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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

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FINNISH JOINERY INDUSTRY[1]

by

The Finnish Joinery Factories Association
Finland

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FINNISH JOINERY INDUSTRY

A short orientation and some statistical as well as other information.

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1. SHAPE OF THE INDUSTRIAL GROUP IN THE FIELD OF ACTIVITIES OF HOUSEBUILDING

As a part of mechanical wood-conversion industry the joinery industry of Finland is a somewhat clear-cut industry, serving housebuilding production.

It is by joinery industry that most of the following articles needed by housebuilding industry, are delivered:

- Windows
- Doors (flush doors and panelled doors)
- Wooden storage units (kitchen equipments and wardrobes)
- Other wooden fixtures, such as window benches, flights of stairs, banisters etc.
- Certain wooden building components, such as glued beams, roof trusses, light wooden partitions and so on.

About 43 per cent of the wooden storage units (kitchen equipments and wardrobes) are, however, delivered by furniture industry as can be seen from the statistics of production (supplement 4) and on the other hand minor quantities of windows and doors, as well as some wooden components are delivered by the prefabricated house industry.

The current technique of housebuilding leaves its mark on the production of joinery industry. Up to the beginning of the 1960's it was the traditional technique of housebuilding, as it is called, consisting in building one house at a time, that was predominant in Finland.

Consequently the products were mostly delivered to the place of construction "in white" or at the very most (made) rot - restisting; latching, fitting, and painting work were done in the place of construction.

Thus, in a way, manufacturing taking place in a factory was left at the stage of incompleted process to be completed by others in the place of contruction.

Even the responsibility for the completed product used to fall on several parties.

The requirements imposed on joinery industry by the industrialization of housebuilding are, however, different, because it is considered necessary to locate manufacturing process in places with the best possibilities of making use of the adventage of methods of manufacturing by which time and costs can be saved.

With regard to the products of joinery industry this at best means that they can be delivered from the factory completely ready to be installed in the place of construction.

On account of this trend of development the contribution of joinery industry to housebuilding industry as to materials and manufacturing process is increasing, particularly, because the manufacturers attend to the installation of fully completed products.

How large is the share of joinery industry articles here?

It varies from 9 to 15 per cent of the building costs depending on the stage of completion.

In case windows and doors are delivered ready to be installed, that is to say, latched and fitted in frames, painted and glazed and the storage units latched and painted, the share of these articles of the actual cost of building amounts to 15 per cent.

Windows are always delivered hinged and latched and very frequently painted. Wooden storage units are also in most cases delivered with hinges and locks and painted. It might be mentioned that the share of ready-painted windows of the total production of the whole coutry varied between 25 and 30 per cent in 1970.

The painting capacity of the manufacturers will increase during the year 1971 to cover more than 35 per cent of the deliveries of windows of the whole country.

Marketing products mostly takes place directly to building enterprises to their building projects, and annual contracts of delivery are also quite frequent.

2. STRUCTURE OF THE BRANCH

Establishments. The general idea about the furniture and joinery industries is conveyed in statistical supplement 1.

Joinery industry (industrial group 2630) counted 224 establishments in 1968, and manufacturing process is participated in by some 5 300 wage earners. A considerable number of establishments are small in size, with less than 10 wage earners. (For this kind of information statistical supplement 2 is referred to)

From the supplement mentionned above can be seen that the share of the gross value of production of the establishments employing more than 30 wage earners, increased 1963-1968 from 66 per cent to 74 per cent and that there has been further increase ever since.

A trend of development towards major manufacturing units is thus to be found, which is something quite natural with regard to the industrialization of housebuilding and the growth of projects. Neverthless minor establishments are still needed, because their elasticity in delivering orders of varying kind is superior to that of the major ones, whose lines of manufacture meant for producing reasonably large series make it unprofitable for them to fit in minor special orders of delivery.

From statistical supplement 3 it can be seen how joinery industry is spread over the different parts of the country.

The group of minor establishments mainly consists of private-owned and controlled ones, whereas the middle-sized establishments are mainly private companies and the major ones either private companies or co-operative companies. There are also a few state-owned companies.

