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hand, the future export can not be maintained. At the time when the dull export of silk and cotton goods is feared, the production of vinylon is considered to be very important.

It is to be summarized that the fiber which stabilizes the textile field of Japan now standing on its crisis is the man-made fibers and especially synthetic fiber such as vinylon. Vinylon is indeed produced from abundant domestic materials and will be the backbone of Japanese textile field for its self-supply and will play an important role for the foreign trade, that is, vinylon as its own goods or as its blended or mixed goods with cotton, wool, hemp or rayon will be used not only for domestic consumption but also for export purposes and thus will cotribute much for the economical rehabilitation of Japan in the coming new textile ages.

(2) Scientifical signification.

Science seekd for the principle in the nature and the technology applies it to the manufacture of goods. The goods are manufactured from the natural objects by the technology to satisfy the demand of human beings. Therefore, economical meaning of manufacture is proved by satisfying the economical desires of the people, and the scientifical meaning is proved by satisfying the scientifical desires to socialize the principle of nature for human welfare.

In the ancient age of Japan, when the hemp and silk were processed into textiles, these fibers combined the nature and life closely so as to make it being composed into poetry penetrating into the hearts of the nations. Textile industry in this age might be high in its scientific meaning although its economical value was very low. In the following age, along with an increase of population and progress of civilization, more textiles were demanded and the textile industry of Japan made a big turn into a special feature based on the processing and trade system. The production of silk was increased but it was not processed for domestic use but mostly exported as unprocessed. Cotton, wool, hemp and rayon pulp were imported from abroad by an increasing amount and then processed and used for domestic consumption as well as for export purposes. Thus, on the basis of processing and trade, the Japanese textile industry has been astonishingly developed widely. But the mulberry field of Japan has come to have a close connection with silk textiles of foreign countries and on the other hand, cotton and woolen goods of our country were connected with the resources of foreign countries.

Accordingly, there were no more textiles which connect the natural resources and social living, and the close relation of nature and human living as was

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seen in the past became faint. Under these circumstances, it became difficult for our nation to understand the science and technology which connect the nature with human living. It is to say that although the economical progress was highly valued, scientific value could not be elevated and the scientific mind of the nation was not developed. People become only attached to silk as before, bud cotton, wool and rayon have not penetrated into the human hearts so as to be composed into poetry. On the contrary, the nations only feel thirsty for cotton and wool. This is the real feeling of the nations to the textile goods, isn't it?

The introduction of vinylon is now pulling out the scientific mind of the nations and deepening the interest for science and technology. Vinylon is produced from domestic resources and satisfies the thirsty demand of the people for cotton and wool. Expectation to have the fiber aspired for a long time from our soil might turn the people to get interest for vinylon and at the same time for science and technology.

Vinylon has been most intensively researched and industrialized in this country for the first time in the world. Isn't it natural from the standpoint of technical performance combining the nature and human living that in the United States where the silk was abundantly imported, processed and consumed, nylon was firstly produced and in Japan where the cotton and wool was abundantly imported, processed and consumed, vinylon was firstly industrialized. Scientific minds of the nations are now going to understand the scientificmeaning of vinylon manufacture and to breed up it as a fiber of Japan.

The public will remember the matter 10 years ago. When PeCe fiber in Germany, Vinyon and nylon in the United States, produced from coal, water and air were introduced for the first time in the world, the nations expected the appearance of domestic synthetic fiber. During the war, nations forgot the being of synthetic fiber but when they recovered from confusion after the war, they would have regained their interest in the synthetic fiber worrying about the dull recovery of textile industry and suffering from the shortage of textiles. In responce to the inquiries of the public, this company held the first time Exhibition of Vinylon at the Mitsukoshi Department Store in Tokyo in May of 1949 and reported the present situation of vinylon manufactures. The visitors understood the vinylon industry and encouraged us to promote our new enterprise. Deeply impressed by the willingness and moreover the scientifie minds of the nations, we would do our best to develop this industry to contribute the economical recovery of Japan as well as the establishment of the peaceful textile field of the whole world.

The End

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ビニロン織物

新しい合成繊維

倉敷レイヨン株式會社

DECLASSIFIED E.O. 12065 SECTION 3.102, MAR 83

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1 ビニロン　誕生

ビニロンはわが國の科學技術が獨力でつくり出した合成繊維であります。

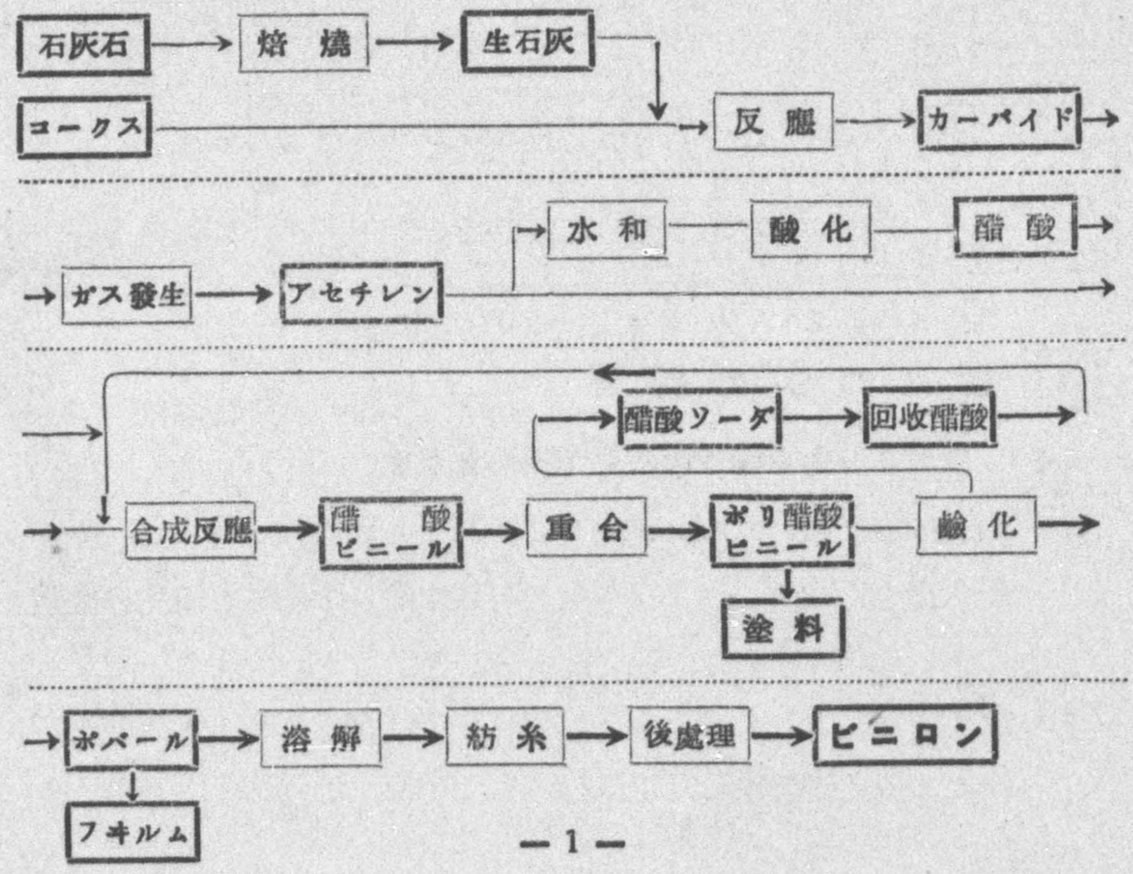
當社は十年にわたる研究努力の結果、獨得の工業技術を確立して、大量生産の基礎をつくることに成功しました。

ビニロンは豊富な國内資源からつくられます。繊維資源に乏しいわが國は、これによつて眞の「日本の繊維」を得たということができます。

ビニロンは種々の優れた性質をもち、被服用としてはもちろん、工業用、漁業用、その他の用途に用いられる最も將來性に富む繊維で、輸出に、内需に、日本再建の一翼を担うこととなるでせう。

2 ビニロンの製法

ビニロンの製法は次の通りであります。



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3 ビニロンと各種繊維との比較

ビニロンを他の各種繊維とその性質を比較してみますと、次の通りであります。

ビニロンと他繊維との性質比較表

項目＼種類	天然繊維			再生繊維系化学繊維			ポリアミド系合成繊維	ポリビニール系合成繊維			
	絹	羊毛	棉花	ビスコース	銅安	アセテート	ナイロン	ビニロン	ベンゾー	ビニヨン	ビオロン
比重	1.36	1.32	1.55	1.5	1.5	1.33	1.15	1.30	1.43	1.22～1.28	1.18
乾強度 g/d	3.0～6.0	1.7	2.5～4.0	1.6～4.0	2.0～2.5	1.1～1.5	4.5～7.5	2.0～6.0	1.8	3.7～4.5	4.0～4.8
乾伸度 %	16～25	54	7～10	8～31	15～30	20～27	14～25	15～30	20	8～28	16～21
ヤング率 kg/mm²	950	260	800	800～1000	800～1000	800	120～400	238～1150	350	300	—
伸長彈性	良	優	可	可	可	良	優	良	優	優	優
屈曲強度	稍強	強	強	弱	弱	稍強	強	強	—	—	—
摩擦強度	稍強	弱	弱	弱	弱	弱	強	強	—	—	—
100°cにおける強度 %	75	76	55	93	—	88	87	70	10	10	73
空中軟化点	—	—	—	—	—	180	235	200	100	80	250
-50°cにおける強度 %	115	100	110	135	—	150	134	140	—	126	140
吸湿度 % 20°c65%	11	16	8	12	12	7	3～4	4.5～5.0	0.1	0.1	0.9
水分吸収度 %				125	125	60	8	30	0.2	0.2	2.5
湿強/乾強 %	80	63	102	45～70	50～70	80	85～93	65～85	100	100	100
收縮度 % 水中100°c				3～5		2～3		2.5			1.5
染色性	良	良	良	良	良	良	稍良	稍悪	不良	稍良	稍良
耐酸性	弱	強	弱	弱	弱	稍強	稍強	強	強	強	強
耐アルカリ性	弱	弱	強	稍弱	稍弱	強	強	強	強	強	強

4 ビニロンの特質

(イ) ビニロンから種々の製品が得られます

- 引張強度が強いため、生糸やナイロンと同様に、細いビニロン絹糸がつくられ、ストツキングの様な薄い編物や、織物の製造に用いられます。
- 適當に低いヤング率をもち、縮れをつけたビニロン・ステープルは、羊毛に類似し、毛織物のやうな輕く柔い、そして溫い織

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物の製造に適します。

・相當に大きなヤング率を持ち、細かい縮れを持つたビニロン・ステープルは棉花に類似し、綿織物や麻織物のような、しまつた織物になります。

この様に一種類の原料から多種多様の製品が得られるものは他に類がありません。

(ロ) ビニロン製品は輕い

ビニロンの比重は輕いので、本質的に輕い製品が得られます。

(ハ) ビニロン製品は溫い

ビニロンは熱の傳導性が低いので、溫い製品が得られます。

(ニ) ビニロン製品は強い

ビニロンは屈曲に強く、摩擦には一層強いので、ビニロン製品の耐久力は非常に大であります。

(ホ) ビニロン製品の保存は容易であります

ビニロンは虫に喰われず、又黴やしみが出來ません。それだけ保存が容易であります。

(ヘ) ビニロン製品は燃えにくい

ビニロン織物は普通なかなか燃えません、攝氏210度以上の高溫では軟化し、とけて固まつて來ます。

(ト) ビニロン製品は酸及びアルカリなどに強い

ビニロンは酸やアルカリに對しては非常に強い。又油性にも強いために、種々の工業用途に多くの期待をかけられます。

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（チ） ビニロンは海水に強い

ビニロンは海水に強いために、漁業用材料としては、非常に優れた性能をもち天然繊維に遙かに勝ります。

（リ） ビニロンは混用性に富んでいます

各種の特質をもつビニロン・ステープルは、羊毛、棉花、レイヨン・ステープルとの混紡に適し、ビニロン絹糸は生糸その他の糸との交織に適します。

混用に依つて共助の効果をあげ、相手の繊維の價値を高めます。

このような種々の特質をもつビニロンがあらわれ、天然繊維及び化學繊維の品質と調和するようになり、繊維全般の價値を増大して少い量で大きな満足を得ることが出来るわけであります。

5 ビニロンの用途

ビニロンは上記しましたような特質によつて用途は非常にひろく、今後開かれる分野はさらに大きいと思われますが、現在考えられています用途は、

（イ） 被 服 用

婦人用長靴下、短靴下、肌着、夏服、冬服、服裏地、オーバー、毛布、フエルト、帽子、手袋、手編糸、縫糸等

（ロ） 特殊被服用

海水着、レインコート、化學工場作業衣、坑内衣、潜水衣等

（ハ） 日用品家具用

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パラソル、アンブレラ、手拭、テーブルクロース、カーテン、
カーペット、マット、家具用織物等

(ニ) 工 業 用

濾過布、パッキング、抄紙フエルト、電解隔膜等

(ホ) 漁 業 用

釣 糸、漁 網、ロ ー プ等

(ヘ) そ の 他

天幕、ロープ、ケーブル、外科用縫糸等

6 わが國の纖維産業とビニロン工業

(イ) かつてわが國は土地が狹く、棉花の栽培、緬羊の飼育に適せず、僅かな土地をさいて蠶を養い麻を栽培して、漸く國民の衣生活をみたして來ました。然しながら美を愛する國民性の深さは、わが國個有文化の上に、纖維に對する極めて強い關心を示して來ました。

(ロ) 明治の中頃以來、機械文明の波に乘つて、わが國の纖維産業も、急速に機械化され著しい發展を遂げました。纖維資源に乏しい國狀の下では唯一の國産纖維である生糸に依存し、その大部分を輸出し、棉花と羊毛を輸入して、その加工品を輸出する所謂加工貿易方式に依つてのみ、世界有數の纖維産業國に生長することが出來ました。それはわが國の地勢と地理的條件並に國民性の纖維産業に對する適合性が資源の不足を克服したからであります。

(ハ) 大正年代に至り、わが國にも化學纖維が生れ、國土の中に纖維資源を開拓して自給自足の態勢を確立し、內需に輸出にその輝かし

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い足跡は正に纖維の黄金時代を思わせるものがありました。然し化學纖維も長期に亘る戰爭のため、その資源たる森林が枯渇にひんし、レイヨンパルプの增產の爲には、多大の努力をはらわねばなりません。

しかし、こゝに自給しうる國內資源からつくり出される新しい合成纖維が出現して、わが國纖維產業に一大革命を來たさんとしています事は誠に意義深きこと丶言わねばなりません。

7 ビニロン工業の經濟的意義

(イ) 世界纖維界は如何に變化しているでありませうか。

1 世界各國はその國の資源を以て、天然纖維及び化學纖維を生產して纖維の自立をはかる方向に進みつゝあります。

2 世界各國はその國の纖維、あるいは輸入の纖維を合理的に利用して需要に最もよく適合する纖維製品をつくり出す新工夫をこらしています。

3 世界各國の間で纖維及び纖維製品が交易されることは今迄と同じですが、その種類は變化し、自國にあるものを輸出し、ないものを輸入するのは當然です。

(ロ) この變遷の動向に添うて、わが國の纖維界は如何に變化すべきでせうか。

1 わが國も國の資源をもつて、纖維を生產せねばなりません。わが國の天然纖維資源は貧困でありますが、化學纖維資源は豊富であります。森林の木材からレイヨンが、石灰石、石炭、空氣、水などから合成纖維が得られます。

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そこでレイヨンと合成繊維の増産がはかられますが、特にわが国の豊富な水力源と石灰石と石炭とからつくられるビニロンの増産は極めて重要となつて來ます。

2 わが國も種々の繊維を合理的に利用して繊維製品をつくらねばなりません。若しわが國に合成繊維がなければ、棉花、羊毛、麻とともに合成繊維を輸入せねはならないでせう。從つて國產の合成繊維の生產が必要であります。

3 わが國は棉花や羊毛などわが國で生產できぬ繊維の輸入が必要でありませうが、そのためには、わが國でつくつたものを必ず輸出してお返しをせねばなりません。わが國產のビニロンは必ず海外市場の要求をみたすでせう。

