			37,351													
	Sum	81,950	124,564	100	82,345	125,165	100	56,983	86,614	69	25,362	38,551	31			
1.3 "	592 - 07		48,276													
1.31			3,418													
	Sum	32,717	51,694	100	29,117	43,675	84	27,196	40,793	93	1,921	2,882	7			
1.3 "	592 - 14		121,414													
1.34			58,625													
1.31			68,554													
	Sum	175,055	248,593	100	143,278	200,590	81	82,242	115,139	57	61,036	85,451	43			

PLANT / WERK: CSILLAGHEGY — PRODUCTION DATA WEAVING

WERNER — FORM-No A-100

1.3 = Csillaghegy; 1.31 = [illegible]; 1.32 = [illegible]; 1.33 = [illegible]; 1.34 = [illegible]

		1975 GREIGE METERS			FINISHED FABRICS 1975 — TOTAL METERS			SPLIT-UP IN — EXPORT & I.QUALITY			ALL OTHER QUALITIES			LOSS greige to finish		REMARKS
	STYLE/STYLE GROUP	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Meters	Sq.Meters	%	Sq.Meters	%	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.3 73-33	592 - 53		51.560													
1.34			3.817													
1.31			64.545													
	Sum	84.452	119.922	100	82.758	115.862	97	48.166	67.432	58	34.592	48.430	42			
1.31 "	592 - 53	1.777	2.843	100	1.895	2.843	100	1.459	2.189	77	436	654	23			
1.31 "	592 - 56	4.879	7.024	100	5.017	7.024	100	4.816	6.743	96	201	281	4			
1.3 73-35	593 - 32	681	1.022	100	681	1.022	100	415	623	61	266	399	39			
1.33 73-47	600 - 51	39.220	40.003	100	39.520	40.310	100	36.239	36.964	92	3.281	3.346	8			
1.3 73-27	601 - 01	396.589	399.571	100	395.909	378.703	95	312.063	303.047	80	83.846	75.656	20			
1.3 "	801 - 01		256.000													
1.3			79.534													
	Sum	218.365	335.534	100	204.965	307.447	92	168.071	252.106	82	36.894	55.341	18			
1.3 "	801 - 06	25.207	26.456	100	24.934	24.934	94	19.723	19.723	79	5.211	5.211	21			
1.3 "	801 - 07	27.705	23.826	100	29.782	23.826	100	26.804	20.443	90	2.978	2.383	10			
1.3 "	801 - 51	12.470	13.031	100	14.814	15.110	116	13.821	14.097	93	993	1.013	7			
1.3 "	801 - 52	169.744	219.149	100	177.728	225.056	103	163.686	206.861	92	14.044	16.209	8			
1.3 "	801 - 53		350.876													
1.32			230.154													
	Sum	516.636	581.030	100	510.041	561.045	97	467.198	513.918	92	42.844	47.128	8			
1.3 "	801 - 54	573.580	613.934	100	581.170	597.836	97	455.078	468.784	78	126.092	129.053	22			
1.3 "	801 - 55	257.590	362.889	100	260.809	349.562	95	174.610	223.845	64	86.199	125.717	36			
1.3 "	801 - 63	441.787	579.521	100	441.093	561.483	97	414.510	526.215	94	26.583	35.268	6			
1.3 "	801 - 66		4.947													
1.3[illegible]			62.045													
	Sum	54.726	66.992	100	64.774	66.071	99	33.876	34.555	52	30.898	31.516	48			
1.3 73-37	802 - 51	124.412	159.886	100	128.605	159.718	100	118.115	146.462	93	10.690	13.256	7			
1.3 "	802 - 53		209.040													
1.3[illegible]			23.018													
	Sum	158.689	232.058	100	161.960	216.792	93	136.702	183.027	84	24.658	33.765	16			
GRAND TOTAL		6.222.273	7.263.073	100	6.447.080	7.128.311	98	5.348.927	5.903.010	83	1.098.153	1.225.301	17	178.000	1,7	

PLANT WERK CSILLACHEGY

WEAVING MACHINE SPECIFICATION

WERNER FORM-No W-100

		MACHINE PARK								PRODUCTION DATA ; EFFICIENCIES											PICKS PRODUCED			
PLANT KOOP	STYLE GROUP	MACHINE MAKE	WARP MOTION	WEFT INPUT	WARP STOP MOTION	WEFT INSERT.	AVAIL LOOMS	LOOMS IN OPERAT.	WIDTH	% AVAIL. TO RUN	PPM	LOOM-HRS per 24 hrs 100%	DOWNTIME IN % Warp chang	Rep	Miss Mat.	Miss Pers.	Var.	Total	LOOM-HRS p-24 hrs net	M/C EFF %	Picks per 24 hrs in Millions 100 %	ACTUAL	PLANT EFF %	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
		AT - 100	exc	plrn	mech	conv	34	34	95	100	195													
			dob	plrn	mech	conv	6	6	95	100	195													
		Sum AT-100					40	40		100	195	960	4.9	1.8	1.4	.1	.9	9.1	873	90.9	11.232	9.147	81.4	
		AT - 120	exc	plrn	mech	conv	10	10	115	100	168													
			dob	plrn	mech	conv	4	4	115	100	168													
		Sum AT-120					14	14	115	100	168	336	4.9	1.6	1.2	.3	.7	8.7	307	91.3	3.387	2.636	77.8	
		AT - 175	exc	plrn	mech	conv	15	15	165	100	147													
			dob	plrn	mech	conv	3	3	165	100	147													
		Sum AT-175					18	18	165	100	147	432	1.8	.8	2.4	./.	.6	5.6	408	94.4	3.810	2.637	69.2	
		Picanol 132	exc	plrn	mech	conv	36	36	127	100	191	864	4.1	.7	1.9	.2	.4	7.3	801	92.7	9.901	7.564	76.4	
		Picanol 176	exc	plrn	mech	conv	68	54	165	79	182	1.296	3.0	.8	1.3	.1	.2	5.4	1.226	94.6	14.152	10.063	71.1	
[illegible]Y TOTAL							176	162		92	182	3.868	3.8	1.1	1.5	.1	.5	7.0	3.615	93.0	42.482	32.047	75.4	
KOOP SZEDSZARD		Hagyo	exc	plrn	./.	conv	40	32	155	80	130	512						20.1	409	79.9	3.993	1.348	33.8	
KOOP BEBESZ		AT - 175	exc	plrn	mech	conv	18	18	165	100	147	432						10.9	385	89.1	3.810	992	26.0	

PLANT WERK: CSILLAGHEGY | WEAVING CLOTH SPECIFICATION ; QUANTITIES | WERNER | FORM-No W-101

	1.3 - Csillaghegy; 1.31 - Szeszgyár; 1.32 - Bonyhad; 1.33 - Kefe S; 1.34 - Pálmafa	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	WARP Mix	WEFT Nm	WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT. Warp	% CONTRACT. Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in Meter I. QUART	II. QUART	III. QUART	IV. QUART	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.3 73-31	232 - 05	2:2 twill	92.5	50/2	Cotton	15	Line	37.7	19.5	175	120	295	20	.2	3560	900		75					119.175
2	" "	232 - 06	2:2 twill	94.5	50/2	"	15	"	37.7	19.5	175	120	295	20	.2	3560	900		75					70.456
3	"	232 - 08	3:1 twill	93	40/2	"	15	"	27.1	19.5	155	110	265	16	2.7	2520	990		85					33.369
4	- "	235 - 04	3:1 twill	92	50/2	C 16 V	18	" 16 V	35.5	17	150	85	235	16	1.6	3272	928		50					99.333
5	"	236 - 07	Plain	92.5	40/2	Cotton	15	"	26.6	15	140	100	240	16	.9	2464	744		80					2.551
6	1.33 "	236 - 07	"	92.5	40/2	"	15	"	26.6	15	140	100	240	16	.9	2464	744		80					254.686
7	1.3 "	236 - 17	2:2 twill	94.5	20	"	15	" 16 V	25.7	19.3	120	95	215	14	-	2520	1140		100					384.920
8	" "	236 - 19	3:1 twill	95	50/2	"	15	12 PAN	29.7	17	110	90	200	16	1.7	2836	990		85					186.163
9	"	236 - 23	Plain	95	50/2	"	15	" 12 PAN	29.7	15	110	90	200	18	2.1	2836	990		84					10.135
10	1.33 "	236 - 20	"	95	50/2	"	15	" 12 PAN	29.7	15	110	90	200	18	2.1	2836	990		84					167.018
1	1.3 73-21	239 - 01	2:2 twill	94	34/2	PE	34/2	PE	23.8	16	160	100	260	20	4.2	2240	1020		50					155.847
2	" 73-33	306 - 11	Plain	150	27/1	Cotton	15	Line 16 PE	22.9	15.5	75	80	155	16	1.6	3430	1160		100					9.965
3	1.34 "	306 - 11	"	150	27/1	"	15	" 16 PE	22.9	15.5	75	80	155	16	1.6	3430	1160		100					30.348
4	1.31 73-36	406 - 51	3:1 twill	112	27/2	C 16 V	10	tow	19.5	16	135	150	285	14	3.3	2152	819		80					70.221
5	1.3 "	406 - 61	Plain	111	27/2	Cotton	9	" 6 V	18	11	120	100	220	15	1.8	2000	644		60					2.411
6	" "	406 - 62	3:1 twill	112	15	Line 6 V																		
7					27/2	Cotton	9	" 6 V	19.5	14.5	140	155	295	14	1.8	2152	1001		80					5.436
8	1.31 "	406 - 62	3:1 twill	112	15	Line 6 V																		
9					27/2	Cotton	9	" 6 V	19.5	14.5	140	155	295	14	1.8	2152	1001		80					31.715
10	" "	406 - 63	Plain	142	15	Line 6 V																		
1					27/2	Cotton	6	"	19.4	8.5	140	130	270	14	2.5	2752	546		80					7.955
2	1.3 "	416 - 13	3:1 twill	95	50/2	C 16 V	12	Line 6 V	25.6	14.5	90	100	190	12	3.2	2430	1058		56					20.715
3	" "	416 - 13	3:1 twill	106	50/2	C 16 V	12	Line 6 V	25.6	14.5	90	100	190	12	1.9	2700	1008		56					30.973
4	" "	416 - 13	3:1 twill	116	50/2	C 16 V	12	Line 6 V	25.6	14.5	90	100	190	12	3.2	2970	1008		56					18.143
5	" "	416 - 13	3:1 twill	148	50/2	C 16 V	12	Line 6 V	25.6	14.5	90	100	190	12	3.0	3780	1008		56					2.858
6	" 73-25	421 - 01	Plain	95	27/2	Cotton	27/2	Cotton	25.5	14	220	95	315	20	1.6	2430	840		70					5.916
7	" "	421 - 01	"	143	27/2	"	27/2	"	25.5	14	220	95	315	20	1.1	3644	840		70					7.571
8	" "	421 - 01	"	148	27/2	"	27/2	"	25.5	14	220	95	315	20	1.1	3996	1008		70					53.359
9	" "	421 - 06	"	68.5	34/2	"	20/2	"	24.3	14.5	150	140	290	16	4.3	1664	812		100					101.025
10	" "	421 - 06	"	77	34/2	"	20/2	"	24.6	14.5	150	140	290	16	3.8	1872	812		100					6.977
1	" "	421 - 06	"	86	34/2	"	20/2	"	24.6	14.5	150	140	290	16	3.5	2080	812		100					6.565
2	" "	421 - 06	"	96	34/2	"	20/2	"	24.8	14.5	150	140	290	16	4.2	2340	812		100					6.142
3	" "	421 - 06	"	107	34/2	"	20/2	"	24.3	14.5	150	140	290	16	3.8	2600	812		100					3.200
4	" "	421 - 06	"	128	34/2	"	20/2	"	24.3	14.5	150	140	290	16	4.1	3120	812		100					19.917
5	" "	421 - 23	"	75.5	27/2	"	20/4	"	32	9	270	175	445	23	1.3	2418	640		52					6.555
6	" 73-35	452 - 03		102	27/2	"	15	Line	11.6	13	85	85	170	10	6.9	1180	1320		100					182.451
7	" 73-25	471 - 01	plain	112	40/2	"	34/2	Cotton	30.4	20	210	115	325	19	4.5	4480	1110		62					20.044
8	" 73-28	501 - 04	"	87	27/1	"	27/2	"	33	16	80	80	160	10	7.7	2882	1100		100					82.634
9	" "	501 - 58	"	101	60/3	"	60/3	"	39.6	22	235	110	345	20	2.0	4000	1200		100					.977
40	" "	506 - 02	2:2 twill	145	27/1	"	20/1	"	34.8	17	140	80	220	10	3.4	5090	990		100					22.800
1	" "	511 - 02		84	40/2	"	14/1	"	16.5	42	75	330	405	6	8.3	1391	810		50					44.378
2	" "	519 - 01	2:2 twill	100	34/4	PE	34/8	PE	23	10	325	235	560	2	5.0	2300	671		50					1.253
3	" "	519 - 03	2:2 twill	86	34/4	PE	34/4	PE	26	15	350	180	530	20	3.5	2240	600		50					3.909
4	" "	519 - 06	2:2 twill	115	34/4	PE	34/4	PE	25.9	15	350	180	530	20	2.9	2970	600		50					1.046
5	" "	519 - 06	2:2 twill	146	34/4	PE	34/4	PE	26	15	350	180	530	20	2.7	3780	600		50					7.468
6	"	[illegible] - 15	2:2 twill	91	840/140 PA		840/140 PA		26.2	13	240	160	400	20	4.9	2380	700		83					13.801

PLANT / WORK: CSILLAGHEGY

WEAVING CLOTH SPECIFICATION ; QUANTITIES

WERNER — FORM-No W-101

	1.3 = Csillaghegy; 1.31 = Szekszard; 1.32 = Bonyhad; 1.33 = Kafe S; 1.34 = Bekesza	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP Mix	MATERIAL WEFT Nm	MATERIAL WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in Meter I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.3 73-2[illegible]	519 - 15	2:2 twill	93	840/140	PA	840/140	PA	25.8	18	240	160	400	20	5.4	2380	700		83					4,056
2	" 73-28	519 - 15	2:2 twill	114	840/140	PA	840/140	PA	26.1	18	240	160	400	20	4.9	2928	700		83					1,823
3	" 73-30	519 - 20	plain	140	500/100	PE	500/100	PE	19	19	105	95	200	20	6.8	2660	700		83					2,571
4	" 73-28	519 - 21	2:2 twill	95	1000/200	PE	1000/200	PE	27	19	332	210	545	20	4.7	2566	700		83					2,713
5	" 73-39	519 - 25	2:2 twill	139	1500/200	PE	1000/200	PE	14.5	10	240	100	340	10	3.9	2026	660		50					1,595
6	" "	519 - 25	2:2 twill	144	1500/200	PE	1000/200	PE	14.5	10	240	100	340	10	4.2	2100	660		50					2,074
7	" 73-28	519 - 27	2:2 twill	130	34/4	PE	34/4	PE	16.3	15.5	180	145	325	20	6.2	2124	780		50					20,557
8	" "	521 - 03	plain	145	20/2	Cotton	20/2	Cotton	19	15	215	145	360	20	5.5	2760	720		60					16,385
9	" "	521 - 06	double	155	34/2	Cotton	14/1	Cotton	19	42	120	280	400	16	8.1	2800	750		50					9,695
10	" "	521 - 07	plain	150	20/2	Cotton	20/2	Cotton	15	15.5	170	150	320	18	7.1	2250	710		60					47,161
1	[illegible] "	521 - 07	"	150	20/2	Cotton	20/2	Cotton	15	15.5	170	150	320	18	7.1	2250	710		60					23,204
2	[illegible] "	521 - 10	"	140	20/2	Cotton	20/2	Cotton	15	14	170	140	310	18	7.1	2100	710		60					9,325
3	" "	521 - 12	"	150	34/4	Cotton	34/4	Cotton	12	17	155	145	300	15	9.0	1800	1380		60					,752
4	1.31 "	521 - 12	"	150	34/4	Cotton	34/4	Cotton	12	12	155	145	300	15	9.0	1800	1380		60					7,884
5	1.3 "	521 - 22	3:1 twill	91	40/2	Cotton	34/2	Cotton	26.4	19.5	120	80	200	16	3.0	2478	1044		100					3,706
6	" "	521 - 24	2:2 twill	93.5	27/2	Cotton	27/2	Cotton	19	19.5	115	115	230	12	4.6	1800	1120		100					8,462
7	" "	521 - 24	2:2 twill	104	27/2	Cotton	27/2	Cotton	19.2	19.5	115	115	230	12	4.5	2000	1120		100					9,040
8	" "	526 - 05	plain	141	34/2	Cotton/PE	34/2	Cotton/PE	14.9	12.8	180	140	320	18	4.5	2104	1300		50					2,165
9	" "	529 - 05	plain	89	34/2	PE	34/1	PE	16.4	24.5	105	80	185	10	10.5	1452	990		50					3,870
20	" 73-38	529 - 0[illegible]	plain	92	1000/200	PE	1000/200	PE	28.8	9.5	375	175	500	20	4.8	2700	720		50					6,654
1	" "	529 - 16	plain	90	1000/200	PE	1000/200	PE	36	13	470	120	590	20	5.8	3200	700		50					6,781
2	" 73-37	529 - 18	plain	100	34/2	PAN	34/2	PAN	30.4	16	190	90	280	20	2.6	3056	720		100					3,538
3	" "	529 - 18	plain	116	34/2	PAN	34/2	PAN	30.5	16	190	90	280	20	1.7	3560	720		100					1,156
4	" 73-25	541 - 51	plain	75	34/1	Cotton	20/1	Cotton	21.5	17	60	60	120	20	9.6	1612	960		100					25,010
5	" "	541 - 51	plain	105	34/1	Cotton	20/1	Cotton	21.3	17	60	60	120	20	8.9	2240	1320		100					29,778
6	" 73-39	592 - 07	plain	125	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,6	1690	1320		55					5,653
7	" "	592 - 07	plain	133	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,6	1798	1320		55					8,715
8	" "	592 - 07	plain	147	20/2	Cotton	6	Tow	12.7	12	140	180	320	20	2.4	1868	1320		55					85,427
9	1.34 "	592 - 07	plain	147	20/2	Cotton	6	Tow	12.7	12	140	180	320	20	2.4	1868	1320		55					20,309
30	[illegible] "	592 - 07	plain	147	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,7	1986	1320		55					8,287
1	1.31 "	592 - 07	plain	147	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,7	1986	1320		55					44,701
2	1.3 "	592 - 07	plain	147	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,7	1986	1320		55					115,690
3	" "	592 - 07	plain	153	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,8	2068	1320		55					55,766
4	1.34 "	592 - 07	plain	153	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,8	2068	1320		55					1,215
5	1.31 "	592 - 07	plain	153	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	,8	2068	1320		55					24,412
6	" "	592 - 07	plain	158	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	3.3	2040	1320		55					2,153
7	1.3 "	592 - 07	plain	158	20/2	Cotton	6	Tow	13.4	11.5	140	180	320	20	3.3	2040	1320		55					30,554
8	" "	592 - 14	plain	142	20/2	Cotton	10	Tow	14.3	12.5	130	100	230	16	2.1	2030	1392		50					85,509
9	1.34 "	592 - 14	plain	142	20/2	Cotton	10	Tow	14.3	12.5	130	100	230	16	2.1	2030	1392		55					41,255
40	1.31 "	592 - 14	plain	142	20/2	Cotton	10	Tow	14.3	12.5	130	100	230	16	2.1	2030	1392		55					42,277
1	" "	592 - 53	plain	142	20/2	Cotton	10	Tow	14.3	12.5	165	110	275	16	2.1	2030	1392		50					45,454
2	1.34 "	592 - 53	plain	142	20/2	Cotton	10	Tow	14.3	12.5	165	110	275	16	2.1	2030	1392		50					7,055
3	1.3 "	592 - 53	plain	142	20/2	Cotton	10	Tow	14.3	12.5	165	110	275	16	2.1	2030	1392		50					36,311
4	1.31 "	592 - 53	plain	152	20/2	Cotton	10	Tow	14.4	12.5	165	110	275	16	2.5	2190	1392		50					1,870
5	" "	592 - 55	2:2 twill	144	20/1	Cotton	3	Tow	38.8	8	190	230	420	14	1.3	5600	1100		50					4,877
6	1.3 "	593 - 32	plain	160	10	Line	3	Tow	13.4	12	145	120	265	15	1.9	2100	1196		50					,539

PLANT WERK C S I L L A C H E G Y

W E A V I N G CLOTH SPECIFICATION ; QUANTITIES

WERNER

FORM-No W-101

[illegible] = Csillaghegy
1.31 = [illegible]
1.32 = [illegible]
1.33 = [illegible] S
1.34 = [illegible]

	1	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm		MATERIAL WEFT Nm		CLOTH SPEC Warp e/cm	Weft p/cm	WEIGHT gr/sq.m. Warp	Weft	Total	% CONTRACT Warp	Weft	ENDS PER BEAM	BEAM LENGTH m	∅ PARTIE LENGTH	PIECE LENGTH m	PRODUCTION 1975 in Meters I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
					Nm	Mix	Nm	Mix																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.3 73-27	800 - 51	plain	102	20/2	Cotton	3,5	Tow	30	6,5	345	230	575	26	0,0	3060	574		50					39.220
2	" "	801 - 01	plain	90	50/2	Cotton	27/1	Cotton	26,3	22,5	120	80	200	14	4,2	2550	1140		100					112.252
3	" "	801 - 01	plain	105	50/2	Cotton	27/1	Cotton	28,0	22,5	120	80	200	16	5,0	3000	1856		100					284.337
4	"	801 - 01	plain	153	50/2	Cotton	27/1	Cotton	29,0	22,5	120	80	200	16	3,6	4440	1856		100					122.267
5	1.34 "	801 - 01	plain	153	50/2	Cotton	27/1	Cotton	29,0	22,5	120	80	200	16	3,6	4440	1856		100					38.647
6	" "	801 - 01	plain	155,5	50/2	Cotton	27/1	Cotton	29,0	22,5	120	80	200	16	3,0	4440	1856		100					13.121
7	1.3 "	801 - 01	plain	155,5	50/2	Cotton	27/1	Cotton	29,0	22,5	120	80	200	16	3,0	4440	1856		100					44.329
8	" "	801 - 06	plain	105	50/2	Cotton	20/1	Cotton	28,0	18,7	120	95	225	16	5	3000	1856		100					25.207
9	" "	801 - 07	plain	86	50/2	Cotton	27/1	Cotton	27,9	19	95	55	150	14	3,3	2400	1400		100					27.705
10	"	801 - 51	plain	104,5	34/3	Cotton	27/5	Cotton	29,2	10,2	320	185	505	26	1,6	3060	693		50					12.470
1	"	801 - 52	plain	112	40/2	Cotton	34/2	Cotton	39,2	20	210	115	330	19	4,4	4400	1110		60					97.127
2	"	801 - 52	plain	114	40/2	Cotton	34/2	Cotton	38,6	20	210	115	330	19	4,8	4400	1110		60					[illegible]
3	" "	801 - 52	plain	143	40/2	Cotton	34/2	Cotton	39,2	20	210	115	330	19	3,4	5600	1110		60					1.805
4	" "	801 - 52	plain	153	40/2	Cotton	34/2	Cotton	39,2	20	210	115	330	19	4,2	6000	1110		60					69.472
5	" "	801 - 53	plain	112,5	50/4	Cotton	20/4	Cotton	29,2	10,2	290	190	480	23	1,8	3300	636		43					312.052
6	1.32 "	801 - 53	plain	112,5	50/4	Cotton	20/4	Cotton	29,2	10,2	290	190	480	23	1,8	3300	636		43					204.561
7	1.3 "	801 - 54	plain	100	20/2	Cotton	20/3	Cotton	19,3	15	275	220	445	26	5,3	2044	1010		80					550.860
8	"	801 - 54	plain	145,5	20/2	Cotton	20/3	Cotton	19,2	15	225	220	445	26	3,4	2800	928		80					14.820
9	"	801 - 55	plain	110	40/2	Cotton	20/1	Cotton	33,8	21	180	100	280	14	5,6	3070	1254		100					104.979
20	"	801 - 55	plain	153	40/2	Cotton	20/1	Cotton	33,2	21	180	100	280	14	5,4	5328	1200		60					157.511
1	" "	801 - 63	plain	114	34/3	Cotton	34/3	Cotton	28,8	16,5	275	150	425	20	4,8	3300	720		50					252.070
2	" "	801 - 63	plain	154	34/3	Cotton	34/3	Cotton	28,8	16,5	275	150	425	20	4,4	2000	780		50					189.731
3	" "	801 - 66	plain	103,5	34/4	Cotton	27/5	Cotton	29,5	10,5	385	200	585	23	,9	3060	576		52					4.760
4	1.32 "	801 - 66	plain	103,5	34/4	Cotton	27/5	Cotton	29,6	10,5	385	200	585	23	,9	3060	576		52					59.946
5	1.3 73-37	802 - 51	plain	128,5	60/3	Cotton	18	Line	36,6	20	220	100	320	22	2,2	4674	1170		64					126.412
6	" "	802 - 53	plain	105	34/3	Cotton	10	Line	31	13,5	320	130	450	20	2,4	3264	660		50					19.108
7	1.31 "	802 - 53	plain	105	34/3	Cotton	10	Line	31	13,5	320	130	450	20	2,4	3264	660		50					4.968
8	" "	802 - 53	plain	143	34/3	Cotton	10	Line	31	13,5	320	130	450	20	1,7	4420	660		50					12.442
9	" "	802 - 53	plain	143	34/3	Cotton	10	Line	31	13,5	320	130	450	20	1,7	4420	660		50					122.107
30																								
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
40																								
1																								
2																								
3																								
4																								
5																								