Number of establishments, personnel and gross value of production in per cents by owner in 1967 among furniture and joinery industries.

	Individuals %	Private companies %	State companies %	Co-operatives %	Other corporations %	State and communes %	Total %
Owners	40	37	0,5	1,5	19	2,0	100
Personnel	14,5	69,2	2,6	3,5	8,6	1,6	100
Gross value of production	12,0	72,2	2,5	5,0	7,0	1,3	100

In a few cases major constructors doing large scale regional building, have found it useful to establish a joinery factory of their own, mostly in connection with their factory, turning out prefabricated structures. Of course, even these factories have to compete for the market in their own building projects, too and to be able to market their surplus production capacity somewhere else.

The problem of surplus production capacity in joinery industry is going to be rather actual, even if not alarming to the extent as for instance in Sweden. According to the research "Trends in Finnish Industrial Policy in the 1970's" by the Industrial Association of Finland the share of furniture and joinery industries of all manufacturing amounted to 2,6 per cent at the end of the 1960's.

Since 1948 the annual rate of growth in production has been 5,6 per cent on an average, but has been a little slower since 1954. In the 1960's, however the rate of growth was accelerated owing to the growth of export. In the future a continuous growth of production at the annual rate of 5,6 per cent on an average can be expected.

The contribution of work has shown an average annual increase of 1,6 per cent during the postwar time, but since 1954 2 per cent. We cannot count on such a big increase of contribution of work without risking the capability of competing. According to estimations the rate of growth of the contribution of work will not amount but approximately to 1 per cent annually. In this case the growth in productivity would be 4,5 per cent a year, while it has been a little less than 4 per cent annually.

The differences in productivity of Finnish furniture and joinery industries are still too big in comparison to the other Scandinavian countries, although the differences have considerably decreased since 1965, when they were, if Finland is marked by 100: Sweden 170, Norway 149, and Denmark 142.

3. VOLUME, SALES VALUE, AND DISTRIBUTION OF THE PRODUCTION OF THE JOINERY ARTICLES

The sales value of the production of doors, windows, wooden storage units, and other fixtures, amounted to about 200 million Finnish marks in 1969. The share of the manufactures of the furniture factories of this sum was some 25 million Finnish marks, consisting mainly of wooden storage units and other fixtures. The most part of the volume of production comprising some 950 000 doors, 690 000 windows and 1 113 000 wooden storage units, was marketed in Finland. The volume of export was about 6 per cent of the gross value of production. The volume of import of the articles stated above was fairly insignificant, having no essential importance as to the whole.

The statistics about production are to be found in statistical supplement 4.

4. THE STRUCTURE OF THE PRODUCTION, VALUE ADDED, EFFECTIVENESS OF THE USE OF REAL PRODUCTION CAPACITY AND SOME OTHER FACTUAL INFORMATION

The structure of costs of production and value added in joinery industry can be seen in the tables 1-4 of statistical supplement 5. The statistical figures in supplement 5, table 1 show us that the share in percentage of rawmaterials and half-completed products of the gross value of production is 43, that of auxiliary materials, electric energy, repairs etc. 6, that of salaries and wages 35 and that of the other costs and profit 16. The same figures of statistics show us furthermore that the average share in percentage of changing costs in the group, that is to say the costs of rawmaterials and wages paid to manufacturing workers are 43 + 24 = 67. Thus the share of fixed costs and business profit is 33 per cent.

Comparing statistical figures characteristic of furniture and joinery industries are given in tables 2 and 3 of statistical supplement 5. From them can be seen that value added per working person varied in 1967 between 6 473 and 14 426 marks. Value added in percentage of the gross value has increased from 50,4 to 52,3 in 1965-67, and after salaries and wages have been taken off from 17,7 to 19,6.

In factories delivering their products highly completed the corresponding percentages may be 56 and 24.

The value of fixed capital per working person varied in 1967 from 13 500 to 16 000 marks.

The use of real technical capacity of joinery industry is of course dependent on conjunctures and total amount of orders of delivery.

The use of the real technical capacity of joinery industry was some 80-85 per cent owing to high conjuncture.