それだけビニロンの増產とビニロン單獨製品あるいは混用製品の輸出振興が重要になつてきます。

(ハ) ビニロンはわが國の經濟に如何に貢獻するでありませうか。

1 假りに年80.000.000封度のビニロン・ステープル（日產約100噸）を生產するとします。そしてこれが1封度當り540圓の價値（ナイロン・ステープルと同價値)があるとしますと年80.000.000封度の繊價は432億圓となります。これを織物、編物（單獨製品あるいは混用製品）にするとその價値は二倍に見積つて864億圓になります。

2 年80.000.000封度のビニロン・ステープルの織物や 編物の50%を輸出しますと432億圓が得られます。 これで棉花332.000.000封度（20s標準量產稼動能力53.120萬錘） あるいは羊毛62.000.000封度（2/36標準量產稼動能力24.800萬錘）を輸入することが出來ます。こ

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の棉花あるいは羊毛を加工して糸あるいは織物編物として、その半分を再輸出しますと輸出金額は432億圓になります。

3 年80.000.000封度のビニロンの經濟的貢獻は

國內消費のビニロン製品		432億圓
國內消費の棉製品	166.000.000封度	432億圓
〃 の羊毛製品	31.000.000封度	
輸出金額		432億圓
合 計		1.296億圓

以上のようになります。

8 ビニロン工業と世界の動き

諸外國における合成繊維はアメリカを先頭にドイツ、イギリス、カナダ、イタリーなどにおいて、非常な熱意をもつて研究され製造されています。昨年のアメリカの生産量はすでに7.000萬封度に達し、同年度のわが國人絹、スフの合計生産量をも凌駕せんとしており、近代的繊維國はこぞつて合成繊維の研究製造に邁進しています。

アメリカの例をとつてみますと、合成繊維が工場生産になつてからいまだ7、8年ですが、その消費量はすでに絹の10倍、羊毛の10分の1に達しています。

私達は今が合成繊維黃金時代の前夜であり、それはやがて飛躍的に發展して必ず人々を驚嘆せしめるものと確信します。

わが國の產業に繊維產業の占める重要性は申すまでもなく、戰後の再建には最も重要なる役割をはたすことはいうまでもありません。

合成繊維工業はわが國が近代的繊維國として生きるならば、絶對に

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必要缺くべからざるものであります。

もし今にしてわが國に合成繊維の生産が確立しないとすれば、われわれは羊毛や棉花と同様に、合成繊維をも輸入せざるを得なくなることは明らかであり、合成繊維の大量生産化はすでに日本にとつても看過しがたい目前の要請となつているのであります。

9 結　　び

以上の概觀によつてビニロン繊維は多くの特長を兼ねそなえた優秀な繊維であるばかりでなく、その原料は豊富な國内資源から得られることからいつても、今後わが國において飛躍的に發展すべき新繊維であることを御理解いただけたことと思います。當社は長年の努力研究の結晶として、いよいよビニロン繊維の大量生産工場の建設に着手しました。今後一段の品質上の研究と生産費低減の努力によつて、輸出に、内需に、御期待にそうことのできる日もあまり遠くないことと思います。皆様の御批判と一層の御後援御鞭撻とを乞い願つてやみません。

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倉敷レイヨン株式會社

取締役社長　大原總一郎
專務取締役　仙石襄　　常務取締役　豊島武治
取締役技師長 工學博士　友成九十九　　取締役 施設部長　満谷三夫

創立　大正15年6月24日
資本金　7億5千万円
營業品目　ビスコース：人絹、スフ、スフ糸、織物
ビニロン：絹糸、スフ、紡績糸、織物
醋酸ビニール、塩化ビニール、その他合成樹脂

事務所

本社事務所　大阪市東區今橋4丁目1番地　電話北濱2351-6
東京事務所　東京都中央區日本橋本町4丁目2番地　電話茅場町3903-6

工場

倉敷工場　倉敷市酒津1.621番地
（ビニロン：絹糸、スフ、　ビスコース：人絹、　合成樹脂）

西條工場　西條市朔日市892番地
（ビスコース：人絹、スフ）

岡山工場　岡山市海岸通1丁目3番地
（スフ紡績、ビニロン繊維工場建設中）

富山工場　富山市蓮町16番地
（ビニロン原料工場建設中）

丸岡工場　福井縣坂井郡長畝村
（撚糸、織物）

24.10.

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GENERAL DESCRIPTION

THE OKAYAMA PLANT

KURARAY RAYON CO., LTD.

JANUARY 20, 1950.

DECLASSIFIED E.O. 11652 SECTION 3 (E)(2), NARS DATE 12-18-78

Okayama Plant

Kurashiki Rayon Co., Ltd.

1. Location: Kaigandori 1-chome, Okayama City.

2. Area of Site: 452,195 Sq. meters.

3. Area of Building: 69,970 Sq. meters.

4. Production at present and future plan:

A. Rayon staple yarn.

We are producing rayon staple yarn and Spindle in operation are 23,427 spindles (Cotton system: 13,427 spindles. Draft Break system: 10,000 spindles.).
We intend to install 50,000 spindles in the future.

B. Synthetic fiber (Vinylon)

We are planning to construct the Vinylon Plant and furtheremore we intend to produce 20 ton/day of Vinylon.

5. Production before the war:

Rayon filament: Capacity - 16.7 ton/day

6. Number of employees: (as at January 20, 1950.)

Male: 215

Female: 437

Total: 652

7. History:

a. Established on January 11, 1935 as the Okayama Plant of Chugoku Rayon Co., Ltd., capitalized at ¥20,000,000 (paid-up), and then it was amalgamated to Kurashiki Rayon Co., Ltd. on November 26, 1935.

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b. Commenced to produce rayon filament yarn on August, 1936. Production capacity was 16.7 ton per day (14,400 nozzles) at the maximum.

c. Stopped production of rayon in November, 1943 as it was obliged to convert for military purpose.

d. Procured by the Brindiv in August, 1946 and was released in September, 1947.

e. 23,427 spindles of rayon staple spinning was allocated by the Director of Textile Bureau of Commerce and Industry. Ministry.

f. The approval by GHQ dated May 24,1948 was informed by Shuhai Shonin Ki. No. 1086 dated May 28, 1948.

g. Commenced operation partially of rayon staple yarn on March 11, 1949.

8. Main staffs of the plant:

Manager of the plant:	M. Tatsumi.
Chief of Spinning Section:	I. Miyagawa.
Chief of General Affairs Sec.:	K. Igi.
Chief of Labour Section:	H. Mori.
Chief of Machine Section:	S. Sakakihara.
Chief of Architectual Section:	S. Masuda.

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Lt Rawlins
Info and Plt History file

Outline of Kurashiki Rayon Co., Ltd.

Nov. 1, 1948

Address of Main Office: 4-chome, Imabashi, Higashiku, Osaka

Representative : Soichiro Ohara, President.

Establishment date of company: June 24, 1926.

Capital: ¥50,000,000 (Paid-up)
(To be increased to ¥250,000,000 in this year)

Main products: Rayon filament

Rayon staple

Staple yarn

Synthetic fiber (Vinylon)

Plastic moulding powder

Production in the past:

Before the War, this company has had four rayon plants in the cities of Kurashiki and Okayama in Okayama Pref. and Niihama and Saijo in Ehime Pref. and has kept the production capacity of 88.157 ton/day for rayon filament and 84.50 ton/day for rayon staple. (approximately 10 % of the whole capacity in Japan)

Production at present: (Capacity)

Kurashiki Plant: Rayon filament: 5 ton/day (Rehabilitation is almost completed)

Synthetic fiber: 200 kg/day
(Under operation)

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Saijo Plant: Rayon filament: 11.8 ton/day (under operation)
Rayon staple : 30.6 ton/day (under operation)

Okayama Plant: Staple yarn : 5.7 ton/day (23,400 spindles) (under rehabilitation)

Niihama Plant: was sold by the Government order.

Future plan: This company is now planning to increase the production capacity of rayon filament to 10 ton/day and synthetic fiber to 2 ton/day in Kurashiki Plant and to construct the rayon staple yarn weaving equipments equipped with 500 weaving machines in Okayama Plant.

Note: Ratio of actual result of production against the registered capacity: (Sept., 1948)

1. Rayon filament:

Average in Japan:	36.5 %
Our company :	75.3 %

2. Rayon staple:

Average in Japan:	17.5 %
Our company :	13.4 %

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General Description of Kurashiki Plant

Kurashiki Rayon Co., Ltd. Nov. 1, 1948

1. Location: 1621 Sakazu, Kurashiki City, Okayama Pref.
2. Area of site: 386,685 Sq. meters (96 acre)
3. Area of building: 72,776 Sq. meters (18 acre)

   Capacity of dormitory: Male dormitory: 300 persons

   Female dosmitory: 600 persons

   Employees' quarters: 320 houses
4. Number of employees: Male: 1,549

   Female: 532

   Total: 2,081 (At the end of Oct., 1948)
5. History of the plant:

   a. Began construction of the plant in May, 1927.

   b. Completed construction on December 31, 1927.

   c. Commenced operation on May 9, 1928.

      Quantity of rayon filament production: 2 ton/day.

   d. Expansion of production equipments has been done in 1939.

      Production capacity of rayon filament: 26.312 ton/day.

      Production capacity of rayon staple : 12.600 "

   e. Converted to the wood working and electrolysis metallic manganese production in 1943.

   f. Upon termination of war, stopped operation.

   g. Granted permission dated Dec. 13, 1945 for producing plywood, prefabricated house and plastic moulding powder with the equipments and materials which have been kept during the war.

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h. Granted permission from HQ, I Corps in Kyoto on May 3, 1946 to produce the synthetic fiber.

i. Granted permission from GHQ on July 21, 1947 for rehabilitation fund to produce 200 kg/day of synthetic fiber.

j. Granted permission from GHQ on April 13, 1948 for the rehabilitation fund to produce 5 ton/day of viscose rayon filament.

k. Commended operation to produce synthetic fiber on April 27, 1948.

l. Stopped production of prefabricated house at the end of December, 1947 and plywood at the end of June, 1948.

6. Production before the war:

	Capacity
Rayon filament:	26,212 kg/day
Rayon staple :	12,600 "

7. Production after the war:

Product	Quantity (month)	Total quantity produced		
		For U.S.Army	For BCOF	Others
Plywood	60,000 sheets	14,250 shts	90,379 shts	1,164,425 shts
Door		1,000	3,992	
Sash		2,998	9,713	
Box			10,000	
Transom			8,370	
Flash door		1,653		
Prefabricated house	60 houses		For Japanese 268 houses	
Plastic moulding powder	30 tons			

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8. Production at present & future plan:

a. Rayon filament:

We are now rehabilitating the production equipments of 5 ton/day of rayon filament and will commence to operate partially in this month.

After the completion of the rehabilitation work, we plan to manufacture 10 ton/day production of rayon filament.

b. Synthetic fiber:

We have now the production capacity of 200 kg/day of synthetic fiber, (Vinylon staple) and are producing about 1.5 ton of vinylon staple per month.

And now we are experimenting synthetic rayon filament production and so after the completion of this experiment, we plan to manufacture 1 ton/day production of vinylon filament, and 1 ton/day production of vinylon staple

c. Plastic moulding powder:

We are now producing about 20 ton of plastic moulding powder per month and will produce 30 ton/month if the allocation of materials will be given enough.

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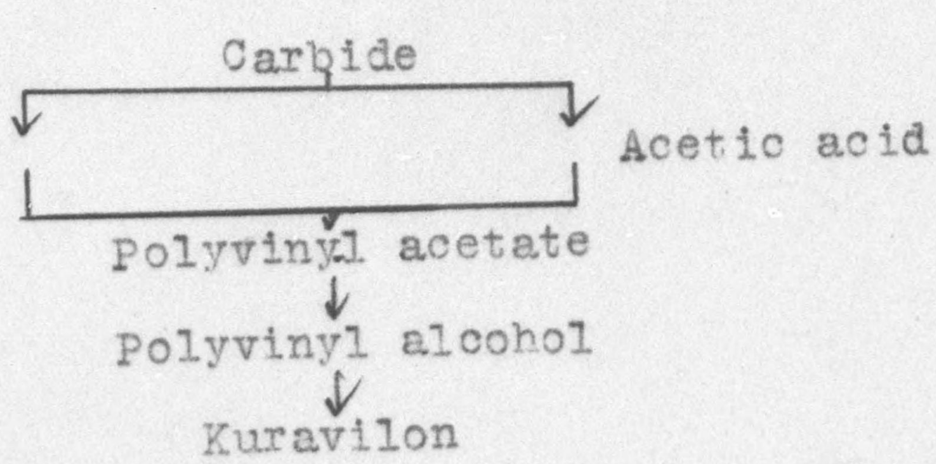
On the production of the Synthetic Fiber (Kuravilon)

Kurashiki Plant, Kurashiki Rayon Co., Ltd.

1. When the discovery of Nylon was announced by E.I Du Pont in 1938, the people had much interesting in the synthetic fiber and research on it was progressed at several places. In 1939, the discovery of "Synthetic fiber 1-go" was made public at the Kita Laboratory of the Kyoto University and our company made research on the industriali zation of "Synthetic fiber 1-go", keeping close connection with this laboratory. Upon the termination of war, as the plan of the first period, we completed the equipments of 200 kg/day and we have operated since April, 1948 and by the acquirement of production technique and the foresight of an economical success, we desire to increase the day production to 2,000 kg as the second plan. The synthetic fiber is PvA and is generally called "Vinylon" in Japan and our company put the trade name of "Kuravilon" to this synthetic fiber.

2. Production:

We summarise the flowsheet from carbide to the fiber "Kuravilon".



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Production process: Flowsheet

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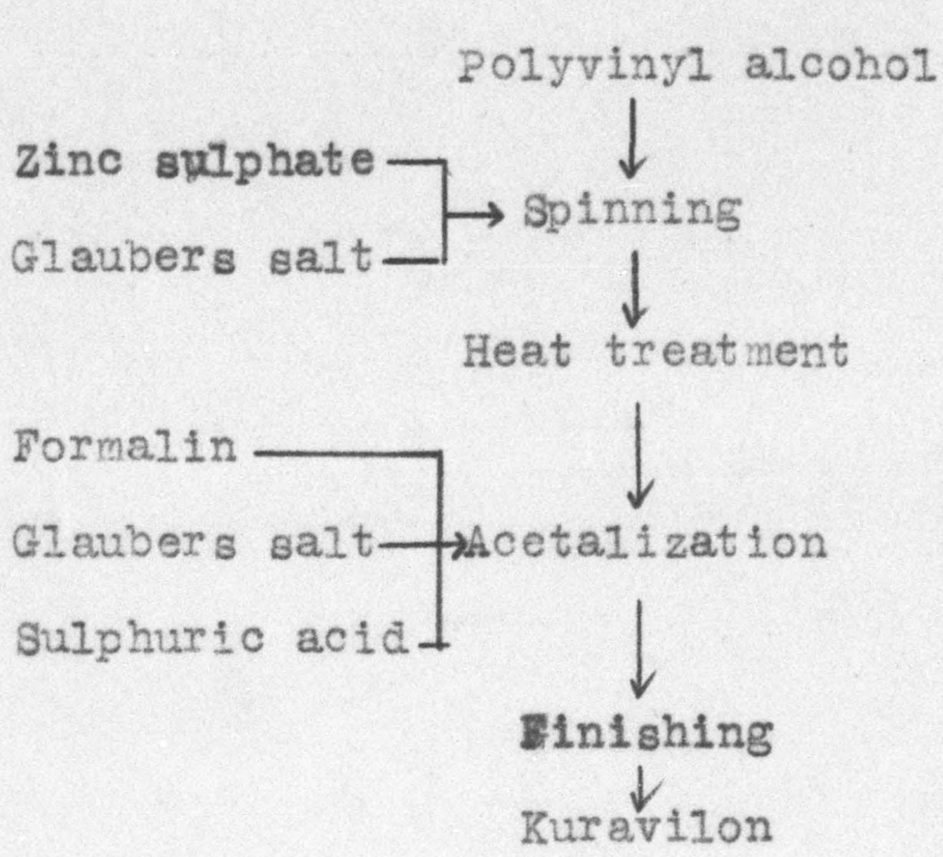

The main material is the carbide which is produced from lime stone, coal and coke and the supplementary materials are methanol, caustic soda, formalin and sulphuric acid, almost all of them are produced in Japan. "Kuravilon" is the main item of production and from the same material, film, paint and other plastics are made.

