

RESTRICTED

ENCLOSURE (G)

RESTRICTED

X-38(N)-10

ENCLOSURE (G)

REPORT ON
THE NIPPON SEIRO K. K.
TOKUYAMA PLANT

ENCLOSURE (G)

TABLE OF CONTENTS

I. Introduction Page 83

II. History and Organization Page 83

III. Description of Process Page 83

IV. Production and Quality Page 84

LIST OF TABLES AND ILLUSTRATIONS

Table I(G) Annual Production Totals at Nippon Wax, Ltd., Tokuyama Plant Page 85

Table II(G) Typical Inspections on Products at Nippon Wax, Ltd., Tokuyama Plant Page 85

Figure 1(G) Flow Sheet of Nippon Wax, Ltd., Tokuyama Plant Page 86

ENCLOSURE (G)

I. INTRODUCTION

This report records and summarizes technical information of the Nippon Seiro K. K. (The Japan Paraffin Wax Refining Co., Ltd.) plant at TOKUYAMA, obtained by the Petroleum Section of NavTechJap on 30 October 1945. The following Japanese personnel were interviewed and assisted in supplying the information presented herewith:

Mr. M. TAMURA, General Manager.
 Mr. H. KATAGIRI, Head of General Affairs Dept.
 Mr. Y. HAGA, Head of Manufacturing Dept.
 Mr. S. KOBAYAKAWA, Head of Maintenance Dept.

The investigation of this plant was made primarily to establish its relation to the Japanese shale oil industry.

II. HISTORY AND ORGANIZATION

This plant was founded in 1929 to refine crude pressed wax imported from the Fushun Mining Corp. in Manchuria. Construction of the plant was completed in 1930. Total capitalization of the plant is 4,000,000 and all stock is held by the South Manchurian Railway Co. No other plants of this type are operated by S. M. R. in Japan.

The plant suffered one air raid, in which only two outlying storage tanks were hit and destroyed. Imports of oil made by shipping crude wax from FUSHUN to DAIREN by rail, and from DAIREN to TOKUYAMA by boat, were cut off about June, 1945, and at the time of the inspection, supplies of raw wax feed stock in storage were exhausted.

The total number of employees at the plant during the war was 240.

III. DESCRIPTION OF PROCESS

The feed stock at TOKUYAMA is crude pressed wax obtained from shale oil at FUSHUN by the following operations: The crude shale oil is distilled into a light gasoline out (20%), a middle wax out (60%), and a residuum. The residuum is coked to yield an overhead distillate (about 60% on coker still charge) which is blended with the middle wax out. The blend is chilled and crude wax separated by filter-pressing. The yield of crude pressed wax is about 20% of Fushun crude shale oil.

A flow sheet of operations at TOKUYAMA is given by Figure 1(0). The crude pressed wax containing 3% oil is subjected to three successive chilling and dewaxing steps; warm dewaxing at 25°C, middle dewaxing at 15°C, and cold dewaxing at 0°C. The pressed wax from each step is acid treated with 1% by volume of 80° Be. sulphuric acid and sweated. The sweated waxes of different melting points are filtered over active clay prior to moulding and packaging. The hard pitch produced by distillation of the pressed oil from the middle dewaxing step, and the heavy pressed oil from the cold dewaxing step, are also marketed.

The chilling and pressing equipment is of conventional design, consisting of ammonia chilling tanks and 1) plate and frame filter presses, each with 70 plates one meter square. The sweating ovens were stated to have some novel features based on improvements of the original Czechoslovakian design. Each oven consisted of a tier of 10 horizontal rectangular troughs. The sides of the trough were about 6 inches high and the bottom was V-shaped so that the center of the trough was 12 inches deep. A wire screen (1/8 inch mesh) was placed at the 6 inch depth to support the wax. Twenty 1/2 inch pipes

ENCLOSURE (G)

at 4-5 inch spacing ran horizontally in the trough at the 3 inch level. The filling procedure was to fill the V-bottom with water, and then introduce melted wax in the top to fill the trough. After the wax solidified the water was drawn off, leaving the wax supported on the screen. Each trough holds one ton of wax. In the sweating operation, water at controlled temperature is circulated through the pipes, and sweated oil is withdrawn from the bottom of the V-troughs. The whole tier of troughs is placed in a closed room and heated air of controlled temperature is circulated by blowers. The length of the sweating operation is about 85 hours. Improvements made at this plant related mainly to the circulation and distribution of hot air to permit closely controlled temperature.

