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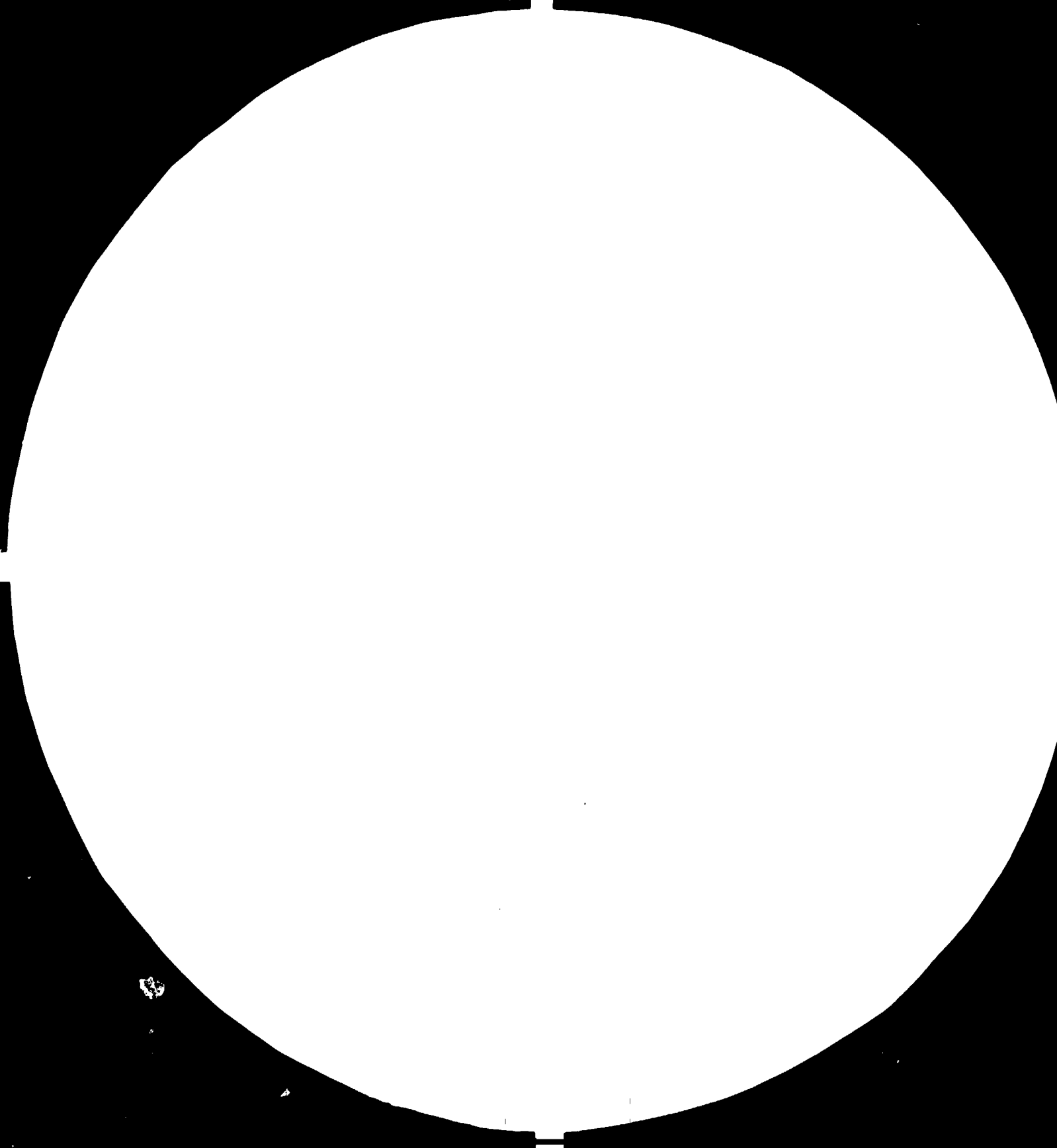
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(ANSI and ISO TEST CHART No. 2)

12167

(1 of 17)

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034

TURKEY

Turkey

ADDENDUM TO TECHNICAL REPORT NO. XI: DEMAND FOR CAPITAL GOODS FOR
PETROCHEMICALS INDUSTRY

VOL. I

UNITED NATIONS DEVELOPMENT PROGRAMME IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

November 1982
English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Addendum to Technical Report No. XI-Demand for Capital Goods for
Petrochemicals Industry, Vol. I

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of Capital Goods
Development Project in Turkey

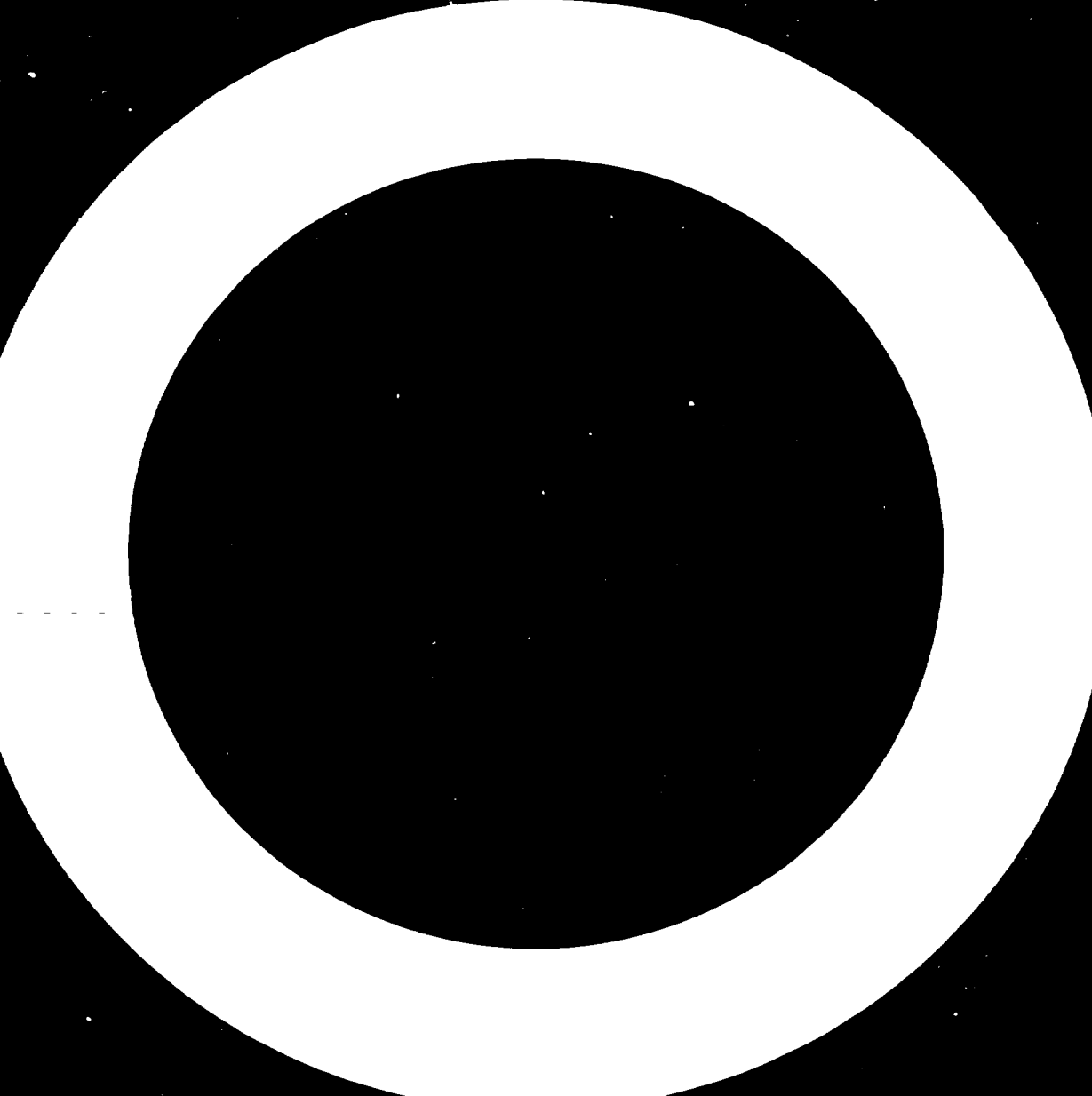
United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share the
views presented.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEYINTRODUCTION

At the request of UNIDO, a limited review has been carried out of the basis for estimating the demand for capital goods in the Petrochemicals sector and of the influence of modern petrochemical technology on the demand of these capital goods. This review has mainly been directed towards answering the following questions which were issued by CTA, UNIDO as "terms of reference" for the subject review:

1. On the assumption that a third petrochemicals complex which presently is envisaged at Yumurtalık in the early 1990's, will contain the process units as described in the Technical Report No. XI, are they likely to adopt the same process technologies as currently used in Aliağa/Yarımca complexes?. If not, what are the present trends?.
2. Is it expected that a third Petrochemical complex will require process units with the same capacities as selected for Aliağa/Yarımca in order to economically produce petrochemicals using current modern technology. If not, what would be the minimum size for economical operations?.
3. To what extent are new technological developments in the proposed petrochemicals processes, expected to result in process units with significantly different demands on the capital goods industry?.



CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

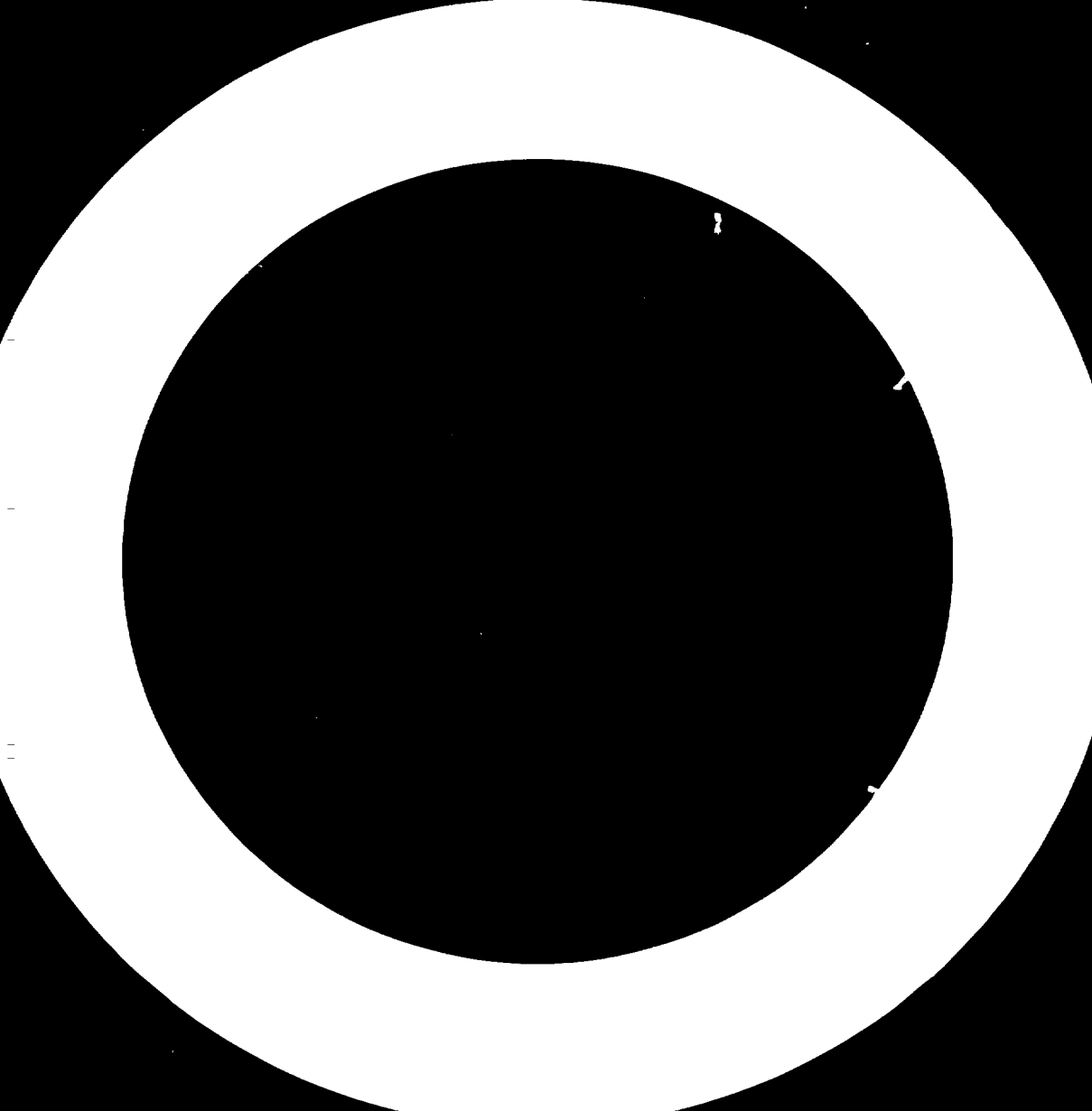
REPLIES TO TERMS OF REFERENCE

1. PROCESS TECHNOLOGY FOR A THIRD PETROCHEMICAL COMPLEX

Technological and economic developments in the petrochemical industry demand thorough evaluation of new processes and frequent re-evaluation of existing production methods. These evaluations are necessary to take account, for example of changes in feedstock prices and of new process technologies, which in the recent past, have made certain processing methods economically less desirable long before this previously could have been envisaged. It is therefore extremely difficult if not impossible to predict whether the process technologies of the late 1970's as used for the Aliağa complex, will still be the best available in the late 1980's, when final evaluations for new major investments may be envisaged. Some of the trends in process technologies which currently play an important part in process evaluations are mentioned below:

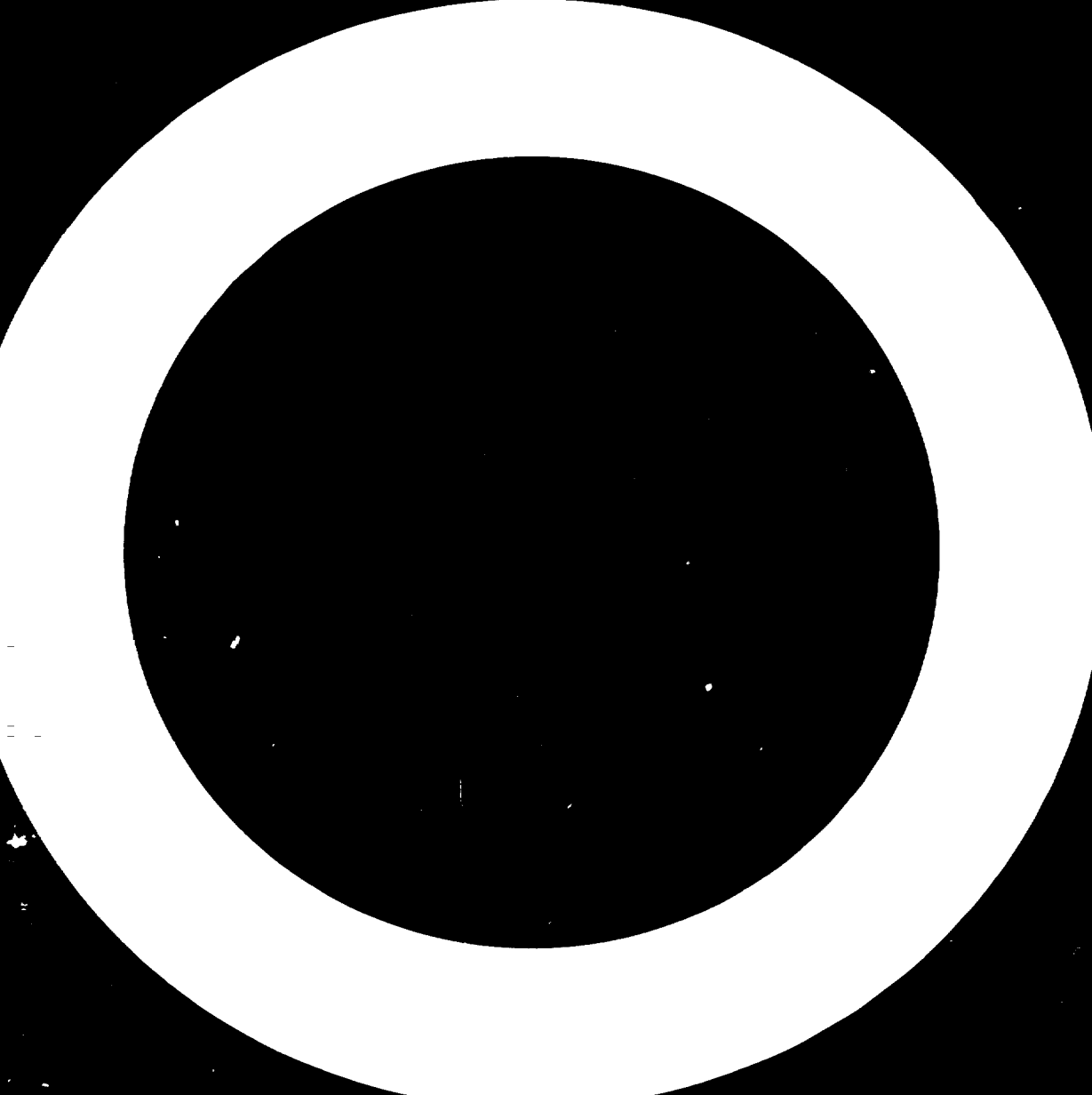
1.1. IMPROVED PRODUCT YIELDS

In several processes product yields have been increased through the application of improved catalysts. For instance greater catalyst selectivity can lead to reduced production of by-products and reduced feedstock requirements thus reducing both capital and operating costs. In some cases the reduction of by-product formation has led to the elimination of entire process sections, which originally were needed to recover and recycle these by-products.



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In addition certain observations have been added in paragraph 4. to clarify the application of the capital goods project methodology to the petrochemicals industry for possible future additions to technical Report XI. Finally a note has been added in paragraph 5 on the capital goods demand of the petroleum industry.



1.2. ENERGY SAVINGS

Increased cost of energy has led to many attempts to reduce the amount of fuel and power used in units. For example, by making better use of the heat available in the process through more heat-exchange between hot product streams and colder feed streams, valuable savings in energy cost have been realised. Because energy costs and fuel costs have recently risen so much, the savings in operating cost are outweighing the increased capital cost of the additional heat-exchange equipment.

1.3. LOWER CAPITAL PLANT COST

Since the petrochemical industry is relatively new and employs rapidly changing technologies there is often considerable scope for reducing the size of equipment items. An example is the reduction of liquid hold-up times within the process through a better knowledge of operating characteristics.

1.4. ENVIRONMENTAL REQUIREMENTS

The production of waste-products that are harmful for the environment has received considerable attention in recent times. The treatment of liquid and gaseous waste streams has in many cases significantly added to the capital and operating cost of petrochemical processes.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY1.5. NEWLY IMPROVED PRODUCT GRADES

Especially in the polymer technology new product grades with improved properties are constantly being developed. These newer grades can make existing production methods obsolete so that production modifications are necessary to adequately respond to market requirements.

1.6. RESEARCH AND DEVELOPMENT CENTRE

It has been realised that Turkey should not remain so completely dependent on imported technology and a Research and Development centre has therefore been established at Yarımca. Amongst other activities, this R and D centre is engaged in the further development of imported technologies for instance to take account of feedstock supply problems in Turkey and to take account of any specific market requirements of the Turkish chemical industry regarding petrochemical products and product grades.

The continuing development of this R and D centre will be of considerable importance for the successful growth and operation of the petrochemicals industry in Turkey and could enhance the participation of local equipment fabrication industry for this industrial sector. Summarising the above it has been found that current trends in process technology make it necessary for detailed appraisals to be carried ^{out} /between the licensors offering competing technologies.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY2. PROCESS PLANT CAPACITIES

In order to determine whether a certain plant capacity will enable the production of petrochemicals at an economic price, the actual manufacturing cost has to be estimated, taking into account many factors of which a few are mentioned below:

- Capital charges, i.e. interest charges on capital loans, amortisation.
- Feedstock costs, and product and by-product prices.
- Fuel cost and other energy charges such as power and steam cost.

In the majority of petrochemical processes the largest cost factor is the Feedstock cost. Unlike the situation in many other industries considered in the capital goods project, feedstock costs in the petrochemical industries are subjected to far greater fluctuations and depend to a far greater extent on local supply conditions.

Since feedstock costs determine to such a large degree the production cost of chemicals and since the amount of feedstock is constant per unit of product, it follows that chemical plant economics are less dependent on the size of the operation than in industries where capital charges are a larger proportion of the operating cost.

In view of the above there is for a particular process no universal minimum size plant for economic production. Each location will have its own minimum economic production capacity depending on the parameters mentioned above and on any other

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

criteria which may be applicable.

As an example it can be mentioned that the 20.000tons/year styrene plant at Yarımca is currently not in operation as adequate supplies of styrene can be purchased at a cost below the plant operating cost so that the operation of this unit is not economic. However if market prices for styrene would rise this situation could be reversed.

With regard to the plantsizes selected for the Aliğa/Yarımca petrochemical complexes and the plantsizes used for the capital goods project for a possible third complex, it may be observed that all plantsizes with the exception of the styrene plant and the Poly-styrene plant are within the capacity ranges of plants completed during the last few years or presently under construction in Europe and Asia. The size range of recent Poly-styrene plants starts at 20.000 tons/annum whereas the smallest styrene plant constructed in recent years would appear to have a capacity of 70.000 tons/annum. However, this does not mean for the reasons explained above, that in Turkey the minimum economic size could not be at a different level.

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3. THE EFFECT OF TECHNOLOGICAL DEVELOPMENTS ON THE
DEMAND FOR CAPITAL GOODS

3.1. In the first instance the effect of the developments listed in section 1 has been analysed in the following paragraphs.

IMPROVED PRODUCT YIELDS These improvements generally lead to a reduction in capital goods demand. The demand of all types of capital goods may be reduced.

ENERGY SAVINGS Invariably these savings require additional heat exchange equipment.

LOWER CAPITAL PLANT COST The particular example quoted in paragraph 1.3 will result in smaller pressure vessels.

ENVIRONMENTAL REQUIREMENTS Additional waste treatment facilities can increase the demand for all types of Capital Goods. If these facilities operate at ambient temperatures, no additional heat exchange equipment would be needed.

IMPROVED PRODUCT GRADES The changes in capital goods demand due to the production of new products cannot be predicted in a general way since both increases and decreases are possible. For instance entirely new products or new product grades with superior properties may require a plant with a much higher capital cost, which could be economically acceptable if the new product could be sold at a high price.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEYRESEARCH AND DEVELOPMENT IN TURKEY

It is not expected that these activities will lead to significant changes in overall capital goods demand. However, many of the R and D activities will be directed towards a reduction in the volume of imported capital goods.

SUMMARY It is clear from the above notes that specific predictions regarding significant changes in capital goods demand due to technological developments cannot be made. However, most of these developments are not expected to change the broad demand patterns for capital goods. On the other hand it should be realised that the effect of changes in the demand for chemicals and other economic factors could exert a far greater influence on capital goods demand than technological changes. For this reason section 3.3 has been added to indicate how market developments could influence future petrochemicals investments and especially the prospects of a third petrochemical complex.

3.2. PROVISIONAL ANALYSIS OF CAPITAL GOODS DEMAND

A second approach to question 3 of the terms of reference has been made by preparing a provisional analysis of the capital goods demand for the 3rd petrochemicals complex, with a view to identifying specific demand patterns for various petrochemicals processes. For new and modified process technologies a similar provisional analysis could be made and rough predictions for

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capital goods demand formulated.

For this analysis, all capital goods considered in the study have been divided into three groups, and each group subdivided into two parts according to the likely hood that these goods are manufactured in Turkey. The results of the analysis are listed in table 1. A number of explanatory notes are given below:

- (a) The group of tanks and pressure vessels contains all equipment with SITC codes 69211, 69241, 69243, 74165 and 74166. Equipment with other SITC numbers has been included in this group where this equipment could be considered a pressure vessel.
- (b) The group of heat exchangers contains only equipment with SITC code 74161.
- (c) The group of pumps includes only equipment with codes 74210, 74220 and 74230.
- (d) All other equipment is included under "special equipment"
- (e) For the purposes of this analysis carbon steel tanks and pressure vessels with a maximum wall thickness of 28 mm are considered local supply. All tanks and pressure vessels not made of carbon steel and with a wall thickness exceeding 28 mm are considered imported supply. It is however realised that a number items in the latter category could be made in Turkey. The limit of 28/29 mm is based on the head-forming capacity of Turkish fabricators, which was specified in Petkim's instructions to bidders for

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new process plants.

(f) Carbon steel heat exchangers with steel walls less than 29 mm are considered local supply. All others are considered imported supply.

(g) Cast iron pumps are considered local supply, pumps made from other materials are considered imported supply.

(h) For a particular type of process plant the percentage distribution of the equipment cost over the 7 categories will generally be constant for different plantsizes. However the distribution could change with regard to the wall thickness limit of 28/29 mm when vessel walls go over this limit due to a change in vessel diameter as a result of a capacity change.

From table 1 the following broad conclusions may be drawn:

1. The cost of the carbon steel vessels and tanks that can be purchased in Turkey varies for most plants between 25 and 50 % of the total equipment cost. Plants producing base-chemicals are generally at the upper end of this range, polymer plants at the lower end.
2. The cost of the carbon steel heat exchangers that can be purchased in Turkey varies for most plants between 5 and 20 % of the total equipment cost.
3. Pumps for petrochemical plants are generally not made of cast iron, and will therefore have to be imported.

TABLE 1

Analysis of capital goods demand in percent of total listed equipment cost

Equipment Group	Tanks, pressure vessels		Heat exchangers		Pumps		Special equipment	Equipment cost
	Material	CS	SS	CS	SS	C.I			CS/SS
Plate thickness	< 29mm	> 28mm	< 29mm	> 28mm	-	-	-	10 ⁶ \$ (1980)
Plants								
NSC	44.4	14.5	24.8	6.0	-	2.9	7.4	48.09
CA	81.8	3.4	4.9	0.2	0.2	6.2	3.3	6.71
VCM	49.2	2.5	21.3	1.9	0.3	4.2	20.6	13.64
PVC	50.5	11.6	5.3	-	3.2	5.7	23.7	5.40
LDPE	4.8	33.3	4.2	2.0	-	4.5	51.2	15.62
PP	23.4	27.8	6.2	2.9	-	3.2	36.5	19.18
STY	57.6	7.4	19.5	1.8	2.4	6.8	4.5	3.98
PS	25.6	4.9	1.9	-	-	4.4	63.2	2.33
ACN	24.8	24.8	19.0	2.1	0.1	4.4	24.8	8.91
SBR	56.6	3.9	28.0	-	1.3	2.9	7.3	3.67
EO/EG	26.7	32.6	14.3	14.5	-	2.8	9.1	9.12
BDX	56.3	-	39.4	-	-	4.3	-	1.67
PTA	19.2	22.3	18.6	3.0	-	3.2	23.7	7.41
AROM	36.5	19.7	17.0	4.5	-	4.6	17.7	29.98

Notes for Table 1.

1. For some plants and particularly for the CA-plant, cost data on some special equipment items were not available: These special equipment items are however, generally imported so that the cost of equipment fabricated in Turkey will not be affected by this.
2. The percentage breakdown of the HDPE-plant equipment is considered to be similar to that of the PP-plant because of the similarity of the technologies used in these two plants.
3. Columns headed SS/> 28mm include all non-carbon steel equipment and also all carbon steel equipment with wall thickness over 28mm.
4. See text for further explanatory notes a) to h).
5. For the CA plant, the cost of the mercury cells, which is more than double the cost of all listed equipment items, has not been included under special equipment.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEYPROVISIONAL ANALYSIS OF CAPITAL GOODS DEMAND ON A WEIGHT BASIS

In addition to the provisional cost analysis given in table 1, a provisional analysis has also been made of the weight of vessels, tanks, and exchangers, which Petkim considers as possible indigenous supply.

From this additional analysis it may be concluded that at present technological capability exists in Turkey for manufacture of roughly 75-80 % of the listed fabricated equipment. However, the adequacy of this in quantitative terms to meet anticipated demand has not yet been established and will be determined only after the aggregation of demand of all sectors and a matching capacity survey on a national basis.

On a cost basis the above percentage would be around 70 %.

The provisional weight analysis has been included in table 2.

TABLE 2
 Analysis of demand for
 fabricated equipment in Tons

Equipment group	Tanks and pressure vessels		Heat Exchangers	
	CS	SS	CS	SS
	< 29mm	> 28mm	< 29mm	> 28mm
Plants				
NSC	13924	2210	1264	921
CA	780	10	21	1
VCM	2747	170	985	20
PVC	539	133	99	9
LDPE	136	312	284	56
HDPE	104	223	130	-
PP	1042	877	128	93
STYR	1300	85	112	14
PS	145	18	5	-
ACN	2091	746	221	35
SBR	347	118	70	-
EO/EG	377	988	220	341
BDX	230	-	151	-
PTA	77	246	75	14
AROM	1724	1528	1190	53
Totals	25563	64	4955	1557

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY3.3. DEVELOPMENT OF CHEMICALS DEMAND IN TURKEY

This section on chemicals demand has been added to illustrate how market developments may have a greater influence on future chemical plant investments and therefore on capital goods demand, than the technological developments discussed in the previous sections.

On pages 16,17 and 18 of Technical report XI Volume 1 production targets for the 3 petrochemical complexes have been listed, on the basis of demand projections made in the late 1970's-Recently, however, the demand forecast for most petrochemicals has been decreased with the result that at Aliağa only the Polypropylene and the Acrylonitrile plants would have to operate at full capacity before 1990 to satisfy the projected demand. According to these new forecasts the Aliağa LDPE and PVC plants would have to operate at full capacity in 1991, in addition to the two plants mentioned earlier.

These more recent demand projections further show with respect to the products that are presently made only at Yarımca but were planned for the third complex i.e styrene, styrene-butadiene-rubber (SBR), poly-styrene, and butadiene-extraction (BDX), that demand will exceed production capacity in the early 1980's except for SBR in 1987. These new demand projections therefore do not suggest the planning of a new third complex as listed on page 18, but mainly point in the direction of plants other than those included in the Aliağa

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complex, with the exception of the Acrylonitrile and polypropylene capacity mentioned earlier.

Such far-reaching changes in the plans for petrochemical plants will ofcourse greatly influence forecasts of capital goods demand. However the methodology worked out for this demand has the flexibility for revised estimates to be included at a later date.

No new detailed estimates of Capital Goods required, will be available at that time, but broad estimates for equipment groups rather than individual equipment items can be used as these will still give a useful picture of future needs for fabrication capacity.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY4. METHODOLOGY FOR PETROCHEMICAL INDUSTRIES

The following observations are intended to clarify the methodology worked out for the capital goods demand in the petrochemical industries. The page and paragraph numbers quoted below refer to those used in Volume 1 of the Technical report XI.

Page 7, para 2.2.1 METHODOLOGY

Instruments and electrical equipment are not included in this study, since their demand will be covered separately.

It is noted that the following categories of equipment have also been excluded from this study:

- Piping material, including valves, fittings and gaskets
- Control valves and relief valves.
- Steel structures to support plant and equipment
- Insulation and fireproofing materials.

Electric motors are presently included in the weights and costs of pumps compressors etc. However, these motors are also included in a separate study on overall national motor demand and capacity.

Page 8, para 2.3.2 MODULAR PRODUCTION CHARTPage 11, para 2.3.4 MODULAR PROCESS FLOW DIAGRAM

For the sake of clarity it is suggested that the flow direction of all fluids in these diagrams are indicated by an arrow.

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In para 2.3.2 it is noted that the utilities produced and consumed in the plant are also identified by ellipses.

It is suggested that in para 2.3.4 the first line indicates that modular process flow diagrams identify "EACH MACHINE IN" each module.

Page 12 para 2.3.4.1 MODULAR PROCESS FLOW DIAGRAM

Numbers 30-39 have not been used in the petrochemicals sector since in this sector inspection activities do not take place in capital goods items. Storage equipment items with numbers 40-59 have been identified by circles when they form part of the process and by triangle symbols (\triangle) when they are located in a tankfarm.

Numbers 60-79 have been used for transport equipment which has been identified by arrow symbols: \rightarrow .

In certain modules (or process unit sections) there are more than 30 process equipment items and more than 20 storage and transport items. In those cases the following additional numbers are used:

100-129 for process equipment

140-159 for storage equipment

160-179 for transport equipment

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Page 12 Para 2.3.4.3

This paragraph could be deleted as it duplicates the first part of para 2.3.4.2

Page 12 New Para 2.3.4.3 TERMINOLOGY

For consistency with other sectors of industry the same terminology has been used throughout this study. Where this terminology differs from usual practice in the petrochemical industry, the two have been compared below:

<u>TERMINOLOGY</u>	<u>TERMINOLOGY</u>
<u>TECHNICAL REPORT XI</u>	<u>PETROCHEMICAL INDUSTRY</u>
Machine	Equipment item
Production activity	Process operation within a process section
Production module	Process section
Technology name	Name of process operation

Page 19 Para 3.5 UTILITIES UNITS AND OFF-SITE FACILITIES

The capital goods requirements for the utilities units and the off-site facilities have not yet been included in this report and should be added when these requirements have been determined. These units and facilities will contain some very high capital cost equipment such as steamboilers, water-treatment plant, instrument and plant aircompressors.

A typical list of these units and facilities for a major petrochemicals complex would read as follows:

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

1. Steamboiler plant and boiler feed-water treatment plant.
2. Cooling water plant.
3. Fresh water and fire water facilities.
4. Plant air and instrument air plant
5. Fuel gas and fuel oil facilities.
6. Inert gas supply system.
7. Flare and blowdown facilities.
8. Waste product treatment plant.
9. Feedstock and product tankage.
10. Electrical substation, transformers, emergency power generators.

Page 25 RELATIONSHIP BETWEEN FLOWDIAGRAMS AND ACTIVITIES

It is suggested that the numbers shown on these sheets are identified as "product numbers" by introducing column headings as follows:

<u>PRODUCT</u>	<u>PRODUCTION ACTIVITY</u>
<u>NUMBERS</u>	<u>OF PROCESS MODULE</u>
0 to 10	Feed storage
10 to 11	Cracking
etc.	etc.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY5. CAPITAL GOODS DEMAND OF PETROLEUM INDUSTRY

The capital goods project DP/TUR/76/034 covers the demand of a large number of industrial sectors of which the fertiliser sector has equipment demands very similar to that of the petrochemicals sector. It has been observed however, that the demands of the petroleum industry which also has similar capital goods requirements, have not been included. Although the petroleum sector presently does^{not} require new refinery units in addition to those presently engineered and constructed. It is suggested that as soon as further plans for refinery units are made, that their capital goods requirements be analysed and added to the requirements of the other industrial sectors.

DPT YAYINLARI ÜCRETSİZDİR, SATILAMAZ

YAYIN ve TEMSİL DAİRESİ MATBAA BİRİMİ 1983 ANKARA

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CAPITAL GOODS INDUSTRIES
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DEVELOPMENT OF
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DP/TUR/76/034
TURKEY

Technical Report No.XI- Demand for Capital Goods for
Petrochemicals Industry, Vol.I

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share the
views presented.

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CHAPTER I

INTRODUCTION

- 1.1. The State Planning Organisation of Turkey in close collaboration with the United Nations Industrial Development Organisation (UNIDO) has undertaken a detailed study to develop and expand the capital goods manufacturing industries. The priority sectors selected by the Government for this study are represented in a chart on Page 2.
- 1.2. PETKİM Petrokimya A.Ş., being the only company in Turkey for large-scale production of petrochemicals, was asked by SPO to undertake the petrochemical section of this comprehensive study.
- 1.3. The whole project involving various industry sectors has been conducted under the direction of Mr. M.M.Luther, Chief Technical Adviser, since Nov. 1979, Mr. A.D.Surie, Mechanical Engineer, joined the project as an expert in March 1981 and was assigned to work with PETKİM experts.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

NATIONAL PRIORITIES

USER INDUSTRIES

- 1. POWER
 - Generation
 - Distribution
 - Transmission
- 2. MINING
- 3. PULP & PAPER
- 4. CEMENT
- 5. FOOD & BEVERAGES
- 6. CHEMICALS & PETROCHEMICALS
- 7. FERTILISERS & PESTICIDES
- 8. RAILWAYS

MACHINE BUILDING INDUSTRIES

- MACHINE TOOLS METAL CUTTING
- " " " FORMING
- DIESEL & PETROL ENGINES
- ELECTRIC MOTORS & INDUSTRIAL MACHINERY
- PUMPS & COMPRESSORS

Whose capital goods require for manufacture

Which require for manufacture

FACILITIES FOR HIGH ACCURACY MACHINING & ASSEMBLY

AND

AND

INFRASTRUCTURE
STEEL FABRICATION
CASTINGS
FORGINGS
ELECTRONICS

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1.4. Throughout the course of this study the team of Engineers, Mr. Şevki Keskin, Mr. İskender Fethi Yıldız and Mrs. Aysun Aksu, assigned by PETKİM has concentrated on the equipment and machinery related to future petrochemical plants and in particular, a possible third petrochemical complex taking into account the long-term market and technological requirements. This study has been done under the overall direction of Mr. Hikmet Gürsey, Asst. General Director of PETKİM and Mr. Ali Zulfü Tigröl, Manager of Project and Study Department of PETKİM.

1.5. Mrs. Güler İzmirlioğlu and Mr. Ziya Siddiki, National Project Coordinators have been continuously associated with the work at all stages.

1.6. This report has been discussed with the management of PETKİM who are in agreement with it.

1.7. This report follows the methodology for process industries detailed in Technical Report No. I by CTA, Capital Goods Development Project. It outlines the requirement of capital goods for the 15 plants, currently visualised for this sector. Vol.I describes,

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in brief, the work done, the methodology followed and gives samples of charts and formats besides summaries of capital goods demand, plant wise and year wise both by cost and weight according to 5 digit SITC codes.

1.8. All the detailed data including modular product charts, activity charts and yearwise details of demand for capital goods for individual plants are in

Volumes 2-16 as under:

Volume 2 - (NSC) Naphtha Steam Cracking

Volume 3 - (CA) Chlorine -Alkali

Volume 4 - (VCM) Vinyl Chloride Monomer

Volume 5 - (PVC) Polyvinyl Chloride

Volume 6 - (LDPE) Low Density Polyethylene

Volume 7 - (HDPE) High Density Polyethylene

Volume 8 - (PP) Polypropylene

Volume 9 - (STY) Styrene

Volume 10- (PS) Polystyrene

Volume 11- (ACN) Acrylonitrile

Volume 12 - (SBR) Styrene-Butadiene Rubber

Volume 13 - (EO) Ethylene Oxide
(EG) Ethylene Glycol

Volume 14 - (BDX) Butadiene Extraction

Volume 15 - (PTA) Pure Terephthalic Acid
(MA) Methanol

Volume 16 - (ARO) Aromatics

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CHAPTER II

OBJECTIVES AND METHODOLOGY

2.1. OBJECTIVES OF THE PROJECT

2.1.1. The main objective of the Capital Goods Development Project is to plan the long range development of capital goods industry in Turkey through identification of machinery and equipment requirements of industrial plants planned to be constructed up to 2000 and prepare plans for manufacture of as many of these capital goods as possible to reduce the level of their imports.

2.1.2. The demand for capital goods for process industries has been determined by following the methodology presented in Technical Report No.I -Methodology for Planning of Capital Goods Industries by CTA, UNIDO. It deals with the details of equipment and machinery in terms of their specifications as well as manufacturing characteristics.

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2.1.3. By means of a computer programme, the expected requirement for groups of equipment for the plants were determined and sorted in ascending numerical order according to their codes and classified into groups of equipment.

The computer programme also lists for each equipment the quantity required, unit weight and unit cost in US dollars (1980 base) and furthermore, gives weight and cost distributions, yearwise on the basis of anticipated year of commissioning. These lists have been compiled as a result of examination of the modular production charts, modular flow diagrams and plant survey forms which are explained in the following sections.

2.2. METHODOLOGY FOR PROCESS INDUSTRIES

2.2.1. Different concept have been used by the Capital Goods Development Project teams for working out future demands of capital goods in different types of industries. This section briefly outlines the methodology as developed for process industries.

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The technology and plant size for each plant have been considered and a mathematical model developed. The data has been codified under 15 digit codes and information transferred on to a computer programme. Using a computer system, it will be possible to identify common items and to readily establish requirements first for each plant, then for the particular industry and finally for all industries.

Estimated cost data for each item has also been included in the programme.

Instruments and electrical requirements are not included in this study.

2.3. CLASSIFICATION OF INDUSTRY

2.3.1. COMMODITY CLASSIFICATION

The 4 digit Industrial Standard Industrial Classification of all Economic Activities of United Nations (ISIC) has been used as the basis for classification of different parameters of industry to suit the Turkish conditions.

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A fifth digit has been added to identify the specific commodity under consideration. Petrochemicals considered were classified as shown on Page 10 .

It will be noted that while ISIC code shows only 3513, another group 3514 has been added to accommodate the 18 plants considered.

2.3.2. MODULAR PRODUCTION CHART

This chart shows the use of raw materials, the resultant intermediate products, by-products, waste products and of course the final products.

It does not take into account the process used nor the type of machinery or plant capacities. The main products and by-products are indicated in a square and the waste products in an ellipse. Full lines joining any two represent a production module in which the machine pool exists. In case of more than one entry to the same production module,

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these multiple production lines converging for production modules are represented by a full production line. Each product (main, by-, intermediate or waste) has been given a two digit number. A sample is on page 22 .

2.3.3. INDUSTRY ACTIVITIES CHART

To classify and codify the process industries and production activities an industry activities chart showing the stages of production has been prepared for each main product. A cumulative 9 digit coding system consisting of SITC code for industry sector(4), main product (1), intermediate product or production stage (2), technology (1), capacity (1) has been used. As explained in Para 2.311., the 5th digit identifies the main product, a specific item in the sector covered by the relevant ISIC Code. Out of the remaining 4 digits on the industry activity chart, the first 2 for intermediate products

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CLASSIFICATION OF PETROCHEMICALS

ISIC CODE - 3513 - Manufacture of synthetic resins, plastic materials and man-made fibres except glass.

The manufacture of synthetic resins, plastic materials and non-vulcanizable elastomers, in the form of moulding and extrusion compound, solid and liquid resins, sheets, rods, tubes, granules and powders, cellulosic and other man-made fibres, except glass, in the form of monofilament, multifilament, staple or tow suitable for further processing on textile machines, and vulcanizable elastomers (synthetic rubber). Not included are the further processing of purchased resin or plastic materials to produce plastic products, film and sheets, which is classified in group 3560 (Manufacture of plastic products n.e.c.), and the throwing, twisting, spinning and weaving of purchased man-made fibres, which is classified in group 3211 (Spinning, weaving and finishing textiles).

- 3513 - 1- (NSC) Naphtha Steam Cracking
- 3513 - 2- (CA) Chlorine -Alkali
- 3513 - 3- (VCN) Vinyl Chloride Monomer
- 3513 - 4- (PVC) Polyvinyl Chloride
- 3513 - 5- (LDPE) Low Density Polyethylene
- 3513 - 6- (HDPE) High Density Polyethylene
- 3513 - 7- (PP) Polypropylene
- 3513 - 8- (STY) Styrene
- 3513 - 9- (PS) Polystyrene
- 3514 - 1- (ACN) Acrylonitrile
- 3514 - 2- (ABS) Acrylonitrile Butadien - Styrene
- 3514 - 3- (SBR) Styrene-Butadiene Rubber
- 3514 - 4- (EO) Ethylene Oxide
- 3514 - 5- (EG) Ethylene Glycol
- 3514 - 6- (BDX) Butadiene Extraction
- 3514 - 7- (PTA) Pure Terephthalic Acid
- 3514 - 8- (MA) Methanol
- 3514 - 9- (ARO) Aromatics

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which are processed in a production module. The 8th and 9th digits are for the alternative technologies and capacities of a particular production module respectively. In addition the name of the critical equipment and its capacity (defined as the 8th digit of SITC Codification system which will be described later) are also shown on the chart. In case of more than one critical equipment determining the capacity the item with the highest value is considered as critical. A sample is on page 23.

2.3.4. MODULAR PROCESS FLOW DIAGRAM AND PLANT SURVEY FORM

To identify each production module one modular process flow diagram showing the process flow and one plant survey for recording the required information have been prepared.

2.3.4.1. The modular process flow diagram shows the process flow between equipment and machines in the order they are required. The left hand side of the diagram is the flow diagram and the right hand side is the list of equipment which are used in the process together with their 15 digit codes quantitative and machine function codes. Different symbols and codes numbers are given to the equipment according to

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their functions. The circle symbol (O) and numbers between 0-29 are used for process equipment while the square symbol (□) and numbers 30-39 for inspection, the triangle symbol (Δ) and numbers 40-59 for storage, the arrow symbol (→) and numbers 60-79 for transport equipment. Full lines (___) represent work flow. A sample is on page 24 . A sample chart indicating the relationship between flow diagram and activities is on Page 25.

2.3.4.2. Plant survey form shows besides actual costs and 1980 base costs, all the actual data of specifications and manufacturing characteristics and identifies specifically the 15 digit code for each. A sample is on page 26.

2.3.4.3. The purchase year, the cost at the time of purchasing and the cost in 1980 US dollars of the equipment are also given in these forms.

2.4. CLASSIFICATION AND CODIFICATION OF CAPITAL GOODS

2.4.1. A 15 digit system based on the 5 digit SITC code has been evolved to cover all capital goods expected to be used in sectors considered by the Capital Goods Development Project in Turkey. The first 5 digits are the SITC codes and classify machines and equipment according to their functions. The next 9 digits have been allocated for definition of nomenclature, specifications and manufacturing characteristics.

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LAYOUT OF 15 DIGIT CODES FOR CAPITAL GOODS

1 2 3 4 5	SITC Group name
6 7	Machine name
8	Major specification (Capacity)
9	Major specification (Optional) 1
10	Major specification (Optional) 2
11	Type
12	Manufacturing Characteristics 1 (Weight)
13	Manufacturing characteristics 2 (κ)
14*	Manufacturing characteristics 3 (κκ)
15	Origin

(κ) Type of material in the case of fabricated equipment (eg. type of steel) and that of principal parts in the case of machines (eg. type of casting).

(κκ) Plate thickness in the case of fabricated equipment and maximum weight of a component in the case of machinery.

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CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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and the last digit is used for information on whether it is imported or manufactured in Turkey. This system is schematically shown on the Page No.13.

2.4.2. EXAMPLE OF CAPITAL GOODS CODES BASED ON SITC

The 15 digit codes developed on the basis of SITC code Number 64241 is on page 27 .

If, for example, a particular drum has to be codified, the 15 digit code for it 692410510322111 would be evolved as under:

The particulars of a drum to be codified are given below:

SITC Code	69241
Nomenclature	Drum(Digits 6 and 7, Code 05)
Capacity	7.5 m ³ (Digit 8 -Code 1)
Major specification 1	N11(Digit 9 - Code 0)
Major specification 2	Temp. 70°C(Digit 10-Code 3)
Type	Cylindrical(Digit 11-Code 2)
Weight	6T (Digit 12 - Code 2)
Material	Stainless steel plate(Digit 13-Code 6)
Plate thickness	12 mm (Digit 14 -Code 1)
Origin	Turkey(Digit 15 -Code 1)

Rev.	Tarih	İsmi

petkim

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Petkim 11/17/85 B-2/1880

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

2/3

TABLE -1

COMPLEX	PLANTS	CAPACITY (tpy)	1982 PRODUCTION	PRODUCTION ESTIMATE			
				1985	1986	1997	2000
Yarımca İst. Petro- chemical Comp- lex	M Ethylene	35 000	35 000	67 000	67 000	67 000	67 000
	PE	24 300	24 300	24 300	24 300	24 300	24 300
	V.C.M	48 600	48 600	48 600	48 600	48 600	48 600
	P.V.C	64 300	64 300	64 300	64 300	64 300	64 300
	Styrene	19 450	19 450	19 450	19 450	19 450	19 450
	P.S	13 500	13 500	13 500	13 500	13 500	13 500
	C.A	32 400	32 400	32 400	32 400	32 400	32 400
	D.D.E	20 000	20 000	20 000	20 000	20 000	20 000
	Carbon Black *	30 000	30 000	30 000	30 000	30 000	30 000
	Caprolactam	25 000	25 000	25 000	25 000	25 000	25 000
	S.B.R	32 150	32 150	32 150	32 150	32 150	32 150
C.B.R	13 500	13 500	13 500	13 500	13 500	13 500	
B.D.X	32 360	32 360	32 360	32 360	32 360	32 360	
* An expansion of 12 000 tpa capacity is scheduled to come on stream from 1985 onwards							

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Pe.	Tarih	İsim



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CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

TABLE - I

2/2

COMPLEX	PLANTS	CAPACITY (tpy)	1982 PRODUCTION	PRODUCTION ESTIMATE			
				1984	1985	1986	2000
Aliağa	C.A	75 000	-	37 500	56 250	75 000	75 000
Second	V.C.M	105 000	-	52 500	78 750	105 000	105 000
Petrochemical	P.V.C	100 000	-	50 000	75 000	100 000	100 000
Complex	H.D.P.E	40 000	-	20 000	30 000	40 000	40 000
	L.D.P.E	150 000	-	75 000	112 500	150 000	150 000
	P.P	60 000	-	30 000	45 000	60 000	60 000
	P.T.A	70 000	-	35 000	52 500	70 000	70 000
	EO / EG	68 000	-	34 000	51 000	68 000	68 000
	P.A	30 000	-	15 000	22 500	30 000	30 000
	Acrylonitrile	70 000	-	35 000	52 500	70 000	70 000
	N.S.C	300 000	-	150 000	225 000	300 000	300 000
	Aromatics	124 000	-	62 000	93 000	124 000	124 000

No.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Form: 103 F 6 B 2 100

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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TABLE - I

COMPLEX	PLANTS	CAPACITY (tpa)	1992 PRODUCTION	PRODUCTION ESTIMATE			
				1995	1996	1997	2000
Yumurtalık	N.S.C	500 000	-	250 000	375 000	500 000	500 000
	C.A	150 000	-	75 000	112 000	150 000	150 000
Third Petrochemical Complex	V.C.N	210 000	-	105 000	157 500	210 000	210 000
	P.V.C	200 000	-	100 000	150 000	200 000	200 000
Complex	L.D.P.E	200 000	-	100 000	150 000	200 000	200 000
	H.D.P.E	80 000	-	40 000	60 000	80 000	80 000
	P.P	90 000	-	45 000	67 500	90 000	90 000
	Styrene	120 000	-	60 000	90 000	120 000	120 000
	P.S	40 000	-	20 000	30 000	40 000	40 000
	Acrylonitrile	90 000	-	45 000	67 500	90 000	90 000
	S.B.R	60 000	-	30 000	45 000	60 000	60 000
	EO/EG	70 000	-	35 000	52 500	70 000	70 000
	BDX	60 000	-	30 000	45 000	60 000	60 000
	P.T.A	70 000	-	35 000	52 500	70 000	70 000
	Aromatics	200 000	-	100 000	150 000	200 000	200 000

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CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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- 3.2. The analysis of capital goods for the petrochemical sector is based on the data available for the above plants. It is however necessary to note that as detailed market research and feasibility reports are finalised, the actual capacity and hence the capital goods requirements may change. This methodology however has the flexibility to admit changes as and when they are finalised and revised data for a plant as a whole for a part of the plant fed into the computer files.
- 3.3. The methanol and Acrylonitrile-Butadiene-Styrene (ABS) plants which are also included in the third petrochemical complex of PETKİM, have not been analyzed in this study, because of non-availability of the necessary data. Details of these two plants will be added when they become available.
- 3.4. During this study, the data for the Styrene, Polystyrene, Styrene-Butadiene Rubber and Butadiene Extraction plants are based on YARIMCA Complex of PETKİM and that pertaining to others on ALIĞA Complex of PETKİM. The equipment and machinery requirements have been determined according to plants' capacities.

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CHAPTER IV

CONCLUSIONS

- 4.1. The grand totals of capital goods demand for the third complex of PETKİM according to the 5 digits SITC codes are on computer outputs, Annexures 1 and 2. They also show their yearwise cost and weight distribution.
- 4.2. The computer outputs Annexures 3 to 32 give the same information separately for each plant of the third complex.
- 4.3. The total demand for the 15 plants considered is as under:

Fabricated Equipment	138.612.2 Tons
Machinery	42.468.9 Tons
TOTAL	181.081.1 Tons

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CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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4.4. An analysis of capacity for capital goods required for process industries will require aggregation of the demands for same and similar equipment for all the industries. In the case of equipment which basically consists of steel fabrication the aggregation will be on the basis of manufacturing characteristics while in the case of machines (eg. pumps and compressors), it will be based on quantities of machines to different specifications. This work will be taken up when details of demands year wise, as coded are available for all industries under consideration.



PETKIM PETROKIMYA A S

UNIDO/SPO (PETKIM) CAPITAL GOODS
DEVELOPMENT PROJECT

INDUSTRY ACTIVITIES CHART
(PART 1- NSC)

IND CODE: 3513-1
IND NAME: SYNTHETIC RESINS, PLASTIC
MATERIALS AND MAN-MADE FIBERS- NSC

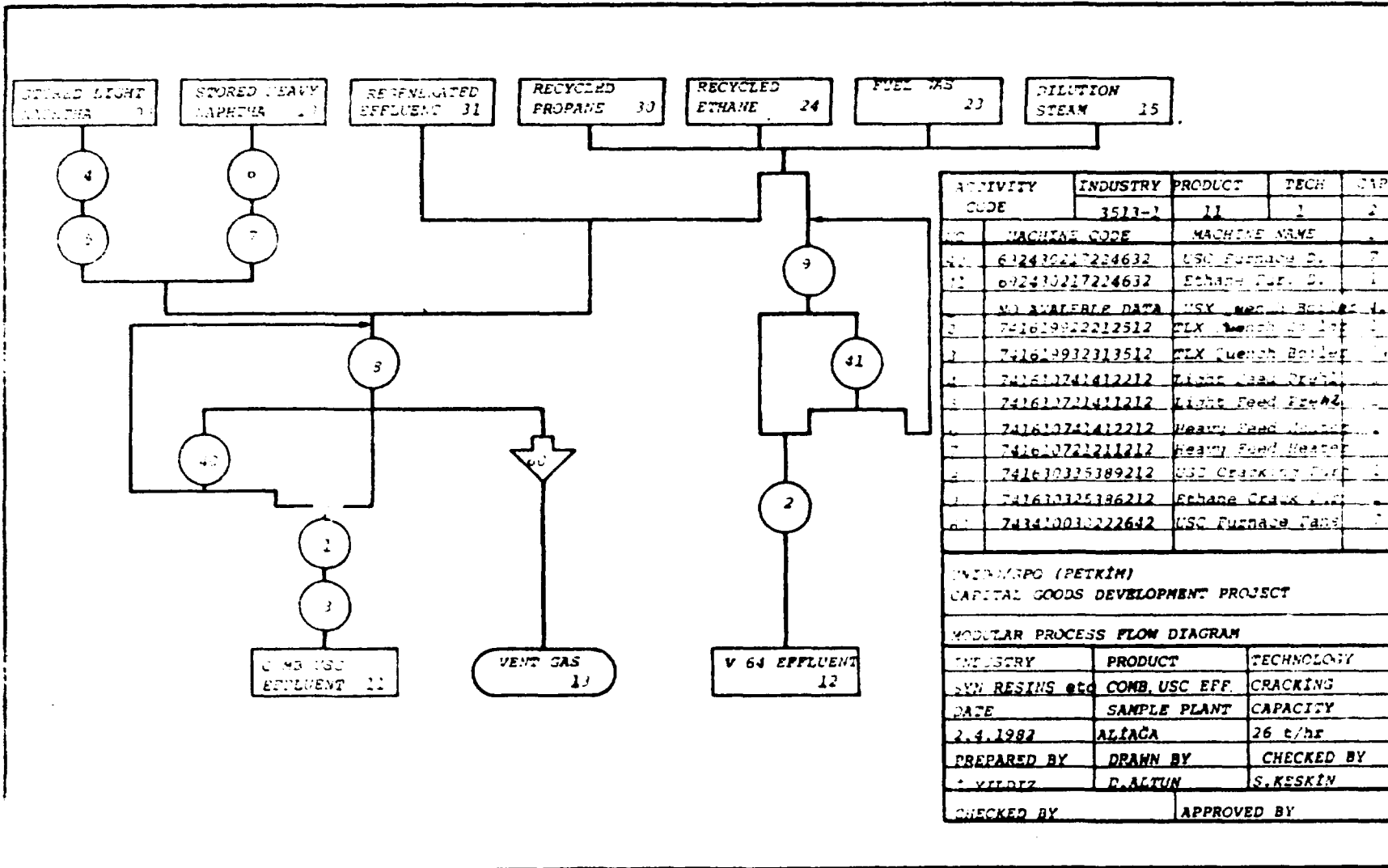
PROD.S	PRODUCT NAME	PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
10	STORED HEAVY NAPHTHA		1	FEED STORAGE	NAPHTHA TANK	95000-1000000 m ³	1	95.000 m ³
							2	300.000 m ³
							3	650.000 m ³
							4	1.000.000 m ³
11	COMB.USC. EFFLUENT		1	CRACKING	CRACKING FURNACE	10-50 t/hr	1	10 t/hr
							2	26 t/hr
							3	34 t/hr
							4	43 t/hr
							5	50 t/hr
16	CRACKED GAS		1	PRIMARY FRACTIONATION AND DILUTION	PRIMARY FRACTIONATOR	1000-3000 m ³	1	1000 m ³
							2	1750 m ³
							3	3000 m ³
27	LIQUID ETHYLENE		1	REACTION AND FRACTIONATION	HYDROGENATION REACTOR	129-400 m ³	1	120 m ³
							2	260 m ³
							3	400 m ³
33	PROPYLENE		1	PROPYLENE PRODUCTION	HIGH PURITY PROPYLENE TOWER	200-1500 m ³	1	200 m ³
							2	630 m ³
							3	1100 m ³
							4	1500 m ³
41	ETHYLENE VAPOR		1	PRODUCT STORAGE	ETHYLENE STORAGE TANK	10000-120000 m ³	1	10000 m ³
							2	18000 m ³
							3	73000 m ³
							4	120000 m ³

PREPARED BY	CHECKED BY	APPROVED BY
S.KESKIN		

--	--	--



PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3511-1	11	1	2
NO	MACHINE CODE	MACHINE NAME		
01	612410217224632	USC Furnace D.		2
02	612410217224632	Ethane Crack. D.		1
NO AVAILABLE DATA		USY. Reg. B.		1
03	74161072212512	TLX Wash B.		1
04	74161072212512	TLX Quench Boiler		1
05	741610741412212	Light Feed Heater		1
06	741610741412212	Heavy Feed Heater		1
07	7416107221211212	Heavy Feed Heater		1
08	741610335189212	USC Cracking Furn.		1
09	741610325186212	Ethane Crack. Furn.		1
10	741410010222642	USC Furnace Fans		2

UNION/SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
NEW RESINS etc	COMB. USC EFF.	CRACKING
DATE	SAMPLE PLANT	CAPACITY
2.4.1987	ALİAĞA	26 t/hr
PREPARED BY	DRAWN BY	CHECKED BY
A. YILDIZ	D. ALTUN	S. KESKİN
CHECKED BY	APPROVED BY	



PETKIM PETROKIMYA A.Ş.

AND ACTIVITIES FOR NSC PLANT

01 TO 10 FEED STORAGE

10 TO 11 CRACKING

11 TO 16 PRIMARY FRACTIONATION AND DILUTION

16 TO 27 REACTION AND FRACTIONATION

18 TO 33 PROPYLENE PRODUCTION

27 TO 47 PRODUCT STORAGE

REV.	TARİHİ	İSİMİ

PROJE NO: 1374/83/100

Activity Code: 35131112

SR No	W/M	Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code									
												Unit	Total	Unit	Total		12345	67	8	9	10	11	12	13	14	15
40		USC furnace steam drum	16.64 m ³	pr:116kg/cm	Temp:321°C	CY	45	SS	45 mm	I	7	140 000	980 000	184 400	123800	1978	69243	02	1	7	2	2	4	6	3	2
41		Ethane furnace drum	5.312 m ³	pr:116kg/cm	Temp:321°C	CY	25	SS	45 mm	I	1	77 700	77 700	102 400	102 400	1978	69243	02	1	7	2	2	4	6	3	2
1		USX quench boilers	NO AVAILABLE DATA							I	42	161 700	2591400	86 500	363000	1978	NO AVAILABLE DATA									
2		Eth furn TLX quen boiler	HS:41.5 m ²	SD:1.1m	TL:3.5 m	FST	6	HAS	3.6 mm	I	1	45 650	45 650	56 450	56 450	1978	74162	99	2	2	2	1	1	2	5	2
3		TLX quench boilers	HS:98.9m ²	SD:1.3 m	TL:5.6 m	FST	15	HAS	3.6 mm	I	14	114 100	1597000	141 100	2975400	1978	74162	99	3	2	3	1	1	3	5	2
4		Light feed pre-heater No:1	HS:304 m ²	SD:0.84 m	TL:7.32m	FST	9	CS	17 mm	I	1	30200	30200	42 350	42 350	1978	74161	10	4	1	4	1	1	2	2	2
5		Light feed pre-heater No:2	HS:40.2 m ²	SD:0.39 m	TL:4.9 m	FST	1	CS	9.52 mm	I	1	16 550	16 550	23 250	23 250	1978	74161	10	2	1	4	1	1	1	2	2
6		Heavy feed heater No:1	HS:304 m ²	SD:0.84 m	TL:7.32 m	FST	9	CS	17 mm	I	1	30 200	30 200	42 350	42 350	1978	74161	07	4	1	4	1	1	2	2	2
7		Heavy feed heater No:2	HS:44.4m ²	SD:0.46 m	TL:3.66 m	FST	3	CS	12 mm	I	1	19 900	19 900	27 900	27 900	1978	74161	07	2	1	2	1	1	1	2	2
8		VSC naphta crack tanks	25.6 tons/hr	Temp:1135°C	gaseous oil	Cracking	1960	CS	5 mm	I	1	932 500	932 500	1153300	1153300	1978	74163	03	3	5	3	6	9	2	1	2
9		Ethane Crack Furnace	12.43tons/hr	Temp:1110°C	gaseous oil	Cracking	110	CS	5 mm	I	1	548 750	548 750	678700	678700	1978	74163	03	2	5	3	6	6	2	1	2
60		I.D VSC furn	26.24m ³ /sec	WH:-	DG	Induced Draught	8	CS	8 tons	I	1	548 800	387 600	64 250	449750	1978	74161	00	3	0	2	2	2	6	4	2

Note: a) Max. component weight for machines plate thickness for plate fabricated inwards

Fabricated equipment

SITC Code 69241 - Casks, drums, cans, boxes and similar containers of sheet or plate iron or steel of a description commonly used for the conveyance or packing of goods.