PLANT OSILLACHEGY | WEAVING RUNNING DATA ; PRODUCTIVITY

WERNER | FORM-No W-102

PLANT LOOP	STYLE / STYLE GROUP	LOOM-MAKE	LOOM STOPS Warp M ends 10000p	LOOM STOPS Weft 10.000 picks	LOOM STOPS Mech 10.000 picks	% WASTE Warp	% WASTE Weft	% WASTE Total	LOOMS per WEAVER	PRODUCTION 1975 m x 10^3	LABOR HOURS 1975 DIRECT	LABOR HOURS 1975 INDIRECT	LABOR HOURS 1975 TOTAL	PRODUCTIVITY in MTR/WORK.HOUR Direct	PRODUCTIVITY in MTR/WORK.HOUR Indirect	PRODUCTIVITY in MTR/WORK.HOUR Total	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	73-31 232 - 06	AT - 100	.56	2.68	1.19				6.6	119.2							
	" 232 - 06	AT - 120	.56	2.68	1.61				6.2	70.5							
	" 232 - 08	AT - 100	.77	2.5	1.23				6.7	33.4							
	" 236 - 04	AT - 100	.65	2.8	1.44				5.7	99.4							
	" 236 - 07	AT - 100	.82	2.6	1.32				6.5	2.5							
	" 236 - 17	AT - 100	.63	3.1	1.22				6.8	384.0							
	" 236 - 19	AT - 100	.63	3.1	1.31				6.4	186.2							
	" 236 - 20	AT - 100	.63	3.1	1.31				5.6	10.1							
	73 - 21 239 - 01	AT - 100	1.2	2.2	1.46				6.9	155.8							
	73 - 33 306 - 11	AT - 175	.67	5.36	1.78				6.1	9.5							
	73 - 36 406 - 61	AT - 120	.85	5.68	3.11				4.0	2.4							
	" 406 - 62	AT - 120	.85	5.68	3.11				4.0	5.5							
	" 416 - 13	AT - 100	1.02	2.8	1.54				5.4	20.7							
	" 416 - 13	AT - 120	.52	2.8	1.32				5.9	30.9							
	" 416 - 13	AT - 120	.52	3.1	1.37				5.5	18.1							
	" 416 - 13	AT - 175	.49	2.86	1.79				6.0	2.8							
	73 - 25 421 - 01	AT - 100	1.27	2.0	1.16				6.7	5.9							
	" 421 - 0.	AT - 175	1.08	2.36	2.07				5.1	7.6							
	" 421 - 01	AT - 175	.8	1.8	2.07				5.1	83.5							
	" 421 - 06	AT - 100	.9	1.5	1.09				7.1	101.0							
	" 421 - 06	AT - 100	.9	1.67	1.04				6.4	6.9							
	" 421 - 06	AT - 100	.9	1.87	1.01				6.0	6.5							
	" 421 - 06	AT - 100	.9	2.1	.96				6.2	6.2							
	" 421 - 06	AT - 100	.9	2.3	1.24				5.4	3.2							
	" 421 - 06	AT - 175	.63	2.2	1.29				5.4	13.9							
	" 421 - 23	AT - 100	1.07	3.93	1.85				4.3	6.2							
	73 - 35 452 - 03	AT - 120	1.32	2.3	1.32				6.6	162.5							
	73 - 25 471 - 01	P - 132	.77	1.5	1.51				[illegible]	20.0							
	73 - 28 501 - 04	AT - 100	.9	2.3	1.09				4.6	82.6							
	73 - 28 501 - 50	P - 176	.43	.43	2.07				5.1	1.0							
	73 - 28 506 - 02	AT - 175	.62	1.34	2.12				5.8	22.8							
	" 511 - 02	AT - 100	1.29	1.7	1.26				6.4	44.4							
	" 519 - 01	P - 132	.77	1.5	1.49				8.5	1.2							
	" 519 - 06	P - 132	1.32	1.48	1.49				8.6	4.0							
	" 519 - 08	P - 132	1.32	1.48	1.48				8.6	1.6							
	" 519 - 03	P - 176	1.32	2.59	2.72				5.4	7.6							
	" 519 - 15	P - 132	.74	2.5	1.82				8.9	10.1							
	" 519 - 15	P - 132	.74	2.56	1.82				8.9	1.0							
	73 - 38 519 - 20	P - 176	.74	2.96	1.35				9.4	2.5							
	73 - 28 519 - 21	P - 132	.71	2.96	1.82				8.9	2.7							
	73 - 38 519 - 25	P - 175	.74	2.96	1.35				9.4	3.7							
	73 - 23 519 - 27	P - 176	.74	2.95	1.35				9.4	10.0							
	73 - 28 521 - 03	P - 176	1.01	1.5	1.29				6.6	16.5							
	73 - 28 521 - 06	AT - 175	1.14	2.3	1.29				6.6	10.0							
	73 - 28 521 - 07	AT - 175	1.15	1.2	1.80				5.4	47.2							
	[illegible] 521 - 10	P - 176	1.15	1.2	1.59				5.2	10.0							

PLANT KILLAGHEGY	WEAVING RUNNING DATA : PRODUCTIVITY																	WERNER FORM-No W-102
PLANT	STYLE / STYLE GROUP	LOOM-MAKE	LOOM STOPS			% WASTE			LOOMS per WEAVER	PRODUCTION 1975 m x 10^3	LABOR HOURS 1975			PRODUCTIVITY in MTR/WORK.HOUR			REMARKS
			Warp N ends 10000p	Weft 10.000 picks	Mech 10.000 picks	Warp	Weft	Total			DIRECT	INDIRECT	TOTAL	Direct	Indirect	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	73-28 521 - 12	P - 176	1.15	1.2	1.28				11.6	1.0							
	" 521 - 22	P - 132	1.15	1.2	2.09				7.4	3.8							
	" 521 - 24	AT - 100	.82	4.3	1.28				6.1	8.2							
	" 521 - 24	AT - 120	.82	4.5	1.02				7.1	9.-							
	" 526 - 05	P - 176	.76	1.72	2.09				7.4	2.1							
	" 529 - 05	AT - 100	.74	2.5	1.32				6.7	3.5							
	73-38 529 - 06	P - 132	.74	2.5	2.35				6.2	6.6							
	" 529 - 16	P - 132	.74	2.5	2.35				6.2	6.8							
	73-37 523 - 18	P - 132	.74	2.5	1.40				9.9	3.5							
	" 529 - 18	P - 132	.74	2.5	1.40				9.9	1.1							
	73-25 541 - 51	AT - 100	1.3	1.5	1.03				8.1	25.0							
	" 541 - 51	AT - 175	1.85	1.5	2.06				5.1	29.5							
	73-39 592 - 07	P - 132	.79	2.1	1.12				12.4	5.6							
	" 592 - 07	P - 176	.79	2.2	2.09				3.7	8.7							
	" 592 - 07	AT - 175	.79	2.48	1.86				4.6	85.3							
	" 592 - 07	AT - 175	.79	2.98	1.86				4.6	115.6							
	" 592 - 07	P - 176	.79	2.5	2.07				3.7	55.4							
	" 592 - 07	P - 176	.79	2.6	2.09				3.7	30.4							
	" 592 - 14	AT - 175	.86	3.65	1.59				5.7	65.5							
	" 592 - 53	P - 176	.86	3.65	1.64				9.7	10.3							
	" 592 - 53	AT - 175	.86	3.65	1.59				5.7	17.0							
	" 593 - 32	P - 176	5.85	4.2	4.97				3.4	0.6							
	73-22 801 - 01	P - 132	.57	1.4	1.01				13.7	112.0							
	" 801 - 01	AT - 120	.5	1.3	.94				8.5	80.5							
	" 801 - 01	P - 132	.57	1.4	1.01				13.7	203.1							
	" 801 - 01	P - 176	.43	1.5	1.03				12.4	172.3							
	" 801 - 01	P - 176	.43	1.5	1.03				12.4	44.3							
	" 801 - 06	AT - 120	.5	1.3	.94				8.5	25.2							
	" 801 - 07	AT - 100	.5	1.3	.95				8.8	27.7							
	" 801 - 51	P - 132	.69	1.1	1.70				9.1	12.5							
	" 801 - 52	P - 132	.77	1.5	1.35				1.7	98.4							
	" 801 - 52	P - 176	.77	1.9	1.51				8.1	1.8							
	" 801 - 52	P - 176	.8	2.2	1.51				8.1	69.5							
	" 801 - 53	P - 176	.85	2.4	1.09				7.4	312.0							
	" 801 - 54	P - 132	1.05	1.5	1.62				8.2	559.0							
	" 801 - 54	P - 176	1.66	2.05	2.35				6.2	15.0							
	" 801 - 55	P - 132	.49	1.0	.95				12.9	52.5							
	" 801 - 55	P - 176	.45	1.0	.95				12.9	204.5							
	" 801 - 63	P - 176	.85	1.2	1.58				8.1	252.0							
	" 801 - 63	P - 176	.71	1.1	1.56				8.1	190.0							
	" 801 - 66	P - 132	.98	.8	2.03				7.4	4.7							
	" 802 - 51	P - 176	.43	2.6	1.36				9.9	124.4							
	73-37 802 - 53	P - 132	1.03	2.0	2.36				5.6	19.2							
	" 802 - 53	P - 176	1.03	2.5	2.76				3.4	132.1							
TOTAL								2.84			228.290	221.001	449.300				

PLANT: CSILLAGHEGY

WEAVING PRODUCTION CALCULATIONS, COMPARISON

WERNER — FORM-No W-103

PLANT	STYLE / STYLE GROUP	LOOM MAKE	LOOM PERFORMANCE: RPM	LOOM PERFORMANCE: Picks/hour 100 %	LOOM PERFORMANCE: eff %	LOOM PERFORMANCE: Picks/hour exp	LOOM PERFORMANCE: Meter/hour exp	PRODUCTION acc. to act. eff.: No of Looms	PRODUCTION acc. to act. eff.: Meter/year expected	PRODUCTION acc. to act. eff.: Sq.Meter/year expected	ACTUAL PRODUCTION 1975 x 10^3: No of looms	ACTUAL PRODUCTION 1975 x 10^3: Meter/year	ACTUAL PRODUCTION 1975 x 10^3: Sq.Meter year	PLAN PRODUCTION x10^3: Meter/year	PLAN PRODUCTION x10^3: Sq.Meter/year	PROD. acc. to WERNER-EFF x 10^3: eff %	PROD. acc. to WERNER-EFF x 10^3: No of looms	PROD. acc. to WERNER-EFF x 10^3: Meters/year	PROD. acc. to WERNER-EFF x 10^3: Sq.Meters year	COMP: Prod. act. eff = 100: PROD 1975	COMP: Prod. act. eff = 100: PLAN 1975	COMP: Prod. act. eff = 100: WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Csillagregy		AT - 100	195	11,700	81.4	9.524	5.19	40	1.335	1.201	40	1.336	1.207	1.270	1.143							
		AT - 120	168	10.080	78	7.862	4.76	14	429	441	14	428	439	406	416							
		AT - 175	147	8,820	69.4	6,121	4.39	18	508	740	18	506	737	483	703							
		Picanol 132	191	11.460	76.4	8.755	4.92	36	1.139	1.194	36	1.139	1.194	1.584	2.144							
		Picanol 170	182	10,920	71	7,753	4.73	68	2,095	2.837	54	1.606	2,256	1,584	2.144							
		TOTAL						176	5.506	5.413	162	5.075	5.833	4.829	5.544							
[illegible]		Hagyo	130	7.800	50	3,900	3,30	40	565	756	32	307	410	374	500							
[illegible]		AT - 175	147	8.820	60	5,292	3.29	18	300	502	13	165	244	200	290							

PLANT WERK CSILLAGHEGY	WARP PREPARATION MACHINE SPECIFICATIONS	WERNER	FORM-No W-106

1			PLANT KOGP					
2			PROCESS	Sect.beaming				
3			MACHINE MAKE	Textima				
4			No of MACHINES	5				
5			No of Creels	5				
6	BEAMER		STOP MOTION					
7	BEAMER		BEAM BRAKE	yes				
8	BEAMER		MAX.METER / MINUTE	600				
9	BEAMER		SPEED REGULATION	yes				
10	BEAMER		DISTANCE BEAM-CREEL	350 cm				
1	BEAMER		MAX.SECTION WIDTH cm	30				
2	BEAMER		CONUS DEPTH cm	24				
3	BEAMER	BEAM	ø DISC mm	650				
4	BEAMER	BEAM	ø BASE mm	125				
5	BEAMER	BEAM	WIDTH mm	1720				
6	BEAMER							
7	BEAMER							
8	BEAMER							
9	BEAMER		Power Need kW	5				
20	BEAMER		Noise level dB	76				
1	CREEL		MAX.CONES / CREEL	460				
2	CREEL		GAUGE cm	22				
3	CREEL		MAX.CONE WEIGHT gr	1800				
4	CREEL		TENSION CONTROL	yes				
5	CREEL		CHANGEABLE CONECREEL	yes				
6	CREEL		STOP MOTION ENDBREAK	electr				
7	CREEL							
8	CREEL							
9	CREEL							
30	CREEL							
1	CREEL							
2								
3								
4								
5								
6								

PLANT WORK [illegible]SILLASHEGY

WARP PREPARATION PRODUCTION DATA, COMPARISON

WERNER FORM-No W-107

PLANT	PROCESS	MACHINE MAKE	QUALITY	MATERIAL		ENDS PER SECTION/BEAM	end breaks/MM ends-mtr	Beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Downtime in min/			DELIVERY			CAPACITY		PRODUCTION in m x 10^3			WERNER-PROD. in m x 10^3				COMP: Prod.acc.to act.eff.= 100		
				Nm	Mix							END-BREAK	BEAM CHANGE	CREEL CHANGE	m/min 100 %	eff %	m/min exp	No.of M/C	M-hrs/year	EXPECTED 1975	ACTUAL 1975	PLAN 1975	No of M/C	M-hrs/years	eff %	PROD.	ACT.	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Sect.		232-06	50/2	Cotton	3500	33	900/10	1500	60	4																		
2	beaming		232-08	40/2	"	2520	24	990	1500	114	4																		
3			236-04	50/2	"	3272	33	928	1500	15	4																		
4			236-07	40/2	"	2464	24	744/ 8	1500	12	5																		
5			236-19	50/2	"	2836	33	990/10	1500	78	4																		
6			236-20	50/2	"	2836	33	990/10	1500	78	4																		
7			239-01	34/2	"	2240	17	1020/17	1500	120	3																		
8			406-61	27/2	"	2000	20	644	1500	55	4																		
9			406-62	15	Line				1000																				
10				27/2	Cotton	2152	20	1001/11	1200	67	2																		
11			416-13	50/2	"	2430	20	1008/16	1500	89	5																		
12			416-13	50/2	"	2700	33	1008/16	1500	48	4																		
13			416-13	50/2	"	2970	33	1008/16	1500	43	4																		
14			416-13	50/2	"	3780	33	1008/16	1500	48	3																		
15			421-01	27/2	"	2430	20	720/10	1200	60	3																		
16			421-01	27/2	"	3644	20	720/10	1200	26	2																		
17			421-01	27/2	"	3906	20	720/10	1200	27	2																		
18			421-06	34/2	"	1664	17	812/ 7	1200	6	5																		
19			421-06	34/2	"	1872	17	812/ 7	1200	6	5																		
20			421-06	34/2	"	2080	17	812/ 7	1200	54	4																		
21			421-06	34/2	"	2340	17	812/ 7	1200	54	4																		
22			421-06	34/2	"	2600	17	812/ 7	1200	54	3																		
23			421-06	34/2	"	3120	17	812/ 7	1200	54	3																		
24			421-23	27/2	"	3418	20	640/10	1200	62	2																		
25			452-03	27/2	"	1160	20	1100/10	1200	237	3																		
26			471-01	40/2	"	4430	24	1110/15	1500	7	2																		
27			501-58	60/3	"	4000	8	1200	1500	60	2																		
28			511-02	40/2	"	1391	24	910/15	1500	42	9																		
29			519-01	34/8	PE	2300	2	671/11	1000	53	1																		
30			519-03	34/4	PE	2240	3	600/10	1000	100	2																		
31			519-08	34/4	PE	2070	3	600/10	1000	325	1																		
32			519-08	34/4	PE	3760	3	600/10	1000	100	1																		
33			519-27	34/4	PE	2124	3	780/13	1000	310	1																		
34			521-03	20/2	Cotton	2760	19	720/10	1000	280	1																		
35			521-06	34/2	"	2500	17	754/13	1000	3	3																		
36			521-07	20/2	"	2150	19	710/10	1000	149	2																		
37			521-10	20/2	"	2100	19	710/10	1000	148	2																		
38			521-12	34/4	"	1800	14	1380/12	1000	130	1																		
39			521-22	40/2	"	2478	24	1044/ 9	1500	38	4																		
40			521-24	27/2	"	1800	20	1120/10	1200	68	2																		
41			521-24	27/2	"	2000	20	1120/10	1200	68	2																		
42			526-05	34/4	Cot / PE	2404	6	1003/17	1000	122	1																		
43			529-05	24/2	PE	1452	8	990/18	1200	35	5																		
44			529-18	34/2	PAN	3056	8	720/ 7	1200	57	3																		
45			529-18	34/2	PAN	3500	8	720/7	1200	57	3																		
46			592-07	20/2	Cotton	1590	19	1320/20	1000	209	1																		

PLANT DEPT. COILLACHECY

WARP PREPARATION PRODUCTION DATA, COMPARISON

WERNER FORM-No W-107

PLANT DEPT.	PROCESS	MACHINE MAKE	QUALITY	MATERIAL Nm	MATERIAL Mix	ends per section/beam	end breaks/ per end-mtr	beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Downtime in min/ end break	beam change	creel change	DELIVERY m/min 100 %	eff %	m/min exp	CAPACITY No. of M/C	M-hrs/ year	PRODUCTION in m x 10^3 EXPECTED 1975	ACTUAL 1975	PLAN 1975	WERNER-PROD. in m x 10^3 No. of M/C	M-hrs/ year	eff %	PROD.	COMP: Prod. acc. to act. eff. etc. ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Sect. warping		592-07	20/2	Cotton	1798	19	1370/20	1000	208	1																		
			592-07	20/2	"	1808	19	1056/16	1000	208	1																		
			592-07	20/2	"	2068	19	1056/16	1000	200	1																		
			592-07	20/2	"	2040	19	1924/14	1000	38	1																		
			592-14	20/2	"	2030	19	1392	1000	164	1																		
			592-53	20/2	"	2190	19	1392/24	1000	164	1																		
			593-37	10/1	Line	2100	43	1196	300	63	1																		
			801-01	50/2	Cotton	2550	33	1044/ 9	1500	104	4																		
			801-01	50/2	"	3000	33	1160/10	1500	108	3																		
			801-01	50/2	"	4440	33	1160/10	1500	103	2																		
			801-06	50/2	"	3000	33	1044/ 9	1500	104	3																		
			801-07	50/2	"	2400	33	1140/10	1500	41	4																		
			801-51	34/3	"	3060	23	693/11	1000	22	2																		
			801-52	40/2	"	4400	24	1110/15	1500	57	2																		
			801-52	40/2	"	4400	24	1110/15	1500	57	2																		
			801-52	40/2	"	5000	24	1110/15	1500	39	1																		
			801-52	40/2	"	6000	24	1110/15	1500	39	1																		
			801-53	50/4	"	3300	8	635/12	1200	80	2																		
			801-54	20/2	"	2044	19	1010/10	1000	293	1																		
			801-54	20/2	"	2800	19	980/13	1000	110	1																		
			801-55	40/2	"	3870	24	1254/11	1500	190	2																		
			801-55	40/2	"	5328	24	1200/16	1500	60	2																		
			801-63	34/3	"	3300	23	660/11	1200	11	2																		
			801-63	34/3	"	4500	23	660/11	1200	404	1																		
			801-65	34/4	"	3060	14	576/9	1200	181	2																		
			802-51	60/3	"	4674	8	1170/15	1500	96	2																		
			802-53	34/3	"	3264	23	660/11	1200	32	2																		
			802-53	34/3	"	4420	23	660/11	1200	404	1																		
		Textima										1,20		76,5	300	71		5	6432	68,687	67,963	68000							
														per 1000	30	rebeam													

PLANT WERK CSILLAGHEGY	WINDING; QUILLING SPECIFICATIONS, PRODUCTIVITY																			WERNER FORM-No W-108
PLANT SHOP	PROCESS	MACHINE MAKE	DESCRIPTION	Spindles/ Machine	MATERIAL		EDMSFH	% Waste	INPUT		OUTPUT		Spindles/ Operator	PRODUCTION 1975 to	WORKING HOURS 1975			PRODUCTIVITY in kg/work.hour		
					Nm	Mix			Form	gr	Form	gr			DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Quilling	UA - 300		12	17.8	Cotton + Line	4.200		Cone	1000	pirn		24	357						
		Schärer		10	11.6	Cotton + Line	3.000		Cone	1000	pirn		20	298.5						
		Schweiter		30	10.9	Cotton	2.500		Cone	1000	pirn		30	426.3						
		Total												1,081.8	32,580	17,376	49,956	33	62	22
	Winding	N - 150		100	13.0	Cotton	1.500				cone	1500	50	773.8	21.720	10.860	32,590	3.6	7.1	2.4
	Doubling	Guthl		90	11.3	Cotton	2.000		Cone	1000	bobbin	1200	45	305.3						
		Schlafhorst		90	11.3	Cotton	2.000		Cone	1000	bobbin	1200	45	305.3						
		Total												610.6	8.688	4,344	13,032	70	140	47

[illegible] S I L L A C H E G Y	W I N D I N G ; Q U I L L I N G P R O D U C T I O N D A T A , C O M P A R I S O N	WERNER	FORM-No W-100

[illegible]	PROCESS	MACHINE MAKE	MACHINES		SPINDLES			MATERIAL		DELIVERY				PRODUCTION in tons/year 1975						COMP: expect.1975 = 100 %		
			Total	In Op.	Total	In Op.	%	Nm	M i x	m/min 100 %	gr/Sph 100 %	eff %	gr/Sph exp	EXPECTED 1975	ACTUAL 1975	PLAN 1975	W E R N E R 1975 Spindles	% eff	Production	ACTUAL	PLAN	WERNER
1	2	3	4	5		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Quilling	UA - 300	4	4	48	46	100	15	Line	340	1360	70	952	293,91	280							
		UA - 300	2	2	24	24	100	23,4	Cotton	340	872	77,2	673	103,90	77							
		Total	6	6	72	72	100	17,8		340	1146	75	859	397,81	357							
		Schärer	1	1	10	7		16	Line	610	2033	82	1667	75,00	67							
						3		9,7	Cotton	610	3773	82	3093	59,60	53,5							
		Schärer	1	1	10	10	100	9,7	Cotton	610	3773	82	3093	198,9	178							
		Total	2	2	20	20	100	11,5		610	3155	82	2587	333,5	298,5							
		Schweiter	1	1	30	30	100	10,9	Cotton	580	3190	77	2456	473,9	426,3							
		GRAND TOTAL	9	9	122	122	100	13,4		443	1939	77	1535	1204,5	1081,9							
	Winding	M - 150	3	3	300	300	100	13	Cotton	420	1940	54	1050	1350,7	773,8							
	Doubling	Gutal	1	1	90	90	100	11,3	Cotton	360	1910	54	1031	397,88	305,33							
		Schlafhorst	1	1	90	90	100	11,3	Cotton	360	1910	54	1031	397,88	305,33							
		Total	2	2	180	180	100	11,3		360	1910	54	1031	795,76	610,66							

PLANT S I L L A C H E G Y

T W I S T I N G   P R O D U C T I O N   D A T A : C O M P A R I S O N

WERNER — FORM-No S-103

PLANT	Proc. Type	Machine Type	Year	QUALITIES Name	Mix	Nm	Cr/m	SPEED RPM Spi	Del. m/min	DELIVERY gr/Sph 100%	eff %	Contr %	gr/Sph exp	IND.ENGINEERING DATA Input gr	Output gr	EOPNSPH	Spl/ Operat.	PRODUCTION acc.to act.eff.in t. No M/C	No Spl	Sp-hr year	PROD	ACT. PROD 1975	PLAN PROD 1975	PRODUCTION acc.to WERNER No of Spdls	Sp-hrs year	tons	COMP: Prod.act.eff=1% ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Ring	F 411	1963	Cotton	100 %	17.-	470	7000	14.69	52.6	65	2.4	44.7	1.5	120	88	1080	1	360	6.432	103.5	68.8	76.7				66.5	74.1	
	"	F 411	1965	Cotton	+ PE	20	600	7000	11.66	33.8	85	2.6	28.7	1.5	120	56	1080	1	360	6.432	66.4	44.5	49.6				67	74.7	
	"	F 411	1965	Cotton	+ PE	20	600	7000	11.66	33.8	85	2.6	28.7	1.5	120	56	1080	1	360	6.432	66.4	44.5	49.6				67	74.7	
	"	Textima	[illegible]	Cotton	100 %	5	300	4000	13.33	160.0	50	2.3	80	1.5	180	160	624	1	312	6.432	160.5	107	121.5				66.7	75.7	
	"	Textima	1970	Cotton	+ PE	8.5	350	5000	13.88	98.0	60	2.7	56.8	1.5	180	135	624	1	312	6.432	118.0	78.7	87.7				66.7	74.3	
	"	Textima	1970	Cotton	100 %	8	480	5000	10.42	78.1	73	2.4	57	1.5	180	114	624	1	312	6.432	114.4	75.4	85.1				66.8	74.4	
	"	Textima	1970	Cotton	100 %	10	450	7000	15.22	91.3	65	1.9	59.3	1.5	200	88	624	1	312	6.432	119.0	79.3	89.3				66.6	74.2	
	"	Textima	1970	Cotton	100 %	10	450	7000	15.22	91.3	65	1.9	59.3	1.5	200	88	624	1	312	6.432	119.0	79.3	89.3				66.6	74.2	
[illegible]						11.3	462.1	6146	13.3	70.5	72.2	2.3	50.9	1.5	160	100	-	8	2,640	6,432	805.6	578.5	644.5				66.9	74.5	

3.2 FINISHING

3.0 CSILLAGHEGY

3.2 Finishing

3.2.1 Location

The finishing plant is located a few kilometres from the BUDAKALASZ finishing plant in a good labour market. Cloth woven at BUDAKALASZ but finished at CSILLAGHEGY can be transported economically.

3.2.2 Buildings and Lay-out

The building at CSILLAGHEGY in one long room, 140 metres long and 19 metres wide for 50 metres, but only 10 metres wide for 90 metres, giving a total of 1850 m^2.

Lay-out of machinery is good, the cloth flows in a straight line through the building. However, the location of the support columns and the narrowness of the building results in very poor working conditions. Lighting is poor.

Space for cloth storage in process in non-existant. This must cause considerable processing and planning problems.

3.2.3 Process Flow and Material Handling

The process flow is good in the sense that it is a straight line flow.

The material handling is made difficult due to the narrowness of the building, the transport of small, water saturated cloth rolls, and the support column in the middle of the building.

3.2.4 Machine Obsolescence

The machines that could be considered obsolescent at CSILLAGHEGY are the two Donath jiggers, and possibly the Haubold calander (1924) and the Weissbach calander (1920).

Modern calanders operate at a very high speed and modern jiggers are covered, automatic, tensionless and with a variable speed drive. The Zittau foulard (1920) is definitely antiquated (12m/min.) and should be replaced if money is available.

3.2.5 Machine Improvements

There are several simple modifications and improvements to the existing machinery that would improve the efficiency and productivity. Certain modifications could be made by the plant maintenance department at low cost that would result in a distinct improvement in productivity.

3.2.6 Mill Balance

A proper, correct mill balance could not be calculated for CSILLAGHEGY because it is not clear from the data submitted what processes are being given to the cloth.