3. Product:

a. The specific gravity of this yarn is between Nylon and silk and is about 20 % lighter than rayon.

b. The strength is almost the same with Nylon and silk and 2 - 3 times than rayon.

c. Elasticity is big, the same with nylon and silk.

d. Softness is the same with silk though the nylon is too soft.

e. Temperature preservation is better than rayon and cotton and is the same with silk.

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f. As the moisture absorption is moderate, it is better than Nylon as clothing.

g. Proof against chemicals is the same with Nylon and is far stronger than rayon, cotton and silk.

We mention here the use of this yarn, considering above-mentioned special qualities:

a. It is good for clothing as it has the moderate absorption, softness and temperature preservation.

b. It is good for clothing for industrial use as it is strong with chemical proof and proof against climate.

c. Because of its chemical proof, it is good for industrial materials as filter cloth and packing, etc.

d. As the monofilament is easily produced, it is used for fishing string and net and will be developed into the textiles for daily use.

e. Paint, adhesives, film, imitation leather and other plastics, each of which has its own peculiarity are produced by the same materials.

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On the Synthetic Fiber (Kuravilon) Plant

1. Introduction:

Research on the production of Kuravilon was being carried on in the laboratory of our Okayama Plant before the war and we completed the intermediate test production equipments but during the war, these equipments in the plant were partially burnt out. Upon termination of the war, we planned to rehabilitate the equipments in Kurashiki Plant, got the permission from HQ, I Corps in Kyoto on May 3, 1946, got the formal approval from GHQ on July 21, 1947 and was granted approval from Finance Ministry of Japanese Government for finance of fund. Furtheremore, we got the approval of loan from SCAP for the additional fund due to the price raise of construction materials.

Charcoal production equipments were completed on Nov. 3, 1946.
Calcium carbide equipments were completed on March 20, 1947.
Production equipments of polyvinyl alcohol and polyvinyl alophol fiber (Kuravilon) were completed on April 27, 1947.
All these are being operated but the charcoal production was stopped temporarily due to the change of situation. Production equipments of polyvinyl acetate were completed excepting the acetic acid and began to operate on Oct. 20, 1945.

We set up the production technique by using these equipments, and at the same time, we examine the function of each equipment. After acquiring the exact expectation for the quality of the product and its use, we wish to materialize the 2nd plan of 2,000 kg/day production of Kuravilon. The products at present are staple and tow and in the near future we are preparing to produce the filament yarn.

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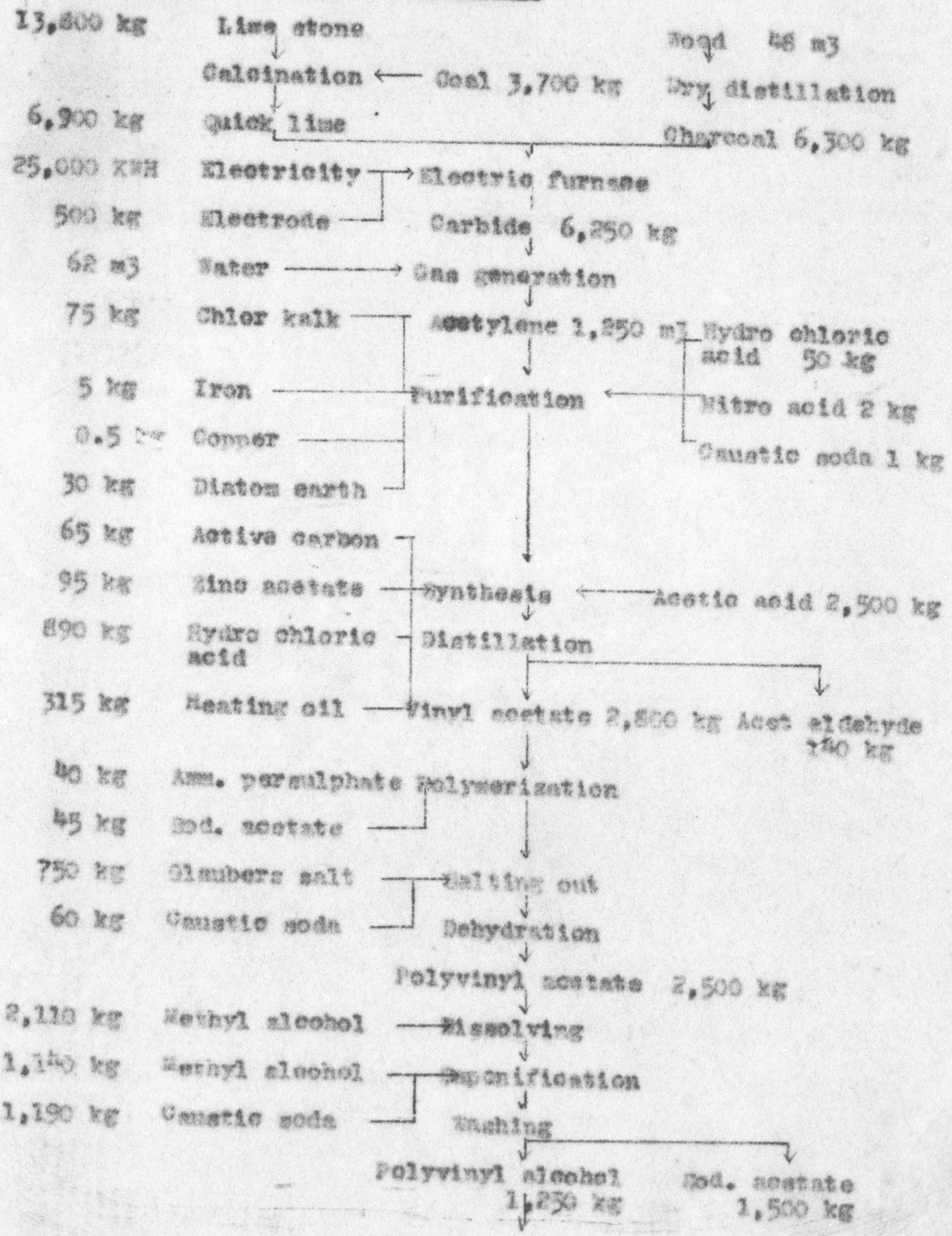
2. Production process: Flowsheet



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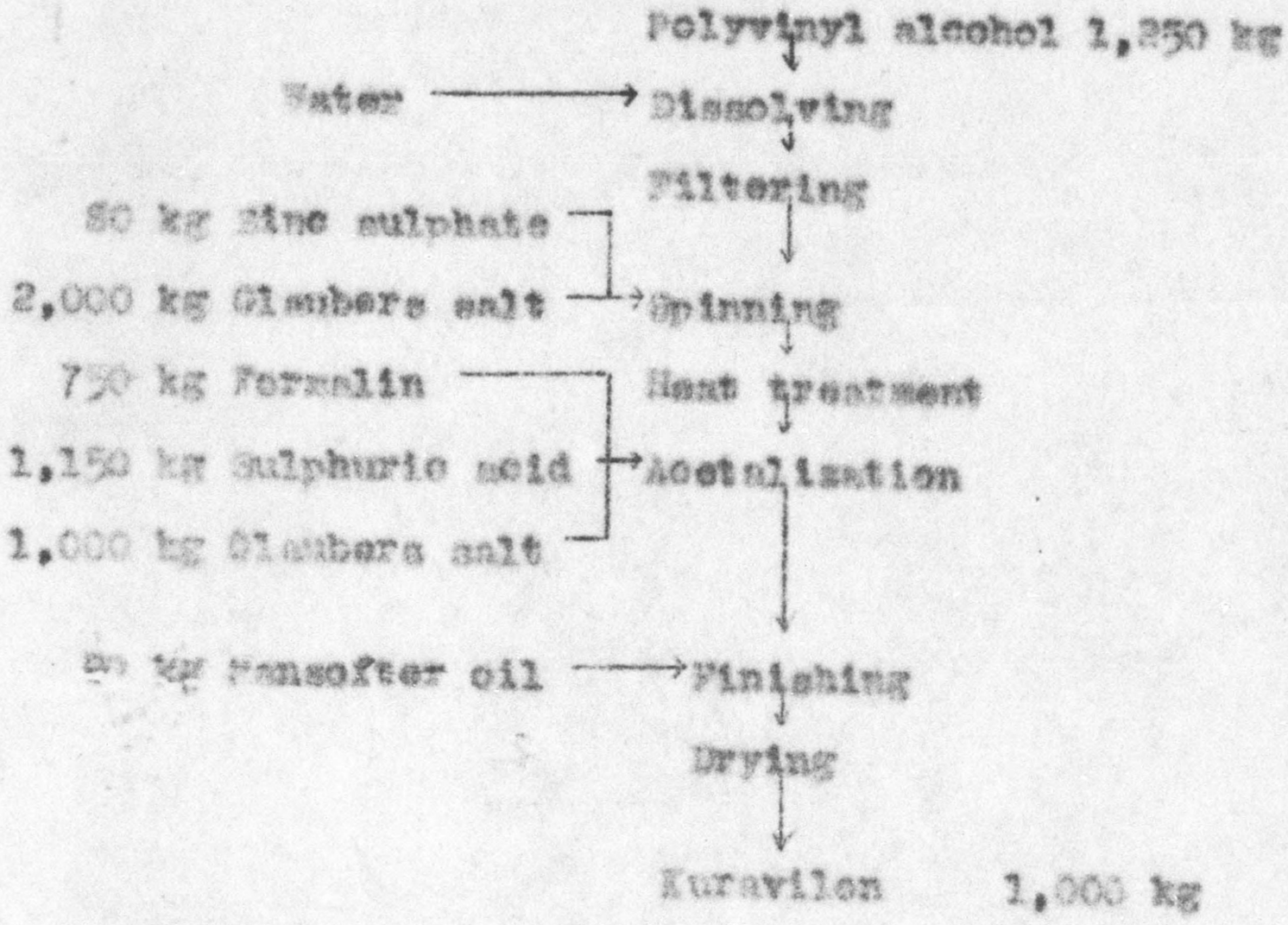

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3. Production equipments:

The main equipments are as follows:

	Item	Type	Quantity
Charcoal production	Circular saw	40"	2
		20"	1
	Dry distillator	300 kg/day	20
	Dye product treatment		1 set
Calcium carbide production	Lime kiln	7.5 ton/day	2
	Electric furnace	6 "	1
	Transformer	2,800 KVA	1
Polyvinyl acetate production	Acetylene generator	2,750 ϕx6,200H	1
	Gas holder	90 m3	1
	Acetylene purifier	1,200 ϕx900H	4
	Acetylene preheater	600ϕx4,500H	1
	Acetic acid evaporator	700ϕx4,500H	1
	Gas preheater	900ϕx4,000H	1
	Reaction vessel	1,300ϕx3,100H	2
	Heat exchanger	300ϕx3,700H	1
	Distillation of vinyl acetate		1 set
	Polymerization vessel	1,700ϕx2,200H	1
Polyvinyl alcohol production	Dissolver of PVAC	1,100ϕx2,000H	2
	Saponificator	750ϕx1,000H	3
	Vacuum dryer	Closed	1
	Washer	1.5 m3	2

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	Item	Type	Quantity
	Distillator of methanol		1 set
Kuravilon production	Dissolver of PvA	1.8 m³	2
	Spinning machine	10 nozzles	3
	Hete treatment app.	14 m L	2
	Aftertreatment App.	21 m L	2
	Dryer	Roller type	2
	Bath evaporator		1 set

4. Products:

We commenced the production of Kuravilon on April 27, 1948 and the quantity up to this day is cited as follows:

Month	Calcium carbide	Kuravilon (staple or tow)	PvA	VAC (monomer)
Apr. 1948	96,797 kg	100 kg	1,240 kg	0
May	95,940	146.2	1,276	0
Jun	95,695	366.03	2,552	0
Jul	110,002	1,457	1,310	0
Aug	93,860	2,071.17	1,367	0
Sept	88,350	1,592	2,180	0
Oct	102,500	2,449	1,028	0

Calcium carbide is now being sold through the allocation system. PvA is being self-consumed for production of fiber and some part for film and others. Fiber is now under spinning test. The reason of the low production quantity than an estimate (6,000 kg/day) is due to the re-construction of equipments, the delay

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the delay of making the product into complete articles and the shortage of the raw materials.

Equipments for acetic acid is not yet completed and so we purchase it from others.

5. Hocks for operation of the plant:

As this is the enterprise undertaken for the first time, there are many bottlenecks which are described as follows:

a. Difficult finance of fund.

Fund supply is difficult as it takes long to make the products into complete articles.

b. It takes a long time to make the products into complete articles. Difficulties to make the product into complete articles are described as follows:

i. When spinning, it is easy to generate the static electricity, therefore moisture adjustment of operation room is necessary.

ii. Because of the difficult nature of dyeing, when spinning, be careful not to mix with other fibers. (When used by mixing, it is other matter.)

iii. At present, textiles are very busy with full operation. for the reason mentioned above, it takes a long time to spin them into yarn and make them into textiles.

c. It is hard to secure the raw materials.

It is hard to secure the VAC monomer and good active carbon. Accordingly, the operation is not running smoothly

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related with each other and thereby make the uniformity of the product very hard. Consumption of chemicals increases and efficiecy of operation lowers. However, since VAC monomer began to be produced in this plant from this October, this problem will be solved.

d. High production cost.

It is natural that 200 kg/day is only a small quantity as this is the pilot plant but we should do the full operation to decrease the loss and to raise the efficiency of operation.

e. Others.

So as to make the product easy to be the complete articles, we should prevent the static electricity of the product, make crimping, make good dyeing, increase the strength and make it good looking, etc. All these points are being improved gradually.

Coal is also the neck for smooth operation, but we are doing our efforts to solve this question.

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B. On the Viscose Rayon Plant

1. Production process - flowsheet

2. Manufacturing condition

3. Production equipments

4. Characteristics of installation

5. Researches

6. Raw materials and chemicals

7. Employees for rayon production

8. Training for operation

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(1) Production process of rayon filament at Kurashiki Plant

Pulp → Open the bale → Punching machine (cutting and punching) → Dryer room (control the moisture content 6 %) → Weighing machine → Elevator (transfer pulp to steeping room of upstairs) → Steeping press → Crusher → Apron conveyer → J.H. Shredder → High speed fan → Cyclone → Wagon → Weighing machine (weigh alkali cellulose with weighing machine) → Vacuum conveyer → Vacuum kneader (short ageing, xanthating, cellulose xanthate dissolving) → Mixing → First filter → Second filter → Third filter → Spin tank → Pot spinning machine → Cake →

Skein: Reeling machine → Bleaching machine → Hydro extracter-Dryer → Air conditioning → Sorting → Grading → Packing

Cake: Sucking machine → Bleaching machine → Pot hydro-extracter → Dryer → Air conditioning → Winding → Sorting → Grading → Packing

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Rayon manufacturing condition

Kind of product: semi-dull lustre 120 D

A. Viscose section:

1. Steeping and shredding:

Conc of steeping solution	230 g/L
Quantity of steeping solution	4,100 L/one batch
Temp of steeping solution	12°C
Conc of hemi-cellulose of steeping solution	Below 6 g/L
Number of section of steeping press	47 sec
Weight of pulp for one batch	200 kg
Steeping hour	120 min
Pressing hr	30 min
Pressing ratio	2.7
Percentage of cellulose in alkali cellulose	31.0 %
Percentage of alkali in alkali cellulose	16.5 %
Shredding hr	50 min
Temp at shredding	25°C
Weight of alkali cellulose for one batch	540 kg

2. Ageing, xanthating and dissolving:

Temp of ageing in the beginning	35°C
Highest temp of ageing	45°C
Temp at cooling	23.5°C
Cooling hr	120 min
Temp at xanthating	23.5°C- 25.0°C
Xanthating hr	150 min

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Dissolving hr	180 min
Temp at the end of dissolving	15°C
Transfe hr of viscose	20 min
Percentage of adding CS2	36 %
Vacuum degree of kneader	500 m.m.
Percentage of adding Na2CO3	5 %
Quantity of additional solution	3,000 L/2 batches
Alkalinity of additional solution	28 g/L
Percentage of adding TiO2	1.01 %
Total quantity of viscose	3,720 L/2 batches
Percentage of cellulose in viscose	8.0 %
Percentage of alkali in viscose	6.3 %

3. Mixing:

Receiving hr of viscose	40 min/4 batches
Mixing hr of viscose	240 min/4 batches
Transfer hr of viscose	40 min/4 batches
Temp at the end of mixing	18°C
Viscosity at the end of mixing	160 second

4. Ripening:

Ripening hr	45 hrs
Ripening temp	18°C
Pressure at 1st filter	3 kg/cm2
First filtration hr	3 hrs
Cloth of 1st filter	One sheet of calico and one sheet of flannel
Pressure of 2nd filter	3 kg/cm2
Second filtration hr	3 hrs

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Cloth of 2nd filter	2 sheets of flannel
Pressure of 3rd filter	2 kg/cm2
3rd filtration hr	3 hrs
Cloth of 3rd filter	3 shts of calico & 1 sht of flannel
Pressure of spinning tank	5.6 kg/cm2
Viscosity at the beginning of spinning	130 sec.
Ripening degree in the beginning of spinning	9.0 c.c.