Basic Machine Nomenclature		Major Specification (Capacity)	Major Spec.-1 Optional	Major Spec.-2 Optional	Type	Manufacturing characteristic -1	Manufacturing characteristic -2	Manufacturing characteristic -3	Origin
Code	Name	Code Cubic meters (m ³)	Code	Code Temperature °C	Code Description	Code Weight(tons)	Code Main body materials	Code Plate thickness mm.	Code
01	Boxes	1.Upto 10		1.Above 500	1.Rectangular/ cubic	1.Upto 5	1.Mild steel upto 0.20 carbon (untested quality)	1.Upto 20	1.Turkey
02	Cans	2.10-25		2.500-100		2.5-10		2.20-40	2.Imported
03	Casks	3.25-50		3.100-0	2.Circular	3.10-25		3.40-50	
04	Containers	4.50-75		4.0-(-25)	cylindrical,	4.25-50		4.Over 50	
05	Drums	5.75-100		5.(-25)-(-50)	semi-	5.50-100	2. Carbon steel above 0.20 C tested quality		
06	Vessels	6.100-150		6.(-50)-(-100)	cylindrical,	6.100-200			
07	Vessels (lined)	7.150-200		7.(-100)-(-120)	elliptical	7.200-300			
08	Pots	8.200-300		8.(-120)-(-170)	3.Spherical	8.300-500	3. Boiler steel		
99	Others not indicated above (nia)	9.Over 300		9. Below (-170)		9.Over 500	4. Alloy steel 5. High alloy steel 6. Stainless steel 7. Non-ferrous materials 9. Others		
				(nia: not indicated above)	9. Others (nia)				

UNIT 7 SPURVEY K 1 1
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENTS FOR THE NEW PETROBRAS LULA COMPLEX PLANT
 LOCATION - YMURTALEK
 UNIT WEIGHTS IN TONS, UNIT COST IN 1000 U.S.-A DOLLARS (1980)

EQP-DEPARTMENT-PETROBRAS / ANMAN	SITC BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 TOT_COST
65211	RESEVCOIRS,TANK	24214.5	8542.4	3512.9							36270.2
69241	CASKS,DRUMS	6594.8	3345.5	2402.4							12702.7
69243	CONTAINERS(PRESSURE)	3327.4	528.5	569.2							4425.1
72831	SCREENS,CLASSIFIERS		26.4	350.9	7.0						384.3
72832	CRUSHERS,MINING MILLS			115.2	39.6						154.8
72833	MIXERS		10.2	968.2							978.4
72834	AGGLOMERATORS		19.8	1777.3							1797.1
74842	EXTRUDERS			3437.6							3437.6
74121	BLICHER BURNERS		104.2								104.2
74132	NON-ELECT.FURNACES		3079.1								3079.1
74161	HEAT EXCHANGERS	25064.6	3834.8	7789.3							36688.7
74162	EVAPORATORS,PANS	29.5	51.8	257.8							339.1
74163	FULLICIZED BED,ACTARY	1832.0	30.3								1862.3
74164	LAYERS	536.0	1204.4	337.9							2078.3
74165	REACTION VESSELS	7732.5	5843.5	4068.4							17644.4
74166	CHEM.PROCESS COLUMNS	18713.5	2250.1	5215.3							26178.9
74210	PUMPS(RECIPROCATING)	66.3	464.4	5.6							936.3
74220	PUMPS(CENTRIFUGAL)	4216.8	1136.4	1113.3							6466.5
74230	PUMPS(ROTARY)	389.4	15.9	6.6							411.9
74240	PUMPS(JET,ELECTROMAGNETIC)		104.0								104.0
74212	VACUUM PUMPS	105.3	3.0								108.3
74313	COMPRESSORS	4815.1	5287.1	3896.9							13999.1
74341	FANS	734.6	161.4								896.2
74342	BLOWERS	1081.3	66.4								1147.7
74391	CENTRIFUGES	555.9	1602.6	676.0							2834.5
74361	CYCLONES,PRECIPITATORS	699.0	484.4	109.6							1293.0
74362	THICKENERS,FILTERS	508.0	1147.6	347.6							2003.2
74426	CONVEYORS(MECH)	13.5	618.6	148.0							780.1
74522	WRAPPING PALNAGING M/L'S		424.0								424.0
74525	WEIGHING MACHINERY		1529.2	30.9							1560.1
TOTAL C O S T -----: 53049.4 63597.0 34770.7 28305.3 1358.7											

UNIT 7 SPCIP E T K I 9)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENTS FOR THE NEW PETROCHEMICAL COMPLEX PLANT
 LOCATION = YUMURTALIK

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UNIT WEIGHTS IN TONS, UNIT COST IN 1000 U.S.A DOLLARS (1980)

EDP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT. WEGT
69211	RESERVOIRS, TANK	15240.7	2580.2	2255.9								20096.8
69241	CASKS, DRUMS		1416.2	354.8	420.6							2191.6
69243	CONTAINERS (PRESSURE)		908.4	140.2	130.0							1178.6
72831	SCREENS, CLASSIFIERS				47.6							47.6
72832	CROSHERS, GRINDING MILLS				6.0	6.0						12.0
72833	MIXERS			.4	198.3							198.7
72834	AGGLOMERATORS			8.1	152.1							160.2
72842	EXTRUDERS				212.5							212.5
74121	BCLIER BURNERS			5.0								5.0
74132	NON-ELECT. FURNACES			386.8								386.8
74161	HEAT EXCHANGERS		4522.0	815.0	1127.4							6464.4
74162	EVAPORATORS, PANS	4.0	6.9	24.3								35.2
74163	FLUIDIZED BED, ROTARY	2070.0	8.8									2078.8
74164	DRYERS	212.8	95.3	103.9								412.0
74165	REACTION VESSELS	1290.4	610.8	1104.7								3005.9
74166	CHEM. PROCESS COLUMNS	4713.6	521.2	1208.3								6443.1
74210	PUMPS (RECIPROCATING)		2.1	32.7	.2							35.0
74220	PUMPS (CENTRIFUGAL)		344.5	74.6	116.3							535.4
74230	PUMPS (ROTARY)		15.4	1.9	9.6							26.9
74240	PUMPS (JET, ELECTROMAGNETIC)			17.9								17.9
74312	VACUUM PUMPS		8.4	.6								9.0
74313	COMPRESSORS		578.6	364.4	158.1							1101.1
74341	FANS		59.9	22.3								82.2
74342	BLOWERS		2.4	118.0	.8							121.2
74351	CENTRIFUGES			16.8	38.4	38.0						93.2
74361	CYCLONES, PRECIPITATORS			129.6	31.8	19.0						180.4
74362	THICKENERS, FILTERS			155.8	133.6	40.7						330.1
74426	CONVEYORS (MECH)				58.2	16.1						74.3
74522	WRAPPING PACKAGING M/C'S				28.2							28.2
74525	WEIGHING MACHINERY				24.9	4.0						28.9
TOTAL WEIGHT		23551.5	11681.1	7342.0	2894.6	123.8						45593.0

UNIDO / SPOIPETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW POLYPROPYLENE
 LOCATION=YLURTALIK
 ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993
*****	*****	*****	*****	*****
69211	RESERVOIRS, TANK		1321.8	
69241	CASKS, DRUMS			70.7
69243	CONTAINERS (PRESSURE)			5.1
72831	SCREENS, CLASSIFIERS.			
72833	MIXERS			
72834	AGGLOMERATORS			
72842	EXTRUDERS			
74161	HEAT EXCHANGERS			220.8
74162	EVAPORATORS, PANS		29.0	
74163	FLUIDIZED BED, ROTARY		3.7	
74164	DRYERS		32.1	
74165	REACTION VESSELS		285.0	
74166	CHEM. PROCESS COLUMNS		204.1	
74210	PUMPS (RECIPROCATING)			5.5
74220	PUMPS (CENTRIFUGAL)			31.2
74313	COMPRESSORS			12.0
74341	FANS			.8
74342	BLWERS			26.9
74351	CENTRIFUGES			
74361	CYCLONES, PRECIPITATORS			
74362	THICKENERS, FILTERS			
74426	CONVEYORS (MECH)			
74522	WRAPPING PACKAGING M/C'S			
74525	WEIGHING MACHINERY			
TOTAL WEIGHT -----:			1875.7	373.0

PLANT,CAPACITY = 60 000 TON/YEAR

1994	1995	1996	1997	1998	1999	2000	TDI_WEGT
							1321.8
							70.7
							5.1
29.2							29.2
162.2							162.2
4.5							4.5
108.6							108.6
							220.8
							29.0
							3.7
							32.1
							285.0
							206.1
							5.5
							31.2
							12.0
							.8
							26.9
17.9							17.9
18.7							18.7
114.7							114.7
34.9							34.9
9.2							9.2
11.6							11.6
511.5							2760.2

UNICC / SPO(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW STYRENE PLANT, CAPACITY = 19 000 TON/YEAR
LOCATION=YUPLRITALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EDP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
69211	RESERVICIRS,TANK		1133.0									1133.0
69241	CASKS,DRUMS			192.6								192.6
74161	HEAT EXCHANGERS			847.8								847.8
74165	REACTIGN VESSELS		384.7									384.7
74166	CFEM.PROCESS COLUMNS		870.3									870.3
74210	PLMPS(RECIPROCCATING)			11.1								11.1
74220	PLMPS(CENTRIFUGAL)			356.6								356.6
74313	COMPRESSORS			174.1								174.1
74362	THICKNERS,FILTERS				6.6							6.6
T O T A L C O S T -----:			2388.0	1582.2	6.6							3976.8

UNICC / SPCIPETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW POLYSTRENE PLANT, CAPACITY = 13 500 TON/YEAR
 ACCATICA=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
69211	RESERVOIRS, TANK		318.0									318.0
69241	CASKS, DRUMS			3.0								3.0
72831	SCREENS, CLASSIFIERS.				108.0							108.0
72832	CRUSHERS, GRINDING MILLS				115.2							115.2
72833	MIXERS				45.9							45.9
72834	AGGLOMERATORS				83.1							83.1
72842	EXTRUDERS				.0							.0
74161	HEAT EXCHANGERS			44.8								44.8
74164	DRYERS		274.8									274.8
74165	REACTION VESSELS		390.0									390.0
74220	PUMPS (CENTRIFUGAL)			103.2								103.2
74341	FANS			2.8								2.8
74342	ELMERS			62.1								62.1
74361	CYCLONES, PRECIPITATORS				24.6							24.6
74362	THICKENERS, FILTERS				544.4							544.4
74426	CONVEYORS (MECH)				19.0							19.0
74522	WRAPPING PACKAGING M/C'S				63.9							63.9
74525	WEIGHING MACHINERY					129.6						129.6
TOTAL COST -----:			982.8	215.9	1004.1	129.6						2332.4

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UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW POLYSTYRENE PLANT, CAPACITY = 13 500 TON/YEAR
 LOCATION=YUNUR TALIK
 ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEGT
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
69211	RESERVOIRS,TANK		121.2									121.2
69241	CASKS,DRUMS			.2								.2
72831	SCREENS,CLASSIFIERS.				6.1							6.1
72832	CRUSHERS,GRINDING MILLS				6.0							6.0
72833	MIXERS				2.5							2.5
72834	AGGREGATORS				3.8							3.8
72842	EXTRUDERS				23.9							23.9
74161	HEAT EXCHANGERS			4.8								4.8
74164	DRYERS		16.3									16.3
74165	REACTION VESSELS		42.0									42.0
74220	PUMPS(CENTRIFUGAL)			1.6								1.6
74341	FANS			.4								.4
74342	BLOWERS			5.2								5.2
74361	CYCLONES,PRECIPITATORS				.8							.8
74362	THICKENERS,FILTERS				10.9							10.9
74426	CONVEYORS(MECH)				1.1							1.1
74522	WRAPPING PACKAGING M/C'S				2.1							2.1
74525	WEIGHING MACHINERY					2.6						2.6
TOTAL WEIGHT -----:			179.5	12.2	57.2	2.6						251.5

UNICC / SPC (PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW ACRYLONITRILE PLANT, CAPACITY = 70 000 TON/YEAR
 LOCATION=YLMURIALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
69211	RESERVOIRS, TANK		2109.8									2109.8
69241	CASKS, DRUMS				680.1							680.1
74161	HEAT EXCHANGERS				1888.3							1888.3
74165	REACTION VESSELS			189.2								189.2
74166	CHEM. PROCESS COLUMNS			1430.1								1430.1
74220	PLUMPS (CENTRIFUGAL)				399.4							399.4
74313	COMPRESSORS				2032.7							2032.7
74361	CYCLONES, PRECIPITATORS					54.4						54.4
74362	THICKENERS, FILTERS					121.7						121.7
TOTAL COST -----:			3729.1		5000.5	176.1						8905.7

UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW ACRYLONITRILE PLANT,CAPACITY = 70 000 TON/YEAR
 LOCATICA=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EGP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEGT
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
69211	RESERVUARS,TANK			1959.9								1959.9
69241	CASKS,DRUMS				122.1							122.1
74161	HEAT EXCHANGERS				256.0							256.0
74165	REACTION VESSELS			355.0								355.0
74166	CHEM.PROCESS COLUMNS			359.6								359.6
74220	PLUMPS(CENTRIFUGAL)				27.8							27.8
74313	COMPRESSORS				60.0							60.0
74361	CYCLONES,PRECIPITATORS					14.0						14.0
74362	THICKNERS,FILTERS					13.9						13.9
TOTAL WEIGHT -----:				2714.5	465.9	27.9						3208.3

UNIDO / SPO (PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW STYRENE BUTADIENE RUBBER PLANT, CAPACITY = 32 000 TON/YEAR
 LOCATION=YUMLURTALIK
 ANTICIPATED DATE OF COMMISSIONING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
69211	RESERVOIRS, TANK			390.7								390.7
69241	CASKS, DRUMS				1046.4							1046.4
72831	SCREENS, CLASSIFIERS					7.0						7.0
72832	CRUSHERS, GRINDING MILLS					39.6						39.6
74161	HEAT EXCHANGERS				1024.6							1024.6
74164	DRYERS			46.1								46.1
74165	REACTION VESSELS			474.4								474.4
74166	CHEM. PROCESS COLUMNS			262.4								262.4
74210	PUMPS (RECIPROCATING)				7.4							7.4
74220	PUMPS (CENTRIFUGAL)				145.2							145.2
74230	PUMPS (ROTARY)				6.6							6.6
74240	PUMPS (JET, ELECTROMAGNETIC)					.0						.0
74313	COMPRESSORS				86.6							86.6
74342	BLOWERS				28.4							28.4
74362	THICKENERS, FILTERS					1.9						1.9
74426	CONVEYORS (MECH)					67.7						67.7
74525	WEIGHING MACHINERY					30.9						30.9
TOTAL COST -----:				1173.6	2345.2	147.1						3665.9

LNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW STYRENE BUTADIENE RUBBER PLANT,CAPACITY = 32 000 TON/YEAR
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEGT
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
65211	RESERVOIRS,TANK			71.7								71.7
69241	CASKS,DRUMS				177.8							177.8
72831	SCREENS,CLASSIFIERS.					.0						.0
72832	CRUSHERS,GRINDING MILLS					6.0						6.0
74161	HEAT EXCHANGERS				70.1							70.1
74164	DRYERS			100.0								100.0
74165	REACTION VESSELS			75.2								75.2
74166	CHEM.PROCESS COLUMNS			40.6								40.6
74210	PLUMPS(RECIPROCATING)				.2							.2
74220	PLUMPS(CENTRIFUGAL)				18.2							18.2
74230	PLUMPS(ROTARY)				9.6							9.6
74240	PLUMPS(JET,ELECTROMAGNETIC)					.0						.0
74313	COMPRESSORS				8.0							8.0
74342	BLOWERS				.0							.0
74362	THICKENERS,FILTERS					.3						.3
74426	CONVEYERS(MECH)					8.5						8.5
74525	WEIGHING MACHINERY					4.0						4.0
TOTAL WEIGHT -----:				287.5	283.9	18.8						590.2

UNICC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW ETHYLENE OXIDE/GLYCOL PLANT, CAPACITY = 68 000 TON/YEAR
LOCATION=YUVRTALIK
ANTICIPATED DATE OF COMMISSINING= 1995
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
ECP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEIGHT
69211	RESERVOIRS,TANK			145.6								145.6
69241	CASKS,DRUMS				56.0							56.0
69243	CONTAINERS(PRESSURE)				130.0							130.0
74161	HEAT EXCHANGERS				560.9							560.9
74165	REACTION VESSELS			487.5								487.5
74166	CHEM.PROCESS COLUMNS			545.8								545.8
74220	PUMPS(CENTRIFUGAL)				46.1							46.1
74313	COMPRESSORS				36.7							36.7
74362	THICKENERS,FILTERS					26.5						26.5
TOTAL WEIGHT -----:				1178.9	829.7	26.5						2035.1

UNICC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW BUTADIENE EXTRACTION PLANT, CAPACITY = 33 000 TON/YEAR
LOCATION=YUPLRITALIK
ANTICIPATED DATE OF COMMISSINING= 1995
UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EDF-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
69211	RESERVOIRS,TANK			46.6								46.6
69241	CASKS,DRUMS				133.5							133.5
74161	HEAT EXCHANGERS				656.5							656.5
74166	CHEM.PROCESS COLUMNS			758.2								758.2
74220	PLMPS(CENTRIFUGAL)				70.6							70.6
T O T A L C O S T -----:				804.8	860.6							1665.4

UNICC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW BUTADIENE EXTRACTION PLANT,CAPACITY = 33 000 TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1995
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EGP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEGT
69211	RESERVOIRS,TANK			21.6								21.6
69241	CASKS,DRUMS				32.4							32.4
74161	HEAT EXCHANGERS				151.3							151.3
74166	CHEM.PROCESS COLUMNS			175.9								175.9
74220	PLUMPS(CENTRIFUGAL)				6.3							6.3
TOTAL WEIGHT -----:				197.5	190.0							387.5

UNIC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW PURE TEREPHTHALIC ACID PLANT, CAPACITY = 70 000 TON/YEAR
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECF-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_COST
69211	RESERVOIRS, TANK			217.1								217.1
69241	CASKS, DRUMS				206.0							206.0
74161	HEAT EXCHANGERS				1597.2							1597.2
74162	EVAPORATORS, PANS			22.8								22.8
74164	DRYERS			291.8								291.8
74165	REACTION VESSELS			2113.4								2113.4
74166	CHEM. PROCESS COLUMNS			537.8								537.8
74220	PUMPS (CENTRIFUGAL)				237.4							237.4
74313	COMPRESSORS				942.8							942.8
74342	BLWERS				38.0							38.0
74351	CENTRIFUGES					1067.8						1067.8
74361	CYCLONES, PRECIPITATORS					55.2						55.2
74420	CONVEYERS (MECH)			80.3								80.3
TOTAL COST -----:				3263.2	3021.4	1123.0						7407.6

UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 SUMMARY OF EQUIPMENT REQUIREMENT FOR THE NEW PURE TEREPHTHALIC ACID PLANT, CAPACITY = 70 000 TON/YEAR
 LOCATION=YUNURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC	BASIC MACHINE NAME	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WEGT
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
69211	RESERVOIRS, TANK			17.1								17.1
69241	CASKS, DRUMS				32.7							32.7
74161	HEAT EXCHANGERS				89.1							89.1
74162	EVAPORATORS, PANS			2.2								2.2
74164	DRYERS			3.9								3.9
74165	REACTION VESSELS			187.0								187.0
74166	CHEM. PROCESS COLUMNS			86.4								86.4
74220	PUMPS (CENTRIFUGAL)				17.9							17.9
74313	COMPRESSORS				53.4							53.4
74342	BLOWERS				.8							.8
74351	CENTRIFUGES					51.0						51.0
74361	CYCLONES, PRECIPITATORS					5.0						5.0
74426	CONVEYORS (MECH)			7.6								7.6
TOTAL WEIGHT -----:				304.2	193.9	56.0						554.1

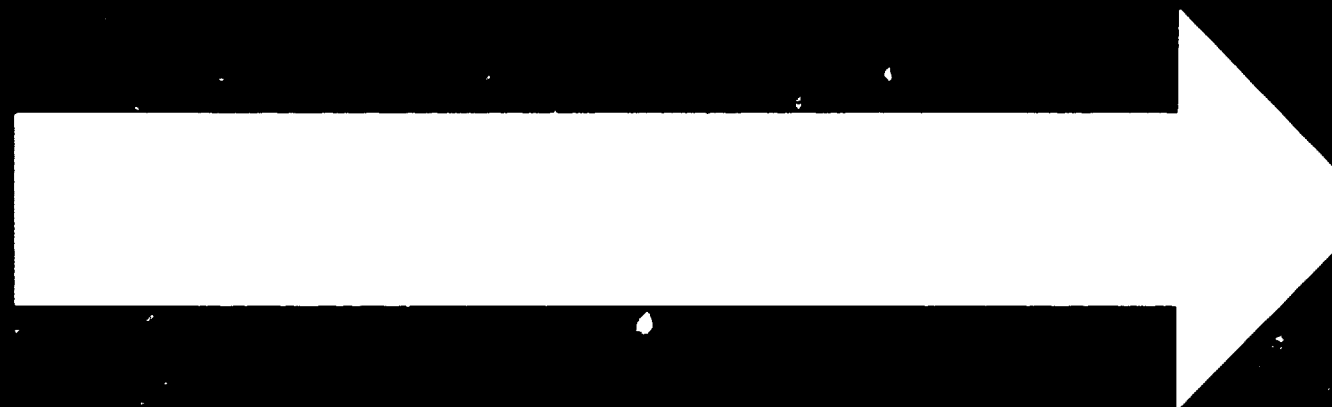
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(3 of 17)

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

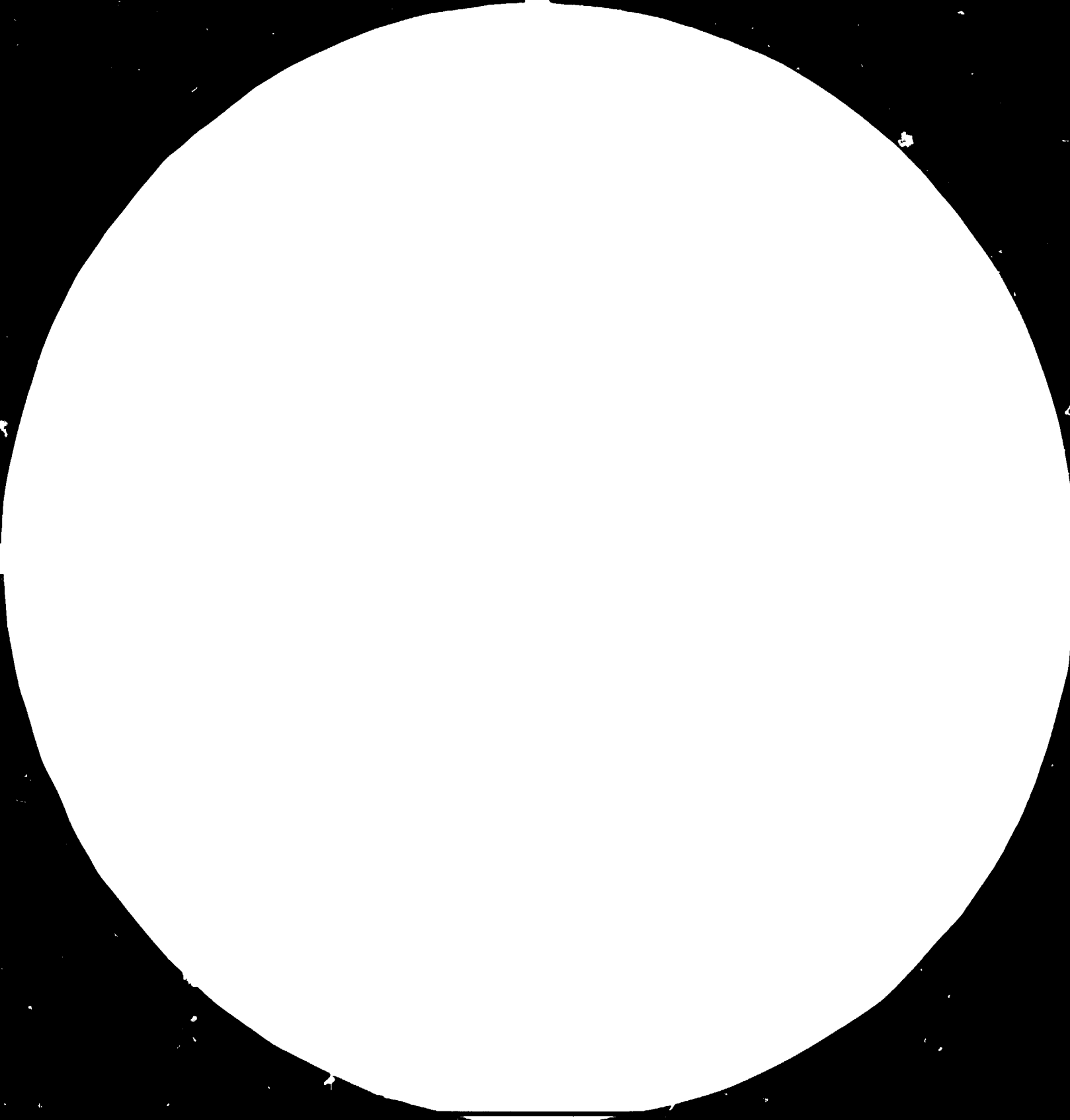
Technical Report No.XI- Demand for Capital Goods for
Petrochemicals Industry,

Vol.II - Technical data for
(NSC) Naptha Steam Cracking

B-525



84.10.02





2.8

3.2

3.6

4.0

4.5



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

U.S. GOVERNMENT PRINTING OFFICE: 1963 O 338-001

4025-O - (2) - NATIONAL BUREAU OF STANDARDS

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Restricted

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol.II- Technical data for
(NSC) Naptha Steam Cracking

Prepared for the Government of Turkey

by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

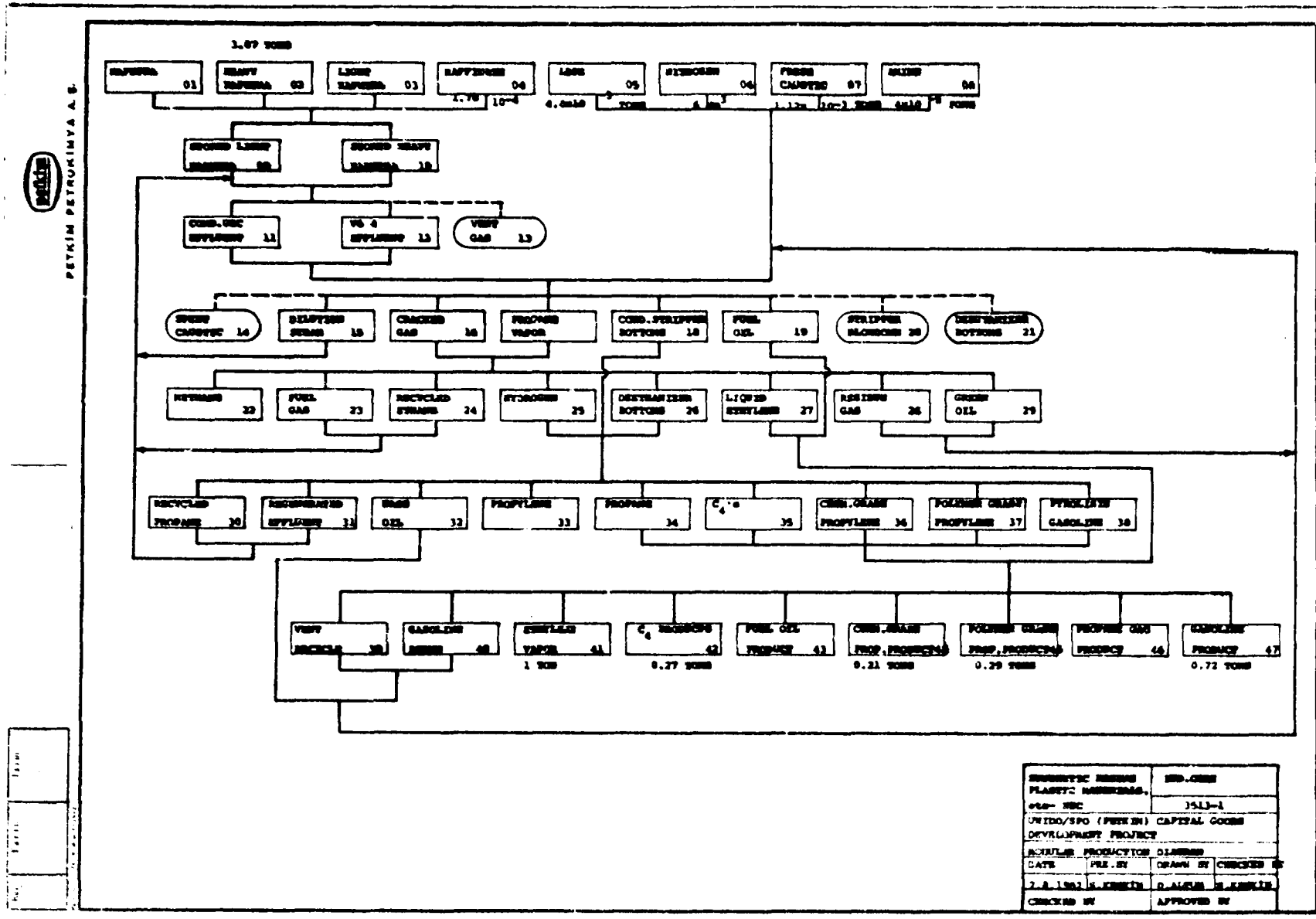
This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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PETKIM PETROKIMYA A.B.

Date: _____

SYNTHETIC RUBBER	IND. CHEM		
PLASTIC MATERIALS	IND. CHEM		
PLA- SEC	IND. CHEM		
UNITO/SPO (PHEIN) CAPITAL GOOD			
DEVELOPMENT PROJECT			
NOVILE PRODUCTION CLASS			
DATE	FILE BY	DRAWN BY	CHECKED BY
7.2.1962 S. KRISHN		D. ALPUS	S. KRISHN
CHECKED BY	APPROVED BY		

RELATIONSHIP BETWEEN FLOW DIAGRAMS
AND ACTIVITIES FOR TSC PLANT

PETKIM PETROKIMYA A.Ş.



- 01 TO 10 FEED STORAGE
- 10 TO 11 CRACKING
- 11 TO 16 PRIMARY FRACTIONATION AND DILUTION
- 16 TO 27 REACTION AND FRACTIONATION
- 18 TO 23 PROPYLENE PRODUCTION
- 27 TO 47 PRODUCT STORAGE

Rev.	Tarih	İsmi

Revizyon: 03/09/82/1940

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.

UNIDO/SPO (PETKIM) CAPITAL GOODS
DEVELOPMENT PROJEC.

INDUSTRY ACTIVITIES CHART
(PART 1- NSC)

IND CODE: 3513-1
IND NAME: SYNTHETIC RESINS, PLASTIC
MATERIALS AND MAN-MADE FIBERS- NSC

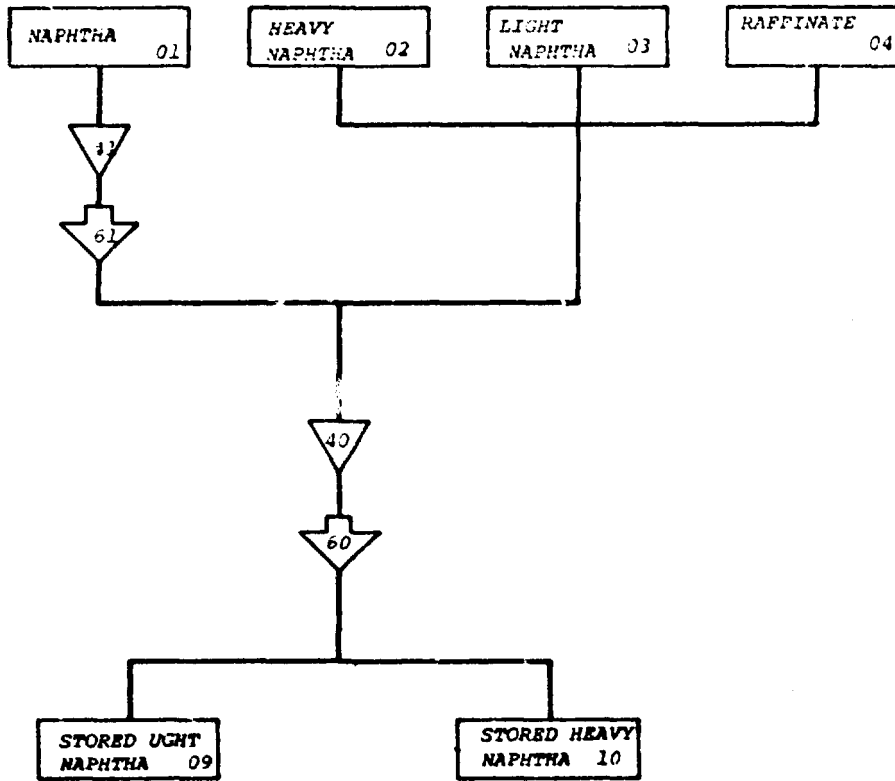
PROD.3	PRODUCT NAME	PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY	
							CODE	
10	SFORED HEAVY NAPHTHA		1	FEED STORAGE	NAPHTHA TANK	95000-1000000 m ³	1	95.000 m ³
							2	300.000 m ³
							3	650.000 m ³
							4	1.000.000 m ³
11	COMB.USC. EFFLUENT		1	CRACKING	CRACKING FURNACE	10-50 t/hr	1	10 t/hr
							2	26 t/hr
							3	34 t/hr
							4	43 t/hr
							5	50 t/hr
16	CRACKED GAS		1	PRIMARY FRACTIONATION AND DILUTION	PRIMARY FRACTIONATOR	1000-3000 m ³	1	1000 m ³
							2	1750 m ³
							3	3000 m ³
27	LIQUID ETHYLENE		1	REACTION AND FRACTIONATION	HYDROGENATION REACTOR	129-400 m ³	1	120 m ³
							2	260 m ³
							3	400 m ³
33	PROPYLENE		1	PROPYLENE PRODUCTION	HIGH PURITY PROPYLENE TOWER	200-1500 m ³	1	200 m ³
							2	530 m ³
							3	1100 m ³
							4	1500 m ³
41	ETHYLENE VAPOR		1	PRODUCT STORAGE	ETHYLENE STORAGE TANK	10000-120000 m ³	1	10000 m ³
							2	18000 m ³
							3	73000 m ³
							4	150000 m ³

PREPARED BY	CHECKED BY	APPROVED BY
S. KESKIN		

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.



FEED STORAGE

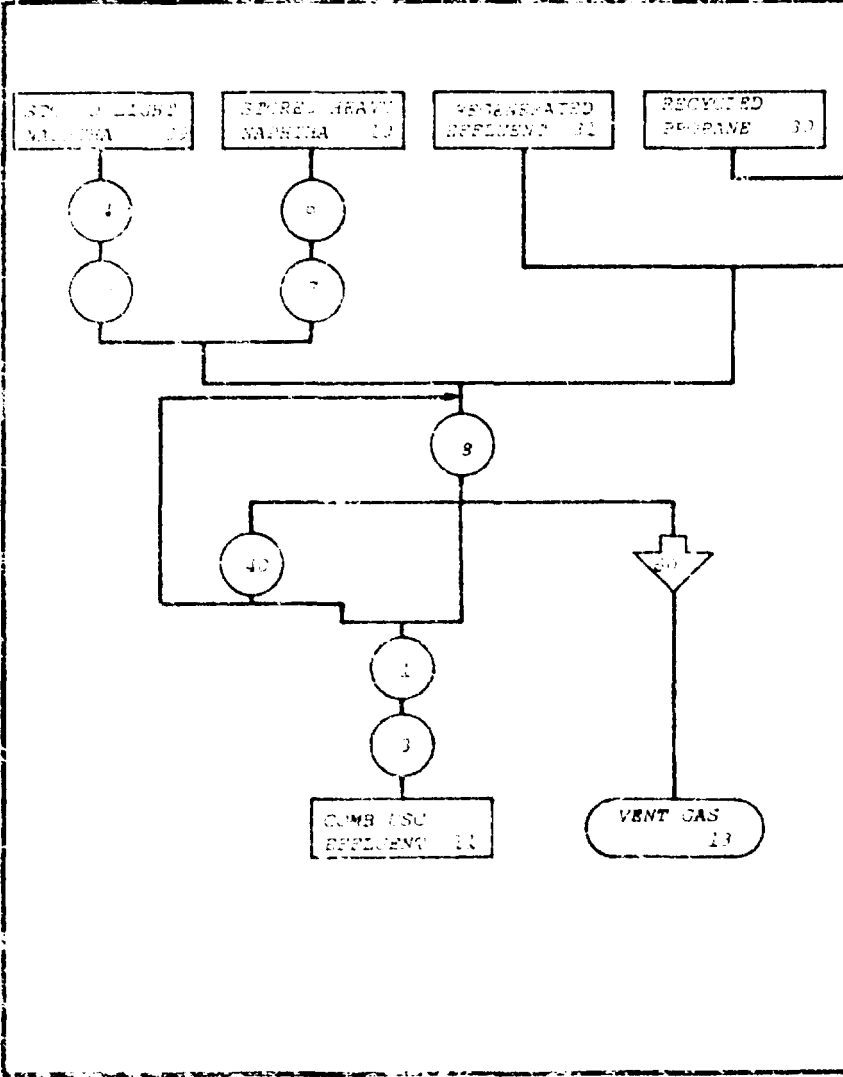
ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	1511-1	10	1	1
NO	MACHINE CODE	MACHINE NAME	Q	
60	742200130221632	Naphtha Day St P.	1	
61	742200141311632	" Bulk St.P.	1	
40	692110754326211	" Day Tank	2	
41	692110794129211	" Tank	4	

UNIDO / SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

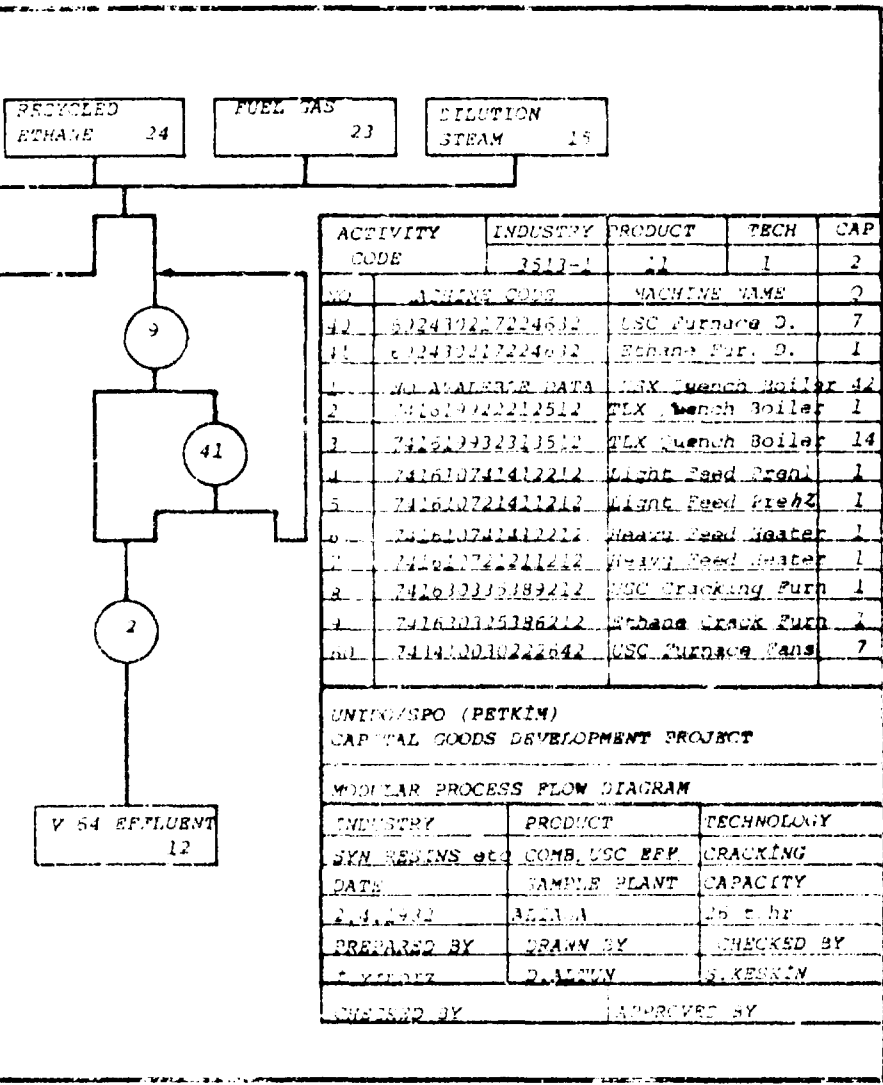
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	STORED H. NAPHTHA	FEED STORAGE
DATE	SAMPLE PLANT	CAPACITY
2.4.1982	ALFAÇA	95400 m ³
PREPARED BY	DRAWN BY	CHECKED BY
T. YILDIZ	D. ALTUN	S. KESKIN
CHECKED BY	APPROVED BY:	

Rev.	Description	Date





PETKIM PETROKIMYA A.Ş

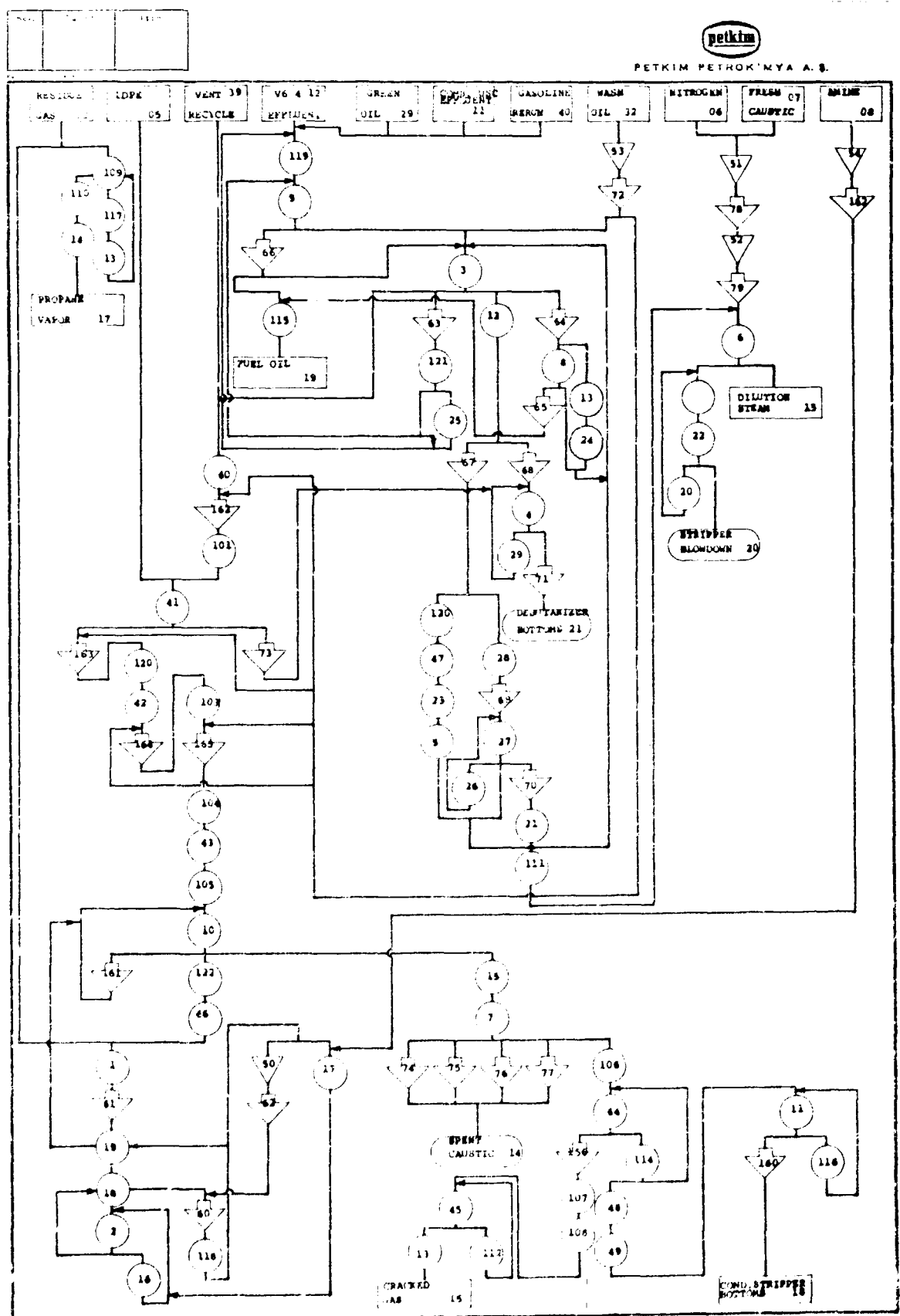


ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3517-1	11	1	2
NO	MACHINE CODE	MACHINE NAME	Q	
40	702410217224612	LSC Furnace D.	7	
41	602410217224612	Ethane Pur. D.	1	
1	741610714112212	TLX Quench Boiler	42	
2	741610714112512	TLX Quench Boiler	1	
3	741610714113512	TLX Quench Boiler	14	
4	741610714112212	Light Feed Preh2	1	
5	741610714112212	Light Feed Preh2	1	
6	741610714112212	Heavy Feed Heater	1	
7	741610714112212	Heavy Feed Heater	1	
8	7416107141189212	LSC Cracking Furn	1	
9	7416107141186212	Ethane Crack Furn	1	
10	741410018222642	LSC Furnace Fans	7	

UNIKASPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	COMB. LSC EFF.	CRACKING
DATE	SAMPLE PLANT	CAPACITY
2.1.1992	ASİMA	25 t/hr
PREPARED BY	DRAWN BY	CHECKED BY
S. KESKİN	D. ALKIN	S. KESKİN
CHECKED BY	APPROVED BY	



Rev.	Tarikh	Isim



PETKIM PETHOKIMYA A.S.

Form 111119 A-7-1972

ACTIVITY CODE	INDUSTRY	PRODUCT	TEC	CAP				
	3513-1	27	1	1				
NO	MACHINE CODE	MACHINE NAME	Q					
1	741661144116642	Deaethanizer	1		101	741610100054902	N ₂ prod. exch.	1
2	741661144316742	Deethanizer	1		104	741610100054902	Demet. condenser	1
3	141669953118432	Ethy. tow. no.1	1		105	741610341311212	Res. gas comp aft. cool	1
4	741166993115222	Ethy tow. no.2	1		106	741610800053902	Ethy.prod.super h.no.1	1
40	692430311221211	Fuel gas mix.drum			107	741610800053902	Ethy prod super h.no.2	1
5	692410520423222	Dem. feed sep. no.1	1		108	741610300052902	Ethy prod cooler no.1	1
6	692410510523222	Dem. feed sep. no.2	1		109	741610300052902	Ethy prod cooler no.2	1
7	692410510623222	Dem. feed sep no.3	1		110	741610300052902	Ethy prod cooler no.3	1
8	692410510721612	Dem. feed sep no. 4	1		111	74161070142212	Meth. prod heat.	1
9	692410510821612	Dem. feed sep no. 5	1		112	741610500054902	Deet cc. condenser	1
10	692410510921612	M 2 separator	1		113	741610262213212	Deet reboiler	2
41	692410510721612	Deem reflux drum	1		114	741610162416222	Acy. reac. feed exch.	1
42	692410540524232	Dee. reflux drum	1		115	741610741211212	Acy. Iso.reac. heat.	1
11	741650842145232	Acy. hyd. Iso. reac.	2		116	741610141412221	Acy. adia. reac. feed	1
43	692410520221212	Acety res. cooler	1		117	741610192413222	Ace. adia reac.feed exch1	1
12	741650823143222	Acety. Hyd.adia reac	2		118	741610342416222	Ace. adia. reac. feed	1
13	692410510522422	Greear oil sep.	1		119	741610342413221	Ace.adia.reac.off.cooler 1	1
14	741660324232222	Greear oil absor	2		120	741610552413211	Ace. reac. coolant cond	1
44	692410520323412	Eth. surge drum	1		121	741610342213212	Eth. split feed pre.	1
45	692410520323412	Eth. tow. con.ref.dr	1		122	741610500054902	Eth. tow. conder.	1
46	692410550524422	Eth. tow.ref.drum.	1		123	741610262414222	Eth. tow side reboiler	2
15	741650623143222	CO methan drum	1		124	7416.0252313212	Eth. tow. reboiler	1
16	741644020091202	hydrogen driers	1		125	741610341411212	Deet bottom cooler	1
17	692410710321211	CO meth. off. sep.	1		126	741610141212212	CO methan feed /ef. exch 1	1
18	741610252513222	Demet reboiler	2		127	741610700011212	CO meth. feed heat.	1
19	741610352513212	Demet feed reboiler	1		128	741610921211212	CO meth. feed LP.st.	1
20	741610342413212	Demet feed pre.cool2	1		60	742200131521712	Dem. reflux pump	2
21	741610352413212	Demet feed pre.cool3	1		61	742200242521712	Demet reflux pump	2
22	741610342414212	Demet feed pre cool	1		62	742200241511712	Ethy. tow.intex pump	1
23	741610300054902	Demet 1 1rd feed pre	1		63	742200151511712	Ethy. tow. ref. cool	2
24	741610300054902	Demet 2 2nd feed pre	1		64	74161034212742	Res. gas comp.	1
25	741610300054902	Demet 3rd feed precool	1		102	741610100054902	Demet core exch.no.5	1
26	741610100054902	Demet core exch. no.5	1					
27	741610100054902	Demet core exch. no.4	1					
28	741610100054902	Demet core exch.no.2	1					
29	741610100054902	Demet core exch.no.1	1					
101	741610100054902	Demet core exch.no.6	1					

UNID/SPO (PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 MEANAR PROCESS FLOW DIAGRAM

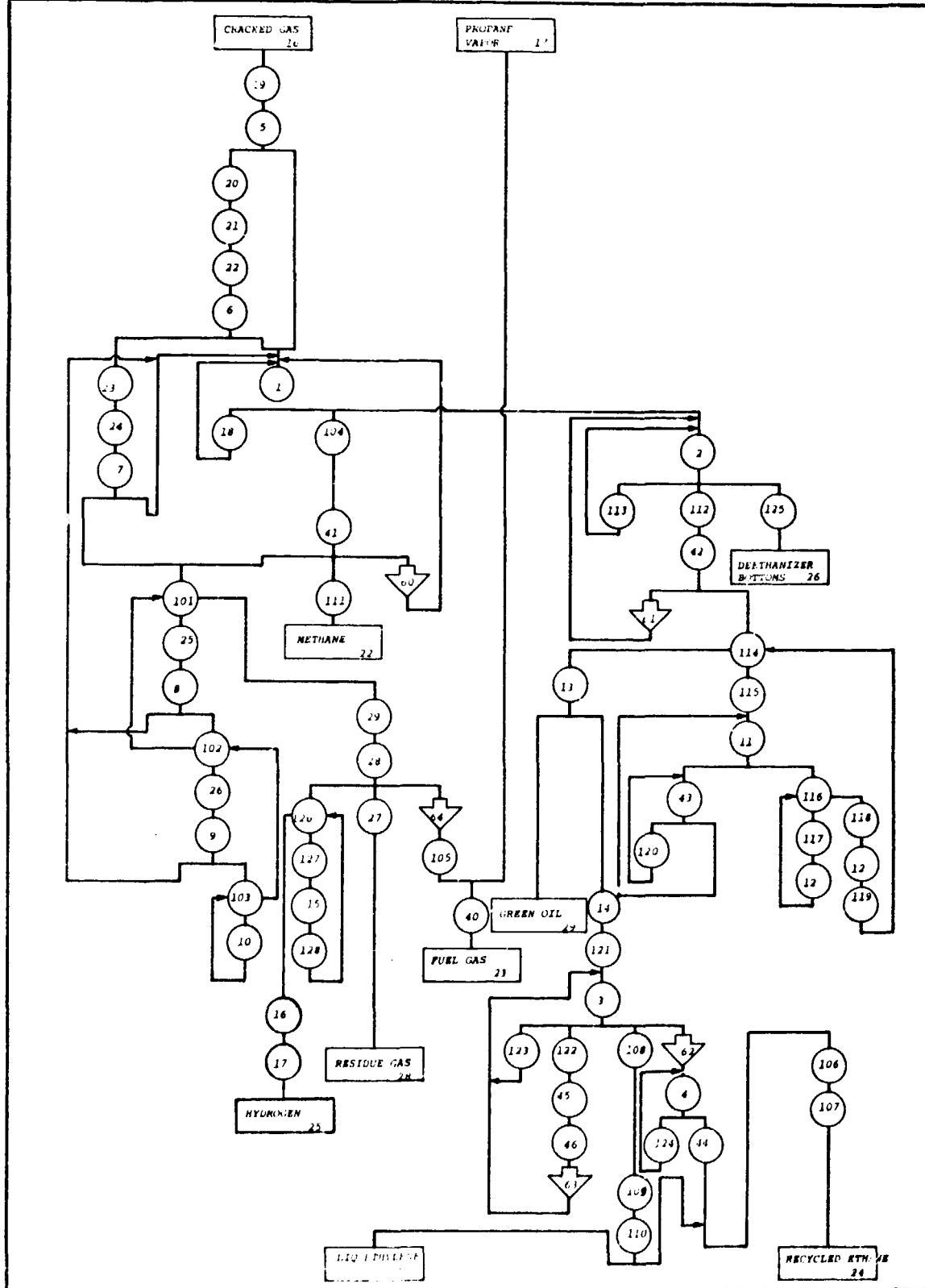
DESIGNED BY L. YILMAZ	PROJECT LIQUID STYRENE SMALL PLANT MILWAJ	TECHNOLOGY REACTION AND SEPARATION CAPACITY 120 g
DRAWN BY L. YILMAZ	CHECKED BY M. SAIT	CHECKED BY A. ARSU
CHECKED BY	APPROVED BY	

Rev.	Tarikh	Isim

Petkim 101.019.A-7/1972



PETKIM PETROKIMYA A.Ş.



Rev.	Farin	Isim



PETKIM PETHOKIMYA A.S.

NO	MACHINE CODE	INDUSTRY	PRODUCT	TECH	QTY
1	741000711412	Rich am. strip			1
2	741000711412	Am. strip			1
3	741000711412	Rich am. strip			1
4	741000711412	Am. strip			1
5	741000711412	Rich am. strip			1
6	741000711412	Am. strip			1
7	741000711412	Rich am. strip			1
8	741000711412	Am. strip			1
9	741000711412	Rich am. strip			1
10	741000711412	Am. strip			1
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16	741000711412	Am. strip			1
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18	741000711412	Am. strip			1
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20	741000711412	Am. strip			1
21	741000711412	Rich am. strip			1
22	741000711412	Am. strip			1
23	741000711412	Rich am. strip			1
24	741000711412	Am. strip			1
25	741000711412	Rich am. strip			1
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38	741000711412	Am. strip			1
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67	741000711412	Rich am. strip			1
68	741000711412	Am. strip			1
69	741000711412	Rich am. strip			1
70	741000711412	Am. strip			1
71	741000711412	Rich am. strip			1
72	741000711412	Am. strip			1
73	741000711412	Rich am. strip			1
74	741000711412	Am. strip			1
75	741000711412	Rich am. strip			1

NO	MACHINE CODE	MACHINE NAME	QTY
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78	741000711412	Rich am. strip	1
79	741000711412	Am. strip	1
80	741000711412	Rich am. strip	1
81	741000711412	Am. strip	1
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83	741000711412	Am. strip	1
84	741000711412	Rich am. strip	1
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127	741000711412	Am. strip	1
128	741000711412	Rich am. strip	1
129	741000711412	Am. strip	1
130	741000711412	Rich am. strip	1
131	741000711412	Am. strip	1
132	741000711412	Rich am. strip	1
133	741000711412	Am. strip	1
134	741000711412	Rich am. strip	1
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140	741000711412	Rich am. strip	1
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144	741000711412	Rich am. strip	1
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148	741000711412	Rich am. strip	1
149	741000711412	Am. strip	1
150	741000711412	Rich am. strip	1
151	741000711412	Am. strip	1
152	741000711412	Rich am. strip	1
153	741000711412	Am. strip	1
154	741000711412	Rich am. strip	1
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156	741000711412	Rich am. strip	1
157	741000711412	Am. strip	1
158	741000711412	Rich am. strip	1
159	741000711412	Am. strip	1
160	741000711412	Rich am. strip	1
161	741000711412	Am. strip	1
162	741000711412	Rich am. strip	1

UNITO / SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

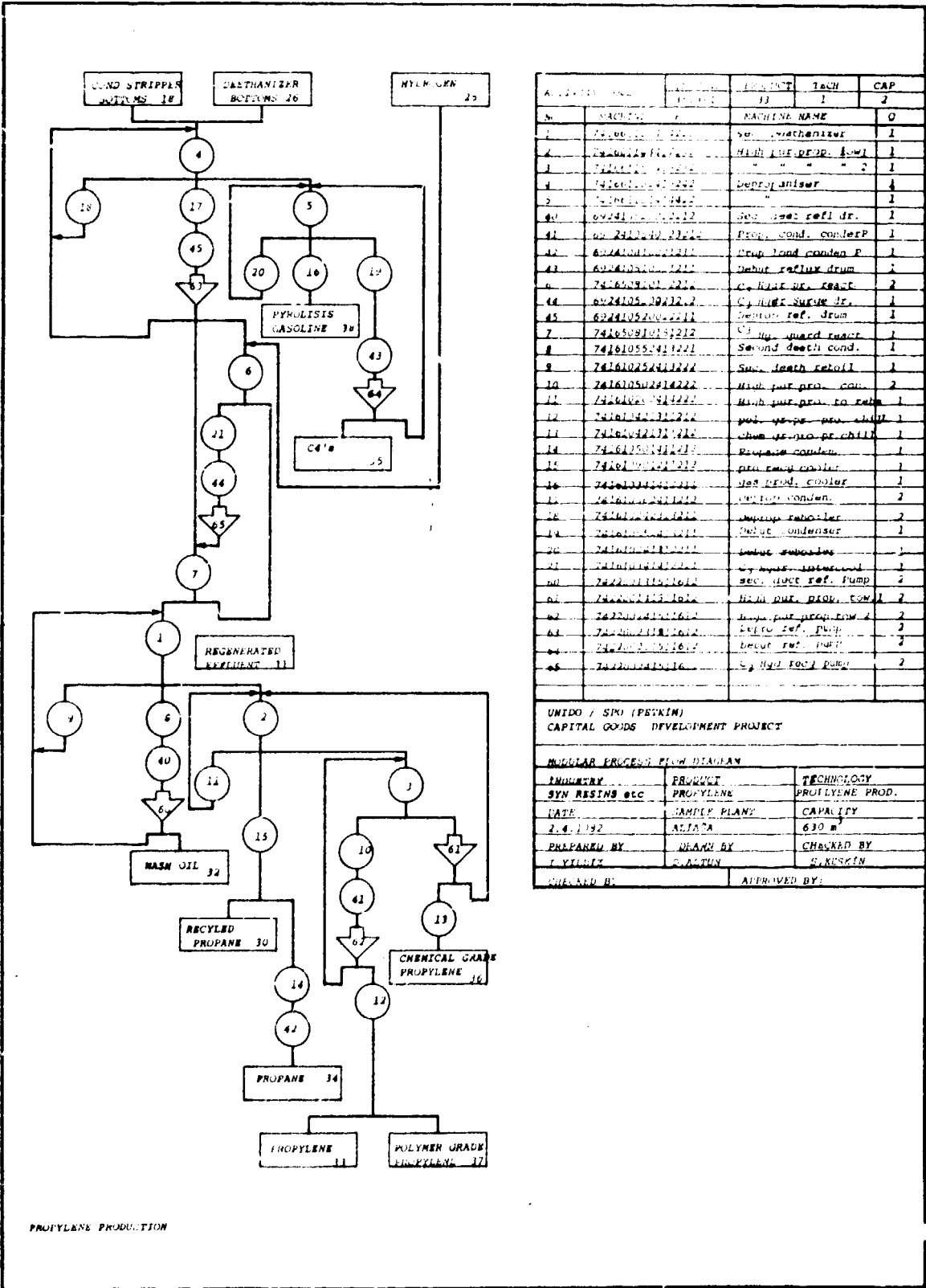
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	CRACKED GAS	PRIMARY FRAC.
DATE	FACILE PLANT	CAPACITY
2.4.1992	ALISA	1752 m ³
PREPARED BY	DRAWN BY	CHECKED BY
I. YULDEZ	D. ANJUN	S. RESKIN
CHECKED BY	APPROVED BY :	

Rev.	TARIH	Isim



PETKIM PETROKIMYA A. S.



NO.	MACHINE	PROJECT	TECH	CAP
1	741605511111	11	1	2
2	741605511111	11	1	2
3	741605511111	11	1	2
4	741605511111	11	1	2
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80	741605511111	11	1	2

UNIDO / SIM (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PROJECT	TECHNOLOGY
SYN RESINS etc	PROPYLENE	PROPYLENE PROD.
DATE	DESIGN PLANS	CAPACITY
2.4.1992	ALJADA	630 M ³
PREPARED BY	DRAWN BY	CHECKED BY
E. YILMAZ	E. YILMAZ	E. YILMAZ
CHECKED BY:	APPROVED BY:	

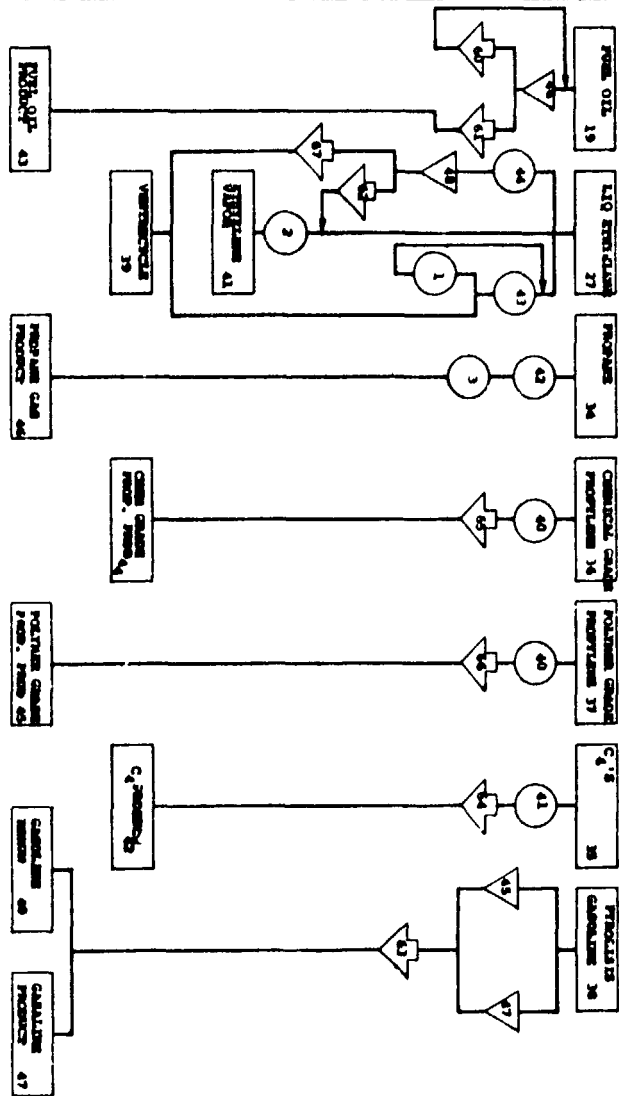
PROPYLENE PRODUCTION

Rev.	Tarih	İsim



PETKİM PETROKİMYA A.Ş.