According to the data submitted, the cloth is not being dried before finishing, or else the cloth, saturated with water from the jigger, is being wet-on-wet finished which is not likely. Cloth dyed with Sulfur (Kenes) Olive is given three passes through the impregnales foulard and the drum dryer, which would allow no width control. We cannot believe that these data are correct. Cloth after jig dyeing is usually given an extra-heavy squeeze (Roberto or Kuster foulard) to remove the greatest amount of water and thus leaving the minimum amount of moisture in the cloth before drying.

3.2.7 General Comments

The production of cloth at CSILLAGHEGY, including including and dyeing, is carried out on jiggers.

This is a most uneconomical method of preparing cotton and linen fabrics. The cloth should be prepared for dyeing on a modern open-width boil-off and bleaching machine so that the cloth arrives at the dye foulard or jiggers ready for dyeing.

A modern preparation machine could prepare the 5.000.000 metres/year in one shift.

Production/year: 6.432 hrs./year x 60 min./hr, x 60 m/min. =

23.155.200 m/year.

This would reduce the jig hours required per year by at least:

50%.

The fact that CSILLAGHEGY is producing 5.000.000 metres per year on partly obsclescent machinery, utilising 15 jiggers with 38 people indicates that CSILLAGHEGY is, in spite of the poor working conditions, a comparatively efficient plant.

10116

VOLUME IV OF VI

KOMAROM

U.N.I.D.O.

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME IV OF VI

K O M A R O M

4.1 Spinning

4.2 Weaving

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL
Brussels - New York

1977

TABLE OF CONTENTS

		Page
4.0	KOMAROM	1.
4.1	Spinning	1.
4.1.1	Location	1.
4.1.2	Buildings and Lay-out	1.
4.1.3	Process Flow and Material Handling	1.
4.1.4	Machine Obsolescence	2.
4.1.5	Machine Improvements	2.
4.1.6	Summary of Mill Balances	4.
4.1.6.1	Wet Spinning - Mill Balance	4.
4.1.6.2	Dry Spinning - Mill Balance	5.
4.1.6.3	Wet and Dry Spinning Summary Mill Balance	6.
4.1.7	Summary of Labour Complement	7.
4.1.8	Notes and Explanations Relating to the Summary of the Mill Balance and Labour Complement	9.
4.1.8.1	General	9.
4.1.8.2	Spindle RPM	9.
4.1.8.3	Spinning Room Efficiency	9.
4.1.8.4	Production	10.
4.1.8.5	Spindle Allocation and End-Breaks	11.

TABLES

I	Wet Spinning - Mill Balance	4.
II	Dry Spinning - Mill Balance	5.
III	Wet and Dry Spinning KOMAROM - Mill Balances	6.
IV	Summary of Labour Complement	7.
V	Production	10.

TABLE OF CONTENTS

		Page
4.0	KOMAROM	14.
4.2	Weaving	14.
4.2.1	Location	14.
4.2.2	Buildings and Lay-out	14.
4.2.3	Process Flow and Material Handling	14.
4.2.4	Machine Obsolescence	15.
4.2.5	Machine Improvements	15.
4.2.6	Machine Park 1975-1977	15.
4.2.7	Summary of Mill Balance	16.
4.2.8.	Summary of Labour Complement	18.
4.2.9	Notes and Explanations Related to the Summary of the Mill Balance and Labour Complement	19.
4.2.9.1	General	19.
4.2.9.2	Number of Looms	19.
4.2.9.3	Efficiencies	19.
4.2.9.4	KOMAROM Weave-Room Efficiency	21.
4.2.9.5	Operator Efficiency	22.
4.2.9.6	Plant Efficiency	22.
4.2.9.7	Production	23.
4.2.9.8	WERNER Proposal 2	23.
4.2.9.9	Loom Assignments	23.
4.2.9.10	Estimation of Number of Looms per Weaver	24.
4.2.9.11	Summary of Yarn Consumption	25.

TABLES

I	Machine Park 1975-1977	15.
II	Summary of Mill Balance	16.
III	Summary of Labour Complement	18.
IV	Summary of Yarn Consumption	25.

TABLE OF CONTENTS

APPENDIX

Spinning

Form S-100	Yield	
Form S-101	Spinning,	Machine Specification
Form S-102	Spinning,	Production Data, Comparison
Form S-104	Roving,	Machine Specification
Form S-105	Roving,	Production Data, Comparison
Form S-106	Drawing,	Machine Specification
Form S-107	Drawing,	Production Data, Comparison
Form S-109	Combing,	Production Data, Comparison

Weaving

Form W-100	Weaving,	Machine Specification
Form W-101	Weaving,	Cloth Specification, Quantities
Form W-102	Weaving,	Running Data, Productivity
Form W-103	Weaving,	Production Calculations, Comparison
Form W-106	Warp Preparation,	Machine Specification
Form W-107	Warp Preparation,	Production Data, Comparison
Form W-108	Winding, Quilling,	Specifications, Productivity
Form W-109	Winding, Quilling,	Production Data, Comparison

4.1 SPINNING

4.0 KOMAROM

4.1 Spinning

4.1.1 Location

The spinning mill KOMAROM is located in an exceptionally good area in regard to labour availability.

4.1.2 Buildings and Lay-out

Buildings are suitable for their task and sufficiently spacious for the operation involved. Machine positioning is good and material flow logical.

Room climate: for the dry spinning operation we would recommend air-conditioning on a mid-term basis.

4.1.3 Process Flow and Material Handling

Although the general material flow is logical, the material handling can be improved greatly through:

- Modernising the material transport system. This can be done in a relatively simple and inexpensive way by designing proper:
  - . trucks,
  - . doffing trucks,
  - . yarn carriers.
- Mobilising (in conjunction with the transport system) intermediate stocks. There is no necessity for double handling and precision stacking of bobbins as is done currently.
- Avoiding, where possible, all lifting of heavy objects by female labour (example: doff trays in wet spinning).

4.1.4 Machine Obsolescence

The equipment in spinning preparation is partly outdated and should gradually be replaced by modern machinery. In wet and dry spinning the machine park is acceptable and with a properly installed preventive maintenance system can fulfil the present needs.

4.1.5 Machine Improvements

On two different visits we noticed that the machine maintenance program was not being carried out correctly.

- In preparation
  - poor combs,
  - nicked teeth,
  - teeth missing,
  - nicked flyer arms.
- In spinning
  - boards around guide bars,
  - deep roller cuts,
  - worn out rollers,
  - blocked travellers,
  - suction devices out of place (dry spinning).

One of the reasons for the high end-break rate lies in the bad condition of the rollers. This condition not only incurs a higher labour force than necessary but also produces bad yarn quality which causes a high breakage rate throughout all the following process stages, which in turn incurs an even higher labour force.

It is our opinion that for replacement material
of rollers, only first class and suitable material should be
used and then properly maintained while in use.

The present condition of the rollers is not up to the standards
required.

4.1.6 Summary of Mill Balances

4 1.6.1 Wet Spinning - Mill Balance

Table I

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of working days/year	268	268	268
Working hours/day	24	24	24
No. of spinning frames	32	32	32
No. of spindles	7304	7304	7304
Spindle hours/year available	46.979.328	46.979.328	46.979.328
Machine: Spindle RPM max.	6585	6585	6585
Ø speed		3890	4300
Plant Eff. %	81	73.2	84
Product mix: Linen %	48	48	48
Linen/synth. %	27	27	27
Tow %	25	25	25
Nm Ø	12.26	12.26	12.26
Hi-10	21-6	21-6	21-6
T/M	351	351	351
αm	100	100	100
Production: tons/year	2064	1866	2366
comparison %	100	90	115
Ø cops weight in gr	159	159	159
Ø bobbin weight in gr	1320	1320	1320
Cops to doff/8 hours	-	14.600	18.508
Bobbin to creel/8 hours	-	1.760	2.229
End breaks/ M spindles/hour	-	682	300
Ø spindles/operator	-	166	600

4.1.6.2 Dry Spinning - Mill Balance

Table II

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames	3	3	3
No. of spindles	300	300	300
Spindle hours/year available	1.929.600	1.929.600	1.929.600
Machine: Spindle RPM max.	3000	3000	3000
Ø speed	2450	2450	2600
Plant efficiency	74	64	78
Product mix: Tow %	100	100	100
Nm Ø	2.75	2.75	2.75
hi-lo Nm	6-1.75	6-1.75	6 1.75
T/M	174	174	174
α m	105	105	105
Production: tons/year	440	382	490
comparison %	100	87	111
Ø cops weight in gr	-	203	203
Ø input weight in gr	-	2981	2981
Cops to doff/8 hours	-	2.340	3000
Input changes/8 hours	-	159	204
End-breaks/M spindles/hour	-	1142	400
Ø spindles/spinner	-	100	200

4.1.6.3 Wet and Dry Spinning KOMAROM - Mill Balance

Table III

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames	35	35	35
No. of spindles	7604	7604	7604
Spindle hours/year available	48.910	48.910	48.910
Expected gr/spindle hour	-	-	-
Average Nm	10.7	10.6	10.6
Production: tons/year	2504	2248	2856
comparison %	100	90	114
Labour complement persons	602	602	444
Productivity: kg/work. hour	1.94	1.74	3.00
comparison %	100	90	155
" %	-	100	172

4.1.7 Summary of Labour Complement

Table IV

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

		Actual 1975				WERNER Proposal 1			
		Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.
Preparation	Hackling	3	29	13	45	3	29	13	45
	Carding	-	10	9	19	-	10	9	19
Prep. Linen	Foremen	5	-	-	5	4	-	-	4
	- Helper	-	-	4	4	-	-	-	-
	Mechanic	-	-	3	3	-	-	3	3
	Mat. preparation	-	-	3	3	-	-	3	3
	Transport	-	-	7	7	-	-	7	7
	Cleaning	-	-	4	4	-	-	4	4
	Yarn Rov. Transp.	-	-	6	6	-	-	6	6
	Drawing	-	15	-	15	-	15	-	15
	Doubling	-	6	-	6	-	6	-	6
	Roving	-	19	-	19	-	21	-	21
	Dir. spinner/var.	-	8	-	8	-	8	-	8
		5	48	27	80	4	50	23	77
Prep. Tow	Foremen	5	-	-	5	3	-	-	3
	- Helper	-	-	3	3	-	-	-	-
	Transport	-	-	6	6	-	-	6	6
	Mechanic	-	-	3	3	-	-	3	3
	Combing	-	2	-	2	-	3	-	3
	Drawing	-	17	-	17	-	17	-	17
	Dir. spinner	-	5	-	5	-	-	-	-
		5	24	12	41	3	20	9	32
Spinning									
Wet	Foremen	6	-	-	6	4	-	-	4
	- Helper	-	-	7	7	-	-	-	-
	Mechanic	-	-	5	5	-	-	5	5
	End-break check	-	-	2	2	-	-	3	3
	Oiler	-	-	3	3	-	-	2	2
	Waste collection	-	-	3	3	-	-	3	3
	Mach. cleaning	-	-	6	6	-	-	8	8
	Rove transport	-	-	6	6	-	-	7	7
	Cops transport	-	-	8	8	-	-	9	9
	Creeler	-	-	8	8	-	-	10	10
	Doffer	-	-	36	36	-	-	12	12
	Team leader	-	-	12	12	-	-	6	6
	Spinner	-	126	-	126	-	42	-	42
	- Reserve	-	-	-	-	-	-	8	8
		6	126	96	228	4	70	45	119
Dry	Spinner + Reserve	-	9	-	9	-	9	-	9

		Actual 1975				WERNER Proposal 1			
		Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.
Winding		5	-	-	5	3	-	-	3
	Mechanic	-	-	-	-	-	-	-	-
	Winder	-	57	-	57	-	40	-	40
	- Reserve	-	-	-	-	-	6	-	6
	Quality control	-	-	-	-	-	-	-	-
	Packing	-	-	-	-	-	-	-	-
	Cleaning	-	-	-	-	-	-	-	-
	Transport	-	-	-	-	-	-	-	-
		5	57	23	85	3	46	18	67
Bleaching	Foremen	1	-	-	1	1	-	-	1
	Operators	-	5	-	5	-	5	-	5
		1	5	-	6	1	5	-	6
Various		-	-	44	44	-	-	30	30
	Spinning	25	308	224	557	18	239	147	404
Twisting	Foremen	4	-	-	4	4	-	-	4
	Cotton-Twister		15		15				
	-Indirect			1	1				
	Line - Twister		10		10				
	- Indirect			15	15				
		4	25	16	45	4	22	14	40
		29	333	240	602	22	261	161	444

Since Werner's opinion, on what is direct or indirect, which indirect personnel belongs to which department, might differ from the actual labour complement, not too much weight should be placed on a departmental comparison, but rather on the total complement.

4.1.8 Notes and explanations relating to the summary of the mill balance and labour complement.

4.1.8.1 General

Basis for all calculations was the given data which was assumed to be correct. In calculating a mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average. Therefore, the possibility of having taken some incorrect figures from the submitted data has been greatly reduced.

4.1.8.2 Spindle RPM

As shown in the summary, the maximum spindle speed is not utilised.

Based on our experience in flax and linen spinning, the average spindle speeds were increased from 2450 to 2600 RPM in dry spinning, and from 3890 to 4300 RPM in wet spinning.

4.1.8.3 Spinning Room Efficiency

Following are efficiency comparisons:

- LENFONO plan 1975 : 81 %
- Actual 1975 : 73.2%
- WERNER proposal : 84 %

The low actual 1975 efficiency is mostly due to labour shortage.

Our action plan to improve the efficiency is as follows:

- New up-to-date bonus system
- Standard working procedures
- Operator training program
- Improving running condition of material
- Rigid maintenance program for the spinning frames
- Correct job distribution.

4.1.8.4 Production

Comparison based on LENFONO plan 1975, actually achieved 1975 and WERNER proposal 1.

Table V

Wet Spinning	Plan	=	100%	=	2.064 tons
	Actual 1975	=	90%	=	1.866 tons, Nm 12.26
	WERNER 1	=	115%	=	2.366 tons, Nm 12.26
Dry Spinning	Plan	=	100%	=	440 tons
	Actual 1975	=	87%	=	382 tons, Nm 2.75
	WERNER	=	111%	=	490 tons, Nm 2.75
Summary	Plan	=	100%	=	2.504 tons, Nm 10.7
	Actual 1975	=	90%	=	2.248 tons, Nm 10.6
	WERNER	=	114%	=	2.856 tons, Nm 10.6

Comparing these figures, one sees a realistic plan made by the LENFONO management, on which we can, nevertheless, improve by:

14%

and by average 24% compared with the actual 1975 level.

The comparisons show that both the LENFONO plan and WERNER standards are 14% and 24% respectively higher than the actual 1975 level.

4.1.8.5 Spindle Allocation and End-Breaks

Running conditions of the material, expressed in end-breaks per M spindle hours, is extremely bad.

An end-break rate of:

- 682 per M spindle hour for wet spinning
- 1142 per M spindle hour for dry spinning

exceeds any conditions which could be regarded as "normal".

Obviously, running a spinning room under these conditions, requires a high labour input, and it also decreases the running conditions in all subsequent process stages.

The following table shows the standards as they are maintained in the Western countries:

- Wet Spinning

Expected end-breaks/M spindle hours.

	Normal Mill	Very Good Mill	Bad Mill
Unbleached Flax:			
- carded tow	20 x Nm	10 x Nm	40 x Nm
- long fibres	5 x Nm		
Prebleached Flax:			
- carded tow	4 x Nm		10 x Nm
- long fibres	3 x Nm		5 x Nm

- Dry Spinning

	Normal Mill	Very Good Mill	Bad Mill
- Grey flax	35 x Nm	15 x Nm	50 x Nm

- WERNER proposes an an intermediate step to achieve the following results:

  - Wet spinning 25 x Nm
  - Dry spinning 50 x Nm

These results are conservatively estimated and can be achieved by the following course of action through the program outlined:

- Setting an optimum overall fibre yield in respect to raw flax. LENFONO achieves a yield of:

  - ca. 10% long fibre
  - ca. 17% short fibre

  ca. 27% Total

  which, in our opinion, is too high for quality yarn and optimal running conditions.

- Setting an optimum rejection rate at the threshing process in respect to high yield and good running conditions/good quality yarn.

- Setting, controlling and maintaining standard quality procedures in all preparatory stages.

- Rigid maintenance control on all equipment (standard routines, sequences, responsibilities, follow-up procedures).

Spindle Allocation

WERNER estimated an average of 600 spindles/spinner.(Wet spinning) and an average of 200 spindles/spinner for dry spinning.
This implies:

- Correct job diversification.
- Applied job responsibilities.
- Correct and standard working methods.
- Training program (also to lessen the impact of high labour fluctuation).
- Retraining of all skilled operators.
- Correct bonus systems, based on effective individual performance (part of the large savings potential could be passed on to the labour force to off-set the higher wage rates in neighbouring industry).
- All machines in good working conditions (application of a tight controlled preventive maintenance system).
- Correct auxiliary equipment to make the most use of handling procedures.
- Bringing all processing stages and raw material input to the optimum, in order to achieve the above mentioned end-break rate to an average of:

  - wet spinning : 20 x Nm
  - dry spinning : 40 x Nm

  expressed in EDPMSPH.

APPENDIX

SPINNING

PLANT / WERK: KOMARON	YIELD	WERNER	FORM-No S-100

Wet spun Line

PROCESS		Waste per process input of 100 kg			Price /kg	Yield of 100 kg yarn			
		Total	reuse	Sale		%	reuse %	Input kg	Output kg
1	2	3	4	5	6	7	8	9	10
Spreading		1.8	0.6			98.20	0.60	122.06	119.84
Doubling		1.5	0.5			96.71	0.49	119.84	118.05
A-Drawing		1.0	0.3			95.74	0.29	118.05	116.87
B-Drawing		1.0	0.3			94.78	0.29	116.87	115.70
C-Drawing		1.0	0.2			93.80	0.19	115.70	114.50
D-Drawing		1.0	0.2			92.90	0.18	114.50	113.40
Roving		2.2				90.86		113.40	110.91
Spinning		8.0		6.0	3.20	83.69		110.91	102.40
Winding		2.0		1.7	3.20	81.93		102.40	100.00

RAW MATERIAL INPUT (Input minus reusable waste) = 119.60 kg

YIELD = 83.6 %

PLANT WERK KONAROM	YIELD	WERNER	FORM-No S-100

wet spun tow

PROCESS		Waste per process input of 100 kg			Price /kg	Yield of 100 kg			
		Total	reusabl	Sale		%	reusable %	Input kg	Output kg
1	2	3	4	5	6	7	8	9	10
Carding		9.5	2.0	3.0	4.72	90.5	2.02	136.56	123.61
Combing		3.5	1.0			87.35	0.91	123.61	119.29
Doubling		1.0	0.2			86.47	0.17	119.29	118.09
A-Drawing		1.0	0.2			85.61	0.17	118.09	116.91
B-Drawing		1.0	0.2			84.75	0.17	116.91	115.74
C-Drawing		1.0	0.2			83.89	o.17	115.74	114.57
Roving		2.2	1.1			82.06	0.92	114.57	112.06
Spinning		8.0		6.0	3.20	75.49		112.06	103.10
Winding		3.0		1.7	3.20	73.23		103.10	100.00

RAW MATERIAL INPUT (Input minus reusable waste) ≈ 130.38 kg

Yield 76.7 %

PLANT WERK KOMAROM	YIELD	WERNER	FORM-No S-100

dry spun tow

	PROCESS		Waste per process input of 100 kg			Price /kg	Yield of 100 kg yarn			
			Total	reuse	Sale		%	reusable %	Input kg	Output kg
	1	2	3	4	5	6	7	8	9	10
1	Breaker Card		10.6	3.45			89.40	3.45	152.93	136.73
2										
3	Carding		16.5	5.0			74.66	4.47	136.73	114.17
4										
5	Doubling		1.0	0.3			73.91	0.22	114.17	113.03
6										
7	A-Drawing		1.0	0.2			73.17	0.15	113.03	111.90
8										
9	B-Drwaing		1.0	0.2			72.44	0.15	111.90	110.78
10										
1	C-Drawing		1.0	0.2			71.71	0.14	110.78	109.67
2										
3	Spinning		6.0				67.41		109.67	103.09
4										
5	Twisting		3.0		1.6	3.20	65.39		103.09	100.00
6										
7										
8										
9										
20										
1										
2										
3										
4										
5										
6										
7										
8										
9										
30										
1										
2										
3										
4										
5										
6										

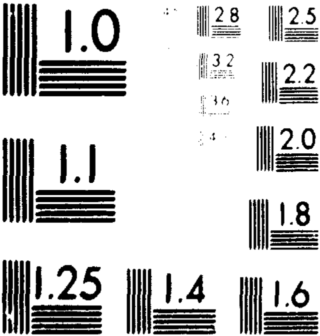
RAW MATERIAL INPUT (Input minus reusable waste) = 139.78 kg | YIELD = 71.5 %

PLANT WERK → KOMARON	SPINNING MACHINE SPECIFICATION	WERNER	FORM-No S-101

1	PLANT KOOP					
2	MACHINE MAKE	PM - 88 - L3	PM - 88 - L1	PM - 114 - L1	0.800	0.[illegible].1
3	YEAR	1963 - 71	1958	1971	1960/61	1962
4	PROCESS	wet	wet	wet	wet	wet
5	No of MACHINES	13	4	3	4	8
6	SPINDLES / MACHINE	240	236	184	192	240
7	TOTAL No of SPINDLES	3120	944	552	768	1920
8						
9						
10	DOFFING SYSTEM	manual	manual	manual	manual	manual
1	TRAVELLING BLOWER	no	no	no	no	no
2	SPEED REGULATION	no	no	no	no	no
3	AUT.ENDSTOP cops filled	no	no	no	no	no
4	INPUT TYPE	bobbin	bobbin	bobbin	bobbin	bobbin
5	CREEL SYSTEM					
6	SPINDLE DRIVE	spi tape	spi tape	spi tape	spi tape	spi tape
7	SUCTION end breaks	no	no	no	no	no
8						
9						
20						
1	Max. SPINDLE RPM	6550	6500	6300	6000	7000
2	GAUGE mm	88	88	114	118	94.4
3	RING - DIAMETER mm	62	62	76	75	65
4	TUBE LENGTH mm	237	205	264	230	237
5	LIFT mm	210	180	230	210	210
6	CHASE mm	55	50	65	55	55
7	Ø FRONT ROLLER mm	38	38	44.5	50	50
8						
9	DRAFT ELEMENT Make				Zworykin	Zworykin
30	DRAFT ELEMENT Type	3-roller	3-roller	2-roller	2-roller	2-roller
1						
2						
3						
4						
5	POWER NEED kW	14	10	14	12	12
6	NOISE LEVEL					

PLANT WERK		WERNER	FORM-No
K O H A R O N	S P I N N I N G MACHINE SPECIFICATION		S-101

1	PLANT KOOP					
2	MACHINE MAKE	Mackie	Mackie			
3	YEAR	1938	1930			
4	PROCESS	dry	dry			
5	No of MACHINES	1	2			
6	SPINDLES / MACHINE	100	100			
7	TOTAL No of SPINDLES	100	200			
8						
9						
10	DOFFING SYSTEM	manual	manual			
1	TRAVELLING BLOWER	no	no			
2	SPEED REGULATION	no	no			
3	AUT.ENDSTOP cops full	no	no			
4	INPUT TYPE	can	bobbin			
5	CREEL SYSTEM					
6	SPINDLE DRIVE	spi tape	spi tape			
7	SUCTION end breaks	no	no			
8						
9						
20						
1	MAX. SPINDLE RPM	3000	3000			
2	GAUGE mm	108	108			
3	RING DIAMETER mm	./.	./.			
4	TUBE LENGTH mm	140	140			
5	LIFT mm	140	140			
6	CHASE mm	./.	./.			
7	Ø FRONT ROLLER mm	60	60			
8						
9	DRAFT ELEMENT Make					
30	DRAFT ELEMENT Type	3-roller	3-roller			
1						
2						
3						
4						
5	POWER NEED kW	13	13			
6	NOISE LEVEL dB					



MICROCOPY RESOLUTION TEST CHART

PLANT / WERK: KOMAROM

SPINNING PRODUCTION DATA ; COMPARISON

WERNER — FORM-No S-102

PLANT KOOP	MACHINE MAKE	Type of spi-process	QUALITY Name	QUALITY Mix	QUALITY Nm	Nm rove	Draft	alpha metric	Turns/Meter	SPEED RPM fr.r.	SPEED RPM Spi	SPEED DEL. m/min	DELIVERY gr/Sph 100%	DELIVERY eff %	DELIVERY gr/Sph exp	INDUSTRIAL ENGINEERING DATA Input gr	INDUSTRIAL ENGINEERING DATA Cups gr	INDUSTRIAL ENGINEERING DATA EOP NSPH	INDUSTRIAL ENGINEERING DATA Spi/Spinner	PROD. acc.to act.eff. 1975 No of M/C	PROD. acc.to act.eff. 1975 No.of Spi	PROD. acc.to act.eff. 1975 Sp-hrs yrx10³	PROD. acc.to act.eff. 1975 tons year	ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION No of M/C	WERNER - PRODUCTION Sp-hrs yrx10³	WERNER - PRODUCTION tons year	COMP: Prod.acc.to act. efficiency =100 ACT	COMP: PLAN	COMP: WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	PN-88-	wet	Lino		12	1.1	10.9	99	345		4310	12.5	62.5	81	50.6	1800	140	625	240	13	15.6	100.3	5.1								
	L3		"		15	1.1	13.6	98	384		4610	12	48		38.9	1800	140	635	240		1442	9274.5	160.8								
			"	V 6 %	15	1.4	10.7	100	390		4800	12.5	50		40.5	600	140	635	240		501	3222.4	130.5								
			"	PE 15 %	15	1.4	10.7	100	390		4900	12.5	50		40.5	600	140	635	240		303.5	1952.1	78								
			"	V 6 %	18	1.4	12.9	100	426		4860	11.4	38		30.8	600	140	724	240		658	4232.2	130.4								
			"	V 16 %	18	1.4	12.9	100	426		4940	11.6	38.7		31.3	600	140	724	240		34.6	222.5	7								
			Lencērna		12	1.1	10.9	109	380		4860	12.8	64		51.8	1800	140	753	240		65.6	421.9	21.9								
			"		15	1.4	10.7	109	424		5000	11.8	47.2		33.2	1200	140	416	240		24.9	160.2	6.1								
			"		18	1.4	12.9	101	430		4860	11.3	37.7		30.5	600	140	532	240		71.7	461.2	14.1								
			"		21	1.4	15	98	450		4820	10.7	30.6		21.8	1200	140	566	240		3.1	19.9	0.5								
	PN-89-		Lino	V 16 %	15	1.4	10.7	100	390		4290	11	44		35.6	1200	90	647	118	4	455	2926.6	104.2								
	L1		"		18	1.4	12.9	98	420		4540	10.8	36		29.2	1200	90	699	118		450	2894.4	84.5								
			"	PE 16 %	18	1.4	12.9	100	426		4650	11	36.7		29.7	1200	90	699	118		39	250.8	7.5								
	PN-114-		"		8	1.1	7.3	98	260		3220	11.5	85.3		69.9	1800	250	879	184	3	3.3	21.2	1.5								
	L1		"		8.5	1.1	7.7	99	290		3480	12	84.7		68.6	1800	250	635	184		69	443.8	30.4								
			"		10	1.1	9.1	102	324		3730	11.5	69.		55.9	1800	250	676	184		128	823.3	46								
			Lencērna		8.5	1.1	7.7	110	322		4030	12.5	88.2		71.4	1600	250	662	184		3.9	25.1	1.8								
			"		10	1.1	9.1	108	342		4100	12	72		58.3	1800	250	770	184		125.8	809.1	47.2								
			"		12	1.1	10.9	109	380		4370	11.5	57.5		46.6	1800	250	811	184		13.8	88.8	4.1								
			Tow		8.5	1.4	6.1	102	300		3750	12.5	88.2		71.4	1600	250	809	184		6.1	39.2	2.8								
			"		10	1.4	7.1	104	330		3800	11.5	69		55.9	1600	250	811	184		202.1	1299.9	72.7								
	0.803		Lino		6	1.1	5.5	100	246		2830	11.5	115		93.2	1800	200	1014	96	4	100.7	666.3	64								
			"		6 Sp	1.1	[illegible]	100	246		2830	11.5	115		93.2	1800	200	609	96		150.5	968	90.2								
			"		10	1.1	9.1	102	324		3500	10.8	64.8		52.5	1800	200	699	96		47.6	306.2	16.1								
			Lencērna		10	1.1	9.1	108	342		3600	10.7	64.2		52	1800	200	629	96		22.3	143.4	7.5								
			Tow		6	1.4	4.3	104	255		2670	11.2	112.		90.7	1600	200	856	96		147.4	948.1	86								
			"		10	1.4	7.1	104	330		3370	10.2	61.2		49.6	1600	200	780	96		293.5	1887.8	93.6								
			Lino		6 Sp	1.1	5.5	100	246		2850	11.6	116		93.9	1800	150	682	120	8	34.6	272.5	20.9								
			"		8.5	1.1	7.7	93	250		3420	11.8	83.3		67.5	1800	150	971	120		23	147.9	10								
			"		10	1.1	9.1	102	324		3180	9.8	58.8		47.6	1800	150	749	120		445.4	2854.8	136.4								
			"	V 16 %	12	1.1	10.9	101	350		3290	9.4	47		38.1	1800	150	649	120		203.5	1308.9	49.9								
			"	PAN 12%	15	1.4	10.7	100	390		3510	9	36		29.2	600	150	471	120		268.9	1729.6	50.5								
			Lencērna		10	1.1	9.1	108	342		3520	10.3	61.8		50.1	1800	150	909	120		59.5	320.7	19.2								
			"		12	1.1	10.9	109	380		3420	9	45		36.5	1600	150	582	120		11.5	73.9	2.7								
			Tow		10	1.4	7.1	104	330		3140	9.5	57		46.2	550	150	570	120		873.6	5618.9	259.6								
TOTAL					12.26				351.5		3796							682	166	32	7304	46978.8	2064	1866	1898				90.4	91.9	