B. Spinning Section:

Number of nozzle per one spinning machine	100 nozzle
Spinning speed	80 m/min
Output per day per one spinning machine	260 lb/day
Quantity of viscose flowing out by gear pump	9.6 c.c./min
Immersion length	100 m.m.
Size of spinnerette	50x0.08x12x17x5
Dia of pot	160 ø
Doffing hr	4 hrs
Traverse	20.0 times
Sp.gr of coagulating bath	1.290
Acidity of bath	138 g/L
Concentration of $ZnSO_4$	23 g/L
Concentration of Na_2SO_4	250 g/L
Temp of bath	48°C
Bath supply quantity per one spinning machine	2,000 L/h

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Temp at spinning room	22°C
Moisture degree of spinning room	85 %
Ventilation time of spinning room	45 times/hr

C. After-treatment Section:

1. Reeling room:

Revolution time of reel hanks	300 r.p.m.
Meter manifestation	4,300
Knitting method of skein	4 x 4
Temp in reeling room	22°C
Moisture in reeling room	80 %

2. Skein bleaching & drying:

Speed of bolaching machine	70 min
Number of reel per one bleaching rod	40 s
Cone of Na2S	11 g/L
Temp of Na2S bath	55°C
Cone of bleaching liquor	0.4 g/L
Alkalinity of bleaching liquor	0.46 g/L
Concentration of oiling bath	1.5 g/L
Temp of oiling bath	50°C
Dehydration hr	15 min
Dryer speed	260 min
Number of skein per one dryer rod	12 s
Output per one dryer per hr	2,600 s
Highest temp in dryer	83°C

3. Cake bleaching, drying and winding:

Speed of bleaching machine	400 min

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Number of cake per one bleaching rod	12 cakes
Output of cake per day per one bleaching machine	11,300 cakes
Revolution time of dehydration pot of cake	2,700 r.p.m.
Dryer speed	24 hrs
Number of cake per one dryer rod	5 cakes
Output of cake per day per one dryer	6,630 cakes
Speed of winder	160 m/min
Winding hr for one cone	10 hrs
Weight of one cone	1,260 kg

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3. Production equipments

Production equipments, number of machines installed and operable machines as at Nov. 1 are as follows:

Machinery equipments	Type	Total No. of machine	Operable machines on Nov.1	Remarks
Alkali dissolving tank	10 ton/day	1	1	
Alkali solution stock tank	45,000 L	3	3	
"	19,5000 L	15	15	
Cone alkali stock tank	45,000 L	4	4	
Stock tank of setting alkali	12,500 L	3	3	
Additional alkali stock tank	45,000 L	2	2	
Recovering alkali stock tank	45,000 L	2	2	
Mixed alkali stock tank	45,000 L	1	1	
Adjusted alkali stock tank	45,000 L	4	4	
Underground tank of returned alkali	16,000 L	2	2	
Underground tank of pressed solution	12,000 L	2	2	
Hard water softening equipments	11 m3/h	3	2	
Soft water tank	3,000 L	4	4	
Alkali evaporator	500 L/h	1	1	
Alkali dializer	3,000 L/day	15	1	
Pulp punching machine	Pulp 8 ton/day	2	2	Nov. 30 4 Dec. 31 5 Jan. 31 10 Feb. 28 15

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Steeping and pressing machine	Pulp 440 lb/batch	6	6	
Temp adjusting tank of normal alkali	12,000 L	2	2	
Shredder	Pulp 464 lb/batch	3	3	
Alkali cellulose fan	2460 m3/h x 90 mm	3	3	
Vacuum kneader	5,500 L	10	10	
Vacuum tank	5,000 L	4	4	
Viscose mixer	13,000 L	2	2	
Viscose tank	13,800 L	22	22	
Filter press	580x820x45 frame	12	6	Dec.31 -12
Washing machine	38" ϕ x 46"L 2 HP	3	2	Dec.15 - 1
Hydro extractor	800 ϕ x 350 H 5 HP	2	1	Dec.15 - 2
Carbon disulphide stock tank	25,000L	2	2	
Measuring tank of carbon disulphide	8,000 L (1,700/x3,500 L)	3	3	
Air conditioning equipments	75,000 m3/h	4	4	
Bath tank	8,000 L	2	2	
Bath collection tank	65,000 L	4	4	
Pot liquor stock tank	3,500 L	2	2	
Zinc oxide dissolving tank	1,000 L	2	1	
Sulphuric acid adjusting tank		2	2	
Bath heater	410 ϕx1,500 x 2	4	2	
Bath evaporation equipments	7,000 L	5	3	Dec.15 - 5

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Bath crystalizer	Vertical 1,000 ø x 2,000 H	3	3	
Glauber salt dehydration tank	Na2SO4 3 ton/day	3	2	Dec.15 - 3
Spinning machine	100 nozzle centrifugal type	45	9	Nov.9 - 9 Nov.30-14 Dec.30-19
Sulphuric acid stock tank	40,000 L	4	4	
Air conditioning equipments	175,000 m3/h 50 HP	3	3	
Exhaust fan	100,000 m3/h 20 HP	6	6	
Reeling machine	2 skein x 6# swift	6	6	
Na2S circulation tank	7,500 L	2	2	
Bleaching liquor circulation tank	7,500 L	2	2	
Sulphuric acid circulation tank	7,000 L	2	2	
Soap liquor circulation tank	6,250 L	2	2	
Saponification vessel	438 L	2	2	
Na2S dissolving tank	4,200 L	1	1	
Na2S precipitation tank	13,000 L	5	5	
Liquid chlorine synthetic dissolving tank	9,120 L	2	2	
Skein bleaching machine	9,700 skein/h	2	2	
Skein hydroextractor	1,200 ø x 500 h	3	3	
Skein dryer	2,955 skein/h	3	3	
Bundling machine	300 bundle/day	3	3	

Baling machine	100 bale/day	1	1	
Cake bleaching machine	10,776 cake/day	2	1	Dec.15 - 2
Cake hydroextractor	240 cake/h	4	4	
Cake dryer	6,630 cake/day	2	2	
Reeling machine for cone	72 hanks	1	1	
Cone winder	56 spindle	36	24	Dec.20 - 36

DECLASSIFIED E.O. 12065 SECTION 3 (E), MAR 31

4. Characteristic of installation:

Compared with that of Saijo Plant, we mention here the special features of Kurashiki Plant in its installation as follows:

(1) Moisture control of pulp:

In order to keep the content of moisture in the punched pulp within 6 % (mainly home-made pulp) we installed the pulp dryer next to the pulp ware house. Inserting the pulp of 14 sheets in one section, pulp is gently dried by the steam pipe on the floor by 40°C for 16 to 20 hrs.

Moisture control is to be done by the following order:

Open the bale of pulp, cut it into one half, punch it and insert it in the dryer in each section of 14 sheets to decrease the content of moisture and then is carried over to the next weighing room where the pulp is left for 24 hrs for adjustment of moisture and then after weighing it is carried over to the steeping room of upstairs by pulp elevator.

(2) Filter of CS2:

Due to the mixing of dust in CS2, the cock with which CS2 is weighed and inserted to vacuum kneader is sometimes damaged, therefore, we put the filter press of CS2 next to the weighing tank of oil. Filter press is dipped in the water while using, and in case of cloth exchange, the water is discharged from the tank.

(3) Purification of water used for viscose and caustic preparation:

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Water is cleaned by ordinary Zeolite Filter, and then cleaned through manganese Zeolite Filter in order to decrease the content of Fe in the watrer and the dust in the water is extracted through the filter press.

(4) Purification of conc caustic soda solution:

In case of diluting of liquid caustic soda of 500 - 700 g/L into conc solution of 350 g/L, we take the measure of settling by circulating the steam heater by pump by 30°C and accereiate the precipitation.

(5) Purification of dissolving alkali liquor:

After adjusting the dissolving liquor for xanthation in the soft water and conc soda solution, we transfer it to the additional alkali temp adjusting tank through the filter press in order to extract the dust from the liquor.

(6) Installation of air conditioning equipments for alkali cellulose plant.

We installed the air conditioning equipments for weighing pulp room, steeping room, shredding room and alkali cellulose weighing room in order to control the moisture content of pulp, to prevent the drying of alkali cellulose and also to inify the temperature.

(7) Vacuum transport of alkali cellulose:

On steel belt conveyer at Omijo Plant, alkali cellulose touches to the air too much and it causes the carbonation and drying of alkali cellulose and in order to prevent this, alkali cellulose which comes out from J.B. Shredder and is received by the wagon through cyclone and sent to

DECLASSIFIED E.O. 11652 SECTION 3 (E)(2) NARS Date

vacuum kneader through the pipe by vacuum after weighing.

(8) Adjustment of cooling and heating of vacuum kneader:

In order to make the kneader uniformly cooled and heated, we make the passage of cold and hot water more efficient than that of Saijo Plant.

(9) Uniform temperature of viscose dissolving:

We installed the cooler and temp adjusting tank next to the vacuum kneader room to make the viscose dissolving in low and uniform temperature.

(10) Installation of the completely temp-controlled ripening room:

As the ripening room of Saijo Plant is not satisfactorily constructed in its temp adjusting equipments and building, Kurashiki Plant paid the special attention to the temp adjusting equipments and temp maintenance of building.

(11) Conduction equipments of spinning machine:

We separate the driving system to the high speed part (godet) and the low speed part (gear pump and cam) at the starting point and therefore, inside of gear box is simple and appropriate.

(12) Screen of spinning machine:

Screen of Saijo Plant is not easy for opening and closing with the cutting of the rope several times, therefore, we made it working by spring.

(13) Double godet:

In order to make the uniform yarn from spinning machine, we experimentally constructed one spinning machine

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with double godet. All others are also planned capable to be changed into double godet.

(14) Reeling maching:

We made the construction to be stable so as to make the opening and close of the swift exactly.

(15) Cake bleaching:

Paying attention to the oiling in cake bleaching, we installed oiling bath tank separated from skein oiling.

(16) Air conditioning in after-treatment section:

We installed the air conditioning equipments in the conditioning room where the skein and cake are left after drying, and also in the winder room and sorting room.

(17) Test room:

Fiber testing room is always kept in the same condition with temperature of 20°C and 65 % humidity.

5. Researches: Items of research which we are going to take up are as follows:

(1) Decrease the hemi-cellulose in the steeping liquor.

(2) Temperature control of alkali cellulose in J.E. shredder.

(3) Temperature control of heating and cooling in vacuum kneader.

(4) Utilization of electric high vibration apparatus for the removal of air bubbles in mercerization.

(5) Determination of the operation condition of the double godet spinning machine to produce the uniform yarn.

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Production Schedule

Kind of product: Skein and cone
Semi dull lustre
120 D (50 filament)

Production plan is estimated as follows considering the progress of the construction work and the acquirment of raw materials.

Month	Charge per day	Number of spinning machine operated	Production quantity of cone (lb)	" of skein (lb)	Total (lb)	Remarks
Nov.	4-10	3-14		60,000	60,000	start of spinning: Nov. 6
Dec.	10-14	14-19	30,000	100,000	130,000	

6. Raw materials and chemicals

We submitted the application for the special allocation for the second quarter as the running stock, but no ticket has been given and so we have to wait for the regular allocation for the 3rd quarter. It gives much obstacle to the commencement of operation and therefore, we submit the application for approval of transferring the stock in our Saijo Plant. We wish the regular allocation for the 3rd quarter shall be issued as quickly as possible and upon receiving it we will do our effort to materialize the coupon. (allocation ticket)

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Necessary quantities of principal raw materials & chemicals

Unit: Ton

Material	Quantity in stock	November	December
Pulp	0	35	75
NaOH (purity 97 %)	25.0	25	53
CS2	0	11	22
TiO2	0	0.3	0.6
Fe2O3	0	1.6	3.4
H2SO4 (purity 65°Be)	30	37	79
ZnSO4	5.0	3.0	6.2
Na2SO4	60		
ZnS (purity 55 %)	3.0	2.3	4.8
Bleaching powder (Act.ol 24 %)	10	0.7	1.4
Penoafter	0.5	0.4	0.8

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

7. Employees for rayon production:

Production plan and draft (recruition) plan of necessary persons in the rayon manufacturing section.

Necessary persons to carry out the afore-mentioned production plan are as follows:

Month	Production quantity	Female	Male	Total
Nov	60,000 lbs	400	200	600
Dec	130,000 "	450	300	750

Total listed employees in the rayon manufacturing section on Oct. 30 are 730 (Female: 410 and Male: 320) and there is no obstacle for the operation of the plant in November. From the smooth recruition in the past, we can expect the rose future regarding the employment of workers after December.

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6. Training for operation:

Training plan of rayon manufacturing section:

Kurashiki Plant started the viscose rayon filament production in 1925 and continued the production until 1944 and therefore, all the stuffs and foremen are experienced in viscose production. Accordingly, we carried out gradually the rayon production plan from the beginning of this year and completed the actual planning up to April 20. Engineering and technique are being learned by the installation of machinery and through text book and we sent the employees to Saijo Plant for practical learning according to the under-cited schedule and the final group came back from Saijo on Sept 27 and here we have completed the organization of employees for the operation of rayon filament production of 3,000 lbs per day from Oct. 1.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

Number of employees by their living quarters

Period		Total number	Dormitory		Employees quarters		On foot	Remarks
			No.of accomo dation	No.of occumied	No.of house	No.of occu- pied		
At present	M	1531	300	274 34 (clerks)	272	272	951	Oct.20
	F	539	500	311		43	185	
End of Dec.1948	M	1725	540	540	268	268	917	Accomodation for 240 male increased
	F	678	600	391		57	250	
End of Mar.1949	M	1977	540	540	368	368	1059	~~houses increased~~
	F	875	600	563		37	275	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDS NO. [illegible]

BASIC: Ltr. 36th Mil Govt Co, subj: "Application for permission to operate in the production of Civilian Goods. The Kurashiki Rayon and Staple Fibre Co. Ltd., 1621 Sakazu, Kurashiki City, Okayama Ken," dtd 15 Apr 46.

AG 004 - BA 3rd Ind KEN/hy

Hq I Corps, APO 301, 20 MAY 1946

TO: CO, 36th Mil Govt Co, APO 24.

Forwarded to your Headquarters for your information and necessary action.

1 Incl:
n/c

MG

BAX 1769

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO: 1100

36TH MILITARY GOVERNMENT
Headquarters and Headquarters Company MWH:gt
APO 24 (Okayama, Honshu)

15 April 1946

Ref: Operational Instructions No. 2,
Headquarters, I Corps, 15 February 1946.

SUBJECT: Application for permission to operate in the production of Civilian Goods.
The Kurashiki Rayon and Staple Fibre Company ltd.
1621 Sakazu, Kurashiki City, Okayama Ken.

TO: Commanding General, I Corps, APO 301.
ATTENTION: Military Government Section.

1. In accordance with paragraph 7, sub-paragraph c of Operational Instructions No. 2, four (4) copies of application from the above subject company are submitted for consideration.

2. This company is now operating under a permit for Reconversion issued 13 December 1945 by Military Government Section, Headquarters Sixth Army. Annex No. 1 to this permit authorizes the manufacture of veneered panel (plywood), prefabricated houses, moulded bakilite articles (household and electrical), cresol, charcoal, creosote and miscellaneous plywood articles.

3. It is not know whether higher Headquarters will consider approving this application under a new and separate permit or whether they will consider having the items on the current application included or added to their permit of 13 December. The application has been prepared so that it can be handled either way and this Headquarters will be governed accordingly.

4. This Headquarters has reviewed this application with the plant Manager and engineers and has made a complete survey of the Kurashiki factory, also the Okayama factory, some of the equipment for the reconversion program being now located in the latter plant. It is recommended that this application be approved and permit issued to cover the items p planned for 1946-47 production.