Revizyon: 11.01.19 A-11/1972



ACTIVITY CODE	DESCRIPTION	PROPERTY	SIZE	CAF
NO	MACHINE CODE	15L1-1	41	
40	69211076431212	Frp. rec. tank	1	0
41	69211076443212	C4 Product Tanks	1	1
42	69211076453212	Propane tanks	1	1
43	69211071532222	Evaporator	1	1
44	69211076431212	Evaporator	1	1
1	74161094221212	Evaporator	1	1
2	74161094221212	Evaporator	1	1
3	74161090111212	Evaporator	1	1
40	74231010411212	F.O. Clrc Pumps	1	1
41	74231010421212	F.O. Product Pumps	2	2
42	74279011121212	Relieve Sto. Pumps	2	2
43	74230031121212	Pyrol. gas sep. Pumps	2	2
44	74230031121212	C4's prod. Pumps	2	2
45	74230031121212	Propane sep. Pump	1	1
46	74230031121212	Pyrol. gas sep. Pump	1	1
47	NO AVAILABLE DATA	Relieve gas sep. tank	1	1
48	69211076431212	Pyrol. gas sep. tank	1	1
49	69211076431212	Evaporator	1	1
40	69211076431212	Pyrol. gas sep. tank	1	1
41	69211076431212	Evaporator	1	1

DESIGN / ENG (PERSON)	DATE

REVISION	DESCRIPTION

NO	DATE	BY	CHKD

QTY	Basic Machine- Manufacturer	Major Spec (Capacity)	Weight Spec (Optional)	Major Spec (Optional)	Type (Description)	Manufac. Char. 1 (TMS)	Manufac. Char. 2	Manufac. Char. 3	Origin	Purchase Cost		CT. 196-C Cost		Part. Year	SITC Code							
										Unit	Total	Unit	Total		2745	4715	10111	431615				
1	COY AIRCRAFT Squad Team	10-64 m	pr. 110kg m	Temp: 122°C	CY	45	SS	45 mm	I	140,000	883,000	184,400	4,700,000	1978	9743	0212	7	212	4	613	2	
42	PERKINS AIRCRAFT Team	5-322 m	pr. 116kg/cm	Temp: 122°C	CY	25	SS	45 mm	I	77,700	77,700	202,400	102,400	1978	6243	0212	7	212	4	613	2	
1	USX NUMBER SQUAD	NO AVAILABLE DATA							I	61,700	233,700	86,500	363,000	1979	NO AVAILABLE DATA							
2	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	0	HAS	3.6 mm	I	45,650	45,650	56,450	56,450	1971	7462	0714	1	4	2	2	2	
3	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	15	HAS	3.6 mm	I	114,100	1597,000	141,200	3,075,400	1978	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	9	CS	17 mm	I	3,020	3,020	42,350	42,350	1975	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	1	CS	9.32 mm	I	16,550	16,550	23,250	27,250	1979	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	3	CS	17 mm	I	30,200	30,200	42,350	42,350	1978	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	3	CS	12 mm	I	19,430	19,430	27,250	27,250	1978	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	1960	CS	5 mm	I	932,500	312,500	115,300	115,300	1976	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	110	CS	5 mm	I	543,750	548,750	678,700	678,700	1978	7462	0714	1	4	2	2	2	
1	FOR FIGHT SQUAD	NO AVAILABLE DATA		75.3 m	PST	8	SS	8 tons	I	548,800	183,600	64,250	449,750	1978	7462	0714	1	4	2	2	2	

FOR FIGHT SQUAD - FIGHT SQUAD STATE
OPERATION IS TO BE IN PROGRESS

no.	name	Capacity	Pressure	Temp	Type	Material	Number	Material	Number
1	Rich Amine Prestripper	17.6 m ³	Pr: 6.5 atm	Temp: 65°C	PB	CS	11	CS	12 mm
2	Amine stripper	15.6 m ³	Pr: 3.5 atm	Temp: 160°C	PB	AS	9	AS	15 mm
3	Primary Fractionator	1750 m ³	Pr: 3.5 atm	Temp: 85°C	PB	CS	403	CS	21 mm
4	Distillate stripper	127 m ³	Pr: 3.5 atm	Temp: 150°C	PB	CS	14	CS	12 mm
5	LP water strip	26 m ³	Pr: 3.7 atm	Temp: 150°C	PB	CS	12	CS	10 mm
6	HP water strip	85.92 m ³	Pr: 11 atm	Temp: 270°C	PB	CS	39	CS	14 mm
7	Caustic scrubber	368 m ³	Pr: 23 atm	Temp: 80°C	PB	CS	190	CS	12 mm
8	Light F.O. stripper	29.33 m ³	Pr: 3.5 atm	Temp: 200°C	PB	CS	4	CS	8 mm
9	Heavy F.O. stripper	24.2 m ³	Pr: 3.5 atm	Temp: 400°C	PB	CS	11	CS	12 mm
10	Acid-gas Absorber	206 m ³	Pr: 23.2 atm	Temp: 90°C	PB	CS	98	CS	35 mm
11	Condensate strip	33.4 m ³	Pr: 12.9 atm	Temp: 85°C	PB	CS	21	CS	16 mm
12	Oil-H ₂ O separator	186.3 m ³	-	Temp: 120°C	C	CS	4	CS	28 mm
40	Crac. gas 1st diach drum	96 m ³	-	Temp: 150°C	C _y	CS	12	CS	25 mm
41	Crac. gas 2nd diach drum	92 m ³	-	Temp: 80°C	C _y	CS	30	CS	17 mm
42	Crac. gas 3rd diach drum	43 m ³	-	Temp: 80°C	C _y	CS	17	CS	21 mm
43	Crac. gas 4th diach drum	20 m ³	-	Temp: 80°C	C _y	CS	11	CS	21 mm
13	Crack. gas driers	-	-	-	Single Atacaph.	CS	55	CS	54 mm
14	Regen. gas separator	3.12 m ³	-	Temp: 70°C	C _y	CS	3	CS	9 mm
44	Crack. gas 5th at suct. drum	34.5 m ²	-	Temp: 100°C	C _y	CS	21	CS	29 mm
45	Crack. gas 5th diach drum	25.5 m ³	-	Temp: 50°C	C _y	CS	30	CS	41 mm
15	Amine ovhd separator	10.53 m ³	-	Temp: 90°C	C _y	CS	9	CS	25 mm
46	Acid gas Absor bot. coalescer	-	-	Temp: 90°C	C _y	CS	-	CS	12 mm
47	Dil. Ste. feed H ₂ O coalescer	-	-	Temp: 85°C	C _y	CS	-	CS	12 mm
48	Cond. str. feed Flash drum	3.9 m ³	-	Temp: 80°C	C _y	CS	4	CS	19 mm
49	Cond. strb feed coalescer	-	-	Temp: 80°C	C _y	CS	-	CS	12 mm

activity code 35738160

Origin	QTY	Purchase Cost		Cr. Price Cost		Purch. Year	SITC Code									
		Unit	Total	Unit	Total		10045	07	10	11	12	16				
I	1	96300	96300	142000	142000	1978	74166	07	1	1	4	1	3	2	1	2
I	1	82700	82700	122000	122000	1978	74166	07	1	1	4	1	2	4	1	2
I	1	1100000	1100000	1149400	1149400	1979	74166	99	6	1	4	1	0	2	2	2
I	1	116000	116000	171000	171000	1978	74166	07	2	1	4	1	3	2	1	2
I	1	92800	92800	136900	136900	1978	74166	07	2	1	4	1	3	2	1	2
I	1	89800	89800	116800	116800	1978	74166	07	2	2	5	1	4	2	1	2
I	1	402000	402000	595000	595000	1978	74166	02	4	3	4	1	6	2	1	2
I	1	432000	432000	561850	561850	1978	74166	07	2	1	4	1	1	2	1	2
I	1	29150	29150	37950	37950	1978	74166	07	2	1	5	1	3	2	1	2
I	1	205600	205600	205600	205600	1980	74166	07	4	3	4	1	5	2	2	2
I	1	172000	172000	254600	254600	1978	74166	07	2	2	4	1	3	2	1	2
I	1	126700	126700	167000	167000	1978	69241	99	7	0	2	2	2	2	2	2
T	1	97600	97600	167000	167000	1978	69241	99	5	0	2	2	4	2	2	2
T	1	90900	90900	105650	105650	1978	69241	99	5	0	3	2	4	2	1	1
I	1	519000	519000	626000	626000	1978	69241	99	2	0	1	2	3	2	2	2
I	1	45350	45350	45350	45350	1978	69241	99	2	0	1	2	3	2	2	2
I	2	111000	222000	128950	257700	1978	74166	40	0	0	0	1	5	2	4	2
I	1	18300	18300	24150	24150	1978	69241	99	1	0	3	2	1	2	1	1
I	1	43550	43550	50600	50600	1978	69241	99	1	0	3	2	3	2	2	2
I	1	55950	55950	65000	65000	1978	69241	00	3	0	3	2	4	2	3	2
I	1	27450	27450	31900	31900	1978	69241	99	2	0	3	2	3	2	2	2
I	1	16900	16900	22300	22300	1978	69241	99	0	0	3	2	0	2	1	2
I	2	26850	53700	35400	70800	1978	69241	99	0	0	3	2	0	2	1	2
I	1	25250	25250	25250	25250	1980	69241	05	1	0	3	2	1	2	1	2
I	1	16400	16400	21650	21650	1978	69241	99	0	0	3	2	0	2	1	2

ID	Equipment Description	Capacity	Material	Temp	Pressure	Flow	Type	Material	Char. 1	Char. 2	Char. 3	Margin	1990 Cost		Purch. Year	SPCC Code					
													Unit	Total		12	13	14	15	16	17	18	19
113	Turbine condenser	MS: 287 m ²	MS: 1.04 m	7.3 m			FST	CS	13 mm			I	41200	41200	1978	74161	07.4	2.4	1.3	1.2	1.2
114	Cond. stripper	MS: 51 m ²	MS: 1.7 m	4.9 m			FST	CS	28 mm			I	30000	30000	1978	74161	07.3	2.3	1.3	1.2	1.2
115	Feed heater	MS: 152 m ²	MS: 0.7 m	7.3 m			FST	CS	10 mm			I	33150	33150	1980	74161	03.6	1.4	1.2	1.2	1.1
116	Condens. cooler	MS: 86 m ²	MS: 0.6 m	2.4 m			FST	CS	10 mm			I	13100	13100	1980	74161	07.3	1.1	1.1	1.2	1.1
117	Reboiler	MS: 16.5 t/hr	MS: 7.1 m	84°C				CS	6 mm			I	69800	69800	1978	74132	50.2	4.3	0.6	1.2	1.2
60	Furnace	MS: 16.7 m ³ /hr	MS: 7.1 m					CS	0.9 tons			I	39900	39900	1978	74220	02.3	1.2	1.1	1.2	1.2
61	Rich Am. reax. pump	MS: 15.9 m ³ /hr	MS: 6.1 m				H	CS	0.130 tons			I	7030	14000	1978	74220	02.3	1.2	1.1	1.2	1.2
62	Not. pump	MS: 2 m ³ /hr	MS: 8.4 m				H	SS	0.2 tons			I	12450	4900	1978	74210	02.2	1.1	1.1	1.7	1.2
63	Quench oil circ pump	MS: 925 m ³ /hr	MS: 2.8 m				H	SS	0.8 tons			I	23650	47100	1978	74220	02.5	1.5	1.1	1.7	1.2
64	Pon oil circ pump	MS: 911 m ³ /hr	MS: 17 m				H	SS	0.8 tons			I	21400	42800	1978	74220	02.5	1.5	1.1	1.7	1.2
65	Light F.O. st. bottom pump	MS: 3.6 m ³ /hr	MS: 1.8 m				H	SS	0.08 m			I	4900	9800	1978	74220	02.3	1.5	1.1	1.7	1.2
66	Heavy F.O. strip pump	MS: 3.9 m ³ /hr	MS: 1.8 m				H	SS	0.08 m			I	4900	9800	1978	74220	02.3	1.5	1.1	1.7	1.2
67	Bottom pump	MS: 1155 m ³ /hr	MS: 42 m				H	SS	0.31 tons			I	87800	261700	1978	74220	02.6	2.2	1.1	1.2	1.2
68	Pr. Pract. seal pump	MS: 107 m ³ /hr	MS: 44 m				H	SS	0.2 tons			I	9300	18600	1978	74220	02.4	2.5	1.1	1.7	1.2
69	Dist. strip pump	MS: 700 m ³ /hr	MS: 59.5 m				H	SS	0.5 tons			I	41500	83000	1978	74220	02.5	3.2	1.1	1.7	1.2
70	Dist. strip pump	MS: 127 m ³ /hr	MS: 4.2 m				H	SS	0.25 tons			I	12450	24900	1978	74220	02.4	1.2	1.1	1.7	1.2
71	Dist. strip pump	MS: 31.6 m ³ /hr	MS: 2.7 m				H	SS	0.17 tons			I	8900	17800	1978	74220	02.3	1.5	1.1	1.7	1.2
72	Wash oil inject pump	MS: 5.06 m ³ /hr	MS: 35 m				H	ASC	1.0 tons			I	14450	28900	1978	74220	02.2	1.1	1.1	1.7	1.2
73	Dist. strip feed pump	MS: 35 m ³ /hr	MS: 2.94 m				H	SS	0.2 tons			I	5100	10200	1978	74220	02.3	1.5	1.1	1.7	1.2
74	Intermed. caust circ pump	MS: 51.7 m ³ /hr	MS: 6.1 m				H	SS	0.3 tons			I	6650	13300	1978	74220	02.1	1.5	1.1	1.7	1.2
75	Strong caust circ pump	MS: 51.7 m ³ /hr	MS: 6.1 m				H	SS	0.3 tons			I	6650	6650	1978	74220	02.3	1.5	1.1	1.7	1.2
76	Wash H2O circ pump	MS: 51.7 m ³ /hr	MS: 6.1 m				H	SS	0.2 tons			I	5550	11100	1978	74220	02.3	1.5	1.1	1.7	1.2
77	Fresh caustic pump	MS: 35.5 m ³ /hr	MS: 7.26 m				H	SS	0.2 tons			I	5150	10300	1978	74220	02.3	1.2	1.1	1.7	1.2
78	Caustic dosing pump	MS: 4.72 m ³ /hr	MS: 8.17 m				H	SS	0.3 tons			I	7550	15100	1978	74220	02.3	1.5	1.1	1.7	1.2
79	Cond. strip pump	MS: 38 m ³ /hr	MS: 3.48 m				H	SS	0.1 tons			I	5050	6650	1978	74210	11.2	1.1	1.1	1.7	1.2
80							H	SS	0.1 tons			I	4150	8100	1978	74220	01.3	1.1	1.1	1.7	1.2

Activity Code: 3513160

Eq. No.	Machine Name	Major Spec 1 (Optional)	Major Spec 2 (Optional)	Type Description	Manuf. Char. 1 (IN)	Manuf. Char. 2 (Char. 2)	Manuf. Char. 3 (Char. 3)	Origin	Purchase Cost		Est. 1977 Cost		Purch. Year	5-DIGIT CODE		
									Unit	Total	Unit	Total		12345	67890	1011	22345
101	ACID GAS CIR.	6W, 279 m	ACIC	H	27	SS	10 1000	1	6 460	6 460	2 600	2 600	1979	7075	014	101 101
102	AM STRIP BOT. FILLET	Dia: 3.05m	-	S2	5, 13	CS	25 mm	1	74 500	74 500	27 600	27 600	1979	7403	014	102 102
103	FILTER	Dia: 0.74 m	-	-	3, 3	CS	17 mm	1	43 700	43 700	59 350	59 350	1979	7402	010	103 103
104	222 steam Spec.	Dia: 1.22m	-	-	2, 5	CS	10 mm	1	28 750	28 750	49 400	49 400	1978	74 10 000	5 1 0 0 1	104 104
105	222 steam oil str. spec. filter	Dia: 1.5 m	-	S2	7, 3	CS	25 mm	1	25 950	25 950	48 900	48 900	1978	74 02 199	1 2 1 0 2 7	105 105
106	222 steam oil str. spec. filter	Dia: 0.65m	-	S2	5, 2	CS	25 mm	1	37 250	37 250	48 100	48 200	1978	74 03 19	1 2 1 0 2 7	106 106
107	CRAC COMP. 2. SS	NO AVAILABLE DATA	-	-	12	-	-	2	NO AVAILABLE DATA	-	-	-	-	-	-	-
289	CRAC COMP. 4. 100000	-	-	-	12	-	-	2	-	-	-	-	-	-	-	-
288	CRAC COMP. 3. 100000	-	-	-	12	-	-	2	-	-	-	-	-	-	-	-
285	CRAC COMP. 1. 100000	-	-	-	12	-	-	2	-	-	-	-	-	-	-	-
286	CRAC COMP. 4. 100000	-	-	-	12	-	-	2	-	-	-	-	-	-	-	-
287	CRAC COMP. 5. 100000	-	-	-	12	-	-	2	-	-	-	-	-	-	-	-
51	MEA STORAGE TANK	Dia: 5 m	Temp: 160°C	CY	6, 1	CS	5 mm	1	13 950	13 250	13 300	13 300	1979	69211	071	2 12 2 1 2 1 1
52	CRACK HEATING TANK	Dia: 6.5 m	Temp: 250°C	CY	15	CS	9 mm	1	29 650	29 650	29 750	29 750	1979	69211	072	2 2 1 2 1 1 1
53	CRACK HEATING TANK	Dia: 6.5 m	Temp: 600°C	CY	15	CS	6 mm	1	29 650	29 650	29 750	29 750	1979	69211	073	2 2 1 2 1 1 1
54	WASH OIL CASK	Dia: 1.0 m	Temp: 70°C	CY	12	CS	9 mm	1	63 250	63 250	63 500	63 500	1979	69211	074	2 2 1 2 1 1 1

Eq. 51 Max. component weight for machine plate thickness for above fabricated equipments.

No	Name	Capacity	Temp	Pressure	Material	Height	Diameter	Weight	Year	Location	Cost		
											Original	Current	
1	Dist. Machine	4256.7 m ³	Temp: 110°C	37 atm	PM	170	56 mm	575000	1960	74100	31.4	3.1	0.6
2	Dist. Machine	279 m ³	Temp: 25°C	37 atm	PM	130.9	52 mm	487000	1970	74100	11.4	4.1	2.4
3	Dist. Machine	710.3 m ³	Temp: 30°C	37 atm	PM	355.9	47 mm	918700	1970	74100	40.5	3.1	0.9
4	Dist. Machine	154 m ³	Temp: 25°C	37 atm	PM	30	10 mm	252000	1970	74100	9.1	3.1	2.2
40	Dist. Machine	12.4 m ³	Temp: 140°C	5 atm	Cy	4	8 mm	25200	1960	62240	0.1	1.2	1.1
5	Dist. Machine	13.6 m ³	Temp: 15°C	5 atm	Cy	11	16 mm	12250	1970	62240	0.2	1.2	1.2
6	Dist. Machine	8.5 m ³	Temp: 45°C	5 atm	Cy	10	31 mm	28500	1970	62240	0.2	1.2	1.2
7	Dist. Machine	6.9 m ³	Temp: 75°C	5 atm	Cy	6	24 mm	42150	1970	62240	0.2	1.2	1.2
9	Dist. Machine	2.9 m ³	Temp: 110°C	5 atm	Cy	4	18 mm	32400	1970	62240	0.2	1.2	1.2
9	Dist. Machine	1.89 m ³	Temp: 150°C	5 atm	Cy	3	16 mm	25100	1970	62240	0.2	1.2	1.2
10	Dist. Machine	1.22 m ³	Temp: 175°C	5 atm	Cy	2	13 mm	19000	1970	62240	0.2	1.2	1.2
41	Dist. Machine	37 m ³	Temp: 120°C	5 atm	Cy	6	9 mm	16100	1970	62240	0.2	1.2	1.2
42	Dist. Machine	58.74 m ³	Temp: 25°C	5 atm	Cy	34.3	40 mm	70000	1970	62240	0.2	1.2	1.2
43	Dist. Machine	139 m ³	Catalytic	14 atm	PM	59.8	40 mm	191800	1970	74165	0.4	2.1	5.2
43	Dist. Machine	23.7 m ³	Temp: 120°C	5 atm	Cy	3	19 mm	31600	1970	62240	0.2	0.2	1.1
44	Dist. Machine	20.8 m ³	Catalytic	33.5 atm	PM	17	28 mm	40000	1970	74165	0.2	1.4	3.2
45	Dist. Machine	6.7 m ³	Temp: 25°C	5 atm	Cy	6.6	24 mm	14100	1970	62240	0.2	1.4	3.2
46	Dist. Machine	20.6 m ³	Temp: 225°C	37 atm	PM	12	31 mm	124900	1970	74165	0.2	1.2	1.2
47	Dist. Machine	22.96 m ³	Temp: 85°C	5 atm	Cy	12.5	28 mm	16000	1970	62240	0.2	1.2	1.2
48	Dist. Machine	18.5 m ³	Temp: 95°C	5 atm	Cy	8.7	16 mm	21650	1970	62240	0.2	1.2	1.2
49	Dist. Machine	85 m ³	Temp: 40°C	5 atm	Cy	35.5	30 mm	79000	1970	62240	0.2	1.2	1.2
50	Dist. Machine	35 m ³	Catalytic	42.4 atm	PM	10	25 mm	40100	1970	74165	0.2	1.4	3.2
51	Dist. Machine	2.6 t/h	Mid-mounted			11							
52	Dist. Machine	0.26 m ³	Temp: 70°C	5 atm	Cy	0.8	12.5 mm	7100	1970	62240	0.2	1.2	1.2
53	Dist. Machine	151946 m ³	TL: 7.3 m			14	28 mm	169950	1970	74165	0.2	2.1	3.2
54	Dist. Machine	538 m ³	TL: 9.1 m			17	33 mm	72990	1970	74165	0.2	2.1	3.2

Dist. Machine

Item	Basic Description	Make/Spec	Capacity	Weight	Height	Type	Material	Coil Size	Coil Pts	Coil Dia	Coil Spacing	Purch. Case Cost	Net Cost	Gr. Cost	Year	SP#	Code	
20	Duct. Feed Precool. feed precool. no. 3	MSI 630 m ²	SD 1.02 m	TL 2.1 m		PST	CS	13 mm	1			57600	80800	80800	1976	74161	03 4 2 4 1 2 2 1 2	
21	Duct. Feed precool. no. 4	MSI 630 m ²	SD 1.3 m	TL 2.1 m		PST	CS	13 mm	1			82900	102600	102600	1978	74161	03 5 2 4 1 2 2 1 2	
22	Duct. Feed precool. no. 1	MSI 408 m ²	SD 1.05 m	TL 6.1 m		PST		15 mm	1			62300	87400	87400	1976	74161	03 4 2 4 1 2 2 1 2	
23	Duct. Feed precool. no. 2 2nd	C.O.L.D	B.O.X			Plate/Fin	Alumin	-	1			469000	469000	583000	1978	74161	03 0 0 0 5 4 9 0 2	
24	Feed precool. no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1			EXCLUDED. IN MOI 2	PRECOOLER		1978	74161	03 0 0 0 5 4 9 0 2	
25	Feed 3rd Feed precool. no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1			24950	24950	33650	1978	74161	03 0 0 0 5 4 9 0 2	
26	Duct. core exchanger no. 6	C.O.L.D	B.O.X			Plate/Fin		-	1			EXC. MOI 1	PRECOOLER		1978	74161	01 0 0 0 5 4 9 0 2	
27	Duct. core exch. no. 1	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
28	Duct. core exch. no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
29	Duct. core exch. no. 3	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
30	Duct. core exch. no. 4	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
101	Duct. core exch. no. 3	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
102	Duct. core exch. no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
103	Duct. core exch. no. 1	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
104	Duct. core exch. no. 1	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	01 0 0 0 5 4 9 0 2	
105	Feed. gas comp MSI 113 m ²	SOI 0.74 m	TL 4.9 m			PST	CS	10 mm	1			28200	28200	39950	1978	74161	01 4 1 1 1 2 1 2	
106	Rec. pro. super- heater no. 1	C.O.L.D	B.O.X			Plate/Fin	Alumin	-	1			328100	328100	460200	1978	74161	08 0 0 0 5 3 9 0 2	
107	Rec. pro. super- heater no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1			EXCLUDED. IN SUPERHEATER NO. 1			1978	74161	08 0 0 0 5 3 9 0 2	
108	Rec. pro. super- heater no. 1	C.O.L.D	B.O.X			Plate/Fin		-	1			85300	85300	108500	1978	74161	03 0 0 0 5 2 9 0 2	
109	Rec. pro. super- heater no. 2	C.O.L.D	B.O.X			Plate/Fin		-	1			EXCLUDED. IN COOLER NO. 1			1978	74161	03 0 0 0 5 2 9 0 2	
110	Rec. pro. super- heater no. 3	C.O.L.D	B.O.X			Plate/Fin		-	1						1978	74161	03 0 0 0 5 2 9 0 2	
111	Shear. prod heater	MSI -	SOI 0.2 m	TL 6.4 m		PST	CS	7.3 mm	1			2700	3800	3900	1978	74161	07 0 1 4 1 2 1 2	
112	Condensat Deer.	C.O.L.D	B.O.X			Plate/Fin	Alumin	-	1			823000	770600	770600	1978	74161	08 0 0 0 5 4 9 0 2	
113	Deer Reboiler	MSI 794 m ²	SOI 2.5 m	TL 3.7 m		PST	CS	13 mm	1			64750	129500	90000	181600	1978	74161	08 6 2 2 1 3 2 1 2
114	Deer cool. no. 3	MSI 1097 m ²	SOI 1.3 m	TL 9.1 m		PST	CS	28 mm	1			109750	109750	148350	148350	1978	74161	01 6 2 4 1 4 2 2 2
115	Deer cool. no. 1	MSI 56.5 m ²	SOI 0.5 m	TL 2.7 m		PST	CS	10 mm	1			13850	13850	19400	19400	1978	74161	07 4 1 2 1 1 2 1 2

Item #	Basic Machine (Capacity)	Serial No.	Weight (kg)	Type (Description)	Manufac. (MFG)	Manufac. (Year)	Manufac. (Char. 1)	Origin	Q.	Purchase Cost		Ch. 1980 Cost		Purch. Year	Sfr. Code
										Unit	Total	Unit	Total		
116	Agri. M/A. Reac. MS: 152 B ²	SD: 0.9 m	TL: 0.1 m	PS	3	CS	20 mm	T	1	10450	36450	10450	10450	1980	74161 01 4 1 4 1 1 2 2 2 1
117	Agri. M/A. Reac. MS: 476 B ²	SD: 1.2 m	TL: 0.1 m	PS	16	CS	23 mm	T	1	62900	62900	62900	62900	1978	74161 01 4 2 4 1 3 1 2 2 2
118	Agri. M/A. Reac. MS: 460 B ²	SD: 1.1 m	TL: 0.1 m	PS	25	CS	29 mm	T	1	62100	62100	62100	62100	1978	74161 01 4 2 4 1 4 2 2 2 2
119	Agri. M/A. Reac. MS: 151 B ²	SD: 1.1 m	TL: 0.1 m	PS	21	CS	26 mm	T	1	47300	47300	66150	47300	1978	74161 03 4 2 4 1 3 2 2 1
120	Agri. M/A. Reac. MS: 767 B ²	SD: 1.1 m	TL: 0.1 m	PS	17	CS	14 mm	T	1	50000	50000	70200	50000	1978	74161 05 5 2 4 1 3 2 1 1
121	Agri. M/A. Reac. MS: 123 B ²	SD: 1.2 m	TL: 2.7 m	PS	11	CS	13 mm	T	1	37400	27400	38400	27400	1978	74161 03 4 2 2 1 3 2 1 2
122	Agri. M/A. Reac. MS: 151 B ²	SD: 1.1 m	TL: 0.1 m	PS	42	ALUMIN.		T	1					1978	74161 05 0 0 0 5 4 9 0 2
123	Agri. M/A. Reac. MS: 2411 B ²	SD: 1.3 m	TL: 0.1 m	PS	30	CS	2 mm	T	2	294700	312400	240000	461600	1978	74161 02 6 2 4 1 6 2 1 2 2
124	Agri. M/A. Reac. MS: 430 B ²	SD: 1.7 m	TL: 4.1 m	PS	12	CS	11 mm	T	1	13100	13100	13100	13100	1978	74161 02 5 2 3 1 3 2 1 2
125	Agri. M/A. Reac. MS: 122 A ²	SD: 1.6 m	TL: 0.1 m	PS	4	CS	4 mm	T	1	13100	13100	24300	24300	1978	74161 01 4 1 4 1 1 2 1 2
126	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	9	CS	12 mm	T	1	16500	16500	131600	131600	1978	74161 01 4 1 2 1 2 2 1 2
127	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	1	CS	12 mm	T	1	16500	16500	191600	191600	1978	74161 01 4 1 2 1 2 2 1 2
128	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	2	CS	12 mm	T	1	16500	16500	14600	14600	1978	74161 09 2 1 2 1 2 2 1 2
129	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	41	CS	12 mm	T	1	21850	16000	60000	60000	1978	74220 01 3 1 5 2 1 7 1 2
130	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	100	CS	12 mm	T	2	16500	16500	25300	25300	1978	74220 02 4 2 5 2 2 7 2 2
131	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	17	CS	14 mm	T	1	11100	11100	75000	75000	1978	74220 02 4 1 5 1 1 7 1 2
132	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	103	CS	12 mm	T	1	16500	16500	50700	50700	1978	74220 01 5 1 5 1 1 7 1 2
133	Agri. M/A. Reac. MS: 122 B ²	SD: 1.6 m	TL: 0.1 m	PS	20.5	CS	6.5 mm	T	1	16500	16500	419000	419000	1978	74313 01 2 4 2 1 2 7 4 2

MSL 122 B² - 1978 - 1000 - 1000 - 1000 - 1000

No.	Description	Units	Rate	Time	Temp	Pressure	Type	Diameter	Material	Weight	Purchase Cost		Total Cost		Item Code
											Unit	Total	Unit	Total	
1	Secondary										91150	134500	134500	1978	74166 1.2 3 4 1 1 6 2 2 2
2	Distillation tower no. 1	54.8 m ³									467900	608650	608650	1979	74166 1.2 4 7 4 1 7 2 3 2
3	High pur. prop tower no. 2	630 m ³									661900	861000	861000	1978	74166 1.1 5 3 1 1 8 2 3 2
4	Deopropanizer	110.8 m ³									194000	252400	252400	1978	74166 1.1 3 2 4 1 5 2 4 2
5	Debutanizer	65.5 m ³									106650	138750	138750	1978	74166 1.1 3 1 4 1 4 2 2 2
6	Second dist. reflux dr.	15.7 m ³									18000	20900	20900	1988	69241 0.5 2 0 0 2 2 1 1 2
7	High pur. prop tower no. 2	71 m ³									40300	46500	46500	1978	62741 0.5 4 0 0 2 1 2 2 2
8	Prop. cond.	1.2 m ³									6600	6600	6600	1980	69241 0.8 1 0 0 2 1 2 1 1
9	Debut. reflux dr.	5.4 m ³									10500	10500	10500	1980	69241 0.5 1 0 0 2 1 2 1 1
10	C ₃ Hydrot. Pn	5.7 m ³									16400	24150	24150	1978	74166 1.0 4 1 0 1 5 2 1 2
11	Reactors	15 m ³									21100	24500	24500	1978	69241 0.5 2 0 0 2 3 2 1 2
12	C ₃ Hydrot. surge drum	15 m ³									37900	37900	37900	1990	69241 0.5 2 0 0 2 2 2 1 1
13	Deprop. ref. drum	19 m ³									12100	18150	18150	1978	74166 0.8 1 0 1 5 1 2 1 2
14	C ₃ Hydr. guard reactor	6 m ³									55700	55700	55700	1980	74166 0.5 5 2 4 1 3 2 2 1
15	Second dist. cond.	570 m ²									72100	89150	89150	1978	74166 0.2 5 2 4 1 1 2 2 2
16	Secom. dist. reboiler	514 m ²									139100	176200	176200	1976	74166 0.5 0 2 4 1 4 2 2 2
17	High pur. prop tower cond.	514 m ²									167850	207600	207600	1978	74166 0.2 6 4 1 4 2 2 2
18	High pur. prop tower reboiler	2055 m ²									7800	7800	7800	1978	74166 0.4 2 1 3 1 1 2 1 2
19	Poly. fr. prop. prod. chiller	35 m ²									8150	8150	8150	1978	74166 0.4 2 1 3 1 1 2 1 2
20	Chem. fr. prop. chiller	35 m ²									7600	7600	7600	1978	74166 0.5 0 1 4 1 1 3 1 2
21	Propane cond.	1.5 m ²									5400	5400	5400	1978	74166 0.9 0 1 2 1 1 2 1 2
22	Propylene cond.	0.4 m ²									4600	4600	4600	1978	74166 0.9 0 1 2 1 1 2 1 2
23	Gasoline prod. cooler	321 m ²									35800	35800	35800	1980	74166 0.1 4 1 4 1 2 2 1 1
24	Deopropan condenser	1448 m ²									131600	131600	131600	1978	74166 0.5 6 2 4 1 4 2 1 2
25	Deobut. reboiler	441 m ²									59700	119400	119400	1980	74166 0.2 4 2 3 1 1 2 1 1
26	Deobutan condenser	598 m ²									97450	97450	97450	1980	74166 0.5 5 2 4 1 3 2 1 1
27	Deobutan reboiler	564 m ²									29150	29150	29150	1980	74166 0.2 4 1 1 1 2 2 1 1

Activity Code: 3513332

No.	Make	Machine Manufacturer	Water Speed (GPM)	Water Speed (m)	Water Speed (ft)	Drive Description	Manufac. Date 1.	Manufac. Date 2.	Manufac. Capacity	Original Source
47		Cylonic Industrial	3000 GPM	208 m	2100 ft	HP		05	21 ton	I
48		DeLong DeLong Mach. Pump	600 GPM	431.47 m	450 ft	H	04	05	1000	I
49		High purity prep tower	140 GPM	462.7 m	500 ft	H	04	05	1.5 ton	I
50		High purity prep tower	400 GPM	494.0 m	550 ft	H	04	05	1.7 ton	I
51		DeLong ref. pump	75 GPM	454.1 m	500 ft	H	04	05	1.4 ton	I
52		DeLong ref. pump	100 GPM	473.5 m	550 ft	H	04	05	2.1 ton	I
53		Cylonic prep pump	120 GPM	484.4 m	550 ft	H	04	05	3.2 ton	I

NOTE: All data is without weight for each line, please
 refer to the data for each line for more information.

Activity Order 35213711

n	Q-	Purchase Cost		Ct. 1960 Cost		Purch. Year	SITC Code									
		Unit	Total	Unit	Total		12145	67	9	10	11	12	13	14	15	
		17	18	19	20		1	2	3	4	5	6	7	8	9	
1		42 500	42 500	42 500	42 500	1970	74101	02	4	1	4	1	2	2	1	
2		8750	17 500	10 350	20 700	1978	74220	02	5	1	5	2	1	6	1	2
3		22 300	22 300	14 950	29 900	1973	74220	02	4	1	5	1	1	6	1	2
4		14 050	14 050	21 350	42 700	1978	74220	02	4	1	5	1	1	6	1	2
5		20 400	40 800	24 250	48 500	1979	74220	02	4	1	5	1	1	6	1	2
6		6 300	12 600	7 500	15 000	1979	74220	02	4	1	5	1	1	6	1	2
7		12 200	24 400	12 100	24 200	1979	74220	02	4	1	5	1	1	6	1	2

SR	Mfr	Machine	Water Spec	Water Spec (Optional)	Water Spec	Type	Description	Chart 1	Chart 2	Chart 3	Purchase Cost				Total				Year	SIC Code
											Base	Inst	Del	Total	Base	Inst	Del	Total		
46		Hot Water Tank	1550 m ³	1550	1550	CS	Temp=30°C				1550	1550	1550	1550	1979	69211	07 1 1 2 2 1 2 1			
47		Hot Water Tank	9110 m ³	9110	9110	CS	Temp=50°C				9110	9110	9110	9110	1979	69211	07 1 4 1 3 2 1 2			
48		Hot Water Tank	3916 m ³	3916	3916	CS	Temp=35°C				3916	3916	3916	3916	1979	69211	07 1 1 2 2 1 2 1			
49		Hot Water Tank	270 m ³	270	270	CS	Temp=30°C				270	270	270	270	1979	69211	07 1 1 2 2 1 2 1			
50		Hot Water Tank	108 m ³	108	108	CS	Temp=30°C				108	108	108	108	1979	69211	07 1 1 2 2 1 2 1			
51		Hot Water Tank	970 m ³	970	970	CS	Temp=50°C				970	970	970	970	1979	69211	07 1 4 1 3 2 1 2			
52		Hot Water Tank	25800 m ³	25800	25800	CS	Temp=50°C				25800	25800	25800	25800	1979	69211	07 1 4 1 3 2 1 2			
53		Hot Water Tank	42300 m ³	42300	42300	CS	Temp=50°C				42300	42300	42300	42300	1980	69211	07 1 4 1 3 2 1 2			
54		Hot Water Tank	224700 m ³	224700	224700	CS	Temp=50°C				224700	224700	224700	224700	1979	69211	07 1 4 1 3 2 1 2			
55		Hot Water Tank	597000 m ³	597000	597000	CS	Temp=50°C				597000	597000	597000	597000	1979	69211	07 1 4 1 3 2 1 2			
56		Hot Water Tank	221000 m ³	221000	221000	CS	Temp=50°C				221000	221000	221000	221000	1979	69211	07 1 4 1 3 2 1 2			
57		Hot Water Tank	25300 m ³	25300	25300	CS	Temp=50°C				25300	25300	25300	25300	1978	74220	02 1 1 1 1 1 1 1			
58		Hot Water Tank	249800 m ³	249800	249800	CS	Temp=50°C				249800	249800	249800	249800	1978	74220	02 1 1 1 1 1 1 1			
59		Hot Water Tank	42300 m ³	42300	42300	CS	Temp=50°C				42300	42300	42300	42300	1978	74220	02 1 1 1 1 1 1 1			
60		Hot Water Tank	111000 m ³	111000	111000	CS	Temp=50°C				111000	111000	111000	111000	1978	74220	02 1 1 1 1 1 1 1			
61		Hot Water Tank	130 m ³	130	130	CS	Temp=50°C				130	130	130	130	1978	74220	02 1 1 1 1 1 1 1			
62		Hot Water Tank	89 m ³	89	89	CS	Temp=50°C				89	89	89	89	1978	74220	02 1 1 1 1 1 1 1			
63		Hot Water Tank	49 m ³	49	49	CS	Temp=50°C				49	49	49	49	1978	74220	02 1 1 1 1 1 1 1			
64		Hot Water Tank	280 m ³	280	280	CS	Temp=50°C				280	280	280	280	1978	74220	02 1 1 1 1 1 1 1			
65		Hot Water Tank	1116 m ³	1116	1116	CS	Temp=50°C				1116	1116	1116	1116	1978	74220	02 1 1 1 1 1 1 1			
66		Hot Water Tank	2496 m ³	2496	2496	CS	Temp=50°C				2496	2496	2496	2496	1978	74220	02 1 1 1 1 1 1 1			
67		Hot Water Tank	NO AVAILABLE DATA																	
68		Hot Water Tank	42300 m ³	42300	42300	CS	Temp=50°C				42300	42300	42300	42300	1980	69211	07 1 1 2 2 1 2 1			
69		Hot Water Tank	597000 m ³	597000	597000	CS	Temp=50°C				597000	597000	597000	597000	1979	69211	07 1 4 1 3 2 1 2			
70		Hot Water Tank	221000 m ³	221000	221000	CS	Temp=50°C				221000	221000	221000	221000	1979	69211	07 1 4 1 3 2 1 2			
71		Hot Water Tank	597000 m ³	597000	597000	CS	Temp=50°C				597000	597000	597000	597000	1979	69211	07 1 4 1 3 2 1 2			
72		Hot Water Tank	224700 m ³	224700	224700	CS	Temp=50°C				224700	224700	224700	224700	1979	69211	07 1 4 1 3 2 1 2			
73		Hot Water Tank	597000 m ³	597000	597000	CS	Temp=50°C				597000	597000	597000	597000	1979	69211	07 1 4 1 3 2 1 2			
74		Hot Water Tank	221000 m ³	221000	221000	CS	Temp=50°C				221000	221000	221000	221000	1979	69211	07 1 4 1 3 2 1 2			
75		Hot Water Tank	597000 m ³	597000	597000	CS	Temp=50°C				597000	597000	597000	597000	1979	69211	07 1 4 1 3 2 1 2			

UNICG / SPOIPETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW NAPHTHA STEAM CRACKING PLANT,CAPACITY =364 750TON/YEAR
 LOCATICN=YUPURTALIK
 ANTICIPATED DATE OF COMMISSINGING= 1993
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC	CGDE	BASIC MACHINE NAME	GR	UN.WE	UN.CC	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WE
74220	01315	11612	C3 HYDR. INTERCOOLER	2	.8	10.4		1.6								1.6
74220	01315	11712	COND.STRIPPER BTMS PUMP	2	.4	5.6		.8								.8
74220	01315	21712	DEMET. REFLUX PUMP	2	1.4	30.0		2.8								2.8
74220	01413	11612	NAPHTHA BULK STORAGE PUMP	1	2.9	.0		2.9								2.9
74220	01415	11612	HIGH PUR.PROP.TOW-1 PUMP	2	.1	10.4		.2								.2
74220	01515	11712	ETH.TOWER REFLUX PUMP	2	1.5	29.9		3.0								3.0
74220	02211	11712	WASH OIL INJECTION PUMP	2	1.6	19.4		3.2								3.2
74220	02215	11712	HEAVY F.O.ST.BTMS PUMP	2	.2	5.8		.4								.4
74220	02215	11712	LIGHT F.O.ST.BTMS PUMP	2	.2	5.8		.4								.4
74220	02312	11212	RICH AMINE KEST.BTMS PUMP	2	.3	8.3		.6								.6
74220	02312	11212	AMINE STRIPPER BCTOM PU.	2	.9	53.6		1.8								1.8
74220	02312	11712	WASH WATER CIRC. PUMP	2	.3	6.1		.6								.6
74220	02312	11712	PYRCLISIS GAS STOR. PUMP	2	.4	23.0		.8								.8
74220	02315	11612	PCLY-GR.PROD. PUMP	1	1.0	25.3		1.0								1.0
74220	02315	11612	PRCP. REFL. PUMP	2	1.0	21.4		2.0								2.0
74220	02315	11712	DIST.STRIPPER FEED PUMP	2	.3	6.1		.6								.6
74220	02315	11712	STRONG CAUSTIC CIRC. PUMP	2	.2	6.6		.4								.4
74220	02315	11712	DIST.STRIPPER BTMS PUMP	2	.4	10.5		.8								.8
74220	02315	11712	INTERMED.CAUSTIC CIRC.PUMP	1	.4	7.9		.4								.4
74220	02315	11712	FRESH CAUSTIC PUMP	2	.5	9.0		1.0								1.0
74220	02315	11712	WEAK CAUSTIC CIRC. PUMP	2	.4	7.9		.8								.8
74220	02412	11712	OIL-STEAM HP ST.FEED PUMP	2	.6	14.8		1.2								1.2
74220	02415	11612	C3 HYDR. RECYCLE PUMP	2	.5	7.5		1.0								1.0
74220	02415	11612	HIGH PUR.PROP.TOW-2 PUMP	2	.9	15.0		1.8								1.8
74220	02415	11712	ETH.TOWER INTER.PUMP	3	.7	25.0		2.1								2.1
74220	02425	11712	SEC.QUENCH WATER CIRC.PUMP	2	.4	11.0		.8								.8
74220	02425	21712	DEET-REFLUX PUMP	2	1.2	25.3		2.4								2.4
74220	02452	11712	ACID-GAS CIRCULATION PUMP	1	.3	7.6		.3								.3
74220	02515	11612	DEBUTAN REFL. PUMP	2	2.0	24.2		4.0								4.0
74220	02515	11712	PAN OIL CIRCULATION PUMP	2	2.3	25.3		4.6								4.6
74220	02515	11712	QUENCH OIL CIRC. PUMP	2	2.3	28.0		4.6								4.6
74220	02532	11712	PRIMARY FRAC-REFLUX PUMP	2	1.5	49.1		3.0								3.0
74220	02622	11712	PRIMARY QUENCH WATER PUMP	3	2.2	104.0		6.6								6.6
74220	03215	21712	PROPANE EXPORT PUMP	1	.2	5.8		.2								.2
74230	01311	21722	ETHYLENE STORAGE PROD.PU.	2	1.6	73.2		3.2								3.2
74230	02415	21632	C4'S PRODUCT PUMP	2	3.2	47.4		6.4								6.4
74230	10412	11212	F.O.PRODUCT PUMP	2	.5	18.6		1.0								1.0
74230	10412	11222	FOG. CIRCULATING PUMP	3	1.6	37.0		4.8								4.8
74313	01242	12742	RESIDUE GAS COMPRESSOR	1	10.5	439.0		10.5								10.5
74341	00302	22642	I.O.USC FAN	7	8.0	64.3		56.0								56.0
74361	99110	12212	AMINE STRIP. BTMS FILTER	1	5.1	97.6			5.1							5.1
74361	99110	12212	RICH AMINE STR.BTMS FILT.	2	5.1	46.6			10.2							10.2
74361	99110	12222	QUENCH OIL STR.BTMS FILT.	2	7.3	24.5			14.6							14.6
74362	20210	01212	FILTER	1	.3	59.4			.3							.3
74362	20510	01212	OIL-STEAM FEED WATER FIL.	2	2.5	24.7			5.0							5.0

UNICC / SPQ (PETKIM)
 CAPITAL GGGS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW NAPHTHA STEAM CRACKING PLANT, CAPACITY = 364 750 TON/YEAR
 LOCATION = YUPLURTALIN
 ANTICIPATED DATE OF COMMISSIONING = 1993
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
74220 01315 11612	C3 HYDR. INTERCCLER	2	.8	10.4		20.8									20.8
74220 01315 11712	COND. STRIPPER BTMS PUMP	2	.4	5.6		11.2									11.2
74220 01315 21712	DEMET. REFLUX PUMP	2	1.4	30.0		60.0									60.0
74220 01413 11612	NAPHTHA BULK STORAGE PUMP	1	2.9	.0		.0									.0
74220 01415 11612	HIGH PUR.PROP.TCW.1 PUMP	2	.1	10.4		20.8									20.8
74220 01515 11712	ETH.TOWER REFLUX PUMP	1	1.5	29.9		59.8									59.8
74220 02211 11712	WASH OIL INJECTION PUMP	2	1.6	19.4		38.8									38.8
74220 02215 11712	HEAVY F.O.ST.BTMS PUMP	2	.2	5.8		11.6									11.6
74220 02215 11712	LIGHT F.O.ST.BTMS PUMP	2	.2	5.8		11.6									11.6
74220 02312 11212	RICH AMINE REST.BTMS PUMP	2	.3	8.3		16.6									16.6
74220 02312 11212	AMINE STRIPPER/BOTTOM PU.	2	.9	53.6		107.2									107.2
74220 02312 11712	WASH WATER CIRC. PUMP	2	.3	6.1		12.2									12.2
74220 02312 11712	PYROLYSIS GAS STCR. PUMP	2	.4	23.0		46.0									46.0
74220 02315 11612	PCLY.GR.PROD. PUMP	1	1.0	25.3		25.3									25.3
74220 02315 11612	PRCP. REFL. PUMP	2	1.0	21.4		42.8									42.8
74220 02315 11712	DIST.STRIPPER FEED PUMP	2	.3	6.1		12.2									12.2
74220 02315 11712	STRONG CAUSTIC CIRC. PUMP	2	.2	6.6		13.2									13.2
74220 02315 11712	DIST.STRIPPER BTMS PUMP	2	.4	10.5		21.0									21.0
74220 02315 11712	INTERMED.CAUSTIC CIR.PUMP	1	.4	7.9		7.9									7.9
74220 02315 11712	FRESH CAUSTIC PUMP	2	.5	9.0		18.0									18.0
74220 02315 11712	WEAK CAUSTIC CIRC. PUMP	2	.4	7.9		15.8									15.8
74220 02412 11712	DIL.STEAM HP ST.FEED PUMP	2	.6	14.8		29.6									29.6
74220 02415 11612	C3 HYDR. RECYCLE PUMP	2	.5	7.5		15.0									15.0
74220 02415 11612	HIGH PUR.PROP.TCW.2 PUMP	2	.9	15.0		30.0									30.0
74220 02415 11712	ETH.TOWER INTER.PUMP	3	.7	25.0		75.0									75.0
74220 02425 11712	SEC.QUENCH WATER CIRC.PUMP	2	.4	11.0		22.0									22.0
74220 02425 21712	DEET.REFLUX PUMP	2	1.2	25.3		50.6									50.6
74220 02452 11712	ACID-GAS CIRCULATION PUMP	1	.3	7.6		7.6									7.6
74220 02515 11612	DEBUTAN REFL. PUMP	2	2.0	24.2		48.4									48.4
74220 02515 11712	PAN OIL CIRCULATION PUMP	2	2.3	25.3		50.6									50.6
74220 02515 11712	QUENCH OIL CIRC. PUMP	2	2.3	28.0		56.0									56.0
74220 02532 11712	PRIMARY FRAC.REFLUX PUMP	2	1.5	49.1		98.2									98.2
74220 02622 11712	PRIMARY QUENCH WATER PUMP	3	2.2	104.0		312.0									312.0
74220 03215 21712	PRCPANE EXPORT PUMP	1	.2	5.8		5.8									5.8
74230 01311 21722	ETHYLENE STORAGE PROD.PU.	2	1.6	73.2		146.4									146.4
74230 02415 21632	C4'S PRODUCT PUMP	2	3.2	47.4		94.8									94.8
74230 10412 11212	F.C.PRODUCT PUMP	2	.5	18.6		37.2									37.2
74230 10412 11222	FCC. CIRCULATING PUMP	3	1.6	37.0		111.0									111.0
74313 01242 12742	RESIDUE GAS COMPRESSOR	1	10.5	439.0		439.0									439.0
74341 00302 22642	I.C.USC FAN	7	8.0	64.3		450.1									450.1
74361 95110 12212	AMINE STRIP. BTMS FILTER	1	5.1	97.6					97.6						97.6
74361 95110 12212	RICH AMINE STR.BTMS FILT.	2	5.1	46.6					93.2						93.2
74361 95110 12222	QUENCH OIL STR.BTMS FILT.	2	7.3	24.5					49.0						49.0
74362 20210 01212	FILTER	1	.3	59.4					59.4						59.4
74362 20510 01212	DIL-STEAM FEED WATER FIL.	2	2.5	24.7					49.4						49.4

12167
(4 of 17)

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034**

**Technical Report No.XI - Demand for Capital Goods for
Petrochemicals Industry**

**Vol.III - Technical data for
(CA) Chlorine-Alkali**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034

TURKEY

**Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol.III- Technical data for
(CA) Chlorine -Alkali**

**Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Program**

**Based on the work of
Capital Goods Development Project Team in Turkey**

**United Nations Industrial Development Organization
Vienna**

**This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

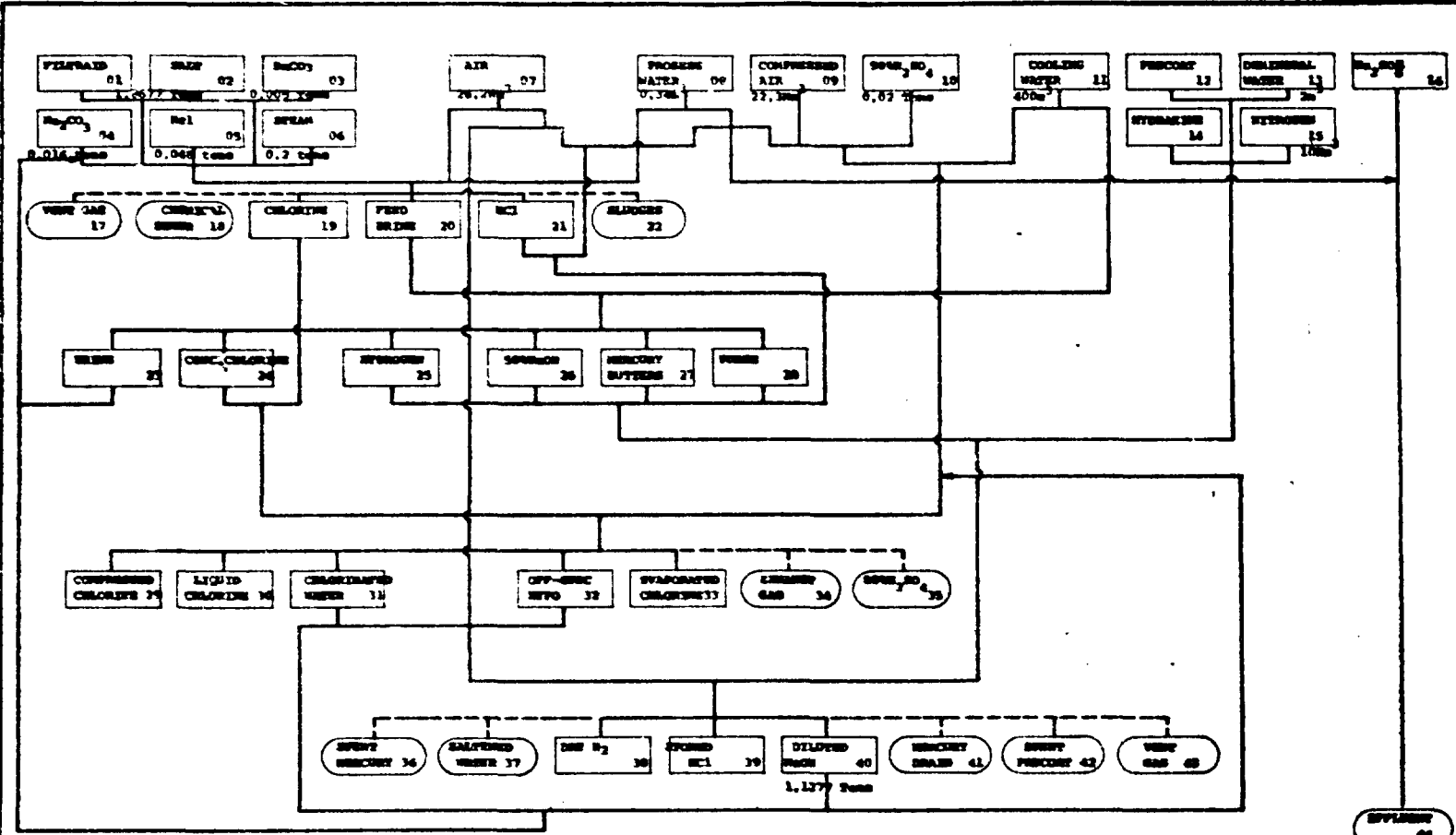
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PETKIM PETROKIMIA A.S.



REVISED 04

No.	Tanggal	Isim

Symbol no.	IND. CODE
Plastic no.	3513-7
UNITO /INDO (PETKIM)	
CAPITAL GOODS DEVELOPMENT & MODULAR PRODUCTION BAZAHAN	
CHECKED BY	APPROVED BY
DRAWN BY	CHECKED BY

DATE	PREPARED	CHECKED BY	APPROVED BY
2.4.82	S. KEMIS	S. ALFUS	S. KEMIS

NO. 3513-7-2-1117



PETKIM PETROKIMYA A.S.

RELATIONSHIP BETWEEN FLOW DIAGRAMS
AND ACTIVITIES FOR CA PLANT

01 TO 20 BRINE TREATMENT

20 TO 24 CHLORINE CONCENTRATION

24 TO 30 CHLORINE DRYING

25 TO 38 HYDROGEN COMPRESSION

12 TO 44 EFFLUENT TREATMENT

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Rev.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

**UNİDQ/SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT**

**INDUSTRY ACTIVITIES CHART
(PART 2 - CHLORINE-ALKALI)**

IND CODE: 3513-2
IND NAME: SYNTHETIC RESINS,
PLASTIC MATERIALS, etc.- CA.

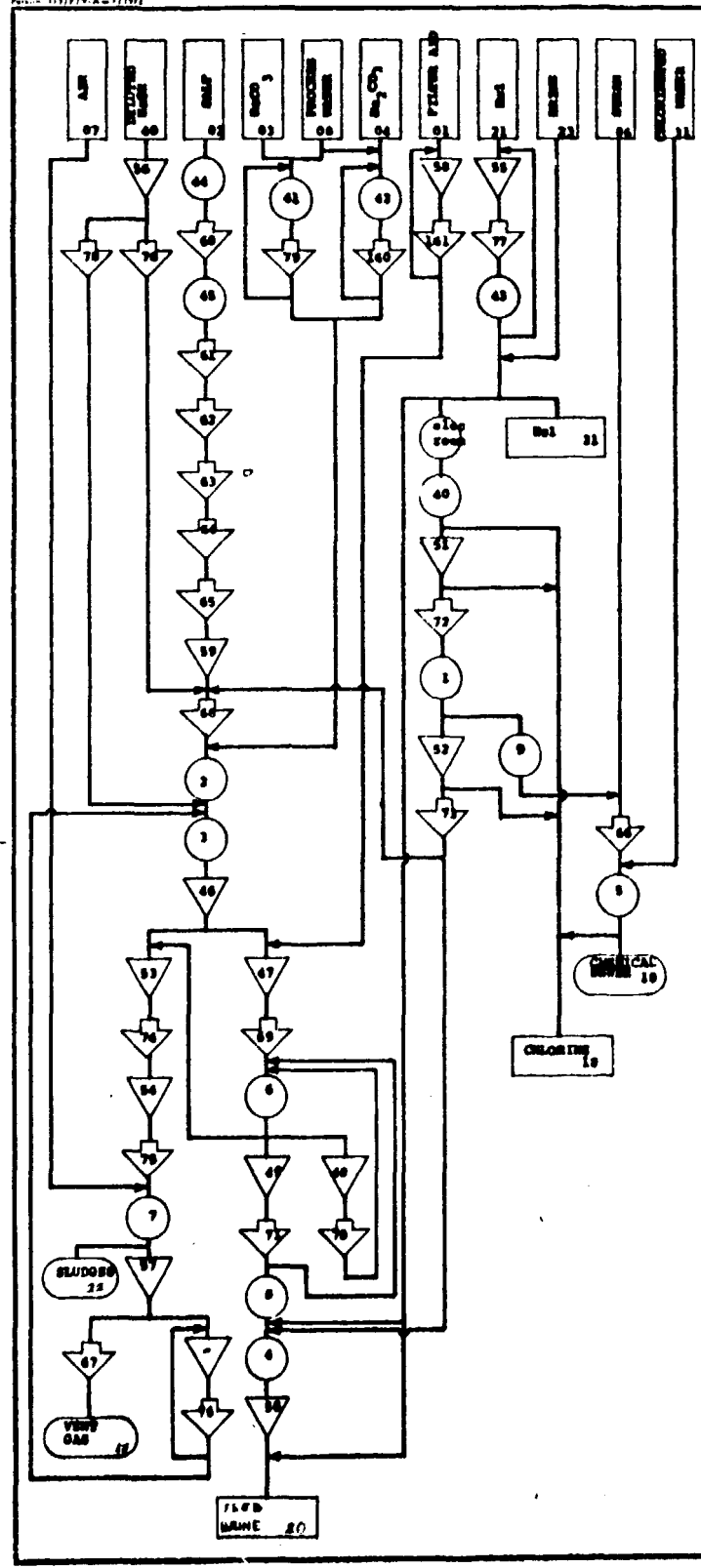
PROD S	PRODUCT NAME / PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY RANGE	
							CAPACITY
18	CHLORINE	1	BRINE TREATMENT	DECHLORINATION TOWER	3-125 m ³	1	3 m ³
						2	31 m ³
						3	66 m ³
						4	100 m ³
						5	125 m ³
24	CONCENTRATED CHLORINE	1	MERCURY PROCESS	DE NORA CELLS	8-20 m ³	1	8 m ³
						2	14 m ³
						3	20 m ³
		2	DIAPHRAGM PROCESS	DIAPHRAGM	60-100 m ³	1	60 m ³
						2	80 m ³
						3	100 m ³
		3	MEMBRANE PROCESS	MEMBRANE	30-100 m ³	1	30 m ³
						2	50 m ³
						3	75 m ³
30	LIQUID CHLORINE	1	CHLORINE DRYING	DRYING TOWER	21-70 m ³	1	21 m ³
						2	40 m ³
						3	55 m ³
						4	70 m ³
36	DRY HYDROGEN	1	HYDROGEN COMPRESSION	REACTOR	10-100 m ³	1	10 m ³
						2	36 m ³
						3	65 m ³
						4	100 m ³
44	EFFLUENT	1	EFFLUENT TREATMENT	REDUCING AGENT TANK	5-20 m ³	1	5 m ³
						2	12 m ³
						3	15 m ³
						4	20 m ³

PREPARED BY I.YILDIZ	CHECKED BY	APPROVED BY
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Tarikh	Isim



PETKIM PETROKIMYA A.S.