5. DEGREE OF STANDARDIZATION OF PRODUCTS AND THE CAPACITY AND RATIONALIZATION OF THE BRANCH

The capacity of joinery industry, that is to say its possibility to produce and deliver highly finished articles needed in modern housebuilding punctually and at a reasonable cost largely depends on the following facts.

- Possibilities of turning out sufficiently large series
- Standards and their degree of utilization from houseplanning to installation
- Standards of products and especially their dimensioning basing on the international modular coordination of construction industries.

The effects of the size of a series

On the basis of research done and by experience we know that a unit produced as "one unit series" may increase the cost of a wooden window nearly nine times bigger and the cost of a panelled door six times bigger than a unit produced as a series of 50-200 which represents the "normal" size of a series in the joinery industry.

A manufacturer has to make large investments in fixed capital to be able to produce large series, and furthermore the large investments result in a considerable increase in the share of fixed costs.

At the same time the production machinery tends to be inelastic so that taking up new models demands bigger costs than before. Thus this question involves that of marketing at the same time, for it is selfevident that the continuity of the demand must be ensured. As a concrete example it may be mentioned that two or three flush door factories really fully equipped and adjusted to making big series are able to satisfy the demand of our inland construction industry.

Still, as you may have found out from what is stated above, it is due to the limited inland market that at least the majority of our joinery factories are obliged to adjust their production machinery to variable production and to content themselves with manufacturing, from international point of view, relatively small series for the inland market.

There are, however, means of avoiding the handicaps mentioned above and these means have already been tried with success: standardization, specialization based on division of labour and specialization of other kind, and manufacturing of standard products for stocking up, and in this case the series are bigger than those in normal orders of delivery.

Standardized products

A standardized product is one of the main premises of rationalized production. Thus it has been necessary to pay enough attention to developing the standards of product and measure, limiting the choice of types, and the utilization of standards.
As to standards of size, one of the important objects has been to make general coordinating size conform to the whole, that is to say conform to the internationally accepted modular coordination.

As to the standardization of constructive materials we ought to bear in mind that national standardization does not necessarily imply questions of outward appearance, neither does it imply measures taken towards the uniformity in outward appearance. The main thing are the questions of coordinating different parts that is to say, general coordinating sizes and ways of coordinating are the main object.

Even if it may sound rather odd, standardized products allow a wider range of variety compared to those that are not standardized. The reason for this is that once the coordinating sizes have been standardized, standardized products may help to multiply the scope of variety and variations compared to those of the not standardized ones.

As a concrete example of this fact it may be referred here to the National Standard of Windows and the Set of Models introduced in Finland in 1968. (A brief account of this with illustrations is to be found in a supplement.)

Considering the points of view treated above energetic measures have been taken by the Finnish Joinery Industry through its organisation to achieve these aims in close co-operation with the National Standardization Authorities of Construction.

As a result from this co-operation it can be realized that the situation in joinery industry standards is good, because after the revised size standard of doors was published in Nov. 1969, the dimensioning of all joinery industry articles conforms to the modular coordination of construction industry.

In consequence of this joinery industry had to carry out a radical revision of sets of models in the years 1968-71, which meant considerable additional costs. Nevertheless, what has been gained hereby compensates for the sacrifices, especially because it has been possible to reduce the choice of procucts, whereas the possibilities of variations increase at the same time. Designers, constructors, and consumers also profit by this.

Rationalization of the branch

It was stated above that there cannot be any rationalization of production, unless there are well-adjusted standards of products. These facts are also the most essential premises of rationalization within the branch. Joinery industry as well as any other branch of industry originating from craftsmanship like form of production and sharing its pattern of thinking has consequently been apt to stick to the tradition of predominantly multiform manufacturing within one establishment.

This has been the case in Finland, too, and is still to day to some extent. However, a considerable development to the better in the pattern of thinking as well as in practice has taken place.

Since most of the production is based on standards and made uniform in technical details, as for instance in latching etc., it has become possible for the establishments to specialize in few items, but inspite of this they have been able to offer a wide range of products by buying products or part of them from other establishments which are specialized in manufacturing them.