/s/ Donald C. Foster
/t/ DONALD C. FOSTER
Lt Col, CMP
Commanding

1 Incl:
Application

DECLASSIFIED E.O. 11652 SECTION 3 (E)(1)(2)(3) or (4)

BASIC: Ltr, 36th Mil Govt Co, subj: "Application for permission to operate in the production of Civilian Goods. The Kurashiki Rayon and Staple Fibre Co. Ltd., 1621 Sakazu, Kurashiki City, Okayama Ken," dtd 15 Apr 46.

1st Ind EHN:fn

AG 004 - BA

Hq I Corps, APO 301.

TO: CO, 36th Mil Govt Co, APO 24.

1. It is the decision of this headquarters that a new reconversion permit be granted to subject company.

2. A permit was issued from this headquarters under date of 3 May 1946, a copy of which is inclosed hereto. This permit includes all items authorized for production by the permit issued by Headquarters Sixth Army, 13 December 1945. You will direct subject company to surrender the initial permit to this headquarters with the least practicable delay. Application attached to basic communication were withdrawn for distribution to higher headquarters.

BY COMMAND OF MAJOR GENERAL HUNT:

/s/ H. B. Taylor
/t/ H. B. TAYLOR
Major, AGD
Asst. Adj Gen.

1 Incl:
1. w/d
Added
2. permit (one)

DECLASSIFIED E.O. 12065 SECTION 3 402/NNSC NO. [illegible]

BASIC: Ltr, 36th Mil Govt Co, Subj: "Application for permission to operate in the production of Civilian Goods. The Kurashiki Rayon and Staple Fibre Co. Ltd., 1621 Sakazu, Kurashiki City, Okayama Ken," dtd 15 Apr 46.

2nd Ind

Hq. 94th Hq & Hq Det Mil Govt Gp. APO 660 (Osaka) 17 May 46

TO: CG, I Corps, APO 301
(ATTN: Mil Govt Sec)

Returned without action. 36th Military Government Company is not under jurisdiction of this Hq.

For the Commanding Officer:

/s/ Richard C. Graef
/t/ RICHARD C. GRAEF
1st Lt. AC
Adjutant

1 Incl:
n/c

DECLASSIFIED E.O. 12065 SECTION 3 NLS/M#S NO. [illegible]

HEADQUARTERS I CORPS
APO 301 (Kyoto, Honshu)

GLS/fsn

Ref: IG - 339

AG 004 - BA

3 MAY 1946

SUBJECT: Permit for Reconversion from War Production and for Resumption of Production of Essential Civilian Commodities.

TO: Kurashiki Rayon & Staple Fibre Mfg. Co., Ltd., Kurashiki Factory
(Name and Address of Firm)

1612 Sakazu, Kurashiki City, Okayama Prefecture.

1. a. In accord with paragraph 3, b, Directive Number Three (3) from the Supreme Commander to the Imperial Japanese Government, dated 22 September 1945, the Kurashiki Factory
(Name of Firm)
is permitted to immediately start production of a. Plywood b. Prefabricated Houses c. Bakelite Goods d. Cresol e. Charcoal f. Creosote g. Synthetic Rayon h. Carbide i. Polyvinyl acetate resin j. Polyvinyl alcohol resin. (NOTHING FOLLOWS)
(Name of Items)

b. Maximum production currently authorized is a. 60,000 sheets/m b. 300 c. 30 T/m d. 3 T/m e. 9 T/m f. 0.3 T/m g. 6,000 kgs/m h. 90,000 kgs/m i. 12,000 kgs/m j. 6,000 kgs/m

2. The acquisition of material, parts and sub-assemblies as well as the disposition of finished products, and the establishment of sales prices will be in accord with the regulations of the Imperial Japanese Government.

3. Until otherwise directed by this headquarters, a monthly report in English of each item, by name, type and quantity produced by each factory, sub-contractor subsidiary within this factory's control will be delivered to this office by the fifteenth (15) day of the following month.

4. It is understood that this permit for reconversion is issued subject to any and all directives affecting reconversion, ultimate disposition or otherwise, which have been issued or may hereafter be issued by the Supreme Commander for the Allied Powers or by this headquarters.

BY COMMAND OF MAJOR GENERAL WOODRUFF:

Info copy to:
SCAP (Attn: ESS) (1) (w/incl)
SCAP (Attn: G-2) (1) (w/incl)
CG Eighth Army (1) (w/incl)
(Attn: Mil Govt)
CO 36th MG Hq Company (1)
Kyoto Liaison Office (1)
Governor of Prefecture concerned (1)
(Okayama)

DECLASSIFIED E.O. 11652 SECTION 3 (E) AND (J) NND

Serial No. of Report

APPLICATION FOR OPERATION OF
AND
REPORT ON INDUSTRIAL FACILITIES

TO: _____

THRU: Messrs 36th Military Gov't
HEADQUARTERS & HQ. CO.

Kurashiki Rayon & Staple Fibre
Manufacturing Co., Ltd.
497 Motomachi Kurashiki City
Name & Address of Reporting Unit

APRIL 12 1946
Date

1. Name of Facility: Kurashiki Factory, Kurashiki Rayon & Staple Fibre Mfg. Co., Ltd.

2. Location: Company; 497 Motomachi Kurashiki City
Factory; 1621 Sakazu Kurashiki City Okayama-ken

3. Name of President or Manager:

SOICHIRO OHARA, President & Director
KYUJIRO KINO, Chief of Kurashiki Factory

4. History:

a. Date of Construction:

Establishment of company; 24 June 1926
Construction of factory; 31 December 1927

b. Date of First Operation: 9 May 1928 (As the Rayon Factory)

c. 1935-1941 Production (Annual value in Yen: Quantities of Principal Products by Units or Weight):

No synthetic rayon production.

The following is the production of rayon staple fibre:

Incl: 1 MC Sec, Hq, I Corps

DECLASSIFIED E.O. 12065 SECTION 3 402/MNBS NO:

Year	Rayon Yarn		Rayon Staple Fibre	
	Quantity	Value(Yen)	Quantity	Value(Yen)
1935	14,420,000 lbs	¥9,373,000	-	
36	14,430,000 "	8,513,700	-	
37	11,470,000 "	8,831,900	-	
38	6,720,000 "	6,048,000	1,050,000 lbs	¥735,000
39	7,520,000 "	6,768,000	400,000 "	280,000
40	7,720,000 "	6,948,000	1,060,000 "	742,000
41	7,770,000 "	6,993,000	1,400,000 "	980,000

d. Present Capitalization in Yen: ¥50,000,000 (¥30,000,000 paid-up)

e. Changes made in capital structure since 1935: NO

f. Name & Address of Parent Company:

Name; Kurashiki Cotton Spinning Co., Ltd.
Address; 497 Motomachi Kurashiki City Okayama-ken

g. Number of shares outstanding:

400,000 Shares (¥5,000,000 unpaid)
400,000 " (¥15,000,000 unpaid)
Total 800,000 Shares (¥20,000,000 unpaid)

h. Number of stockholders (Give name of those owing 10 % or more of the total):

Owners	No. of shares	Percentage
Kurashiki Cotton Spinning Co.,Ltd. (Soichiro Ohara, President & Director)	142,603	14 %
Ohara Goshi Company (Benji Fujita, Active Partner)	104,787	10 %

i. Funds received from Gov't: None

j. On reverse side give outline sketch of plant layout with approximate dimensions: Attached Blue Print

5. Description

a. Principal Products:

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO: [illegible]

1. Wartime: Polyvinyl alcohol resin 5 tons (monthly)
In our Okayama Factory (3 Kaigan-dori 1-chome Okayama City), where the equipment was complete for polyvinyl alcohol resin & synthetic rayon production. (Capacity: 6 tons/month).

2. At present: No Production
Equipments were damaged by the air-raids on June 29 of last year. Whole building was burnt out, but machinery equipments were left for use by being repaired.

3. Planned for 1946-47:

Synthetic rayon-	6,000	kgs/month
(Carbide-	90,000	")
(Polyvinyl acetate resin-	12,000	")
(Polyvinyl alcohol resin-	6,000	")

We plan to transfer above equipments from Okayama Factory to Kurashiki to produce 6 tons of synthetic rayon and new equipments will be added for the production of 90 tons of carbide and 12 tons of polyvinyl acetate resin per month.

b. Capacity

1. Wartime:

Polyvinyl acetate resin-	12,000	kgs/month
Polyvinyl alcohol resin-	6,000	"
Synthetic rayon-	6,000	"

(At Okayama Factory)

2. At present: None

3. 1946-47 (With unrestricted access to materials)

Polyvinyl alcohol fibre (Synthetic rayon)	6,000	kgs/month
Carbide	90,000	"
Polyvinyl acetate resin	12,000	"
Polyvinyl alcohol resin	6,000	"

c. Number of Employees:

1. Wartime: 124 (For polyvinyl alcohol resin production)

2. At present: 30 (For study & researching)

3. 1946-47 (At maximum capacity for polyvinyl alcohol fibre)
220

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

6. Machinery & Equipments in Plant

A. Apparatus for production of Carbide

Description	Quantity	Condition
a. Electric furnace	1	3 tons/day, transfered from other place where it is not used.
b. Lime kiln	2 Each	3 tons/day new
c. Transformer	2 Each	800 k.v.a. on hand, self-repair

B. App. for production of Acetate Acid

a. Acetylene generator	1	10 m3	on hand
b. Purificator of gas	1 set	600 m3/day	ditto
c. Gas holder	1	50 m3	ditto
d. Hydrater	2 Each	6 m3	ditto
e. Recovery plant of mercury	1 set	100 kgs/day,	on hand, self-repair
f. Distillation column	1	4 tons/day,	on hand, self-rebuilt
g. Oxidation autocrabe	1	2 m3	new
h. Oxygen tank	1	50 m3	self-made
i. Rectification column	1	0.6 ton/day	new

C. App. for production of Polyvinyl Alcohol

a. Reaction tower	2	1.5 m dia,2 mh	new
b. Acetylene saturator	1	0.8 m dia, 2 mh	ditto
c. Rectification column	1 set	0.4 ton/day	ditto
d. Autocrabe for polymerization	2 Each	1.5 m3	self-made
e. Saphonificator	2 Each	1.5 m3, on hand,	self-repair
f. Alcohol tank	5	4 m3	on hand
g. Centrifugal hydro-extractor	2	800 m dia	ditto
h. Drier (Rotary)	3	1 m dia, 2 mL	Ditto
i. Sodium acetate crystallizer	4	0.5 m3	ditto
j. Alcoholic alkali solution plant	1 set	300 kgs/day	self-made
k. Recovery plant of alcohol	1 set	2 m3/day, on hand,	self-rebuilt

D. Spinning app. for synthetic rayon

a. Spinning solution dissolver	2 Each	1.7 m3	on hand
b. Filter press	4	36 plates	ditto
c. Spinning machine	2	10 spinnerets, on hand,	self-rebuilt
d. Aftertreatment app.	1 set	200 kgs/day,	self-made
e. Drier	1 set	200 kgs/day	new

DECLASSIFIED E.O. 12065 SECTION 3-402/NNBS NO:

7. Present stores of raw materials, supplies and unfinished goods. None

8. Present stores of finished goods. None

9. Present stores of fuel. None

10. Machinery & equipment needed for maximum production 1946-47. Described in Item 6

11. Raw materials & supplies needed (monthly).

a. For present capacity (5b2 above): None

b. For maximum (5B3 above):

Description	Quantity	
Carbon (cokes & charcoal)	99,000 kgs	63 tons for carbide 36 " for limestone
Lime stone	180,000 "	
Mercury	24 "	
Nitvic acid	300 "	
Soda ash	300 "	
Sulphuric acid	8,000 "	
Alcohol	9,000 "	
Caustic soda	6,000 "	
Sodium sulphate	20,000 "	
Electric power	430,000 KWH	

NOTE: We use about 30 tons of charcoal manufactured by us.

12. Fuel needed (monthly) (Do not include present stocks)

Coal	250,000 kgs

13. Additional personnel needed (Not locally available)

None

14. Price (Give current selling prices in Yen of principal products).

Description	Unit	Price
Synthetic rayon	100 lbs	¥10,000

NOTE: If official selling price be fixed, price will be changed accordingly.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO: [illegible]

15. Remarks (Include here any factor hampering production not already mentioned and any recommendation you consider necessary).

Kurashiki Factory started its production of rayon and staple fibre from May 1928 to the last month of 1941. In 1942, upon the request of the Japanese Military Authority, it converted to the wood working and electrolized metallic mangan industry.

At the termination of war, it stopped operation and requested the permission of reconversion again to the peacetime production, dated October 5 1945 and has been granted permit by the Military Gov't of the 6th Army, dated December 13 of the same year.

Under the provisions of the permit, it is now operating its factory for the production of veneered panel, prefablicated houses, bakelite compound and its articles.

We are now planning to produce the synthetic rayon on the basis of a long year experience of the fibre production technique, with the object to distribute the fibre goods to the people impoverished by the war.

Concerning the synthetic fibre production, we have studied for ten years on the cellulose acetate and chemical industry of acetylene derivatives in our Research Laboratory and completed the preparation of a mass production in Okayama Factory. But sorry to say, we had to stop before starting operation because of the air damage. And this plan will be finally materialized in Kurashiki Factory with a production scale of 6 tons per month at first and then will be expanded its scale to 50 tons per month production of synthetic rayon.

In this connection, fortunately for co-operative production, we have one affiliate, The Showa Chemical Industry Co., Ltd. (Capital:¥3,000,000 paid-up. Location: Kanose-mura Higashi-Kambara-gun Niigata-ken), where the productive equipment is complete for preparation of polyvinyl acetate from carbide.

Chemists and engineers to bring this plan into being are already lined up long before the war.

The building in Kurashiki Factory is enough for a new production only by being reformed partly, and machines will be transfered fromOkayama Factory by reparing those which had been partly damaged or stored for use.

Some will be purchased which are not now actually used.

16. Certification by applicant:

I certify that the information contained herein is true to the best of my knowledge and belief.

Signed: S. Ohara

Title: President & Director

DECLASSIFIED E.O. 12065 SECTION 3 402/MNBS NO: [illegible]

17. Action by Occupation Forces

The Factory described in this application has been inspected and the following action:

a. Ordered to remain closed Yes ____ No X

b. Ordered to cease operation immediately

Yes ____ No X

c. Authorized to produce at the following rate:

Item to be manufactured	Monthly quantity
Polybinyl alcohol fibre (Synthetic rayon)	6,000 kgs per month
Carbide	90,000 " "
Polyvinyl acetate resin	12,000 " "
Polyvinyl alcohol resin	6,000 " "

M.W. HOLLINGSWORTH, Major, QMC
Signature of Authorizing Officer

36th Military Government Company
Designation of Authorized Unit

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

General Plan of Kura

Private truck

63

Machine shop

Ware house

Office

Gate way

Dining-room

Polyvinyl acetate resin

Acetic acid

530

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. [illegible]

Kurashiki Factory

Kurashiki Rayon & Staple Fibre Co. Ltd.

N

Size 1/500

150

Ware house

60

100

Boiler

140

35

Polyvinyl alcohol resin

Laboratory

Veneered panel

Plastics

Polyvinyl alcohol fibre

167

Ware house

67

Carbide

95

60

Transformer sub station

0 10 20 30 40 50 100 150 m.

DECLASSIFIED E.O. 12065 SECTION 3 NND/NARS NO.

HEADQUARTERS SIXTH ARMY
Military Government Section

APO 442

File: MG 309 Date: 19 December 1945

SUBJECT: Permit for Reconversion from War Production and for Resumption of Production of Essential Civilian Commodities.

TO : Kurashiki Rayon & Staple Fibre Mfg. Co. Ltd.,
(Name & Address of Firm)
Okayama Factory,
1-chome, Kaigan-dori, Okayama City.

1. In accordance with the provisions of paragraphs 3 a and 3 b of Directive No. 3 from the Supreme Commander for the Allied Powers, dated 22 September 1945; Memorandum for the Imperial Japanese Government, Subject: Reconversion of War Production Plants to Peacetime Production, dated 28 October 1945; and under authority granted this Headquarters by CINCAFPAC Radio ZAX 6197 dated 3 October 1945, you are authorized to commence operation of your plant, and to manufacture the essential civilian commodities listed in Annex No. 1 to this permit.