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CA
NO	3913-2	18	1	2
NO	MACHINE CODE	MACHINE NAME		Q
1	74160521412212	Dechlor tower		1
2	692410350032221	Brine purifier		1
3	692410310322211	Brine purifier		1
4	692410310322121	Airline mixer		1
60	692410310321712	Brine degas tank		1
41	692410320321612	Bar. cor. diesel tank		1
42	692410320321712	Sol. cor. diesel tank		1
43	692410310321612	Hydroch. Dr. head tank		1
5	74160711411212	Brine tower		1
44	No. available data	Wash salt hopper		1
45	692111410322211	Hopper		2
60	No. available data	wash salt conv.		1
61	-	1st trans conv.		2
62	-	2nd trans conv.		2
63	-	3rd trans conv.		2
64	-	4th trans conv.		2
65	-	5th trans conv.		2
6	741621075000212	Brine filter		3
7	741621011002212	Brine sludge-filter		1
8	741610331211212	Brine heat exch.		1
9	741610221211212	Dechlor. Coolax		1
66	742221030111612	Steam ejector		1
67	741122311126612	Vacuum pump		1
68	742200031171612	Brine recn. pump		2
69	742200052221612	Cilaci brine pump		2
70	742200041221612	Pre. jet. pump		1
71	742200062221612	Brine feed pump		2
72	742200052221612	Chlor. brine pump		2
73	742200052221612	Dechlor. brine pump		2
74	742200071211612	Sludge pump		2
75	742102221811212	Thick sludge pump		2
76	742200021211612	Flit. brine pump		2
77	742200021211612	Hydroch. acid pump		2
78	742101121511612	Calc. maturing pump		3
79	742200021101612	Am CO ₂ pump		1
160	742200021111612	#2 CO ₂ pump		1
416	692110744322211	Brine clarifier		1
47	692110771322211	Clar. brine receiver		1
48	692110764322211	Pre. cool. exch. tank		1
49	692110744322211	Brine sto. tank		1
50	692110721322211	Brine head tank		2
51	692110711322222	Chlor. brine mixer		1
52	69210711322212	Sludge receiver		1
54	692110834122212	Sludge thick.		1
55	692110711322212	Hydro acid hold tank		1
161	742200021711212	Filter acid pump		1
56	6921107113221111	Gdl. conc. soda tank		1
57	692119912221212	Liq. separator		1
58	6921107113221212	Filter acid tank		1
59	69211072222211	Brine separator		2

UNIDO/SPO PETKIM
CAPITAL GOODS DEVELOPMENT PROJECT

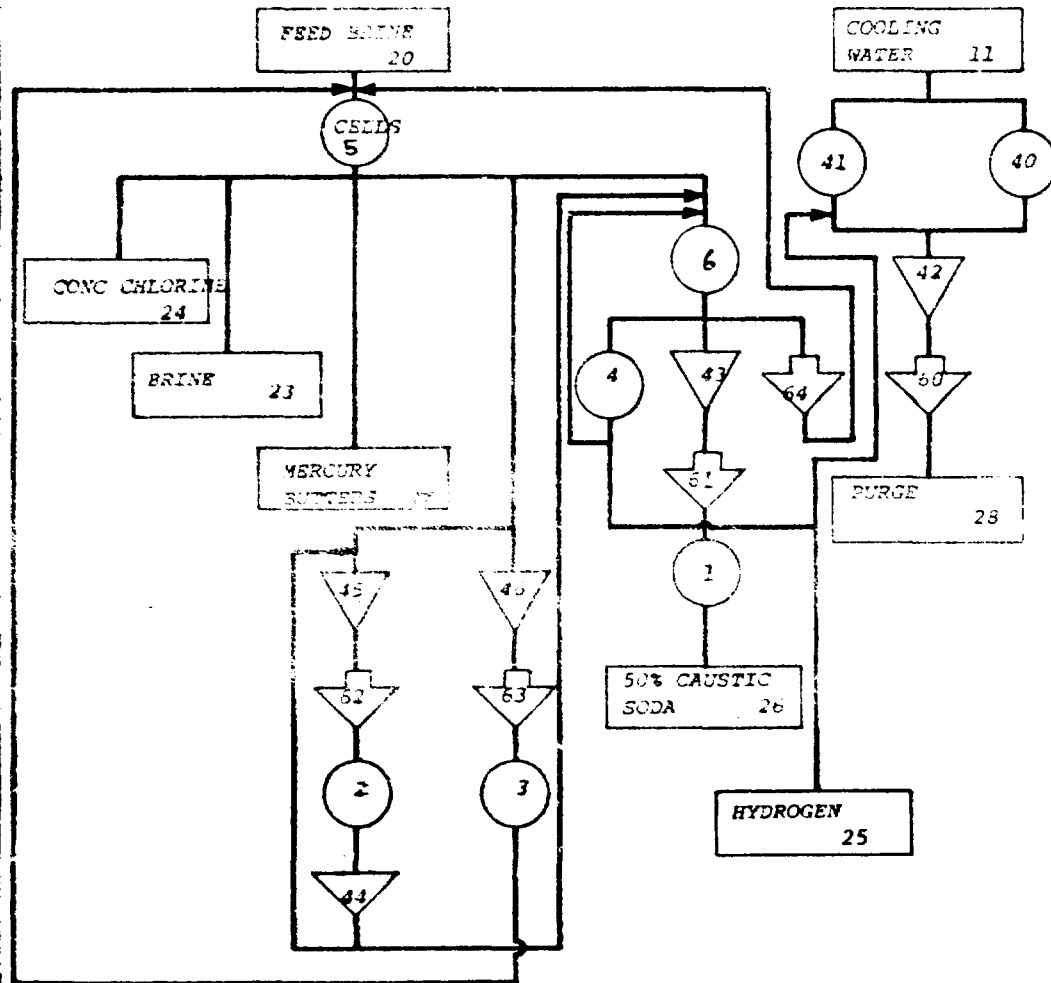
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS STC	CHLORINE	BRINE TREATMENT
DATA	SAMPLE FLOW	CAPACITY
10.4.1992	ALJAGA	31 m
PREPARED BY	DRAWN BY	CHECKED BY
J. YILDIS	P. ALTUN	A. NISPI
CHECKED BY	APPROVED BY	

Rev	Date	SW



PETKIM PETROKIMYA A.S.



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3513-2	24	1	1
NO	MACHINE CODE	MACHINE NAME	Q	
40	692410510321211	Hydraul. seal	1	
41	692410510321211	Hydraul. seal	1	
1	741610310151512	Caus. soda cooler	1	
2	741610331311312	ini. end. H ₂ O cooler	1	
60	NO AVAILABLE DATA	Waste H ₂ O cooler	1	
61	74220022221612	Caustic soda Pump	2	
62	742200032221712	ini. end. H ₂ O cooler	1	
63	742200031121612	Out. end. H ₂ O cooler	1	
42	692110711321211	Waste H ₂ O tank	1	
43	692110711321742	Caus. soda receiver	1	
44	692110711321612	Water head tank	1	
45	692110711321612	dem. and. wash H ₂ O	1	
46	692110711321612	wash H ₂ O receiver	1	
47	NO AVAILABLE DATA	Mercury cells	-	
64	"	"	Hg Pumps	-
5	"	"	Cells	-
6	"	"	decompresser	-

UNIDO / SPO (PETKIM)

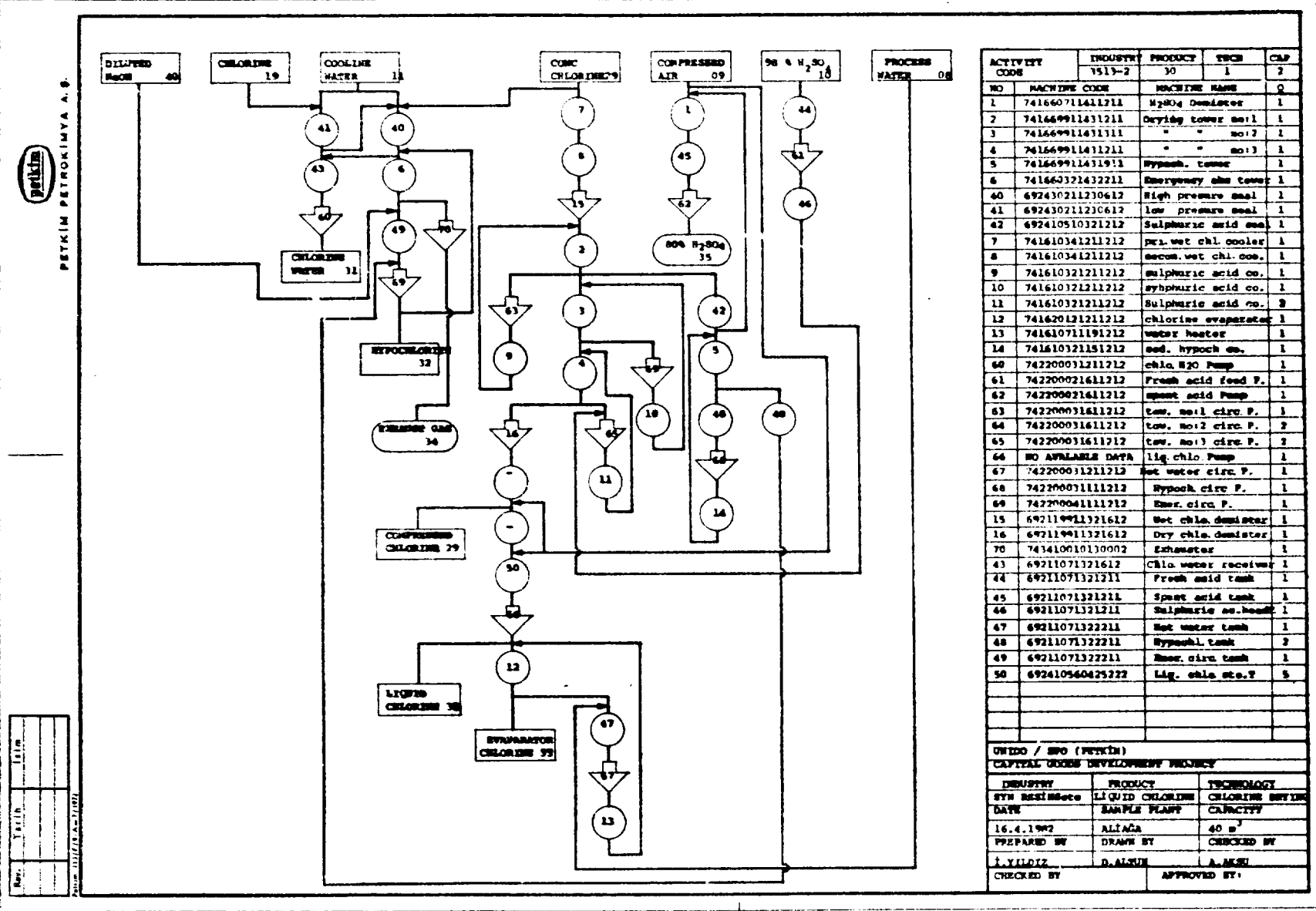
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
Sun Resins etc	CON CHLORINE	MERCURY CELLS
DATE	SAMPLE PLANT	CAPACITY
16.4.1992	ALIAGA	14 m ³
PREPARED BY	DRAWN BY	CHECKED BY
I. YILDIZ	D. ALTUN	S. KESKIN

CHECKED BY

APPROVED BY:



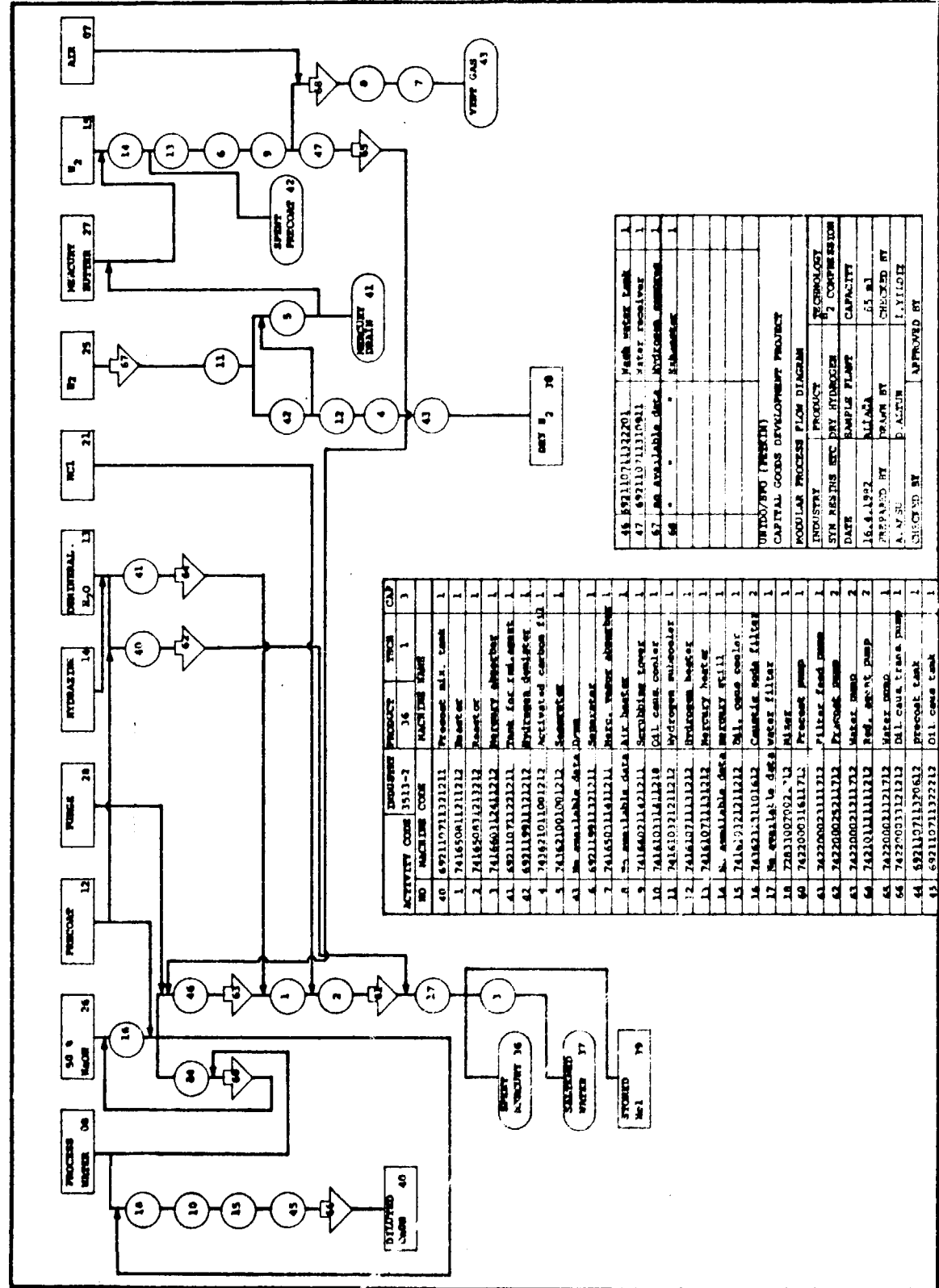
PETKİM PETROKİMYA A.Ş.

ACTIVITY CODE	INDUSTRY	PRODUCT	EQUIP		CAP
			1	2	
NO	MACNIME CODE	MACNIME NAME	Q		
1	741660711411211	H ₂ O ₂ Demister	1		
2	741669911431211	Drying tower seal	1		
3	741669911431111	" " no:1	1		
4	741669911411211	" " no:1	1		
5	741669911411911	By-pass. tower	1		
6	74166321432211	Emergency abs tower	1		
40	692430211230612	High pressure seal	1		
41	692430211230612	low pressure seal	1		
42	692410510321212	Sulphuric acid seal	1		
7	741610341211212	pre.wet chl. cooler	1		
8	741610341211212	secun.wet chl. coo.	1		
9	741610321211212	sulphuric acid co.	1		
10	741610321211212	syphuric acid co.	1		
11	741610321211212	Sulphuric acid co. 2	1		
12	741620121211212	chlorine evaporator	1		
13	741610711191212	water heater	1		
14	741610321151212	sed. hypoch co.	1		
60	742200031611212	chlo. H ₂ O Pump	1		
61	742200021611212	Fresh acid feed P.	1		
62	742200021611212	sprout acid pump	1		
63	742200031611212	tow. no:1 circ. P.	1		
64	742200031611212	tow. no:2 circ. P.	2		
65	742200031611212	tow. no:3 circ. P.	2		
66	NO AVAILABLE DATA	lig. chlo. Pump	1		
67	74220001211212	Hot water circ. P.	1		
68	742200031111212	Hypoch. circ. P.	1		
69	742200041111212	Eme. circ. P.	1		
15	692119911321612	Hot chlo. demister	1		
16	692119911321612	Dry chlo. demister	1		
70	741410010100002	Exhauster	1		
43	69211071321612	Chlo. water receiver	1		
44	69211071321711	Fresh acid tank	1		
45	69211071321211	Sprout acid tank	1		
46	69211071321211	Sulphuric ac. head	1		
47	69211071322211	Hot water tank	1		
48	69211071322211	Hypochl. tank	2		
49	69211071322211	Eme. circ. tank	1		
50	692410540425222	Lig. chlo. sta. T	5		

UNİDO / SPO (PETKİM)
 CAPITAL GÜÇÜNE GELİŞTİRİLMİŞ PROJESİ

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESİNSİSİ	LIQUID CHLORINE	CHLORINE OXYGEN
DATE	SAMPLE PLANT	CAPACITY
16.4.1992	ALİAÇA	40 t
PREPARED BY	DRAWN BY	CHECKED BY
J. YILDIZ	D. ALTUN	A. NESU
CHECKED BY	APPROVED BY:	

Rev.	1	16.4.1992
Drawn	J. YILDIZ	
Checked	D. ALTUN	
Approved	A. NESU	



PATIM PETROKIMA A.S.



ACTIVITY CODE	INDUSTRY	PRODUCT	TRUCK	CLM
40	1511-2	MAKING TANK	1	3
1	74165081121212	Pre-heat mix. tank	1	1
2	74165081121212	Boiler	1	1
3	74166011241212	Recovery absorber	1	1
4	45211071111212	Thick fac. ml. settl.	1	1
5	45211071111212	Hydrogen separator	1	1
6	741621001001212	Activated carbon filter	1	1
7	741621001001212	Separator	1	1
8	45211071111212	Separator	1	1
9	741660211421212	Mix. tank	1	1
10	74161011141212	Scrubbing tower	1	1
11	74161011141212	CO ₂ gas cooler	1	1
12	74161011141212	Hydrogen separator	1	1
13	74161011141212	Hydrogen boiler	1	1
14	45211071111212	Recovery boiler	1	1
15	74161011141212	Mix. gas cooler	1	1
16	74162111101612	Carbonic soda filter	2	1
17	45211071111212	Water filter	1	1
18	7422100702112	Mixer	1	1
19	742200011611712	Pre-heat pump	1	1
20	742200011611712	Filter feed pump	1	1
21	742200011611712	Pre-heat pump	2	1
22	742200011611712	Water pump	2	1
23	742200011611712	Ref. gas pump	2	1
24	742200011611712	Water pump	1	1
25	742200011611712	CO ₂ gas pump	1	1
26	452110711122012	Pre-heat tank	1	1
27	452110711122012	CO ₂ gas tank	1	1

45	45211071112201	Water storage tank	1
46	45211071112201	Water separator	1
47	45211071112201	Hydrogen separator	1
48	45211071112201	Hydrogen boiler	1
49	45211071112201	Recovery boiler	1
50	45211071112201	Pre-heat tank	1
51	45211071112201	CO ₂ gas tank	1
52	45211071112201	Water filter	1
53	45211071112201	Water pump	1
54	45211071112201	CO ₂ gas pump	1
55	45211071112201	Water pump	1
56	45211071112201	Ref. gas pump	1
57	45211071112201	Water pump	1
58	45211071112201	CO ₂ gas pump	1
59	45211071112201	Water pump	1
60	45211071112201	CO ₂ gas pump	1
61	45211071112201	Water pump	1
62	45211071112201	CO ₂ gas pump	1
63	45211071112201	Water pump	1
64	45211071112201	CO ₂ gas pump	1
65	45211071112201	Water pump	1
66	45211071112201	CO ₂ gas pump	1
67	45211071112201	Water pump	1
68	45211071112201	CO ₂ gas pump	1
69	45211071112201	Water pump	1
70	45211071112201	CO ₂ gas pump	1
71	45211071112201	Water pump	1
72	45211071112201	CO ₂ gas pump	1
73	45211071112201	Water pump	1
74	45211071112201	CO ₂ gas pump	1
75	45211071112201	Water pump	1
76	45211071112201	CO ₂ gas pump	1
77	45211071112201	Water pump	1
78	45211071112201	CO ₂ gas pump	1
79	45211071112201	Water pump	1
80	45211071112201	CO ₂ gas pump	1

NO	DATE	REVISION
1	16.4.1992	1
2	16.4.1992	2
3	16.4.1992	3
4	16.4.1992	4
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80	16.4.1992	80

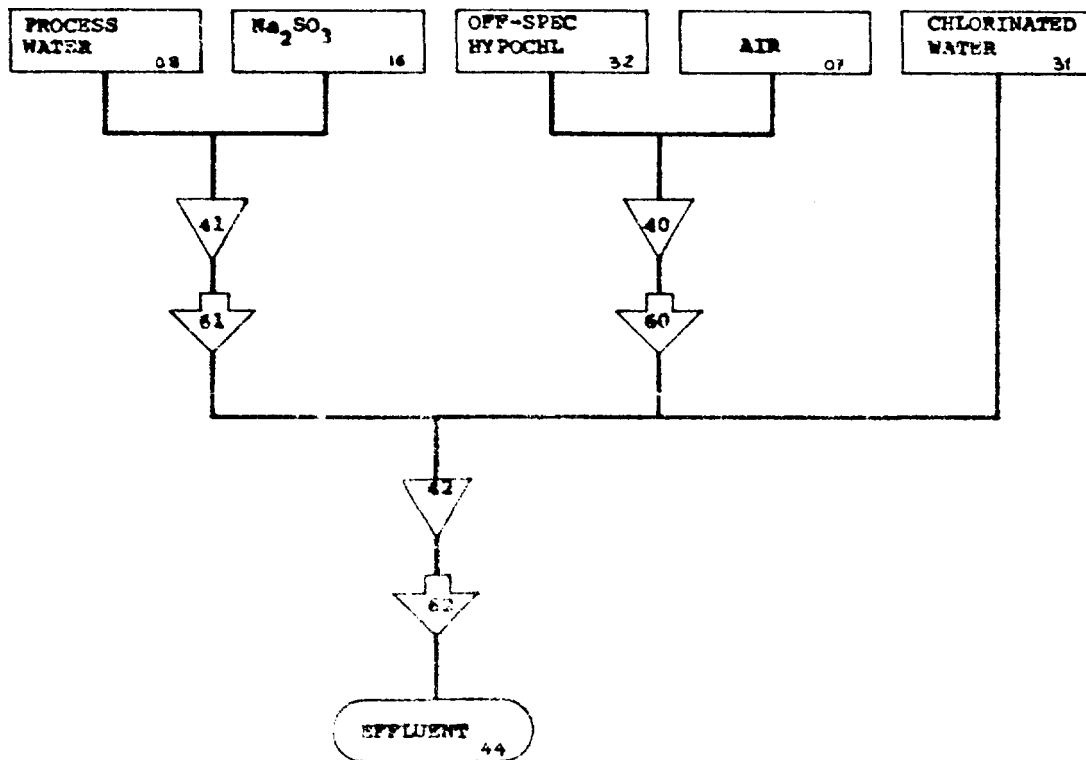
UNIDOP/PTO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	REVISION
SYN RESINS ETC DRY HYDROGEN	2	COMPRESSION
DATE	16.4.1992	CAPACITY
PREPARED BY	ALISA	55 ml
CHECKED BY	D. ALI	1.1.1992
APPROVED BY		

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.



ACTIVITY CODE	Industry	Product	Tech.	Cap.
	35/3.2	44	1	2
No	MACHINE CODE	MACHINE NAME	Q	
40	692410560323211	off-spec hypoch tank	1	
41	6924105203321211	Red. agent tank	1	
42	Omitted (concrete)	Eff. Collection pit	1	
60	742200031311812	off-spec hypoch p.	1	
61	742200031311812	Reducing agent pump	1	
62	742200032121712	Effluent diach pump	1	

UNIDO/SFO (PETKİM)

CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN. RESINS ETC.	EFFLUENT	EFFLUENT TREAT
DATE	SAMPLE PLANT	CAPACITY
16.4.1982	ALİAĞA	12 m ³
PREPARED BY	DRAWN BY	CHECKED BY
İ.YILDIZ	Ö.ALTUN	İ.YILDIZ
CHECKED BY		APPROVED BY

ID	Basic Machine Nameplate	Major Spec (Capacity)	Major Spec (Details)	Major Spec (Temp)	Type (Description)	Manuf. Char. 1 (PNS)	Manuf. Char. 2	Manuf. Char. 3	Design	Purchase Cost		CS Item Cost		Purch. Year	SFC Code	
										Unit	Total	Unit	Total			
1	Oachlo-tower	31.3 m ³	0° atm	Temp: 85°C	PM	10	CS	11 mm	I	2	53100	106200	70950	141900	1978	74166 05 2 1 4 1 2 2 1 2
2	Brine purifier	80 m ³	-	Temp: 80°C	CY	6.7	CS	5 mm	T	1	58000	58000	52430	52400	1978	69241 05 5 0 3 2 2 2 1 1
3	Brine purifier	80 m ³	-	Temp: 80°C	CY	6.7	CS	5 mm	T	1	58000	58000	52400	52400	1978	69241 05 1 0 3 2 2 2 1 1
4	Brine mixer	2 m ³	-	Temp: 75°C	CY	0.65	CS	6 mm	I	1	5860	5860	5260	5260	1978	69241 05 1 0 3 2 1 2 1 2
40	Brine Jogan tank	3.5 m ³	-	Temp: 75°C	CY	0.196	SS	5 mm	I	1	650	650	7950	7950	1978	69241 05 1 0 3 2 1 6 1 2
41	Bar.car. filter tank	11 m ³	-	Temp: 10°C	CY	2.1	CS	8 mm	I	1	7100	7100	8500	8500	1978	69241 05 2 0 3 2 1 2 1 2
42	Sod.car.diisol tank	18.6 m ³	-	Temp: 10°C	CY	3	CS	8 mm	I	1	9450	9450	11300	11300	1978	69241 05 2 0 3 2 1 2 1 2
43	Hydroch acid head tank	0.8 m ³	-	Temp: 10°C	CY	0.08	SS	5 mm	I	1	2100	2100	3000	3000	1978	69241 05 1 0 3 2 1 6 1 2
5	Strip tower washed salt hopper	1 m ³	Pre 1 atm.	Temp: 220°C	PM	0.81	CS	3 mm	I	1	30900	30800	41150	41150	1978	74166 07 1 1 4 1 1 2 1 2
44	Hopper	14 m ³	NO AVAILABLE DATA	Temp: Amb	CY	0.4	CS	5 mm	T	2	3400	6800	3150	6300	1978	69211 14 1 1 3 2 1 2 1 1
50	Washed salt conv					3.8			T	1	36600	36600	33100	33100	1979	
51	1st transconv					6.7			T	2	64600	129000	58000	116000	1979	
62	2nd trans conv		NO AVAILABLE DATA			6.4			T	2	61800	121600	55700	111400	1979	
52	2nd trans conv					20.4			T	2	197000	394000	177300	354000	1979	
54	4th trans conv					8.6			T	2	63200	126000	74700	154400	1979	
55	5th trans conv					4.6			T	2	44300	88600	43000	86000	1978	
6	Brine filter	720 tons/hr	Diat 2 m			5.2	SS	5 mm	I	3	15500	46500	43000	55500	1978	74362 10 7 1 0 0 9 2 1 2
7	Brine sludges filter	2 tons/hr	Diat 1.5 m			6.5	CS	5 mm	I	1	15800	15800	10900	18900	1978	74362 10 1 1 0 0 7 2 1 2
8	Brine heat exch.	MS: 32.2 m ² SS: 0.6 m ²	Diat 1.6 m			1.0	CS	8.5 mm	I	1	39600	39600	35600	55600	1978	74161 03 3 1 2 1 1 2 1 3
9	Fechlor cooler	MS: 49 m ² SS: 0.5 m ²	Diat 1.6 m			1.2	CS	9.5 mm	I	1	21100	21100	24600	32400	1978	74161 03 2 1 2 1 1 2 1 2
10	Steam ejector	15 m ³ /min	Air			2.3	CS	0.2	I	1	4800	4800	6450	6450	1978	74112 30 3 0 1 1 1 6 1 2
11	Steam pump	33.8 m ³ /min	250 mm dia	Air		0.07	CS	8.2 ton	I	1	2500	2500	3350	3350	1978	74312 23 3 1 1 2 1 1 6 1 2
12	Brine recovery pump	15 m ³ /h	MS: 15 m	DCU		0.1	CS	0.07 ton	I	2	5000	10000	6700	13400	1978	74320 00 3 1 1 1 2 1 1 6 1 2
13	Classified brine pump	15000 m ³ /h	MS: 40 m	DCU		1.8	MS	0.8 ton	I	2	14400	28800	19350	38700	1978	74320 00 5 2 2 2 1 1 6 1 2
14	Precoat pump	113 m ³ /h	MS: 20.5 m	DCU		0.4	CS	0.1 ton	I	1	5200	5200	7000	7000	1978	74320 00 4 1 2 2 1 1 6 1 2

NO AVAILABLE DATA

Sl. No.	S/N	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 1 (Optional)	Major Spec. 2 (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Cr. 1980 Cost		Purch. Year	SITC Code										
												Unit	Total	Unit	Total		12145	2714	910	1112	1212	1312	1412				
40		Hydraulic Seal	2.3 m ³		Temp: 45°C	Cy	1.24	CS	7 mm	I	1	9500	9500	8600	8600	1979	69241	05	1	0	3	2	1	2	1	1	
41		Hydraulic Seal (Caus. Soda Cooler)	2.3 m ³		Temp: 45°C	Cy	1.24	CS	7 mm	I	1	9600	9600	8700	8700	1979	69241	05	1	0	3	2	1	2	1	1	
1		Inl. end H ₂ O Cooler	HS: 12.16m ²		PL: 1.3 m	Plate	0.56	NAS	20 mm	I	1	5850	5850	8200	8200	1978	74161	03	3	0	1	5	1	5	1	2	
2		Inl. end H ₂ O Cooler	HS: 91.1 m ²	SD: 0.5 m	PL: 6.1 m	PST	2.6	CS	9.5 mm	I	1	12550	12550	17600	17600	1978	74161	03	3	1	3	1	1	3	1	2	
60		Waste H ₂ O Pump Caustic soda pump		NO AVAILABLE DATA							I	1	-	-	-	-	1979										
61		Inl. end H ₂ O cooler	25 m ³ /h	WH: 50 m	HCLC	H	0.173	CS	0.12 ton	I	2	5200	10400	7000	14000	1978	74220	00	3	2	2	2	1	6	1	2	
62		Outt. end H ₂ O cooler	70 m ³ /h	WH: 27 m	HCLC	H	0.296	SS	0.20 ton	I	1	8000	8000	10750	10750	1978	74090	00	3	2	2	2	1	7	1	2	
63		Inl. end H ₂ O cooler	50 m ³ /h	WH: 25 m	HCLC	H	0.155	CS	0.11 ton	I	1	8650	8650	11600	11600	1978	74220	00	3	1	1	2	1	6	1	2	
42		Waste H ₂ O tank	10.5 m ³	dia: 1.9 m	Temp: 80°C	Cy	2.83	CS	7 mm	I	1	19900	19900	18000	18000	1979	69211	07	1	1	3	2	1	2	1	1	
43		Caus soda receiver	2.5 m ³	dia: 0.9 m	Temp: 125°C	Cy	1.86	NPM	75 mm	I	1	40750	40750	48650	48650	1978	69211	07	1	1	3	2	1	7	4	2	
44		water head tank	20 m ³	dia: 1 m	Temp: 50°C	Cy	1.23	SS	12 mm	I	1	15700	15700	18750	18750	1978	69211	07	1	1	3	2	1	6	1	2	
45		den and wash H ₂ O receiver	10 m ³	dia: 1.9 m	Temp: 70°C	Cy	0.232	SS	72 mm	I	1	11450	11450	13700	13700	1978	69211	07	1	1	3	2	1	6	1	2	
46		wash water receiver	10 m ³	dia: 1.9 m	Temp: 70°C	Cy	0.232	SS	12 mm	I	1	9650	9650	11550	11550	1978	69211	07	1	1	3	2	1	6	1	2	
4		Mercury cells		no available data																							
51		Hg Pumps		no available data																							
		CELLS		no available data																							
		DECOMPSZE		no available data																							

Note: All Net. important weight for machines plate
 thickness for plate fabricated equipments

SP No	M/F	Basic Machine Identification	Major Spec (Capacity)	Major Spec (Optional)	Major Spec (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SYC Code											
											Unit	Total	Unit	Total		1974	1975	1976	1977	1978	1979						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17											
1	S	3/4 Domestic	0.123 m ³	Pr:1 atm	Temp:100°C	Pm	0.15	US	T	1	1	1	1	1	1979		74166	07									
2	S	Drying tower No.2	21.3 m ³	Pr:2 atm	Temp:70°C	Pm	2.5	CS	F	1	1	57	400	51	700	1979	74166	49									
3	S	Drying tower No.2	21.3 m ³	Pr:2 atm	Temp:70°C	Pm	2.5	CS	T	1	1	57	400	51	700	1979	74166	93									
4	S	Drying tower No.2	21.3 m ³	Pr:2 atm	Temp:70°C	Pm	2.5	CS	T	1	1	57	400	51	700	1979	74166	09									
5	S	Hypochlorite pump	3.16 m ³	Pr:0.16 atm	Temp:17°C	Pm	0.6	PV	F	1	1	21	750	29	130	1978	74166	27									
6	S	Emergency Absorption Sol	21 m ³	Pr:2 atm	Temp:30°C	Pm	0.4	CS	T	1	1	49	500	44	600	1979	74166	28									
7	S	High pressure seal	2.5 m ³	Pr:0.005Kgf/cm ²	Temp:40°C	Cy	1.2	SS	T	1	1	4	400	5	850	1979	69243	02									
8	S	Low pressure seal	2.5m ³	Pr:0.005Kgf/cm ²	Temp:10°C	Cy	1.2	SS	T	1	1	4	400	5	850	1978	69243	24									
9	S	Sulphuric acid sump	0.05m ³		Temp:10°C	Cy	0.105	CS	F	1	1	2	750	3	100	1979	69242	35									
10	S	Primary wet chlorine absorber	NS121.4m ²	SD:0.15m	Pr:1.4.3 m	PST	2.9	CS	F	1	1	51	350	25	350	1978	74161	38									
11	S	Secondary wet chlorine absorber	NS130.5m ²	SD:0.65m	Pr:4.5 m	PST	2.2	CS	F	1	1	43	400	40	700	1978	74161	39									
12	S	Sulphuric acid absorber	NS21 m ²	SD:1.1	Pr:1.1 m	PST	4.1	CS	F	1	1	6	600	6	300	1975	74161	40									
13	S	Sulphuric acid absorber	NS11m ²	SD:0.1 m	Pr:1.3 m	PST	4.1	CS	F	1	1	9	600	9	300	1979	74161	41									
14	S	Sulphuric acid absorber	NS12m ²	SD:0.1m	Pr:1.2	PST	4.1	CS	F	1	1	6	600	6	300	1978	74161	42									
15	S	Sulphuric acid absorber	NS21.1m ²	SD:1.1	Pr:1.5 m	PST	4	CS	F	1	1	24	400	24	400	1978	74162	43									
16	S	Water heater	NS11m ²	SD:1.1	Pr:1.1m	PST	0.5	CS	F	1	1	4	900	4	450	1978	74161	44									
17	S	Sodium hypochlorite absorber	NS21.1m ²	SD:0.1 m	Pr:1.1 m	PST	0.5	CS	F	1	1	4	900	4	450	1978	74161	45									
18	S	Chlorinated water pump	15 m ³	Pr:1.5 m	Pr:1.5 m	P	1.2	CS	F	1	1	5	500	5	250	1978	74220	06									
19	S	High pressure pump	NS21.1m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	5	500	5	250	1978	74220	07									
20	S	Spent acid pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	08									
21	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	09									
22	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	10									
23	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	11									
24	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	12									
25	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	13									
26	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	14									
27	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	15									
28	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	16									
29	S	Water pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	500	2	250	1978	74220	17									
30	S	Liquid chlorine pump	NO AVAILABLE DATA																								
31	S	Hot water circ pump	NS11m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	900	2	450	1979	74220	18									
32	S	Sulphuric acid pump	NS21.1m ²	SD:1.1	Pr:1.5m	PST	0.1	CS	F	1	1	2	950	2	475	1979	74220	19									

Note: a) Mat. component weight for machine. Plate thickness for plate fabricated equipments.

	Equip. Machine Nomenclature	Basic Cond (Capacity)	Water Cond 1 (Diam. Pall)	Water Cond 2 (Diam. Pall)	Type Description	Manufac. Char. 1	Manufac. Char. 2
	Emergency circ pump	200 m ³ /h	WH: 15 m	CCLC	H	0.240	CS
69	wet chlorine demister	15 m ³	Dia: 2.7 m	Temp: Amb	Cy	4.9	SS
15	Dry chlorine demister	9.65 m ³	Dia: 1.67	Temp: Amb	Cy	1.3	CS
16	Exhauster	0.66 m ³ /ac WH	Air	Exhaust	Cy	-	-
70	Chlorinated water receiver	3 m ³	Dia: 1.2 m	Temp: 25°C	Cy	0.24	SS
43	Fresh acid tank	17 m ³	Dia: 2.2 m	Temp: 10°C	Cy	1.75	CS
44	Spent acid tank	15 m ³	Dia: 2.2 m	Temp: 16°C	Cy	3.8	CS
45	Sulphuric acid head tank	0.76 m ³	Dia: 0.94 m	Temp: 10°C	Cy	0.49	CS
46	Hot water tank	32 m ³	Dia: 3 m	Temp: 10°C	Cy	1.4	CS
47	Hypochlorine tank	50 m ³	Dia: 2m	Temp: 20°C	Cy	5.2	CS
48	Emergency circ tank	50 m ³	Dia: 2m	Temp: 20°C	Cy	5.2	CS
49	liquid chlorine storage tank	128 m ³	-	Temp: -15°C	Cy	64.6	CS
50							

1. Max. component weight for machine, plate,
thickness for plate fabricated equipments

Activity Code: 4513g.22

Manufac. Char. 1)	Origin	Q.	Purchase Cost		Total Cost		Purch. Year	SITC Code						
			Unit	Total	Unit	Total		27145	27146	27147	27148	27149		
0.05 tons	I	1	11350	11350	15250	15250	1978	74220	00.4	1.1.1	1.2.1	1.2		
12 mm	I	1	53500	53500	63900	63900	1978	69211	99.1	1.3.2	1.6.1	1.2		
12 mm	I	1	21650	21650	25850	25850	1978	69211	99.1	1.3.2	1.2.1	1.2		
-	I	1	5200	5200	6250	6250	1978	64341	00.1	1.3	0.0	0.0	1.2	
7 mm	I	1	8500	8500	10150	10150	1978	69211	07.1	1.3.2	1.6.1	1.2		
9 mm	T	1	29800	29800	26850	26850	1979	67211	07.1	1.3.2	1.2.1	1.1		
9 mm	T	1	30600	30600	27600	27600	1979	69211	07.1	1.3.2	1.2.1	1.1		
8 mm	T	1	4000	4000	3650	3650	1979	69211	07.1	1.3.2	1.2.1	1.1		
7 mm	T	1	26500	26500	23900	23900	1979	69211	07.1	1.3.2	2.2.1	1.1		
5 mm	I	2	45000	90000	40650	81300	1979	69211	07.1	1.3.2	2.2.1	1.1		
7 mm	T	1	40000	40000	40650	40650	1979	69211	07.1	1.3.2	2.2.1	1.1		
28 mm	I	5	319000	1595000	407800	2039000	1978	69241	05.6	0.4.2	5.2.2	2.2		

NO	BASIC MACHINE	MAJOR COMP (CAPACITY)	MAJOR SPEC (OPTIONAL)	TYPE	MANUFACT. (CHAR. 1)	MANUFACT. (CHAR. 2)	MANUFACT. (CHAR. 3)	ORIGIN	QTY	PURCHASE COST			CR. 1980 COST			PART. YEAR	SITC CODE
										UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL		
58	#																
40		Reactor	5 #	PT. 1.00	SM				1	5.100	5.100	6.800	6.800	1978	74165	05 1 2 2 1 2 2 2	
39		Reactor	3 #	CHAR. 1	SM				2	4.200	8.400	3.900	3.900	1979	69211	07 1 1 3 2 1 2 1 1	
38		Reactor	5 #	PT. 1.00	SM				1	4.250	4.250	5.700	5.700	1978	74165	00 3 1 2 1 2 2 2 2	
37		Reactor	4 #	PT. 1.00	SM				1	4.250	4.250	5.700	5.700	1978	74166	03 1 2 4 1 1 2 1 2	
41		Reactor	4 #	PT. 1.00	SM				1	4.250	4.250	5.700	5.700	1978	69211	07 1 1 2 2 2 1 1 1	
42		Reactor	9 #	PT. 1.00	SM				1	5.300	5.300	6.800	6.800	1979	69211	99 1 1 3 2 1 2 1 1	
43		Reactor	16 #	PT. 1.00	SM				1	7.650	7.650	9.150	9.150	1978	69211	99 1 1 3 2 1 2 1 1	
44		Reactor	22 #	PT. 1.00	SM				1	24.900	24.900	22.500	22.500	1979	74162	10 1 1 0 0 1 2 1 2	
45		Reactor	3 #	PT. 1.00	SM				1	3.200	3.200	2.950	2.950	1979	74162	10 0 1 0 1 2 1 2	
46		Reactor	0.48 #	PT. 1.00	SM				1	1.200	1.200	1.100	1.100	1979	69211	99 1 1 3 2 1 2 1 1	
47		Reactor	1.00 #	PT. 1.00	SM				1	4.200	4.200	3.900	3.900	1979	74165	03 2 1 4 1 1 2 1 1	
48		Reactor	1 #	PT. 1.00	SM				1	1.500	1.500	1.400	1.400	1979	74166	02 1 1 4 2 2 1 1 1	
49		Reactor	1 #	PT. 1.00	SM				1	1.500	1.500	1.400	1.400	1978	74161	02 1 1 4 2 2 1 1 1	
50		Reactor	2 #	PT. 1.00	SM				1	6.100	6.100	8.800	8.800	1978	74161	07 1 1 1 1 1 1 1 1	
51		Reactor	2 #	PT. 1.00	SM				1	6.100	6.100	8.800	8.800	1978	74161	07 1 1 1 1 1 1 1 1	
52		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1979	74161	08 1 1 1 1 1 1 1 1	
53		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74161	08 1 1 1 1 1 1 1 1	
54		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74162	08 1 1 1 1 1 1 1 1	
55		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74162	08 1 1 1 1 1 1 1 1	
56		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74162	08 1 1 1 1 1 1 1 1	
57		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74162	08 1 1 1 1 1 1 1 1	
58		Reactor	1 #	PT. 1.00	SM				1	11.800	11.800	10.400	10.400	1978	74162	08 1 1 1 1 1 1 1 1	

NOTE: (a) MAX. COMPONENT WEIGHT FOR REACTOR (LBS)
 (b) MAX. COMPONENT WEIGHT FOR REACTOR (LBS)

SR No	M/H	Basic Machine Nameplate	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (e)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code											
												Unit	Total	Unit	Total		12345	67	8	9	10	11	12	13	14	15		
												13	14	15	16		17	18										
62		Precoat Pump	10m ³ /h	MH:12 m	HCLC	H	0.06	SS	0.01 ton	I	2	3 450	6 900	4 650	9 300	1978	74220	00	2	1	2	1	1	7	1	2		
63		water pump	10m ³ /h	MH:15 m	CCLC	H	0.085	CS	0.03 ton	I	2	1 400	2 800	1 900	3 800	1978	74220	00	2	1	1	1	1	2	1	2		
64		Reducing agent pump	0.1m ³ /h	MH:10m	CCLC	H	0.056	CS	0.02 ton	I	2	3 350	6 700	4 500	9 000	1978	74210	11	1	1	1	1	1	2	1	2		
65		water pump	5m ³ /h	MH:20m	CCLC	V	0.4	SS	0.3 ton	I	1	4 450	4 450	5 950	5 950	1978	74220	00	2	1	1	2	1	7	1	2		
66		Dilute caustic transfer pump	25m ³ /h	MH:76m	CCLC	V	0.195	CS	0.150 ton	I	1	3 400	3 400	4 500	4 500	1978	74220	00	3	1	2	1	2	1	2	1		
44		Precoat tank	2.5m ³	Dia:1.2m	Temp:90°C	Cy	-	SS	12 mm	I	1	10 300	10 300	12 300	12 300	1978	69211	07	1	1	3	2	0	6	1	2		
45		Dilute caustic tank	40.8m ³	Dia:1.4m	Temp:20°C	Cy	7.96	CS	10 mm	T	1	64 400	64 400	58 000	58 000	1979	69211	07	1	1	3	2	2	2	1	1		
46		wash water tank	59m ³	Dia:4.7m	Temp:90°C	Cy	-	CS	-	T	-	-	-	-	-	1979	6911	07	1	1	3	2	2	1	1	1		
47		water receiver	1.9m ³	Dia:1.4 m	Temp:90°C	Rec	-	Others	12 mm	T	1	2 200	2 200	2 000	2 000	1979	69211	07	1	1	3	2	0	9	1	1		
67		Hydrogen Compressor	NO AVAILABLE DATA										1978	-	-	268600	268600	-	-	-	-	-	-	-	-	-	-	
68		Exhauster	NO AVAILABLE DATA										1978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: (a) Max. component weight for machine, plate, increased for plate fabrication - equipments.

SI No	Basic Machine Name/Model	Major Spec (Capacity)	Major Spec (Dimensional)	Major Spec (Description)	Manufac. Char. 1 (P.S.)	Manufac. Char. 2	Manufac. Char. 3	Origin	Q.	Purchase Cost		Cr. 1980 Cost		SIT Code											
										Unit	Total	Unit	Total	Purch. Year	12745	67246	1111	123	1425						
40	off-spec. hypochl. tank	194 m ³	-	Temp: Amb	10.15	USCA	7m	I	1	71000	71000	64100	64100	1979	69241	05	6	0	3	2	3	2	1	1	
41	Reducing agent tank	12.23 m ²	-	Temp: Amb	1.9	CS	7 m	I	1	15200	15100	13800	13800	1979	69241	05	2	0	3	2	1	2	1	1	
42	effluent collector							I	1	-	-	-	-												
60	off-spec. hypochl. pump	30 m ³ /hr	WH: 15 m	Cor.	0.3	FRM	0.2 ton	I	1	12300	12300	14850	14850	1979	74220	00	3	1	3	1	1	1	1	1	2
61	Reducing agent pump	25 m ³ /hr	WH: 25 m	CCIC	0.3	FRM	0.2 ton	I	1	13150	13150	15850	15850	1979	74220	00	3	1	1	1	1	1	1	1	2
62	effluent discharge pump	120 m ³ /hr	WH: 35 m	CCIC	0.4	ASC	0.1 ton	I	1	14250	14250	17150	17150	1979	74220	00	3	2	1	2	1	1	1	1	2

Note: a) Max. component weight for machines plant. thickness for data reference statements.

UNICC / SPO(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW CHLORINE ALKALI PLANT, CAPACITY = 75 000TON/YEAR
 LGCATICI=YUNURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1993
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EGP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	FOT_WE
74312 30301 11612	STEAM EJECTOR	1	.3	6.5		.3									.3
74341 00101 30002	EXHAUSTER	1	.0	6.3		.0									.0
74362 10010 01212	SEPARATOR	1	.4	3.0				.4							.4
74362 10110 02212	ACTIVATED CARBON FILTER	1	3.2	22.5				3.2							3.2
74362 10110 02212	BRINE SLUDGES FILTER	1	6.5	18.9				6.5							6.5
74362 10710 02212	BRINE FILTER	3	6.2	18.5				18.6							18.6
74362 31311 01612	CAUSTIC SODA FILTER	2	4.0	39.8				8.0							8.0

00100 / SOCIJETKINI

CAPITAL GOODS DEVELOPMENT PROJECT

REQUIREMENTS FOR THE NEW CHLORINE ALKALI PLANT

PLANT CAPACITY 100 T/AN

ESTIMATED DATE OF PLANT COMPLETION 1973

QUANTITIES IN TONS, UNIT COST IN 1960 US\$ (A DOLLAR = 1100)

SOVIET GOVERNMENT-PROVIDED MATERIAL

SOVIET CODE	UNIT	QUANTITY	UNIT COST	TOTAL COST
11612	STEAM ENGINE	1	11.0	11.0
30002	EXHAUSTER	1	11.0	11.0
01212	SEPARATOR	1	14.0	14.0
01212	ACTIVATED CARBON FILTER	1	22.5	22.5
02212	BRINE SCREEN FILTER	1	18.9	18.9
02212	BRINE FILTER	3	6.2	18.5
01612	CASELCO SOLA FILTER	2	19.9	39.8

CAPACITY = 75 000TON/YEAR

1994	1995	1996	1997	1998	1999	2000	TOY_CO
0.0							0.0
0.3							0.3
	0.2						3.0
	22.5						22.5
	18.9						18.9
	55.5						55.5
	75.0						75.0

12167
(5 of 17)

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No.XI- Demand for Capital Goods for
Petrochemicals Industry

Vol.IV- Technical data for
(VCM) Vinyl Chloride Monomer.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034

TURKEY

**Technical Report No.XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol.IV- Technical data for
(VCM) Vinyl Chloride Monomer**

**Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme**

**Based on the work of
Capital Goods Development Project Team in Turkey**

United Nations Industrial Development Organization

Vienna

**This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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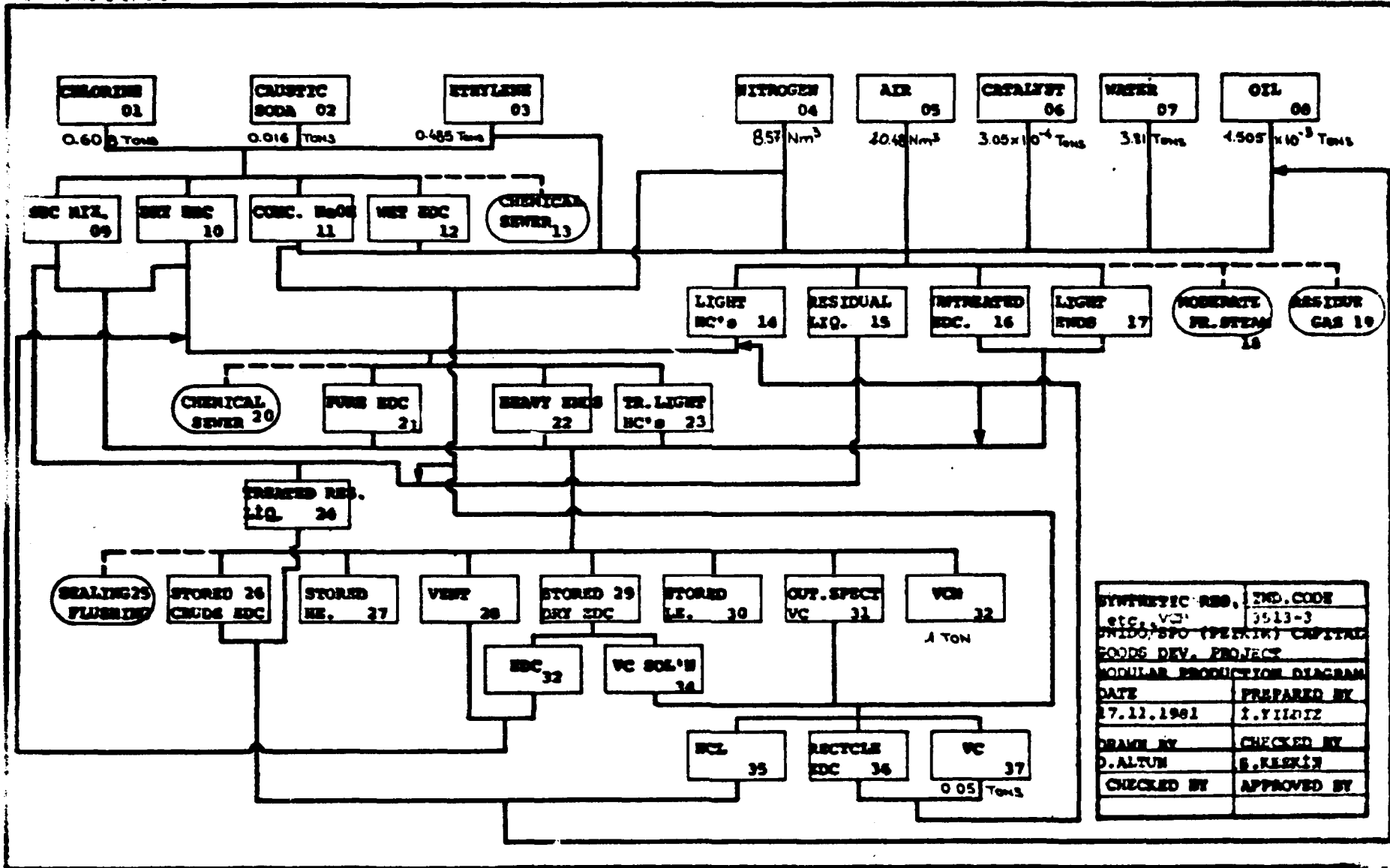
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PETKİM PETROKİMYA A.Ş.

Perk. m. 113 6/9 B-2/1976



SYNTHETIC RES. etc. VC	IND. CODE 3513-3
PNİDİSPO (PETKİM) CAPITAL GOODS DEV. PROJECT	
MODULAR PRODUCTION DIAGRAM	
DATE 17.11.1981	PREPARED BY İ.YILMAZ
DRAWN BY D.ALTM	CHECKED BY S.KESKİN
CHECKED BY	APPROVED BY

**RELATIONSHIP BETWEEN FLOW DIAGRAMS AND ACTIVITIES
FOR VCN PLANT**

- 01 TO 10 ETHYLENE CHLORINATION
- 11 TO 17 OXYCHLORINATION
- 18 TO 21 EDC PURIFICATION
- 22 TO 34 VCN PYROLYSIS
- 35 TO 37 PYROLYSIS GAS TREATMENT
- 38 TO 39 STORAGE
- 40 TO 24 OXYCHLORINATION RESIDUAL LIQUID TREATMENT



PETKIM PETROKIMIA A...

No.	Tarih	Isim

Revisi 11/20/78 2-2/1980

Rev.	Tarih	ismi



PETKIM PETROKIMYA A.Ş.

Petkim 113/F/9 B-2/1976

(UNIDO / SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT)

(INDUSTRY ACTIVITIES CHART)
(PART 3- VCN)

IND CODE : 3513 -3
IND NAME : SYNTHETIC RESINS
PLASTIC MATERIALS ,etc- VCN

PROD CT PROD S.	PRODUCT / NAME	PRODUCTION STAGE	TECH. CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
10	DRY EDC	1	ETHYLENE CHLORINATION	CHLORINATOR	10-100 m ³	1	10 m ³	
						2	30 m ³	
						3	45 m ³	
						4	60 m ³	
						5	90 m ³	
						6	100 m ³	
14	LIGHT HYDROCARBONS	1	OXYCHLORINATION	OXYCHLORINATOR	10-80 m ³	1	10 m ³	
						2	44,5 m ³	
						3	57 m ³	
						4	80 m ³	
21	PURE EDC	1	EDC PURIFICATION	LIGHT HC'S COLUMN	100- 300 m ³	1	100 m ³	
						2	132 m ³	
						3	300 m ³	
34	VC SOLUTION	1	VCN PYROLYSIS	PYROLYSIS FURNACE	10-80 t/hr	1	8 t/h	
						2	42,2 t/h	
						3	52 t/h	
						4	72 t/h	
37	VC	1	PYROLYSIS GAS TREATMENT	VC COLUMN	20-200 m ³	1	20 m ³	
						2	50,9 m ³	
						3	138 m ³	
						4	200 m ³	
24	TREATED RESIDUAL LIQUID	1	OXYCHLORINATION RESIDUAL LIQUID TREATMENT	OXYCHLORINATION RESIDUAL LIQUID COLUMN	10- 40 m ³	1	18 m ³	
						2	17,2 m ³	
						3	40 m ³	
32	VCN	1	STORAGE	VC TRANSIT STORAGE DRUM	155-300 m ³	1	155 m ³	
						2	300 m ³	

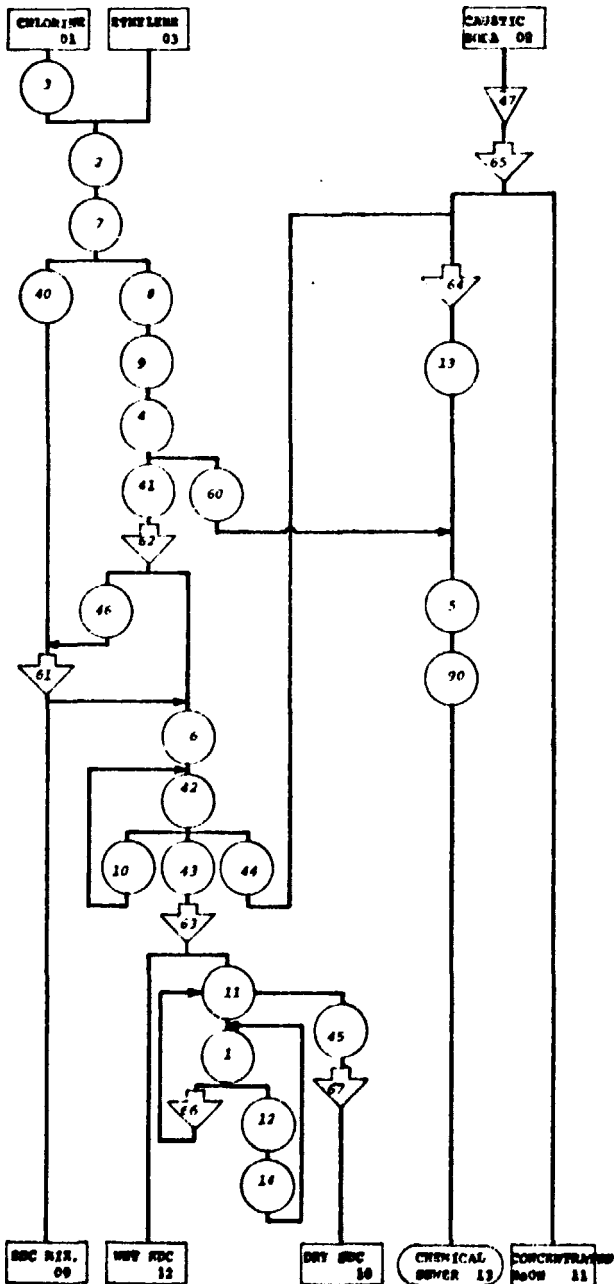
PREPARED BY A. AKSU	CHECKED BY	APPROVED BY
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PETKIM PETROKIMYA A. S.

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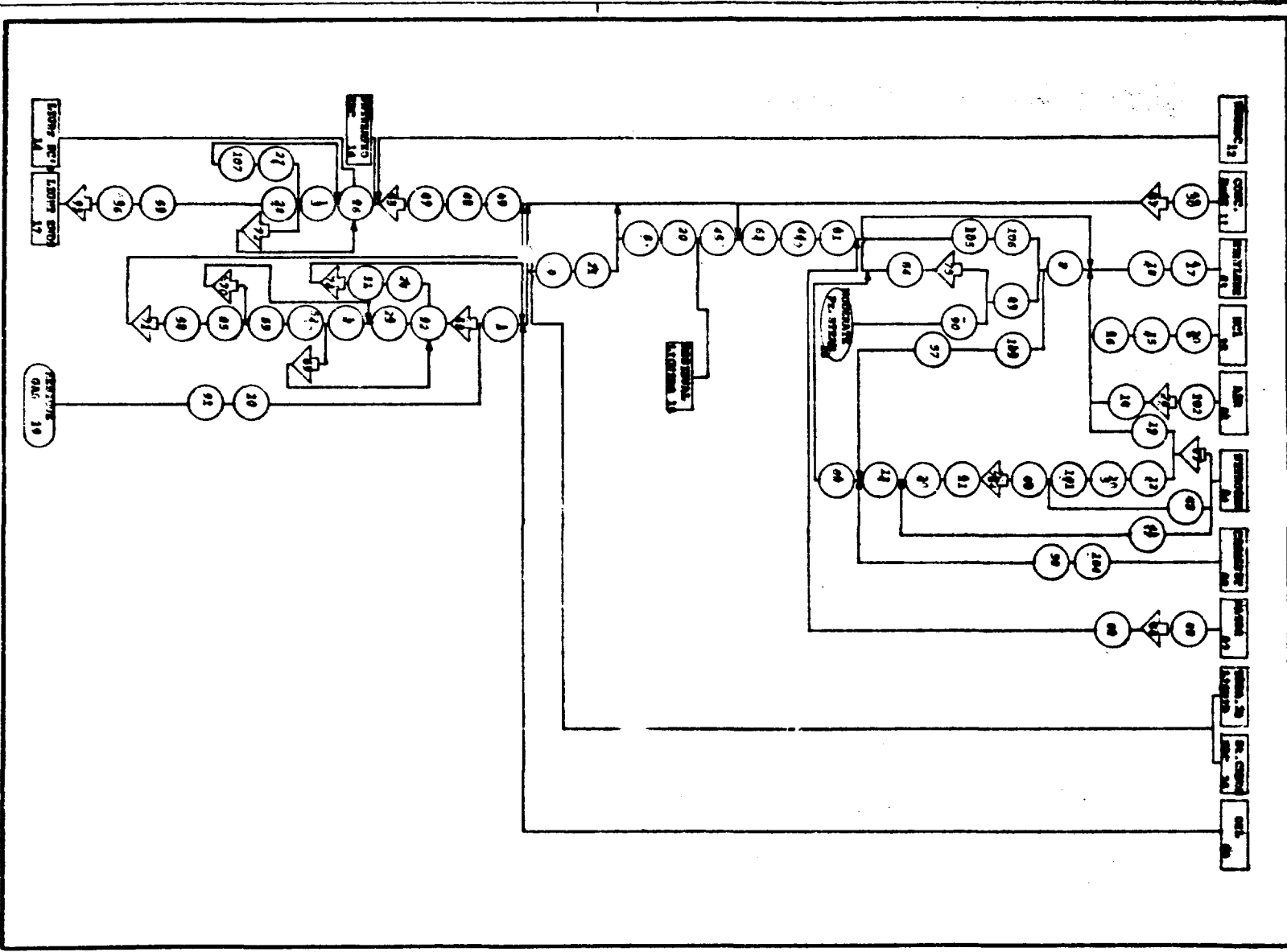
03 TO 13 SUREVIEW CHLORINATION

ACTIVITY CODE	INDUSTRY	PROJECT	TECH	CAP.
3513-3	3513-3	10	1	4
NO	MACHINE CODE	MACHINE NAME	Q	
1	74164014001212	DISTOL COLUMN	1	
2	743614011011212	Chlorine Feed Sep.	1	
2	741650011279222	Chlorinator	1	
40	692430211221211	Chl. Ox. Cond Drum	1	
41	692430211322211	Unreated EDC Drum	1	
4	743620011041241	Treatd EDC Sep.	1	
4	741650011270801	Neutralizer	1	
6	7416500110421211	Wash Scrubber	1	
44	602410011000011	NaOH Scr. Sett. Drum	1	
43	602410011000011	Wet EDC Drum	1	
44	692430211221211	Diluted NaOH Drum	1	
45	692430211000012	EDC Hold Up Drum	1	
46	692430211221211	Settler Purge Drum	1	
7	7416100111421212	Chl. Exh. Air Cond.	1	
8	7416100111421212	Wash Scr. Cond.	1	
9	7416100111421212	Chl. Exh. Cond.	1	
10	7416100111421212	Chl. Vent Cond.	1	
11	7416100111421212	Ery. Chl. Feed. Preh.	1	
12	7416100111421212	Dry. Chl. Rad. Cooler	1	
13	UNLTD	Wash Purge Cooler	1	
14	7431210011110111	Neutralizer Ejector	1	
20	UNLTD	Chlorination Column	1	
41	742700111161112	Chlorinator Exh. P.	1	
42	742700111161112	NaOH Scr. Feed Cond.	2	
43	742700111161112	Dry. Chl. Feed Pump	2	
44	742700111161112	Wash Purge Feed	2	
45	742700111161112	Wash Up Pump	2	
46	742700111161112	Dry EDC Pump	2	
47	UNLTD	Recycle Pump	2	
48	720130020021612	Neutralizer Agitator	1	
49	UNLTD	NaOH Purge	-	

UNITO / SPO (PETKIM)			
CAPITAL GOODS DEVELOPMENT PROJECT			
REGULAR PROCESS FLOW DIAGRAM			
INDUSTRY	PROJECT	TECHNOLOGY	
SYNTHETIC RESIN	DRY EDC	ETHYLENE CHLORIN	
DATE	SAMPLE PLANT	CAPACITY	
08.11.1981	ALIRTA	60 m ³	
PREPARED BY	DRAWN BY	CHECKED BY	
S. YILGATE	D. ALTAJIR	S. PETKIM	
CHECKED BY	APPROVED BY		

№	№	№	№
1	2	3	4
5	6	7	8
9	10	11	12


 ПЕТРИН ПЕТРОНИНА А.С.