PLANT WORK: K O n A R O N	SPINNING PRODUCTION DATA ; COMPARISON	WERNER	FORM-N S-102

PLANT KOOP	MACHINE MAKE	Type of Spl-process	QUALITY			Nm rove	Draft	alpha metric	Turns/Meter	SPEED			DELIVERY			INDUSTRIAL ENGINEERING DATA				PROD.acc.to act.eff. 1975				ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER-PRODUCTION			COMP: Prod.acc.to act efficiency = 10		
			Name	Mix	Nm					RPM fr.r.	RPM Spl	DEL. m/min	gr/Sph 100 %	eff %	gr/Sph exp	Input gr	Cops gr	EQP NSPH	Spl/Spin	No.of M/C	No of Spl	Sp-hrs yrx10^3	tons year			No of Spl	Spl-hrs yr x10^3	tons year	ACT	PLAN	WERNE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Caver	dry	Tow		1,75	-	4.7	100	133		2210	16.6	569.1	53	300.5	-	220	1654	100	1	100	643.2	193.3								
					3.5	0.85	4.1	110	205		2570	12.5	214.2	91	194.1	1400	190	588	100	2	180.8	1162.9	225.7								
					5	0.85	5.9	105	246		2580	10.5	126	91	114.2	1400	190	494	100		9.6	63	7.2								
					3	0.85	3.5	110	191		2600	13.6	272	91	246.4	1400	190	560	100		8.6	55.3	13.6								
					6	1.4	4.3	102	250		2600	10.4	105	91	94.2	1600	190	489	100		.6	3.9	.4								
			Flax		5.5	1.4	3.9	105	250		2500	10.4	113.5	91	102.8	1600	190	489	100		.2	1.3	.1								
TOTAL					2.75				173.8		2414							1142		3	300	1929.6	440	382	385				86.8	87.5	
[illegible] TOTAL																				35	7604		2504	2248	2283				89.7	91.1	

PLANT WORKS KOMAROM

TWISTING PRODUCTION DATA, COMPARISON

WERNER — FORM-No 5-103

PLANT MOOP	Prod. Type	Machine Make	Year	QUALITIES: Name	QUALITIES: Mix	QUALITIES: Nm	QUALITIES: T/m	SPEED: RPM Spl	SPEED: Del. m/min	DELIVERY: gr/Sph 100 %	DELIVERY: eff %	DELIVERY: Contr %	DELIVERY: gr/Sph exp	IND. ENGINEERING DATA: Input gr	IND. ENGINEERING DATA: Output gr	IND. ENGINEERING DATA: EOP KSPH	IND. ENGINEERING DATA: Spl/Operat.	PRODUCTION acc. to act. eff.: No of M/C	PRODUCTION acc. to act. eff.: No of Spl	PRODUCTION acc. to act. eff.: Splhr/year	PRODUCTION acc. to act. eff.: tons year	ACT. PROD 1975	PLAN PROD 1975	WERNER - PRODUCTION: No of Spl	WERNER - PRODUCTION: Spl-hrs/year	WERNER - PRODUCTION: tons year	COMP: Prod. act. eff. = 100: ACT	COMP: Prod. act. eff. = 100: PLAN	COMP: Prod. act. eff. = 100: WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Ring	Textima	1965		Cotton	20/2	400	6500	16,25	97,5	90		87,8	1200	200	49,7						168,9							
						27/2	450	6500	14,14	64,2	90		57,8	1200	200	128,3						28,0							
																	312	2	624			196,9							
		Textima	1953		Cotton	40/2	550	7100	12,90	38,7	90		34,8	1200	200	31,0						24,7							
						50/2	610	7100	11,63	27,9	90		25,1	1200	200	17,0						91,4							
						34/2	500	7100	14,20	50,1	50		45,1	1200	200	30,6						50,1							
																	360	2	720			166,2							
		TOTAL				15,7			13,88	53,0	90		47,7	1200	200	48,1		4	1344	9644,6	412,3	363,1	446				88	108	

PLANT WERK KOMAROM		ROVING MACHINE SPECIFICATION		WERNER	FORM-No S-104	
1	PROCESS	Line	Line	Line	Tow	Tow
2	MACHINE MAKE	Bolelli	Tekmas	Mackie	Tekmas	Mackie
3	YEAR	1975	1963	1910	1963	1930
4	No of MACHINES	1	2	1	2	1
5	SPINDLES / MACH.	80	80	80	80	80
6	TOTAL SPINDLES	80	160	80	160	80
7						
8						
9						
10	BOBBIN SIZE					
1	FLYER TYPE					
2	FLYER SIZE mm	360/170	390/182	295/127	390/182	295/127
3	MAX.FLYER RPM	770	1000	680	1000	680
4	GAUGE mm	220	304.8	150	304.8	150
5	LIFT mm	254	304.8	203.2	304.8	203.2
6						
7						
8						
9	DRAFT Make					
20	DRAFT Type					
1	Ø FR.ROLLER mm	44.5	50	48	50	40
2	SUCTION endbreak	no	no	no	no	no
3						
4						
5	STOP MOTION back	yes	yes	yes	yes	yes
6	STOP MOTION front	no	no	no	no	no
7						
8						
9						
30	POWER NEED kW					
1	NOISE LEVEL dB					
2						
3						
4						
5						
6						

PLANT K O M A R O N | R O V I N G PRODUCTION DATA, COMPARISON | WERNER | FORM-Nr S-105

[illegible]	M/C MAKE	QUALITY Name	Mix	Nm	Nm Input	Draft	alpha metr.	Turns/Meter	SPEED RPM fr.r.	RPM Flyer	Del. m/min	DELIVERY gr/Sph 100 %	eff %	gr/Sph exp	IND.ENGINEERING DATA Input Weight kg	Bobbin Weight kg	EOP CSPH	Spl/Operator	PROD. acc.to act.eff. No of M/C	No of Spl	Spl-hrs year	tons year	ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION No of Spl	Spl-hrs year	tons year	COMP: Prod.act.eff=100 ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Relelli		Line	1.6	.167	9.5	.20	26		750	28.0	1080	77	832	8	1.100		80	1	80										
	Tekmas		Line	1.1	.110	10	.24	25		740	29.6	1614	75	1211	8	1.800	18	80	1	80	514.6	623.1	654	654						
	Tekmas			1.4	.128	11	.24	29		700	28.1	1204	77	927	8	1.200	7	80	1	80	343.7	318.7	257	257						
	"			1.1	.118	9.3	.24	25		790	31.7	1729	75	1297	8	1.800	18	80			170.9	221.6	207.5	208						
	Mackie			1.4	.167	8.3	.24	28		570	20.4	874	75	656	8	.600	6	80	1	80	514.6	337.4	328.2	433						
																			3	240		1500.8	1.446.7	1.552						
	Mackie		Tow	1.4	.204	6.9	.36	43		660	15.3	656	75	492	5	.533	6	80	1	80	514.6	253.1	453	503						
	Tekmas			1.4	.204	6.9	.36	43		900	21.0	900	75	675	5	1.600	6	80	1	80	514.6	347.4								
	Tekmas			.86	.143	6.0	.43	40		930	23.2	1619	75	1214	5	1.400	30	80	1	80	514.6	624.7	206.4	181						
																			3	240		1225.2	659.4	684						

PLANT WERK KOMARON	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	PLANT KOOP	Line				
2	DRAWING PASSAGE				1	
3	MACHINE MAKE	Walker	Mackie	Tekmas	Tekmas	
4	YEAR	1908	1910	1959	1963	
5	No of MACHINES	1	1	1	4	
6	HEADS / MACHINE	1	1	1	2	
7	TOTAL HEADS	1	1	1	8	
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	4	4	4	6	
4	Ø DELIVERY ROLL top	127	101	80	76	
5	Ø DELIVERY ROLL bottom					
6	Max RPM DEL.ROLL	4.5	6.3	6.4	13	
7	Max.DEL.SPEED m/min	36	40	41.5	55	
8						
9						
20						
1						
2	CAN SIZE INPUT				500/900	
3	CAN SIZE OUTPUT	500/900	500/900	500/900	500/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION	no	no	no		
6						
7						
8						
9	POWER NEED kW	2	2	1.7	4.5	
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK KONAROM	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

12

1	PLANT KOOP	1. Line				
2	DRAWING PASSAGE	2	3	4	5	
3	MACHINE MAKE	Technotex	Technotex	Technotex	Technotex	
4	YEAR	1966	1966	1966	1966	
5	No of MACHINES	1	1	1	1	
6	HEADS / MACHINE	4	4	4	4	
7	TOTAL HEADS	4	4	4	4	
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	8	8	4	
4	∅ DELIVERY ROLL top	56	56	56	56	
5	∅ DELIVERY ROLL botto:					
6	Max RPM DEL.ROLL	25.4	24.7	24.7	22.3	
7	Max.DEL.SPEED m/min	36.4	38.4	44.6	39.6	
8						
9						
20						
1						
2	CAN SIZE INPUT	500/900	350/900	300/900	300/900	
3	CAN SIZE OUTPUT	350/900	300/900	300/900	300/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION					
6						
7						
8						
9	POWER NEED kW	3.5	3.5	3.5	3.5	
20	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK K O M A R O M	D R A W I N G MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	P L A N T KOOP	II. Line				
2	DRAWING PASSAGE	2	3	4	5	
3	MACHINE MAKE	Technotex	Technotex	Technotex	Technotex	
4	YEAR	1967	1967	1967	1967	
5	No of MACHINES	1	1	1	1	
6	HEADS / MACHINE	4	4	4	4	
7	TOTAL HEADS	4	4	4	8	
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	8	8	4	
4	Ø DELIVERY ROLL top	56	56	56	56	
5	Ø DELIVERY ROLL botto[illegible]					
6	Max RPM DEL.ROLL	26.6	26.6	25.[illegible]	25.7	
7	Max.DEL.SPEED m/min	32.8	36.4	38.9	38.7	
8						
9						
20						
1						
2	CAN SIZE INPUT	500/900	350/900	300/900	300/900	
3	CAN SIZE OUTPUT	350/900	300/900	300/900	300/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION					
6						
7						
8						
9	POWER NEED kW	4	4	4	4	
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK KONARON	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	PLANT KOOP	III. Line				
2	DRAWING PASSAGE	2	3	4	5	
3	MACHINE MAKE	Bolelli	Bolelli	Bolelli	Lawson	
4	YEAR	1967	1967	1975	1914	
5	No of MACHINES	1	1	1	1	
6	HEADS / MACHINE	5	5	5	5	
7	TOTAL HEADS	5	5	5	10	
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	8	8	4	
4	Ø DELIVERY ROLL top	50	50	50	48	
5	Ø DELIVERY ROLL bottom					
6	Max RPM DEL.ROLL	22.6	20	21.5	19	
7	Max.DEL.SPEED m/min	35	35	35	30	
8						
9						
20						
1						
2	CAN SIZE INPUT	500/900	500/900	350/900	350/900	
3	CAN SIZE OUTPUT	500/900	350/900	350/900	300/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION				no	
6						
7						
8						
9	POWER NEED kW	5.5	5.5	5.5	5	
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK 15 KOMARON	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	PLANT KOOP	XI. Tov				
2	DRAWING PASSAGE	1	2	3	4	
3	MACHINE MAKE	Tekmas	Tekmas	Lawson	Lawson	
4	YEAR	1963	1963	1908	1920	
5	No of MACHINES	2	1	1	1	
6	HEADS / MACHINE	1	1	6	4	
7	TOTAL HEADS	1	2	6	16	
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	4	8	2	
4	Ø DELIVERY ROLL top	38	38	38	38	
5	Ø DELIVERY ROLL botto					
6	Max RPM DEL.ROLL	246.5	246.5	46	47.7	
7	Max.DEL.SPEED m/min	105	105	22	23	
8						
9						
20						
1						
2	CAN SIZE INPUT	450/900	400/900	300/900	300/900	
3	CAN SIZE OUTPUT	1100/900	300/900	300/900	300/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION					
6						
7						
8						
9	POWER NEED kW	1.7	1.7	2.2	2.2	
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK 16 K C M A R O M	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	PLANT KOOP	XII. Tov	Dauer			
2	DRAWING PASSAGE	1	2	3	4	
3	MACHINE MAKE	Tekmas	Tekmas	Mackie	Mackie	
4	YEAR	1963	1963	1938	1961	
5	No of MACHINES	1	1	1	1	
6	HEADS / MACHINE	1	1	12	12	
7	TOTAL HEADS					
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	6	2	1	
4	Ø DELIVERY ROLL top	38	38	50	50	
5	Ø DELIVERY ROLL botto					
6	Max RPM DEL.ROLL	246.5	246.5	47.8	87.8	
7	Max.DEL.SPEED m/min					
8						
9						
20						
1						
2	CAN SIZE INPUT	450/900	400/900	400/900	400/900	
3	CAN SIZE OUTPUT	400/900	1100/900	400/900	400/900	
4	AUTOMATIC CAN CHANGER	no	no	no	no	
5	STOP MOTION					
6						
7						
8						
9	POWER NEED kW	1.7	1.7	4.5	4.5	
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK K O M A R O M	D R A W I N G M A C H I N E S P E C I F I C A T I O N S	WERNER	FORM-No S-106

1	P L A N T KOOP	T o v				
2	DRAWING PASSAGE	1	2	3		
3	MACHINE MAKE	Mackie	Mackie	Mackie		
4	YEAR	1930	1930	1930		
5	No of MACHINES	1	1	1		
6	HEADS / MACHINE	3	3	4		
7	TOTAL HEADS	6	6	16		
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	6	6	8		
4	Ø DELIVERY ROLL top	42	42	34		
5	Ø DELIVERY ROLL bottom					
6	Max RPM DEL.ROLL	47	47	58		
7	Max.DEL.SPEED m/min	25	25	25		
8						
9						
20						
1						
2	CAN SIZE INPUT	./.	./.	./.		
3	CAN SIZE OUTPUT	./.	./.	./.		
4	AUTOMATIC CAN CHANGER	no	no	no		
5	STOP MOTION	no	no	no		
6						
7						
8						
9	POWER NEED kW	2.2	2.2	2.2		
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK KOMAROM

DRAWING PRODUCTION DATA , COMPARISON

WERNER FORM-No 5-107

PLANT KOOP	MACHINE MAKE	DRAW. PASS.	QUALITY	PRODUCTION DATA					DELIVERY				IND.ENGINEERING DATA			PRODUCTION acc.act.eff			ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION			COMP: Prod.act.eff=100		
				Heads/ M/C	Doubl.	Input gr/m	Output gr/m	Draft	m/min 100 %	kg/M-hr 100 %	eff %	kg/M-hr exp	Input Can Wt. kg	Output Can Wt. kg	Heads/ Operator	No of M/C	M-hrs/ year	tons year			No of M/C	M-hrs/ year	tons year	ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Line	Welker				4	282	55	20.5	34.3	113.2	80	90.5		24	1	1	6.432	582.1								
	Mackie				4	308	60	20.5	37.8	136.1	80	108.9		24	1	1	6.432	700.4								
	Teknos				4	282	55	20.5	35.8	118.1	80	94.5		24.	1	1	6.432	607.8								
Line	Teknos	1			6	55	26/2	12.6	37.5	117.9	75	88.4	24	16	2	1	6.432	568.6								
		1			6	60	40	9	34.7	166.6	75	124.9	24	24	2	1	6.432	803.3								
		1			6	55	36.7	9	29.6	130.4	75	97.8	24	22	2	1	6.432	629.0								
		1																								
Line I	Technotx	2			6	26.2	19.6	8	24.2	113.8	70	79.7	16	10.5	8	1	6.432	512.6								
		3			8	19.6	17.3	9.1	26.2	108.8	70	76.2	10.5	8		1	6.432	490.1								
		4			8	17.3	14.4	9.6	31	107.1	70	75	8	8		1	6.432	482.4								
		5			4	14.4	6	9.6	33	95	70	65.5	8	8	12	1	6.432	427.7								
Line II	Technotex	2			6	40	24.6	9.8	29	171.2	70	119.9	24	10.5	8	1	6.432	771.2								
		3			8	24.6	20.5	9.6	32.4	159.4	70	111.6	10.5	8		1	6.432	717.8								
		4			8	20.5	18.2	9	34	148.5	70	104	8	8		1	6.432	668.9								
		5			4	18.2	9.1	8	33	144.1	70	100.9	8	8	12	1	6.432	649.0								
Line III	Bolelli	2			6	36.7	22	10	23.3	193.4	70	135.4	22	22	10	1	6.432	870.9								
	Bolelli	3			8	22	17.6	10	30.3	160	70	112	22	10.5		1	6.432	720.4								
	Bolelli	4			8	17.6	15.6	9	31	145.1	70	108.6	10.5	10.5		1	6.432	653.5								
	Lawson	5			4	15.6	7.8	8	30	140.4	70	98.3	10.5	8	15	1	6.432	632.3								
Tow XI	Teknos	1			6	15	17	5.3	75	76.5	70	53.6	7.5	8.5	2	2	6.432	689.5								
	Teknos	2			4	17	14.5	4.7	90	156.6	72	112.8	8.5	11.5	2	1	6.432	725.5								
	Lawson	3			8	14.5	16	7.3	19	109.4	76	83.2	11.5	5	6	1	6.432	535.1								
	Lawson	4			2	16	4.9	6.5	21	98.8	70	69.2	5	5	16	1	6.432	445.1								
Tow XII	Teknos	1			5	15	16.3	4.5	96	93.9	70	65.7	7.5	12	2	0.5	6.432	211.3								
	Teknos	2			6	16.3	21.7	4.5	96	125	70	87.5	12	10		0.5	6.432	281.4								
	Mackie	3			2	21.7	7	6.2	27.7	139.6	70	97.7	10	5	12	0.5	6.432	314.2								
Tow Coner	Teknos	1			6	17.6	24.4	4.3	95	139.1	70	97.4	8.8	12	2	0.5	6.432	313.2								
	Teknos	2			6	24.4	34	4.3	95	193.8	70	193.8	12	10		0.5	6.432	436.4								
	Mackie	3			4	34	22	6.2	27.7	438.8	70	307.1	10	9	12	0.5	6.432	987.6								
	Mackie	4			1	22	3.14	7	46.8	211.6	70	142.1	9	5	24	1	6.432	952.6								

PLANT KONARCN

COMBING PRODUCTION DATA, COMPARISON

WERNER — FORM-No S-109

PLANT ROOP	MACHINE MAKE	QUALITY	PRODUCTION DATA: Doubl.	Input gr/m	Output gr/m	Draft	% Waste	DELIVERY: m/min 100 %	kg/M-hr 100 %	eff %	kg/M-hr exp	INDUSTRIAL ENGIN.DATA: Lap Weight kg	Net Can Weight kg
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Textima	6-10 Tow	12	15	15		17.3	6.7	6.03	90	5.43	5.5	7.5
	Schlum-		12	15	15		17.3	6.7	6.03	90	5,43	5.5	7.5
	berger		12	15	15		17.3	8.2	7.38	90	6.64	5.5	7.5
											5.80		

INDUSTRIAL ENGIN.DATA: Mach./Operator	PROD.acc.to act.eff.: No of M/C	M-hrs/year	tons year	ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION: No of M/C	M-hrs/year	tons/year	COMP: Prod.act.eff=100: ACT.	PLAN	WERNER	REMARKS
15	16	17	18	19	20	21	22	23	24	25	26	27
	4											
	4											
	2											
6	10	64,320	373	130,14	141,80				34,90	38,00		

4.2 WEAVING

4.0 KOMAROM

4.2 Weaving

4.2.1 Location

The weaving mill KOMAROM was built up based on the availability of labour in KOMAROM. Originally, KOMAROM was a spinning mill, but due to labour shortage in BUDAKALASZ and GYOR this new weave mill was established.

4.2.2 Buildings and Lay-out

Considering the build-up of KOMAROM as a spinning mill, the weave-room was improvised but the buildings are suitable.

The lay-out precludes efficient weaver and loom fixer assignments. Only 100 looms in one location is not recommended and cannot be an economical unit. However, circumstances dictated the location and size of the unit.

4.2.3 Process Flow and Material Handling

The process flow is not at its optimum. The lay-out of the looms and the preparatory processes should be improved.

It is necessary to improve and invest in material handling equipment, not only to make it easier for transport personnel but also to do it more efficiently.

4.2.4 Machine Obsolescence

A modernisation program should be established for KOMARON, but for the present time, there is no need for a drastic change in machines.

The question of modernisation of KOMAROM weaving can be answered after the decision has been made as to whether this weave-room will stay or be moved.

4.2.5 Machine Improvements

There is a definite lack of low cost machine attachments which would greatly improve the running condition of the material. Short-term investment should not only be made for prime equipment but more immediately and effectively for:

- Machine attachments,
- Auxiliary equipment.

4.2.6 Machine Park 1975-1977

The following data was submitted by the mill personnel.

Table I

1975 Looms in Operation as Stated in Mill Balance W-103				1977			
Make	No.	Width	ppm	Make	No.	Width	ppm
AT-120	7.9	116	183		23	116	190
AT-175	35.4	165	155		68	172	160
Mech.	22.4	-	120				
Mech.	18.9	130	160				
				Mech.	8	170	140
Total	85		149	Total	99	159	165

4.2.7 Summary of Mill Balance

Table II

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
No. of working days/year	268	268	268	268
Working hours/day	24	24	24	24
Machine hours/year	6432	6432	6432	6432
Total no. of looms	100	100	100	99
Looms in operation	85	85	85	99
Average ppm/loom	149	149	149	165
Picks/24 hours 100% 10^6	18.2376	18.2376	18.2376	23.5224
Picks/24 hours actual 10^6	11.4528	10.3250	14.7360	19.0061
Plant efficiency %	63	57	80.8	80.8
Machine efficiency %	-	94	94	-
Operator efficiency %	-	61	86	-
Product mix: Ø ppcm	14.05	14.05	14.05	14.05
Ø width cm	126	126	126	126
Production: m x 10^3/year	2185	2035	2811	3625
sqm x 10^3/year	2752	2571	3542	4568
Production comparison %	100	93	129	166
Loom stops: warp/[illegible] ends/10^4 p	-	3.0	1.0	-
weft/10^4 picks	-	3.9	1.3	-
mech/10^4 picks	-	4.3	.5	-
ca. looms stops/loom hour	-	7	3	-
Ø no. of looms/weaver	-	4.9	12	12

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1	WERNER Proposal 2
Ø warp beam length m		736	736	-
Ø ends/beam		2121	2121	-
Ø warp changes/24 hours		10	14	18
Ø piece length m		81	81	-
Ø piece doffs/24 hours		94	129	167
Yarn consumption: warp to		360	496	641
weft to		394	544	702
total to		754	1040	1343
Prod. split: GYÖR $m \times 10^3$		124	172	-
BUDAKAL. $m \times 10^3$		1831	2539	-
CSILLAG. $m \times 10^3$		80	111	-
Labour complement tot. pers.		174	126	151
Productivity: m/work. hours		5.45	10.41	11.20
comparison %		100	191	205

4.2.8 Summary of Labour Complement

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

Table III

		Actual 1975				WERNER Proposal 1				WERNER Proposal 2			
		Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.
Quilling	Transport	-	-	-	-	-	-	2	2	-	-	3	3
	Weft adm.	-	-	-	-	-	-	1	1	-	-	1	1
	Pirn strip + sort	-	-	-	-	-	-	1	1	-	-	1	1
	Pirn collect	-	-	-	-	-	-	1	1	-	-	2	2
	Winder	-	-	-	-	-	10	-	10	-	14	-	14
	Reserve	-	-	-	-	-	-	2	2	-	-	2	2
	Steam relax	-	-	-	-	-	-	1		-	-	1	1
		-	12	5	17	-	10	8	18	-	14	11	25
Warp Prep.	Foremen	-	-	-	-	1	-	-	1	2	-	-	2
	Beamer	-	-	-	-	-	6	-	6	-	6	-	6
	- Helper	-	-	-	-	-	-	4	4	-	-	6	6
	Reserve	-	-	-	-	-	-	1	1	-	-	2	2
	Transport	-	-	-	-	-	-	1	1	-	-	2	2
		1	12	-	13	1	6	6	13	2	6	10	18
Draw-in	Hands	-	-	-	-	-	4	-	4	-	5	-	5
	Harness cleaning	-	-	-	-	-	-	1	1	-	-	1	1
		-	9	4	13	-	4	1	5	-	5	1	6
Weaving	Overseer	-	-	-	-	4	-	-	4	4	-	-	4
	Loom fixer	-	-	-	-	-	-	9	9	-	-	10	10
	Mechanic	-	-	-	-	-	-	3	3	-	-	3	3
	Weaver	-	-	-	-	-	27	-	27	-	30	-	30
	- Helper	-	-	-	-	-	-	3	3	-	-	4	4
	Reserve	-	-	-	-	-	-	5	5	-	-	5	5
	Warp change + transp.	-	-	-	-	-	-	3	3	-	-	4	4
	Knotter	-	-	-	-	-	-	2	2	-	-	3	3
	Reserve	-	-	-	-	-	-	1	1	-	-	1	1
	Battery filler	-	-	-	-	-	-	9	9	-	-	9	9
	Piece doffer	-	-	-	-	-	-	3	3	-	-	3	3
	Weft transport	-	-	-	-	-	-	3	3	-	-	3	3
	Loom cleaner	-	-	-	-	-	-	2	2	-	-	2	2
	Oiler	-	-	-	-	-	-	1	1	-	-	1	1
	Various	-	-	-	-	-	-	3	3	-	-	4	4
		14	53	48	115	4	27	47	78	4	30	52	86
Shearing, Inspection	Shearing	-	-	-	-	-	1	-	1	-	1	-	1
	Inspecting	-	-	-	-	-	7	-	7	-	9	-	9
	Reserve	-	-	-	-	-	-	2	2	-	-	2	2
	Transport	-	-	-	-	-	-	2	2	-	-	3	3
	Foremen	-	-	-	-	-	-	-	-	1	-	-	[illegible]
		-	16	-	16	-	8	4	12	1	10	5	16
		15	102	57	174	5	55	66	126	7	65	79	[illegible]

Since WERNER's opinion on what is direct or indirect and which indirect personnel belongs to which department, there might be a difference in comparison by department. The total complement is the most important comparison.