2. This permit grants authority only to operate. The acquisition of materials, parts, and sub-assemblies, as well as the disposition of finished products and establishment of sales prices, will be in accord with the regulations of the Imperial Japanese Government.

3. At the end of the first month of operation, and at the end of each three-month period thereafter, until notified to the contrary by this Headquarters a report will be made to the Commanding General X Corps, Headquarters Kure, Attention: Military Government Section. This report will be written in English and will list each item, by name, type, and quantity produced by each factory, subsidiary, or sub-contractor operating under the provisions of this permit. This report will be delivered to Corps Headquarters not later than fifteen (15) days after the conclusion of the period to which the report pertains.

FILE
GDS
MDC
DSL
mfm
jm
ab

GEORGE D. SEARS
Colonel, Infantry
Military Government Officer

Info Copies To:

GHQ, SCAP (Attn: E. & S. Sec)
CG X Corps, (Attn: MG Sec.)
Imperial Japanese Gov't
(6th Army Jap. Liaison Office, Kyoto)

1 Incl:
Annex No. 1

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO: [illegible]

HEADQUARTERS SIXTH ARMY
Military Government Section
APo 442

19 December 1945

ANNEX NO. 1

Permission is granted to Kurashiki Rayon & Staple Fibre Mfg. Co. Ltd., Okayama Factory, 1-chome, Kaigan-dori, Okayama City, to produce the following items listed below:

a. Kitchen knives.
b. Frying pans.
c. Fire shovels.
d. Fire tongs.
e. Portable cooking stoves.
f. Hoes.
g. Sickles.
h. Pans.
i. Ladles.
j. Flour manufactured from sweet patato vine.
k. Prefabricated housing.
l. Mat and Tex (straw insulating board, somewhat similar to "celotex").

- -

(Nothing Follows)

D. S. LOCKIE
Capt, F. D.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNSS NO. [illegible]

HEADQUARTERS X CORPS
Office of the Commanding General
APO 310

AG 383-Z

5 December 1945

SUBJECT: Applications for Resumption of Industrial Production.

TO : Commanding General, Sixth Army, APO 442.
ATTENTION: Military Government Section.

1. In accordance with par 5, Ltr, Headquarters Sixth Army, dated 6 November 1945 the basic requests are forwarded for review and approval of action taken.

FOR THE COMMANDING GENERAL:

F. NOWAKOWSKI
Col., AGD,
Adj. General

3 Incl:
Incl 1 - Ltr, Applications of Kurashiki Rayon and Staple Fibre Manufacture Co and Kurashiki Industrial Co for permission to convert to civilian production.
Incl 2 - Application of Kurashiki Rayon and Staple Fibre Manufacture Co, Okayama Factory, for permission to manufacture civilian goods.
Incl 3 - Application of Kurashiki Industrial Co, Tamashima Factory, for permission to manufacture civilian goods.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO.

HEADQUARTER OKAYAMA TASK FORCE
MILITARY GOVERNMENT SECTION
APO #24

30 November 1945

REFERENCE: Letter of 6 November 1945, Headquarters Sixth Army, Military Government Section

SUBJECT : Applications of Kurashiki Rayon and Staple Fibre Manufacture Co. and Kurashiki Industrial Co. for permission to convert to civilian production

TO : Headquarters Sixth Army, Military Government Section through Headquarters X Corps, Military Government Section

1. The attached applications for permission to convert to civilian production were prepared before the receipt by this Section of the outline of information contained in the letter of 6 November 1945 from Headquarters Sixth Army. Accordingly, they do not contain all the information now being required of applicants. However, in order to expedite production, the applications are submitted for consideration in this form with the hope that sufficient information is available for a decision.

2. If Headquarters Sixth Army requires the complete information as outlined before considering these cases, this Section will require the companies to submit new applications in the current form. On the other hand, it might be possible to issue permits on the basis of the present applications with the understanding that this Section will assemble later any data needed to complete the records of Headquarters Sixth Army.

Inclosures 2

Raymond S. Watts
RAYMOND S. WATTS
Lt. Col., A. C.
Chief of Section

DECLASSIFIED E.O. 12065 SECTION 3 402/MNSC NO: 1

HEADQUARTER OKAYAMA TASK FORCE
MILITARY GOVERNMENT SECTION
APO #24

30 November 1945

REFERENCE: Letter of 6 November 1945, Headquarters Sixth Army, Military Government Section

SUBJECT : Application of Kurashiki Rayon and Staple Fibre Mfg. Co., Okayama Factory, for permission to manufacture civilian goods.

TO : Headquarters Sixth Army, Military Government Section through Headquarters X Corps, Military Government Section

1. In accordance with paragraph 5 of the referenced letter, the application of the Kurashiki Rayon and Staple Fibre Mfg. Co., Okayama Factory is submitted for consideration.

2. This Section has made a thorough investigation of the application and has inspected the plant.

3. On order of the Imperial Government, this company ceased manufacture of textiles in January 1944. After 2 to 3 months for plant conversion, production of aircraft parts was begun in April 1944 as a sub-contractor of Kyushu Aircraft Mfg. Co. In November 1944, the company ceased manufacture of parts and became a prime contractor with the Navy for the assembly of aircraft. This change over was made on order of the Navy and continued in force until August 1945.

4. Cost of converting the plant from textile to aircraft production was 30,000,000 Yen. This cost was borne by the company through a private loan from the Industrial Bank of Japan (civilian) at an annual interest rate of 4½%. To date all interest payments have been met but no payment has been made against the principle. No subsidies or other financial assistance was received from the government or the prime contractor.

5. The company has received payments from the Navy totaling about 3,500,000 Yen; no payments have been received from

DECLASSIFIED E.O. 12065 SECTION 3 (E)(2) NLS No. [illegible]

Kyushu Aircraft Co. The company estimates that it stands to lose 20 million Yen if the government does not pay for production completed and in process. An additional 10 million Yen will be lost if the government does not pay for machinery purchased by the company for aircraft production.

6. The straw insulating board (Tex and Mat) proposed to be manufactured by this plant is needed for the continued production of prefabricated houses already underway at the Kurashiki plant of this pompany. The first such house (which will also be manufactured at the Okayama plant) is almost completed and it offers great promise. This Section believes it is very important that these houses be gotten into mass production by both factories as soon as possible.

7. The proposed plan for the production of civilian goods by this plant is believed to be an excellent one, and this Section recommends the earliest approval of the application.

OK

Inclosure 6

Raymond S Watts

RAYMOND S. WATTS
Lt. Col., A. C.
Chief of Section

DECLASSIFIED E.O. 12065 SECTION 3 (E)(2) NARS DATE 11-30-78

ADDITIONAL
APPLICATION FOR THE PERMISSION OF CONVERSION TO THE ESSENTIAL CONSUMERS COMMODITIES

November 17, 1945
Additional to the application submitted Oct.12,1945

By

Kurashiki Rayon & Staple Fibre Manufacturing Co.,Ltd.
497 Motomachi, Kurashiki City, Okayama-ken

S. Ohara

Soichiro Ohara
President & Director

DECLASSIFIED E.O. 12065 SECTION 3 102/MR3 NO:

ADDITIONAL
APPLICAYION FOR THE PERMISSION OF CONVERSION
TO THE ESSENTIAL CONSUMERS COMMODITIES
November 17,1945

Additional to the application submitted Oct.12,1945

A. Name:

a. Name of company; Kurashiki Rayon & Staple Fibre Manufacturing Co.,Ltd.
(During the war, we use the name of Kurashiki Rayon, Staple Fibre, Wooden airplane & Accessories Manufacturing Co., Ltd.)
Name of factory; Okayama Factory

d(3) B. Capital: ¥50,000,000 (¥30,000,000 paid)

d(7) C. Ownership: March 31, 1945

Owners	Number of shares
Kurashiki Cotton Spinning Co., Ltd.	142,603
Ohara Goshi Company	104,787
Sumitomo Co.,Ltd.	29,000
Sumitomo Chemical Industry Co.,Ltd.	12,800
Sumitomo Mining Co., Ltd.	27,000
Mr. Kichiemon Sumitomo	10,000
Mr. Sumizi Hara	9,805
War Time Cash Office	8,760

d(8) D. Relation to the Government: Not at all

d(1) E. Date of Foundation:

Company; 24 June, 1927
Factory; 9 June, 1935

b F. Location:

Company: 497 Motomachi, Kurashiki City, Okayamaken
Factory; 1-chome, Kaigan-dori, Okayama City

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

f

G. General description of machinery & plant:

1. Area of site;	452,195	Sq. meters
2. Area of building:	69,970	"

3. Machinery:

Lathe	88
Drilling machine	28
Boring machine	1
Planing machine	1
Shaping machine	15
Slotting machine	4
Milling machine	25
Cutting machine	16
Grinder	6
Other machine tools	76
Hammar machine	1
Friction press	2
Crank press	8
Hydraulic press	2
Plate rollers	25
Air compressor	4
Band saw	8
Circular saw	9
Plane machine	28
Other machines for wood-working	30
Motors	96
Transformer & other electric apparatus	78
Sclerometers	2
Boiler	6

80

4. Raw materials on hand:

Steel	8.9 tons
Special steel	129.3 "
Rolled plate of alminium	17.55 "
Casting & forging alminium	0.2 ton
Electric wires	8,048 meters
Paints	5.82 tons
Lumber	2,019 cubic meters
Laminated press panel	2,030 sq. meters
Petrol	0.44 ton
Wheat straw	7,151 tons

DECLASSIFIED E.O. 12065 SECTION 3 402/NNDS NO. [illegible]

e(3)(b) H. Number of employees: Nov. 1, 1945

Staffs:	168	(Men	165	Women	3)
Workers:	246	("	202	"	44)
Total	414		367		47

e(3)(c) Note: When setting to work, we will increase the number of workers to about 1,000.

I. Production before the war:

Article	Monthly production
Rayon	1,000,000 lbs.
Staple Fibre	6,600 "
Pulp (experimental)	300 tons

e(1)(a) J. Production during the war:
e(2)(a)

Article	Monthly production
Accessories for wooden airplane (central, rear & supporting plane)	For 20 airplanes
Wooden airplane	TWO
Furfural	48 tons
Tex (INSULATING BOARD SIMILAR TO "CELOTEX")	10,000 sq. meters

e(1)(c) K. Future plan of production: At your permission.

Article	Monthly production	Materials
Kitchen knife	500	carbon steel plate 800 kgs
Frying pan (big size)	500	
" (small size)	500	
Fire shovel	500	
Fire tongs	500	iron plate 1,500 kgs
Portable cooking stove	300	
Hoe	500	
Sickle	1,000	
Pan	1,000	alminium 600 kgs
Ladle	1,000	
SWEET POTATOE VINE Flour food	60,000 kgs	sweet potatoes vine (SEE ANNEX 1) 70,000 kgs
PREFABRICATED HOUSE (LAMINATED PLYWOOD)	600	LUMBER - 5000 CU.M. (" " 2)
TEX+MAT (STRAW INSULATING BOARD)	20,000 sq. M.	STRAW - 200 TONS (" " 3) LIME - 6 TONS

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO: [illegible]

Outline of Okayama Factory
Kurashiki Rayon & Staple Fibre Manufacturing Co., Ltd.

d I. Foundation of the Company & its Okayama Factory:

A. Kurashiki Rayon & Staple Fibre Manufacturing Co., Ltd. was founded in June,1926 as the sister company of Kurashiki Spinning Company at Kurashiki, the city famous for its culturalattainments and chemical fibre industry cultivated by the strenuous effort of the late Mr. Magosaburo Ohara, predecessor of the company and man of culture. The capital at present is totalized ¥50,000,000 with three big factories in Kurashiki, Okayama and Saijo.

d(1) B. Okayama Factory was founded in June, 1936, facing to the Asahi River, with the quay equipped with landing facilities for the ships of 150 tons alongside.

Its area of site: 452,195 sq. meters
Area of building: 69,970 "

2. Enterpriges before the war:

A. Since Mr. Soichiro Ohara, present president, returned from abroad, the company made a rapid progress by his conscientious and effective administration and the rayon and staple fibre manufactured there were holding the 1st rate superiority and fame in the world.

B. Its products and volume of production per month:

Rayon	1,000,000 lbs
Staple Fibre	6,600 "
Rayon Pulp	Experimental production (plan - 300 tons)

DECLASSIFIED E.O. 12065 SECTION 3 402/NNDS NO. [redacted]

e 3. Enterprises during the war:

A.In April, 1943, at the request of the government, the company was compelled to give up its position and honor in manufacturing rayon & staple fibre. Firstly pulp making factory was converted to producting furfural and tex and then as the subcontract company of the Kyushu Airplane Manufacturing Company set to work manufacturing accessories for wooden airplane like central, rear and supporting plane and its framing of airplane. However, in addition to the difficulties both in dissolution of large equipments of rayon production and also in obtaining machines and raw materials neccessary for a new production, poor technical instruction by the authorities did nothing other than prolong the duration of conversion. And finally, we came across the historical termination of war before we took the regular course for a new production.

e(1)(a) e(2)(a) B.Products & Volume of production per month:

Accessories for wooden airplane (central, rear & supporting plane)	for 20 airplane
Wooden airplane	two
Furfural	45 tons
Tex	10,000 sq. meters

f C. Machinery:

Machine tools	254
Production machines	42
Machine for wood working	75
Electric machines	174
Sclerometers	2

DECLASSIFIED E.O. 12065 SECTION 3 402/NNDS No: [illegible]

e (3)(a) D. Employees: Aug. 14, 1946

	Men	Women	Total
Staffs	321	7	314
Workers	1,278	978	2,276

4. State of affairs after the war:

A. On termination of the war, we stopped war production on all sphere at the command of the Head Quarters of the Allied Forces and all machines, equipments, raw materials and products are now being carefully preserved as they were at the time of closing war.

9 B. Raw materials on hand:

Steel	156 tons
Electric wires	8,048 meters
Paints	5.82 tons
Lumber	2,019 cubic meters
Veneered panel	2,030 sq. meters
Straw	7,151 tons
Lime	30 tons

e(3)(b) C. Employees: Oct. 1, 1946

	Men	Women	Total
Staffs	165	3	168
Workers	180	70	250
			Total 418

Besides this number, we have about 1,000 workers, now at their homes, waiting for the re-opening of the factory.

e(1)(e) 5. Plan of conversion to the peace production:

We hope to turn back to the rayon production of 30 tons a day in the near future as we have many equipments for water works, steam, electricity and dyeing as they were before in addition to many technical experts and some machines necessary for rayon production. However, under the situation of to-day, we are planning to set to work the following production as the temporary enterprise.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNSC NO: [illegible]

Products	Production per month	Raw materials	
Laminated structural house	600	lumber	5,000 cubic meters
Tex	10,000 sq. meters	straw	200 tons
Mat	10,000 "	lime	6 "
Flour food	60 tons	sweet-potatoes vines	70 tons

NOTE: Immediately at your permission, we set to work partly and then get to the scheduled volume of production.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO:

ANNEX 1

Plan of production
Flour Food

1. Brief outline of the plan:

At this critical moment from shortage of food, we intend to do flour production by utilizing eatables which are not paid notice by the people and then gradually extend our production to the complete nutritious food by suitable combination of something nutritious in it. However, for lack of materials for complete food, we set to work for flour food production only and then complete food on the occasion we will have some materials for it.

2. Quantity of production:

Quantity of flour food production per month is 30 tons from the capacity of machines on hand and those to be self-made.

Installation & arrangement of machines & equipments takes about two months. Therefore, we will be able to start on January 1, 1946.

Monthly production amount to 10 tons and by March 30 tons, as following;

Month	Ja.	Feb.	Mar.	Apr.	Ma.	Jun.	Juk.	Aug.	Sep.	Oct.	Nov.	Dec.
Volume	10	20	30	30	30	30	30	30	30	30	30	30

Total 330 tons

Note: As the volume of production depends much on the capacity of crushing machine, we must have so many crushing machines that we may take the course of mass production.

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3. Materials:

By the assistance of Food Dept. of Okayama Prefectural Office we are doing now our best to gather the materials in several districts of Okayama Prefecture.

The following are those expected to gather:

Sweet-potatoes' vine	75 tons
Mug-wort	19.5 tons
Radish leaves	1.1 ton
Acorn	0.15 ton

Note: No worry about the mass gathering of the materials by reason of endevour given by the prefectural office which instructed already the people in prefecture to carry about sweet-potatoes' vine as possible as they can. Its total amount expected is 2,250 tons.