PT. KIM PETROKIMIA A.S.

ACTIVITY CODE	INDUSTRY 3513-3	PRODUCT 1A	TYPE 1	CHARACTER 2
NO	DESCRIPTION CODE	DESCRIPTION NAME		CHAR
1	74164071142221	Absorption Column		2
2	74164011142121	Demerption Column		1
3	74164041141321	Comp-Striper Column		1
40	69243071222121	Comp. Parga Drum		1
4	74161001101121	Inert Gas Separator		1
40	69243083412342	HC. HP. Gas. Vessel		1
42	69243093212472	HC. HP. Gas. Vessel		1
9	74161401101121	HP. IG Separator		1
0	74161401101121	HCl Feed Separator		0.1
2	74164012174212	Organolixinator		2
40	69243011427222	Steam Drum		2
40	74164012174212	Water Scrubber		2
40	74164021242121	NaOH Scrubber		2
8	74163083104121	HC. St. Cond. Separator		2
9	74163083104121	Cond. St. Cond. Separator		2
40	69241011072221	H2C Rectifying Drum		1
47	69241011072221	Distrected H2C Drum		1
40	69241011072221	Water Drum		1
49	74164021142121	Gas. H2C. NaOH Scrubber		1
50	69241011072221	NaOH Scrub. Drum		1
10	74161241101121	Ab. Col. Cnd. Separator		2
51	6924103303121	Lean Oil Pump		1
52	69241011072221	Gas Col. Recting Drum		1
53	69241061022122	Rec. Oil Pump Drum		1
54	69241051032122	Gas Col. Cond. Drum		1
55	69241051032122	Dry Col. Cond. Str. Drum		1
56	69241081002122	Dry Col. Reflux Drum		1
57	0017700	Catalyst St. Vessel		-
58	0017700	Catalyst Vessel		-
59	74161071144121	HP. Inert Gas Cooler		1
60	74161071134121	HP. Inert Gas Cooler		1
61	74161071144121	Steam Cond. H.C. Heater		1
62	74161071134121	Air Heater		2
63	74161071134121	Ind. St. HCl. Feed Heater		1
64	74161071134121	Ind. St. Styrene Feed Heater		1
65	74161071134121	Ind. St. Styrene Feed Heater		1
66	74161071134121	Recycled Inert Gas Heater		1
90	0017700	Steam Generator		-
70	74161051342412	Ind. St. H2C. Air Cond.		2
71	74161052134222	Ind. St. H2C. Air Cond.		2
72	74161012140121	Lean-Rich Oil Exch.		4
73	74161071134121	Rich Oil Heater		1

Rev.	Termin	Form

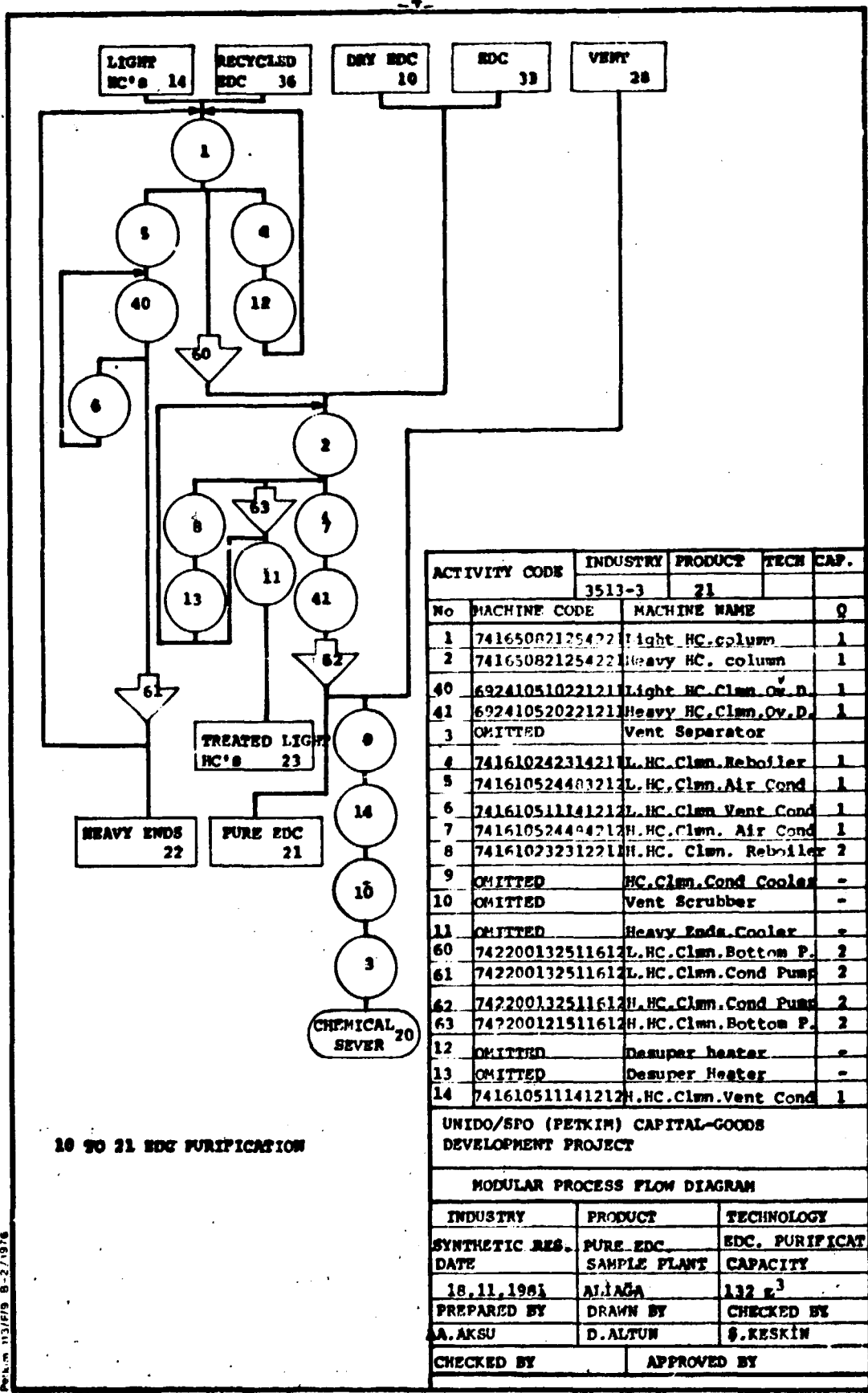
74	74161031149221	Lean Oil Cooler		2
75	741610501251702	Gas Col. Cnd. Cond.		2
24	74161011139121	Drying Col. Feed Preheater		1
27	74161034134121	Drying Col. Reheater		1
28	741610501251702	Drying Col. Cnd. Cond.		2
60	74160010201121	Catalyst Steam Ejector		1
61	74240010121171	Water Scrubber Ejector		2
62	74160020421171	Water Scrubber Ejector		1
63	74240010421171	NaOH Scrubber Ejector		2
64	0017700	Steamup Ejector		-
61	0017700	Steamup Ejector		-
65	74230013331171	Distrected H2C. pump		2
66	74220012411171	Water Scrubber Feed Pump		2
67	74220012351171	NaOH Scrubber Feed Pump		2
68	74220011351112	Abn. Col. Bottom Pump		1
69	74220013321161	Gas. Col. Bottom Pump		1
70	74230011331171	Oil Recycle Pump		1
71	74220012251181	Gas Col. Cond. Pump		2
72	74220011251161	Dry H2C Pump		2
73	74220012251181	Drying Col. Cond. Pump		2
74	74220013411161	Lean Oil Feed Pump		2
75	0017700	Start-up Pump		-
101	74164403010020	HP. Inert Gas Pump		1
102	74162401052120	Air Compressor Filter		2
103	74162411130060	Catalyst Steam Filter		1
104	74162411130060	Catalyst Steam Filter		1
105	74161122100041	Spand. Column		2
106	0017700	Ind. St. Air. Column		-
107	0017700	Organolixinator		-
76	74113010421010	HP. H2C Compressor		1
77	74113010221010	Recycled H2C Compressor		1
78	74112110311313	Air Compressor		2

UNIDO/UNEP (PARKER) CAPITAL GOODS DEVELOPMENT PROJECT
MODULAR PROCESS FISH PLANT

CHECKED BY		APPROVED BY	
INDUSTRY	PROJECT	TECHNOLOGY	
SYNTHETIC RUBBER, etc.	LENER H.C.'s	ANTICLORINATOR	
DATE	ENGINEER NAME	CHARACTER	
25.11.1981	ALIZA	64.5	
DESIGNED BY	DRAWN BY	CHECKED BY	
A. ASH	B. ASH	A. ASH	



PETKIM PETROKIMYA A.Ş.



10 TO 21 EDC PURIFICATION

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP.
	3513-3	21		
No	MACHINE CODE	MACHINE NAME		Q
1	74165082125422	Light HC. column		1
2	74165082125422	Heavy HC. column		1
40	69241051022121	Light HC. Clmn. Ov. D.		1
41	69241052022121	Heavy HC. Clmn. Ov. D.		1
3	OMITTED	Vent Separator		
4	74161024231421	L.HC. Clmn. Reboiler		1
5	74161052448321	L.HC. Clmn. Air Cond		1
6	741610511141212	L.HC. Clmn. Vent Cond		1
7	741610524484212	H.HC. Clmn. Air Cond		1
8	74161023231221	H.HC. Clmn. Reboiler		2
9	OMITTED	HC. Clmn. Cond Cooler		-
10	OMITTED	Vent Scrubber		-
11	OMITTED	Heavy Ends Cooler		-
60	742200132511612	L.HC. Clmn. Bottom P.		2
61	742200132511612	L.HC. Clmn. Cond Pump		2
62	742200132511612	H.HC. Clmn. Cond Pump		2
63	742200121511612	H.HC. Clmn. Bottom P.		2
12	OMITTED	Desuper heater		-
13	OMITTED	Desuper Heater		-
14	741610511141212	H.HC. Clmn. Vent Cond		1

UNIDO/SFO (PETKIM) CAPITAL-GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

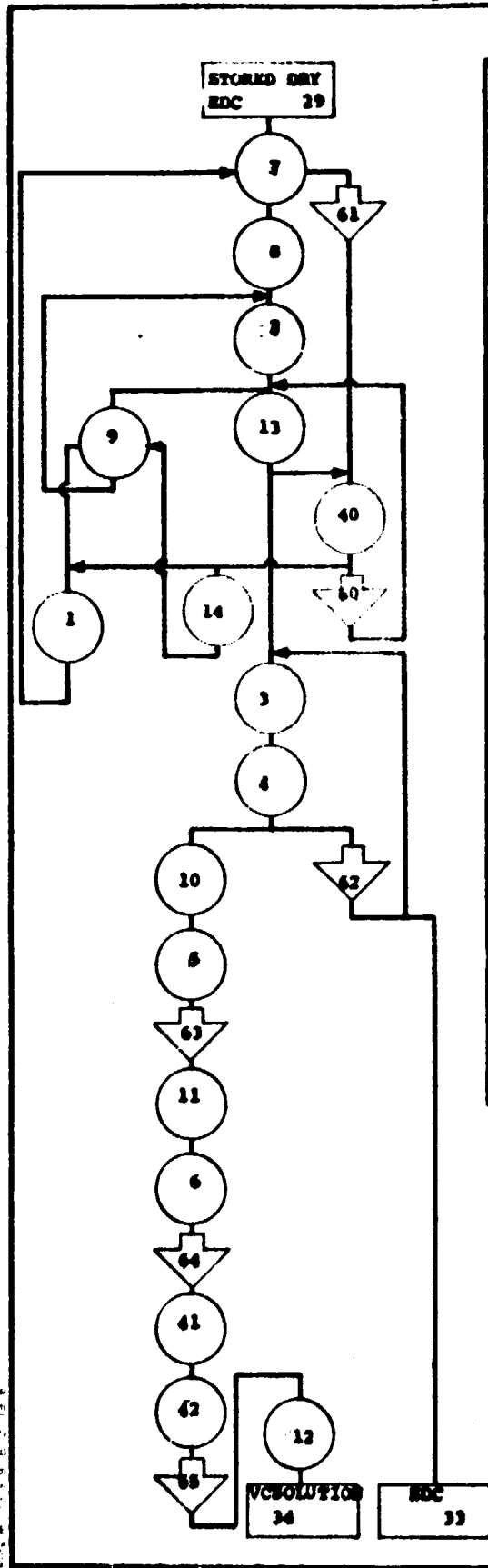
INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RES.	PURE EDC	EDC. PURIFICATION
DATE	SAMPLE PLANT	CAPACITY
18.11.1981	ALİAGA	132 t ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AKSU	D.ALTUN	Ş.KESKİN
CHECKED BY	APPROVED BY	

Rev.	Tarih	İsmi

PETKIM 1131/19 B-2/1976



PETKİM PETROKİMYA A.Ş.



ACTIVITY CODE	IND.	PROD.	TECH.	CAP.
	3513-3	34	1	2
NO	MACHINE CODE	MACHINE NAME	Q	
1	74162003100121	1st. St. Que. Gs. Cond.	1	
2	74161401101222	EDC Vaporizer	1	
40	211101122221	Pyrolysis Furn. Flush	1	
3	74165081121161	Quench mixer	1	
4	74161442013437	Pyro. gases sep.	1	
5	74362004100221	1st cond. separator	1	
6	74362003100121	2nd cond separator	1	
41	74165991225422	VC treatment vessel	1	
42	OMITTED	Surge Drum	-	
7	74161072119121	Pure EDC Heater	1	
8	74161072119121	Pure EDC Steam Heater	1	
9	74161090321222	EDC Vaporizer	1	
107	74161052448221	1st. st. que. gs. cond.	1	
11	74161051249221	2nd. st. que. gs. cond.	1	
12	74161031119121	VC treat. Dr. feed coil	1	
13	74132125130821	Pyrolysis furnace	1	
60	74220013221161	Cond. Water Rec. Pump	2	
61	74220012221161	Cond. Water Feed Pump	2	
62	74220015151161	Que. Recycled Lig.	2	
63	74220013151161	1st. st. cond. Pump	2	
64	74220013151161	VC treat. Vas. Feed P.	2	
65	74220013251161	Hcl column feed pump	2	
14	OMITTED	Deaerator	-	

UNIDO/SPO (PETKİM) CAPITAL-GOODS DEVELOPMENT PROCESS

MODULAR PROCESS FLOW DIAGRAM

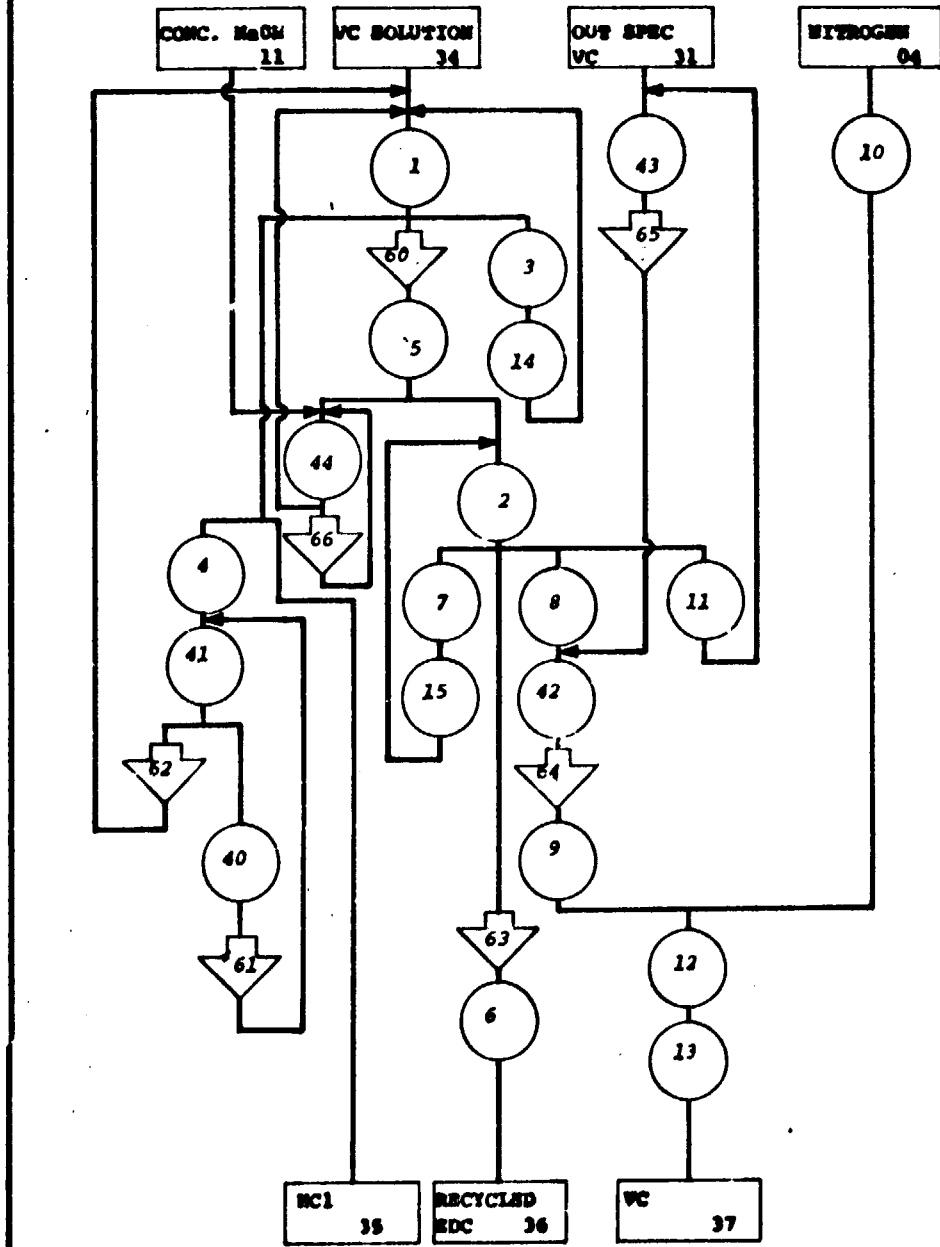
INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RES.	VC SOL'N	VCM PYROLYSIS
DATE	SAMPLE PLANT	CAPACITY
17.12.1981	ALİAĞA	41.2 t/h
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	D. ALTUN	Ş. KESKİN
CHECKED BY		APPROVED BY
29 TO 34 VCM PYROLYSIS		

Rev	Tarih	İsmi

01.01.1982 13:16



PETKIM PETROKIMYA A.Ş.



34 90 37 PYROLYSIS GAS TREATMENT

Rev	Yarsh		

P.04.013.F9.E.2.19.0



PETKIM PETROKIMYA A.S.

Rev	Tarih	isim

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

ACTIVITY CODE	MACHINE CODE	INDUSTRY	PROJECT	THER.	CAPACITY
1	74160112415222		HCl Column		1
2	741600M413211		VC Column		1
40	692410950621422		Liq. HCl. Storage Drum		1
41	692410950622212		HCl. Column Ovhd Drum		1
42	6924109510321211		VC Column Ovhd Drum		1
43	6924109510321211		Ovhd Spec. VC Tank		1
44	692111312235222		Organic liq. Storage		1
3	7416107420012211		HCl. Clm. reboiler		2
4	7416109520021212		HCl. Clm. ovhd cond		1
5	741610120091211		VC clm. feed cooler		1
6	741610120091211		Recycled HCl cooler		1
7	741610252413211		VC clm. reboiler		1
8	741610557432211		VC clm. ovhd cond		1
9	741610311391211		VC cooler		1
10	741610711141212		Nitrogen heater		1
11	7416109511141212		VC Vent condenser		1
60	74220011511212		HCl. Clm. draw off pump		1
61	74220011511212		Liq. HCl. Trans. pump		1
62	742200133511212		HCl clm. cond pump		2
63	742200133511212		HCl recycle pump		1
64	742200133511212		VC clm. cond. pump		2
65	742200134511212		VC recycle pump		1
66	742200132511212		Organic liq. Pump		1
12	741640141132311		VC Dryer		2
13	7436213221001202		VC Filter		2
14	OMITTED		Desuper heater		2
15	OMITTED		Desuper heater		2

UNIDO / SPO (PETKIM) CAPITAL GOODS DEVELOPMENT PROJECT

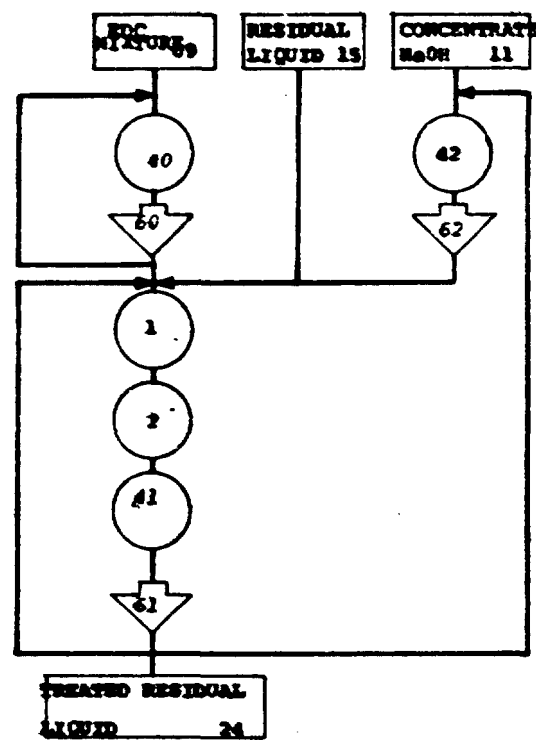
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RESINS etc	VC	PYROUSIS GAS TREATMENT
DATE	SAMPLE PLANT	CAPACITY
19.11.1981	ALTAĞA	50,9 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AKSU	O. ALTUN	S.KESKIN
CHECKED BY	APPROVED BY	

Year	ISSN



PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP.
	3513 -3	24	1	2
No	MACHINE CODE	MACHINE NAME	QUAN	
1	741650811241211	Drych Res. Liq. Colm.	1	
40	692410510321212	Wasteliq. Collecting Drum	1	
41	692410510321211	Cond. Setting Drum	1	
42	692410510321211	NaOH Drum	1	
2	741610511291211	K-RL C. In. Overhd Cond	1	
60	742200122511812	Waste Liquid Pump	2	
61	742200122511112	K-RL Cola. Condensa to Pump	1	
62	742200123511112	NaOH Pump	2	

UNIDO /SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RESIN etc	TREATED RES. LIQ	OXYCHC RESID LIQ TREAT
DATE	SAMPLE PLANT	CAPACITY
18.11.1981	ALIAÇA	17,2 m ³
PREPARED BY	DRAWN BY	CHECKED BY
P. CELEBI	D. ALTUN	S. KESKIN
CHECKED BY		APPROVED BY

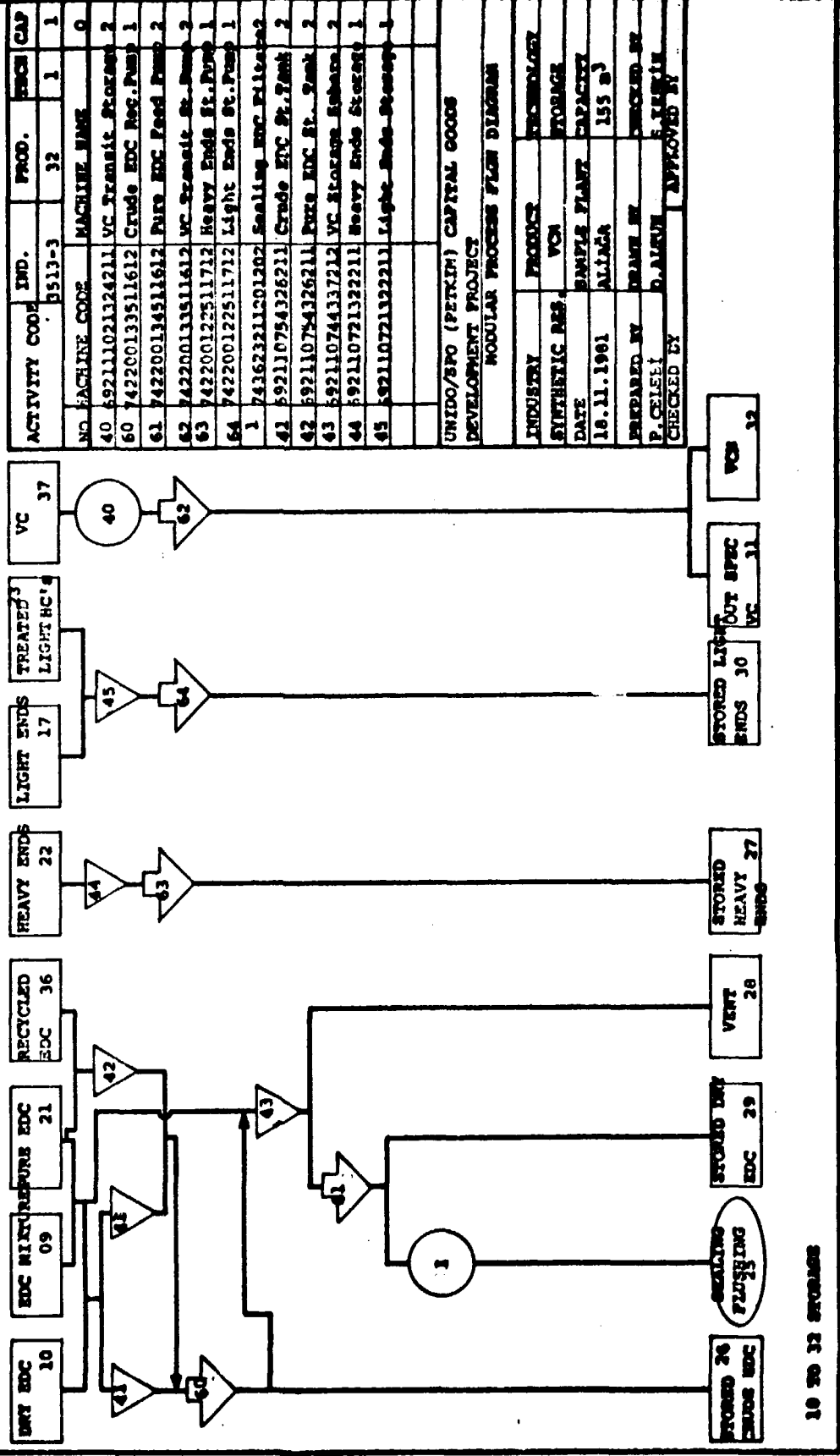
15 TO 24 OXYCHLORINATION RESIDUAL LIQUID TREATMENT

Rev.	Tarih	İsmi

Proje No: 03.5.9.6.2.1375



PETKİM PETROKİMYA A.Ş.



10 TO 32 STORAGE

SR No	w/ No	Basic Machine Name	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manuf. Char. 1. (Tons)	Manuf. Char. 2.	Manuf. Char. 3.	Origin	Purchase Date	Purchase Cost		Cr. 1966 Cost		Purc. Year	SIT Code				
												Date	Total	Unit	Total		1966	1967	1968	1969	
1	1	Drying co-lumn	-	-	-	COUNTRY Flow	7			I	13300	33300	43600	43600	1976	4164	01	01	03	12	12
2	1	Chlorine feed separator	16,4t/hr	Dia: 0,75m	-	SZ	1,2			I	5700	5700	6700	6700	1976	74301	01	10	11	12	12
3	1	Chlorinator	60 m³	P: 4,13atm	-	others	23			I	88000	88000	115300	115300	1976	74105	08	11	12	12	12
4	1	SO ₂ absorber	2,03 m³	P: 10kg/cm²	Temp: 110°C	CY	4			I	4300	4300	5100	5100	1976	69243	02	11	12	12	11
41	1	untreated EDC Drum	22 m³	P: 10kg/cm²	Temp: 85°C	CY	9,5			I	18900	18900	22300	22300	1976	69743	02	11	13	12	11
4	1	Edson Soxhlet EDC Drum	5,5m³/hr	Dia: 0,5m	-	-	0,6			I	5400	5400	6400	6400	1976	74303	01	11	10	12	4
5	1	Neutralizer	4,4 m³	P: 10 atm	Non catalytic	Others	-			I	Civil works	-	-	-	1976	74105	01	12	12	10	01
6	1	Sach Scrubber	6,4 m³	P: 2 atm.	Temp: 70°C	PM	1,9			I	6300	6300	8350	8350	1976	74105	01	04	21	12	11
42	1	SO ₂ scrubber Drum	30 m³	-	Temp: 60°C	CY	6,7			I	14300	14300	16000	16000	1976	69741	05	10	12	12	11
43	1	SO ₂ scrubber Drum	2,9 m³	-	Temp: 60°C	CY	1,6			I	5700	5700	6700	6700	1976	69741	05	11	12	11	11
44	1	Blended Wash Drum	21 m³	-	Temp: 60°C	CY	5			I	12000	12000	14700	14700	1976	69741	05	11	13	11	11
45	1	Settler purge Drum	14,7 m³	-	Temp: 30°C	CY	4			I	10100	10100	11900	11900	1976	69741	05	11	14	11	11
46	1	EDC hold up Drum	6,3 m³	-	Temp: 105°C	CY	35			I	48500	48500	57300	57300	1976	69741	05	11	15	11	11
47	1	SO ₂ absorber Drum	HS: 17,2 m³	SD: 3,0 m	TL: -	Flamed Dishes	45,8			I	48500	48500	55400	55400	1976	74105	01	03	08	14	12
48	1	EDC secondary air condenser	HS: 0,2 m³	SD: 9,4 m	TL: -	" "	20			I	41400	41400	50100	50100	1976	74105	01	03	08	14	12
49	1	EDC fresh condenser	HS: 0,15 m³	SD: 0,7 m	TL: 3,8 m	DP	1,7			I	9400	8400	10700	10700	1976	74105	01	03	08	14	12
50	1	Chloranition vent condenser	HS: 0,1 m³	SD: 0,3 m	TL: 3,0 m	DP	0,2			I	1200	1200	1450	1450	1976	74105	01	03	08	14	12
51	1	Drying column feed preheater	HS: 8,43 m³	SD: 0,4 m	TL: 4,4 m	ST	1,3			I	8000	8000	9700	9700	1976	74105	01	03	08	14	12
52	1	SO ₂ absorber cooler	OMITTED	-	-	-	-			I	-	-	-	-	-	-	-	-	-	-	-
53	1	Drying column reboiler	HS: 13,55m³	SD: 0,7m	TL: 4,0 m	FST	2,5			I	11300	11300	13700	13700	1976	74105	01	03	08	14	12
54	1	A neutralizer	-	P: 750 mm Wg	DG	0,4				I	1500	3600	1800	3600	1976	74105	01	03	08	14	12
55	1	Chlorination chimney	OMITTED	-	-	-	-			I	-	-	-	-	-	-	-	-	-	-	-
56	1	Chlorinator	33m³/hr	Wgt: 25 m	Corrosive	H	0,15			I	2600	2600	3100	3100	1976	74701	01	15	11	11	12
57	1	SO ₂ scrubber feed pump	12,5m³/hr	Wgt: 20 m	"	H	0,1			I	5200	10400	6100	12300	1976	74701	01	15	11	11	12
58	1	Drying column feed pump	14,2m³/hr	Wgt: 42 m	HCLC	H	0,1			I	4500	9000	5300	10600	1976	74701	01	15	11	11	12
59	1	SO ₂ scrubber feed pump	19 m³/hr	Wgt: 33 m	HCLC	H	0,2			I	2000	4600	2400	4800	1976	74701	01	15	11	11	12

Note: a) Max. component weight for complete, place thickness for plate fabricated equipments.

No	M	Basic Machine Description	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Type (Description)	Manufac. Char. 1. (Code)	Manufac. Char. 2. (Code)	Manufac. Char. 3. (Code)	Origin	Purchase Cost		Cr. 100 Cost		Proc. Year	SIC Code							
										Unit	Total	Unit	Total		1234	567	89	011	2345			
1	2	Adsorption Column	97 m ³	P: 100g/cm ³	CS	20	CS	23	I	35300	70600	46750	93500	1976	74100	03	11	4	3	9	1	
2	2	Adsorption Column	30,5 m ³	P: 2kg/cm ³	PH	14,5	CS	6	I	49600	47600	65000	65000	1976	74100	01	11	4	1	1	1	1
3	2	Adsorption Column	21 m ³	P: 3 kg/cm ³	PH	17,5	CS	15	I	66900	69000	87900	87900	1976	74166	14	11	4	1	1	1	1
40	2	Compressor	0,07 m ³	P: 1,5 kg/cm ³	Cy	0,2	CS	7	I	1700	1700	1400	1400	1976	69243	11	3	1	1	1	1	1
41	2	Compressor	11 m ³ /hr	P: 10,3 kg/cm ³	SZ	0,7	CS	10	I	1500	1500	1900	1900	1976	74301	40	11	0	1	1	1	1
42	2	Storage vessel	100,1 m ³	P: 135 kg/cm ³	Cy	65	CS	57	I	176000	176000	149900	149900	1976	69243	12	0	4	3	0	2	1
43	2	Storage vessel	100,1 m ³	P: 14,5 kg/cm ³	Cy	35	CS	27	I	77800	77800	83900	83900	1976	69243	12	0	4	3	0	2	1
44	2	Cooler separator	4,5 m ³ /hr	Dia: 0,3 m	SZ	1,5	CS	18	I	5600	5600	6600	6600	1976	74301	40	11	0	1	1	1	1
45	2	Compressor	3,5 m ³ /hr	Dia: 0,7 m	other	0,5	CS	10	I	8100	3100	3700	3700	1976	74301	40	11	0	1	1	1	1
46	2	Compressor	44,3 m ³	P: 15,1 kg/cm ³	other	35	CS	15	I	39400	79000	51900	103700	1976	74155	11	0	1	1	1	1	1
47	2	Steam drum	6 m ³	P: 47 kg/cm ³	Cy	8	CS	27	I	19950	39000	33500	47100	1976	69243	12	0	1	0	1	1	1
48	2	Water separator	9 m ³	P: 17 kg/cm ³	other	4	CS	15	I	10100	20700	11800	23000	1976	74106	10	1	0	1	1	1	1
49	2	Water separator	8 m ³	P: 13 kg/cm ³	other	4	CS	15	I	10100	20700	11800	23000	1976	74106	10	1	0	1	1	1	1
50	2	Water separator	37,7 m ³ /hr	Dia: 1,35 m	other	4,8	CS	18	I	11450	22000	13500	27000	1976	74302	40	11	0	1	1	1	1
51	2	Water separator	19,7 m ³ /hr	Dia: 1,15 m	other	3,7	CS	17	I	9800	17800	10400	20000	1976	74302	40	11	0	1	1	1	1
52	2	Water separator	9,2 m ³	Dia: 0,75 m	other	9,9	CS	15	I	6000	9800	11700	11700	1976	69241	03	11	0	1	1	1	1
53	2	Water separator	9,1 m ³	Dia: 0,75 m	other	1,9	CS	13	I	6300	6300	7400	7400	1976	69241	03	11	0	1	1	1	1
54	2	Water drum	2,7 m ³	Dia: 0,75 m	other	2,1	CS	13	I	6000	6900	8100	8100	1976	69241	03	11	0	1	1	1	1
55	2	Water drum	0,4 m ³	P: 20 kg/cm ³	PH	1,0	CS	9	I	4300	4300	5000	5000	1976	74106	10	1	0	1	1	1	1
56	2	Water surge tank	1,09 m ³	Dia: 0,75 m	other	1,0	CS	6	I	4300	4300	5100	5100	1976	69241	03	11	0	1	1	1	1
57	2	Water surge tank	6,2 m ³	Dia: 0,75 m	other	1,6	CS	8	I	375	11500	5800	13000	1976	74301	30	1	0	1	1	1	1
58	2	Water surge tank	34,2 m ³	Dia: 0,75 m	other	4,4	CS	7	I	10500	10900	12400	13400	1976	69241	03	11	0	1	1	1	1
59	2	Water surge tank	6,9 m ³	Dia: 0,75 m	other	3,0	CS	5	I	17800	17800	15100	15100	1976	69241	03	11	0	1	1	1	1
60	2	Water surge tank	0,24 m ³	Dia: 0,75 m	other	0,8	CS	4	I	5500	5500	6500	6500	1976	69241	03	11	0	1	1	1	1
61	2	Water surge tank	0,8 m ³	Dia: 0,75 m	other	0,9	CS	8	I	7300	7300	8600	8600	1976	69241	03	11	0	1	1	1	1

Note: all max. component weight for machines, plate thickness for plate fabricated equipments.

Activity Code: 3513142

SR No	Machine Name	Major Spec. 1. (Capacity)	Major Spec. 2. (Optional)	Type (Description)	Manuf. Char. 1. (Tons)	Manuf. Char. 2. (Tons)	Manuf. Char. 3. (Tons)	Origin	Purchase Cost		Cr. 1960 Cost		Proc. Year	SITC Code									
									Unit	Total	Unit	Total		13145	47	9	10	11	12	13			
1	2																						
35	Drying coil	1,5 m ³	Temp: 60C	Cy	1	CS	9,5 mm	I	1	8100	8100	9600	1976	89241	05	1	0	3	7	1	1	2	
36	Reflux drum	0,7 m ³	Temp: 60C	Cy	0,9	CS	9,5 mm	I	1	7500	7500	8850	1976	6974105	2	0	3	2	1	3	1	1	2
37	HP inert gas cooler	HS:1,71 m ³	TL: 6,0m	DP	0,4	CS	15 mm	I	1	1750	1750	2100	1976	7416103	1	1	4	4	1	3	1	1	2
38	HP inert gas cooler	HS:2,58 m ³	TL: 4,8 m	DP	0,6	CS	15 mm	I	1	2700	2700	3300	1976	7416103	1	1	3	4	1	2	1	1	2
39	Water heater	HS:0,90 m ³	TL: 2,0 m	DP	0,2	CS	15 mm	I	1	950	950	1150	1976	7416107	1	1	1	4	1	2	1	1	2
40	Water heater	HS:2,64 m ³	TL: 4,8 m	DP	0,8	CS	15 mm	I	2	4200	8400	10700	1976	7416107	1	1	3	4	1	3	1	1	2
41	Water heater	HS:8,93 m ³	TL: 5,0m	DP	1,0	CS	8 mm	I	1	4700	4700	5100	1976	7416107	1	1	3	4	1	3	1	1	2
42	Water heater	HS:3,37 m ³	TL: 7,8m	DP	0,9	CS	15 mm	I	1	4000	4000	4800	1976	7416107	1	1	4	4	1	3	1	1	2
43	Water heater	HS:4,25 m ³	TL: 4,2 m	DP	0,5	CS	15 mm	I	1	2450	2450	3000	1976	7416107	1	1	7	4	1	3	1	1	2
44	Water heater	HS:2,02 m ³	TL: 5,4 m	DP	0,5	CS	15 mm	I	1	2150	2150	2600	1976	7416107	1	1	3	4	1	3	1	1	2
45	Water heater	HS:2,67 m ³	TL: 7,2 m	DP	0,4	CS	15 mm	I	2	2450	4900	6000	1976	7416107	1	1	4	4	1	3	1	1	2
46	Water heater	HS:14,70 m ³	TL: 9,14m	FST	17,1	Inconel 300	15 mm	I	2	87000	164000	198000	1976	7416105	1	5	4	8	1	3	1	1	2
47	Water heater	HS:44,45 m ³	TL: 4,7 m	FST	4,0	CS	10 mm	I	2	27000	34400	65000	1976	7416105	1	1	3	0	1	3	0	1	1
48	Water heater	HS:37,37 m ³	TL: 7,0 m	FST	2,5	CS	8 mm	I	2	11350	22700	27000	1976	7416101	2	1	4	2	1	3	1	1	1
49	Water heater	HS:8,98 m ³	TL: 5,8m	FST	4,7	CS	8 mm	I	1	10300	10300	19700	1976	7416107	1	1	3	0	1	3	0	1	1
50	Water heater	HS:55,5 m ³	TL: 7,0 m	FST	7,0	CS	8 mm	I	1	20000	20900	25300	1976	7416103	3	1	4	2	2	1	1	1	2
51	Water heater	HS:10,43 m ³	TL: 4,5 m	Polublocks	1,8	Graphite	- mm	I	2	15000	21600	38200	1976	7416105	0	1	2	3	1	2	0	2	2
52	Water heater	HS:10,50 m ³	TL: 4,6m	FST	1,0	CS	8 mm	I	1	6400	6400	7700	1976	7416103	1	1	3	0	1	2	1	1	1
53	Water heater	HS:203,78 m ³	TL: 4,0m	BT	2,8	CS	8 mm	I	1	12100	12100	14600	1976	7416102	4	1	2	0	1	3	1	1	1
54	Water heater	HS:10,43 m ³	TL: 4,5m	Polublocks	0,7	Graphite	- mm	I	2	8150	16300	19000	1976	7416105	1	1	2	5	1	2	1	1	2
55	Water heater	HS:10,09 m ³	TL: 3,0 m	BP	0,2	CS	12 mm	I	1	1000	1000	1200	1976	7416105	1	1	1	4	1	2	1	1	1
56	Water scrubber	HS:50 m	SCIS	H	0,4	CS	0,35 T	I	1	1300	1300	1500	1976	7434001	0	2	8	1	1	2	1	1	2
57	Water scrubber	HS:15 m	HCLC	H	0,4	AS	0,35 T	I	2	7950	15900	18900	1976	7434001	0	1	1	1	1	1	1	1	1
58	Water scrubber	HS:125 m	HCLC	H	0,4	Inconel 600	0,35 T	I	2	800	1600	1900	1976	7434002	0	4	1	1	1	1	1	1	1
59	Water scrubber	HS:110 m	Corrosive	H	0,4	AS	0,35 T	I	2	4050	8100	9600	1976	7434002	0	4	5	1	1	1	1	1	1
60	Water scrubber	HS:9,3 m ³ /hr	COM	H	0,2	Mi-resist	0,2 T	I	2	4600	9200	10800	1976	7437001	0	7	3	1	1	1	1	1	1

Note: 1) Max. component weight for machines, plates, etc. 2) Dimensions for plate fabricated equipments.

SR No	W/M	Basic Machine Nameplate	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Quantity Char. 1. (Tons)	Material Char. 1.	Quantity Char. 2.	Material Char. 2.	Origin	Purchase Cost		Ct. 1960 Cost		SITC Code									
												Unit	Total	Unit	Total	Year	12145	6789	0111	351615					
15		Water feed pump	9.8 m/hr	WH:103 m	CCLC	H	0,3	SS	0,3 T	I	11	3200	0400	3500	7600	1976	7470	01	7	4	1	1	1	1	7
16		NaOH scrubber	9.8 m/hr	WH:56,6 m	Corrosive	H	0,3	MI resin	0,3 tons	I	2	5200	10400	6100	12200	1975	7420	01	2	3	5	1	1	7	1
17		Water feed pump	19 m/hr	WH:60 m	"	"	0,1	CS	0,1 "	I	3	2900	8700	2400	10700	1976	7420	01	3	3	5	1	1	1	1
18		Bottom pump	38,5m/hr	WH:63 m	HCLC	H	0,2	CS	0,2 "	I	1	3400	3400	4000	4000	1975	7470	01	3	3	3	1	1	6	1
19		Oil recycle pump	1 m/hr	WH:35 m	HCLC	H	0,1	MI resin	0,1 tons	I	1	4200	4700	5400	5000	1975	7470	01	2	1	2	1	1	1	7
20		Absorption pump	2,8 m/hr	WH:45 m	Corrosive	H	0,2	Graphite	0,2 tons	I	2	1250	2500	1500	3000	1976	7470	01	2	2	5	1	1	1	1
21		Dry S.C. pump	17,3 m/hr	WH:40 m	"	"	0,1	CS	0,1 tons	I	1	2550	5100	3000	6000	1976	7470	01	1	3	1	1	1	1	1
22		Driving column	4 m/hr	WH:40 m	"	"	0,2	Graphite	0,2 tons	I	2	1250	2500	1500	3000	1976	7420	01	2	2	5	1	1	1	1
23		Condensate separator	38,5 m/hr	WH:101 m	CCLC	H	0,3	CS	0,3 tons	I	2	3400	6800	4000	8000	1976	7470	01	3	4	1	1	1	1	1
24		Lean oil feed pump	2,9 t/hr	-	Dia:0,2 m	Stainless	-	CS	- mm	I	1	11500	11600	13700	13700	1976	7418	40	2	0	2	0	1	1	1
101		NP inert gas drivers	2,9 t/hr	-	-	-	-	-	-	I	1	Incl. 105,103	-	-	-	1976	7438	40	1	0	1	5	1	1	1
102		Air compressor	6,8 m/hr	Dia: -	P:0,7kg/cm²	-	13,1	CS	- mm	I	1	550	550	650	650	1976	7430	41	1	1	1	1	5	0	1
103		Suction filter	0,7 m/hr	Dia:0,3m	Stainless	-	-	SS	- mm	I	1	400	400	500	500	1975	7438	41	1	1	1	1	1	1	1
104		Stage drum filter	0,7 m/hr	Dia:0,3m	Stainless	-	-	SS	- mm	I	1	400	400	500	500	1975	7438	41	1	1	1	1	1	1	1
105		Catalyst filter	0,4 t/hr	Dia:0,30m	"	"	-	SS	- mm	I	1	400	400	500	500	1975	7438	41	1	1	1	1	1	1	1
106		oxychlorinator	16 t/hr	Dia:0,6 m	-	NZ	5,3	Inconel 601	6,4 mm	I	2	42300	84600	49900	99800	1976	7431	12	2	1	0	2	1	1	1
107		HP inert gas cyclones	-	P:34kg/cm²	Inert gas	H	-	CIC	- tons	I	1	67000	67000	75000	75000	1976	7431	01	0	4	1	1	1	1	1
108		Compressor	-	P:13kg/cm²	"	"	-	CIC	- tons	I	3	22500	190500	76800	230400	1976	7431	01	3	3	2	1	0	1	1
109		Pressure vessel	-	P:10kg/cm²	air	"	13,1	CIC	2,4 tons	I	2	114000	228000	144000	288000	1976	7431	11	0	3	1	1	1	1	1
110		Air compressor	-	-	-	-	-	-	-	I	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57		Catalyst stage vessel	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58		Catalyst vessel	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59		Steam generator	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90		Generator	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60		Ejector	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61		Chimney	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75		Start-up pump	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108		2-stage oxidizer	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109		Desuperheater	OMITTED	-	-	-	-	-	-	I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note : a) Max. comment weight for machines, plate thickness for plate fabricated equipments.

SN No	Basic Machine Name/Description	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufacturer Char. 1. (TONS)	Manufacturer Char. 2. (a)	Origin	Q.	Purchase Cost		Gr. 1960 Cost		SITC Code														
										Unit	Total	Unit	Total	13248	67	8	9	10	11	12	13	14	15	16	17			
1	Light by iron-132 m ³ carbon column	132 m ³	P: 3 atm.	Non catalytic	PC	44	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
2	Heavy by iron-152 m ³ carbon column	152 m ³	P: 3 atm.	"	PB	45	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
40	Explosion proof air over-heat	9.7 m ³	-	Temp: 100C	CY	2,8	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
41	Heavy by iron-17.2 m ³ carbon column	17.2 m ³	-	Temp: 100C	CY	3,5	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
4	Reboiler	US: 192.7	SD: 1.5m	TL: 5.0m	DP	22,1	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
5	Reboiler	US: 192.7	SD: 3.1m	TL: 9.1m	FT	4,0	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
6	Reboiler	US: 192.7	SD: 0.1 m ³	TL: 3.0m	DP	0,4	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
6	Condenser	US: 192.7	SD: 0.15m	TL: 3.0m	DP	0,4	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
7	Reboiler	US: 15.13m ³	SD: 3.1 m	TL: 9.1m	IFT	46,6	CS	I	1	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
8	Reboiler	US: 78.1m ³	SD: 1.6m	TL: 5.0m	FT	6,3	CS	I	2	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
80	Bottom pump	33 m ³ /hr	SD: 79 m	Corrosive	H	0,2	CS	I	2	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
81	Bottom pump	43.75 m ³ /hr	SD: 40 m	Corrosive	H	0,7	CS	I	2	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
82	Bottom pump	43 m ³ /hr	SD: 45 m	"	H	0,3	CS	I	2	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
83	Bottom pump	5 m ³ /hr	SD: 15 m	"	H	0,1	CS	I	2	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
9	Vent separator	UNLIMITED																										
10	Cooler	UNLIMITED																										
11	Heavy ends cooler	UNLIMITED																										
12	Desuper heater	UNLIMITED																										
13	Desuper heater	UNLIMITED																										

Note: a) Max. component weight for ammonia plate thickness for plate fabricated equipments.

No.	M. N.	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 1 (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. a)	Origin	Q.	Purchase Cost		Cr. 1960 Cost		Purch. Year	STCC Code									
												Unit	Total	Unit	Total		1705	47	0	1	11	12	13	14	15	
1		High Pressure Compressor	34 T/hr	Dia: 1,2m	-	-	2	CS	17 mm	I	1	6700	6700	7400	7900	1976	74357	00	3	1	0	0	1	2	1	1
2		Compressor	141,40/hr	Dia: 2 m	-	SZ	8,2	CS	24 mm	I	1	16900	16900	19950	19950	1976	74361	40	1	1	0	1	2	2	2	1
40		Compressor	0,4 m ³	Dia: 1,6m	Temp:200C	Cy	6,5	CS	15 mm	I	1	16600	16600	19600	19600	1976	74311	10	1	1	2	2	2	2	1	1
3		Quench mixer	0,15 m ³	P: 10atm	Non catalytic	SM	0,3	SS	15 mm	I	1	5500	5500	5500	6500	1976	74165	00	1	1	2	1	1	6	1	1
4		Catalysis gas separator	454 m ³ /hr	Dia: 3,4 m	-	SZ	74	S	40 mm	I	1	60000	60000	70300	70800	1976	74361	40	1	2	0	1	3	4	3	2
5		2 stage cond state separator	93,5 T/hr	Dia: 1,6 m	-	-	3,3	CS	15 mm	I	1	12000	12000	14200	14200	1976	74362	00	4	1	0	0	2	2	1	1
6		Compressor	46,5 T/hr	Dia: 1,3 m	-	-	3,1	CS	15 mm	I	1	8700	8700	10300	10300	1976	74362	00	3	1	0	0	1	2	1	1
41		CO treatment vessel	74,5 m ³	P: 14 atm	1961 Catalytic	PE	30	CS	26 mm	I	1	54000	54000	63700	63700	1976	74165	00	1	2	2	5	4	2	2	2
60		Water recycler pump	42 m ³ /hr	Dia: 37 m	HCLC	H	0,4	CS	0,4 T	I	2	2200	4400	2600	5200	1976	74270	01	3	2	2	1	1	6	1	2
61		Water recycler pump	8 m ³ /hr	Dia: 37 m	HCLC	H	1,6	CS	1,6 T	I	2	5600	11200	5600	12200	1976	74270	01	2	2	1	1	6	2	1	2
62		Water recycler pump	546 m ³ /hr	Dia: 23 m	Corrosive	H	1,0	CS	1,0 T	I	2	16000	32000	14900	37800	1976	74270	01	5	1	5	1	1	6	1	1
63		Water recycler pump	92 m ³ /hr	Dia: 20 m	"	H	0,3	CS	0,3 T	I	2	4600	9200	5400	10800	1976	74270	01	3	1	5	1	1	6	1	2
64		Water recycler pump	45 m ³ /hr	Dia: 2,7 m	Corrosive	H	0,2	CP	0,2 T	I	2	2800	5600	3300	6600	1976	74270	01	3	1	5	1	1	6	1	2
65		HCl column feed pump	45 m ³ /hr	Dia: 47 m	Corrosive	H	0,3	CS	0,3 T	I	2	3900	6000	3550	7100	1976	74270	01	3	2	5	1	1	6	1	2
7		Pure SO ₂ heater	12,76 m ³ /hr	Dia: 0,5 m	TL:3,0 m	FST	3,2	CS	9 mm	I	1	13200	13200	15000	16000	1976	74161	07	2	1	1	9	1	2	1	1
8		Pure SO ₂ steam heater	21,6 m ³ /hr	Dia: 0,47m	TL:4,8 m	FST	4,2	CS	9 mm	I	1	15300	15300	18500	18500	1976	74161	07	2	1	3	9	1	2	1	1
9		SO ₂ absorber	-	Dia: 2,35m	TL:3,0 m	FST	47,9	CS	24 mm	I	1	96000	96000	116200	116200	1976	74161	00	0	1	2	1	2	2	2	1
10		2 stage quench gas separator	13,73 m ³ /hr	Dia: 3,05m	TL:4,1 m	FST	39,7	CS	10 mm	I	1	79300	79300	94000	94000	1976	74161	00	0	1	2	1	2	2	2	1
11		2 stage quench gas separator	6,54 m ³ /hr	Dia: 1,13m	TL:6,3 m	FST	14,4	CS	12 mm	I	1	37300	37300	45100	45100	1976	74161	05	1	2	4	9	2	2	1	1
12		Water treatment cooler	2,38 m ³ /hr	Dia: 0,49m	TL:2,44 m	FST	3,6	CS	8 mm	I	1	14100	14100	17100	17100	1976	74161	03	1	1	1	9	1	2	1	1
13		Catalysis furnace	48 t/hr	Temp:233C	G	-	152	CS	6,5 mm	I	1	324100	324100	392200	392200	1976	74132	12	5	1	3	0	6	2	1	2
14		Desuperheater	OMITTED																							
42		Surge	OMITTED																							

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

SP No	w/ Basic Machine No	Major Spec. 1. (Capacity)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TOS)	Manufac. Char. 2. (Optional)	Manufac. Char. 3. (Optional)	Origin	Q.	Purchase Cost		Cr. 1960 Cost		Pure. Year	BYC Code							
										Unit	Total	Unit	Total		12345	6789	10	11	12	13		
1		5.5 m ³	14 kg/cm ²	P6	7	CS	15 mm	I	1	10400	10400	10000	10000	1976	74190	011	0	1	1	1	1	
1		48.1 m ³		PB	60	CS	39 mm	I	1	-	-	-	-	1976	74166	011	0	1	1	1	1	
2		50.9 m ³	P:7.5kg/cm ²	Cy	90	CS	30 mm	T	1	40000	40000	52400	52400	1976	74166	011	1	1	1	1	1	
40		45.8 m ³		Cy	10.5	S	21 mm	I	1	50500	59500	70000	70000	1976	69241	050	0	0	0	0	0	0
41		12.3 m ³		Cy	6	CS	15 mm	I	1	23300	23300	27500	27500	1976	69241	050	0	0	0	0	0	0
42		7.5 m ³		Cy	2.9	CS	11 mm	T	1	8000	8000	9450	9450	1976	69241	050	0	0	0	0	0	0
43		7.5 m ³		Cy	2.9	CS	10 mm	T	1	8000	8000	9450	9450	1976	69241	050	0	0	0	0	0	0
44		33.5 m ³	Dia:7.25	Sp	56	CS	27 mm	I	1	69000	69000	81000	81000	1976	69711	131	0	0	0	0	0	0
45		111 m ³		FSI	6.7	CS	10 mm	T	2	20500	41000	74800	496000	1976	74166	050	0	0	0	0	0	0
46		21.57 m ³		SUT	22	CS	19 mm	I	1	50000	50000	70000	70000	1976	74166	050	0	0	0	0	0	0
47		15 m ³		AES	3.3	CS	8 mm	T	1	13300	13300	10100	10100	1976	74166	050	0	0	0	0	0	0
48		13.1 m ³		ABS	2.7	CS	8 mm	T	1	11800	11800	14400	14400	1976	74166	050	0	0	0	0	0	0
49		805.3 m ³		FSI	10.7	CS	12 mm	T	1	47300	47300	57200	57200	1976	74166	050	0	0	0	0	0	0
50		592.0 m ³		AES	16.2	CS	12 mm	T	1	46000	46000	56100	56100	1976	74166	050	0	0	0	0	0	0
51		9.86 m ³		AES	1.7	CS	8 mm	T	1	8700	8700	10500	10500	1976	74166	050	0	0	0	0	0	0
52		0.63 m ³		Df	0.7	CS	15 mm	I	1	1700	1700	1450	1450	1976	74166	071	1	1	1	1	1	1
53		0.33 m ³		Df	1	CS	10 mm	I	1	5300	5300	6400	6400	1976	74166	050	0	0	0	0	0	0
54		40 m ³ /h		H	0.3	CS	0.3 tons	I	1	3700	3700	3800	3800	1976	74220	015	1	5	1	1	1	1
55		12 m ³ /h		H	0.2	CS	0.2 tons	I	1	3000	3000	3550	3550	1976	74220	015	1	5	1	1	1	1
56		10 m ³ /h		H	0.2	CS	0.2 t	I	2	3050	5100	3600	3600	1976	74220	015	3	5	1	1	1	1
57		20 m ³ /h		H	0.2	CS	0.2 t	I	1	2900	2900	3400	3400	1976	74220	015	3	5	1	1	1	1
58		31.5 m ³ /h		H	0.3	CS	0.3 t	I	2	2950	5000	3400	3400	1976	74220	015	3	5	1	1	1	1
59		21 m ³ /h		H	0.3	CS	0.3 t	I	1	3300	3300	3900	3900	1976	74220	015	3	5	1	1	1	1
60		45 m ³ /h		H	0.3	CS	0.3 t	I	1	2000	2000	2400	2400	1976	74220	015	2	5	1	1	1	1
61		18.7 t/h	Length: Dia: 1.1	Counter f- flow	0.15	CS	15 mm	T	2	7500	15000	8850	17700	1976	74164	014	1	1	1	1	1	1
62		18.2 t/h	Dia: 0.5 m	P:	0.1	CS	-	I	2	1250	2500	1500	3000	1976	74367	137	1	1	1	1	1	1

Note: 1. All Max. capacities weight for machines. Plate thickness for plate fabricated equipments.

No.	Basic Machine Description	Make	Model	Year	Type	Manuf. Char. 1 (C or D)	Manuf. Char. 2	Manuf. Char. 3 (a)	Origin	Q.	Purchase Cost		St. 1946 Cost		Proc. Year	SITC Code
											Unit	Total	Unit	Total		
											11	14	15	16		
1	Machine	17,0 m³			?	9	CS	10 mm	I	1	21600	21600	24300	24300	1976	74165 04 1 1 2 4 1 1 1 1
40	Machine	3 m³			JY	1,0	CS	10 mm	I	1	10500	10500	12400	12400	1976	69241 05 1 0 2 1 2 1 1 7
41	Machine	1 m³			JY	0,6	CS	0 mm	I	1	2200	2200	2600	2600	1976	64241 05 1 0 3 2 1 2 1 1
42	Machine	1,0 m³			JY	0,95	CS	0 mm	I	1	4100	4100	4800	4800	1976	69241 05 1 0 3 2 1 2 1 1
2	Machine	841, 1 m³			PST	3,3	CS	10 mm	I	1	13300	13300	16100	16100	1976	74161 05 1 1 2 2 1 2 1 1
50	Water liquid	5 m³				0,7	Graph.	0,2 tons	I	2	1750	3500	1475	2950	1976	74220 01 2 2 5 1 1 1 1 2
61	Machine	1 m³				0,1	CIC	0,1 tons	I	1	2100	2100	2500	2500	1976	74220 01 2 2 5 1 1 1 1 1 7
62	Machine	1,0 m³				0,2	CIC	0,2 tons	I	2	3650	7300	4300	8600	1976	74220 01 2 2 5 1 1 1 1 1 2

Note : a) Max. component weight for machines, plate thickness for plate fabricated equipments.

Note: All unit component weight for each item, date, thickness for date indicated equipment.