IV. PRODUCTION AND QUALITY

A summary of annual production totals is given in Table I(G). Typical inspections on each product are given in Table II(G). An estimated distribution of each product over the last three years follows:

Paraffin Wax

Army	5%
Navy	5%
Civil Government ..	90%

Heavy Oil

Navy	90%
Domestic Fuel.....	10%

Hard Pitch

Electrodes	50%
Domestic Fuel	50%

It was planned to divert a substantial proportion of the wax production for manufacture of lubricating oil at the second Naval Fuel Depot, YOKKAICHI.

ENCLOSURE (G)

Table I(G)
ANNUAL PRODUCTION TOTALS AT NIPPON WAX, LTD., TOKUYAMA PLANT*

Period	Crude Wax Charged	Products		
		Paraffin Wax	Heavy Oil	Pitch
Oct. 1940 Sept. 1941	21,979	12,585	6,202	238
Oct. 1941 Sept. 1942	20,630	11,387	6,750	238
Oct. 1942 Sept. 1943	21,616	11,505	7,051	204
Oct. 1943 Sept. 1944	14,752	7,375	6,086	234
Oct. 1944 Sept. 1945	8,380	4,017	3,655	213

* Metric Tons

Table II(G)
TYPICAL INSPECTIONS ON PRODUCTS AT NIPPON WAX, LTD., TOKUYAMA PLANT

Product	Specific Gravity	Melting Point(°C)	Flashing Point(°C)	Viscosity (Red W. No. 1)	Paraffin Content(%)
Paraffin Wax No. 1	(at 60°C) 0.784	60.0	225.0		
No. 2	0.782	55.0	210.0		
No. 3	0.780	50.0	198.0		
No. 4	0.778	45.0	188.0		
Heavy Oil	(at 15°C) 0.886	4.8	105.3	(at 30°C)	10.5
Hard Pitch		112.3			

ENCLOSURE (G)