6. CO-OPERATION BETWEEN ESTABLISHMENTS

There is vertical-integrated co-operation between the establishments within the association of the branch, as well as horizontal-integrated co-operation between the individual establishments.

The association of the joinery industry acts as the connecting link between the establishments of the branch and as a common forum in questions of mutual interests, in matters of general development of the branch, and as to contacts to authorities and other corporations.

This kind of working objects are among other things:

- Developing customs of commerce and stipulation
- Having research done about the branch by research institutes
- Collecting and working up information and statistics about production and market, and circulating this information among all the members
- Attending to the standardization in co-operation with the Standardization Authorities
- Arranging different kinds of schooling occasions and conferences on the special questions of the branch and even on other questions, if necessary
- The continuel informing of the members about all the matters concerning the group
- Informing the circles of customers, the authorities, and the general public.

Co-operation in technical and commercial matters is taking place within to the forum of the joinery association participated in by the interests of the main lines of production of the branch has proved to be of great consequence.

Furthermore it has been apt to promote mutual confidence between the establishments.

There are three of such interests: the window one, the door one, and the fixture one, and it is quite voluntary to enter these within the association.

Horizontal large scale co-operation between the individual establishments is also to be found. One of the most solid forms of this co-operation is a marketing company attending to the marketing of the products of those manufacturers that are its members.

Technical work and developing work of other kind has also been centralized in cases like this.

Statistical supplement Nr 1

NUMBER OF ESTABLISHMENTS, WAGE-EARNERS AND GROSS VALUE OF PRODUCTION AMONG FURNITURE AND JOINERY INDUSTRIES 1960 - 1968.

Year	FURNITURE INDUSTRY			JOINERY INDUSTRY		
	Number of establishments	Number of wage-earners	Gross value of production 1000 Fmk x)	Number of establishments	Number of wage-earners	Gross value of production 1000 Fmk
1960	121	4638	74 071	244	4464	64 015
1961	123	4997	83 112	259	4883	80 179
1962	124	5086	92 485	263	4939	84 610
1963	126	4978	94 893	248	4978	93 659
1964	129	5179	109 804	244	5029	102 876
1965	126	5292	124 650	236	5334	121 837
1966	123	5460	140 024	237	5415	129 569
1967	117	5493	161 761	236	5705	119 711
1968	117	5548	167 754	224	5522	149 512

x) 1000 Fmk = 100 £

UNIDO SEMINAR, FINLAND, AUGUST 1971

J O I N E R Y   I N D U S T R Y

Statistical supplement Nr 2

Numeral distribution of establishments within joinery industry into size groups according to the number of wage earners, the gross value of production in thousands of Finnish marks in each size group as well as the share in per cents of the gross value of production.

Number of wage earners in production	Number of establishments in the group		The share of gross value 1000 Fmk x)		The share of gross value in per cents	
	1965	1968	1965	1968	1965	1968
1 - 3	38	36	2.160	2.085	1.8	1.4
4 - 5	47	55	4.099	7.188	3.4	4.8
6 - 10	60	49	9.046	8.590	7.4	5.7
11 - 20	44	34	14.198	12.440	11.6	8.3
21 - 30	18	15	10.898	9.305	8.9	6.2
31 - 50	13	15	12.413	16.733	10.1	11.2
51 - 70	4	8	6.882	16.107	5.6	10.8
71 - 100	2	2	4.660	6.568	3.8	4.4
100 - 200	7	5	18.909	13.036	15.5	8.7
201 - 500	3	5	38.572	57.460	31.6	38.4
	236	224	121.887	149.512	100.0	100.0