Item No.	Part No.	Part Name	Unit	QTY	Unit Cost	Total Cost	Part No.	Part Name	Unit	QTY	Unit Cost	Total Cost
50	6021107	PLATE	PLATE	2	60700	121400	6021107	PLATE	PLATE	1	3000	3000
51	6021107	PLATE	PLATE	2	5500	11000	6021107	PLATE	PLATE	1	3700	3700
52	6021107	PLATE	PLATE	2	3100	6200	6021107	PLATE	PLATE	1	2400	2400
53	6021107	PLATE	PLATE	1	2500	2500	6021107	PLATE	PLATE	1	3000	3000
54	6021107	PLATE	PLATE	1	1500	1500	6021107	PLATE	PLATE	1	2250	2250
55	6021107	PLATE	PLATE	2	1000	2000	6021107	PLATE	PLATE	2	2400	4800
56	6021107	PLATE	PLATE	1	94000	94000	6021107	PLATE	PLATE	1	151000	151000
57	6021107	PLATE	PLATE	2	24000	48000	6021107	PLATE	PLATE	2	151000	302000
58	6021107	PLATE	PLATE	2	200000	400000	6021107	PLATE	PLATE	2	151000	302000
59	6021107	PLATE	PLATE	2	6700	13400	6021107	PLATE	PLATE	2	7000	14000
60	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
61	6021107	PLATE	PLATE	1	1500	1500	6021107	PLATE	PLATE	1	1700	1700
62	6021107	PLATE	PLATE	2	1000	2000	6021107	PLATE	PLATE	2	2400	4800
63	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
64	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
65	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
66	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
67	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
68	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
69	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
70	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
71	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
72	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
73	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
74	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
75	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
76	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
77	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
78	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
79	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
80	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
81	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
82	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
83	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
84	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
85	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
86	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
87	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
88	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
89	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
90	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
91	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
92	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
93	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
94	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
95	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
96	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
97	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
98	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
99	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900
100	6021107	PLATE	PLATE	1	2700	2700	6021107	PLATE	PLATE	1	2900	2900

UNITED STATES GOVERNMENT

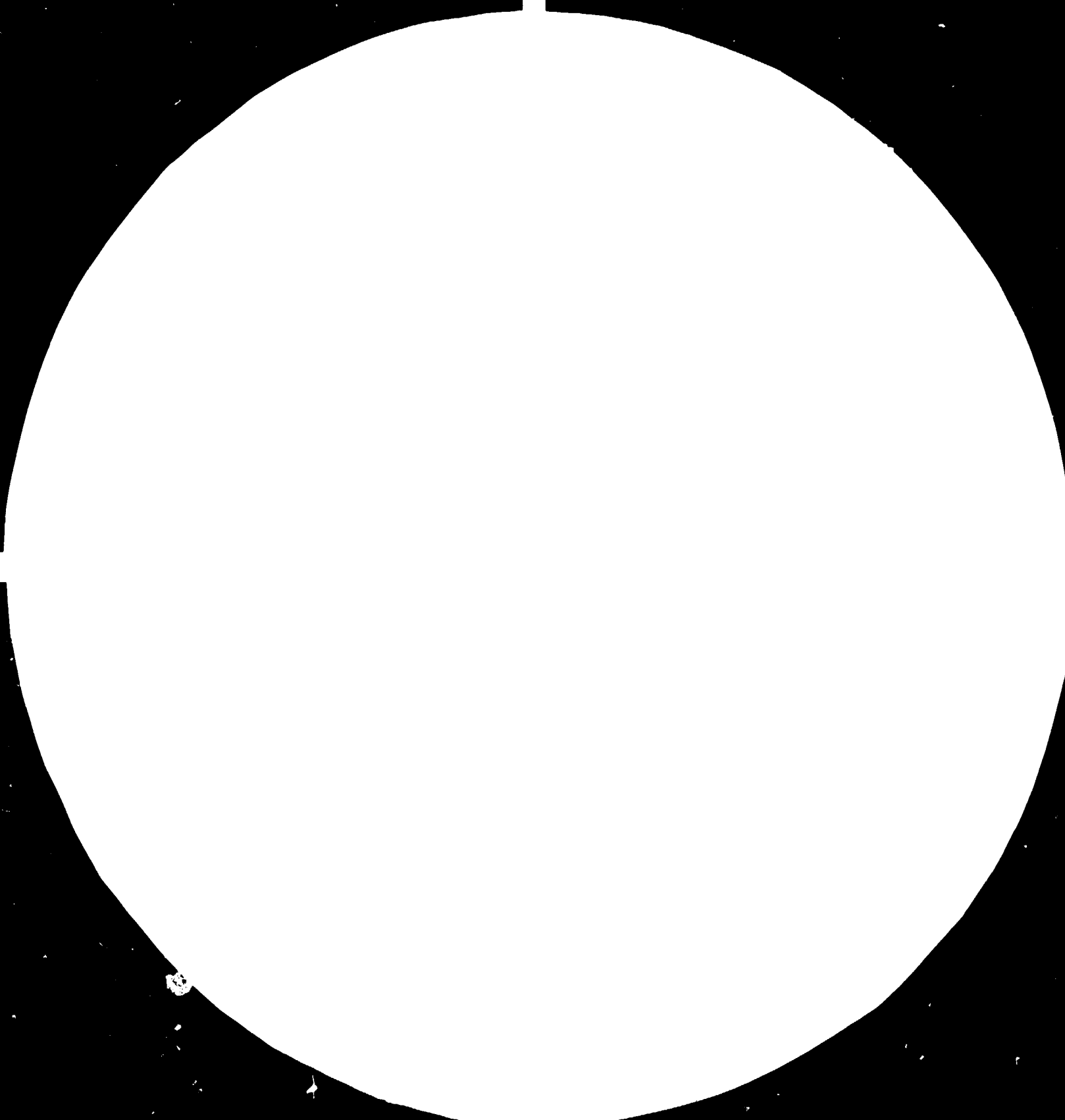
UNITED / SPOI(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW VINYL CHLORIDE MONOMER PLANT, CAPACITY =105
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1993
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994
74161 05112 91211	XL CCL.OVHD. CONDENSER	1	1.0	4.3		1.0		
74161 05124 92211	SECOND ST.QUEN.GASES CON.	1	14.4	37.3		14.4		
74161 05124 92211	SECCND ST.QUEN.GASES CON.	1	14.4	37.3		14.4		
74161 05150 83212	ECC SECONDARY AIR CONDEN.	1	20.0	50.1		20.0		
74161 05150 83212	EDC SECONDARY AIR CONDEN.	1	20.0	50.1		20.0		
74161 05200 23212	HCL CGL.OVHD.CONDENSEA	1	22.0	72.4		22.0		
74161 05200 23212	HCL CCL.OVHD.CONDENSEA	1	22.0	72.4		22.0		
74161 05213 91212	SECCND STA.EDC AIR HEATER	2	4.0	32.9		8.0		
74161 05230 84212	CHLGRIN.PRIMARY AIR CONO.	1	45.8	55.4		45.8		
74161 05230 84212	CHLGRIN.PRIMARY AIR CONO.	1	45.8	55.4		45.8		
74161 05244 82212	FIRST ST.QUEN.GASES COND.	1	39.7	79.3		39.7		
74161 05244 82212	FIRST ST.QUEN.GASES COND.	1	39.7	79.3		39.7		
74161 05244 83212	L.H. CCL.OVHD.AIR CONDEN.	1	40.6	94.4		40.6		
74161 05244 83212	L.H. CCL.OVHD.AIR CONDEN.	1	40.6	94.4		40.6		
74161 05244 84212	H.M CGL.OVHD.AIR CONDEN.	2	46.6	116.2		93.2		
74161 05244 84212	H.M CGL.OVHD.AIR CONDEN.	2	46.6	116.2		93.2		
74161 05254 83412	FIRST STA.EDC AIR HEATER	2	4.0	32.9		8.0		
74161 05254 83412	FIRST STA.EDC AIR HEATER	2	17.8	99.2		35.6		
74161 05254 83412	FIRST STA.EDC AIR HEATER	2	17.8	99.2		35.6		
74161 05254 93211	VC CCL.OVHD. CONDENSEA	1	16.2	56.1		16.2		
74161 05254 93211	VC CCL.OVHD. CONDENSEA	1	16.2	56.1		16.2		
74161 07111 41212	PNEU.CONVEYCR I.G HEATER	1	.2	1.2		.2		
74161 07111 41212	NITROGEN HEATER	1	.2	1.5		.2		
74161 07111 41212	PNEU.CONVEYOR I.G HEATER	1	.2	1.2		.2		
74161 07111 41212	NITROGEN HEATER	1	.2	1.5		.2		
74161 07112 41212	FIRST STA.ETHY.FEED HEAT.	1	.5	3.0		.5		
74161 07112 41212	FIRST STA.ETHY.FEED HEAT.	1	.5	3.0		.5		
74161 07113 41212	AIR HEATER	2	.8	5.1		1.6		
74161 07113 41212	FIRST STA.HCL FEED HEATER	1	1.0	5.1		1.0		
74161 07113 41212	SECCND STA.ETH.FEED HEAT.	1	.4	2.6		.4		
74161 07113 41212	SECCND STA.ETH.FEED HEAT.	1	.4	2.6		.4		
74161 07113 41212	FIRST STA.HCL FEED HEATER	1	1.0	5.1		1.0		
74161 07113 41212	AIR HEATER	2	.8	5.1		1.6		
74161 07113 91211	RICH GIL HEATER	1	4.7	19.7		4.7		
74161 07113 91211	RICH OIL HEATER	1	4.7	19.7		4.7		
74161 07114 41212	SECOND STA.HCL FEED HEAT.	1	.9	4.8		.9		
74161 07114 41212	SECOND STA.HCL FEED HEAT.	1	.9	4.8		.9		
74161 07114 41212	RECY. INERT GAS HEATER	2	.4	3.0		.8		
74161 07114 41212	RECY. INTERT GAS HEATER	2	.4	3.0		.8		
74161 07211 91211	PURE EDC HEATER	1	3.2	16.0		3.2		
74161 07211 91211	PURE EDC HEATER	1	3.2	16.0		3.2		
74161 07213 91211	PURE EDC STEAM HEATER	1	4.2	18.5		4.2		
74161 07213 91211	PURE EDC STEAM HEATER	1	4.2	18.5		4.2		
74161 09032 12221	EDC VAPORIZER	1	47.9	116.2		47.9		
74161 09032 12221	EDC VAPORIZER	1	47.9	116.2		47.9		
74161 10112 91211	DRYING CGL.FEED PREHEATER	1	1.3	9.7		1.3		
74161 10112 91211	DRYING CGL.FEED PREHEATER	1	1.3	9.7		1.3		
74161 10113 91211	DRY.CCL. PREHEATER	1	.1	7.7		.1		
74161 10113 91211	DRY.CCL. PREHEATER	1	.1	7.7		.1		
74164 01400 31212	DRYING CGLUMM	1	7.0	43.6	7.0			
74164 01400 31212	DRYING CGLUMM	1	7.0	43.6	7.0			
74164 01411 32211	VC DRIER	2	6.2	8.9	12.4			
74164 01411 32211	VC DRIER	2	6.2	8.9	12.4			
74164 40201 90202	ND INERT GAS DRYERS	1	.0	13.7	.0			
74164 40201 90202	NP INERT GAS DRYERS	1	.0	13.7	.0			
74165 05104 21211	NACH SCRUBBER	1	1.9	8.3	1.9			
74165 05104 21211	NACH SCRUBBER	1	1.9	8.3	1.9			
74165 08112 11612	QUEN MIXER	1	.8	6.5	.8			
74165 08112 11612	QUENCH MIXER	1	.8	6.5	.8			

000TON/YEAR

94	1995	1996	1997	1998	1999	2000	TOT_ME
**	*****	*****	*****	*****	*****	*****	*****
							1.0
							14.4
							14.4
							20.0
							20.0
							22.0
							22.0
							8.0
							45.8
							45.8
							39.7
							39.7
							40.6
							40.6
							93.2
							93.2
							8.0
							35.6
							35.6
							16.2
							16.2
							.2
							.2
							.2
							.2
							.5
							.5
							1.6
							1.0
							.4
							.4
							1.0
							1.6
							4.7
							4.7
							.9
							.9
							.8
							.8
							3.2
							3.2
							4.2
							4.2
							47.9
							47.9
							1.3
							1.3
							.1
							.1
							7.0
							7.0
							12.4
							12.4
							.0
							.0
							1.9
							1.9
							.8
							.8







28

25

32

22

36

20



18

16



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

U.S. GOVERNMENT PRINTING OFFICE: 1963 O 352-103

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12167
(6 of 17)

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry

Vol V - Technical data for
(PVC) Polyvinyl Chloride

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol. V - Technical data for
(PVC) Polyvinyl Chloride

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial Development Organization which does not, therefore, necessarily share the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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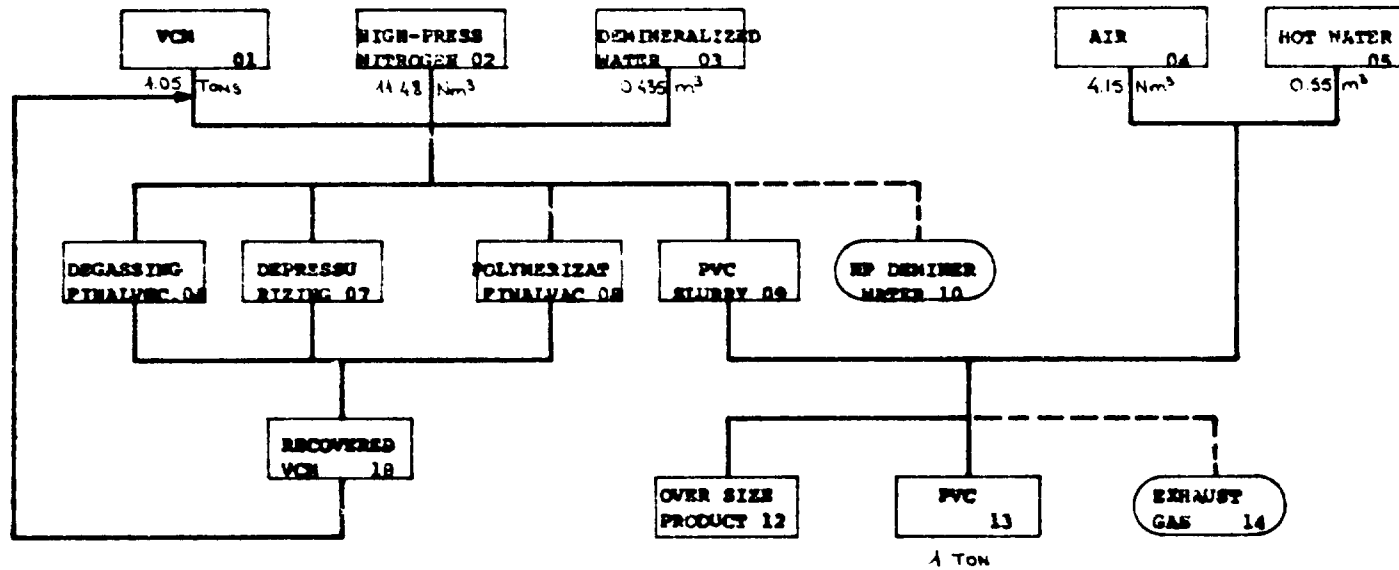
VOL.V

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Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.



SYNTHETIC RESINS etc	IND CODE
PVC	3513-4
UNIDO/SPO (PETKİM)	
CAPITAL GOODS DEV. PROJECT	
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
26.11.1981	A. AKSU
DRAWN BY	CHECKED BY
D. ALIYEV	S. KYSKIN
CHECKED BY	APPROVED BY



PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND ACTIVITIES

FOR PVC PLANT

- 01 TO 09 POLYMERIZATION
- 09 TO 13 SUSPENSION DRYING
- 06 TO 11 VCM RECOVERY

Rev.	Tarih	İsmi

Petkim 113/P/3 B-2/1980

Rev	Tarih	İst



PETKIM PETROKIMYA A.Ş.

UNIDO/SPO (PTEKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

IND.CODE: 3513-4
IND.NAME: SYNTHETIC RESINS, PLASTIC
MATERIALS AND MAN-MADE FIBERS-PVC

INDUSTRY ACTIVITIES CHART
PART 4- PVC

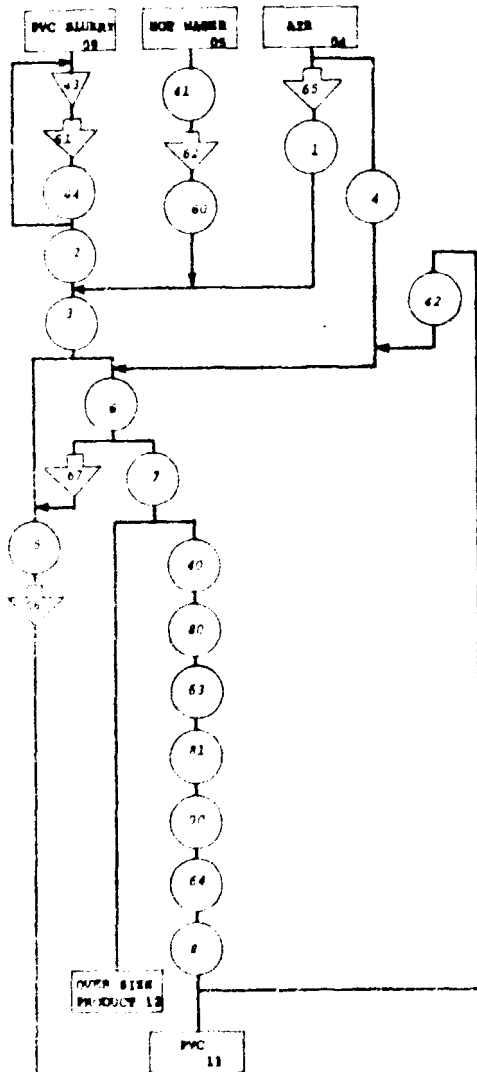
PROD. LINE	PRODUCED	TECH. CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
09	PVC SLURRY	1	BULK POLYMERIZATION	BATCH POLYMERIZER	5-20 m ³	1	5 m ³
						2	7.8 m ³
						3	20.0 m ³
						4	10 m ³
						5	23.6 m ³
						6	65 m ³
		2	SUSPENSION POLYMERIZATION	BATCH POLYMERIZER	10-100 m ³	1	100 m ³
						2	10 m ³
						3	40 m ³
						4	65 m ³
						5	100 m ³
						6	100 m ³
13	PVC	1	SUSPENSION DRYING	FLUID BED DRYER	1-20 t/hr	1	0.9 t/hr
						2	4.7 t/hr
						3	12.3 t/hr
						4	18 t/hr
						5	0.9 t/hr
						6	9.0 t/hr
		2	EMULSION DRYING	SPRAY DRYER	1-10 t/hr	1	4.5 t/hr
						2	9.0 t/hr
						3	9.0 t/hr
						4	9.0 t/hr
						5	9.0 t/hr
						6	9.0 t/hr
11	RECOVERED VCM	1	VCM RECOVERY	DEASSENT COLUMN	0,1-10 m ³	1	0.1 m ³
						2	0.9 m ³
						3	6.0 m ³
						4	10.0 m ³

PREPARED BY	CHECKED BY	APPROVED BY
S. KESKIN		

Rev	DATE	BY



PETKIM PETROKIMYA A.Ş.



EXHAUST GAS 14

28 TO 13 SUSPENSION DRYING

NO	MACHINE CODE	MACHINE NAME	TYPE	CAP
41	92110911221211	Hot Water Exp. PUMP	2	2
42	92111421321213	Hopper above bag St.1	1	1
43	52111411321213	PVC Recycle Hopper	1	1
44	41610701411402	Drying Air Heater	1	1
45	43460201311413	Dryer Steam Inj.heat	1	1
46	42200131311712	Centrifuge Feed P.	4	4
47	43200141211112	Hot Water Circ. P.	4	4
48	43511000321212	Centrifuge	1	1
49	41544210013112	Fluid bed Dryer	1	1
50	43614001011702	PVC Convey Air Fan	1	1
51	4161111011602	Prod. Recovery Fan	1	1
52	4161111011602	Dry PVC Cyclone	1	1
53	4161111011602	Metal Separator	-	-
54	NO AVAILABLE DATA	Centrifuge feed R.	-	-
55	728110611010702	Vibrating Screen	6	6
56	748140402011722	Manual Ballasting	1	1
57	744240102020002	Belt CONVEYOR	1	1
58	NO AVAILABLE DATA	Sloping Belt Conv.	-	-
59	743420091111112	Drying Air Blower	1	1
60	743420091111112	Dryer Exhaust Fan	1	1
61	743420091111112	Dry PVC Cyclone Exh.	1	1
62	60241071321212	Slurry Tank	4	4
63	OMITTED	Bagging Station	-	-
64	OMITTED	St. Control Seals	-	-

UNIDO (SIN) (PETKIM)
CAPITAL GROWTH DEVELOPMENT PROJECT
NOCULAR PROCESS FLOW DIAGRAM

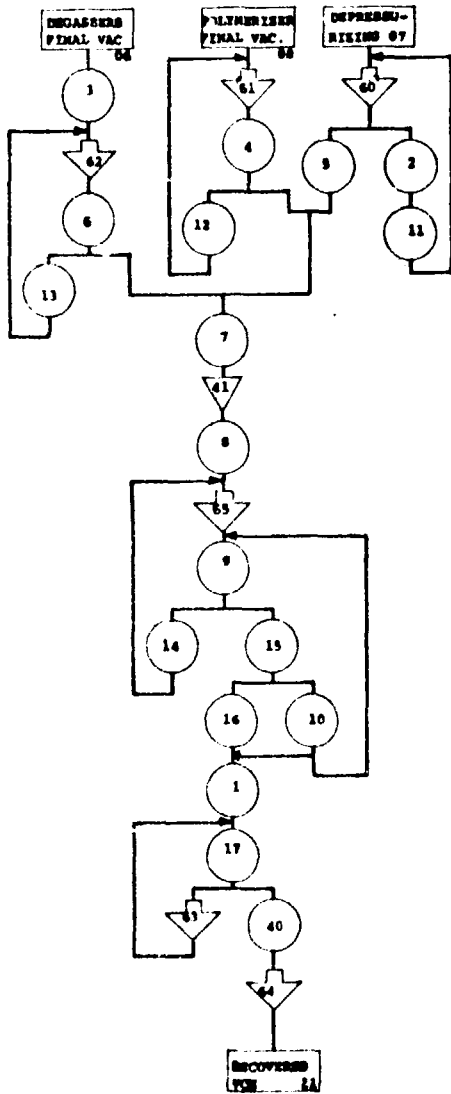
INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RESIN	PVC	SUSPENSION DRY.
DATE	SAMPLE SLAB	CAPACITY
27.11.1981	ATLANTA	4.7 T/D
PREPARED BY	DRAWN BY	CHECKED BY
S. KASIM	B. ALTUN	S. KASIM

Rev	Tarih	Isim



PETKİM PETROKİMYA A.Ş.

Proje No: 22733 An-3/1991



00 99 11 VCM RECOVERY

INDUSTRY	PRODUCT	TRCH	CAP.
ACTIVITY CODE: 3811-4	11	1	2
NO	MACHINE CODE	MACHINE NAME	Q
1	741860111421211	Pressing Column	1
2	741823011101211	Initial Vac. P. Sep.	1
3	741823011101211	Poly Vac. Foam Sep.	2
4	741823011101211	Poly Vac. Pump Sep.	1
5	741823011101211	Depressurizing P.A.	1
6	741823011101211	Degas Final Vac. P. Sep.	1
7	OMITTED	Flame Arrestor	-
8	OMITTED	Flame Arrestor	-
9	741823011101211	VCM Compr. Sep.	1
10	741820411001211	Cond. VCM Mat. Dec.	1
40	892410520121211	Recovered VCM St. H.	1
11	741810321111211	Ini. Vac. Pump Cooler	1
12	741810321111211	Poly Vac. Pump Cooler	1
13	741810311111211	Deg. Vac. Pump Cooler	1
14	741810321111211	VCM Comp. Cooler	1
15	741810521111211	1st. St. VCM Cond.	1
16	OMITTED	2nd. St. VCM Cond.	-
17	741810201111211	Deg. Clm. Reboiler	1
60	743122311211112	Initial Vac. Pump	2
61	743122311211112	Poly Final Vac. Pump	1
62	743122311211112	Deg. Final Vac. Pump	1
63	742200111111111	Hot Water Circ. Pump	2
64	742200111111112	Recov. VCM Tran. Pump	2
65	74311241122111112	VCM Compressor	2
41	892410341125211	Gas Holder	1

UNIDO/SPC (PETKİM)

CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RES.	RECOVERED VCM	VCM RECOVERY
DATE	SAMPLE PLANT	CAPACITY
14.11.1991	ALMAGA	0.9 m ³
PREPARED BY	DRAWN BY	CHECKED BY
S. AKIN	R. ALTUN	S. KEMAL
CHECKED BY	APPROVED BY	

Item No.	Equipment Name	Capacity	Material	Temp.	Pressure	Height	Weight	Material	Thickness	Notes	QTY	Unit	Material	Weight	Material	Thickness	Notes	QTY	Unit						
1	Polymerizer	23,36 m ³	P: 22 Kg/cm ²	Catalytic	SM	19,3		CS	27 mm		15	I	131000	1965000	1976	74165	06	1	2	1	1	3	2		
2	Slurry degas sling vessel	25,4 m ³	P: 6 Kg/cm ²	Non Catalytic	Supports	20		CS	16 mm		3	I	117050	336150	1976	74165	99	1	2	9	3	2	1	2	
3	Condensate Receiver	4,07 m ³	-	Temp: 60C	Cv	2		CS	10 mm		3	T	6300	18900	1976	60241	04	1	0	3	2	1	1	1	
4	Surge Drum	30,72 m ³	-	Temp: 50C	Cv	17,2		CS	14 mm		1	T	37750	37750	1976	69241	05	1	0	3	2	3	2	1	1
5	Injection Pump	20 lt	-	Temp: 60C	Cv	0,1		SS	4 mm		15	I	1350	20250	1976	69241	05	1	0	3	2	1	0	1	2
6	Deaerator	240,70 m ³	Dia: 6 m	Temp: 40C	Cv	4		CS	5 mm		1	T	10300	10300	1976	69211	07	2	3	2	3	2	1	1	1
7	Injection Tank	54,44 m ³	Dia: 3,4 m	Temp: 50C	Cv	7		SS	6 mm		1	I	30000	30000	1976	69211	07	1	1	3	2	6	1	2	1
8	Injection Tank	21,54 m ³	Dia: 2,8 m	Temp: 50C	Cv	2,5		AS	6 mm		1	I	12500	14750	1976	69211	07	1	1	3	2	1	4	1	2
9	Injection Tank	10 m ³	Dia: 2 m	Temp: 50C	Cv	1,8		SS	6 mm		1	I	11700	11700	1976	69211	07	1	1	3	1	0	1	2	1
10	Solution N storage tank	0,95 m ³	Dia: 1 m	Temp: 90C	Cv	0,5		SS	4 mm		1	I	5850	5850	1976	69211	07	1	1	3	2	1	6	1	2
11	Injection Tank	6 t/hr	WH: 21 m	HCLC	H	0,8		CS	0,8 T		15	I	1850	27750	1976	74240	02	2	1	2	1	1	2	1	2
12	Condenser	HS: 9,54 m ²	Dia: 0,5 m	TL: 3,5 m	H	8,3		CS	8 mm		3	T	21700	65100	1976	74101	05	1	2	1	2	2	1	1	1
13	Condenser	HS: 117,14 m ²	Dia: 0,9 m	TL: 6,4 m	H	20,8		CS	10 mm		3	T	40200	120600	1976	74101	05	4	1	4	1	2	2	1	1
14	VCM Pump	75 m ³ /h	WH: 61,2 m	Corrosive	H	0,8		CI	0,8 T		2	I	4500	9000	1976	74220	01	3	5	1	1	1	1	1	2
15	Additive so- lution pump	5,6 m ³ /h	WH: 150 m	"	H	0,25		SS	0,75 T		2	I	5500	11000	1976	74220	01	2	4	5	1	1	7	1	2
16	Polymerizer	150 m ³ /h	WH: 19 m	HCLC	H	0,33		CI	0,30 T		15	I	6000	90000	1976	74220	01	4	1	2	1	1	1	1	2
17	Slurry trans- fer pump	100 m ³ /h	WH: 26,6 m	Corrosive	H	0,30		SS	0,30 T		4	I	17300	69200	1976	74220	01	4	2	5	1	1	7	1	2
18	VCM Pump	86,2 m ³ /h	WH: 30 m	CCLC	H	0,13		SS	0,13 T		2	I	5300	10600	1976	74220	01	3	2	1	1	1	7	1	2
19	VCM Pump	17,2 m ³ /h	WH: 205 m	CCLC	H	0,17		SS	0,17 T		2	I	14300	28600	1976	74220	01	3	5	1	1	1	7	1	2
20	VCM Pump	120 m ³ /h	WH: 25 m	CCLC	H	0,21		SS	0,21 T		2	I	6500	13000	1976	74220	01	4	2	1	1	1	7	1	2
21	VCM Pump	17,2 m ³ /h	WH: 203 m	CCLC	H	0,22		SS	0,22 T		2	I	14300	28600	1976	74220	01	3	5	1	1	1	7	1	2
22	VCM Pump	15 m ³ /h	WH: 28,5 m	HCLC	H	0,15		CS	0,15 T		3	I	4500	13500	1976	74220	01	3	2	1	1	0	1	2	
23	Solution N Pump	1 m ³ /h	WH: 150 m	Corrosive	H	0,22		SS	0,22 T		2	I	2000	4000	1976	74220	01	2	4	5	1	1	7	1	2
24	VCM Filter	75 m ³ /h	Dia: 0,4 m	-	-	0,18		SS	-		3	I	2700	8100	1976	74362	13	4	1	0	1	7	0	2	
25	Polymer sep- arator cyclone	2,4 m ³	Dia: 1,2 m	-	SZ	0,97		NSCD Steel	-		3	I	9300	27900	1976	74361	11	1	0	1	1	9	0	2	
26	Additive so- lution filter	5,6 m ³ /h	Dia: 0,2 m	-	-	0,04		SS	-		1	I	1300	1300	1976	74362	13	1	1	0	1	0	1	6	0

Note: a) Max. component weight for each case, plate, thickness for plate fabricated equipments.

Item No.	Basic Machine Designation	Major Spec (Capacity)	Major Spec (Original)	Major Spec (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (d)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code									
											Unit	Total	Unit	Total		12745	67	8	9	10	11	12	13	14	
9	Solution N Filter	-	Dia:0,5 m	P:18,3	-	0,1	SS		I	1	1300	1300	1500	1500	1976	74362	13	0	1	1	0	1	6	0	2
43	Demin. water Drum	OMITTED														OMITTED									
5	Soln. N Cooler	OMITTED														OMITTED									
72	Soln. "N" Pump	OMITTED														OMITTED									
49	Soln Storage tank	OMITTED														OMITTED									
30	Measuring Scale	OMITTED														OMITTED									

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

No.	Description	Unit	Spec. 1	Spec. 2	Type	Manuf. Char. 1	Manuf. Char. 2	Manuf. Char. 3	Origin	Q.	Purchase Cost		Ct. 1960 Cost		Yr.	SITC Code										
											Unit	Total	Unit	Total		12145	12146	12147	12148	12149	12150	12151	12152	12153	12154	12155
1	Degassing column	0,9 m ³	P: 7 atm.	Temp: 150c	PM	1,3	CS	6 mm	T	1	5300	5300	6950	6950	1976	7416603	1	1	4	2	1	2	1	1	1	
2	Initial vacuum pump	1,44 m ³	Dia: 0,7 m	P: 2 Kg/cm ²	-	0,7	CS	6 mm	T	1	3150	3150	3700	3700	1976	74362	301	1	1	0	1	2	1	1	1	
3	Polymerizer	2,4 m ³	Dia: 1,2 m	P: 2 Kg/cm ²	-	1,2	CS	8 mm	T	2	4500	9000	5300	10600	1976	74362	301	1	1	0	1	2	1	1	1	
4	Polymerizer	1,5 m ³	Dia: 1,0 m	P: 2 Kg/cm ²	-	0,6	CS	6 mm	T	1	2800	2800	3300	3300	1976	74362	301	1	1	0	1	2	1	1	1	
5	Degassing column	4,9 m ³	Dia: 1,2 m	P: 2 Kg/cm ²	-	0,8	CS	6 mm	T	1	3300	3300	3900	3900	1976	74362	301	1	1	0	1	2	1	1	1	
6	Degassing column	0,67 m ³	Dia: 0,7 m	P: 2 Kg/cm ²	-	0,7	CS	6 mm	T	1	3150	3150	3700	3700	1976	74362	301	1	1	0	1	2	1	1	1	
7	Flame arrestors	OMITTED													1976	OMITTED										
8	VCM compressor	2,1 m ³	Dia: -	P: 7 Kg/cm ²	-	1,4	CS	9 mm	T	1	4900	4900	5800	5800	1976	74362	301	1	1	0	1	2	1	1	1	
9	Condensate pump	1 l/hr	Dia: 1 m		-	0,5	CS	17 mm	T	1	2500	2500	2950	2950	1976	74362	041	1	0	0	1	2	1	1	1	
10	Decanter	10,2 m ³		Temp: 50c	Cy	18,0	CS	11 mm	T	1	8800	8800	10400	10400	1976	69241	052	0	3	2	3	2	1	1	1	
11	Refrigerator	HS: 23,74m SD: 0,46m TL: 4,5m			FST	2,8	CS	8 mm	T	1	11500	11500	13900	13900	1976	74161	032	1	2	1	1	2	1	1	1	
12	Refrigerator	HS: 25,49m SD: 0,46m TL: 4,5m			FST	2,8	CS	8 mm	T	1	11500	11500	13900	13900	1976	74161	032	1	2	1	1	2	1	1	1	
13	Refrigerator	HS: 1,78m SD: 0,25m TL: 5,5m			FST	0,7	CS	8 mm	T	1	3800	3800	4600	4600	1976	74161	031	1	3	1	1	2	1	1	1	
14	VCM compressor or cooler	HS: 19,84m SD: 0,5 m TL: 6 m			FST	1,8	CS	8 mm	T	1	8400	8400	10200	10200	1976	74161	032	1	3	1	1	2	1	1	1	
15	Water VCM Condenser	HS: 30,02m SD: 0,7 m TL: 6 m			FST	3,3	CS	8 mm	T	1	12300	12300	14900	14900	1976	74161	052	1	3	1	1	2	1	1	1	
16	Degassing column		SD: 2,6 m	TL: 1,7m	FST	0,4	CS	8 mm	T	1	2000	2000	2400	2400	1976	74161	030	1	1	1	1	2	1	1	1	
17	Initial vacuum pump	1620 m ³ /hr	P: 1,05 Kg/cm ²	Air+N ₂	H	1,44	CI	1,40 tons	I	2	17800	35600	21000	42000	1976	74312	233	1	2	1	1	1	1	1	2	
18	Polymerizer	1000 m ³ /hr	P: 1,10 Kg/cm ²	VCM+N ₂	H	1,44	CI	1,40 tons	I	3	11800	35400	13900	41700	1976	74312	233	1	2	1	1	1	1	1	2	
19	Degassing column	200 m ³ /hr	P: 1,10 Kg/cm ²	VCM+N ₂	H	0,17	CI	0,15 tons	I	3	2800	8400	3300	9900	1976	74312	232	1	2	1	1	1	1	1	2	
20	Hot water circulation pump	25 m ³ /hr	WH: 11 m	WCLC	H	0,15	CI	0,15 tons	T	2	2300	4600	2700	5400	1976	74320	013	1	1	1	1	1	1	1	1	
21	Recovery VCM transfer pump	20 m ³ /hr	WH: 9 m	Corrosive	H	0,5	Steel	0,5 tons	I	2	6800	13600	8000	16000	1976	74220	013	3	5	1	1	9	1	2	1	
22	VCM compressor	890m ³ /min	P: 7,8 Kg/cm ²	VCM+N ₂	H	0,65	SS	0,6 tons	I	2	76650	153300	92750	185500	1976	74313	203	2	2	1	1	7	1	2	1	
23	Gas holder	1500 m ³	P: 1 atm.	Temp: 20c	Cy	95,2	CS	8 mm	T	1	47800	47800	56400	56400	1976	69243	034	1	3	2	5	2	1	1	1	
24	2 nd stage VCM Condenser	OMITTED																								

Note: 1) Net equipment weight for machines, plate thickness for plate fabricated equipments.

No.	Basic Machine Name-Model	Water Temp Capacity	Major Spec Original	Water Spec Original	Type Description	Manufac. Char. 1. (DIMS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	2	Purchase Cost		Ct. 1980 Cost		Proc. Year	SITC Code									
											Unit	Total	Unit	Total		12145	6749	11	12	13	14	15	16	17	18	19	20
41	Hot water expansion drum	0,1 m ³	Dia: 0,4m	Temp: 120c	Cy	0,1	CS	6 mm	T	3	100	300	120	360	1976	69211	05	1	1	2	2	1	2	1	1
42	Hot water raising tank	72 m ³	Dia: 4,5m	Temp: 20c	Cy	14	CS	5 mm	I	3	61800	185400	72900	218700	1976	69211	14	2	1	3	2	1	2	1	2
43	PVC recycle hopper	0,23 m ³	Dia: 0,7m	Temp: 20c	Cy	0,05	CS	2 mm	I	3	650	1950	800	2400	1976	69211	14	1	1	1	2	1	2	1	2
44	Slurry tank	100 m ³	Dia: 5,5m	Temp: 60c	Cy	13	SS	5 mm	I	6	56025	339750	66800	400800	1976	69241	07	1	2	3	2	3	6	1	2
45	Drying air heater	HS: -	SD: 0,4 m	TL: 4 m	FST	3	AS	-	I	3	Included in H ₂ O ₂	-	-	-	1976	74161	07	0	1	4	1	1	4	0	2
46	Dryer steam injector	-	WH: 47 m	HCLC	H	0,1	CS	0,1 ton	I	3	2000	6000	2400	7200	1976	74240	02	0	2	2	1	1	6	1	2
47	Centrifuge feed pump	21,3 m ³	WH: 19,6 m	Corrosive	H	0,6	SS	0,6 ton	I	4	17300	69200	20400	81600	1976	74220	01	3	1	5	1	1	7	1	2
48	Hot water circulation pump	25,6 m ³	WH: 19,7 m	HCLC	H	0,6	GIC	0,6 ton	I	4	8200	32400	9700	38800	1976	74220	01	4	1	2	1	1	1	1	2
49	Drying air blower	229,2 m ³ /min	PH: 0,153 Kg/cm ²	Air	Straight blow	0,8	SS	0,8 ton	I	3	Included in H ₂ O ₂	-	-	-	1976	74342	00	5	1	1	1	1	7	1	2
50	Dryer exhaust fan	380 m ³ /min	WH: 400 mm	Air	Exhaust	0,8	CS	0,8 ton	I	3	78600	254800	92750	278750	1976	74341	00	5	6	1	3	1	6	1	2
51	Dry PVC cyclone exhaust	-	WH: 1100mm	Air	Exhaust	0,5	SS	0,5 ton	I	3	Included in H ₂ O ₂	-	-	-	1976	74341	00	1	9	1	3	1	7	1	2
52	Centrifuge	-	-	-	Aut. Batch	5,6	SS	15 mm	I	3	157000	471000	185300	555900	1976	74351	10	0	0	0	3	2	6	1	2
53	Fluid bed dryer	5,25 t/hr	-	-	Single atm	14	SS	3 mm	I	3	36100	108300	42600	127800	1976	74164	02	3	0	0	1	3	6	1	2
54	PVC conveying air filter	-	Dia: 0,9m	-	SZ	0,08	SS	-	I	3	Included in H ₂ O ₂	-	-	-	1976	74361	40	0	1	0	1	1	7	0	2
55	Product recovery cyclone	0,8 t/h	Dia: 1,9m	-	SZ	0,7	SS	-	I	3	" "	-	-	-	1976	74361	11	1	1	0	1	1	6	0	2
56	Dry PVC cyclone	5,7 t/h	Dia: 1,6m	-	SZ	0,3	SS	-	I	3	" "	-	-	-	1976	74361	11	1	1	0	1	1	6	0	2
57	Vibrating Screen	3,975 t/h	SD: 0,25mm	-	OT	-	SS	-	I	6	3750	27500	4600	26400	1976	72831	06	1	1	0	1	0	7	0	2
58	Manuel palletizing	-	Dia: 7,20m	-	Pallet Drum	2,7	SS	2,0 ton	I	3	5800	15000	2500	19400	1976	74334	04	0	2	6	1	1	7	2	2
59	1 st Belt conveyor	-	Width: 560 mm	-	PDP	-	Z	-	I		1900	11400	4500	13500	1976	74426	01	0	2	0	2	0	0	0	2
60																									
61																									

... ..

UNICC / SPCIPETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW POLYVINYL CHLORIDE PLANT,CAPACITY =100 000TON/YEAR
LOCATION=YILDIRTALIK
ANTICIPATED DATE OF COMMISSIONING= 1993
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EDP-DEPARTMENT-PETNIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CC	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
74362	13C11 C1602 SOLUTION N.FILTER	1	.1	1.5				1.5							1.5
74362	13110 C1602 ADDITIVE SOLUTION FILTER	1	.1	1.5				1.5							1.5
74362	3C111 C1211 POLYM.VAC.PUMP SEPARATOR	1	.6	3.3				3.3							3.3
74362	3C111 C1211 DEFRES.ROAM SEPARATOR	1	.8	3.9				3.9							3.9
74362	3C111 C1211 VCM COMPRESS SEPARATOR	1	1.4	5.8				5.8							5.8
74362	3C111 C1211 POLYM.VAC.ROAM SEPARATOR	2	1.2	5.3				10.6							10.6
74362	3C111 C1211 DE.FIN.VAC.PUMP SEPARATOR	1	.7	3.7				3.7							3.7
74426	C1C20 2C002 FIRST BELT CONVEYER	3	.0	4.5				13.5							13.5

12167

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry

Vol. VI- Technical data for
(LDPE) Low Density Polyethylene

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034
TURKEY

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol.VI- Technical Data for
(LDPE) Low Density Polyethylene

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
, Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial Development Organization which does not, therefore, necessarily share the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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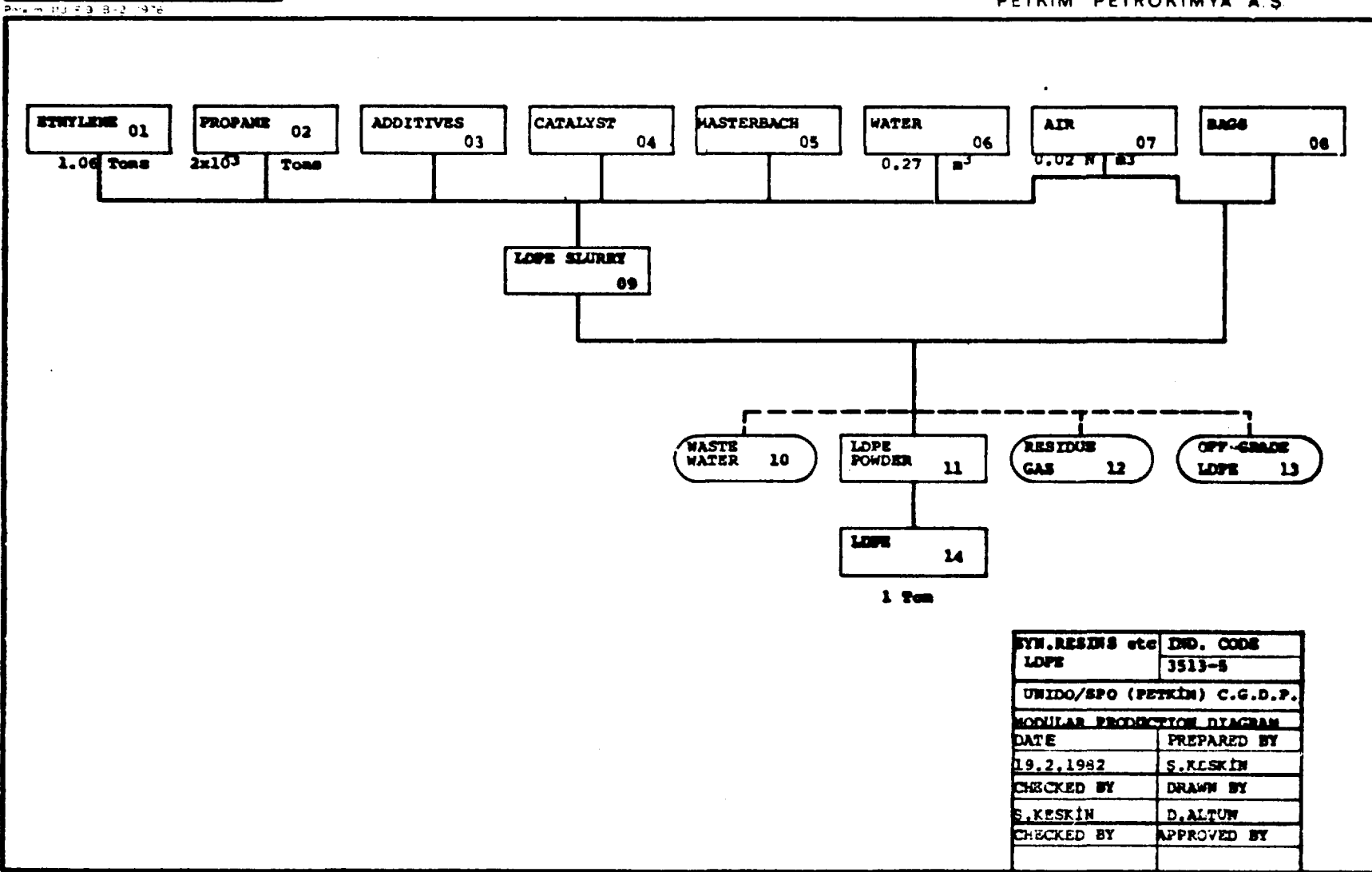
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Rev	Tarih	İsmi



PETKIM PETROKİMYA A.Ş.



SYN.RESINS etc	IND. CODE
LDPE	3513-S
UNIDO/SPO (PETKİM) C.G.D.P.	
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
19.2.1982	S.KESKİN
CHECKED BY	DRAWN BY
S.KESKİN	D.ALTUN
CHECKED BY	APPROVED BY



PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND
ACTIVITIES FOR LOPE PLANT

- 01 TO 09 HP AUTOCLAVE REACTION
- 09 TO 11 BLENDING
- 11 TO 14 PACKING

Rev.	Tarih	Ismi

PKIM-311JF 3 B-2/1980

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.

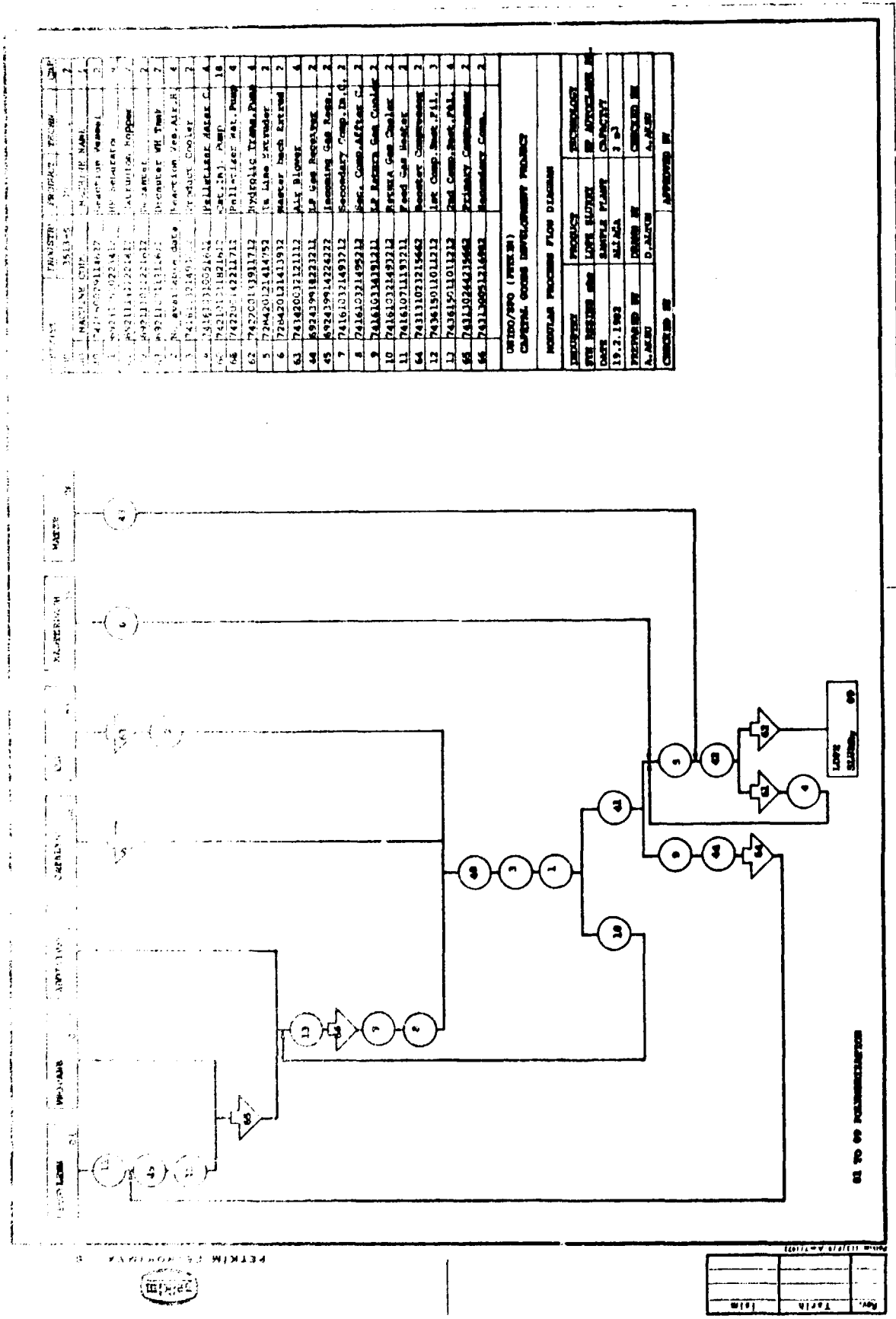
UNIDO/SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT
PROJECT

INDUSTRY ACTIVITIES CHART
(PART 5- LDPE)

IND CODE: 3513-5
IND NAME: SYNTHETIC RESINS, PLASTIC
MATERIALS, etc. LDP

PROC	PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY	
						CODE	CAPACITY
09	LDPE SLURRY	1	HP Autoclave Process	Reaction Vessel	2 - 3 m ³	1	2 m ³
						2	3 m ³
		2	HP Tubular Process	Reaction Vessel	1 - 2 m ³	1	1 m ³
						2	1,5 m ³
11	LDPE POWDER	1	Blending	Blender	10 - 21 t/h	3	2,0 m ³
						1	9 t/h
						2	12,6 t/h
						3	16,2 t/h
						4	18,9 t/h
14	LDPE	1	Automatic Packing	Weighing and Sackfilling machine	10 - 50 t/h	1	9 t/h
						2	18 t/h
						3	27 t/h
						4	45 t/h

PREPARED BY	CHECKED BY	APPROVED BY
S.KESKİM		



NO.	DESCRIPTION	UNIT	QTY
1	REACTOR	REACTOR	1
2	HEAT EXCHANGER	HEAT EXCHANGER	1
3	PUMP	PUMP	1
4	HEAT EXCHANGER	HEAT EXCHANGER	1
5	PUMP	PUMP	1
6	HEAT EXCHANGER	HEAT EXCHANGER	1
7	PUMP	PUMP	1
8	HEAT EXCHANGER	HEAT EXCHANGER	1
9	PUMP	PUMP	1
10	HEAT EXCHANGER	HEAT EXCHANGER	1
11	PUMP	PUMP	1
12	HEAT EXCHANGER	HEAT EXCHANGER	1
13	PUMP	PUMP	1
14	HEAT EXCHANGER	HEAT EXCHANGER	1
15	PUMP	PUMP	1
16	HEAT EXCHANGER	HEAT EXCHANGER	1
17	PUMP	PUMP	1
18	HEAT EXCHANGER	HEAT EXCHANGER	1
19	PUMP	PUMP	1
20	HEAT EXCHANGER	HEAT EXCHANGER	1
21	PUMP	PUMP	1
22	HEAT EXCHANGER	HEAT EXCHANGER	1
23	PUMP	PUMP	1
24	HEAT EXCHANGER	HEAT EXCHANGER	1
25	PUMP	PUMP	1
26	HEAT EXCHANGER	HEAT EXCHANGER	1
27	PUMP	PUMP	1
28	HEAT EXCHANGER	HEAT EXCHANGER	1
29	PUMP	PUMP	1
30	HEAT EXCHANGER	HEAT EXCHANGER	1
31	PUMP	PUMP	1
32	HEAT EXCHANGER	HEAT EXCHANGER	1
33	PUMP	PUMP	1
34	HEAT EXCHANGER	HEAT EXCHANGER	1
35	PUMP	PUMP	1
36	HEAT EXCHANGER	HEAT EXCHANGER	1
37	PUMP	PUMP	1
38	HEAT EXCHANGER	HEAT EXCHANGER	1
39	PUMP	PUMP	1
40	HEAT EXCHANGER	HEAT EXCHANGER	1
41	PUMP	PUMP	1
42	HEAT EXCHANGER	HEAT EXCHANGER	1
43	PUMP	PUMP	1
44	HEAT EXCHANGER	HEAT EXCHANGER	1
45	PUMP	PUMP	1
46	HEAT EXCHANGER	HEAT EXCHANGER	1
47	PUMP	PUMP	1
48	HEAT EXCHANGER	HEAT EXCHANGER	1
49	PUMP	PUMP	1
50	HEAT EXCHANGER	HEAT EXCHANGER	1
51	PUMP	PUMP	1
52	HEAT EXCHANGER	HEAT EXCHANGER	1
53	PUMP	PUMP	1
54	HEAT EXCHANGER	HEAT EXCHANGER	1
55	PUMP	PUMP	1
56	HEAT EXCHANGER	HEAT EXCHANGER	1

Rev.	Form	Date

01 TO 00 PUMP/HEAT EXCHANGER

UNIT/STG (PUMP)

CAPITAL GOODS INVESTMENT PROJECT

NUCLEAR PROCESS FLOW DIAGRAM

PROJECT

DATE

PREPARED BY

CHECKED BY

APPROVED BY

DATE

PROJECT

DATE

PREPARED BY

CHECKED BY

APPROVED BY

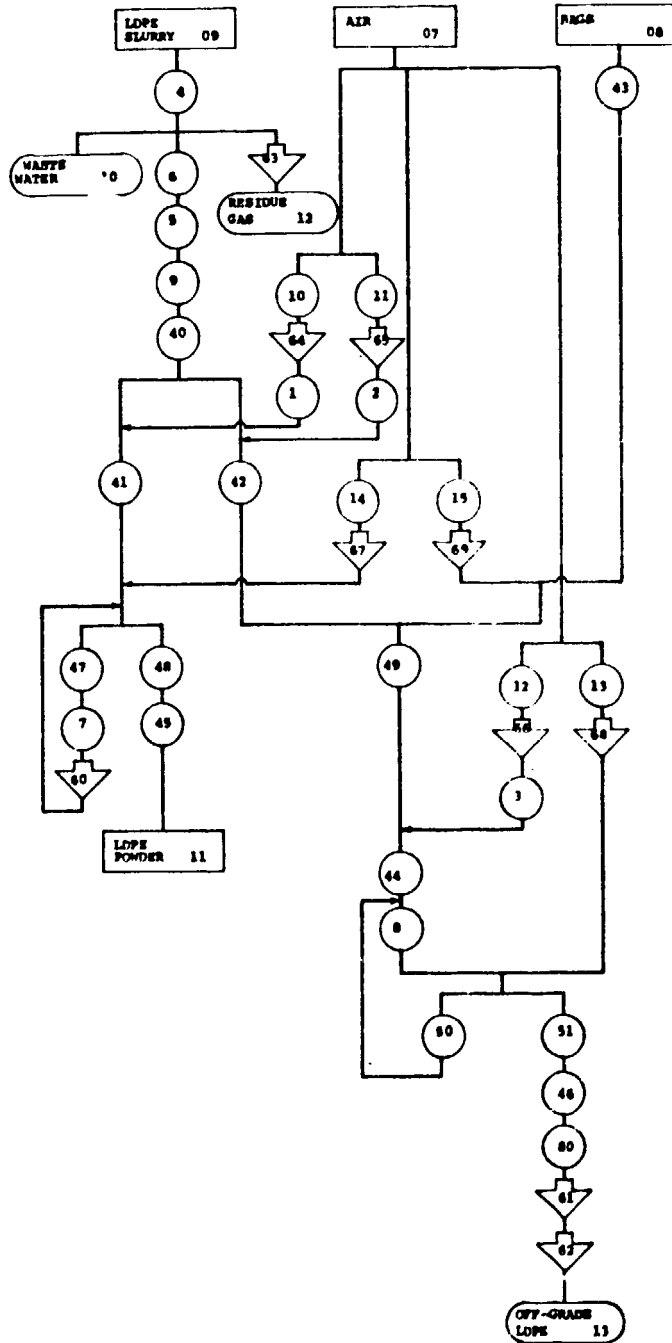
DATE

Rev:	Tarikh:	Isim:



PETKIM PETROKIMIYA A. S.

Doc: 111275-A-21107



ACTIVITY CODE	INDUSTRY CODE	PRODUCT	TECH.	CAP
80	9513-9	II	I	2
40	892111411291911	MACHINE WAGE		2
41	892111421291911	Weigh Hopper		4
42	892111411291911	Degassing Hopper		8
43	892111411311911	Off-Grade Degr. Hop.		2
44	892111421291911	Bag Feed Hopper		1
45	892111422222911	Off-Gr. Hold Hopper		2
46	892111421221911	Packing Hopper		2
47	892111421221911	Off-Gr. Packing Hop.		1
1	No available data	Purge Air Heater		8
2	No available data	Purge Air Heater		2
3	No available data	Purge Air Heater		1
4	728310015011712	Dewatering Screen		2
5	728310615011712	Classifying Screen		2
6	741646240111621	Centrifugal Dryer		2
7	728310050012842	Blender		2
8	728310050012832	Off-Gr. Blender		1
9	728313019011712	Magnetic Separator		2
10	743615021011112	Degas. Hop. Purge Fil.		2
11	743615011011112	Off-Gr. Deg. Hop. P.		2
12	743615021011112	Off-Gr. Hold Fur. A. Fi		2
13	Included in Blower	Off-Gr. Blender Fil.		2
14	Included in Blower	Conveying Air Fil.		2
15	Included in Blower	Packing Filter		4
47	892119911221912	Blender Deflonser		2
48	892119911221912	Packing Deflonser		2
49	892119911221912	Hold Hopper Deflon.		2
50	892119811221912	Off-Gr. Blender Def.		1
51	892119911221912	Off-Gr. Pac. Hop. Def.		1
60	744262120211712	Rotary Fed. D. Desc.		2
80	74525050211812	Packing Weigher Off.		1
61	744260112021712	Sack Conveyor		1
62	744262112021712	Convey Take off Ch.		1
63	743411011121912	Centr. Extract. Fan		2
64	743411021111621	Purge Air Fan		8
65	743411021111621	Purge Air Fan		2
66	743411021111621	Purge Air Fan		1
67	743421031121132	Transfer Blower		4
68	743421031121132	Transfer Blower		2
69	743421032121132	Transfer Blower		2

UNIDO/SPO (PETKIM)

CAPITAL GOODS DEVELOPMENT PROJECT

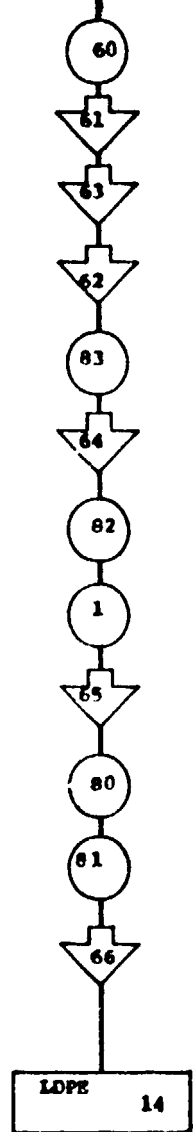
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN-RESINS, etc.	LDPK POWDER	RE/MODING
DATE	SAMPLE PLANT	CAPACITY
23.7.1982	ALLIAGA	14 m ³
PREPARED BY	DRAWN BY	CHECKED BY
S. KESKIN	D. ALTUN	S. KESKIN
CHECKED BY:	APPROVED BY:	



PETKIM PETROKİMYA A.Ş.