4.2.9 Notes and explanations related to the summary of Mill Balance and Labour Complement.

4.2.9.1 General

Basis for all calculations was the data submitted to WERNER which was assumed to be correct.

In calculating the mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average. Therefore, the possibility of having taken some wrong figures from the submitted forms has been greatly reduced.

4.2.9.2 Number of Looms

Form W-100 shows a total of 100 looms. Form W-103 (Weaving Production Calculation) stated 84.6 running looms. Despite being told that the difference of 15 looms were idle due to labour shortage, these were not taken into account in the production calculation.

WERNER proposal 1 is based on 85 looms in operation.

WERNER proposal 2 is based on 99 looms which was given as the 1977 loom complement.

4.2.9.3 Efficiencies

Standard procedure for WERNER requires a split up in three different types of efficiencies:

1. <u>Machine Efficiency</u>

   A loom is available 24 hours a day on a three shift basis which equals a 100% machine efficiency.

   Whenever a loom is stopped for any other than weaver interferences, the stopped hours are called "downtime hours" and reduce the machine efficiency accordingly.

2. <u>Operator Efficiency</u>

   100% hours minus downtime hours are the machine hours available to the weaver which is 100% for the weaver.

   Actual picks compared to the possible picks in that time gives operator efficiency.

3. <u>Plant Efficiency</u>

   This gives the net efficiency of a weave-room and is calculated either by multiplying:

   - machine efficiency x operator efficiency, or
   - the relation of actual picks to possible picks in 24 hours.

   WERNER practice does not distinguish a difference between downtime hours of less or more than eight hours a day.

   All efficiencies mentioned in "Summary Mill Balance" are based on 24 hours per day, 268 working days per year as an absolute 100%.

4.2.9.4 KOMAROM Weave-Room Efficiency

Based on above definitions (section 4.2.9.3) and through historical calculation, with average picks per loom, 85 looms in operation, and actual picks inserted, we derived the following efficiencies for the plant:

- Plant efficiency - 57 % (actual 1975)
- Machine efficiency - 94% (actual 1975)
- Operator efficiency - 61% (actual 1975).

Individual downtime losses were given as:

- Warp changing	-	3.2%
- Repair	-	1.8%
- Missing material	-	.3%
- Various	-	.5%
Total		5.8%

This indicates a potential of 94.2% machine efficiency. This is, in our opinion, a good result and we based the calculations on a:

94%

machine efficiency.

By taking into consideration 100 looms, the downtime for labour shortages would have been:

15%

4.2.9.5 Operator Efficiency

Actual 1975 was 61%. There is no reason why this 61% cannot be improved to 86% through:

- New up-to-date bonus system
- Standard working procedure
- Operator training program
- Improving running conditions of raw material
- Rigid maintenance program for the looms
- Correct job distribution.

4.2.9.6 Plant Efficiency

LENFONO's 1975 plan called for:

2.185.000 running metres;
2.752.000 Sqm

with a product mix giving an average of:

14.05 picks per cm

and an average picks per loom of:

149 per minute

which, with 85 looms, would have given a plant efficiency of:

63%

In comparison:	Actual	:	57%
	WERNER proposal 1	:	80.8%

4.2.9.7 Production

A comparison based on LENFONO's plan 1975, the actual achievement, and WERNER proposal 1 shows:

- Plan = 100% - 2.752 square metres (10^3)
- Actual 1975 = 93% - 2.571 square metres (10^3)
- WERNER 1 = 129% - 3.542 square metres (10^3)

The comparison shows a realistic plan made by LENFONO management which can still be improved by:

29%

and by 36% compared with actual 1975.

4.2.9.8 WERNER Proposal 2

In order to also get an up-to-date evaluation of the weaving mill, the 1977 loom complement was employed and a mill balance was calculated on this basis.

As far as production is concerned, WERNER would expect an output from the 99 looms which would amount to:

4.568 square metres (10^3).

4.2.9.9 Loom Assignments

The running conditions of the raw material expressed in loom stops (the data given does not necessarily illustrate the actual picture since the figures have been taken from their time study evaluation) show:

- Warp stops : Actual = 3/M ends/10^4 picks
  WERNER = 1/M ends/10^4 picks.

The exact reasons for LENFONO's high breakage rate are not pointed out since time did not allow for an analysis of the machine/material combination. By comparing the warp material with similar products, a value of 1.0 is obtainable.

- Weft stops : Actual = 3.9 per 10^4 picks
  WERNER = 1.3 per 10^4 picks.

Part of the high breakage rate lies in the yarn quality as has been shown in the spinning process data. But it is also in part due to the running condition of the loom:

- Shuttle control, cleanliness;

- Mech. stops per 10^4 picks.

The figure was given at 4.3

A clear breakdown of this value was not available. By applying WERNER standard procedures as far as correct job distribution and maintenance schedules are concerned, there is no justification for this value being higher than 5, as far as weaver interferences are concerned.

4.2.9.10 Estimation of Number of Looms per Weaver

- Actual : 4.9 looms per weaver
- WERNER : 12 looms per weaver.

This implies the execution of several improvement programs:

- Machine condition (preventive maintenance program)
- Running condition of yarn
- Correct bonus system
- Operator training program
- New machine lay-out
- Handling procedure.

4.2.9.11 Summary of Yarn Consumption

Table IV

		According to Mill Balance W-100 - W-103	WERNER Proposal 1	WERNER Proposal 2
Warp:	Linen and blends	80.324	110.847	-
	Cotton and blends	279.771	385.606	-
	Total	360.095	496.453	640.214
Weft:	Linen and blends	83.096	114.671	-
	Tow	281.000	387.780	-
	Cotton	24.838	34.277	-
	Synthetics	5.350	7.383	-
	Total	394.284	544.111	701.674
Weft:	Own spun	364.096	502.452	647.950
Warp:	Own spun	80.324	110.847	142.946
	Total	444.420	613.299	790.896
Weft:	Bought	30.188	41.660	53.724
Warp:	Bought	279.771	385.606	497.268
	Total	309.959	427.266	550.992
	Total	754.379	1.040.565	1.341.888

APPENDIX

WEAVING

PLANT WORK: COMARON — WEAVING MACHINE SPECIFICATION — WERNER — FORM-No W-100

PLANT WORK	STYLE GROUP	MACHINE PARK: MACHINE TYPE	WARP MOTION	WEFT INPUT	WIDTH	WARP STOP MOTION	WEFT INSERT	AVAIL. LOOMS	LOOMS IN OPERAT.	PRODUCTION DATA, EFFICIENCIES: % AVAIL TO RUN	PPM	LOOM-HRS per 24 hrs 100%	DOWNTIME IN %: Warp chang	Rep	Miss. Mat.	Miss Pers	Var.	Total	LOOM-HRS 24 hrs net	M/C eff %	PICKS PRODUCED: Picks per 24 hrs in Millions 100 %	ACTUAL	PLANT EFF %	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	320-06 416-13 592-07 593-40	AT - 175	plain	pirn	165	mech	conv.	40	40	100	155,8	907,5	3,4	1,7	,4	,1	,5	6,1	853	94	8,974	5,322	59,3	
	463-52	MECH	plain	pirn	200	mech	conv.	4	4	100	110										634			
	229-03 256-01 263-06 306-13 306-06 406-62																							
	592-03 592-07 592-14 592-26 592-52 593-32 593-40 596-05	MECH	plain	pirn	150	mech	conv.	20	20	100	135										3,869			
	263-06 316-33 405-62 416-13 421-06 421-08 592-03 592-07 592-28 593-05 593-40	MECH	plain	pirn	130	mech	conv	36	36	100	155										8,035			
												1036,1	3,1	1,9	,2	,3	,5	6,0	974	94	12557	5,003	39,8	
GRAND TOTAL								100	100	100	149	1943,6	3,2	1,8	,3	,2	,5	6,0	1827	94	21,531	10,325	48,0	

PLANT / WERK: KOMAROM

WEAVING CLOTH SPECIFICATION ; QUANTITIES

WERNER — FORM-No W-101

PLANT	STYLE / STYLE GROUP	CONSTRUCTION	WIDTH cm	MATERIAL WARP Nm	MATERIAL WARP Mix	MATERIAL WEFT Nm	MATERIAL WEFT Mix	CLOTH SPEC Warp e/cm	CLOTH SPEC Weft p/cm	WEIGHT gr/sq.m. Warp	WEIGHT Weft	WEIGHT Total	% CONTRACT Warp	% CONTRACT Weft	ENDS PER BEAM	BEAM LENGTH m	Ø PART'E LENGTH	PIECE LENGTH m	PRODUCTION 1975 in mtr x 10^3 I.QUART	II.QUART	III.QUART	IV.QUART	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
produced for Gyor	306 - 13	plain weave	152	18	Line 16PE	18	Line 16PE	14,7	17,5				14	5,2	2260	798	,61	100	7,28				7,28
	593 - 40	"	140	10	Line	10	Tow	13,1	13,5			288	15		1820	800	2,01	100		24,06			24,06
	593 - 40	"	158	10	Line	10	Tow	13,3	13,5			290	14	2,2	2080	690	2,23	75			26,70		26,70
	593 - 40	"	145	10	Line	10	Tow	12,7	13,0			282	14	4,2	1848	679	2,33	85				28,01	28,01
	203 - 06	"	144	18	Line	18	Line	17,4	16,5			-	12	0,7	2536	784	0,50	100		6,02			6,02
	203 - 06	"	111	18	Line	18	Line	17,7	16,0			-	12	2,2	1956	784	0,60	100		6,16			6,16
	415 - 13	twill	93	50/2	Cotton	12	Line 16 V	26,2	15,0			-	16	1,3	2430	900	0,99	80		10,72			10,72
	Various																1,12			5,14	5,42	2,86	13,42
produced for	229 - 03	twill	145	34/2	Cotton	10	PAN 100 %	27,0	14,0			-	19		3916	595	2,09	100		11,73	13,37		25,10
[illegible]	303 - 05	plain	128	40/2	Cotton	15	Line 16 PE	21,3	19,0			249	18		2750	830	9,11	70	51,29	35,22	22,80		109,31
	316 - 03	"	845	50/2	Cotton	18	Line 16 PE	21,8	21,5			150	12		1840	864	3,83	120	25,85	15,04	5,06		45,95
	405 - 62	"	112	27/2	Cotton	9	Tow 6 V	19,5	14,5			320	15		2192	720	6,21	80	24,74	10,42	22,85	15,45	[illegible]
	415 - 13	twill	106	50/2	Cotton 16 V	12	Line 16 V	25,5	14,5			238	12		2750	720	2,66	80	14,94	17,03			31,97
	415 - 13	"	126	50/2	Cotton 16 V	12	Line 16 V	25,4	14,5			237	12		3220	720	4,21	80	15,29	9,54	17,97	7,70	50,50
	415 - 13	"	136	50/2	Cotton 16 V	12	Line 16 V	25,6	14,5			238	12		3500	720	2,45	70	11,88	5,08	12,47		29,43
	415 - 13	"	147	50/2	Cotton 16 V	12	Line 16 V	25,4	14,5			237	12		3750	720	3,46	70	8,15	6,79	9,42	17,17	41,53
	416 - 13	"	157	50/2	Cotton 16 V	12	Line 16 V	25,2	14,5			237	12		3940	720	2,15	70	18,20		7,56		25,76
	410 - 13	"	157	50/2	Cotton 16 V	12	Line 16 V	25,3	14,5			237	12		4260	720	3,08	70	20,70		7,38	6,91	35,99
	592 - 03	plain	96	50/2	Cotton	10	Tow	18,6	15,0			230	15		1780	1035	4,42	100	13,57	21,39		18,12	53,08
	592 - 03	"	128	50/2	Cotton	10	Tow	18,6	15,0			239	15		2550	920	3,49	100	13,01	28,85			41,86
	592 - 07	"	133	70/2	Cotton	6	Tow	12,4	12,0			340	11		1664	624	36,61	70	103,54	296,13	37,23	102,45	539,35
	592 - 07 foh	"	133	70/2	Cotton	6	Tow	12,7	12,0			320	11		1664	624	5,0	70			59,97		59,97
	592 - 07	"	140	70/2	Cotton	6	Tow	12,8	12,0			290	16	1,4	1600	888	1,05	70		12,55			12,55
	592 - 07	"	150	20/2	Cotton	6	Tow	12,5	12,0			320	16		1890	650	1,30	70			15,68		15,68
	592 - 07	"	140	20/2	Cotton	6	Tow	12,8	12,0			364	16		1800	888	4,97	70	59,67				59,67
	592 - 14	"	142	20/2	Cotton	10	Tow	14,3	12,5			291	16		2062	928	6,82	100	71,57	10,25			81,82
	592 - 28	"	131	20/2	Cotton	6	Line	12,4	13,0			370	22		1000	500	4,27	20			51,27		51,27
	592 - 52	"	135	20/2	Cotton	10	Line	14,3	13,0			301	10		1040	500	2,71	100				72,54	72,54
	593 - 05	"	79	10	Line	10	Tow	13,0	13,5			288	15		814	540	3,09	80				37,13	37,13
	593 - 32	"	139	10	Line	10	Tow	13,1	13,5			288	15		1708	690	1,40	100	17,70				17,70
	593 - 40	"	139	10	Line	10	Tow	13,1	13,5			288	15		1620	800	12,08	70		63,44	39,03	52,03	154,50
	593 - 40	"	86	10	Line	10	Tow	12,9	13,5			288	15		1120	690	5,39	100			55,48	9,16	64,64
	593 - 40	"	76	10	Line	10	Tow	12,8	13,5			288	15		1120	690	3,97	100				47,60	47,60
	593 - 40	"	79	10	Line	10	Tow	12,8	13,5			288	15		1030	920	1,55	100				18,62	18,62
	390 - 05	"	137	40/2	Cotton	18	Line 16 PE	19,8	16,5			208			2750	826	1,81	100	22,95				22,95
	421 - 06	"	83	27/2	Cotton	20/2	Cotton	25,0	14,0			364	18		2000	500	,54	100	6,42				6,42
	421 - 06	"	126	34/2	Cotton	20/2	Cotton	24,4	14,5			326	12		3160	672	6,72	70			42,91	37,76	80,67
	421 - 06	"	105	34/2	Cotton	20/2	Cotton	24,7	14,5				12		2600	672	1,66	80			9,81	10,06	19,87
	Various																3,47		5,62	14,09	7,73	14,20	41,64
produced for	801 - 07	"	86	50/2	Cotton	27/1	Cotton	27,7	19,0			199			2400	912	5,08	100			22,45	38,46	60,91
Csillaghegy	801 - 07	"	108	50/2	Cotton	27/1	Cotton	27,7	19,0			199			3000	912	1,60	100	19,20				19,20
	GRAND TOTAL																		531,58	511,65	492,55	499,23	2.035,02

PLANT / WERK: K O N A R O M | W E A V I N G RUNNING DATA ; PRODUCTIVITY | WERNER | FORM-No W-102

PLANT / WERK	STYLE / STYLE GROUP		LOOM TYPE	LOOM STOPS Warp N ends 10.000p	LOOM STOPS Weft 10.000 picks	LOOM STOPS Mech 10.000 picks	% WASTE Warp	% WASTE Weft	% WASTE Total	LOOMS per WEAVER	PRODUCTION 1975 $m \times 10^3$	LABOR HOURS 1975 DIRECT	LABOR HOURS 1975 INDIRECT	LABOR HOURS 1975 TOTAL	PRODUCTIVITY in MTR/WORK.HOUR Direct	PRODUCTIVITY in MTR/WORK.HOUR Indirect	PRODUCTIVITY in MTR/WORK.HOUR TOTAL	REMARKS
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	335 - 13	152	AT - 175	3.2	4.9	3.0				5	7,28							
	593 - 40	140	M	5.6	3.5	8.5				4	24,06							
	593 - 40	158	M	5.5	4.3	17.1				4	26,70							
	593 - 40	145	M	5.6	3.5	8.5				4	28,01							
	203 - 05	144	AT - 175	3.3	4.4	3.6				5	6,02							
	203 - 06	111	AT - 120	3.5	3.6	2.6				5	8,16							
	416 - 13	93	AT - 120	1.5	2.2	3.6				5	10,72							
											13,42							
	229 - 03	145	AT - 175	1.2	4.6	2.4					25,10							
	336 - 06	128	AT - 175	1.4	3.8	1.5				6	109,31							
	316 - 03	84	M	3.9	2.6	4.0				6	45,06							
	[illegible] - 02	112	M	4.2	5.6	[illegible]				5	74,46							
	416 - 13	109	AT - 120	.6	2.4	1.2				5	31,97							
	416 - 13	126	M	1.2	3.2	1.8				5	52,50							
	416 - 13	130	AT - 175							5	29,43							
	416 - 13	147	AT - 175	.4	2.1	1.2				5	41,53							
	416 - 13	157	AT - 175	.4	2.3	1.3				5	25,76							
	416 - 13	167	AT - 175	.4	2.4	1.3				5	36,99							
	592 - 03	56	M	3.3	4.4	2.4				5	53,08							
	592 - 03	136	M	1.4	1.3	6.8				5	41,86							
	592 - 07	133	AT - 175	2.0	6.2	2.0				4	439,35							
	592 - 07	133	AT - 175	2.0	6.2	2.0				4	59,97							
	592 - 07	140	M	2.0	1.2	9.7				4	17,56							
	592 - 07	150	M	2.0	1.4	10.3				4	15,68							
	592 - 07	140	M	2.0	1.2	9.7				4	59,67							
	592 - 14	142	AT - 175	1.9	2.2	7.8				5	61,82							
	592 - 28	131	AT - 175	3.4	3.3	9.7				5	51,27							
	592 - 52	135	AT - 175	2.5	2.8	2.4				5	22,54							
	593 - 05	78	AT - 120	7.0	1.6	5.7				5	37,13							
	593 - 32	139	M	5.6	7.4	6.7				5	17,70							
	593 - 40	139	M	5.6	3.5	8.5				4	154,50							
	593 - 40	95	M	9.9	3.5	8.8				6	64,64							
	593 - 40	70	M	9.9	4.0	2.2				6	47,60							
	592 - 40	79	M	5.8	4.0	2.2				6	18,62							
	596 - 05	137	AT - 175	1.8	2.5	2.2				5	22,95							
	421 - 03	89	AT - 120	2.4	2.5	3.7				5	6,42							
	421 - 05	120	M	1.3	3.9	5.2				5	30,67							
	421 - 06	105	AT - 120	1.5	3.2	1.9				5	19,87							
											41,64							
	801 - 07	86	AT - 120	1.7	1.9	3.4				6	60,91							
	801 - 07	108	AT - 120	1.6	2.1	4.1				6	19,20							
									6.9	4.9	2,o35,02	352,387	23.496	375.883	5,77	86,61	5,41	

PLANT WERK KOMAROM

WEAVING PRODUCTION CALCULATIONS ; COMPARISON

WERNER

FORM-No W-103

PLANT KOOP	STYLE / STYLE GROUP	LOOM TYPE	LOOM PERFORMANCE					PRODUCTION acc.to act.eff.			ACTUAL PRODUCTION 1975 mx10^3			PLAN-PRODUCTION x10^3		WERNER-PROD in mx 10^3				COMP: prod.acc.to actual efficiency = 100		
			RPM	Picks/ hour 100 %	eff %	Picks/ hour exp	Meter/ hour exp	No of looms	Meter/ year exp	Sq.Meter year exp	No of looms	Meter/ year	Sq.Meter/ year	Meter/ year	Sq.Meter/ year	eff %	No of Looms	Meters/ year	Sq.Meters year	PROD. 1975	PLAN 1975	WERNER 1975
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	306 - 13 152	AT - 175	155	9.300	66,9	6,712	3,55	.3	6,85	10,41	.3	7,28	11,07	6,58	10,00							
	503 - 40 140	M	120	7.203	58.1	4.183	3.10	1.2	23,93	3,50	1.2	24,06	33,68	24,64	34,50							
	593 - 40 153	M	120	7.200	58.1	4.183	3.10	1.3	25,92	40,95	1.3	26,70	42,19	26,58	42,00							
	593 - 40 155	M	120	7.200	58.1	4.183	3.22	1.4	28,59	42,04	1.4	28,01	40,61	34,48	50,00							
	293 - 06 144	AT - 175	155	9.300	66.8	6.712	3.76	.3	7,25	10,45	.3	6,02	8,67	6,75	9,00							
	293 - 06 111	AT - 120	183	10.980	63.9	7.016	4.39	.3	8,47	9,40	.3	8,16	9,06	22,52	25,00							
	416 - 13 93	AT - 120	183	10.980	63.9	7.016	4.08	.4	12,04	11,20	.4	10,72	9,97	11,72	10,90							
	144	AT - 175	155	9.300	66.8	6.212	3.76	1.0	24,18	34,82	1.0	13,42	19,32	17,36	25,00							
	229 - 03 145	AT - 175	155	9.300	66.8	6.212	4.44	1.0	28,56	41,41	1.0	25,10	36,40	13,79	20,00							
	305 - 06 128	AT - 175	155	9.300	65.8	6.212	3.27	5.2	109,37	139,99	5.2	109,31	139,92	102,81	131,6							
	316 - 03 94	M	160	9.600	58.1	5.578	2.59	3.0	49,98	42,23	3.0	45,96	38,84	44,73	37,80							
	409 - 62 112	M	160	9.600	58.1	5.578	3,85	3.0	74,29	83,20	3.0	74,46	83,40	140,18	157,00							
	416 - 13 106	AT - 120	183	10.980	63.9	7.016	4,94	1.0	31,13	33,00	1.0	31,97	33,89	32,08	34,00							
	416 - 13 126	M	160	9.600	58.1	5.578	3,95	2.0	49,53	62,41	2.0	50,50	63,63	56,75	71,50							
	416 - 13 136	AT - 175	155	9.300	66.8	6.212	4.28	1.1	30,28	41,18	1.1	29,43	40,02	25,00	34,00							
	416 - 13 147	AT - 175	155	9.300	66.8	6.212	4,28	2.0	55,06	80,94	2.0	41,53	61,05	51,02	75,00							
	416 - 13 157	AT - 175	155	9.300	66.8	6.212	4,28	1.0	27,53	43,22	1.0	25,76	40,44	38,22	60,00							
	416 - 13 167	AT - 175	155	9.300	66.8	6.212	4.28	1.3	35,79	59,77	1.3	36,99	61,77	32,83	55,00							
	592 - 03 96	M	160	9.600	58.1	5.578	3,72	2.7	52,64	50,53	2.2	53,08	50,96	59,90	57,50							
	592 - 03 138	M	120	7.200	58.1	4.183	2.79	2.3	41,27	56,95	2.3	41,06	57,77	39,13	54,0							
	592 - 07 133	AT - 175	155	9.300	66.8	6.212	5.18	13.2	439,70	584,92	13.2	439,35	584,34	469,32	624,7							
	592 - 07 133	AT - 175	155	9.300	66.8	6.212	5.19	2.0	66,64	88,63	2.0	59,97	79,76	26,32	35,0							
	592 - 07 140	M	120	7.200	58.1	4.183	3.49	1.0	22,45	31,43	1.0	12,55	17,57	11,43	16,0							
	592 - 07 150	M	120	7.200	58.1	4.183	3.49	1.0	22,45	33,68	1.0	15,68	23,52	11,20	16,8							
	592 - 07 140	M	120	7,200	58,1	4,183	3,49	3.0	67,34	94,28	3.0	59,67	83,54	56,43	79,0							
	592 - 14 142	AT - 175	155	9.300	66.8	6.212	4.97	3.0	95,90	136,18	3.0	81,82	116,18	88,73	126,0							
	592 - 23 131	AT - 175	155	9.300	66.8	6.212	4.78	2.0	61,49	80,55	2.0	51,27	67,16	54,73	71,7							
	592 - 52 135	AT - 175	155	9.300	66.8	6.212	4.78	1.0	30,74	41,50	1.0	32,54	43,93	26,67	36,0							
	593 - 05 79	AT - 120	183	10.980	63.9	7.016	7.80	1.0	50,17	39,63	1.0	37,13	29,33	37,97	30,0							
	593 - 32 139	M	120	7.200	58.1	4.183	3.49	1.0	22,45	31,21	1.0	17,70	24,60	14,39	20,0							
	593 - 40 139	M	120	7.200	58.1	4.183	3.10	8.0	159,51	21,72	8.0	154,50	214,76	174,10	242,0							
	593 - 40 160	M	160	9.600	58.1	5.578	4.13	2.4	63,75	54,83	2.4	64,64	55,59	58,37	50,2							
	593 - 40 76	M	160	9.600	58.1	5.578	4.13	2.0	53,13	40,38	2.0	47,60	36,18	36,84	28,0							
	593 - 40 79	M	160	9.600	58.1	5.578	4.13	1.0	26,56	20,98	1.0	18,52	14,71	20,25	16,0							
	596 - 05 137	AT - 175	155	9.300	65.8	6.212	3.76	1.0	24,13	33,13	1.0	22,95	31,44	25,55	35,0							
	421 - 08 83	AT - 120	183	10.980	63.9	7.016	5.01	.2	6,44	5,35	.2	6,42	5,33	7,22	6,0							
	421 - 06 126	M	160	9.600	58.1	5.578	3.85	3.3	81,72	102,97	3.3	80,67	101,64	80,48	101,4							
	421 - 06 105	AT - 120	183	10.980	63.9	7.016	4.84	1.0	31,13	32,69	1.0	19,87	20,86	27,43	28,8							
	157	M	120	7.200	58.1	4.183	2.88	2.2	40,75	63,98	2.2	41,64	65,37	46,88	73,6							
	801 - 07 86	AT - 120	183	10.980	63.9	7.016	3.69	3.0	71,20	61,23	3.0	60,91	52,38	69,77	60,0							
	801 - 08 108	AT - 120	183	10.980	63,9	7,016	3,69	1.0	23,73	25,63	1.0	19,20	20,74	18,70	20,20							
								84.6	2.184,59	2.752,50	84.6	2.035,02	2.571,59	2.149,52	2.709,70							