x) 1000 Fmk ≈ 100 £

Statistical supplement Nr 3

DISTRIBUTION OF JOINERY INDUSTRY INTO STATISTICAL REGIONS

Statistical region	Number of establishments	Number of wage earners	Doors and doorframes: Doors 1000 Fmk	Doors and doorframes: Doorframes 1000 Fmk	Windows 1000 Fmk	Other joinery products as stationary fixtures and wooden building components 1000 Fmk	Kitchen equipments and wardrobes 1000 Fmk	Gross value 1000 Fmk
11. Uusimaa	38	429	562	455	1.168	2.663	1.802	10.469
12. Varsinais-Suomi	23	332	1.730	348	2.274	402	3.766	9.975
12. Ahvenanmaa	4	34	105	42	150	2	1.083	1.399
14. Satakunta	15	310	1.387	444	2.008	239	1.485	8.301
15. Etelä-Häme	26	1.305	12.415	3.088	5.846	6.432	9.031	39.657
16. Tammermaa	25	467	2.855	363	1.593	4.814	2.358	13.125
17. Kaakkois-Suomi	19	368	836	526	1.851	249	1.871	8.406
21. Keski-Suomi	7	321	3.155	856	2.194	478	211	8.525
22. Etelä-Savo	11	160	411	167	494	36	206	3.314
23. Pohjois-Savo	8	554	3.700	1.190	4.714	3.683	291	16.166
24. Pohjois-Karjala	3	91	233	173	1.203	106	106	2.312
31. Etelä-Pohjanmaa	18	608	3.622	1.083	3.067	2.694	2.498	14.287
32. Keski-Pohjanmaa	14	148	497	262	869	119	825	3.107
41. Pohj.-Pohjanmaa	7	154	519	161	1.116	857	1.045	4.094
42. Kainuu	4	81	364	133	662	37	8	1.578
43. Lappi	2	160	911	391	135	179	-	4.797
	224	5.522	33.302	9.682	29.344	22.990	26.586	149.512

1000 Fmk = 100 £

To supplement Nr

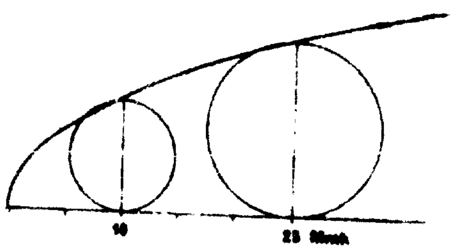
DISTRIBUTION OF JOINERY INDUSTRY
BY GROSS VALUE OF PRODUCTION 1968
INTO STATISTICAL REGIONS