LDPE POWDER 11



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP
	3513-5	14	1	2
NO	MACHINE CODE	MACHINE NAME		
60	745250570211612	Weighing and Saef.M.	4	
61	744260112021612	Belt Conveyor	2	
62	744260112021612	Diverter Conveyor	2	
63	745250412021612	Check Weigher	2	
64	744260112021612	Diverter Conveyor	2	
62	744260112021612	Bag Flattener	2	
63	744250112021612	Conveyor	2	
1	728340421012632	Palletiser	2	
65	744263113821612	Palet Conveyor	2	
80	745220271211612	Shrink Wrap Unit	2	
81	745220270211632	Shrink Wrap Tunnel	2	
66	744260113021612	Outloading Conveyor	2	

UNIDO/SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc.	LDPE	AUTO-PACKING
DATE	SAMPLE PLANT	CAPACITY
19.2.1982	ALİAĞA	20 t/h
PREPARED BY	DRAWN BY	CHECKED BY
I.P.YILDIZ	D.ALTUN	I.P.YILDIZ
CHECKED BY		APPROVED BY

10 TO 14 AUTOMATIC PACKING

Rev.	Tarih	İsmi

No.	Equip. Name	Capacity	Process	Temp. (°C)	Material	No. of Units	Mfg. Char.	Mfg. Char.	Mfg. Char.	Mfg. Char.	Mfg. Char.	Mfg. Cost		Mfg. Year	Mfg. No.
												Total	Unit		
40	Reaction Vessel	2 m ³	P:850ata, Catalytic		UM	40	SS	29 mm	I	2	348000	681200	1977	74165 00 2 9 1 1 4 6 2 2	
41	HP Separator		300°C		Cy	24	AS	10 mm	I	4	314300	1297200	1977	69241 05 0 2 3 4 1 2	
42	Extrusion Heater	12,0 m ³	Dia: 2 m	300°C	Cy	2,5	AS	10 mm	I	2	88750	177500	1977	69211 14 1 1 2 2 1 4 1 2	
43	Decanter	13,5 m ³	Dia: 2,4 m	100°C	Cy	1,1	SS	10 mm	I	2	17300	34600	1978	69211 10 1 1 2 2 1 6 1 2	
44	Reaction Vessel	1,65 m ³	Dia: 0,7 m	100°C	RC	0,3	SS	3 mm	I	2	3850	7700	1978	69211 07 1 1 2 1 1 6 1 2	
45	Reaction Vessel									4	27500	110000	1977	74161 07	
46	Product cooler	HS: 20,6 m ³	SD: 0,1 m TL: 9,4 m		Concentric Tubes	24	-	10 mm	I	2	29700	59400	1977	74161 03 2 1 4 9 3 0 1 2	
47	Pelletizer water cooler	HS: 2 m ³	SD: -		Plates	2	SS	10 mm	I	4	11550	46200	1978	74161 03 1 0 0 5 1 6 1 2	
48	Catalyst In-jection pump	0,08 m ³ /h	WH: 13,9 m		SOMS	1,3	CSC	0,3 ton	I	18	23800	46400	1977	74210 10 1 1 8 2 1 6 1 2	
49	Pelletizer water pump	220 m ³ /h	WH: 30,3 m		HCLC	0,5	SS	0,08 ton	I	4	2100	8400	1978	74220 01 4 2 2 1 1 7 1 2	
50	Hydraulic Pump	0,8 m ³ /h	WH: 64 m		SOMS	0,5	SS	0,08 ton	I	4	5600	22400	1978	74220 01 3 3 6 1 1 7 1 2	
51	In line Extruder	1 t/h	Dia: 0,38 m	135 rpm	Single Screw	30	ASC	10 ton	I	2	361450	722900	1977	72842 01 2 1 4 1 4 7 5 2	
52	Master batch Extruder	1 t/h	Dia: 0,15 m	148 rpm	Single Screw	10	SF	3 ton	I	2	96400	192800	1977	72842 01 2 1 4 1 3 9 3 2	
53	Air blower	4,1 m ³ /min	P: 1,76 Kg/cm	Air	Propellerty	2,0	CI	0,6 ton	I	4	8600	34400	1977	74342 00 3 2 1 2 1 1 1 2	
54	LP Gas Receiver	73,6 m ³	P: 17 Kg/cm	Temp: 100°C	Cy	20	CS	14 mm	I	2	126250	252500	1980	69243 99 1 1 2 2 3 2 1 1	
55	Incoming gas Receiver	5,3 m ³	P: 38 Kg/cm	Temp: 100°C	Cy	27	CS	38 mm	I	2	48100	96200	1978	69243 99 1 4 2 2 4 2 2 2	
56	Secondary Comp. Intercooler	HS: 23 m ³	SD: 0,1 m TL: 9,14 m		Concentric Pipes	21,5	CS	10 mm	I	2	70500	141000	1977	74161 03 2 1 4 9 3 2 1 2	
57	Secondary Intercooler	HS: 37 m ³	SD: 0,1 m TL: 9,14 m		Concentric Pipes	93,0	CS	10 mm	I	2	70500	141000	1977	74161 03 2 1 4 9 5 2 1 2	
58	LP Return Gas Cooler	HS: 160,1 m ³	SD: 3,8 m TL: 4,8 m		BBM	1,9	CS	10 mm	I	2	12250	24500	1980	74161 03 3 4 3 9 1 2 1 1	
59	Return Gas Cooler	HS: 45 m ³	SD: 0,1 m TL: 9,34 m		Concentric Pipes	17	CS	10 mm	I	2	63700	127400	1977	74161 03 2 1 4 9 3 2 1 2	
60	Feed gas Heater	HS: 1,9 m ³	SD: 0,15 m TL: 1,8 m		Concentric Pipes	14	CS	13 mm	I	2	88400	176800	1980	74161 07 1 1 1 9 3 2 1 1	
61	Reactor comp. Intercooler	7,6 m ³ /min	P: 18,2 Kg/cm	Ethylene	H	68	CSC	22 tons	I	1	65000	65000	1976	74313 10 2 3 2 1 5 6 6 2	
62	1st Comp. Intercooler	23 m ³ /hr	Dia: 0,15 m		Single Zone	0,1	CS	8 mm	I	3	5750	17250	1978	74361 50 1 1 0 1 1 2 1 2	
63	2nd Comp. Intercooler	23 m ³ /hr	Dia: 0,15 m		Single Zone	0,1	CS	8 mm	I	4	16700	66800	1977	74361 60 1 1 0 1 1 2 1 2	
64	Primary compressor	20,8 m ³ /min	P: 28,2 Kg/cm	Ethylene	Combined	68	CS	22 tons	I	1	15000	15000	1976	74313 02 4 4 2 3 5 6 6 2	
65	Secondary compressor	119 m ³ /min	P: 2 Kg/cm	Ethylene	H	100	SF	65 tons	I	2	120000	240000	1976	74313 00 5 1 2 1 6 9 8 2	

Note: (a) Max. thickness of pipe is 10 mm.
 (b) Thickness of plate is 10 mm.

SP No	W/M	Basic Machine Nomenclature	Major Spec 1 (Capacity)	Major Spec 1 (Optional)	Major Spec 2 (Optional)	Type (Description)	Manufac. Char. 1 (TONS)	Manufac. Char. 2	Manufac. Char. 3 (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code										
												Unit	Total	Unit	Total		12345	678	9	10	11	12	13	14	15		
40		Weigh Hopper	29,3 m ³	Dia: 3,2m	Temp:100c	Conical	2	Al.alloy	3 mm	T	6	55250	331500	55250	331500	1980	69211	14	1	1	2	9	1	9	1	1	
41		Degassing Hopper	110 m ³	Dia: 4,4m	Temp:100c	Conical	3,8	Al.alloy	6 mm	T	8	105000	840000	105000	840000	1980	69211	14	2	1	2	9	1	9	1	1	
42		Off Grade Degassing Hopp.	55 m ³	Dia: 3,6m	Temp:100c	Conical	2,2	Al.alloy	5 mm	T	2	60750	121500	60750	121500	1980	69211	14	1	1	2	9	1	9	1	1	
43		Bag Feed Hopper	1 m ³	Dia: 1 m	Temp: 25c	Cubic	0,1	Al.alloy	3 mm	T	1	2800	2800	2800	2800	1980	69211	14	1	1	3	1	1	9	1	1	
44		Of Grade Hold Hopper	110 m ³	Dia:4,4 m	Temp:100c	Conical	3,8	Al.alloy	6 mm	T	2	105000	210000	105000	210000	1980	69211	14	2	1	2	9	1	9	1	1	
45		Packing Hopper	414 m ³	Dia:6,0 m	Temp:100c	Cy	8,1	Al.alloy	13 mm	T	2	220000	440000	220000	440000	1980	69211	14	2	2	2	2	9	1	1	1	
46		Off Grade Backing Hopp.	110 m ³	Dia:4,4 m	Temp:100c	Cy	2,6	Al.alloy	6 mm	T	1	71800	71800	71800	71800	1980	69211	14	2	1	2	2	1	9	1	1	
1		Purge Air Heater	NO AVAILABLE DATA								I	8	2100	16800	2700	21600	1978										
2		Purge Air Heater	NO AVAILABLE DATA								I	2	1750	3500	2200	4400	1978										
3		Purge Air Heater	NO AVAILABLE DATA								I	1	2100	2100	2700	2700	1978										
4		Dewatering Screen	13 t/hr	SO:4,7 mm	-	Open type	0,3	SS	0,1 tons	I	2	17150	34300	24450	48900	1977	72831	00	1	5	0	1	1	7	1	2	
5		Classifying Screen	12 t/hr	SO:4,7 mm	-	Open type	0,6	SS	0,2 tons	I	2	9450	18900	13500	27000	1977	72831	06	1	5	0	1	1	7	1	2	
6		Centrifugal Dryer	13 t/hr	-	Dia:0,75	Alm.	1	SS	10 mm	I	2	44750	89500	63900	127800	1977	74164	62	4	0	1	1	1	6	1	2	
7		Blender	14 m ³	-	-	Repulser	9,8	Al.alloy	5 tons	I	2	85700	171400	122400	244800	1977	72833	00	5	0	0	1	2	8	4	2	
8		Off Grade Blender	14 m ³	-	-	Repulser	6,5	Al.alloy	2 tons	I	1	65750	65750	93850	93850	1977	72833	00	5	0	0	1	2	8	3	2	
9		Magnetic Separator	12 t/hr	SO:4,8 mm	-	Open type	0,12	SS	0,08	I	2	1500	3000	2150	4300	1977	72831	30	1	5	0	1	1	7	1	2	
10		Degas. Hopp. purge filter	14 m ³ /hr	Dia:0,4m	-	Single zone	1	MS	8 mm	I	8	950	7600	1050	8400	1979	74361	50	2	1	0	1	1	1	1	2	
11		Off grade De air filter	9,6 m ³ /hr	Dia:0,4m	-	Single Zone	0,1	MS	4 mm	I	2	600	1200	650	1300	1979	74361	50	1	1	0	1	1	1	1	2	
12		Off grade air filter	14 m ³ /hr	Dia:0,4m	-	Single zone	0,1	MS	4 mm	I	1	900	900	1000	1000	1979	74361	50	2	1	0	1	1	1	1	2	
13		Off grade signal filter	INCLUDED IN K 607									2				1977											
15		Packing filter	INCLUDED IN K 605									4				1977											
14		Conveying Air filter	INCLUDED IN K 608									2				1977											
47		Blender	4 m ³	Dia:1,0 m	Temp:100c	Cy	0,5	Al.alloy	5 mm	I	2	17300	34600	20800	41600	1978	69211	99	1	1	2	2	1	9	1	2	
48		Packing Deflosser	4 m ³	Dia:1,0 m	Temp:100c	Cy	0,7	Al.alloy	6,35 mm	I	2	17300	34600	20800	41600	1978	69211	99	1	1	2	2	1	9	1	2	
49		Hold Hopper Deflosser	2 m ³	Dia:0,7 m	Temp:100c	Cy	0,3	Al.alloy	5 mm	I	2	17300	34600	20800	41600	1978	69211	99	1	1	2	2	1	9	1	2	
50		Off grade Blend, Defloss	4,1 m ³	Dia:0,5 m	Temp:100c	Cy	0,3	Al.alloy	5 mm	I	1	8450	8450	10200	10200	1978	69211	99	1	1	2	2	1	9	1	2	

SR	NO	W/M	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 2 (Optional)	Major Spec. 3 (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code												
													Unit	Total	Unit	Total		12345	67	8	9	10	11	12	13	14	15	16	17	
													13	14	15	16		17	18	19	20	21	22	23	24	25	26	27	28	
51			Off. Grade Sack Blower	4 m ³	Dia:0,5 m	Temp:100c	Cy	0,1	Al.alloy	5 mm	I	1	7700	7700	9250	9250	1978	59211	99	1	1	2	2	1	9	1	2			
60			Rotary feed Blower	65 t/hr	-	-	PDP	0,60	SS	0,15	I	2	3950	7900	5650	11300	1977	74426	71	2	0	0	2	1	7	1	2			
80			Pack Weigher Off. Grade	15 t/hr	-	Electrical	Fixed	0,9	-	0,6	I	1	21450	21450	30600	30600	1977	74325	05	5	0	2	1	1	0	2				
61			Sack Conveyor	15 t/hr	650 mm	-	PDP	0,6	SS	0,09ton	I	1	4700	4700	6700	6700	1977	74426	01	1	2	0	2	1	7	1	2			
62			Conveyor for Off. Grade	15 t/hr	600 mm	-	PDP	0,1	SS	0,03 ton	I	1	550	550	750	750	1977	74426	71	1	2	0	2	1	7	1	2			
63			Centrifuge Extract Fan	0,8m ³ /sec	WH:0,3 m	Air	Ind. Draught	0,3	SF	0,1 ton	I	2	4700	9400	4700	9400	1980	74341	10	1	1	1	2	1	9	1	2			
64			Purge Air Fan	4m ³ /sec	WH:0,94m	Air	Forced	1,8	CSC	1,0 ton	T	8	11600	92800	11600	92800	1980	74341	10	2	1	1	1	1	6	2	1			
65			Purge Air Fan	2,6m ³ /sec	WH:0,81m	Air	Forced	2,0	CSC	1,0ton	T	2	12900	25800	12900	25800	1980	74341	10	2	1	1	1	1	6	2	1			
66			Purge Air Fan	4m ³ /sec	WH:0,94m	Air	Forced	1,8	CSC	1,0 ton	T	1	11600	11600	11600	11600	1980	74341	10	2	1	1	1	1	6	2	1			
67			Transfer Blower	20 m ³ /min	WH:Kg/cm ² 1,4	Air	Propeller	3,5	CI	3,0	I	4	17050	68200	25000	100000	1977	74342	10	3	1	1	2	1	1	2	2			
68			Transfer Blower	33,4m ³ /min	WH:Kg/cm ² 1,3	Air	Propeller	2,0	CI	1,05	I	2	6000	12000	8850	17700	1977	74342	10	3	1	1	2	1	1	2	2			
69			Transfer Blower	57m ³ /min	WH:Kg/cm ² 1,5	Air	Propeller	4,0	CI	2,2	I	2	11450	22900	16800	33600	1977	74342	10	3	2	1	2	1	1	3	2			

Note: All quantities are in metric units unless otherwise stated.
 All prices are in US dollars unless otherwise stated.

No.	M/W	Basic Machine Description	Motor Spec (Capacity)	Motor Spec (rpm)	Motor Spec (Voltage)	Type (Section)	Manufac. Char. 1. (S/N)	Manufac. Char. 2. (S/N)	Manufac. Char. 3. (S/N)	Origin	Purchase Cost		Ct. 1960 Cost		Purch. Year	SIFC Code										
											Unit	Total	Unit	Total		12345	6789	101112131415								
60		Supplying Machine	20 t/hr	-	Electrical	Fixed	1,9	CSC	1,0 ton	I	4	47050	188200	67200	268800	1977	7452500	710	2	1	1	6	1	2		
61		Belt Conveyor	20 t/hr	650 mm	-	PDP	1,6	CSC	0,8 ton	I	2	5450	10900	7800	15600	1977	7442601	1	2	0	2	1	6	1	2	
62		Diverter Conveyor	20 t/hr	650 mm	-	PDP	0,5	CSC	0,07ton	I	2	7150	14300	10200	20400	1977	7442601	1	2	0	2	1	6	1	2	
63		Check Weigher	20 t/hr	650 mm	-	PDP	0,5	CSC	0,07ton	I	2	14950	29900	21350	42700	1977	7452504	1	2	0	2	1	6	1	2	
64		Diverter Conveyor	20 t/hr	650 mm	-	PDP	0,5	CSC	0,07ton	I	2	5000	10000	7150	14300	1977	7442601	1	2	0	2	1	6	1	2	
65		Bag Flattener	20 t/hr	650 mm	-	PDP	0,6	CSC	0,08ton	I	2	10800	21600	15400	30800	1977	7442601	1	2	0	2	1	6	1	2	
66		Conveyor	20 t/hr	800 mm	-	PDP	0,4	CSC	0,08ton	I	2	2700	5400	3850	7900	1977	7442601	1	2	0	2	1	6	1	2	
67		Pelletizer	100t/hr	Dia: 1 m	-	Pallet Drum	6,9	CSC	2,5 ton	I	2	69255	138510	99450	198900	1977	7283404	2	1	0	1	2	1	6	3	2
68		Pallet Conveyor	25t/hr	1300 mm	-	PDP	0,5	CSC	0,07ton	I	2	8600	17200	12300	24600	1977	7442631	1	3	0	2	1	6	1	2	
69		Shrink Wrap Unit	25t/hr	V:2,6 m	Electrical	Fixed	1,5	CSC	0,9 ton	I	2	43250	90500	64650	129300	1977	7452202	7	1	2	1	1	6	1	2	
70		Shrink Wrap Tunnel	25t/hr	-	Electrical	Mobile	3,1	CSC	2,3 ton	I	2	18500	37000	26450	52900	1977	7452202	7	0	2	1	1	6	3	2	
71		Outloading Conveyor	25t/hr	1300 mm	-	PDP	0,5	CSC	0,07ton	I	2	8000	16000	11400	22800	1977	7442601	1	3	0	2	1	6	1	2	

Site of Man. Machines: 35354/2, 35354/3, 35354/4, 35354/5, 35354/6, 35354/7, 35354/8, 35354/9, 35354/10, 35354/11, 35354/12, 35354/13, 35354/14, 35354/15, 35354/16, 35354/17, 35354/18, 35354/19, 35354/20, 35354/21, 35354/22, 35354/23, 35354/24, 35354/25, 35354/26, 35354/27, 35354/28, 35354/29, 35354/30, 35354/31, 35354/32, 35354/33, 35354/34, 35354/35, 35354/36, 35354/37, 35354/38, 35354/39, 35354/40, 35354/41, 35354/42, 35354/43, 35354/44, 35354/45, 35354/46, 35354/47, 35354/48, 35354/49, 35354/50, 35354/51, 35354/52, 35354/53, 35354/54, 35354/55, 35354/56, 35354/57, 35354/58, 35354/59, 35354/60, 35354/61, 35354/62, 35354/63, 35354/64, 35354/65, 35354/66, 35354/67, 35354/68, 35354/69, 35354/70, 35354/71, 35354/72, 35354/73, 35354/74, 35354/75, 35354/76, 35354/77, 35354/78, 35354/79, 35354/80, 35354/81, 35354/82, 35354/83, 35354/84, 35354/85, 35354/86, 35354/87, 35354/88, 35354/89, 35354/90, 35354/91, 35354/92, 35354/93, 35354/94, 35354/95, 35354/96, 35354/97, 35354/98, 35354/99, 35354/100.

UNICE / SPO4PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW LOW DENSITY POLYETHYLENE PLANT, CAPACITY =150 000TON/YEAR
 LOCATION-YUNLATALIK
 ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_ME
65211 07112 11612	DECANTER WATER TANK	2	.3	4.7		.6									.6
65211 10112 21612	DECANTER	2	1.1	20.9		2.2									2.2
65211 14221 21911	OFF GR.PACKING HOPPER	1	2.6	71.8		2.6									2.6
65211 14222 22511	PACKING HOPPER	2	8.1	220.0		16.2									16.2
65211 14251 91511	DEGASSING HOPPER	8	3.8	105.0		30.4									30.4
65211 14251 91511	WEIGH HOPPER	6	2.0	55.0		12.0									12.0
65211 14251 91511	OFF GR.HOLD HOPPER	2	3.8	105.0		7.6									7.6
65211 14251 91511	OFF GR.DEGAS. HOPPER	2	2.2	60.8		4.4									4.4
65211 14211 11511	BAG FEED HOPPER	1	.1	2.8		.1									.1
65211 95112 21912	BLENDER DEFLOSSER	2	.5	20.8		1.0									1.0
65211 95112 21912	OFF GR.PACK.HOP.DEFLOSSER	1	.1	9.3		.1									.1
65211 95112 21912	PACKING DEFLOSSER	2	.7	20.8		1.4									1.4
65211 95112 21912	HOLD HOPPER DEFLOSSER	2	.3	20.8		.6									.6
65211 95112 21912	OFF GR.BLEN.DEFLOSSER	1	.3	10.2		.3									.3
65241 C5C02 23412	MP SEPARATOR	4	24.0	448.8			96.0								96.0
65241 C5C02 23412	MP SEPARATOR	4	24.0	126.8			106.0								106.0
65243 95112 23211	LP GAS RECEIVER	2	20.0	126.3			40.0								40.0
65243 95142 24222	LP GAS RECEIVER	2	27.0	94.7			54.0								54.0
72831 C0150 11712	DEWATERING SCREEN	2	.3	24.5				.6							.6
72831 C0150 11712	CLASSIFYING SCREEN	2	.6	13.7				1.2							1.2
72831 C0150 11712	MAGNETIC SEPARATOR	2	.1	2.2				.2							.2
72833 C0500 12832	OFF GR.BLENDER	1	6.5	33.5				6.5							6.5
72833 C0500 12842	BLENDER	2	9.8	122.4				19.6							19.6
72834 C4210 12632	PALLETIZER	2	6.7	45.7				13.4							13.4
72842 C1214 14752	IN LINE EXTRUDER	2	30.0	945.0				60.0							60.0
72842 C1214 14752	MASTERBACK EXTRUDER	2	12.0	177.6				24.0							24.0
74161 C3100 51612	PELLETIZER WATER COOLER	4	2.0	14.8				8.0							8.0
74161 C3214 93312	PRODUCT COOLER	2	24.0	44.7				48.0							48.0
74161 C3214 93212	SEC.COMP.INTER COOLER	2	21.5	106.2				43.0							43.0
74161 C3214 93212	RETURN GAS COOLER	2	17.0	95.8				34.0							34.0
74161 C3214 95212	SEC.COMP.ASTER COOLER	2	63.5	176.2				127.0							127.0
74161 C3343 91212	LP RETURN GAS COOLER	2	1.9	12.3				3.8							3.8
74161 C7111 93212	FEED GAS HEATER	2	14.0	88.4				28.0							28.0
74164 62401 11612	CENTRIFUGAL DRYER	2	1.0	63.9			2.0								2.0
74165 C0291 14622	REACTION VESSEL	2	40.0	534.1			80.0								80.0
74230 10118 21612	CATALYST INJECTION PUMP	18	1.3	37.2				23.4							23.4
74230 01338 11712	HYDRAULIC TRANSFER PUMP	4	.5	6.9				2.0							2.0
74230 01482 21712	PELLETIZER WATER PUMP	4	.5	2.6				2.0							2.0
74310 C0582 10482	SECONDARY COMPRESSOR	1	100.0	1900.0				100.0							100.0
74310 C0440 37000	PRIMARY COMPRESSOR	1	68.0	3500.0				68.0							68.0
74310 C0251 10600	AUXILIARY COMPRESSOR	1	64.3	450.0				64.3							64.3
74341 C0111 21912	CENTRIFUGAL FAN	1	.3	4.7				.3							.3
74341 C0241 11312	PURGE AIR FAN	8	1.8	17.6				14.4							14.4
74341 C0241 11312	PURGE AIR FAN	7	2.0	12.9				14.0							14.0
74341 C0241 11312	PURGE AIR FAN	1	1.8	11.0				1.8							1.8
74342 C0301 21112	AIR DRYER	4	2.0	12.6				8.0							8.0
74342 10311 21422	TRANSFER BLOWER	2	2.0	17.7				4.0							4.0
74342 10311 21132	TRANSFER BLOWER	2	4.0	33.6				8.0							8.0
74342 C0311 21132	TRANSFER BLOWER	4	3.5	25.0				14.0							14.0
74361 50110 11112	OFF-GR.PURGE AIR FILTER	2	.1	.7				.2							.2
74361 50110 11212	FIRST COMP.SUCT.FILTER	3	.1	6.9				1.8							1.8
74361 50110 11212	SECOND COMP.TEM.SUC.FILL.	4	.1	23.9				1.6							1.6
74361 50210 11112	OFF-GR.HOLD PURG.AIR.FILTER	1	.1	1.0				.1							.1
74361 50210 11112	DEGAS.HOP.PURGE FILTER	8	1.0	1.1				8.0							8.0
74425 C1120 21612	CONVEYOR	2	.4	3.9				.8							.8
74426 C1120 21612	DIVERTER CONVEYOR	2	.5	10.2				1.0							1.0
74426 C1120 21612	BAG FLATTENER	2	.6	15.4				1.2							1.2
74426 C1120 21612	DIVERTER CONVEYOR	2	.5	7.2				1.0							1.0
74426 C1120 21612	BELT CONVEYOR	2	1.6	7.8				3.2							3.2

UNICC / SPC(PETKIM)
 CAPITAL GCCCS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW LOW DENSITY POLYETHYLENE PLANT,CAPACITY =150 000TON/YEAR
 LOCATICA=YUMURTALIK
 ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CC	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
45211	C1112 11612	2	.3	4.7		9.4									9.4
45211	10112 21612	2	1.1	20.9		41.8									41.8
45211	14221 21511	1	2.6	71.8		71.8									71.8
45211	14222 22911	2	8.1	220.0		440.0									440.0
45211	14251 91911	8	3.8	105.0		840.0									840.0
45211	14251 91511	6	2.0	55.0		330.0									330.0
45211	14251 91511	2	3.8	105.0		210.0									210.0
45211	14251 91911	2	2.2	60.8		121.6									121.6
45211	14211 11511	1	-1	2.8		2.8									2.8
45211	99112 21912	2	-5	20.8		41.6									41.6
45211	99112 21912	1	-1	9.3		9.3									9.3
45211	99112 21912	2	-7	20.8		41.6									41.6
45211	99112 21912	2	-3	20.8		41.6									41.6
45211	99112 21912	1	-3	10.2		10.2									10.2
49241	05002 23412	4	24.0	448.8			1795.2								1795.2
49241	05002 23412	4	24.0	126.8			507.2								507.2
49243	99112 23211	2	20.0	126.3			252.6								252.6
49243	99142 24222	2	27.0	64.8			129.6								129.6
72831	CC150 11712	2	-3	24.5				49.0							49.0
72831	CC150 11712	2	-6	13.5				27.0							27.0
72831	3C150 11712	2	-1	2.2				4.4							4.4
72833	CC500 12832	1	6.5	93.9				93.9							93.9
72833	CC500 12842	2	9.8	122.4				244.8							244.8
72834	C4210 12632	2	6.9	99.0				198.0							198.0
72842	C1214 14752	2	30.0	516.0				1032.0							1032.0
72842	C1214 14752	2	10.0	137.6				275.2							275.2
74161	C3100 51612	4	2.0	14.8				59.2							59.2
74161	C3214 93012	2	24.0	44.7				89.4							89.4
74161	C3214 93212	2	21.5	106.2				212.4							212.4
74161	C3214 93212	2	17.0	95.8				191.6							191.6
74161	C3214 95212	2	63.5	106.2				212.4							212.4
74161	C3343 91212	2	1.9	12.3				24.6							24.6
74161	C7111 93212	2	14.0	88.4				176.8							176.8
74164	62401 11612	2	1.0	63.9			127.8								127.8
74165	CC291 14622	2	40.0	534.1			1068.2								1068.2
74210	10118 21612	18	1.3	37.2				669.6							669.6
74220	01338 11712	4	-5	6.9				27.6							27.6
74220	C1422 11712	4	-5	2.6				10.4							10.4
74313	00512 16982	2	100.0	1500.0				3000.0							3000.0
74313	02442 35662	1	68.0	850.0				850.0							850.0
74313	10232 15662	1	68.0	850.0				850.0							850.0
74341	10211 21912	2	.3	4.7				9.4							9.4
74341	10211 11612	8	1.8	11.6				92.8							92.8
74341	10211 11612	2	2.0	12.9				25.8							25.8
74341	10211 11612	1	1.8	11.6				11.6							11.6
74342	CC321 21112	4	2.0	12.6				50.4							50.4
74342	10311 21122	2	2.0	17.7				35.4							35.4
74342	10311 21132	2	4.0	33.6				67.2							67.2
74342	10311 21132	4	3.5	25.0				100.0							100.0
74361	50110 11112	2	-1	.7				1.4							1.4
74361	50110 11212	3	-1	6.9				20.7							20.7
74361	50110 11212	4	-1	23.9				95.6							95.6
74361	50210 11112	1	-1	1.0				1.0							1.0
74361	50210 11112	8	1.0	1.1				8.8							8.8
74426	C1120 21612	2	.4	3.9				7.8							7.8
74426	C1120 21612	2	.5	10.2				20.4							20.4
74426	C1120 21612	2	.6	15.4				30.8							30.8
74426	C1120 21612	2	.5	7.2				14.4							14.4
74426	C1120 21612	2	1.6	7.8				15.6							15.6

UNICC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW LOW DENSITY POLYETHYLENE PLANT,CAPACITY =150 000TJN/YEAR
LOCATION=YLMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
74426	C1120 21712 SACK CONVEYER	1	.6	6.7					6.7						6.7
74426	C1130 21612 OUTLOADING CONVEYER	2	.5	11.4					22.8						22.8
74426	B1130 21612 PALLET CONVEYER	2	.5	12.3					24.6						24.6
74426	C1120 21712 CONVEYOR TAKE OFF CHUTE	1	.1	.8					.8						.8
74426	71200 21712 ROT.FEED.BLEND.DISCHARGE	2	.6	5.7					11.4						11.4
74522	C2702 11632 SHRINK WRAP TUNNEL	2	3.1	26.5					53.0						53.0
74522	C2712 11612 SHRINK WRAP UNIT	2	1.5	64.7					129.4						129.4
74525	C4120 21612 CHECK WEIGHER	2	.5	21.4					42.8						42.8
74525	C5502 11012 PACK.WEIGHER OFF GRADE	1	.9	30.6					30.6						30.6
74525	O5502 11012 PACK.WEIGHER OFF GRADE	1	.9	30.9					30.9						30.9
74525	C5702 11612 WEIGHING AND SACFILL.MAC.	4	1.9	67.2					268.8						268.8

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry

Vol. VII - Technical data for
(HDPE) -High Density Polyethylene

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No.XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol. VII - Technical Data for
(HDPE) -High Density Polyethylene

Prepared for the Government of Turkey .
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey
United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

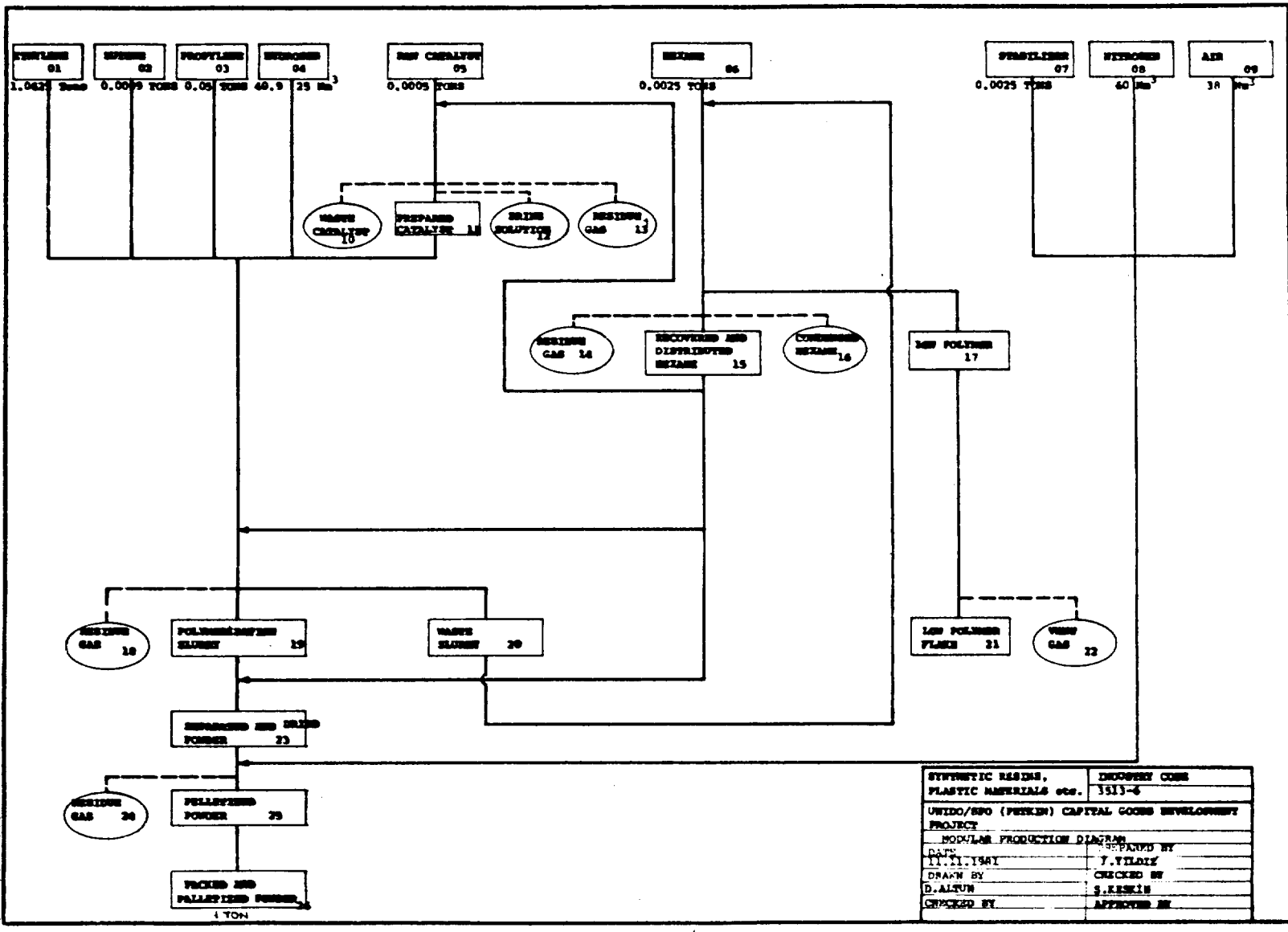
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PETKIM PETROKIMIA A.S.



No.	
Tarikh	
Isim	

FORM 111/12/12/1981

STYRENIC RESIN, PLASTIC MATERIALS etc.	DEIVERY CODE 3513-6
UNIDO/SPC (PEKMIN) CAPITAL GOODS DEVELOPMENT PROJECT	
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
11.11.1981	J. YILDIZ
DRAWN BY	CHECKED BY
D. ALTUN	S. ERKIN
CHECKED BY	APPROVED BY

Rev.	Tarih	İsmi

Peşin 1000,00 TL



PETKİM PETROKİMYA A.Ş.

RELATIONSHIP BETWEEN RESEARCH AND ACTIVITIES

FOR HDPE PLANT

05 TO 11	CATALYST PREPARATION
01 TO 19	POLYMERIZATION
19 TO 23	SEPARATION AND STORAGE
23 TO 25	PELLETIZING
25 TO 26	PACKAGING
17 TO 21	QUALITY CONTROL
06 TO 15	PLANT OPERATION

Q. 1		

INTEGRATED (PETRIE)
 NATIONAL BUSINESS DEVELOPMENT
 COMPANY

IND. SER. METER

PART / HDP.

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97	97000000	97000000	97000000
98	98000000	98000000	98000000
99	99000000	99000000	99000000
100	100000000	100000000	100000000



PETKIM PETROKIMYA A.Ş.

IND. CODE : 1513-6
 IND. NAME : SYNTHETIC RESINS,
 PLASTIC MATERIALS AND MAN-MADE
 FIBERS-HERE

TYPES CHART

TYPE	CAPACITY RANGE	CAPACITY TYPE	CAPACITY
DRUM	0-71m ³	1	6 m ³
		2	7.1 m ³
	2.5 m ³	1	2.5 m ³
		2	5 m ³
		3	7.5 m ³
		4	10 m ³
		5	12.5 m ³
	10 m ³	1	10 m ³
		2	20 m ³
	15 m ³	1	15 m ³
		2	30 m ³
	20 m ³	1	20 m ³
		2	40 m ³
	30 m ³	1	30 m ³
		2	60 m ³
	40 m ³	1	40 m ³
		2	80 m ³
	50 m ³	1	50 m ³
		2	100 m ³

(Loading Surface)

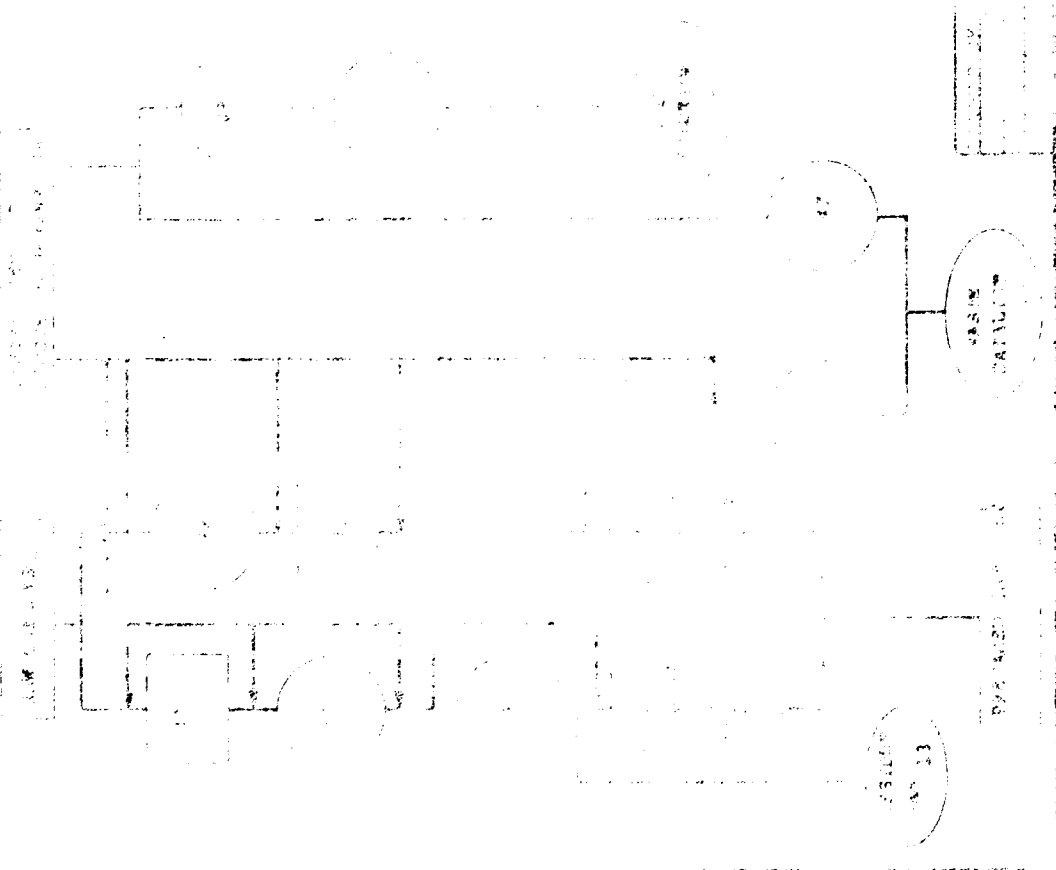
PREPARED BY	DATE	APPROVED BY



PETKİM PETROKİMYA A.Ş.

YAKITLAR (FUEL) CAPİNG PAKETİ YERLEŞİMİ KURULUŞU

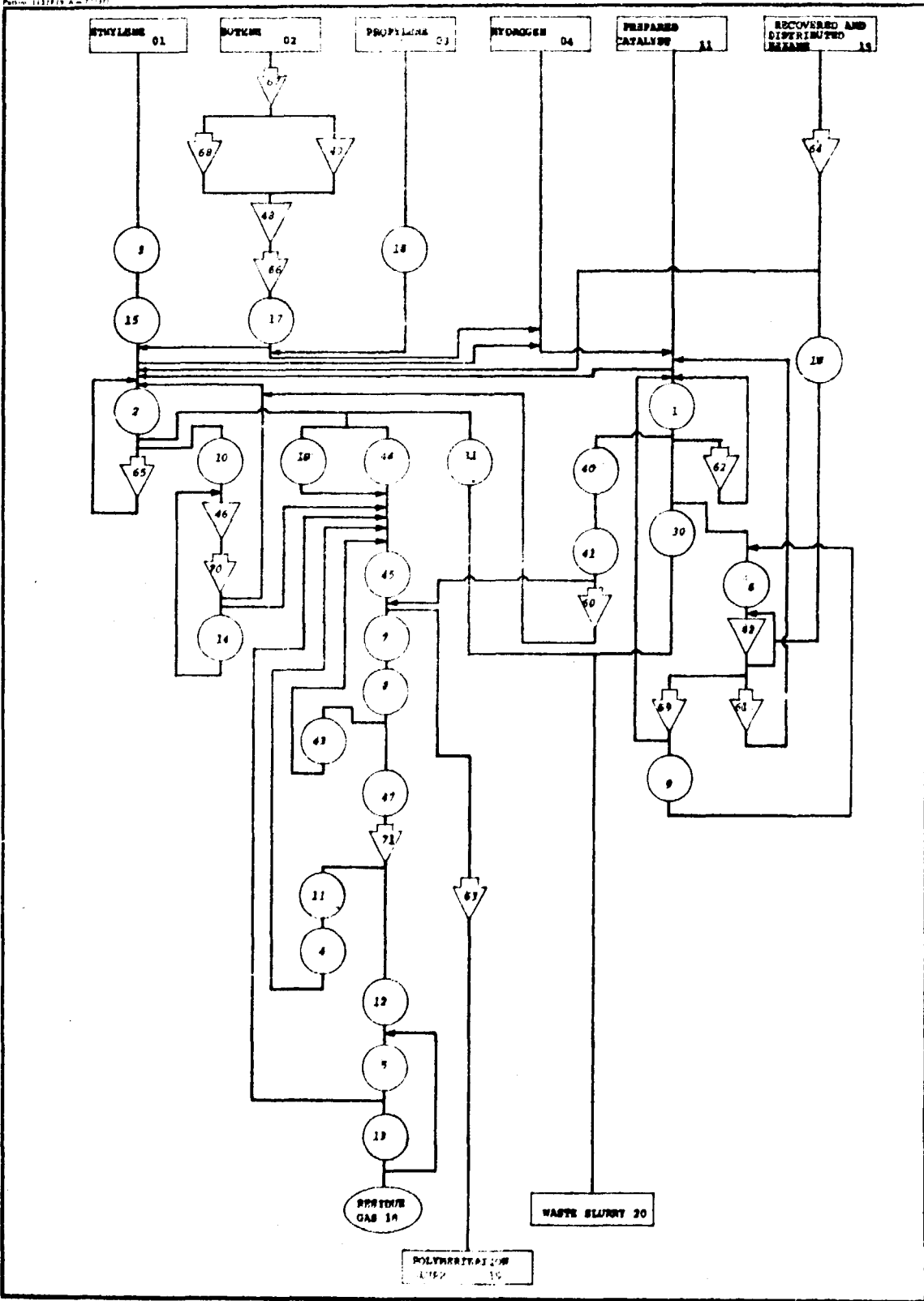
ACTIVITY CODE	PROD.	STAN	CAPACITY
3511-4	11	1	1
MACHINE NAME			
2E Feed Drum			1
AT Receiving Drum			1
7E Holding Drum			1
19 Receiving Drum			1
2E Dilution Drum			1
AT Dilution Drum			1
AT Dilution Drum			1
2E Feed Drum			1
DEAD FOR			1
Water Condenser			1
2E Transfer Drum			1
2E Feed Pump			6
2E Feed Pump			3
2E Receiving Drum			6
19 Receiving Drum			1



Rev.	Tarih	Item



PETKIM PETROKIMYA A.Ş.

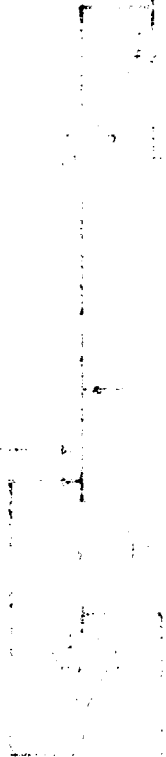
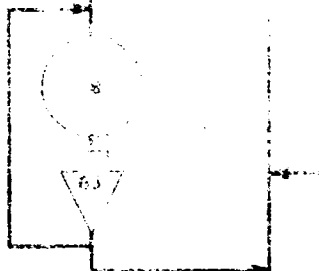




PETKİM PETROLİMYA A.Ş.

POLYMERİZASYON
SİSTEMİ

13

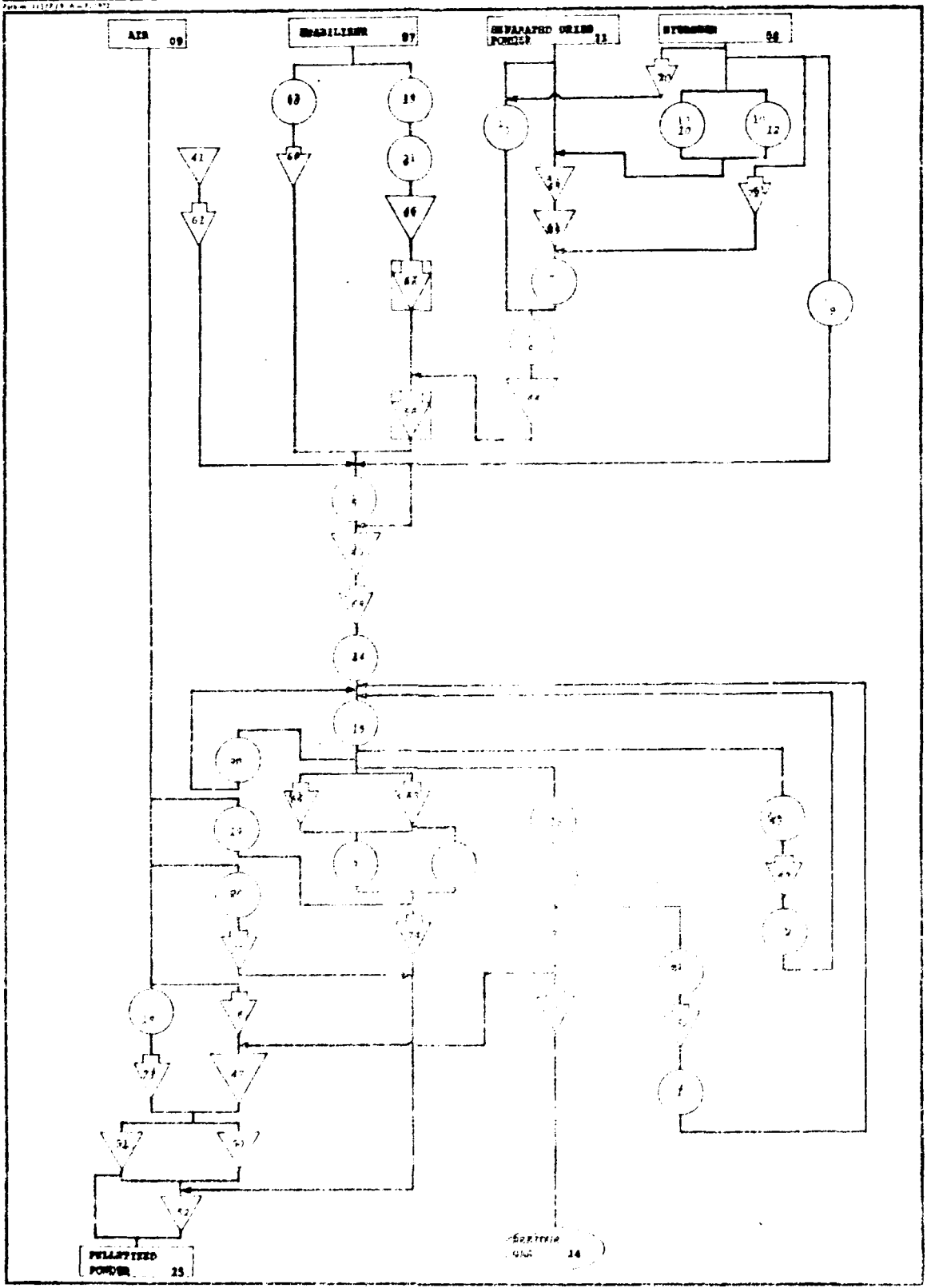


SEPARASYON VE
SİSTEMİ

Rev.	Tarikh	Isim



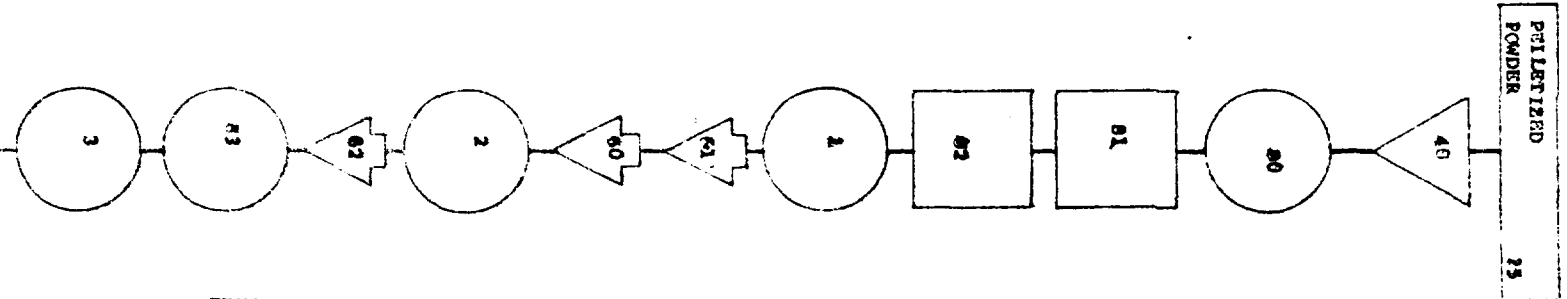
PETKIM PETROKIMYA A. S.





PETKIM PETROKIMYA A.S

Rev	Tarih	İsmi



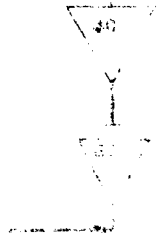
ACTIVITY CODE		ZNO.	POSD.	TECHN.	CAPACITY
60	74522	3513-6	26	1	1
MACHINE NAME		QUANTITY			
60	74445	Weighing Machine			
61	74522	Conveyor			
61	74523	Metal Detecting Device			
61	72032	Automatic Weight Checker			
61	74426	Sorting Device			
61	74426	Induction Conveyor			
62	72034	Palletizer			
64	74426	Conveyor			
83	74522	Serial Film Wrapping Mach. 1			
1	74163	Metal Oven			
40	49211	Packer Hopper			
UNIT/NO/SYMBOL					
MODULAR PROJECT					
TECHNOLOGY					
POWER FACTORY, PETKIMIZIN					
DATE					
27.10.1991					
CHECKED BY					
S. KECILIN					
APPROVED BY					

PACKED AND PALLETIZED POWDER
26
25 TO 26 PACKING AND PALLETIZING



PETKIM PETROKIMYA A.Ş.

LOW POLYMER



ACTIVITY CODE	IND.	PROD.	TRCEP	CAPACITY
	3513-6	21	1	1
MACHINE CODE	MACHINE NAME	QUANTITY		
101-211	Low Polymer Storage Tank	1		
102-211	Water Cooler	1		
103-211	Cooling Water Pump	1		
104-211	Low Polymer Acidifying Tank	1		
	Crum Plates			
	Insulated			
	RODS OPEN			

LOW POLYMER FLASK
21

REV	DATE	BY

TRIP TO THE ...

CONSTRUCTION ...

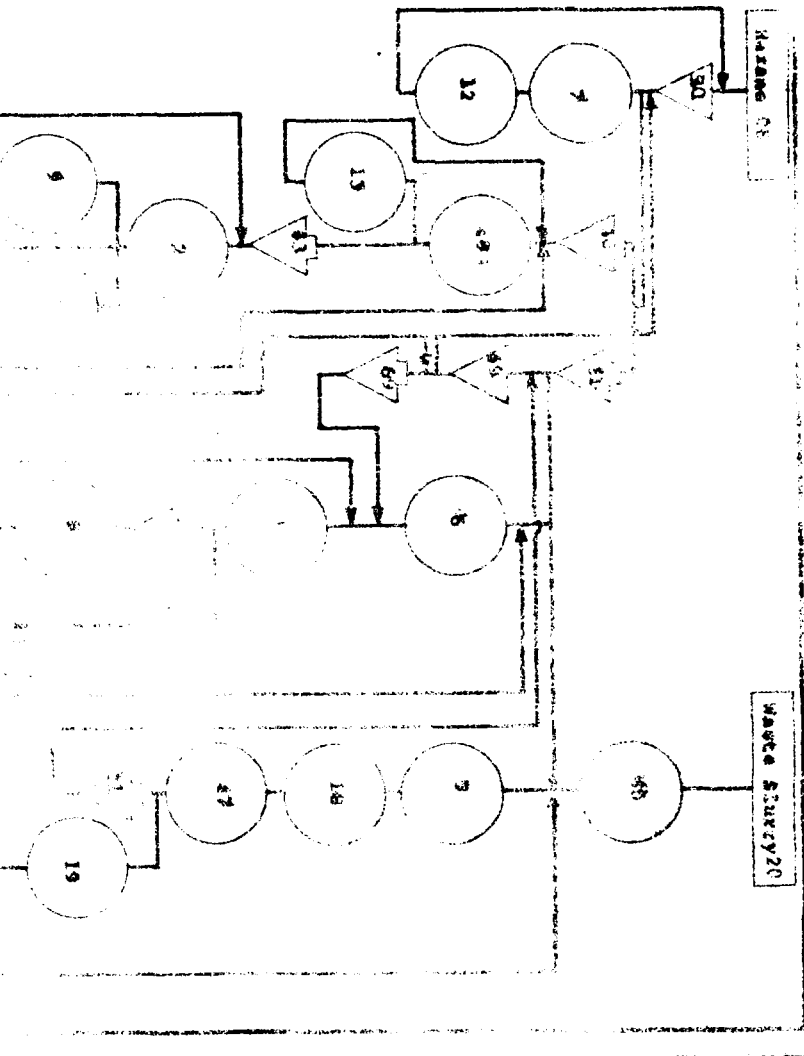
THE ...



RESERVE
GAS 14



PETKİM PETROKİMYA A.Ş.





PETKIM PETROKIMYA A.S

UNIDO/SPO (REV. 01) GENERAL PROCESS IMPROVEMENT PROJECT
NOROLAK PROCESS PLANT MALFAN

ACTIVITY CODE		ITEM NO	PRODUCT	TSCHN	CAPACITY
NO	MACHINE CODE	DESCRIPTION	NAME	1	1
1	74166 07 114 13211	Hexane Stripper		1	1
2	74163 10 117 13211	Hexane Hydro-clo		1	1
40	69241 05 103 21211	Stripper Receiver		1	1
3	74164 40 331 12211	Hexane Dryer		2	2
41	69211 10 112 21211	Flash Drum		1	1
42	69241 05 103 21211	Low Polymer Storage Drum		1	1
43	69241 05 103 21211	Condensate Receiver		1	1
4	74165 10 112 11212	Deactivator		1	1
44	69241 05 103 21211	Fouled Hexane Drum		1	1
45	69241 05 103 21211	Hexane Drum		1	1
46	69241 05 103 21211	Deactivator Drum		1	1
5	74166 07 114 13211	Hexane Stripper		1	1
47	69241 05 103 21211	Stripper Receiver		1	1
6	74161 10 211 11211	Hexane Storage Drum		1	1
7	74161 03 111 11211	Hexane Storage Drum		1	1
8	74161 02 411 11212	Double Hexane Heat Exchanger		1	1
9	74161 05 411 11212	Hexane Vertical Condenser		1	1
10	74161 02 211 11212	Dehydrator Reboiler		1	1
11	74161 05 111 11212	Dehydrator Vertical Cooler		1	1
12	74161 05 211 11212	Crude Hexane Tank Vent Condenser		1	1
13	74161 05 211 11211	Crude Hexane Tank		1	1
14	74161 05 211 11211	Pure Hexane Tank Vent Cond.		1	1
15	74161 10 211 11212	Crude Hexane Tank		1	1
16	74161 10 111 11212	Low Polymer Flasher		1	1
17	74161 05 111 11211	Storage Drum Condenser		1	1
18	74182 05 211 11211	Hexane Condenser		1	1
19	74161 05 111 11211	Vent Condenser		1	1
60	74220 01 211 11612	Hexane Hexane Mixer		1	1
61	74220 01 341 11612	Double Hexane Pump		1	1
62	74220 01 311 11612	Stripper Bottom Pump		1	1
63	74220 01 321 11612	Stripper Top Pump		2	2
64	74220 01 331 11612	Stripper Bottom Pump		2	2
65	74220 01 341 11612	Stripper Top Pump		2	2
66	74220 01 351 11612	Stripper Bottom Pump		2	2
67	74160 01 211 11612	Hexane Storage Drum		1	1
68	74220 01 311 11612	Stripper Bottom Pump		2	2
69	74220 01 321 11612	Stripper Top Pump		2	2
70	74220 01 241 11612	Deactivator Bottom Pump		2	2
71	74220 00 211 11612	Hexane Transfer Pump		1	1
20	74162 70 010 01202	Hexane Strainer		2	2
48	69241 04 111 21211	Crude Hexane Tank		1	1
49	69241 04 211 21211	Pure Hexane Tank		1	1
50	69241 04 311 21211	Crude Hexane Tank		1	1

REV	DATE	BY

INC. IN RES. OF ...
DATE: ...
CHECKED BY: ...

Item	Quantity	Unit	Material	Part No.	Description	Drawing	Spec.	Lot	Date	Status	Warehouse	Bin	Purchase Cost		Ct. 1945 Cost		Purch. Year	JITC Code									
													Unit	Total	Unit	Total		1315	1678	1811	1831	1833					
PZ Feed Drum	1	Drum	650	CV	1.4	SS	5	ma	I	1	27300	27300	41850	41850	1977	69241	05	1	0	3	2	1	6	1	2		
AP Measuring Drum	1	Drum	550	CV	6.2	SS	3	ma	I	1	2600	2600	4000	4000	1977	69241	05	1	0	3	2	1	6	1	2		
PZ Holding Drum	1	Drum	650	CV	1.4	SS	5	ma	I	1	27700	27700	42450	42450	1977	69241	05	1	0	3	2	1	6	1	2		
PZ Measuring Drum	1	Drum	650	CV	6.4	SS	4	ma	I	1	4300	4300	6600	6600	1977	69241	05	1	0	3	2	1	6	1	2		
AP Dilution Drum	2	Drum	650	CV	2.7	SS	6	ma	I	2	44600	89200	68350	136700	1977	69241	05	1	0	3	2	1	6	1	2		
AP Dilution Drum	1	Drum	650	CV	1.9	SS	6	ma	I	1	41200	41200	51900	51900	1977	69241	05	1	0	3	2	1	6	1	2		
AP Dilution Drum	1	Drum	650	CV	2.7	SS	5	ma	I	1	4400	4400	5230	5230	1977	69241	05	1	0	3	2	1	6	1	2		
AP Knock Out Drum	1	Drum	550	CV	6.2	CS	3	ma	I	1						69241	05	1	0	3	2	1	2	1	1		
Drain Pot	1	Pot	650	CV	6.2	SS	5	ma	I	1						69241	06	1	0	3	2	1	2	1	1		
Vent condenser	1	Condenser	500	PSI	3.2	CS	7	ma	I	1						74161	05	1	1	1	1	1	2	1	2		
PZ Transfer Drum	1	Drum	650	CV	6.2	SS	6	ma	I	1						74210	20	1	4	8	1	1	7	1	2		
PZ Feed Drum	1	Drum	650	CV	5.2	SS	4	ma	I	1						4300	4300	1977	74210	20	1	4	8	1	7	1	
AP Feed Drum	1	Drum	650	CV	6.2	SS	4	ma	I	1						3050	3050	1977	74210	20	1	4	8	1	7	1	
AP Feed Drum	1	Drum	650	CV	6.2	SS	4	ma	I	1						1225	1225	1977	74210	20	1	4	1	1	7	1	
PZ Measuring Drum	1	Drum	650	CV																							
AP Measuring Drum	1	Drum	650	CV																							
AP Measuring Drum	1	Drum	650	CV																							
AP Measuring Drum	1	Drum	650	CV																							

AP Measuring Drum 650 CV 6.2 SS 4 ma I 1 1225 1225 1977 74210 20 1 4 1 1 7 1 2
 AP Measuring Drum 650 CV 6.2 SS 4 ma I 1 1225 1225 1977 74210 20 1 4 1 1 7 1 2
 AP Measuring Drum 650 CV 6.2 SS 4 ma I 1 1225 1225 1977 74210 20 1 4 1 1 7 1 2
 AP Measuring Drum 650 CV 6.2 SS 4 ma I 1 1225 1225 1977 74210 20 1 4 1 1 7 1 2

SN	M	Basic Machine	Major Spec. (Capacity)	Major Spec. (Optional)	Major Spec. Type (Optional)	Manufacturer	Char. 1. (TONS)	Manufacturer	Char. 2. (CUB. FT.)	Origins	Q.	Purchase Cost		CE, 1980 Cost		Purchase Code	SINC Code	
												Unit	Total	Unit	Total			
1		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
10		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
11		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
12		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
13		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
14		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
15		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									
16		1.00000000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000									

Note: All item component values for selected dates should be checked for accuracy.

SR No	M/ N	Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manuf. Char. 2.	Manuf. Char. 3. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Proc. Year	SITC Code									
												Unit	Total	Unit	Total		12345	678	9	10	11	12	13	14	15	
17		Butene vaporizer	HS:1,22 m ²	Dia:600mm	TL:1400 mm	Coil	0,5	CS	7 mm	I	1						1977	74101	091	1	1	2	1	2	1	1
60		1 st Slurry transfer Pump	25 m ³ /hr	WH: 35 m	HDM	H	0,5	SS	0,3 tons	I	2	1400	2800	2250	4500	1977	74220	013	3	4	1	1	7	1	2	
61		1 st Condensate Recycle pump	50 m ³ /hr	WH: 45 m	CCLC	H	0,5	SS	0,3 tons	I	2	2050	4100	3350	6700	1977	74220	013	2	1	1	1	7	1	2	
62		1 st Jacket water pump	100 m ³ /hr	WH: 25 m	CCLC	H	0,4	CI	0,2 tons	I	1	840	840	1350	1350	1977	74220	013	2	2	1	1	1	1	2	
63		2 nd Slurry transfer Pump	55 m ³ /hr	WH: 37 m	HDM	H	0,3	SS	0,2 tons	I	2	1230	2460	2000	4000	1977	74220	013	2	4	1	1	7	1	2	
64		2 nd Condensate Recycle pump	50 m ³ /hr	WH: 45 m	CCLC	H	0,5	SS	0,3 tons	I	2	2050	4100	3350	6700	1977	74220	013	2	1	1	1	7	1	2	
65		2 nd Jacket water Pump	100 m ³ /hr	WH: 25 m	CCLC	H	0,4	CI	0,2 tons	I	1	840	840	1350	1350	1977	74220	013	2	2	1	1	1	1	2	
66		Butene transfer Pump	0,6 m ³ /hr	WH: 63 m	CCLC	H	0,5	SS	0,4 tons	I	1	3400	3400	5500	5500	1977	74210	201	3	1	1	4	7	1	2	
67		Butene cold-feeding Pump	20 m ³ /hr	WH: 35 m	CCLC	H	0,3	CI	0,2 tons	I	1	2390	2390	3900	3900	1977	74230	303	1	1	1	1	1	1	2	
68		Butene transfer pump	0,6 m ³ /hr	WH: 63 m	CCLC	H	0,5	SS	0,4 tons	I	1	3050	3050	8200	8200	1977	74210	201	3	1	1	1	7	1	2	
69		Bottom strainer					0,3	SS	5 mm	I	1	1700	1700	2600	2600	1977	74302	700	1	0	0	1	0	1	2	
70		Box																								2
71		Bottom strainer										1700	1700	2600	2600	1977	74302	700	1	0	0	1	0	1	2	
72		Box																								2
69		1 st Recycle gas blower	1500 m ³ /hr	P:1,2kg/cm ²	Medium: HC gas	Straight	4,7	CS	3,7 tons	I	2	33500	67000	51500	103000	1977	74342	004	5	2	1	1	0	3	2	
70		2 nd Recycle gas blower	1500 m ³ /hr	P:1,2kg/cm ²	Medium: HC gas	Straight	4,7	CS	3,7 tons	I	2	33500	67000	51500	103000	1977	74342	004	5	2	1	1	0	3	2	
71		Flash gas Compressor	200 m ³ /hr	P:1,2kg/cm ²	Medium: HC gas	H	5,4	CI	3,0 tons	I	1	134800	134800	155500	155500	1977	74313	012	3	2	1	2	1	3	2	

Note: a) Max. component weight for seamless plate. thickness for plate fabricated equipments.