PLANT WERK KOMARON	WARP PREPARATION MACHINE SPECIFICATIONS	WERNER	FORM-No W-106

No	Section	Item					
1		PLANT KCOP					
2		PROCESS	Sect.beaming	Sect.beaming	Sect.beaming		
3		MACHINE TYPE	Sucker	Sucker	Textima		
4		No of MACHINES	1	1	1		
5		No of CREELS	1	1	1		
6	BEAMER	STOP MOTION					
7	BEAMER	BEAM BRAKE	yes	yes	yes		
8	BEAMER	MAX.METER / MINUTE	240	240	240		
9	BEAMER	SPEED REGULATION	no	no	yes		
10	BEAMER	DISTANCE BEAM - CREEL	250 cm	250 cm	250 cm		
1	BEAMER	MAX.SECTION WIDTH cm	40	41	58		
2	BEAMER	CONUS DEPTH cm	9,5	11	10,8		
3	BEAMER	BEAM Ø DISC	500-600	500-600	500-600		
4	BEAMER	BEAM Ø BASE	105-180	105-180	105-180		
5	BEAMER	BEAM WIDTH	800-2300	800-2300	800-2300		
6	BEAMER						
7	BEAMER						
8	BEAMER						
9	BEAMER	POWER NEED kW	2,2	1,7	4,5		
20	BEAMER	NOISE LEVEL					
1	CREEL	MAX-CONES / CREEL	384	432	594		
2	CREEL	GAUGE cm	22	22	18		
3	CREEL	MAX.CONE WEIGHT gr	1800	1800	1800		
4	CREEL	TENSION CONTROL					
5	CREEL	CHANGEABLE CONECREEL					
6	CREEL	STOP MOTION ENDBREAK	electr	electr	electr		
7	CREEL						
8	CREEL						
9	CREEL						
30	CREEL						
1	CREEL						
2							
3							
4							
5							
6							

MOHARON			WARP PREPARATION PRODUCTION DATA ; COMPARISON																								WERNER	FORM-No W-107	
PLANT	TYPE WARP PREP	MACHINE TYPE	QUALITY	MATERIAL		ends/beam or section	end breaks/ MM ends.mtr	beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Downtimes in min/			DELIVERY			CAPACITY		PRODUCTION in m x 10^3			WERNER-PROD in m x 10^3				COMP: Prod.acc.to act.eff = 100		
				Nm	Mix							end-break	beam change	creel change	m/min 100%	eff %	m/min exp	No of M/C	M-hrs year	EXPECTED 1975	ACTUAL 1975	PLAN 1975	No of M/C	M-hrs/ year	eff %	PROD.	ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Sect. beaming		220-03 145	34/2	Cotton	301	23,63	505	1600	25	45																		
			220-03 155	34/2	Cotton	298	25,33	500	1600	19	40																		
			255-01 144	27/2	C 10V	302	17,58	720	1600	19	30																		
			263-06 111	18	Line	285	46,19	784	1300	37	29																		
			263-06 144	16	Line	282	46,61	784	1300	37	29																		
			302-03 173	40/2	Cotton	259	23,63	708	1600	7	45																		
			306-06 123	40/2	Cotton	306	10,47	830	1600	23	38																		
			306-06 159	40/2	Cotton	311	12,72	626	1600	31	38																		
			306-13 152	18	L 16PE	283	28,75	798	1300	14	29																		
			306-03 84	50/2	Cotton	307	11,32	864	1600	10	46																		
			316-03 85	50/2	Cotton	307	11,32	864	1600	10	46																		
			406-52 112	15	L 16 V				1300		27																		
				27/2	Cotton	313	30,00	720	1600		30																		
			416-08 157	40/2	Cotton	307	41,63	720	1600	16	44																		
			416-12 125	40/2	Cotton	322	39,66	720	1600	16	44																		
			416-12 [illegible]	40/2	Cotton	307	44,65	672	1600	21	47																		
			415-13 93	50/2	Cotton	304	10,66	900	1600	16	44																		
			416-13 105	50/2	Cotton	300	13,52	720	1600	16	55																		
			416-13 118	50/2	Cotton	297	13,64	720	1600	16	55																		
			416-13 121	50/2	Cotton	327	12,59	720	1600	16	55																		
			416-13 135	50/2	Cotton	318	12,75	720	1600	16	55																		
			416-13 147	50/2	Cotton	313	12,98	720	1600	16	55																		
			416-13 152	50/2	Cotton	307	13,71	720	1600	16	55																		
			416-13 157	50/2	Cotton	304	13,33	720	1600	16	55																		
			421-06 105	34/2	Cotton	325	17,43	672	1600	19	40																		
			421-05 125	34/2	Cotton	312	10,09	672	1600	19	40																		
			421-09 83	27/2	Cotton	297	21,14	500	1600	27	36																		
			493-52 206	10	Line	290	56,75	680	1000	49	14																		
			520-11 213	34/2	Cotton	258	12,56	696	1600	-	39																		
			592-03 96	50/2	Cotton	297	16,29	1035	1600	27	38																		
			592-03 139	50/2	Cotton	283	19,23	920	1600	19	43																		
			592-07 133	20/2	Cotton	277	16,76	624	1600	40	25																		
			592-07 132	20/2	Cotton	277	16,76	624	1600	40	25																		
			592-07 140	20/2	Cotton	300	10,90	888	1600	-	18																		
			592-07 150	20/2	Cotton	315	14,15	650	1600	40	24																		
			592-07 140	20/2	Cotton	300	10,90	888	1600	-	18																		
			592-14 142	20/2	Cotton	290	17,47	970	1600	22	17																		
			592-28 131	20/2	Cotton	267	35,44	590	1600	7	27																		
			592-52 135	20/2	Cotton	277	25,46	590	1600	7	27																		
			593-05 79	[illegible]	Line	271	92,46	540	1800	-	20																		
			593-32 139	10	Line	303	48,71	690	1000	34	14																		
			593-40 135	10	Line	303	36,57	800	1000	43	12																		
			593-40 140	10	Line	303	36,57	800	1000	40	12																		
			593-40 85	10	Line	290	42,49	690	1000	34	14																		
			593-40 153	10	Line	303	42,34	590	1000	34	14																		

COMARON

WARP PREPARATION PRODUCTION DATA ; COMPARISON

WERNER — FORM-No. W-107

PLANT	WARP PREP	MACHINE TYPE	QUALITY	MATERIAL Nm	MATERIAL Mix	ends/beam or section	end breaks/ MM ends-mtr	beam length	cone weight (gr)	yarn rest on cone (gr)	beams/cone	Countime in min/ end break	beam change	creel change	DELIVERY m/min 100 %	eff %	m/min exp	CAPACITY No of M/C	M-hrs/ year	PRODUCTION in m x 10³ EXPECTED 1975	ACTUAL 1975	PLAN 1975	WERNER-PROD in m x 10³ No of M/C	M-hrs/ year	eff %	PROD	COMP: Prod.acc.to act.eff = 100 ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
			593-40 140	10	Line	303	35,57	800	1000	40	12																		
			593-40 76	10	Line	245	42,31	650	1000	34	14																		
			593-40 79	10	Line	258	30,35	970	1000	79	10																		
			593-40 145	10	Line	303	42,34	879	1000	49	14																		
			595-05 137	40/2	Cotton	306	20,20	826	1600	31	38																		
			801-07 86	50/2	Cotton	300	13,14	912	1600	31	43																		
			801-07 108	50/2	Cotton	300	13,14	912	1600	31	43																		
			336-13 146	18	Line15PE	283	28,76	798	1300	14	29																		
		Sucker											30'/	47,44 / 100 e	140	16,8		1											
		Sucker													140	16,8		1											
		Textima													140	16,8	23,52	1	19,296	27,227	16,037	18,056							

PLANT KONAKON	WINDING ; QUILLING SPECIFICATIONS , PRODUCTIVITY																			WERNER FORM-No W-108
PLANT SHOP	PROCESS	MACHINE TYPE	DESCRIPTION	Spindles/ Machine	MATERIAL		EDMSFH	% Waste	INPUT		OUTPUT		Spindles/ Operator	PRODUCTION 1975	WORKING HOURS 1975			PRODUCTIVITY in kg/work.hr		
					Nm	MIX			Form	gr	Form	gr			DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Quilling	Kevo		12	6	Tow	14,176		cone	1300	cop	72		69,7						
					6	Tow	10,400			1300		72		,8						
					6	Line	12,272			1300		72		16,2						
					9	Tow	7,099			1300		60		6,6						
					10	Line	6,240			1300		70		2,1						
					10	Tow	4,416			1300		60		70,7						
					12	Line	14,800			1300		60		1,0						
					12	Line 16% Synth	6,978			1300		60		5,9						
					15	Line	15,616			1300		60		,9						
					15	Line 16% Synth	4,603			1300		70		1,3						
					18	Line	15,679			1300		70		4,6						
					20/2	Cotton	3,360			1300		75		1,5						
					27/1	Cotton	1,706			1300		65		,9						
		Kevo Total											24	158,2						
	Quilling	UA-300		12	6	Tow	3,800		cone	1300	pirn	25	12	103,3						
					6	Tow	24,690			1300		30	12	,8						
					9	Tow	16,872			1300		25	12	6,5						
					10	Line	11,902			1300		30	24	4,2						
					10	Tow	4,560			1300		45	24	36,1						
					10	Synthetics	5,677			1300		30	24	4,2						
					12	Line	17,955			1300		30	24	3,4						
					12	Line 16V	12,654			1300		30	24	36,1						
					15	Line	16,416			1300		31	24	,5						
					15	Line 16Synth	13,634			1300		35	24	21,4						
					18	Line	11,070			1300		30	24	7,6						
					20/2	Cotton	10,078			1300		30	24	24,3						
					27/1	Cotton	4,138			1300		30	24	6,3						
					34/2	Cotton	4,053			1300		30	24	,1						
		UA-300 Total												254,8						
	Quilling	SUPER		24	6	Tow	10,738		cone	1300	cop	53		1,3						
					9	Tow	12,600			1300		60		,1						
					10	Tow	5,838			1300		62		1,1						
					12	Line 16V	5,005			1300		60		,4						
					18	Line	3,628			1300		60		,3						
		SUPER Total											12	3,2						
	QUILLING	TOTAL						,3						446,2	25,895	3,916	29,811	17,23	113,90	15,00
	WINDING	M - 150		100	15,7	Cotton			cop	200	cone	1200	25	356,5	11,502		11,502	30,99		30,99

PLANT WERK	KOMAROM	WINDING ; QUILLING PRODUCTION DATA , COMPARISON	WERNER	FORM-No W-109

PLANT	PROCESS	MACHINE TYPE	MACHINES		SPINDLES			MATERIAL		DELIVERY				PRODUCTION in to/year			WERNER 1975			COMP: expect 1975 = 100		
			Total	In op.	Total	In op.	%	Nm	Mix	m/min 100 %	gr/Sph 100 %	eff %	gr/Sph exp	EXPECTED 1975	ACTUAL 1975	PLAN 1975	Spindles	% eff	Production	ACTUAL	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Quilling	Kovo	4	4	48	43	100	6	Tow						69,7							
								6	Tow						,8							
								6	Line						10,2							
								9	Tow						6,6							
								10	Line						2,1							
								10	Line						76,7							
								12	Line						1,0							
								12	Line 16V						5,9							
								15	Line						,9							
								15	Line/Synth						1,3							
								18	Line						4,6							
								20/2	Cotton						1,5							
								27/1	Cotton						,9							
		Kovo Total	4	4	48	43	100			160	1125,4	64	720,3	222,3	198,2							
	Quilling	UA-300	3	3	36	36	100	6	Tow						103,3							
								6	Tow						,8							
								9	Tow						6,5							
								10	Line						4,2							
								10	Line						36,1							
								10	Synthetics						4,2							
								12	Line						3,4							
								12	Line 16V						36,1							
								15	Line						,5							
								15	Line/Synth						21,4							
								18	Line						7,6							
								20/2	Cotton						24,3							
								27/1	Cotton						6,3							
								24/2	Cotton						,1							
		UA-300 Total	3	3	36	36	100			380	2340,9	75	1755,6	406,5	254,8							
	Quilling	SUPER	1	1	24	24	100	6	Tow						1,3							
								9	Tow						,1							
								10	Tow						1,1							
								12	Line 16V						,4							
								18	Line						,3							
		SUPER Total	1	1	24	24	100			140	903,2	85	767,7	118,5	3,2							
	QUILLING	TOTAL	8	8	108	108	100							747,3	446,2	432,3				59,7	57,8	
	WINDING	X - 150	1	1	100	100	100	15,7	Cotton	500	1910,8	65	1242	798,9	355,5	446,0				44,6	55,8	

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME V OF VI

BUDAPEST

5.1 Spinning

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

UNIDO Contract No. 76/41
Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL
Brussels - New York

1977

WERNER ASSOCIATES INC. 1450 BROADWAY NEW YORK, NEW YORK 10018 TELEPHONE 212 565-1260 TELEX 223309 CABLE WERNERCONS

TABLE OF CONTENTS

		Page
5.0	BUDAPEST	1.
5.1	Spinning	1.
5.1.1	Location	1.
5.1.2	Buildings and Lay-out	1.
5.1.3	Process Flow and Material Handling	2.
5.1.4	Machine Obsolescence	2.
5.1.5	Machine Improvements	3.
5.1.6	Summary of Mill Balance	4.
5.1.6.1	Wet - Mill Balance	4.
5.1.6.1	Dry - Mill Balance	5.
5.1.6.1	Gill - Mill Balance	6.
5.1.6.4	Wet and Dry - Summary Mill Balance	6.
5.1.7	Summary of Labour Complement	7.
5.1.8	Notes and Explanations to Substantiate the Summary of the Mill Balance and Labour Complement	8.
5.1.8.1	General	8.
5.1.8.2	Spindle RPM	8.
5.1.8.3	Spinning Room Efficiency	8.
5.1.8.4	Production	9.
5.1.8.5	Spindle Allocation and End-Breaks	10.

TABLES

I	Summary of Mill Balance	4.
II	Summary of Labour Complement	7.
III	Production	9.

APPENDIX

Form S-100	=	Yield	
Form S-101	=	Spinning:	Machine Specification
Form S-102	=	Spinning:	Production Data, Comparison
Form S-104	=	Roving :	Machine Specification
Form S-105	=	Roving :	Production Data, Comparison
Form S-106	=	Drawing :	Machine Specification
Form S-107	=	Drawing :	Production Data, Comparison
Form S-108	=	Combing :	Machine Specification
Form S-109	=	Combing :	Production Data, Comparison
Form W-108	=	Winding :	Specifications, Productivity
Form W-109	=	Winding :	Production Data, Comparison

5.1 SPINNING

5.0 BUDAPEST

5.1 Spinning

5.1.1 Location

The total operation is hampered by shortage of labour, which even necessitated transferring intermediate operations, such as winding, to outside processors.

Reasons for the labour shortage are:

- Labour market in Budapest is tight in general.
- The mill is paying approximately 15% less hourly wages than neighbouring non-textile industrial plants.
- It offers unpleasant working conditions, compared to neighbours.
- It is running a three shift operation where the competition is running one shift only.
- Training of newcomers is inadequate, causing a higher turnover than necessary.

5.1.2 Buildings and Lay-out

Buildings are suitable for their task and sufficiently spacious for the operation involved. Machine positioning is good and material flow logical.

Room climate: for the dry spinning operation, we would recommend air conditioning on a mid-term basis.

5.1.3 Process Flow and Material Handling

Although the general material flow is logical, the material handling can be improved greatly through:

- Modernising the material transport system.
- This can be done in a relatively simple and inexpensive way by designing proper:
  . trucks,
  . doffing trucks,
  . yarn carriers.
- Mobilising (in conjunction with the transport system) intermediate stocks. No need exists for double handling and precision stacking of bobbins as is done currently.
- Avoiding, where possible, all hand-lifting of heavy objects for female labour (doff-trays in wet spinning mainly)

5.1.4 Machine Obsolescence

The equipment in spinning preparation is partly outdated and should gradually be replaced by modern machinery.

In wet and dry spinning, the machine park is acceptable and with a properly installed preventive maintenance system they can fulfil the present needs.

5.1.5 Machine Improvements

On two different visits, we noticed a definite lack of correctly carried out machine maintenance program, for instance:

- In preparation :
  - Poor combs,
  - Nicked teeth,
  - Teeth missing,
  - Nicked flyer arms.

- In spinning :
  - Beards around guide bars,
  - Deep roller cuts,
  - Worn out rollers,
  - Blocked travellers,
  - Suction devices out of place (dry spinning).

One reason for the high end-breakage rate which not only incurs higher labour force than necessary but also produces bad yarn quality (high breakage rate throughout all the following process stages, which incurs an even higher labour force) lies surely in the bad condition of the rollers.

It is our opinion that for replacement material of rollers, only first class and suitable material should be used and accordingly maintained while in use.

The present condition of the rollers is not up to the standards required.

5.1.6 Summary of Mill Balance

5.1.6.1 Wet - Mill Balance

Table I

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of working days/year	268	268	268
Working hours/day	24	24	24
No. of spinning frames	22	22	22
No. of spindles	4.796	4.796	4.796
Spindle hours/year available	30.847.872	30.847.872	30.847.872
Machine: Spi - RPM max.	-	5.472	5.472
Ø run.	-	4.500	4.900
Plant efficiency in %	83.2	43	86
Product Mix: Linen %	19	19	19
Linen/Synth. %	62	62	62
Tow	17	17	17
Tow/Synth. %	2	2	2
Nm average	14.39	14.39	14.39
High-low	30-8	30-8	30-8
T/m Ø	373	373	373
α m	98	98	98
Production: tons/year	1327	685	1453
compared in %	100	52	109
Ø cops weight in gr	-	139	139
Ø bobbin weight in gr	-	1303	1303
Cops to doff/8 hours	-	6130	13.000
Bobbins to creel/8 hours	-	654	1387
EDP M SPH	-	1465	300
Ø spindle/spinner	-	135	600

5.1.6.2 Dry - Mill Balance

Table I

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spinning frames	8	8	8
No. of spindles	1554	1554	1554
Spindle hours/year available	9.995.328	9.995.328	9.995.328
Machine: Spi - RPM max.	8000	8000	8000
Ø/run.	4800	4800	5500
Plant efficiency %	76.6	72.6	80.0
Product Mix: Linen/Synth. %	1	1	1
Tow %	43	43	43
Tow/Synth. %	8	8	8
Synthetics %	48	48	48
Nm average	7.0	7.0	7.0
High-low	15-5	15-5	15-5
T/m	257	257	257
αm	97	97	97
Production: Tons/year	1229	1165	1467
Comparison in %	100	95	119
Ø cops weight in gr	350	-	350
Ø bobbin weight in gr	12.000	-	12.000
Cops to doff/8 hours	-	-	5.213
(Bobbin) to creel/8 hours	-	-	152
EDP M SPH	-	992	300
Ø spindles/spinner	-	205	650

5.1.6.3 Gill - Mill Balance

Table I

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of frames	1	1	1
No. of spindles	80	80	80
Spindle hours available	514.600	514.600	514.600
Expected gr/spindle	265	-	-
Average Nm	1.3	1.3	1.3
Production: tons/year	136.5	15.6	104
comparison in %	100	11	76

5.1.6.4 Wet and Dry - Summary Mill Balance

Table I

	Prod. Acc. to Theor. Efficiency of Hung. Lin. Ind.	Actual 1975	WERNER Proposal 1
No. of spindles	6.430	6.430	6.430
No. of frames	31	31	31
Spindle hours avail. x (10^3)	41.358	41.358	41.358
Expected gr/spindle hour	65.1	45.1	73.6
Average Nm	10.4	9.7	10.3
Production: tons/year	2.692	1865,6	3.024
comparison in %	100	69	112
Labour complement of person	259	259	255
Productivity: kg/work. hour	4.85	3.36	5.53
comparison in %	100	69 100	114 165

5.1.7 Summary of Labour Complement

Note: All direct personnel and all key functions contain a reserve of 15% to off-set absenteeism.

Table II

	Actual 1975				WERNER Proposal 1			
	Adm.	Dir.	Ind.	Sum.	Adm.	Dir.	Ind.	Sum.
Preparation	7	48	32	87	7	63	38	108
Spinning	6	96	27	129	7	51	38	96
Winding	3	26	10	39	3	32	12	47
Adm. and various	1	-	3	4	1	-	3	4
Total	17	170	72	259	18	146	91	255

Since WERNER's opinion, on what is direct or indirect, which indirect personnel belongs to which department, might differ from the actual labour complement, not too much weight should be placed on a departmental comparison but rather on the total complement.

5.1.8 Notes and explanations to substantiate the summary of the mill balance and labour complement.

5.1.8.1 General

Basis for all calculation data was the submitted WERNER forms S-100 to S-109.

We had to work under the assumption that the given data were correct. In calculating a mill balance, all production figures are based upon geometrical averages rather than the normal arithmetical average. Therefore, the possibility of having taken some incorrect figures from the submitted forms has been greatly reduced.

5.1.8.2 Spindle RPM

As one can see in the summary, the maximum spindle speed is not utilised. Based on our knowledge of flax and linen spinning, in both cases, wet and dry, we increased the average spindle speed from 4500 to 4900 RPM in wet spinning, from 4800 to 5500 RPM indry spinning.

5.1.8.3 Spinning Room Efficiency

BUDAPEST operates at the following efficiencies:

- LENFONO plan 1975 : 83.2%
- Actual 1975 : 43 %
- WERNER proposal : 86 %

The low actual 1975 efficiency is mostly due to labour shortage.

Our action plan to improve the efiiciency is as follows:

- New up-to-date bonus system
- Standard working procedures
- Operator training program
- Improving running condition of material
- Rigid maintenance program for the spinning frames
- Correct job distribution.

5.1.8.4 Production

Comparison based on LENFONO plan 1975, the actual achieved, and WERNER proposal 1.

Table III

Wet Spinning	Plan	=	100%	=	1327 tons
	Actual 1975	=	52%	=	685 tons, Nm 14.39
	WERNER 1	=	109%	=	1453 tons, Nm 14.39
Dry Spinning	Plan	=	100%	=	1229 tons
	Actual 1975	=	95%	=	1165 tons, Nm 7.0
	WERNER	=	119%	=	1467 tons, Nm 7.0
Gill Spinning	Plan	=	100%	=	136,5 tons
	Actual 1975	=	11%	=	15,6 tons, Nm 1.3
	WERNER	=	76%		104.0 tons, Nm 1.3
Summary	Plan	=	100%	=	2692 tons, Nm 10.4
	Actual 1975	=	69%	=	1866 tons, Nm 9.7
	WERNER	=	112%	=	3024 tons, Nm 10.3

Comparing these figures, one sees a realistic plan made by the LENFONO management, on which we can, nevertheless, improve by 12% and by average 43% compared with the actual 1975 level.

5.1.8.5 Spindle Allocation and End-breaks

Running conditions of the material, expressed in end-breaks per M spindle hours, is extremely bad.

An end-break rate of:

- 1465 per M spindle hours for wet spinning,
- 992 per M spindle hours for dry spinning,

exceeds any condition which could be regarded as "normal".

Obviously, running a spinning room under these conditions requires a high labour input, and it also decreases the running conditions in all subsequent process stages.

The following table will show the standards as they are maintained in the Western countries:

- Wet Spinning

Expected end-breaks/M spindle hours:

	Normal Mill	Very Good Mill	Bad Mill
Unbleached flax:			
- carded tow	20 x Nm	10 x Nm	40 x Nm
- long fibres	5 x Nm		
Prebleached flax:			
- carded tow	4 x Nm	-	10 x Nm
- long fibres	3 x Nm	-	5 x Nm

- Dry Spinning

	Normal Mill	Very Good Mill	Bad Mill
- Grey flax:	35 x Nm	15 x Nm	50 x Nm

- LENFONO Result

  - Wet spinning: 100 x Nm
  - Dry spinning: 166 x Nm

- WERNER proposes as an intermediate step to achieve the following results:

  - Wet spinning: 20 x Nm
  - Dry spinning: 40 x Nm

These results are conservatively estimated and can be achieved by the following course of action through the program outlined:

- Setting an optimum overall fibre yield in respect to raw flax. LENFONO achieves a yield of:

  - ca. 10% long fibre
  - ca. 17% short fibre

  ca. 27% in total

  which, in our opinion, is too high for quality yarn and optimal running conditions.

- Setting an optimum rejection rate at the threshing process in respect to high yield and good running conditions/good quality yarn.

- Setting, controlling and maintaining standard quality procedures in all preparatory stages.
- Rigid maintenance control on all equipment (standard routines, sequences, responsibilities, follow-up procedures).

Spindle Allocation

WERNER estimated an average of 600 spindles/spinner. This implies:

- Correct job diversification.
- Applied job responsibilities.
- Correct and standard working methods.
- Training program (also to lessen the impact of high labour fluctuation).
- Retraining of all skilled operators.
- Correct bonus system, based on effective individual performance (part of the large savings potential could be passed on to the labour force to off-set the higher wage rates in the neighbouring industry).
- All machines in good working condition (application of a tight controlled preventive maintenance system).

- Correct auxiliary equipment to make the most use of handling procedures.