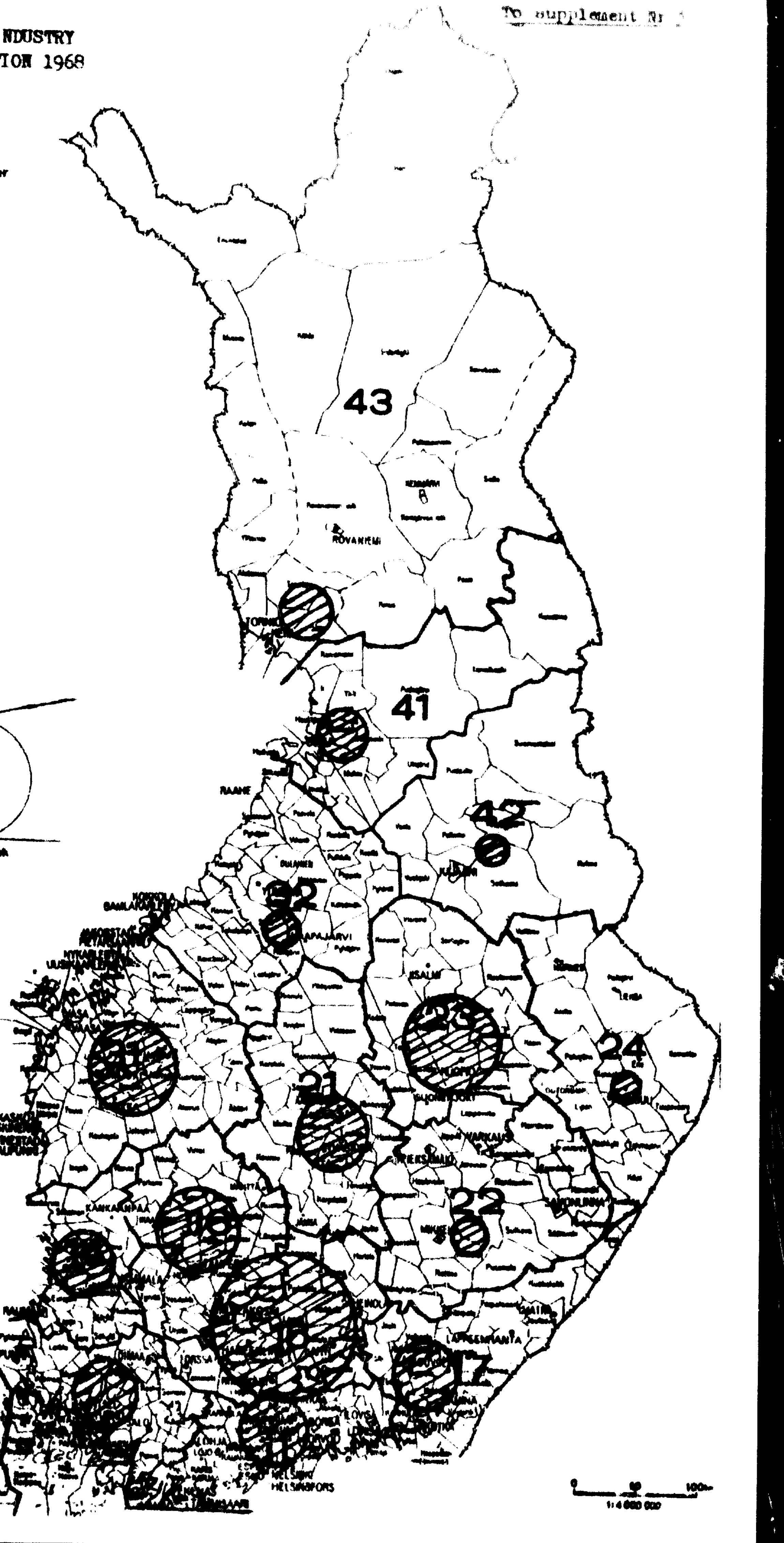
Suomen tilastoalueet

Finlands statistiska regioner

Statistical regions of Finland

11 Uusimaa — Nyland
12 Varsinais-Suomi — Egentliga Finland
13 Ahvenanmaa — Åland
14 Satakunta — Satakunda
15 Etelä-Häme — Södra Tavastland
16 Tammermaa — Tammerland
17 Kaakkois-Suomi — Sydöstra Finland
21 Keski-Suomi — Mellersta Finland
22 Etelä-Savo — Södra Savolax
23 Pohjois-Savo — Norra Savolax
24 Pohjois-Karjala — Norra Karelen
31 Etelä-Pohjanmaa—Södra Österbotten
32 Keski-Pohjanmaa — Mellersta Österbotten
41 Pohjois-Pohjanmaa — Norra Österbotten
42 Kainuu — Kajanaland
43 Lappi—Lappland





Statistical supplement Nr 4

The volume of the joinery products and their gross value in thousands of Fmk and their distribution among joinery industry, furniture industry and "some others" 1969.

Position and under-position	Description of goods	Unit	Quantity	Value 1000 Fmk	Thereof manufactured by: Join. ind.	Furni-ture ind.	Wood. prefabr. house ind.	"Others"
44.23	Joinery products							
1001	Prefabr. wooden residential houses	1000 m^2	63	10170	187	-	9983	-
1002	Other wooden houses	"	44	9271	705	-	7867	699
1003	Wooden houses in components	-	-	9361	2682	-	6658	21
2000	Parkets	1000 m^2	179	3433	8	512	263	2650
3001	Doors	1000 pi	957	48435	47937	42	299	157
3002	Door frames	"	617	12287	12148	16	18	105
4001	Windows	"	726	43953	43455	35	32	331
9000	Other joinery products as stationary fixtures (also forships), wooden building components			35989	20827	1723	11125	2314
94.03								
1001	Kitchen equipments and wardrobes (stationary)	1000 pi	1113	51946	29428	22495	-	23
	TOTAL			224845				
	Thereof:							
	Doors, door frames and windows			104675				
	Other joinery products (Stationary fixtures, wooden building components)			35989				
	Kitchen equipments and wardrobes			51946				
	Parkets			3433				
	Prefabricated wooden houses and houses in components			28802				