Concerning their nutrition value, we have an investigation materials on sweet-potatoes' vine ; while that of mug wort, radish leaves and acorn is under investigation.

Analysis of sweet potatoes vine :

Proportion of water	10.44%
Amide nitrogen	0.028%
Albumen	1.39%
Fat	0.0%
Quantity of sugar	5.71%
Farina	15.3%
Methyl pentozan	1.42%
Pentozan	9.2%
Fibrin	34.49%
Ashes	6.85%

68.34 Calory for 100 gms (test quantity)

As above table of analysis shows, nutritious value, especially that of albumen and fat element is very much insufficient. And that is the reason why we want to have the complete food, mixed with other element like fish-meals or soybean meals.

4. Sweet-potatoes' vine flour:

50 - 80 mesh

Its selling price; ¥650 for ton

DECLASSIFIED E.O. 12065 SECTION 3 402/MNBS NO:

5. Building & machines:

a. Building area: 1,100 sq. meters

b. Machines:

Cutting machine	100 kgs/h	1
Crushing machine	"	1
Pulverizer	2 kgs/h	12
"	10 kgs/h	5
Sieve machine	50 kgs/h	2
Drying machine	"	1

Note: Machines on hand;

Cutting machine	100kgs/h	2
Crushing machine	"	3
Pulvelizer	2 Kgs/h	2
"	10 Kgs/h	5

Others will be completed by 15th of Dec. of this year with materials on hand.

6. Employees neccessary for its production:

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDS NO.

ANNEX 2

Plan of production
Laminated structural houses

1. Outline of the plan:

We are planning now the following special houses with the objeject to solve the House Problems connecting with to-day's shortage of houses to live in.

Its characteristics:

a. Mass production in the factory with low price.

b. Short working hours at the place of building. A day is enough for construction.

c. Special panel (less than 50 kg in weight) for floor, wall and roof.

d. Easy to build and also for dissection or enlargement. Enlargement is to be done twice.

e. Durable for 20 years and safe for earthquake and tyhoon.

f. Owing to the shortage of materials, house is combustible, lumber, veneered panel, mat, tex and paper being used with cement partly. In proportion as production of cement, iron, or glass increases, incombustible structural house must be projected in the near future.

NOTE: Head Office in Kurashiki City is now in charge of its plan and test-production. Mass production is expected in this factorywith its large building and many machine tools for wood-working, while on the other, we must have the special set of people to be despatched to the spot for construction.

2. Form of laminated structural house:

Area of building:	33 sq. meters	
No. of rooms:	3, with porch, kitchen & toilet	
Materials:	Lumber	8.5 cubic meters
	Veneered panel	
	Tex	33 sq. meters
	Mat	23.5 "
	Paper, nail, permaseal, resin solution and thin iron plate prepared.	
Workers:	In factory	about 60
	On actual spot	" 15
Selling p rice:	about ¥5,000	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDS NO. [illegible]

3. Expected volume of production:

a. Operation will start from January 1, 1946

b. 1st plan- 30 houses per month
2nd plan- (in the last month of the same year)
600 houses per month

c. Volume of monthly production:

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Volume	30	60	90	150	210	270	330	390	450	510	570	600

Total 3,660

4. Materials & Employees:

a. Materials;

1. Lumber(for 600 houses) 5,000 cubic meters
2,019 cubic meters of lumber are now on hand and remains will be provided by Peoples' Welfare Promoting Dept.

2. Tex & mat are partly manufactured here, remains being supplied with veneered panel and Japanese mat.

b. Employees:

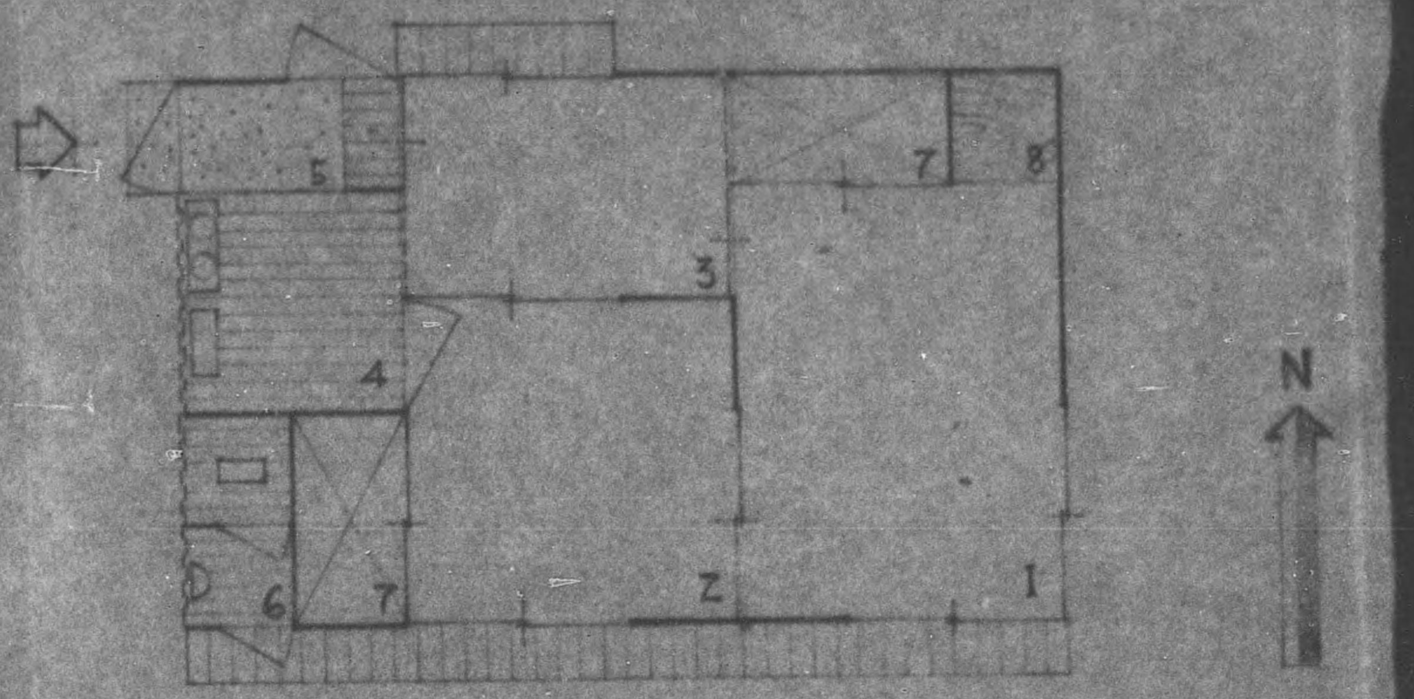
About 1,000 workers are now at homes awaiting the re-opening of the factory and 500 more must be collected.

5. Building & Machinery:

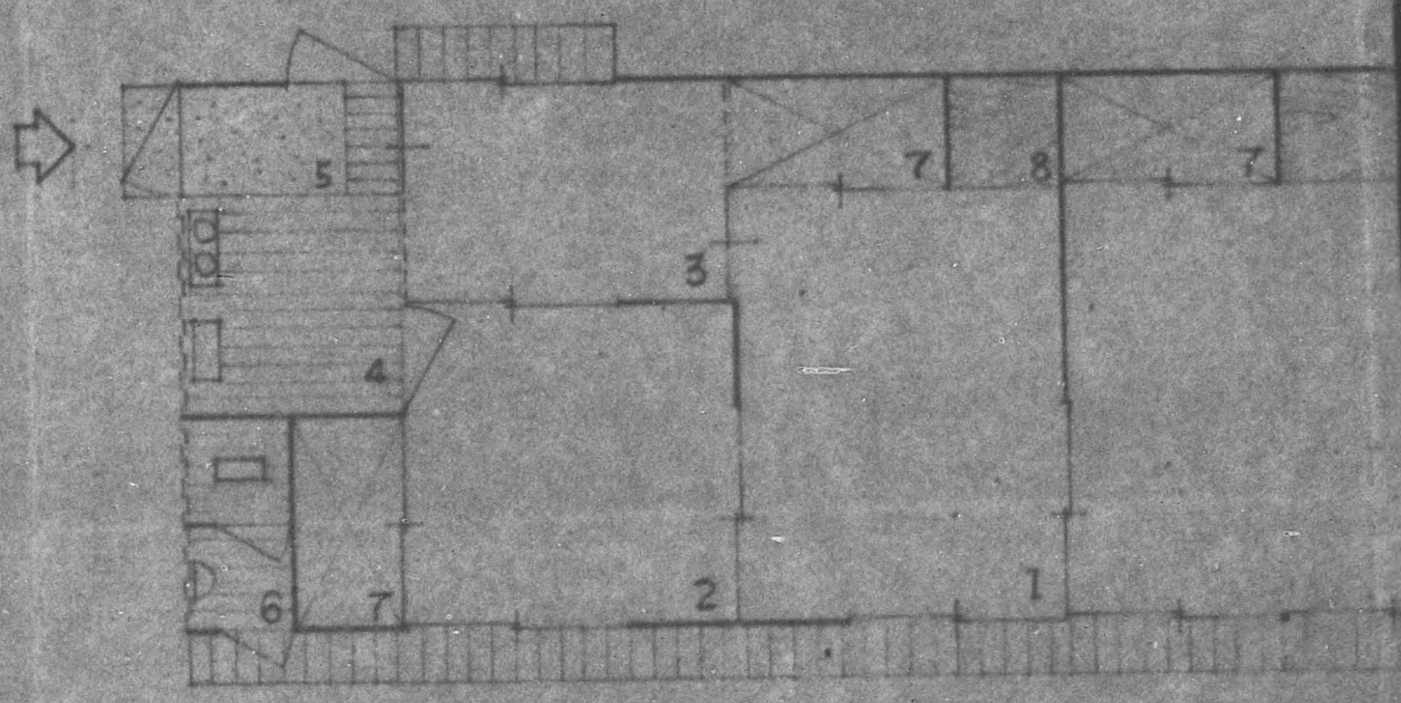
Area of building; About 15,000 sq. meters
Machinery; Machines for wood-working 50

DECLASSIFIED E.O. 12065 SECTION 3 402/MMBS NO:

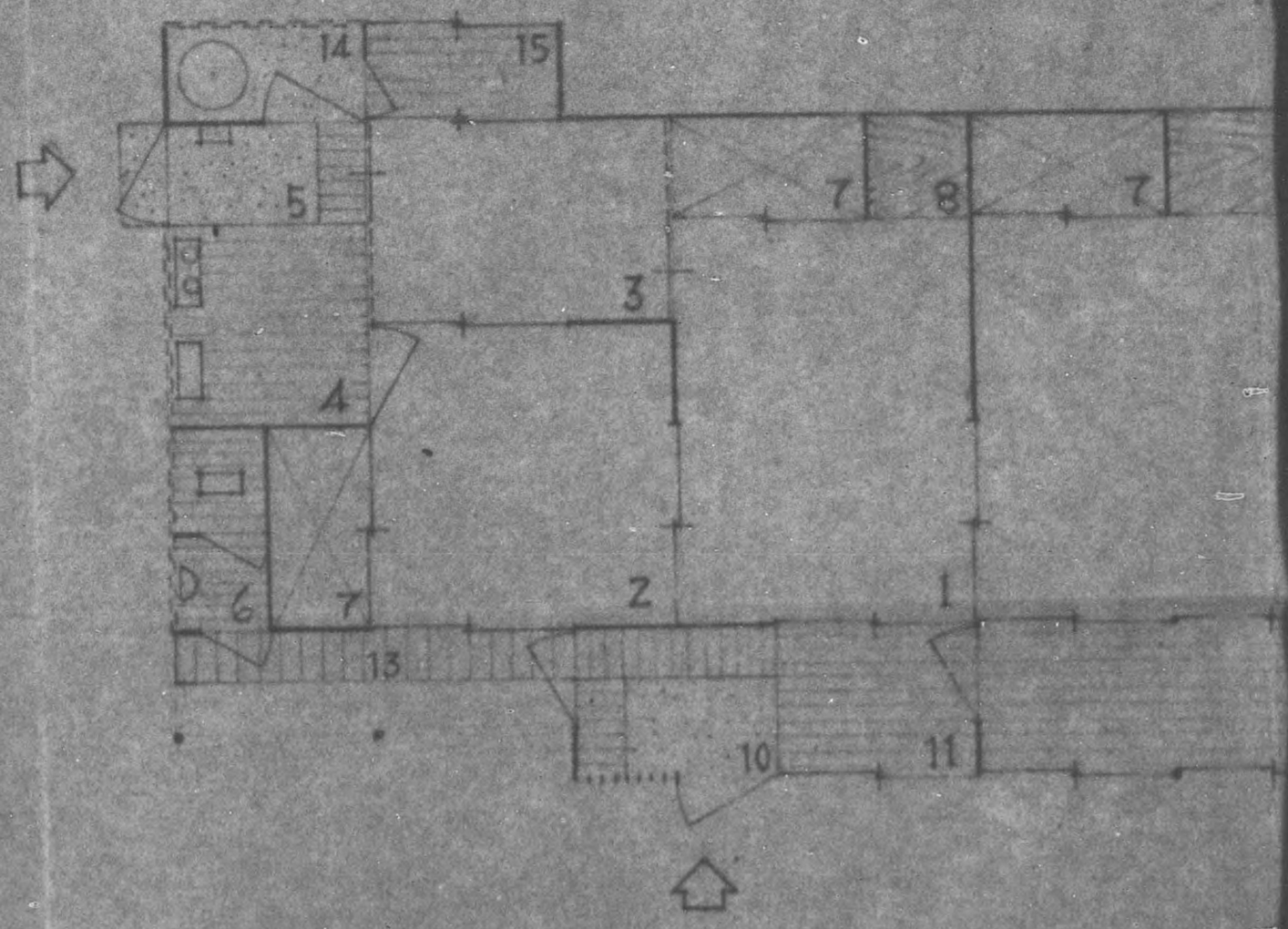
NO	ナマヘ	メンセキ坪
1	六　帖	300
2	四帖半	225
3	三　帖	150
4	ダイドコロ	100
5	ゲンカン	50
6	ベンジョ	50
7	オシイレ	100
8	トコ	25
計		10.00坪



NO	ナマヘ	メンセキ坪
1	六　帖	300
2	四帖半	225
3	三　帖	150
4	ダイドコロ	100
5	ゲンカン	50
6	ベンジョ	50
7	オシイレ	150
8	トコ	75
9	八　帖	400
計		15.00坪



NO	ナマヘ	メンセキ坪
1	六　帖	300
2	四帖半	225
3	三　帖	150
4	ダイドコロ	100
5	カテグチ	50
6	ベンジョ	50
7	オシイレ	150
8	トコ	75
9	八　帖	400
10	ゲンカン	75
11	トリツギ	75
12	サンルーム	150
13	ゲヤ	100
14	フロバ	50
15	センカワ	50
計		20.00坪



DECLASSIFIED E.O. 12065 SECTION 3 402/NNSG NO.