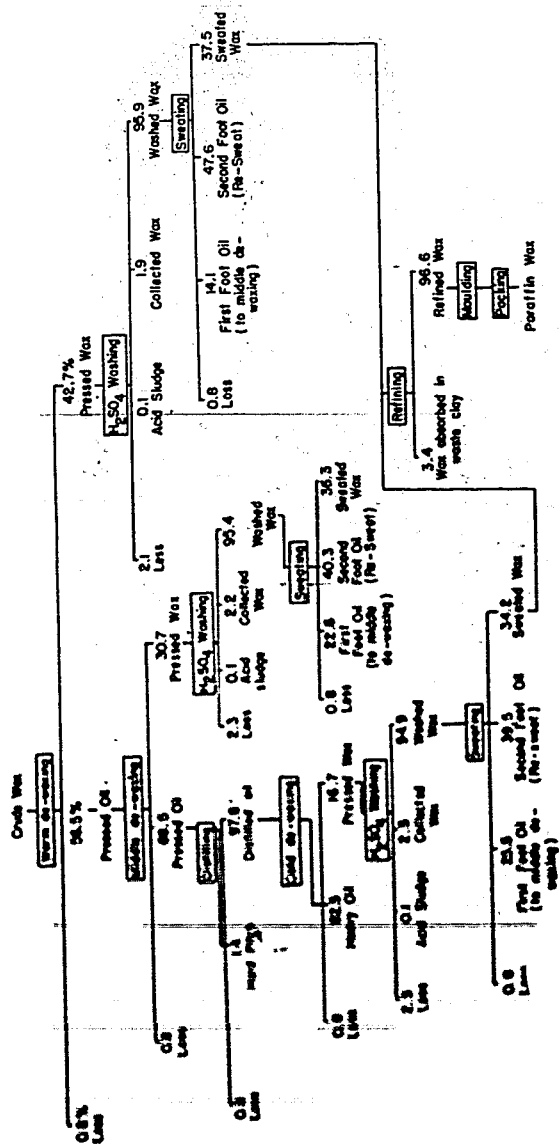
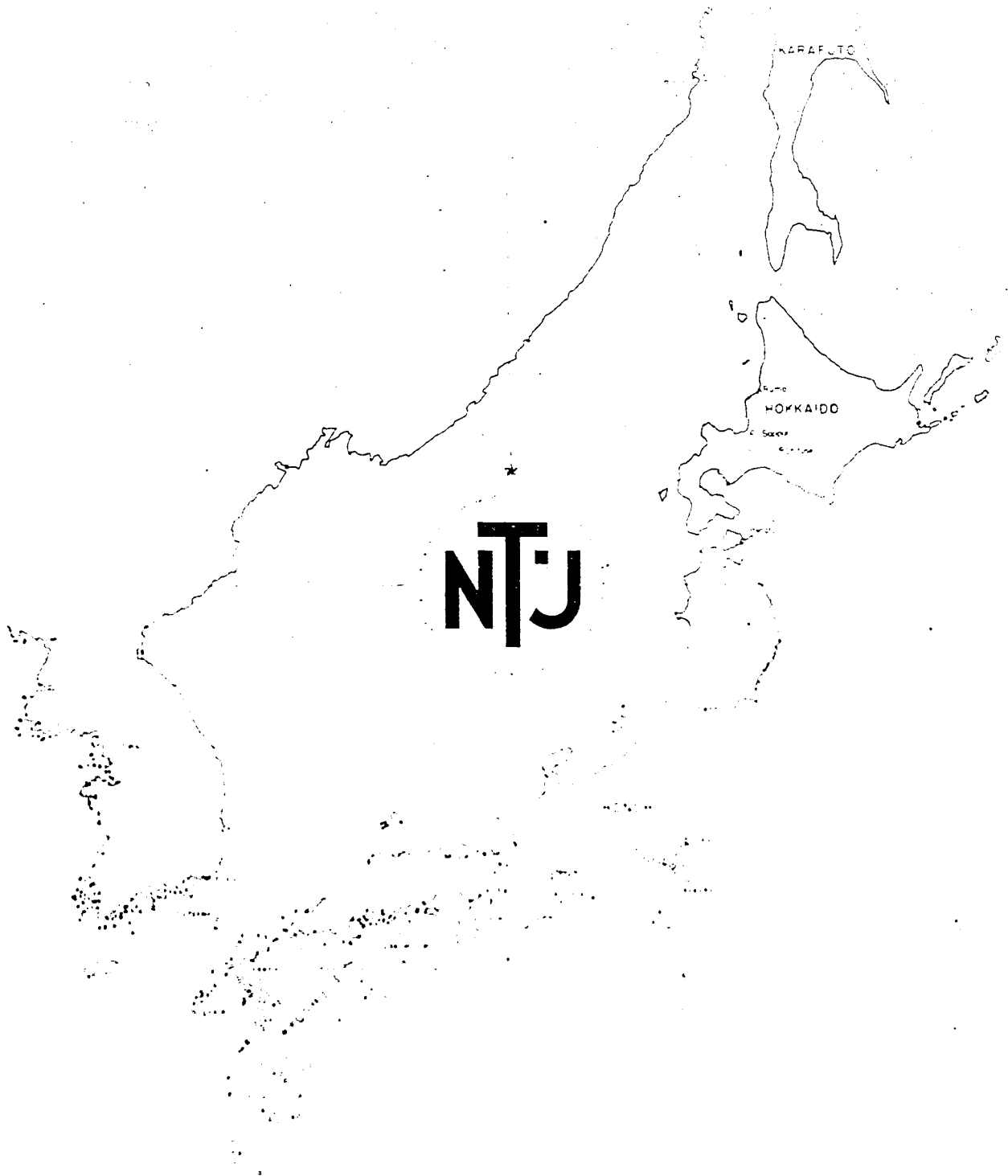


Figure 1(G)
FLOW SHEET OF NIPPON SEIRO K. K., TOKUYAMA PLANT



NTJ

HOKKAIDO

HOKKAIDO