1000 Fmk = 100 £

Statistical supplement Nr 5

Table 1

VALUE AND CERTAIN COSTS OD PRODUCTION IN 1967 WITHIN JOINERY INDUSTRY

		Percentage of gross value
1. Number of establishments	236	
2. Sales value of production on own account (1000 Fmk)	142 347	
3. Income from repair work	1 642	
4. Income from contract work	2 172	
5. Gross value of production	146 161	100
6. Raw materials and semifinished products	62 998	43,1
7. Containers	513	
8. Fuel (purchased only)	893	
9. Purchased steam	404	
10. Lubricants	138	
11. Other auxiliary materials and accessories	2 643	
12. Purchased electric power	3 208	
13. Repairs performed by other establishments	1 841	
14. Contract work by other establ.	3 064	
15. Total raw materials etc. (6.-14.)	71 661	49,0
16. Value added	74 500	51,0
17.) Salaries and wages, total	51 373	35,1
Salaries	10 032	6,9
Wages (total)	41 341	28,3
Of which production workers	36 197	24,8
18.) Other costs	23 127	15,9

Table 3

VALUE ADDED 1965-1967 IN MILL. OF FMK AND IN PERCENTAGE OF GROSS VALUE OF PRODUCTION IN THE FURNITURE AND JOINERY INDUSTRIES AND IN THE HOLE INDUSTRY

Industry group	Value added mill.Fmk			Percentage of gross value of prod.					
				Total value added			Excl. wages + salaries		
	1965	1966	1967	1965	1966	1967	1965	1966	1967
Furniture and	129	142	166	50,4	51,1	52,3	17,7	18,3	19,6
Total (The Whole ind.)	6 707	7 272	7 975	34,6	34,7	17,0	17,0	17,0	17,9

Statistical supplement Nr 5

Table 2

INDUSTRIAL ACTIVITY BY VALUE ADDED IN THE FURNITURE AND JOINERY INDUSTRIES 1967

GROUPS BY VALUE ADDED SIZES FMK	NUMBER OF ESTABLISH-MENTS	NUMBER OF WAGE EAR-NERS	VALUE ADDED 1000 FMK	VALUE ADDED/ WORKING PERSON	VALUE OF FIXED CAPITAL/ WORKING PERSON
Value added negativ	-	-	-	-	-
0 - 49 000	82	326	2 680	6 473	15 251
50 000 - 499 000	225	3 168	37 669	10 354	9 002
500 000 - 4 999 000	59	5 145	75 868	12 530	15 732
5 000 000 -	4	2 806	49 755	14 426	13 525

Table 4

FIXED CAPITAL OF FURNITURE INDUSTRY AND JOINERY INDUSTRY 1967

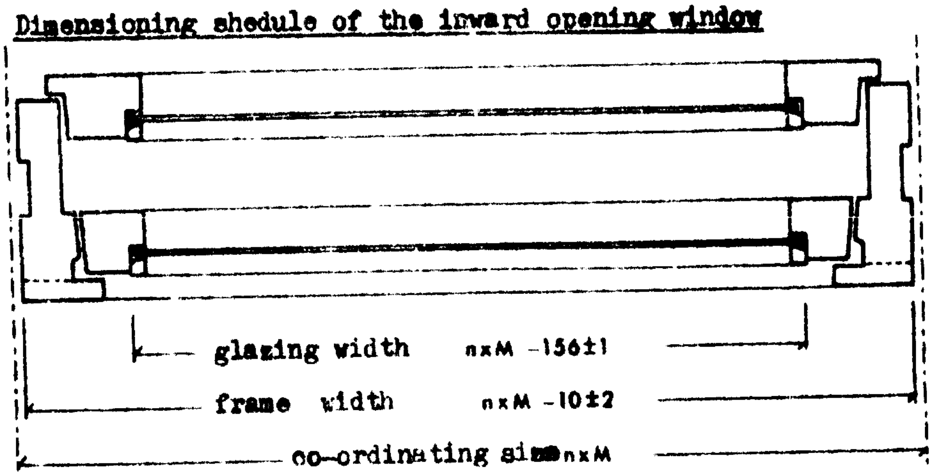
1000 FMK

	FACTORY, OFFICE, AND STORAGE BUILDINGS	OTHER CONSTRUC-TIONS	MACHINERY AND OTHER EQUIPMENT AND OTHER MOVABLES	TOTAL
Furniture industry	56 148	-	25 209	81 357
Joinery industry	56 309	25	40 477	96 811