- Bringing all processing stages and raw material input to the optimum in order to achieve the above mentioned end-break rate to an average of:

  - wet spinning : 20 x Nm
  - dry spinning : 40 x Nm

  expressed in EDPMSPH

APPENDIX

PLANT WERK BUDAPEST	YIELD	WERNER	FORM-No S-100

PROCESS	PROCESS STEP	Waste per process Input of 100 kg			Price /kg	Yield of 100 kg yarn			
		Total	reuse	Sale		%	reusable %	Input kg	Output kg
1	2	3	4	5	6	7	8	9	10
Dry spun tow	Carding	18		18		82		163.88	134.38
	Combing	14		14		86		134.38	115.56
	Drawing	5	5			95	5	115.56	109.79
	Spinning	8	8			92	8	109.79	101.01
	Winding	1		1		99		101.01	100.00
						61.02			
Wet spun line	Doubling	1.5	1.5			98.5	1.5	117.16	115.41
	Drawing	5	5			95	5	115.41	109.64
	Roving	2	2			98	2	109.64	107.45
	Spinning	6		6		94		107.45	101.01
	Winding	1		1		99		101.01	100.00
						85.35			
Hürzal	Drawing	2	2			98		104.64	102.55
	Spinning	2		2		98		102.55	100.50
	Winding	.5		.5		99.5		100.50	100.00
						95.50			

PLANT WERK BUDAPEST	SPINNING MACHINE SPECIFICATION	WERNER	FORM-No S-101

1	PLANT KOOP					
2	MACHINE MAKE	PM - 88 - L1	PM - 88 - L3	PM - 114 - L1	SPINNBAU	SPINNBAU
3	YEAR	1958	1964-1970	1963-1970	1966	1964
4	PROCESS	wet	wet	wet	dry	dry
5	No of MACHINES	9	5	8	7	1
6	SPINDLES / MACHINE	236	240	184	196	182
7	TOTAL No of SPINDLES	2124	1200	1472	1372	182
8						
9						
10	DOFFING SYSTEM	manual	manual	manual	manual	manual
1	TRAVELLING BLOWER	no	no	no	yes	yes
2	SPEED REGULATION	no	no	no	yes	yes
3	AUT.ENDSTOP cops full	no	no	no	yes	yes
4	INPUT TYPE	bobbin	bobbin	bobbin	can	can
5	CREEL SYSTEM					
6	SPINDLE DRIVE	spi tape	spi tape	spi tape		
7	SUCTION end breaks	no	no	no	yes	yes
8						
9						
20						
1	Max. SPINDLE RPM	5500	6000	5000	8000	800
2	GAUGE mm	88	88	114	102,4	102,4
3	RING - DIAMETER mm	C 62	NSC 62	HZ III 75	grain 80	grain 80
4	TUBE LENGTH mm	205	235	265	320	320
5	LIFT mm					
6	CHASE mm					
7	Ø FRONT ROLLER mm	38	38	44	38	38
8						
9	DRAFT ELEMENT Make					
30	DRAFT ELEMENT Type					
1						
2						
3						
4						
5	POWER NEED kW	14	14	14	20	20
6	NOISE LEVEL dB					

PLANT WERK BUDAPEST

SPINNING PRODUCTION DATA, COMPARISON

WERNER FORM-Nr S-107

PLANT	MACHINE MAKE	Type of spl-process	QUALITY Name	QUALITY Mix	QUALITY Nm	Nm rove	Draft	alpha metric	Turns/Meter	SPEED RPM fr.r	SPEED RPM Spl	SPEED DEL. m/min	DELIVERY gr/Sph 100%	DELIVERY eff %	DELIVERY gr/Sph exp	INDUSTRIAL ENGINEERING DATA Input gr	Cops gr	EDP NSPH	Spl/Spinner	PROD acc. to act. eff. 1975 No of M/C	No of Spl	Sp-hrs yrx10^3	tons year	ACT. PROD. 1975 tons	PLAN PROD. 1975 tons	WERNER - PRODUCTION No of M/C	Spl-hrs yrx10^3	tons year	COMP: Produc. acc. to act. efficiency = 100 ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	PN-33-L[illegible]	wet	Line	100 L	12	1.35	9.1	94	330		4020	12.2	61.0	83.2	50.75	1700	105	1363	157					20.8							
				15V/84L	12	1.35	9.1	94	330		4020	12.2	61.0		50.75	1700	105	1472	157					34.8							
				100 L	15	1.35	11.5	99	390		4600	11.8	47.2		39.27	1700	105	1540	157					6.7							
				12PAN/88L	15	1.35	11.5	99	390		4600	11.8	47.2		39.27	1700	105	1471	157					147.2							
				16PE/84L	15	1.35	11.5	99	390		4600	11.8	47.2		39.27	1700	105	1352	157					25.5							
				33PE/67L	15	2.60	6.0	99	390		4600	11.8	47.2		39.27	600	105	1120	236					7.7							
				6V/94L	15	1.35	11.5	99	390		4500	11.8	47.2		39.27	1700	105	1610	118					60.1							
				15V/84L	15	1.35	11.5	99	390		4600	11.8	47.2		39.27	1700	105	1650	118					11.8							
				100 L	18	2.80	6.7	98	426		4500	10.6	35.3		29.36	600	105	1450	118					.7							
			F_2	16PE/84L	18	2.80	6.7	98	426		4500	10.6	35.3		29.36	450	105	1210	157					5.1							
			F_2	67PE/33L	18	2.80	6.7	98	426		4500	10.6	35.3		29.36	450	105	1130	236					4.8							
				12PAN/88L	18	1.35	14.0	98	426		4500	10.6	35.3		29.36	1700	105	1340	157					7.1							
				6V/94L	18	2.80	6.7	98	426		4500	10.6	35.3		29.36	600	105	1080	118					55.5							
					15.14				398						37.27	1487		1498	147	9	2124	13602	509.5	387.8							
	PN-35-L[illegible]	wet	LineF_2	16PE/84L	21	2.30	8.4	95	460		4650	10.2	29.16		24.24	450	120	1184	160					16.1							
				100 L	24	2.60	9.4	95	490		4900	10.0	25.00		20.60	450	120	1244	120					1.3							
				16PE/84L	24	2.60	9.4	95	490		4900	10.0	25.00		20.60	450	120	1136	120					7.1							
				33PE/67L	30	3.00	11.0	90	520		4680	9.0	18.00		14.97	450	120	1118	240					5.8							
				67PE/33L	30	3.00	11.0	90	520		4680	9.0	18.00		14.97	450	120	1084	240					28.9							
					26.70				499						19.10	450	120	1174	201	5	1200	7710	147.9	59.2							
	PN-114L1	wet	Tow	100 L	10	1.45	7.1	90	316		4100	13.0	78.00		64.89	800	200	1530	92					114.4							
				67PE/33L	15	1.90	8.2	99	390		4500	11.5	46.00		38.27	800	200	1309	184					14.0							
			Line	100 L	6	1.10	7.6	90	234		4000	14.0	105.00		87.36	1700	200	1528	123					7.2							
				10V/34L	6	1.10	7.6	98	284		4000	14.0	105.00		87.36	1700	200	1580	123					11.2							
				100 L	8.5	1.10	8.0	90	293		4100	14.0	93.9		67.20	1700	200	1446	123					3.6							
				100 L	10	1.10	9.4	99	316		4100	13.0	78.0		64.89	1700	200	1460	92					87.6							
					10.12				317						70.83	1215	200	1492	100	8	1472	9467	670.6	238.0							
TOTAL		WET			14.79				373						42.40	1303	139	1465	135	22	4796	30849	1.327	685.0	756						

PLANT WERK BUDAPEST — SPINNING PRODUCTION DATA, COMPARISON — WERNER — FORM-No 5-102

PLANT WERK	MACHINE NAME	Type of spinprocess	QUALITY Name	QUALITY Mix	QUALITY Nm	Nm rove	Draft	alpha metric	Turns/Meter	SPEED RPM fr.r	SPEED RPM Spl	SPEED DEL. m/min	DELIVERY gr/Sph 100%	DELIVERY eff %	DELIVERY gr/Sph exp	INDUSTRIAL ENGINEERING DATA Input gr	Cops gr	EDP MSPH	Spl/Spinner	PROD. acc. to act. eff. 1975 No of M/C	No of Spl	Sp-hrs yrx10³	tons year	ACT PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION No of M/C	Spl-hrs yrx10³	tons year	COMP: Prod. acc. to act. efficiency = 100 ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	SPINNBAU	dry	Line	16V/84L	8	.36	22.7	113	325		5200	16.0	120	76.6	91.92	13000	350	1204	131					13.8							
			Tow	100 L	6	.24	24.6	115	280		5700	18.5	185		141.70	13000	350	1172	131					432.2							
				16V/84L	6	.24	24.6	115	280		5000	20.0	200		153.2	13000	350	1030	131					44.5							
				100 L	9	.41	21.7	115	345		5000	14.5	96.6		73.99	13000	350	1680	131					63.4							
				6V/94L	9	.41	21.7	116	345		5000	14.5	96.6		73.99	13000	350	1044	131					48.0							
			Synth	100 PAN	10	.41	24.6	79	252		5500	22.0	132.0		101.10	10000	350	464	392					251.3							
				100 PAN	15	.50	29.8	79	306		5500	18.0	72.0		55.15	10000	350	620	392					.2							
			műszál	100 V	6	.28	20.7	75	184		4200	23.0	230.0		176.19	10000	350	758	196					8.2							
				50Gy/50M	5	.25	19.6	88	195		4300	22.0	264.0		202.20	12000	350	1094	196					211.5							
				100 PAN	6	.28	20.7	75	184		3900	21.0	210.0		160.86	12000	350	1046	196					93.8							
[illegible]		DRY			7				257						123		350	992	205	8	1554	9995	1729.4	1104.9	1126						
	Flyer5ª	Gill	direct	84V/16PA	1.3	.19	6.7	73.5	84		660	8.1	378.8	70	265.18	10.000	800		80	1	80	514.6	136.5	15.6	16						
TOTAL																				31	6430	40843	2092.9	1065.5	1990						

PLANT WERK BUDAPEST	ROVING MACHINE SPECIFICATION	WERNER	FORM-NO S-104

1	PROCESS LINE	Line	Line		Tow	
2	MACHINE MAKE	Mackie 9"	RN-216-L1 12"		Mackie 9"	
3	YEAR	1925	1961		1925	
4	No of MACHINES	2	2		2	
5	SPINDLES / MACHINE	80	80		80	
6	TOTAL No of SPI	160	160		160	
7						
8						
9						
10	BOBBIN SIZE					
1	FLYER TYPE					
2	FLYER SIZE	228/114	305/152,5		228/114	
3	Max FLYER RPM	700	840		680	
4	GAUGE mm	228	305		228	
5	LIFT mm	228	305		228	
6						
7						
8						
9	DRAFT MAKE					
20	DRAFT TYPE					
1	Ø FR.ROLLER mm	38/54	50/70		38/54	
2	SUCTION endbreak	no	no		no	
3						
4						
5	STOP MOTION back	yes	yes		yes	
6	STOP MOTION front	no	no		no	
7						
8						
9						
30						
1						
2						
3						
4						
5						
6						

PLANT
WERK BUDAPEST

ROVING PRODUCTION DATA, COMPARISON

WERNER

FORM-No S-105

PLANT MODE	MACHINE NAME	QUALITY Name	QUALITY Mix	QUALITY Nm	Nm Input	Draft	alpha metr	Turns/Meter	SPEED RPM fr.r.	SPEED RPM Flyer	SPEED DEL. m/min	DELIVERY gr/Spl 100%	DELIVERY eff %	DELIVERY gr/Sph exp	IND.ENGINEERING DATA Input Weight kg	IND.ENGINEERING DATA Bobbin Weight kg	IND.ENGINEERING DATA EDP CSPH	IND.ENGINEERING DATA Spl/Operat.	PROD.acc.to act.eff. No of M/C	PROD.acc.to act.eff. No of Spl	PROD.acc.to act.eff. Spl-hrs year10	PROD.acc.to act.eff. tons year	ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION No of Spl	WERNER - PRODUCTION Spl-hrs year	WERNER - PRODUCTION tons year	COMP: Prod.act.eff.100 ACT	COMP: Prod.act.eff.100 PLAN	COMP: Prod.act.eff.100 WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Line	Mackie 9	Line 15	33PE/67L	2.6	.24	11	27.4	44.2		680	15.4	355.4	85	302.1	6	.600		160												
		Line 18	100 L	2.8	.28	10	27.1	45.4			15.0	321.4		273.2		.600														
		Line 18	16PE/84L	2.8	.28	10	27.8	46.5			14.6	312.8		265.9		.450														
		Line 19	67PE/33L	2.8	.28	10	29.2	40.0			13.9	297.8		251.1		.450														
		Line 18	6V/94L	2.8	.28	10	27.1	45.4			15.0	321.4		273.2		.600														
		Line 21	16PE/84L	2.8	.28	10	27.8	46.5			14.6	312.8		265.9		.450														
		Line 24	100 L	2.8	.28	10	27.1	45.4			15.0	321.4		273.2		.450														
		Line 24	16PE/84L	2.8	.28	10	27.8	46.5			14.6	312.8		265.9		.450														
		Line 30	33PE/67L	3.0	.35	9	27.4	47.5			14.3	266.0		243.1		.450														
		Line 30	67PE/33L	3.0	.33	9	29.2	50.6			13.4	268.0		243.1		.450														
														264.3					2	160	1029	272								
Line	RN-215	Line 8	100 L	1.1	.092	12	22.0	23.0		760	33.0	1600	81.5	1467	10	1.700		160												
		Line 8	16V/84L	1.0	.092	12	23.0	24.2			31.4	1712.7		1395.8		1.700		160												
		Line 8.5	100 L	1.15	.092	12	22.0	23.0			33.0	1600		1467		1.700		160												
		Line 10	100 L	1.10	.092	12	22.0	23.0			33.0	1800		1467		1.700		160												
		Line 12	100 L	1.35	.095	14	22.4	26.0			29.2	1297.7		1057.6		1.700		160												
		Line 12	16V/84L	1.35	.095	14	23.4	27.2			27.9	1240		1000.6		1.700		160												
		Line 15	100 L	1.35	.095	14	22.4	26.0			29.2	1297.7		1057.6		1.700		160												
		Line 15	12PAN/88L	1.35	.095	14	23.4	27.2			27.9	1240		1000.6		1.700		160												
		Line 15	16PE/84 L	1.35	.095	14	23.4	27.2			27.9	1240		1010.6		1.700		160												
		Line 15	6 V / 94L	1.35	.095	14	23.4	27.2			27.9	1240		1010.6		1.700		160												
		Line 15	16V/84 L	1.35	.095	14	23.4	27.2			27.9	1240		1010.6		1.700		160												
		Line 18	12PAN/88L	1.35	.095	14	23.4	27.2			27.9	1240		1010.6		1.700		160												
														1104.6					2	160	1029	1158.5								
Tow	Mackie 9	Tow 10	100 L	1.45	.215	6.75	38.2	46.0		680	14.8	612.4	80	489.9	7	.800		160												
		Tow 15	67PE/33L	1.90	.253	7.5	39.2	54.0			12.6	397.9		318.3																
		Direct	100 M	1.30	.192	6.75	71.8	62.0			8.3	383		306.4																
														371.5					2	160	1029	382.3								
TOTAL																			6	480	3087	1652.8	713.75 15.6 729.35	810.7 16 826.7				39.36	44.61	

PLANT WERK BUDAPEST	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-106

1	PLANT KOOP	Line	Line	Line	Line	Line
2	DRAWING PASSAGE	1-2 3-4	5	1-2 3-4	1-2 3-4	5
3	MACHINE MAKE	Technotex/Pushbar	Technotex	Mackie Pushbar	Mackie	Mackie
4	YEAR	1970 1962	1970 - 1962	1925 1963	1925 - 1928	1925
5	No of MACHINES	XV 1-2 XV 3-4	XV 5	XII 1-2 XII 3-4	XIII 1-2-3-4	XII 5
6	HEADS / MACHINE	4/1	4	2/1	2 3 4 4	4
7	TOTAL HEADS	2x2	8	1 2	2 6 4 16	16
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	8	4	6 8	8 4 8 2	2
4	Ø DELIVERY ROLL top	65	65	80 70	70	70
5	Ø DELIVERY ROLL bottom	56	56	60 50	50	50
6	Max RPM DEL.ROLL	26,3	26,3	14,6 17,5	17,5	15,9
7	Max.DEL.SPEED m/min	32/77	32	22/77	22	20
8						
9						
20						
1						
2	CAN SIZE INPUT	500/900	400/900	550/900 400/900	500/900 400/900	400/900
3	CAN SIZE OUTPUT	400/900	300/900	400/900	400/900	300/900
4	AUTOMATIC CAN CHANGER	no	no	no	no	no
5	STOP MOTION	yes	yes	yes	yes	yes
6						
7						
8						
9	POWER NEED kW	4,5	3,6	2,2	1,4	1,4
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK BUDAPEST	DRAWING MACHINE SPECIFICATIONS	WERNER	FORM-No S-105

1	PLANT KOOP	Line		Tow	Tow	Tow
2	DRAWING PASSAGE	Doubling		1-2	3-4	2-3
3	MACHINE MAKE	LP-500-L		Mackie Berh.T 10	Mackie Berh.T 20	Mackie Pushbar
4	YEAR	1962		1925 - 1966	1925 - 1966	1925 - 1966
5	No of MACHINES	XIII XIV XV		III 1-2 XXII 1-2 XXIII1-2	XXII 3-4 XXIII3-4	III 3-4
6	HEADS / MACHINE	2		4/1 4/1 3/1	4/1	3/1
7	TOTAL HEADS	3x2		3x1	2x4	2
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	12		12/4	8/1	4/3
4	Ø DELIVERY ROLL top	90		60	60	60
5	Ø DELIVERY ROLL bottom	75		40	40	40
6	Max RPM DEL.ROLL	12,3		17,5	17,5	26,7
7	Max.DEL.SPEED m/min	40		90	100	52
8						
9						
20						
1						
2	CAN SIZE INPUT	600/900		500/900	400/900	400/900
3	CAN SIZE OUTPUT	500/900		400/900	400/900	400/900
4	AUTOMATIC CAN CHANGER	no		no	no	no
5	STOP MOTION	yes		yes	yes	yes
6						
7						
8						
9	POWER NEED kW	3,6		4,5	4,5	2,2
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

PLANT WERK BUDAPEST	DRAWING MACHINE SPECIFICATIONS		WERNER		FORM-No S-106

1	PLANT KOOP	tow	tow	tow		
2	DRAWING PASSAGE	5	1	2		
3	MACHINE MAKE	Mackie	Berhardt T 10	Berhardt T 20		
4	YEAR	1925	1966	1966		
5	No of MACHINES	III/5	XXI	3 4 5		
6	HEADS / MACHINE	4	1	1		
7	TOTAL HEADS	16	1	3x4		
8						
9						
10						
1	DRAFT ELEMENT : Make					
2	DRAFT ELEMENT : Type					
3	Max. DOUBLINGS	2	10	2		
4	Ø DELIVERY ROLL top	60	./.	50		
5	Ø DELIVERY ROLL bottom	40	./.	40		
6	Max RPM DEL.ROLL	26,5	./.	88,5		
7	Max.DEL.SPEED m/min	16	90	100		
8						
9						
20						
1						
2	CAN SIZE INPUT	400/900	400/900	400/900		
3	CAN SIZE OUTPUT	270/900	400/900	400/900		
4	AUTOMATIC CAN CHANGER	no	no	no		
5	STOP MOTION	yes	yes	yes		
6						
7						
8						
9	POWER NEED kW	1,4	3,6	3,6		
30	NOISE LEVEL dB					
1						
2						
3						
4						
5						
6						

[illegible] BUDAPEST

DRAWING PRODUCTION DATA, COMPARISON

WERNER FORM-No S-107

				PRODUCTION DATA					DELIVERY				IND. ENGINEERING DATA			PRODUCTION acc. act. eff			ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION			COMP: Prod. act. eff=100		
PLANT [illegible]	MACHINE MAKE	DRAW. PASS.	QUALITY	Heads/ M/C	Doubl.	Input gr/m	Output gr/m	Draft	m/min 100 %	kg/M-hr 100 %	eff %	kg/M-hr exp	Input Can Wt. kg	Output Can Wt. kg	Heads/ Operat.	No of M/C	M-hrs/ year	tons year			No of M/C	M-hrs/ year	tons year	ACT	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
[illegible]	[illegible]	1	[illegible]	4	12-16	33	33	13,8	34	134,4	75	100,8	36	16,7	49	3	19,296	1945	790.1					41,07		
[illegible]	Mackle	1	16 100L	4	6	33	33	12			69		16,7	16,7		1	6,432									
	Pushbar	2	13 16PE	1	4	33	20	3,5	60	144		59,8	16,7	11,0	72	1		639,3								
	Mackle	3	18 6V	4	8	20	20	12					11,0	11,0		1										
	Pushbar	4	21 16PE	1	4	20	16	3,5	68	136		93,8	11,0	11,0	64	1		551,2								
	Mackle	5	24 100L	12	2	16	3,6	9,2	22	57		39,9	11,0	10,0	28	1		230,9								
			24 16PE																							
[illegible]	Mackle	1	15 33PE	2	8	26	23	9	17	47	69	29,6	16,7	8	55	1	6,432	190,4								
	Mackle	2	18 67PE	6	4	23	11	9	18	71		44,7	8	8	40	1		287,5								
	Mackle	3		3	8	11	11	8	20	40		25,2	8	8	25	1		162.								
	Mackle	4		16	2	11	3,1	7,2	16	47		29,6	8	6	40	1		190,4								
[illegible]	Mackle	1	30 33PE	2	8	26	23	9	17	47	69	29,6	16,7	8	55	1	6,432	190,4								
	Mackle	2	30 67PE	6	4	23	11	9	18	71		44,7	8	8	40	1		287,5								
	Mackle	3		3	8	11	10,6	8,4	20	39		24,6	8	8	25	1		150,2								
	Mackle	4		16	2	10,8	2,8	8	16	43		27,0	8	6	36	1		173,7								
																	ø:XIII/4	182								
[illegible]	Technotex	1	12 100L	4	8	33	33	8,7			69		16,7	16,7		1	6,432									
	Pushbar	2	12 16 V	2	2	33	25,6	2,46	63	193		121,6	16,7	15	64	1		782,1								
	Technotex	3	15 100L	4	8	25,6	25,6	6,5					15	15		1										
	Pushbar	4	15 12PAN	2	2	25,6	26	2,46	70	70		137,4	15	15	70	1		883,7								
	Technotex	5	15 16PE	8	4	26	10,8	10,2	28	28		91,4	15	10	72	1		587,9								
			15 6V																							
			15 16V																							
			18 12PAN																							
			8 100L																							
			8 16 V																							
			8,5 100L																							
			10 100L																							
[illegible]-Tow wet	Mackle	1	10 100L	4	6	18	18	4			72		10	10		1	6,432									
	Berh.T10	2	15 67PE	1	4	18	18,5	7,6	80	87		62,6	10	13	38	1		402,6								
	Mackle	3		4	4	18,5	18,5	5,06					13	13		1										
	Pushbar	4		2	3	18,5	14,9	3	46	82		59	13	13	38	1		379,5								
	Mackle	5		16	2	14,9	4,7	6	14	63		45,4	13	7	50	1		292								
Total wet-line																4	25,728	1292,8	714,1	622,8				[illegible]	[illegible]	
XXII-XXIII-Tow dry	Mackle	1	8 16 V	4	12	18	18	4	-		72		10	10		2	12,864									
	Berh.T10	2	6 100L-16V	1	4	18	22	7,6	80	105,5		76	10	13	46	2		977,6								
	Mackle	3	9 100L-16V	4	8	22	22	5 8					13	13		2										
	Berh.T20	4		4	1	22	4,2/2,5	[illegible]	90	91 53		65.5 38.1	13	13	[illegible]0 / 24	1 - 1	[illegible]	[illegible] 245								
[illegible] XXI	Berh.T10	1	10		7	20	22	6,6	70	92		66,2	10	8	60	1	6,432	425,8								
	Berh.T20	2	15 100PAN		1	22	2,45	8,95	90	53		39,1	8	10	30	2	12,864	490								
[illegible] XXI	LS-IA T	1	5 500y/50M		5	28	20	6,95	55	66		47,5	8	8	45	1	6,432	305,5								
	Berh.T10	2	6 100PAN		6	20	22	6,6	70	92		66,2	8	13	40	1		425,8								
	Berh.T20	3	6 100V		1	22	4	5,51	90	86		61,9	13	12	40	1		393								
[illegible]																5	32,100	1554,3	1226,3	1217,6				78,50	78,00	

PLANT WERK BUDAPEST	COMBING MACHINE SPECIFICATION	WERNER	FORM-No S-108

No	Item					
1	PLANT KOOP					
2	MACHINE MAKE	Textima + Pushbarny				
3	YEAR	1959 1962				
4	No of MACHINES	2x10 2x1				
5	Max NIPS / MINUTE	94				
6	No of HEADS / MACHINE	10				
7	DRAFT ELEMENT Make	Pushbar				
8	DRAFT ELEMENT Type					
9	Ø DELIVERY ROLLER mm	81				
10	Max RPM DELIVERY ROLLER	31,4				
1	Max DELIVERY SPEED m/min	8,1				
2						
3						
4						
5						
6						
7						
8	QUALITY		Nm 9 tow	dryspun		
9	CIRC.COMB - Position					
20	- No of n.bars					
1	- Density					
2	- Needle type					
3	FIX.COMB - Thickness					
4	- Length mm		7			
5	- needle/cm		18			
6	- needle type					
7						
8						
9	CAN SIZE	500/900				
30	AUTOMATIC CAN CHANGER	no				
1						
2						
3						
4						
5						
6						

PLANT WERK BUDAPEST

COMBING PRODUCTION DATA, COMPARISON

WERNER

FORM-No S-109

PLANT [illegible]	MACHINE MAKE	QUALITY	PRODUCTION DATA: Doubl	Input gr/m	Output gr/m	Draft	% Waste	DELIVERY: m/min 100 %	kg/M-hr 100 %	eff %	kg/M-hr exp	IND.ENGINEERING DATA: Net Wt. Lap kg	Net Wt. Output kg	Machine /Operat	PROD acc.to act.eff: No of M/C	M-hrs year	tons year	ACT. PROD 1975 tons	PLAN PROD 1975 tons	WERNER - PRODUCTION: No of M/C	M-hrs/ year	tons/ year	COMP: Prod.act.eff=100: ACT	PLAN	WERNER	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	Textima-Pushbar	Nm6 T dry	2x6	240	13		12	6.1	4.75	85	4.04	7		10	2x10	128.040	519.7	255.9								
		Nm9 T dry	5	13	17.7	3.5		21	47.5		40.4		12	1	2	12.804	519.7	255.9	410				49.2	78.8		