クラシキ
C1

N

C1原型

7 8 9

一次拡張

7 8 9 12

二次拡張

倉敷絹織株式會社 建築課					
課長	㊞	製図	木下	検印	
年月日	昭和.20.10				
訂正					
名称	C1型プラン				
縮尺	1/100				
図番	301		部番	C1 プラン	

DECLASSIFIED E.O. 12065 SECTION 3 NLJ/NNSC NSC

ANNEX 3

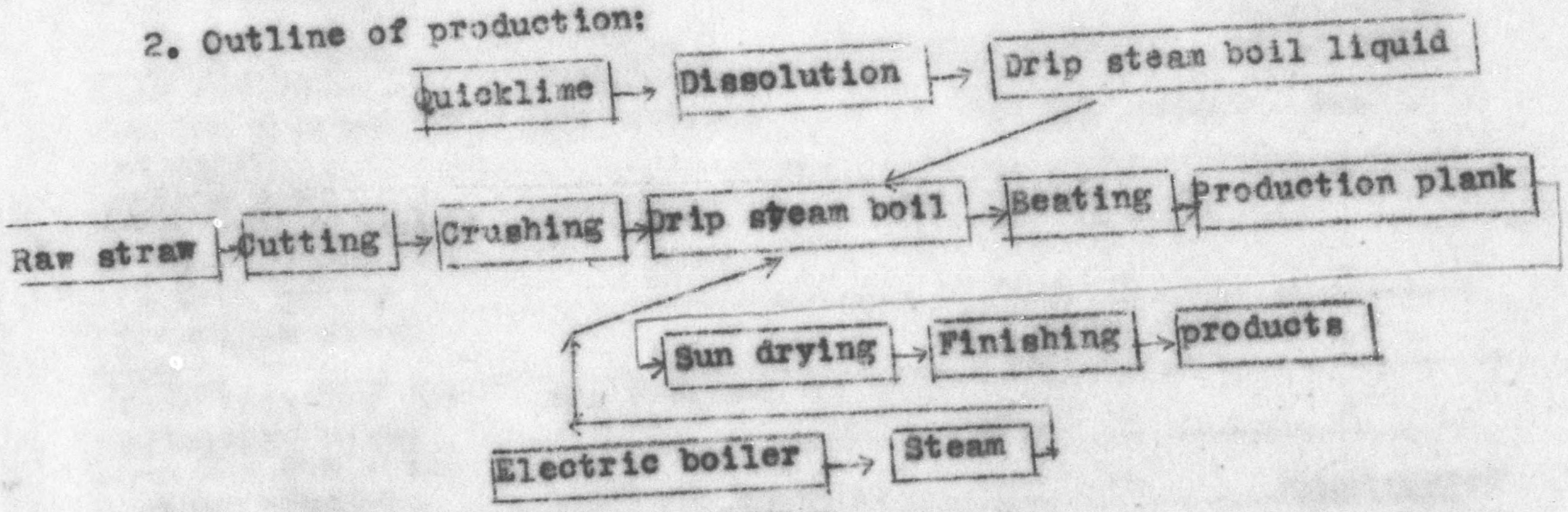
PLAN of Production
Tex and mat.

1. Origin of theplan:

tex factory stopped operation when the building burnt down completely and almost all machines damaged by the bombing on June 29, of this year. But for the purpose of utilizing 7,151 tons of straw on hand, we plan by repairing the tex factory to produce the mat of 3,370 sq. meters and tex of 3,320 ~~tons~~ sq. meters per month for the floor of the laminated structural house.

NOTE: Our plan of production is 10,000 sq. meters of mat & 10,000 sq. meters of tex but we will take the plan above mentioned for the 1st period.

2. Outline of production:



A. Explanation on each process:

1. Cutting & crushing of raw straw:

Cut straw into 35 - 40 mm by the cutting machine of the furfural factory, crush it by J.B. grinder and put it in drip steam boil.

2. Drip steam boil:

Add quicklime, volume of which being 3 % to the raw straw, hold 70°C by the steam adjusted by the small electric boiler, continue this process for 12 hrs. and take it out, extracting liquid.

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3. Beating:

Put the drip steam boiled straw in the beating machine, beat it for 3 hrs., adjust the beated liquid, pour it in the receiver tank and transfer it to mixer tank.

4. Production plank:

Transfer it again from mixer tank to supplier tank and next to production plank machine for making it plank. Cut it 2,000 mm by 1,090 mm size when putting it on the drying frame.

5. Drying:

Dry it by sun for average days of 4. (In summer time 2-3 days and in winter time 6-7 days)

6. Finishing:

Finish it by sawing machine according to each size.

Size for mat	1,901 by 954.5 mm
" for tex	1,000 by 600 mm

3. Equipments for production:

1. Building:

Name of room	Form	Building area	constructed newly built
Room for stock, cutting & crushing raw straw	Tile-roofed one storied	209 sq. meters	new
Beating room	"	151.2 "	"
Steam boiled liquid adjusting room with electric boiler	"	42.6 "	"
Production plank room	"	151.2 "	"
Stock room for dry-unfinished plank	one storied	376.0 "	"
Room for finishing & stock products	concrete building	353.3 "	constructed

Room for finishing and stocking products is the one we used for making lignin compound.

DECLASSIFIED E.O. 12065 SECTION 3 402/NNBS NO.

2. Machines & equipments:

Name of machine	Form	Number	Remarks	
Weighing machine	maximum 1 ton	1	old	on hand
Citting machine	6 blades. capacity 2 tons/ hrs.	2	reformed	"
Cutting machine motor	Fuji form,15 HP by 1,200 r.p.m.	2	new	"
J.B. Grinder		2	"	"
J.B. Grinder motor	50 HP by 1,200 Rpm	2	"	"
Hopper	Iron plate 100 By 100	1	"	"
Belt conveyer	600 wide	2	reformed	"
Belt conveyer motor	2 HP by 1,800 rpm	2	new	"
Exhaust duct	wooden one	1	"	"
Exhaust air machine	Takasago 85-A 50 W.G. 790 rpm 33,000 m/h	1	old	"
Exhaust air machine motor	20 HP by 1,200 rpm	1	"	"
Drip steam boil tank	iron made 30,0001 by 3 3,000 × 3,000 × 10,000	1	reformed	"
Belt conveyer	wooden frame outside	1	new	"
Beating machine	1,000 lbs	1	reformed	"
Beating machine motor	Fuji 50 HP by 1,2000 rpm	1	new	"
Receiver tank	Iron 2,000 by 2,000h	1	old	"
Receiver tank pump motor	130 100 7H 1,200 rpm Yasukawa form 10 HP 1,200 rpm	1	" new	" "
Mixer tank	iron 3,000 2,400 h 17,000 l	2	old	"
Agitator	Arm form	2	"	"
Motor	Fuji 5 HP 1,8000rpm	2	new	"
Mixer tank pump	Iron 160 1500 15H	2	old	"
Motor	Fuji 15 HP 1,200 rpm	2	new	"
Raw material supply tank	iron 2000 2,000 2,000h 8,000 l	1	old	"
Agitator	Propeller form	1	"	"
Motor	Yasukawa form 2 HP 1,800 rpm	1	new	"
Cylinder press	Dram 1,200 1,800	2	reformed	"
Motor	Fuji 10 HP 1,200 rpm	2	new	"
Cylinder press pump	iron 125 900 10 H	2	New & old	"
Motor	Fuji 5 HP 1,200 rpm	2	new	"
Cutting machine	Step andndropping blade form 6 inchesl	1	"	"
Lime solution tank	iron, round form 6,000 L	1	reformed	"
Agitator	Bebel gier form	1	old	"
Motor	Fuji 5 HP 1,200 rpm	1	new	"
Electric boiler &	round form 500 KW 950 1,818	1	"	"
Mixer tank for drip steam boil liquid	iron, round form 3,700 L	1	old	"

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" pump	iron made 125 1000 10 H	2	old	"
" motor	5 HP 1,800 rpm	2	new	"
Finishing machine (A)	1,900 mm	1	"	"
" motor	3 HP 1,800 rpm	1	"	"
Finishing machine (B)	970 mm	1	"	"
" motor	3 HP 1,800 rpm	1	"	"
Finishing machine (C)	600 mm	1	"	"
" motor	3 HP 1,800 rpm	1	"	"
Straw accumulating machine	piling on 20 sheaf per minutes conveyer 800B 10m	1	old	"
" motor	3 HP 1,800 rpm	1	"	"
Draing pump	hard lead, CH.S 155 1200 7h	2	"	"
" motor	10 HP 1,200 rpm	2	"	"
Drying frame	wooden made 2,200 mm 1,090 mm 1,250	350	" new	" new
Drying vehicle	wooden made 24 inches gauge	50	old	reform
Travelling vehicle	iron made 24 inches gauge	5	"	"
Pipes			new & old	"
Electric apparatus & its parts			"	"
Straw transfering vehicle	wooden made 900 3,200	10	new	"

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3. Raw materials & their volumes neccessary for production:

1. Raw materials;

a, Straw- 70,000 kg. per month
For mat production:
650 ÷ 93 × 2 × 3 ÷0.8≈15.9 kg./m²
Note: When boiling by steam, comsuming percentage of straw is 80%.
For tex production:
650 ÷ 93 × 2 ÷0.8 = 5.3 kg./m²
15.9 kg × 3333 + 5.3kg. × 3333 = 7000 kg. / per month
mat 1 m² = Tex 3 m²
Mat 3330 m² Tex 3330 m² = Tex 13,320 m²

b. Quicklime- 2,100 kg/ per month
For mat 0.48 kg./ m²
For tex 0.16 kg/ m²
Note: Quicklime neccessary for straw is 3%

70,000 kg ×0.03 = 2,100 kg/ per month

2. Other v materials:

a. For building;

Materials	lumber	tile	roofing	sand	cement	glass	nail	fittings
Volumes	694.04	554.3m²	275.7m²	16.81m³	240bag	27.4m²	418 kg	180

b. For machines & equipments:

Materials	steel	pig iron	copper	lead	cement	lumber	remarks
Volumes	1,309 kg.	1,550 kg.	1,210 kg.	150 kg.	20 kg.	192.6	on hand

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4. Electric power and steam:

a. Electric power;

machines	number	for use	HP	hour	KWH
Cutting machine	2	1	15	4	38.5
Crusher	2	1	50	4	128.0
Lime solution agitator	1	1	2	4	5.1
Lime transfer pump	1	1	3	2	3.6
Steam boild liquid transfer pump	2	1	5	3	9.0
Conveyer	2	1	2	4	5.1
Drain pump of high pressure	2	1	5	4	12.8
Beating machine	1	1	50	15	447.6
Lifting pump	1	1	10	5	29.8
Mixer agitator	2	1	2	8	10.2
Mixer pump	2	1	15	4	38.5
Supply tank agitator	2	1	2	4	5.1
Cylinder machine-press	2	1	10	4	25.6
Finishing machine (A)	1	1	3	4	7.2
" (B)	1	1	3	4	7.2
" (C)	1	1	2	4	5.1
Electric boiler	1	1	500 KW	24	1,923.0
Electric lift	2	1	40 W	6	7.2
Total	30	30			2,708.6

b. Steam: 3,000 kg/ per day

1,923 x 1.23 ÷ 0.8 = 3,000 kg/ per day

5. Employees:

1. Staffs 2
2. Workers 63

a.	Workers in charge of straw tranfering, cutting & crushing	6 x 2 = 12
b.	" straw boiling & beating	5 x 2 = 10
c.	" plank making, drying & finishing	14 x 2 = 28
		1 x 2 = 2
d.	" chemicals	10 x 1 = 10
e.	" reparing	1 x 1 = 1
f.	recorder	63
	Total	

Note: Working hours:
9 hrs. by turns 1st from 7:30 a.m. - 3:30 p.m.
2nd " 2:00 p.m. - 11:00 p.m.

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6. Expenditure for production: Unit: ¥

Expense	amount	remarks
Raw materials		
straw	0	
chemicals	168	¥1.6x70,000xo.03= 168
Materials including machine tools & repairing	5,000	
Employees' pay	6,170	¥250x26 ¥3x63x30 = 6,170
Welfare promotion	1,690	¥30x63 =1,690
Bonus	1,234	20% of salary
Consumption expenses	900	For 10 years 108,000÷120 = 900
Electric power	3,250	2,708.6 KW x 4 sen = 3,250
Water works	1,000	
Office expenses	1,958	10% of total expenses
Total	21,370	

SELLING PRICE

Cost of ~~Tex~~ mat ¥4.85 per sq. meters - 6¥

" ~~Mat~~ Tex ¥1.63 per sq. meters 2¥

7. Construction expenses: Unit:¥

BUILDING	Carpenters & others	¥36,904.10	building materials on hand
	Miscellaneous expenses	7,095.90	
MACHINES & EQUIPMENTS	Repairing expenses for cutting, beating, plank making machines & others	10,000	
	" steam boiling tank	2,000	
	" lime solution tank	1,000	
	Installation expenses of machines	5,000	
	Expense for self-made finishing machine	3,000	
	Expenses for 1,250 drying frame	25,000	lumber 125 k on hand
	Expenses for electric works	15,000	
	Expenses for construction rails, tubes & pipes	3,000	
Total		108,000	

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6. Summary:

Tex production of before had many favorable points in its production cost and others as it was by-products of Furfural production. However, for the sake of operationg this factory again, we must do our best for its construction and repairing so much that it becomes neccessary for us to operate it as the independent enterprise with originality and effective administration fitting for it. On the other hand, we must always keep in touch with the continuous study in fostering its quality and value.

II. Production:

1. Expected completion of equipments: January 31, 1947

2. Operation: February 1, 1947

Plan after operation: Additional purchase of a beating machine for mat production of 6,000 sq. meters

3. Items of technical improvement and its means:

a. Improvement in its expulsion operation after steam boiling of the straw

b. Improvement in its operation of cutting & crushing straw and its capacity of crushing

c. Diminution of steam volume

d. Improvement in the quality of mat & tex

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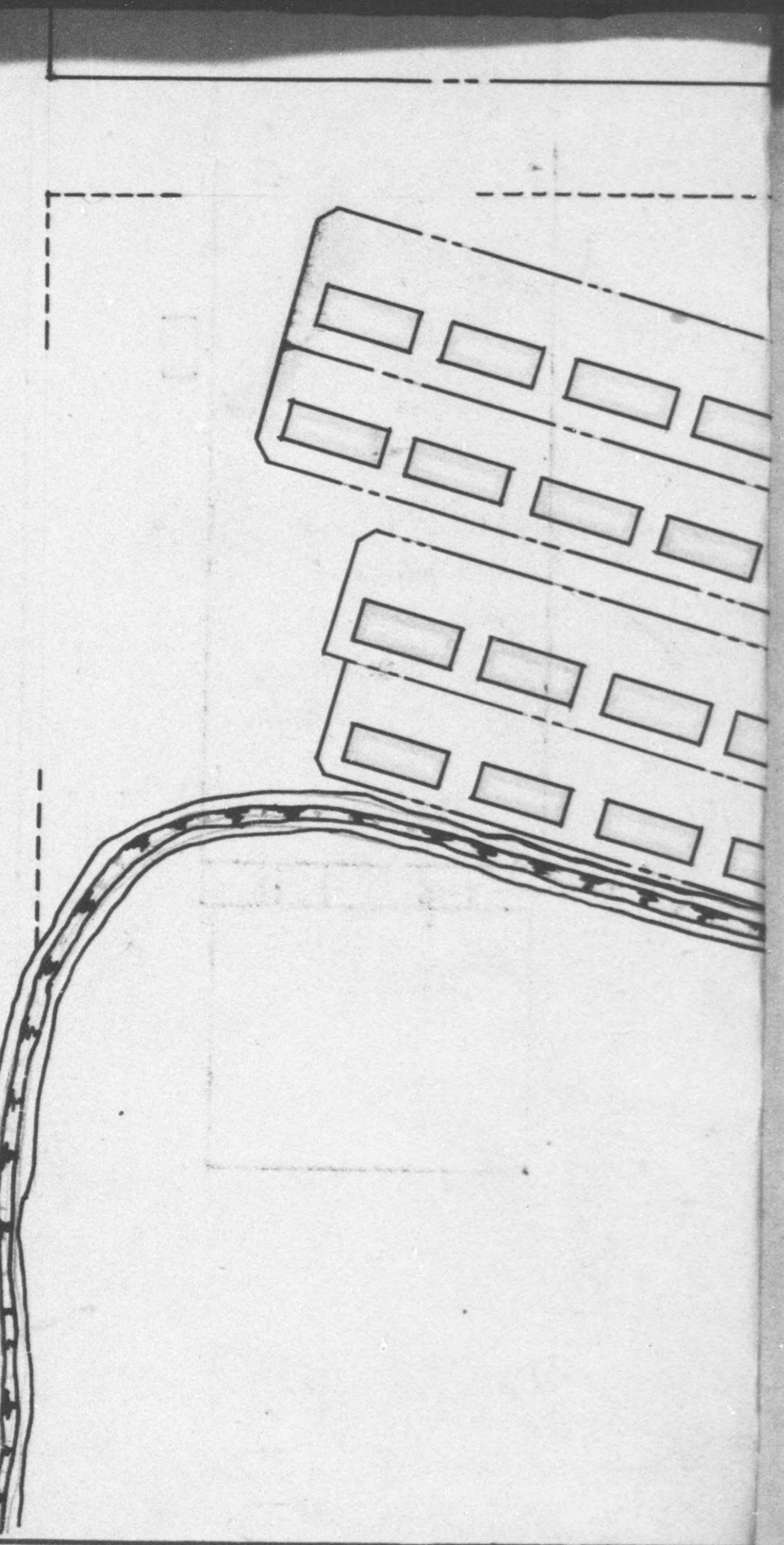

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of this factor

Landing place

Coaling station

Cycle converting
and
central switch plant

Boiler room.