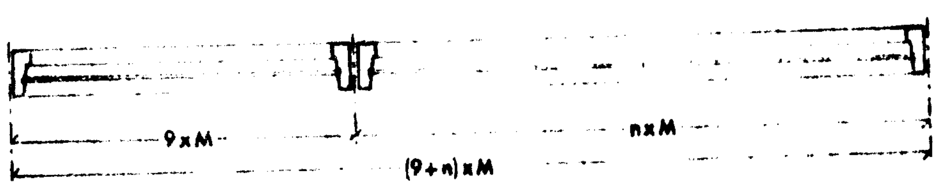
EXAMPLES OF APPLICATION OF THE MODULAR CO-ORDINATION ON THE NATIONAL STANDARDS OF WINDOWS IN FINLAND

1. Since the dimensioning is in accordance with the modular co-ordination of house construction, the co-ordinating sizes are in whole multiples of the basic modul 1 dm (n x M)
2. The overall frame widths are 10 ± 2 mm smaller than the respective co-ordinating sizes. (The gap between frames and the wall are 10 mm in all and the tolerance of overall frame size ± 2 mm.)
3. The profiles of the frames and casements are in all types stright-lined and in main types of the kind that the glass rebate sizes in outside and inside-casements are of the same.
4. The dominating idea is the use of "one-part windows"(the windows without mullions, transoms and glasing bars) as basic units by outlining window shedules and by manufacturing of windows too. That way the possibilities to different variations are very large and at least the number of sizes in stock can be restricted.

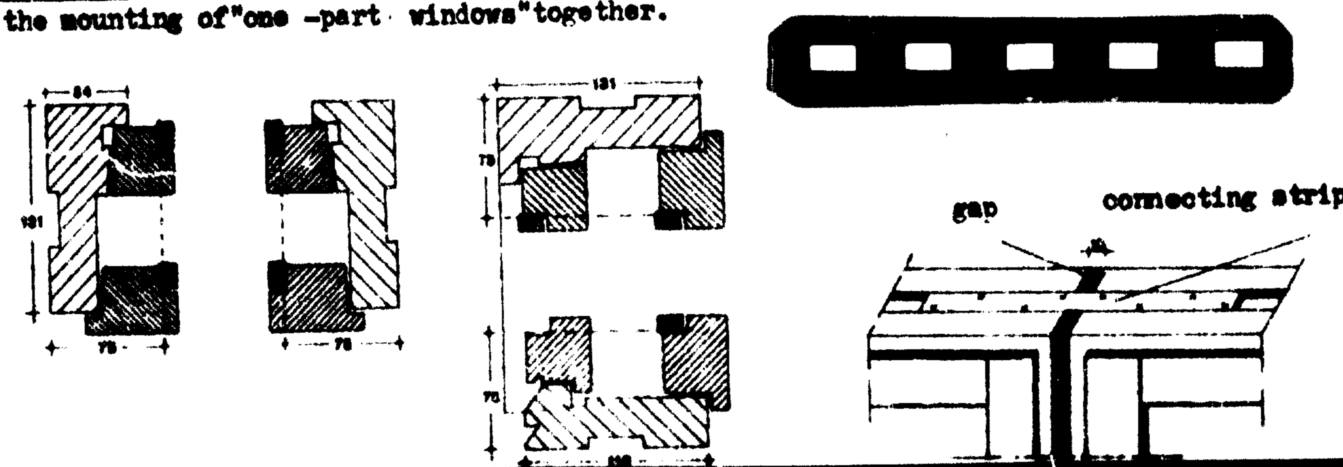
__Sketch 1__ __Dimensioning shedule of the inward opening window__



__Sketch 2__. Fitting of a window door and a window together.



__Sketch 3.__ Horizontal and verticalsection of the inward-inward opening window and the mounting of"one -part windows"together.



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