PLANT BUDAPEST | WINDING SPECIFICATIONS, PRODUCTIVITY | WERNER | FORM-No W-106

PLANT	PROCESS	MACHINE MAKE	DESCRIPTION	Spindles/ Machine	MATERIAL		End breaks/ kg yarn	% WASTE	INPUT		OUTPUT		Spindles/ Operator	PRODUCTION 1975 km x 10^3	WORKING HOURS 1975			PRODUCTIVITY in km/hour		
					Nm	Mix			Form	gr	Form	gr			DIRECT	INDIRECT	TOTAL	DIR	IND	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Winding	Schlafhorst	wet spun (dye cones)	60	10	100 L	1.5	.8	cop	200	cone	1000	30							
					12	100 L	1.8			200										
					15	100 L	2.9			105										
					15	12 PAN/88 L	2.2			105										
		Elitex	dry spun	48	10	100 L	1.0	.5	cop	200	cone	1200	24							
					12	100 L	1.5			700										
					12	16 V/84 L	1.8			200										
					15	100 L	3.0			105										
					15	16 V/84 L	3.9			105										
					15	12 PAN/88 L	2.0			105										
					15	16 PE/84 L	1.8			105										
					18	100 L	3.9			105										
					18	16 PE/84 L F_2	3.5			105										
					21	16 PE/84 L F_2	4.0			120										
					24	16 PE/84 L F_2	6.6			120										
					24	100 L	10.0			120										
					30	33 PE/67 L F_2	12.0			120										
					30	67 PE/33 L F_2	5.6			120										
					10	100 PAN	2.0			350										
														11208,9	64.746	12.454	77.200	173,12	900	145,19

PLANT B U D A P E S T

W I N D I N G   P R O D U C T I O N D A T A , C O M P A R I S O N

WERNER FORM-No W-109

PLANT	PROCESS	MACHINE MAKE	MACHINES Total	MACHINES In Op.	SPINDLES Total	SPINDLES In Op.	SPINDLES %	MATERIAL Nm	MATERIAL Mix	DELIVERY m/min 100 %	DELIVERY km/Sph 100 %	DELIVERY eff %	DELIVERY km/Sph exp	PRODUCTION in km x 10^3 1975 EXPECTED	ACTUAL	PLAN	WERNER, PRODUCTION 1975 Spindles	% eff	Production	COMP: exp.1975 = 100 ACTUAL	PLAN	WERNER
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Winding	Schlafhorst	3	2	180	120	67	10	100 L	180	10.8	55	5.94									
								12	100 L													
								15	100 L													
								15	12 PAN/88 L													
		Total												4584,473								
		Elitex	3	3	144	144	100	10	100 L	400	24.0	62	14.88									
								12	100 L													
								12	16 V/84 L													
								15	100 L													
								15	16 V/84 L													
								15	16 PE/84 L													
								15	12 PAN/88 L													
								18	100 L													
								18	16 PE/84 L F_2													
								21	16 PE/84 L F_2													
								24	16 PE/84 L F_2													
								24	100 L													
								30	33 PE/67 L F_2													
								30	67 PE/33 L F_2													
								10	PAN 100													
		Total												13781,975								
		GRAND TOTAL												18366,448	11200,900							

110116

VOLUME VI OF VI

HUNGARIAN LINEN INDUSTRY

UNIDO Contract No. 76/41

Project No. IS/HUN/95/013

WERNER INTERNATIONAL
MANAGEMENT CONSULTANTS

VOLUME VI OF VI

HUNGARIAN LINEN INDUSTRY

Submitted to:

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO Contract No. 76/41

Project No. IS/HUN/95/013

Prepared by:

WERNER INTERNATIONAL

Brussels - New York

1977

TABLE OF CONTENTS

		Page
6.0	HUNGARIAN LINEN INDUSTRY	1.
6.1	Marketing and Planning	1.
6.1.1	An Overview	1.
6.1.2	Planning	2.
6.1.2.1	Planning Methods	2.
6.1.2.2	Annual Plan	2.
6.1.2.3	Quarterly Plan	2.
6.1.2.4	Basis of Decision	3.
6.1.2.5	Deliveries	3.
6.1.2.6	Controls for Corrective Action	3.
6.1.2.7	Flexibility - Meeting Market Demand	4.
6.1.2.8	Analysis of Planning and Results Achieved	4.
6.1.2.9	Summary	6.
6.1.3	Products	7.
6.1.3.1	Constructions	7.
6.1.3.3	Design and Product Development	9.
6.1.4	Pricing and Profitability	11.
6.1.4.1	Summary	11.
6.1.5	Commercial Section - Marketing	14.
6.1.6	Export Sales to Western Countries	16.
6.1.6.1	Deliveries and Distribution Channels	17.
6.1.6.2	Designs	18.
6.1.6.3	Coupon Service	18.
6.1.6.4	Contingencies	18.
6.1.6.5	Prices	18.
6.1.6.6	Products - Market Comments/Demands	19.
6.1.6.7	Summary	20.

TABLE OF CONTENTS

		Page
TABLES		
I	Analysis of Planning and Results Achieved, 73-2 and 73-3 Fabrics Only	5.
II	Standard Qualities	8.
III	Exports - Loss Analysis	12.
IV	Profit and Loss Analysis	13.

6.0 HUNGARIAN LINEN INDUSTRY

6.1 Marketing and Planning

6.1.1 An Overview

In 1975 the company produced approximately 25 million metres excluding non-wovens, hoses and made-up articles. Distribution by fibre was:

- 60% linen type,
- 40% cotton type.

Sales amounted to 24 million metres with an export element of 22%.

The difference of one million metres between production and sales can most likely be found in a reserve production for export (see sheet 352).

The number of items in the range is estimated to be over 500. The domestic price list contains 389 items of which fabric groups 73-2-3-4 absorb 305 items. The export price list is also very extensive, but many fabrics are of a special construction, others are also sold in Hungary.

The production of individual fabrics does not appear to be confined to one mill per fabric construction. Most fabrics are produced in three different mills.

6.1.2 Planning

The single, most important feature of the organisation is the planning system, not only because of the effect on production but also because the lack of fast reaction to market demands limits the sales potential considerably, particularly so for exports to Western countries.

6.1.2.1 Planning Methods

6.1.2.2 Annual Plan

The commercial department produces an "Annual Plan" in detail per fabric. The advantage of this plan is mainly for the purpose of planning fibre consumption.

6.1.2.3 Quarterly Plan

The "Quarterly Plan" is produced by the commercial department some 45-60 days before the commencement of each quarter. It summarises the customers' requests and orders; it incorporates the department's judgement of the current market demands; it includes sales by contract estimated at 50-60% (including export contracts). Exports, in general, are not part of this plan. Exports are determined per product group only (not per fabric). Export quantities are given in form of a quota to the mill. Specifications are given by Hungarotex.

The mill (total mill planning) notifies the commercial department of its acceptance or rejection of the details of the plan. Variances from the plan must then be negotiated by the salesmen.

6.1.2.4 Basis of Decision

The personal judgement of the sales department is the basis, there is no formalised information system covering market movements and statistics.

6.1.2.5 Deliveries

Customers are required to give orders six weeks before the start of the quarter, and deliveries are then quoted during the quarter. This could mean four months delivery from the date of order. We understand that 8-10% of all orders are late delivered. For exports, late deliveries can rise to 30%. This is presumably due to the short term deliveries expected by importers in Western countries. The sales department does not seem to have adequate means to control deliveries. This applies to domestic sales as well as exports.

6.1.2.6 Controls for Corrective Action

Information of changes, late deliveries, second quality, non-production etc. are in the hands of the mill planning department. The commercial department does not seem to receive variance information quickly enough to take corrective action. As an example: the production of first quality goods in the linen and cotton sectors 73-3, 73-2 amounted to 86% and 81% respectively. The mill gives a scale of rejects which the salesmen have to sell accordingly. Variances from the quarterly plan are considerable. Customer service and control would be virtually impossible without the use of an extremely fast reacting control system by the commercial department.

6.1.2.7 Flexibility - Meeting Market Demand

The quarterly planning system does not allow for the means of meeting varying market demands. The commercial department has the opportunity to use its market judgement once every three months when composing the quarterly plan, but after that the goods available depend largely on the reaction of the mill planners. Mill planners have no direct contact with the market. Their decisions can, therefore, not be expected to aim at the efficient disposal (sales) of goods. Efficient sales give the opportunity of optimizing production efficiency.

6.1.2.8 Analysis of Planning and Results Achieved

The enclosed statistics, Table I, show the following results in 1000 square metres.

Major items 72-2, 73-3 only are included:

Annual plan	18.491	
Quarterly plan	16.934	(4 quarters)
Export production (presumably planned)	7.683	(incl. reserve 1053,6)
	24.617	
Total production	25.110	
Total sales	24.164	(domestic 18.839, export 5.325)
Discrepancy production-sales	964	

The discrepancy can be traced to the reserve production for export, probably second quality.

Table I

ANALYSIS OF PLANNING AND RESULTS ACHIEVED, 73-2 AND 73-3 FABRICS ONLY

1975 LENFONO - BUDAKALASZI SZOVOGYAR - GYORI SZOVOGYAR - CSILLAGHEGYI SZOVOGYAR

End-Use Fibres	Code No.	Annual Plan	Plan 1st Qtr.	Plan 2nd Qtr.	Plan 3rd Qtr.	Plan 4th Qtr.	Total 4 Qtrs.	Quarterly Plan as % of Annual Plan	Product 1000
73-2 Cotton type/not containing linen								m2	
Apparel fabrics	21	1400	370,0	351,9	707,2	595,0	2024,	+ 44,6	3267
Furnishing fabrics	25	700	175,1	147,9	243,9	120,5	687,	- 1,8	1613
Tarpaulins/awnings	27	920	413,8	397,2	324,5	436,6	1572,	+ 70,9	3258
Technical fabrics	28	3258	506,5	501,9	664,4	368,4	2041,	- 37,2	2130
		6278					6324,	- 0,7	10269
							37.3		= 40,9 tot. ex others
73-3 Linen Type									
Apparel (linen)	31	7250	1900,3	1864,6	1454,3	1089,3	6308,5	- 13,0	6202
Linings	32	990	241,2	407,8	360,3	26,0	1035,	+ 4,6	1491
Bed sheetings	33	468	84,5	156,4	77,0	16,2	334,1	- 28,6	401
Tea towels - table linen	34	411	85,4	104,4	-	4,8	194,6	- 52,7	9
Furnishing/household	35	900	255,0	207,8	205,2	194,0	862,0	- 4,2	2405
Mattress/Upholstery/Covers	36	736	231,5	205,2	172,0	332,1	940,0	+ 27,8	904
Tarpaulins	37	900	115,7	132,8	86,1	93,9	428,5	- 52,4	401
Technical fabrics	38	118	25,5	2,9	-	2,2	30,6	- 74,1	513
Apparel(hemp fabrics)	42	400	108,5	140,0	61,5	122,0	432,0	+ 8,0	443
Various	39	40	-	23,0	10,0	10,0	43,0	+ 7,5	1977
		12213					10609,4	NA	
							= 62,7	- 13,1	14840
									= 59,1 total
Total		18491					16934,2	- 8,4	25101
								less prod.f.exp.	7681
								Prod. domestic	1742
									73 - Other 73 - 2
									Total P
									Export excl.
Excluding Hoses " Maradek (320/an)	320	110,0	95,0	110,0	35,0				

SECTION 1

LY

YI SZ CGYAR

Plan 4th Qtr.	Total 4 Qtrs.	Quarterly Plan as % of Annual Plan	Production 1000 m2	Variance from Qtrly. Plan - %	Sales Domestic	Export Sales	Total Sales	% - Variance Sales/Prod.	Export Production
		m^2		m^2				m^2	
595,0	2024,1	+ 44,6	3267,4	+ 61					
120,5	687,4	- 1,8	1613,2	+134,7					
436,6	1572,	+ 70,9	3258,0	+107,2					
368,4	2041,2	- 37,2	2130,6	+ 4,4					
	6324,8	- 0,7	10269,2	+ 62,4	7702,8	2248,2	9951,0	- 3,1	
	37.3%		= 40,9% of tot. excl. others 1,5	= 3944,4 in 1000 m^2	= 40,9%	=42,2%	= 41,2%		
1089,3	6308,5	- 13,0	6202,2	- 1,7					
26,0	1035,3	+ 4,6	1491,5	+ 44,1					
16,2	334,1	- 28,6	401,1	+ 20,1					
4,8	194,6	- 52,7	99,9	- 48,7					
194,0	862,0	- 4,2	2405,3	+179,0					
332,1	940,8	+ 27,8	904,8	- 3,8					
93,9	428,5	- 52,4	401,7	- 6,3					
2,2	30,6	- 74,1	513,3	+1577,5					
122,0	432,0	+ 8,0	443,1	+ 2,6					
10,0	43,0	+ 7,5	1977,6	+4499,1					
	10609,4	NA							
	= 62,7%	- 13,1	14840,5	+ 39,9	11135,9	3076,9	14212,8	- 4,2	
			= 59,1% of total	= 4231,1 in 1000 m^2	= 59,1%	=57,8%	= 58,8%		
	16934,2	- 8,4	25109,7	+ 48,3	18838,7	5325,1	24163,8	- 3,8	7682,7
		less prod.f.exp.	7682,7	=81755,5 m^2 000	= 77,96% of tot. sales	=22,04% of tot sales			
		Prod. domestic	17427,0						

	25109,7
73 - 47	40,3
Others	2952,4
73 - 29 "	1,5
	28103,9
	2952,4
Total Prod.	25151,5

non woven/Hoses/Confection

excluding non woven
Hoses
Confection

Export production
excl. reserve 6629

SECTION 2

6.1.2.9 Summary

- Variance annual plan/quarterly plan = 8.4%
- Variance production and quarterly plan
  . per product group (column 9, excl. technical fabrics) = 49% to 179%
- Variance sales/production total = -3.8%
- Variance sales/production
  . domestic = +11.24%
  . export = -19.7%

It can this be seen that the quarterly plan has little resemblance to the quantity per product group produced by the mills.

Exports are not included in the quarterly plan, hence it serves little purpose for production planning, note the great variances. It serves only as a guide for domestic deliveries and as part of total productive planning.

The planning system incorporates marketing plans once every three months. It is based on three-monthly periods. Market demands, however, change more frequently.

For export purposes, the long period presents a severe handicap in as much as it is out of gear with the planning and budget period commonly used in Western countries where all budgeting is done by the month. As a result, it is unlikely that exports to Western countries can be increased to an extent unless means are found to use monthly planning periods for sales, production and deliveries. Such a changed planning scheme could be introduced for part of the mill capacity. Success could be expected in export markets provided that marketing techniques are introduced to enable service to be given to customers with regard to offers, deliveries, sampling, product development, design and distribution. Wholesalers and makers-up (confection) could then be expected to be amongst the company's customer categories as they could then be serviced in the manner they expect.

6.1.3 Products

14% to 20% of all fabrics are not of first class quality. 33% of cotton type apparel fabrics are rejects. These percentages are so high that efficient marketing is practically impossible.

6.1.3.1 Constructions

There appear to be many very similar constructions. Construction should be examined with a view to:

- Reducing the number of items.
- Reducing costs.

Standard Items

Some twelve million metres are expected to sell throughout the year. This is an excellent opportunity to achieve efficient production. An effort could be made to increase the sale of these items, maybe for exports. In view of the long runs, efficient planning could be instituted with the resultant good service to customers. This, of course, is subject to a profitability test. A list of the items is enclosed.

Table II

STANDARD QUALITIES		1977	≈ 1976
231-02	Militär	1.800 cm^2	1.300
229-03	"Aarmer" (name) Jeans Ladies Printed	1.800 cm^2 100 " 1.900 cm^2	1.500
521-19	100% cotton Base cloth Coated Fabric	2.000 cm^2	1.800
801-01	Rubbercoated 100% cotton Regenmantelstoffe 100% Cotton	800 cm^2	∅
	Berufsbekl. Munkaruha	5.000 cm^2	6.000
		11.500	10.600

6.1.3.3 Design and Product Development

1. First selection of fabric and colour ideas are made by the commercial department both for the domestic and export markets.

2. The selection is sent to the design section who interpret and add their own ideas.

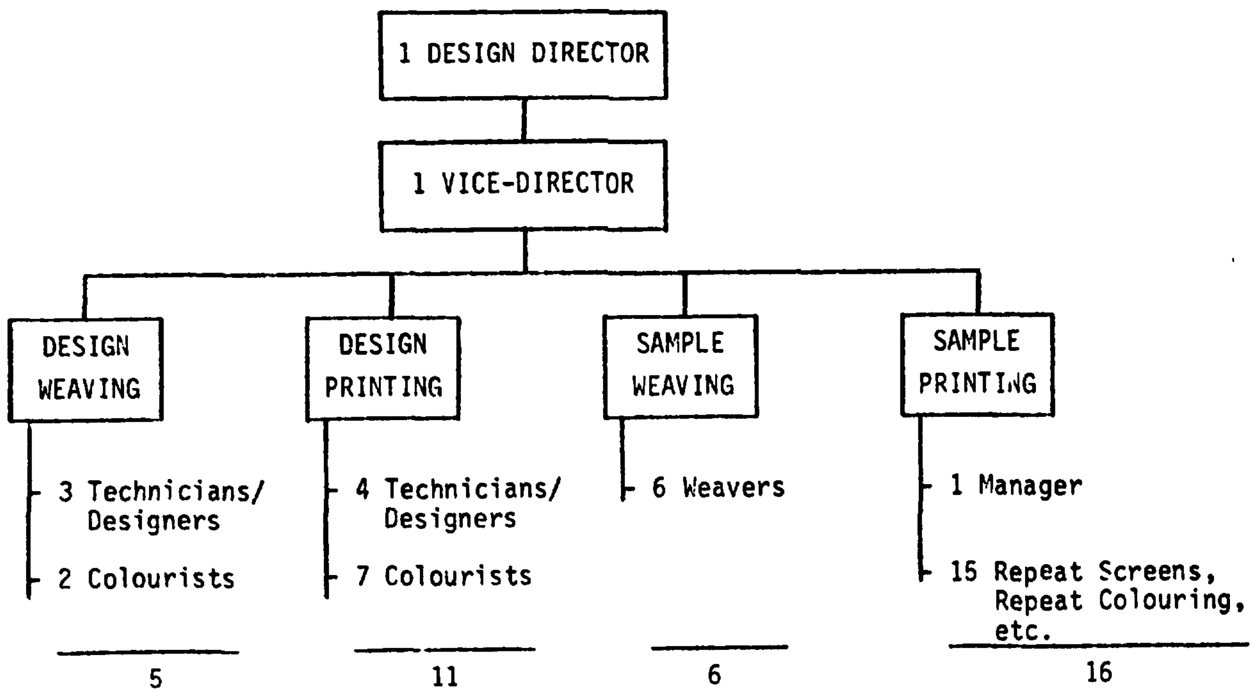
3. The collection is then submitted to a jury consisting of:

   - The managing director,
   - The commercial section,
   - Production,
   - Costing.

4. The approved items are produced on a trial basis to the extent of 500 metres approximately.

5. Trial sales follow.

DESIGN AND FABRIC DEVELOPMENT



TOTAL STAFF : 40

6.1.4 Pricing and Profitability

Pricing is based on a standard cost system. Some percentages are included by direction. The direct cost system (contribution to fixed cost) is not used. The following profit analysis is based on information supplied by the company. As costs are not built up on a basis of contribution to fixed costs, judgement on individual fabrics may be distorted. It would be difficult to evaluate the value of each fabric to the productive process in each mill. Neither customer categories nor individual contracts can be evaluated as to their contribution to the total profitability. Further, quantity planning in view of achievable prices is not reliable. Nevertheless, the following summary and tables III and IV form the basis of taking steps with a view to streamlining the range and improving its profitability.

6.1.4.1 Summary

	244	items show a profit,
of which	31	items produce 73% of the profit.
8 of the	31	items produce 36% of the profit.
	32	items produce a loss of 40.5 million FT.

If costing is to be used as a managerial tool, the introduction and use of the direct costing system would serve more efficiently.

Exports - Loss Analysis

(Part of production only appears to include most major items).

852.8 metres - 15% of total - were sold at a loss of 22.14 FT/ metre. 15 fabrics were involved and were sold at a total loss of 18878.2 FT = 49.6% loss on sales.

Table III

Domestic - in 1000's by Loss Factor						
Sales Value	m^2 Produced	∅ Price	Loss/m^2 FT	Total Loss - FT	No. of Fabrics	% Loss on Sales
81.715	1.938	42.16	15.65	30.328	11	37%
31.656	691	45.81	7.75	5.361	7	16.9%
53.107	1.141	46.54	4.22	4.821	14	9.1%
50.889	956	53.26	4.52	4.325	NA	8.5%
Σ 217.367	4.726	45.99	9.49	44.835	NA Est. 150	20.6%

NA = not available

Marginal Results

24 fabrics produced a profit of 2.8% average, and could therefore be regarded as borderline cases. These fabrics might easily become loss fabrics.

Profit and Loss Analysis

(Part of production only - appears to include most major items)

Table IV

Domestic - m 1000 by Profit in Sales							
	Sales Value	m^2 Produced	ø Price	Profit m^2 - FT	Total Profit	No. of Fabrics	ø % Profit on Sales
	164.284	3.281	50.07	1.90	6.226	24+	3.8% (0-5%)
	381.290	6.531	58.38	7.88	51.481	44	13.5% (10-15%)
	176.319	3.962	44.50	8.24	32.655	29	18.5% (15-20%)
	329.740	4.854	67.93	22.69	110.131	74	33.4% (20%+)
Profit Items	Σ 1051.633	18.628	56.45	10.76	200.493	NA	19.1% Profit Items
Loss Items	Σ 217.367	4.726	45.99	(9.49)	(44.835)	NA	(20.6) Loss Items
Total	1269.000	23.354	54.34	6.67	155.658	NA	+12.3 Total

6.1.5 Commercial Section - Marketing

This section covers all marketing activities with the exception of direct export sales which are in the hands of Hungarotex. Coordination with Hungarotex is, however, the responsibility of the commercial section.

The function of the section can be seen on the diagram on the following page.

The section proposes items for the collection but is not responsible for sampling.

Targets for individual salesmen are not set on a long term basis.

Feed-back reporting in a methododical and systemized manner is not practised.

The section is responsible for producing annual and quarterly plans, details of which are described in the chapter "Planning".

Forecasting is based on personal experience and is not combined with expected financial results.

COMMERCIAL SECTION - MARKETING

- DEPUTY MANAGING DIRECTOR
  - DIRECTOR OF SECTION
    - DOMESTIC
      - 6 Administration
      - 6 Salesmen
    - EXPORTS
      - 3 Salesmen
      - 5 Coordination with Hungarotex
    - MARKETING SPECIFIC ACTIVITIES
      - 4 Advertising, Research, Statistics
    - SALES/PRODUCTION COORDINATION COLLECTION PROD. SAMPLES
      - 2 New Products
      - 5 Sample room
    - AGENTS SUPERVISION
      - 1 Manager
      - 2 Agents, Salesmen of New Products

TOTAL NO. OF SALESMEN : 9

TOTAL NO. OF PERSONNEL INCL. SALESMEN : 35 (excl. Dep. M.D.)

6.1.6 Export Sales to Western Countries

Hungarotex Trading Company is responsible for all export sales.

The company makes available a volume quota per product group but not by individual fabric. Constructions are also given by the company but Hungarotex modifies the constructions in many cases and plans the volume per fabric. Designs are exclusive to Hungarotex.

In many cases, the customers supply their own designs. Acceptance is subject to minimum quantities being ordered which they state are as follows:

- Own design : 8000 m^2 per design
- Yarn dyed : 1000 m^2 per warp
- Collection design : 2000 m^2 - 1000 m^2/colour.

Prices are limit prices, that is, minimum prices acceptable. Subsidies are deducted prior to setting the limit price. Where prices achieved are higher, the excess price is shared 70% company, 30% Hungarotex. A 2% allowance is made for administration by Hungarotex.

Communications between the company and Hungarotex seem to work well.

The following companies were interviewed in order to test the export potential for Lenfono products:

- Goldsoie S.A., Paris
- Tago Textil Aussenhandel Ges.
- Gallion, Echterdingen
- Emil Meyer, Stuttgart
- Südbund, Sechselberg
- Sutex, Sindelfingen
- Konforma, Hanover
- Kupferrot, Munich
- T.A. Ernst, Cologne
- Lutz Knapf, Deizisau
- Otto Purer, Vaihingen

6.1.6.1 Deliveries and Distribution Channels

Most potential customers not only required quick delivery but stock replacement for lines adopted. This applies to furnishing fabrics where we considered the best chances lie. As stated previously, all transactions take place on a monthly basis with relatively short delivery terms. Exact deliveries are taken for granted. Lenfono cannot meet these conditions if the present planning methods are applied. It follows, therefore, that trading companies geared up for long term trading and mills or department stores - for opening orders only - are the only suitable outlets. Wholesalers who have a considerable share of the market, estimated over 50% for furnishing fabrics, would, however, not be interested. Makers-up (confection) require a sampling service of 2-3 weeks as compared with the 3-6 months now being given by Lenfono.

The present quarterly planning system makes deliveries on a monthly basis practically impossible unless stocks are accumulated. In the circumstances it is not surprising that customers in Western countries complain of inaccurate deliveries.

6.1.6.2 Designs

Designs in Western countries differ from those used in Hungary and from each other. France is particularly sensitive in that respect. This problem, however, could be overcome by employing local designers provided adequate sampling could be made available within three weeks.

6.1.6.3 Coupon Service

Coupons are used by customers for selling prior to deliveries of bulk goods. In most cases, delivery within 2-3 months from receipt of order is requested. Lenfono deliveries are made between 3-6 months.

6.1.6.4 Contingencies (Limits in Value)

Limitations of importation exist in some countries, i.e. France. The definitions should be studied, changes in fibre distribution of fabrics supplied or destination by end-use can alleviate this problem to some extent.

6.1.6.5 Prices

Prices do not seem to present an obstacle to increasing exports.

6.1.6.6 Products - Market Comments/Demands

The demand for linen has declined to some extent. Ease of washability and lack of adequate crease resistance are the major reasons. The company's crease resistance finish is said to be inadequate. More mixtures with man-made fibres would probably reduce this problem.

Analyses of some items by end-use:

1. Apparel

   Inadequate crease resistance process, inadequate service (see deliveries).

2. Printed Furnishing Fabrics

   Good chance subject to service, sampling, delivery, design (previously mentioned).

3. Table Cloths

   Quality is not regular. There are too many flaws. Quality is particularly important for table cloths as flaws are easily seen.

4. Tea Towel, Cocktail Towels

   There is a strong demand for half-linens. Sales could be increased particularly in Germany.

5. Grey Goods

   There is a demand for grey goods, but supplying this item may not be in the interest of the company.

6. Technical Fabrics

These must be according to standard specifications applicable to each country. As an example: fabrics which do not meet the DIN standard are not saleable in Germany.

6.1.6.7 Summary

Major Obstacles to Increasing Exports

The company's planning system is out of gear with the buying cycles of Western importing countries. As a result, the company finds it difficult to meet expected service standard.

The volume of goods that does not meet first quality standards is so high that deliveries must suffer to a non-acceptable degree.