SR No	M/M	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 1 (Optional)	Major Spec. 2 (Optional)	Type (Description)	Manufac. Char. 1. (TMS)	Manufac. Char. 2.	Manufac. Char. 3.	Origin	Q.	Purchase Cost		Cr. 1980 Cost		Purch. Year	SIPC Code									
												Unit	Total	Unit	Total		17345	67	8	9	10	11	12	13	14	15
												13	14	15	16		17	18	19	20	21	22	23	24	25	
40		Dryer	21,1 m ³			CV	4,9	SS	0 mm	I	1	26450	26450	41000	41000	1977	69201	09	0	5	2	1	0	1	2	
1		Dryer gas Scrubber	13,1 m ³		Temp: 600	CV	3,2	SS	0 mm	I	1	25900	25900	40000	40000	1977	74166	02	1	4	1	1	6	1	2	
2		Dryer gas filter	0,03 m ³			CV	1,1	SS	3 mm	I	1	2200	2200	3300	3300	1977	74301	04	1	0	1	1	5	1	2	
41		Dryer gas separator	1,19 m ³			CV	1,2	SS	3 mm	I	1	2800	2800	4300	4300	1977	69741	04	1	2	2	1	6	1	2	
42		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						69203	02	1	3	0	1	2	1	1	
7		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1	45000	45000	47000	47000	1977	74161	05	2	1	1	2	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1	14150	14150	14800	14800	1977	74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1	2800	2800	9000	9000	1977	74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³		Temp: 600	CV	0,9	CS	0 mm	I	1						74161	05	1	3	1	1	2	1	2	
		Compressor	1,57 m ³	</																						

SR No	M/N	Basic Machine Nomenclature	Major Spec. 1. (Capacity)	Major Spec. 2. (Optional)	Major Spec. 3. (Optional)	Type (Description)	Manufac. Char. 1. (CORS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origia	Q.	Purchase Cost		Ct. 1980 Cost		Purc. Year	SFTC Code															
												Unit	Total	Unit	Total		17	18	19	20	21	22	23	24	25	26	27	28	29	30		
40		Stabilizer melting drum	1,2m ³	-	Temp 200°C	CY	1,9	SS	11mm	I	1	22300	22300	34200	34200	1977	69241	05	1	0	2	2	1	0	1	2						
41		N.storage Drum	0,1m ³	-	Temp 100°C	CY	0,1	SS	3mm	I	1	2200	2200	2700	2700	1977	69241	05	1	0	1	2	1	0	1	2						
42		PCW Drum	11 m ³	-	Temp 110°C	Rectangular	3,3	SS	5mm	I	1	19100	19100	29300	29300	1977	69241	05	2	0	2	1	1	0	1	2						
43		BCW Drum	6,1m ³	-	Temp 200°C	CY	2,8	CS	9mm	I	1						69241	05	1	0	2	2	1	2	1	1						
1		PCW Cooler	HS 73 m ³ SD 250 mm		TL 4000mm	S T	2,5	CS	7mm	I	1					1977	74161	03	3	1	2	1	1	2	1	2						
2		BCW Cooler	HS 44,1m ³ SD 550 mm		TL 500mm	S T	1,6	CS	8mm	I	1						74161	03	2	1	1	1	1	2	1	1						
3		BC Water Cooler	HS 222 m ³ SD 900 mm		TL 4000mm	S T	0,1	CS	10mm	I	1						74161	03	4	1	2	1	2	2	1	1						
4		Pelletizer	HS 14 m ³ SD		TL	S T	0,4	CS		I	2	5210	10420	4530	9100	1978	74161	03	2	0	0	1	1	2	0	2						
50		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
61		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
62		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
63		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
64		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
65		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
66		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
67		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
68		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
69		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
70		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
71		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
72		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
73		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
74		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
75		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
76		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
77		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
78		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
79		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
80		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
81		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
82		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
83		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
84		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
85		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
86		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
87		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
88		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
89		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
90		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
91		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
92		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
93		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
94		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
95		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
96		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
97		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I	1	3150	3150	3630	3630	1978	74210	11	1	1	4	1	7	1	2							
98		PCW circulation Pump	170m ³ /hr	35 m	H.W	H	0,6	SS	0,3T	I	2	2100	4200	3400	6800	1977	74220	01	4	2	2	1	1	7	1	2						
99		BCW Pump	50m ³ /hr	45 m	H.W	H	0,3	CI	0,3T	I	2	870	1740	1400	2800	1977	74220	01	3	2	2	1	1	1	1	2						
100		BC cooling water pump	100m ³ /hr	30 m	H.W	H	0,3	CI	0,3T	I	2	1600	3200	2600	5200	1977	74220	01	3	2	2	1	1	1	1	2						
101		Pelletizer	37,2m ³ /hr		H.W	H	0,1	CI	0,1T	I	2	5210	10420	6000	12000	1978	74230	00	2	3	2	1	1	1	1	2						
102		Subs oil Cool pump	655,4 m ³ /hr	10,5m	H.W	H	0,3	SS	0,3T	I	1	5150	5150	4500	4500	1978	74210	11	5	1	4	1	7	1	2							
103		Stabilizer feed Pump	81,5m ³ /hr	15,5m	H.W	H	0,3	SS	0,3T	I																						

SN No	Machine Description	Major Spec. (Capacity)	Major Spec. (Optional)	Major Spec. (Optional)	Type (Description)	Manufac. (YMS)	Manufac. Char. 2.	Manufac. Char. 3.	Origin	Purchase Cost		Ct. 1980 Cost		Purc. Year	SITC Code
										Unit	Total	Unit	Total		
15	Pelletizer	3,2t/hr	Dia: 305	CS	47,0 T	I	2	599500	119000	680500	1372400	1978	72834	03	1 1 0 2 5 6 7 2
16	Hot water strainer	7,5t/hr	Dia: 1000mm	SS	-	I	2	5210	10420	6000	12000	1978	74362	70	1 1 0 1 6 6 2
17	Pellet vibrator ring screen	6 t/hr	50:2, 3mm	SS	2,8 T	I	2	26100	52200	30100	60200	1978	71831	06	1 4 0 1 1 7 3 2
69	Ejector	-	P: atm	SS	0,001	I	2	400	800	610	1220	1977	74312	30	0 1 2 1 1 7 1 2
90	Pelletizer hydraulic salt MELTER	-	-	-	-	-	1	-	-	-	-	-	-	-	-
18	Air filter	3000m ³ /hr	Dia: 1754	CS	0,6	I	1	7300	7300	8400	8400	1978	74301	40	1 1 0 1 1 2 1 2
19	Air filter	11300m ³ /hr	Dia: 1501	CS	1,2	I	1	11000	11000	12680	12680	1978	74351	40	2 1 0 1 1 2 1 2
20	Air filter	7000m ³ /hr	Dia: 1347	CS	0,9	I	1	7300	7300	8400	8400	1978	74301	40	1 1 0 1 1 2 1 2
13	Stabilizer	2400m ³ /hr	Dia: 945	CS	0,3	I	2	2850	5700	3300	6600	1978	74361	11	1 1 0 1 1 3 0 2
70	Powder transfer for Blower	30,3m ³ /min	17, 3mm	CS	2,7	I	2	10050	20100	13400	26800	1977	74342	12	3 5 1 1 1 2 2
71	Powder transfer for Blower	3,0m ³ /min	17, 3mm	CS	0,3	I	1	1250	1250	1000	1000	1977	74341	10	2 0 1 3 1 6 1 2
72	Powder transfer for Blower	11,7m ³ /min	17, 3mm	CS	1,1	I	1	12300	12300	10000	10000	1977	74342	10	3 5 2 1 1 2 1 2
73	Pellet transfer for Blower	40 m ³ /min	17, 3mm	CS	1,5	I	2	4000	8000	6250	12500	1977	74742	10	3 5 1 1 1 1 1 2
74	Pellet blender Blender	108, 2m ³ /min	P16, 8mm	CS	12,3	I	1	25250	25250	38700	77400	1977	74342	10	5 1 1 3 1 4 2
75	Pellet blender Blender	116, 7m ³ /min	P16, 78mm	CS	8,1	I	1	15150	15150	24750	24750	1977	74342	10	5 1 1 2 1 1 2
44	Powder hopper	52m ³	Dia: 3,4m	SS	5,3	I	1	44800	44800	51250	51250	1976	69211	14	1 1 3 2 2 6 1 2
45	Mixer hopper	30 m ³	Dia: 3,6m	SS	4,7	I	1	30000	30000	45000	45000	1978	69211	14	1 1 2 2 1 6 1 2
46	Stabilizer	4,7 m ³	Dia: 1,7m	SS	2,4	I	1	28150	28150	32450	32450	1978	69211	14	1 1 2 1 6 1 2
47	Pellet separator hopper	2 m ³	Dia: 1,4m	SS	0,8	I	2	6500	13000	7500	15000	1978	69211	14	1 1 3 2 1 0 1 2
48	Powder silo	400 m ³	Dia: 5,5m	AL	12,0	I	1	4170	4170	4800	4800	1978	69211	06	2 2 3 2 3 7 1 1
49	Breathing tank	0,3 m ³	Dia: 1,0m	SS	0,4	I	1	4170	4170	4800	4800	1978	69211	07	1 1 3 2 1 6 1 2
50	Pellet Silo	280 m ³	Dia: 5,0m	AL	9,3	I	4	-	-	-	-	1978	69211	06	2 1 3 2 2 7 1 1
51	Diff Pellet Silo	40 m ³	Dia: 2,8m	AL	1,6	I	1	-	-	-	-	1978	69211	06	1 1 3 2 1 7 1 1
52	Pellet separator hopper	0,8 m ³	Dia: 1,5m	SS	0,5	I	4	4800	19200	5500	22000	1978	69211	14	1 1 3 2 2 6 1 2

Note: a) Net equipment weight for machines, plate thickness for plate fabricated equipments.

S/N	M	Basic Machine Name	Major Spec (Capacity)	Major Spec 1 (Optional)	Major Spec 2 (Optional)	Type (Description)	Manuf. Char. 1 (TONS)	Manuf. Char. 2	Manuf. Char. 3	Origin	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code										
											Unit	Total	Unit	Total		12145	6710	9	1011	30	34					
3		Banding machine	1000 bag/hr	Vol: 2.18	Electrical	Fixed	4.0	SS	4.0 T	I	1				1978	7452203	1	1	1	1	7	3	2			
4		Conveyor	300 bag/hr	Vol: 770		Pallet bag	0.3	CS	0.3 T	I	1				1978		31	1	2	0	2	1	6	1	2	
81		Metal detector	Deleted							I	1															
82		Automatic weighing device	1700 Bags/hr	Area: 0.46	Electrical	Fixed	0.3	CS	0.3 T	I	1				1978	7452305	1	1	2	1	1	1	1	6	1	2
1		Light checker	1200 Bags/hr			Pressure Tube	0.4	CS	0.4 T	I	1				1978	7283152	1	0	0	2	1	6	1	1	2	
2		Sorting device	1200 Bags/hr	Width: 650 mm		Pallet bag	1.0	CS	1.0 T	I	1				1978	7447602	1	2	0	2	1	6	1	1	2	
3		Inclination Conveyor	1700 Bags/hr	Dia: 5400 mm		Pallet drum	6.5	CS	6.2 T	I	1				1978	7283404	1	6	0	1	2	6	4	2		
4		Palletizer	1200 Bags/hr	Width: 1300 mm		Pallet bag	1.8	CS	1.8 T	I	1				1978	7442631	1	3	0	2	1	6	1	2		
5		Conveyor	50 Pallets/hr	Vol: 18.04 m ³	Electrical	Fixed	3.7	CS	3.6 T	I	1				1978	7457707	1	2	2	1	1	6	3	2		
6		Shrink film wrapping machine	50 Pallets/hr	Temp: 250.0	Electrical	Shrink-heating	5.1	CS		I	1				1978	7416340	1	1	5	9	2	1	0	2		
7		Shrink oven	22 m ³	Dia: 2850 mm	Temp: 60C	CY	0.9	Alumini	6 mm	I	1				1978	6021114	1	1	3	2	1	7	1	1		

Note: a) Max. component weight for machines, place thickness for plate fabricated equipments.

SR No	Basic Machine	Major Spec (Capacity)	Minor Spec (Material)	Major Spec (Description)	Type	Manufac. Char. 1	Manufac. Char. 2	Manufac. Char. 3	Origin	Purchase Cost		Gr. 1933 Cost		SYTC Code		
										Unit	Total	Unit	Total	Purch. Year	1974	1975
1	Low pol. spec	11,400			CY	R,0	CS	U mm	I	1						
40	STORAGE	11,400			CY	R,0	CS	U mm	I	1						
1	LAYER COO	15 m/hr	SPIC,45		ST	0,9	CS	R mm	I	1						
40	COOLING MA	15 m/hr	SPIC,45		H	0,2	CS	0,1tons	I	1						
40	COOLING MA	2 m/hr	SPIC,45		H	0,4	CS	0,1tons	I	1						
41	PERF FLAIR	14 m ³		Complis-02	H	3,0	CS	-	I	1	30550	46800	46800	1977	69241	1977
51	Ventilator	1000	01 atm.	Neallum	H	0,1	CS	0,1tons	I	1	1550	2375	2375	1977	74313	1977

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

ACTIVITY CODE: 95101511

SP	M	M/Basic Machine	M/Basic Machine (Capacity)	M/Basic Machine (Type)	M/Basic Machine (Description)	M/Basic Machine (Char. 1)	M/Basic Machine (Char. 2)	M/Basic Machine (Char. 3)	Q	Purchase Cost			CR. 1980 Cost			Year	SITC Code
										Unit	Total	Unit	Total	Unit	Total		
19		hexane con-	21.5 m	CS	1.0	S I			1							7416105 1 1 1 1 2 1 1	
17		storage drum	5 m	CS	0.4	S I			1							7416105 2 1 1 1 2 1 1	
16		low polymer	3 m	CS	0.4	S I			1					1977		7416105 1 1 1 1 2 1 1	
15		flash burner	3 m	CS	4.1	S I			1		12900	12900	13500	13500	1977	7416110 1 1 1 1 2 1 1	
14		flash vent con-	10.3 m	CS	0.8	S I			1					1977		7416100 2 1 1 1 2 1 1	
13		vent condan-	14 m	CS	1.8	S I			1							7416105 2 1 1 1 2 1 1	
12		flash vent con-	10.3 m	CS	0.7	S I			1							7416105 2 1 1 1 2 1 1	
11		bottom cooler	8 m	CS	3.1	S I			1							7416105 4 1 1 1 2 1 1	
10		recobler	4 m	CS	2.1	S I			1							7416105 2 1 1 1 2 1 1	
9		head condan-	12 m	CS	13.9	S I			1		8500	8500	8900	8900	1977	7416105 2 1 1 1 2 1 1	
8		flash burner	11 m	CS	5.7	S I			1		19500	19500	20400	20400	1977	7416105 4 1 1 1 2 1 1	
7		flash burner	8 m	CS	1.1	S I			1							7416105 2 1 1 1 2 1 1	
6		flash burner	10.9 m	CS	0.9	S I			1							7416110 2 1 1 1 2 1 1	
17		hexane rece-	1.5 m	CV	0.9	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	13.5 m	CS	5.8	CV			1		25100	25100	32000	32000	1977	7416107 1 1 4 1 2 1 1	
		flash burner	1.0 m	CS	0.8	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	1.0 m	CS	0.8	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	2.1 m	CS	1.1	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	2 m	CS	2.0	CV			1		29900	29900	38200	38200	1977	7416510 1 1 2 1 1 2 1 1	
		flash burner	1.0 m	CS	0.8	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	1 m	CS	0.1	CV			1							6924105 1 0 3 2 1 1 1	
		flash burner	10 m	CS	0.4	CV			1							6921110 1 1 2 2 1 2 1 1	
		flash burner	20 m	CS	0.1	CV			1							7416440 3 0 1 1 2 1 1	
		flash burner	9 m	CS	4.6	CV			1							6924105 1 0 3 2 1 2 1 1	
		flash burner	7 m	CS	13.5	CV			1							7416210 1 1 7 7 2 1 1	
		flash burner	14 m	CS	10.8	CV			1							7416107 1 1 4 1 2 1 1	

ADDRESS FOR ORDER: BOSTON, MASSACHUSETTS

28 30	N/ M	Basic Machine Name/Description	Major Spec (Capacity)	Major Spec (Dimensions)	Major Spec (Performance)	Type (Classification)	Manufac. Char. 1 (FNSN)	Manufac. Char. 2	Require. Char. 3	Origin	Purchase Cost		Ct. 1980 Cost		Pur. Year	SIC Code	
											Unit	Total	Unit	Total			
1																	
19		vent. condenser	1000 ft ³ /h	50" dia x 70" h	10 g	ST	0-2	CS	0.1 tons	I	1						
20		heat exchanger	1000 ft ³ /h	50" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1150	1150	1800	1800	1977	74001
21		plate heat exchanger	450 ft ³ /h	40" dia x 60" h	10 g	H	0-2	CS	0.1 tons	I	1	3000	3000	4850	4850	1977	74001
22		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
23		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
24		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
25		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
26		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
27		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
28		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
29		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
30		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
31		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
32		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
33		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
34		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
35		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
36		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
37		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
38		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
39		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
40		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
41		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
42		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
43		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
44		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
45		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
46		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
47		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
48		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
49		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001
50		stripper	13 m ³ /h	40" dia x 70" h	10 g	H	0-2	CS	0.1 tons	I	1	1600	1600	2450	2450	1977	74001

Note: (a) N/A: Component weight for machine plate.
 (b) M: Machine for plate fabrication equipment.

UNICC / SPCIPETKIM)
 CAPITAL CCDS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW HIGH DENSITY POLYETHYLENE PLANT, CAPACITY 40
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSING= 1994
 UNIT WEIGHTS IN TONS, UNIT CCSTS IN 1000 U.S.A DOLLARS (1980)
 EGP-DEPARTMENT-PETKIM / ANKARA

SI7C CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994
74161 02211 11212	DEHYDRATOR REBCILER	1	2.1	8.9				2.1
74161 02411 11212	CRUDE HEXANE REBCILER	1	5.9	20.4				5.9
74161 03111 11211	PURGE GAS COOLER	1	.5	.0				.5
74161 03200 11202	PELLETIZER LUBE OIL COOL.	2	.4	4.6				.8
74161 03211 11211	FLASH GAS COOLER	1	1.2	.0				1.2
74161 03211 11211	BCH COOLER	1	1.6	.0				1.6
74161 03211 11211	OFF GAS COOLER	1	.7	.0				.7
74161 03211 11211	WATER COOLER	1	.9	.0				.9
74161 03212 11211	INTER COOLER	1	1.1	.0				1.1
74161 03212 11211	AFTER COOLER	1	1.1	.0				1.1
74161 03311 11211	CRUDE HEXANE COOLER	1	1.9	.0				1.9
74161 03312 11212	PCM COOLER	1	2.5	.0				2.5
74161 03412 12211	EC WATER COOLER	1	6.1	.0				6.1
74161 03413 11211	DEHYDRATOR BCTYON COOLER	1	3.2	.0				3.2
74161 05111 11211	STORAGE DRUM CONDENSER	1	.4	.0				.4
74161 05111 11211	PURGE GAS CONDENSER	1	.9	.0				.9
74161 05111 11211	VENT CONDENSER	1	1.2	.0				1.2
74161 05111 11212	VENT CONDENSER	1	.2	.0				.2
74161 05111 41211	SECCNO ANALY. GAS CONDEN	1	.1	.0				.1
74161 05111 41211	FIRST ANALY. GAS CONDEN	1	.1	.0				.1
74161 05201 11211	CRUDE HEX. TANK VENT CON.	1	.7	.0				.7
74161 05211 11211	HEXANE CONDENSER	1	1.0	.0				1.0
74161 05211 11211	PURE HEX. TANK VENT CON.	1	.8	.0				.8
74161 05211 11212	PURGE GAS CONDENSER	1	1.1	9.0				1.1
74161 05212 11211	VENT CONDENSER	1	.2	.0				.2
74161 05411 11211	FLASH GAS CONDENSER	1	4.4	.0				4.4
74161 05413 11211	HEXANE OVMD. CONDENSER	1	13.9	.0				13.9
74161 05423 12212	DRYER GAS CONDENSER	1	8.2	47.0				8.2
74161 05523 13212	FIRST OVMD. CONDENSER	1	21.5	48.7				21.5
74161 05523 13212	SECCNO OVMD. CONDENSER	1	21.8	49.3				21.8
74161 07213 11212	DRYER GAS HEATER	1	3.6	14.8				3.6
74161 09111 21211	PROPYLENE VAPORIZER	1	.5	.0				.5
74161 09111 21211	BUTENE VAPORIZER	1	.5	.0				.5
74161 10111 11212	LLB PGLY. PREHEATER	1	.4	.0				.4
74161 10111 31211	ETHYLENE DEHYDRATOR	1	13.5	.0				13.5
74161 10113 41211	ETHYLENE PREHEATER	1	.8	.0				.8
74161 10211 11211	CRUDE HEX. PREHEATER	1	.9	.0				.9
74161 10213 11212	FLASH PREHEATER	1	4.1	13.5				4.1
74163 40115 92202	SHRINK OVEN	1	5.1	.0		5.1		
74164 30300 14602	DRYER	1	32.7	396.8		32.7		
74164 40301 12211	HEXANE DRYER	2	6.1	.0		12.2		
74165 05121 15422	SECCNO POLYMERIZER	1	57.0	424.8		57.0		
74165 09121 15422	FIRST POLYMERIZER	1	57.0	424.8		57.0		
74165 10112 11212	DEACTIVATOR	1	2.8	38.2		2.8		
74166 02114 11612	DRYER GAS SCRUBBER	1	3.7	40.0		3.7		
74166 07114 12211	HEXANE STRIPPER	1	5.8	32.0		5.8		
74166 07114 13211	HEXANE STRIPPER	1	12.0	.0		12.0		
74210 11114 11912	H. STABILIZER FEED PUMP	1	.3	3.6				.3
74210 11121 11112	CENTRIF. LUBE OIL PUMP	1	.1	5.7				.1
74210 11171 11612	DRYER LUBE OIL PUMP	1	.1	5.4				.1
74210 11514 11912	LIG. STABILIZER FEED PUMP	1	.3	4.5				.3
74210 20131 11912	BUTENE TRANSFER PUMP	1	.5	8.2				.5
74210 20144 11912	AT FEED PUMP	3	.2	4.1				.6
74210 20148 11912	P2 FEED PUMP	6	.2	4.0				1.2
74220 00211 11612	HEXANE TRANSFER PUMP	1	.1	1.1				.1
74220 01211 11612	MAKE UP HEXANE PUMP	1	.8	1.9				.8
74220 01211 11612	CONDEN. HEXANE PUMP	2	.1	2.3				.2
74220 01312 11612	DEACTIVATOR BOTTOM PUMP	2	.4	.0				.8

000TON/YEAR

1993	1996	1997	1998	1999	2000	TOT_WE
*****	*****	*****	*****	*****	*****	*****
						2.1
						5.9
						.5
						.8
						1.2
						1.6
						.7
						.9
						1.1
						1.1
						1.9
						2.5
						6.1
						3.2
						.4
						.9
						1.2
						.2
						.1
						.1
						.7
						1.0
						.8
						1.1
						.2
						4.4
						13.9
						8.2
						21.5
						21.8
						3.6
						.5
						.3
						.4
						13.5
						.8
						.9
						4.1
						5.1
						32.7
						12.2
						57.0
						57.0
						2.8
						3.7
						5.8
						12.8
						.3
						.1
						.1
						.3
						.5
						.6
						1.2
						.2
						.1
						.8
						.2
						.8

UNICC / SPG(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW HIGH DENSITY POLYETHYLENE PLANT,CAPACITY = 40 000TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHS IN TONS,UNIT COSTS IN 1000 U.S.-A DOLLARS (1980)
EDP-DEPARTMENT-PETKIM / ANKARA

SATC CODE	BASIC MACHINE NAME	GR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.WE
74522 02122 11632	SHRINK FILM WRAP. MACHINE	1	3.7	.0				3.7							3.7
74522 03112 11932	BAGGING MACHINE	1	4.0	.0				4.0							4.0
74525 05112 11602	AUTOMATIC WEIGHT CHECKER	1	.3	.0				.3							.3

UNICG / SPCIPETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW HIGH DENSITY POLYETHYLENE PLANT,CAPACITY = 40 000TON/YEAR
LOCATION=YUNURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EDF-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
74522 C2122 11632	SHRINK FILM WRAP. MACHINE	1	3.7	.0					.0						.0
74522 C3112 11932	BAGGING MACHINE	1	4.0	.0					.0						.0
74525 C5112 11612	AUTOMATIC WEIGHT CHECKER	1	.3	.0					.0						.0

12167
(9 of 17)

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034**

**Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry.**

**Vol. VIII - Technical data for
(PP) Polypropylene**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry,
Vol.VIII - Technical Data for
(PP) Polypropylene

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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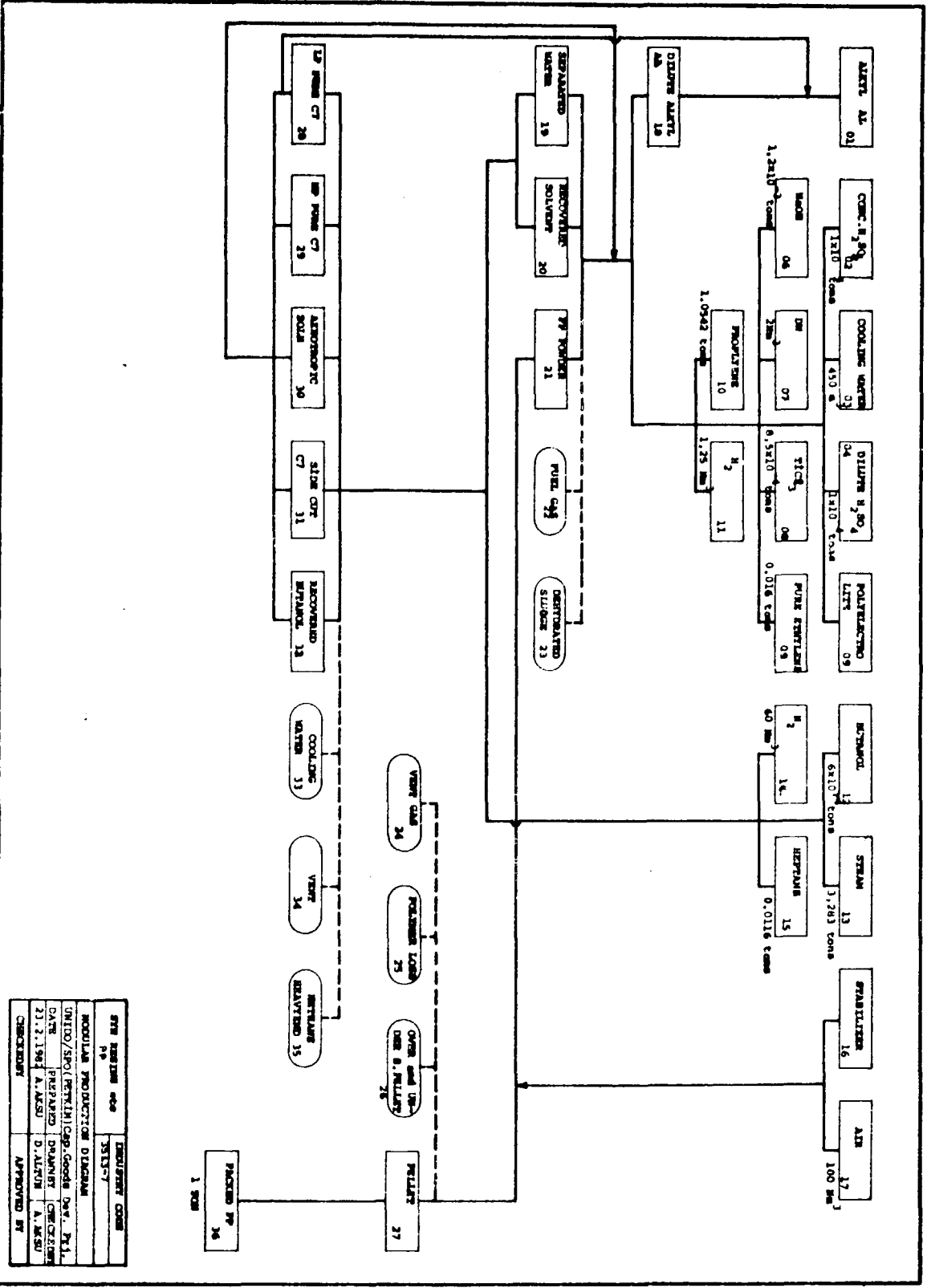
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No.	Tarih	Jelm

Perkim 103127-A-7/1971



PETKIM PETROKIMYA A.Ş.



ŞİŞE BİSMİS NO	513-7	İNŞAAT KODU
PP		
MODÜLER ÜRETİM ÜNİTESİ		
ÜNİTE/SİSİ (PETKİM) ÇAP: 600 MM, 7.5 L		
DATE	PREPARED	DRAWN
21.2.1962	A. AKSU	D. ALTUN
CHECKED BY		APPROVED BY



PETKIM PETROKIMIA A.S.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND
ACTIVITIES FOR PP PLANT

- 01 TO 18 CATALYST DILUTION
- 02 TO 21 LIQ. PHASE POLYMERIZATION
- 21 TO 27 PELLETIZING
- 12 TO 32 BUTANOL RECOVERY
- 27 TO 36 PACKING

Rev.	Tarih	Ismi

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PETKIM PETROKIMYA A.Ş.

UNIDO /SPO (PETKİM)
CAPACITY GOODS DEVELOPMENT PROJECT

INDUSTRY ACTIVITIES CHART
PART 7 -PP

IND CODE : 3513-7
IND NAME : SYNTHETIC
RESINS etc - PP

PROD.C	PROD. STAGE	TECH. CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPAC. FY
18	DILUTE ALKYL-AL	1	DILUTION	ALKYL-AL DILUTION VESSEL	22,75-100 m ³	1	22,75 m ³
						2	50 m ³
						3	75 m ³
						4	100 m ³
21	PP POWDER	1	LIQ PHASE PROCESS	POLYMERIZATION REACTOR	49,4-200 m ³	1	49,4 m ³
						2	110 m ³
						3	200 m ³
		2	VAPOR PHASE PROCESS	POLYMERIZATION REACTOR	100-400 m ³	1	100 m ³
						2	200 m ³
						3	400 m ³
27	PELLET PP	1	PELLETIZING	STABILIZER BLENDER	1000-5000 m ³ /h	1	1000 m ³ /h
						2	2000 m ³ /h
						3	3000 m ³ /h
						4	5000 m ³ /h
32	RECOVERED BUTANOL	1	BUTANOL RECOVERY	BUTANOL RECOVERY TOWER	15-50 m ³	1	15 m ³
						2	30 m ³
						3	40 m ³
						4	50 m ³
36	PACKED PP	1	PACKING	SHRINK WRAPPING	20-100 t/h	1	20 t/h
						2	50 t/h
						3	75 t/h
						4	100 t/h

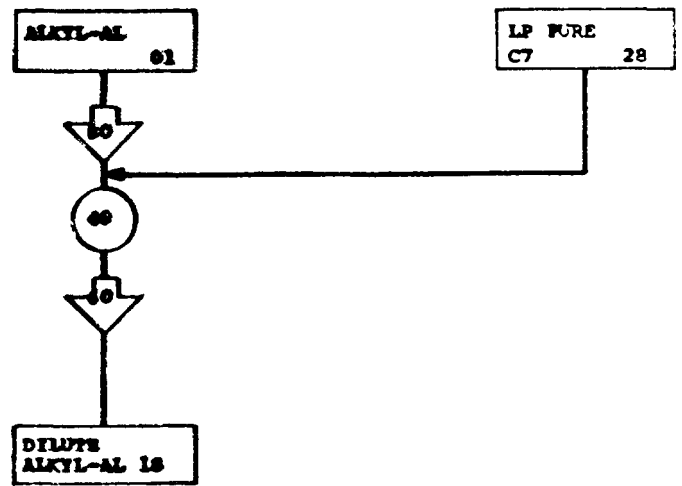
PREPARED BY	CHECKED BY	APPROVED BY
S.KESKİN		

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Revizyon: 03/09/80/01/015



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP
	3513-7	18	1	1
NO	MACHINE CODE	MACHINE NAME	Q	
40	692410620323211	Alkyl-al Dilution V. 2		
60	742000131511912	Dilute Alkl-Al C.P.	2	
80	745250520120602	Alkyl-al Weigher	1	

UNIDO/SPO (PETKİM) CAPITAL GOODS DEVELOPMENT PROJECT

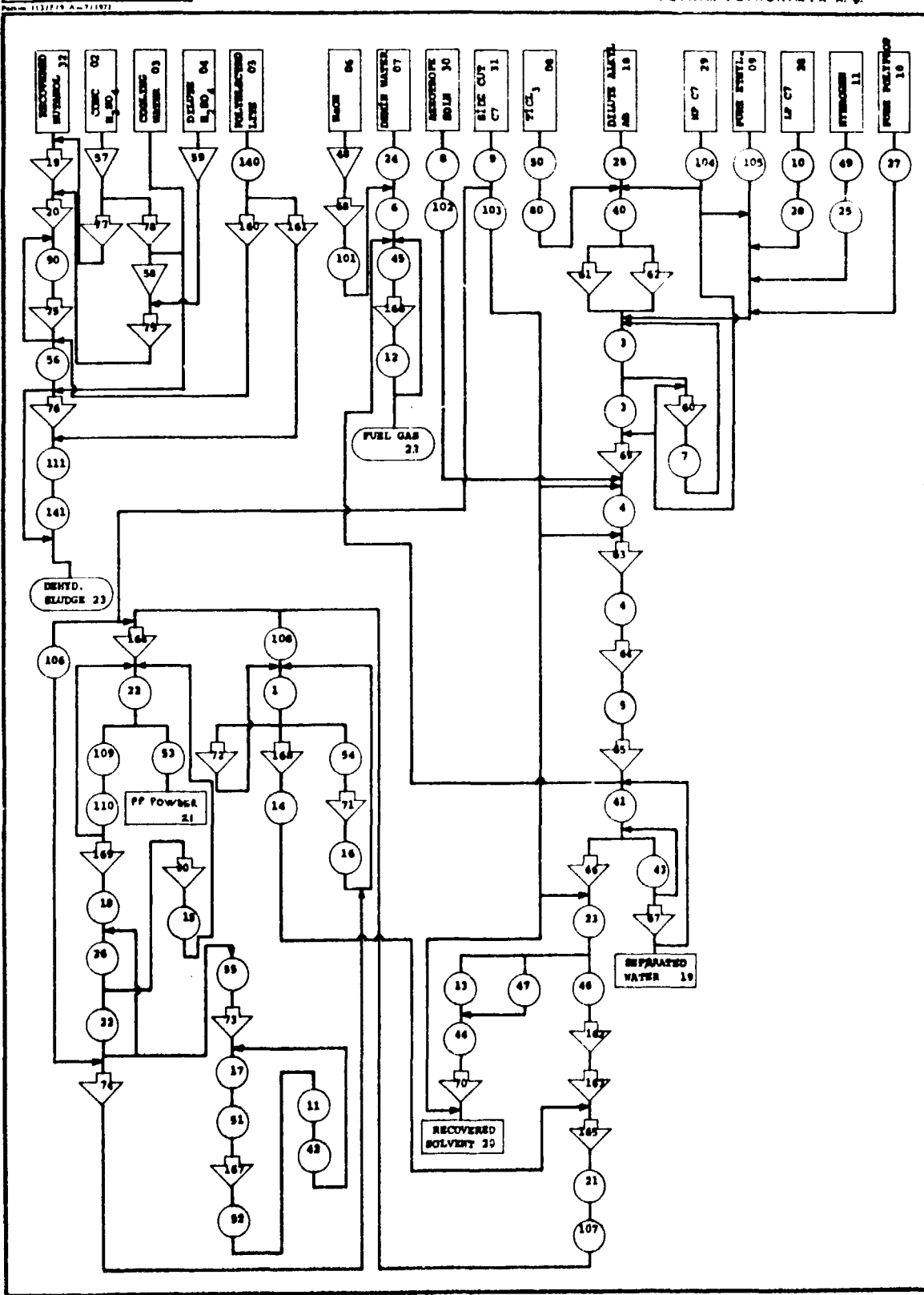
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN. RESINS etc	DILUTE ALKYL-AL	DILUTION
DATE	SAMPLE PLANT	CAPACITY
4.1.1982	ALİAĞA	22.75 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AYSU	D.ALTM	S.KESKİN
CHECKED BY:		APPROVED BY:

Rev.	Tarikh	Isim



PETKIM PETROKIMYA A. B.



INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESIN	PP FIBRES	DID PR PROSES
INDUSTRY	PRODUCT	TECHNOLOGY
CAPITAL GOODS DEVELOPMENT PROJECT		
UNIDO / SBO (PETKIM)		
MODULAR PROCESS FLOW DIAGRAM		
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESIN	PP FIBRES	DID PR PROSES
INDUSTRY	PRODUCT	TECHNOLOGY
DATE	23.1.1982	49.4 m
APPROVED BY	D. ALVIN	7. KESKIN
CHECKED BY	D. ALVIN	7. KESKIN
DATE	23.1.1982	49.4 m
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESIN	PP FIBRES	DID PR PROSES
INDUSTRY	PRODUCT	TECHNOLOGY
DATE	23.1.1982	49.4 m
APPROVED BY	D. ALVIN	7. KESKIN
CHECKED BY	D. ALVIN	7. KESKIN

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP.
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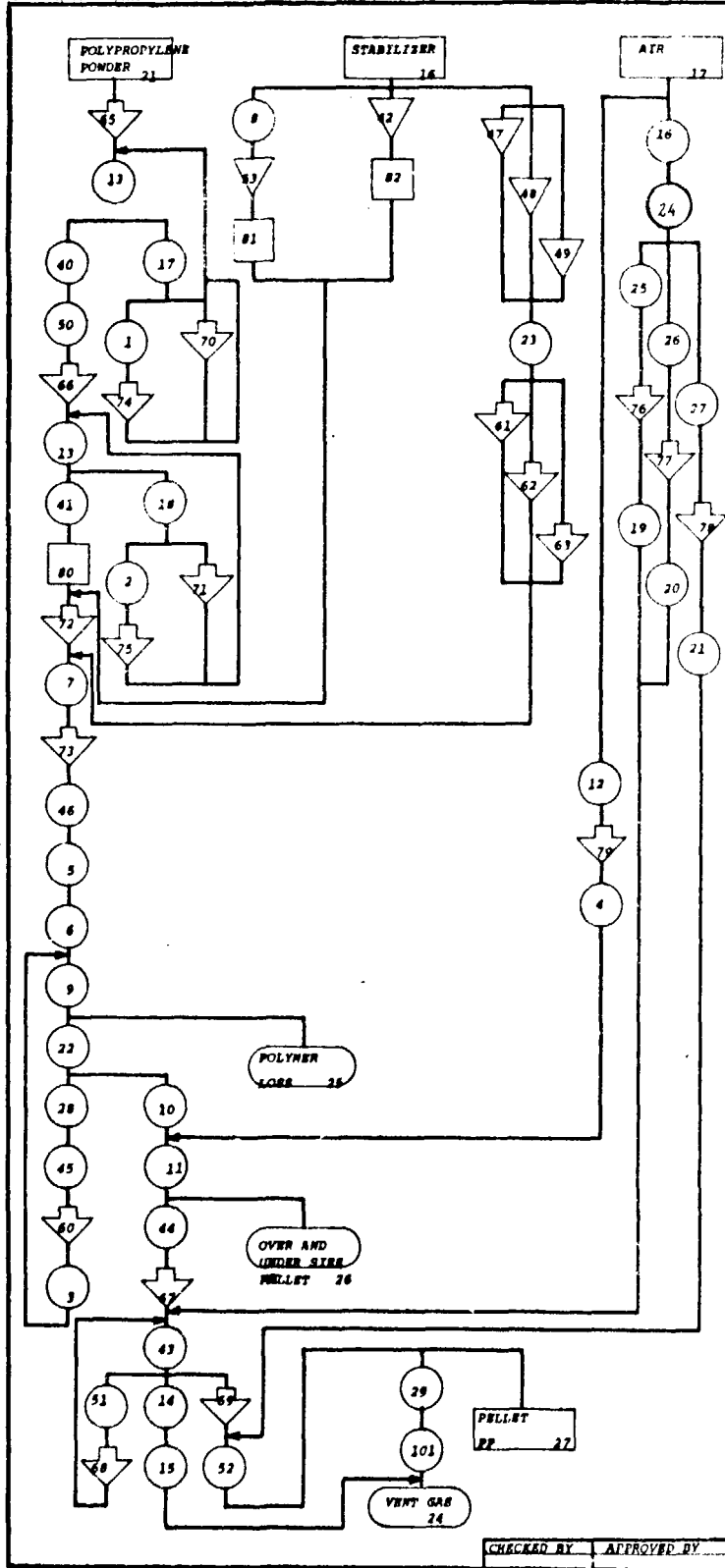
Rev.	1/11
Date	
Page	1/11

Rev.	Part	Item



PETKIM PETROKIMYA A.Ş.

Part No: 111/213.A-71/1972



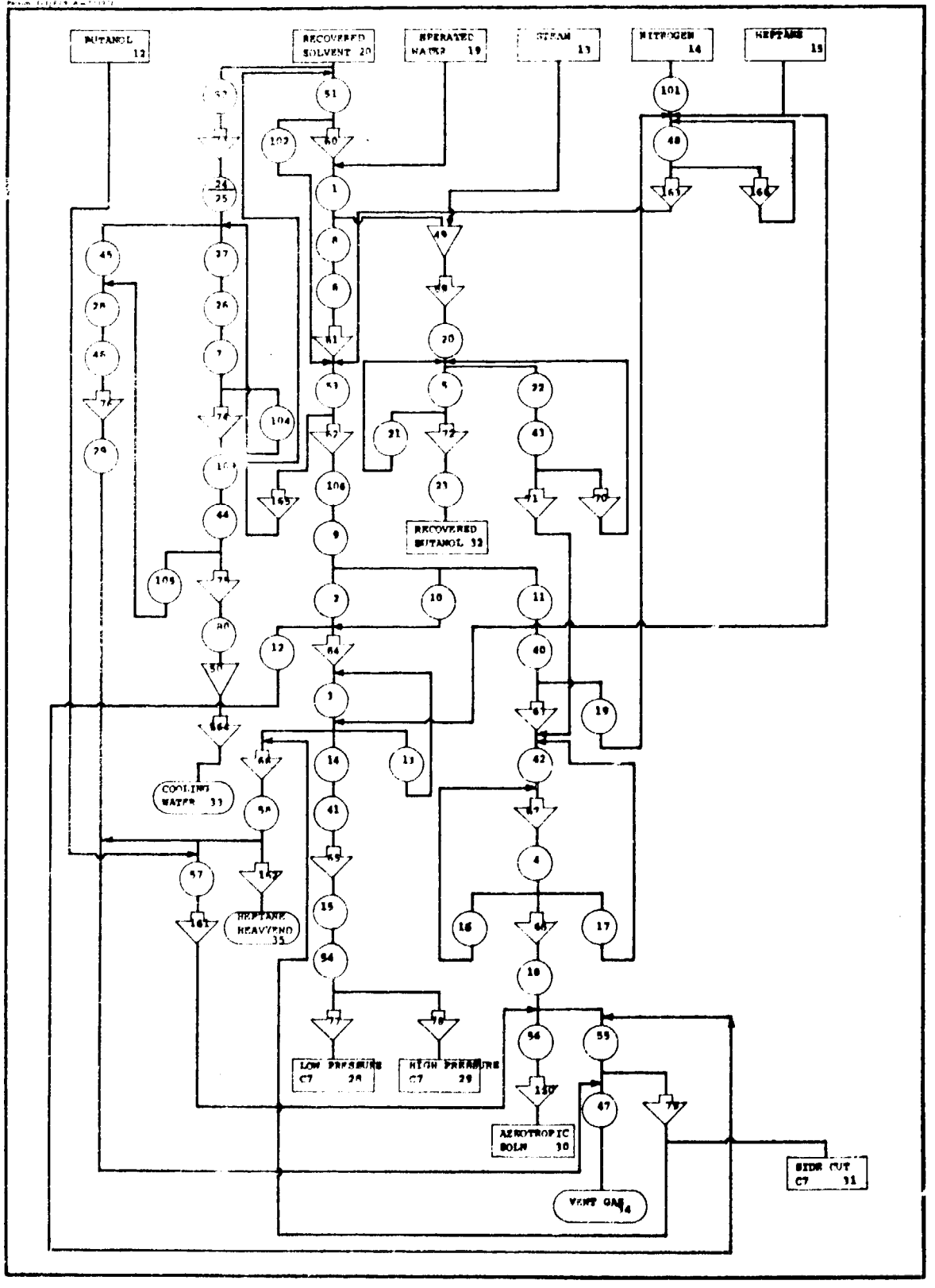
ACTIVITY NO.	INDUSTRY	PRODUCT TECH.	Cap
1	741611011111612	VENT GAS Cyclone	2
2	741611011111612	Powder Silo	2
3	692110611111612	Powder Buffer Hold	22
4	692110611111612	Stabilizer Stor.V	2
5	692110611111612	Polymer Pellet Silo	4
6	692110611111612	Extr. Buf. Buf. Vess.	2
7	692110611111612	Wtr. Water Tank	2
8	692110611111612	Buffer Vessel	2
9	692110611111612	MIX. Stab. Stor.V	2
10	692110611111612	Wool	1
11	692110611111612	Wool	1
12	692110611111612	Wool	1
13	692110611111612	Wool	1
14	692110611111612	Wool	1
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80	692110611111612	Wool	1
81	692110611111612	Wool	1
82	692110611111612	Wool	1

UNIPOL/SPX/PETKIM CAPITAL GAZI OSMAN PAZARI		
MODULAR PROCESS FLOW DIAGRAM		
INDUSTRY	PRODUCT	TECHNOLOGY
PP	PELLET PP	PP/PP/PP
DATE	SAMPLE PLAN	DATE
4.1.2022	ALIAGA	3.5
PREPARED BY	DRAWN BY	CHECKED BY
A.KEGU	B.ALTUN	C.KEGU

Rev.	Tarih	Isim



PETKIM PETROKIMYA A.Ş.





PETKIM PETROKIMYA A.Ş.

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3513-7	32	1	1
NO	MACHINE CODE	MACHINE NAME		Q
1	741660721421212	Primary Stripper	1	
2	741660721414211	Azeotrope Strip.	1	
3	741661121414211	Reptane Tower	1	
4	741661111413211	Azeotrope Tower	1	
5	741661111413211	Butanol Rec.Tower	1	
6	692410510321211	Striped Solvent S.	1	
40	692410510321211	Azeot.Strip.Ref.D	1	
41	692410510221211	Hep.Tow.Ref. Drum	1	
42	692410510321211	Hep.Tow.Ref.D.	1	
43	692410510321211	But.Rec.Tow.Ref.D.	1	
7	741620101292211	Pre. Evaporator	1	
64	622119911292212	APP Receiver	1	
45	692410410221211	Con.Flash Vessel	1	
46	692119911221211	Str'ip. solv.Rec.	1	
47	692410810321211	Tank Seal Pot	3	
48	692430221321211	Vent Gas Buf.Dr.	1	
8	741610541313211	Condenser	1	
9	741611021211211	Strip.Solv.Preheat	1	
10	741610241212211	Azeot.Strip.Ketoc.	1	
11	741610521211211	Azeot.Strip. Con.	1	
12	741610321111211	Side Cut Heat Cool.	1	
13	741610242213211	Hep.Tow.Reboiler	1	
14	741610541212211	Hep.Traser Con.	1	
15	741610331311211	Purified Hep.Cool.	1	
16	741610211211211	Azeo.Tow.Reboiler	1	
17	741610521211211	Azeo. Tow. Con.	1	
18	741610321311211	Azeo. Cooler	1	
19	741610521111211	Ref.Dr.Ovhd Con.	1	
20	741610311211211	Hep.Tow.Feed Preh	1	
21	741610231211211	But.Rec.Tow. Heb	1	
22	74161051211211	But.Rec.Tow.Con.	1	
23	741610541312211	Waste water Cool.	1	
24	74161041021211	Rec. Solv.Preheat	1	
25	741610311211211	" " " "	1	
26	741610411211211	Preheater	1	
27	741620101312211	Contin.Film Swap.	1	
28	741610541312211	Condenser	1	
29	741610311211211	Stripped Slw. Con.	1	
101	741610521211211	Str. Slw. Rec. Ovhd.	1	
102	741610321211211	Tank Vent Gas Con.	1	
103	741610311211211	Feed Preheater	1	
60	742200132211612	Prim.Strip. Feed P.	2	
61	742200132211612	Strip.Solv.Trans.F	2	
62	742200132211612	Azeot.Strip.Fe.P.	2	
63	742200132211612	Azeot.Strip.Ref.F.	2	

64	742200132211612	Hep.Tow.Fe.Pump	1
65	742200132211612	Hep.Tow.Ref.Pump	2
66	742200121211612	Hep.Tow.Bott. P.	1
67	742200121211612	Aze.Tow.Ref.Pump	2
68	742200121211612	Aze.Tow.Bot.Pump	2
69	742200132211612	But.Rec.Tow.Fe.P.	2
70	742200132211612	But.Tow.Ref.Pump	2
71	742200121211612	Rec.Bot.Trans.F.	1
72	742200131411612	But.Tow.Bot.Pump	2
73	742200132211612	Feed Pump	3
74	742200134211612	" " "	2
75	742200124211612	APP Trans. Pump	1
76	742200132211612	Strip.Solv.Trans. P	2
77	742200143111612	LP Pure Hep.Tran.	2
78	742200136111612	HP Pure Hep.Tran.	2
79	742200134111612	Side Cut.Hep.Tr.F	2
160	742200122111612	Pure Aze.Trans.F	2
161	742200121111612	Butanol Tran.Pump	1
162	742200131611612	Hep.Heavy End.Tr.	1
163	742102011301612	Bottom Draw off P.	1
164	742200132111612	Cooling H ₂ O Tran P	1
165	742200121311612	Draw off Pump	1
104	743610010011211	Mist Separator	1
105	743610010011211	Mist " "	1
80	745220000117631	APP Cutter	1
106	743621001001612	Aze.Strip.Fe.Sol.	2
166	743621001211712	Vent Gas Tran. Bls.	1
44	Concrete	RM Pit	1
50	"	CWP Pit	1
51	692110722124211	Decantation Tank	1
52	69211072331211	Rec. Solv.Tank	1
53	69211072331211	Strip.Solv.Tank	1
54	69211072331211	Purified Hep.T	1
55	69211072331211	Side Cut.Hep.T	1
56	69211072331211	Azeo. Tank	1
57	692110711321211	Butanol Tank	1
58	692110711321211	Hep.Heavy End T	1

UNIDO/SPO(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

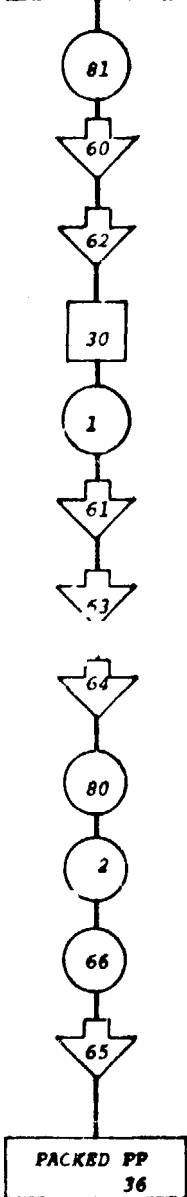
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	RECOVERED BUT.	BUT.RECOVERY
DATE	SAMPLE PLANT	CAPACITY
22.2.1982	ALİAĞA	15 w
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	B. ALFON	A. AKSU
CHECKED BY	APPROVED BY:	

Rev.	1	1
Rev.	2	1
Rev.	3	1
Rev.	4	1
Rev.	5	1



PETKİM PETROKİMYA A.Ş.

PELLET 27



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3513-7	36	I	I
NO	MACHINE CODE	MACHINE NAME	Q	
30	OMITTED	Metal Detector	4	
1	748340416011632	Automatic Fall.	1	
80	745220271211612	Shrink Wrapping U.	1	
2	741634042511202	Shring Oven	1	
60	744260115021612	Flat Belt Con.	1	
61	744262413021612	Belt Con.	1	
62	744265015021622	Inclined Belt Con.	1	
63	744260014021612	Switching Con.	1	
64	744263015021612	Inclined Roller C.	1	
65	744268115021612	Infeed Con.	1	
81	745250570111712	Pellet Packing We.	1	
66	NO AVAILABLE DATA	Fla. Belt Con.	1	

UNIDO/SPO (PETKİM) CAPACITY GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	PACKED PP	PACKING
DATE	SAMPLE PLANT	CAPACITY
4.1.1982	ALIĞA	20 t/h
PREPARED BY	DRAWN BY	CHECKED BY
İ. YILDIZ	D. ALTUN	Ş. KEŞKİN
CHECKED BY		APPROVED BY

Rev	Tarih	İsm.

SR No	M	Basic Machine Nomenclature	Major Spec. 1. (Capacity)	Major Spec. 2. (Optional)	Major Spec. 3. (Optional)	Type Description	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (g)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code											
												Unit	Total	Unit	Total		12345	678	9	10	11	12	13	14	15	16	17	
40		Alkyl Al. Dilution Vesel	22,75 m ³	-		Cy	23,4	CS	8 mm	T	2	55000	110000	70000	140000	1972	70241	06	2	0	3	2	3	2	1	1		
60		Dilute Alkyl Al. Circ Pump	20 m ³ /hr	WH: 10 m	Corrosive	H	0,06	SS	006 Tent	I	2	1100	2200	1250	2500	1972	74220	01	3	1	5	1	1	0	1	2		
80		Alkyl Al. Weigher	3 TONS	-	Mech	Mobile	-	CSC	-	I	1	8500	8500	9700	9700	1973	74525	05	2	0	4	2	0	6	0	2		

Note: a) Max. component weight for machines, plate. thickness for plate fabricated equipments.

No.	Basic Machine Description	Major Spec (Capacity)	Major Spec (Dimensions)	Major Spec (Material)	Type Description	Manuf. Char. 1 (S/N)	Manuf. Char. 2 (a)	Manuf. Char. 3 (b)	Origin	Purchase Cost		St. 19-1 Com.		Year	SFC Code								
										Unit	Total	Unit	Total		12	13	14	15	16	17	18	19	20	21	22
1	5201 electric separator	25.8 m ³	P:0.5 atm	Temp:100C	PB	6,3	SS	4 mm	T	13	1500	6750	15	1978	74166	02	1	4	1	2	6	1	4
2	5201 electric scrubber	14.2 m ³	P:0.5 atm	Temp: 20C	PB	6,5	SS	3 mm	T	14	6000	6000	15	1978	74166	021	1	3	1	2	6	1	4
3	5201 electric separator	49.4 m ³	P:2.4 atm	C	PB	23,4	SS	50 mm	I	15	18000	18000	16	1978	74165	091	1	1	5	3	6	4	2
4	5201 separator	52.3 m ³	P:10,8 atm	NC	PH	14	SS	60 mm	I	16	43000	43000	17	1978	74165	111	2	2	5	5	6	4	2
5	Extractor	104.6 t/h	Dia:3.8m	-	-	105	SS	75 mm	I	17	19750	19750	18	1978	74362	005	1	0	6	6	6	4	2
40	Catalyst Mixing vessel	12.05 m ³	Dia:2.3 m	Temp: 40C	Cy	18	SS	80 mm	I	18	10300	10300	19	1978	69211	101	1	3	2	3	6	4	2
41	Water separation vessel	42.73 m ³	Dia:3.6 m	Temp: 80C	Cy	34,8	SS	5 mm	T	19	3500	3500	20	1978	69211	101	1	3	2	4	6	1	4
42	Refrigerant separator	9.04 m ³	Dia:1.6 m	Temp: 60C	Cy	9,7	CS	30 mm	I	20	52200	52200	21	1978	69211	051	1	3	2	2	2	2	1
43	Separated water receiver	3.4 m ³	Dia:1.2 m	Temp: 95C	Cy	3,7	SS	4 mm	T	21	12600	12600	22	1978	69211	051	1	3	2	1	6	1	4
44	Recovery solvent receiver	12.6 m ³	Dia:2.0 m	Temp: 75C	Cy	7,2	CS	6 mm	T	22	35550	35550	23	1978	69211	051	1	3	2	2	2	1	1
45	Suction buffer vessel	16.7 m ³	Dia:2.2 m	Temp: 75C	Cy	8,1	CS	5 mm	T	23	39000	39000	24	1978	69211	111	1	3	2	2	2	1	1
46	Hopper under H204	3.0 m ³	Dia:1.8 m	Temp: 75C	Conic	0,7	SS	4 mm	T	24	8100	16200	25	1978	69211	141	1	3	9	1	6	1	4
47	Gas separating vessel	0.5 m ³	Dia:0.6 m	Temp: 75C	Cy	0,3	SS	4 mm	T	25	2750	5500	26	1978	69211	101	1	3	2	1	6	1	4
48	NaOH solution storage vessel	32.9 m ³	Dia:2.6 m	Temp: 50C	Cy	43,5	CS	7 mm	T	26	35950	35950	27	1978	69211	101	1	3	2	4	2	1	1
49	H2SO4 buffer vessel	0.21 m ³	Dia:0.45m	Temp: 50C	Cy	0,34	CS	6 mm	T	27	1800	1800	28	1978	69211	101	1	3	2	1	2	1	1
50	HCl3 buffer vessel	0.5 m ³	Dia:0.8 m	Temp: 50C	Conic	0,15	SS	4 mm	T	28	1550	1550	29	1978	69211	101	1	3	9	1	6	1	1
51	K202 suction buffer vessel	1 m ³	Dia:0.8 m	Temp: 25C	Cy	1,58	CS	6 mm	I	29	9500	9500	30	1978	69211	10	1	1	4	2	1	2	1
52	K202 Surge vessel	0.4 m ³	Dia:0.6 m	Temp:100C	Cy	1,2	CS	11 mm	T	30	5650	5650	31	1978	69211	10	1	1	3	2	1	2	1
53	Powder Receiver	1.6 m ³	Dia:1.2 m	Temp:125C	Conic	1,3	SS	3 mm	T	31	13900	13900	32	1978	69211	05	1	1	2	9	1	6	1
54	Heptane Receiver	OMITTED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	"	OMITTED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	Thickener Coagulant vessel	43.1 m ³	Dia:4.1 m	Temp: 40C	Cy	20,0	SS	5 mm	T	32	15100	15100	33	1978	69211	10	1	1	3	2	3	6	1
57	Conc H2SO4 Storage vessel	7.3 m ³	Dia:1.9m	Temp: 40C	Cy	15,0	SS	3 mm	I	33	5400	5400	34	1978	69211	10	1	1	3	2	3	6	1
58	Dilute " "	10.84 m ³	Dia:2.35	Temp:1 40C	Cy	14,0	SS	5 mm	I	34	6050	6050	35	1978	69211	10	1	1	3	2	3	6	1
59	Dilute H2SO4 Receiver	0.3 m ³	Dia:0.6 m	Temp: 40C	Cy	0,6	SS	5 mm	I	35	1050	1050	36	1978	69211	10	1	1	3	2	1	6	1
140	Electrolyte-lite vessel	3.4 m ³	Dia:1.45m	Temp: 40C	Cy	4,5	SS	5 mm	I	36	2450	4900	37	1978	69211	10	1	1	3	2	1	6	1

Note: a) Max. component weight for each base plate. thickness for plate fabricated equipments.

S/N	Basic Machine	Major Spec	Major Spec (Optional)	Type (Detector)	Manufac. (Tons)	Manufac. Char. 1	Manufac. Char. 2	Origin	0	Purchase Cost			Ct. 1980 Cost			SITC Code								
										Unit	Total	Unit	Total	Unit	Total									
141	Dehydrated S	4.0 m ³	Dia: 1.5 m	Temp: 40C	SS	75 mm	I	I	1	5800	5800	6650	6650	1978	74161	05	1	1	2	6	4			
6	Overhead Hopper	HS: 8.3 m ²	SD: 0.75 m	TL: 3.5 m	SS	4 mm	I	I	1	16650	16650	14500	14500	1978	74161	05	1	2	5	1	6	2		
7	Sultry con- denser	HS: 5.0 m ²	SD: 0.18 m	TL: 6.0 m	SS	-	I	I	2	77500	155200	67500	125000	1978	74161	03	2	4	3	4	3	6	2	
8	Azetrope Heater	HS: 2.72 m	SD: 0.3 m	TL: 3.4 m	CS	-	T	T	1	9900	9900	12600	12600	1978	74161	07	1	2	4	1	2	0	1	
9	Side Cut Hep Heater	HS: 3.4 m	SD: 0.3 m	TL: 3.4 m	CS	-	T	T	1	12350	12350	15800	15800	1978	74161	07	1	1	2	4	1	2	0	1
10	Initial Hep Heater	HS: 3.19 m	SD: 0.5 m	TL: 3.0 m	CS	9 mm	T	T	1	23000	23000	29500	29500	1978	74161	07	2	1	1	1	1	2	1	1
11	Refrigerant C ₂ Condenser	HS: 1.34 m	SD: 0.75 m	TL: 5.0 m	CS	10 mm	T	T	1	58350	58350	54000	52000	1978	74161	05	4	1	3	1	2	2	1	1
12	Fuel Gas Con- denser	HS: 4.3 m	SD: 0.6 m	TL: 3.0 m	CS	9 mm	T	T	1	32500	32500	41500	41500	1978	74161	05	2	1	1	1	2	1	1	1
13	Overhead Condenser	HS: 1.0 m	SD: 0.4 m	TL: 2.0 m	CS	9 mm	T	T	1	12750	12750	16300	16300	1978	74161	05	1	1	1	1	1	1	2	1
14	Circulation N ₂ Heater	HS: 1.52 m	SD: 0.92 m	TL: 2.8 m	SS	8 mm	I	I	1	63500	63500	72000	72000	1978	74161	07	4	1	1	1	2	6	1	2
15	Heptane Cool- ing Heater	HS: 7.9 m	SD: 0.43 m	TL: 1.5 m	SS	10 mm	I	I	1	63500	63500	72000	72000	1978	74161	07	3	1	1	1	1	6	1	2
16	Heptane CH ₂ Let	HS: 1.7 m	SD: 0.87 m	TL: 3.12 m	PST	-	I	I	1	29900	28900	32700	32700	1978	74161	03	2	1	2	1	1	7	0	2
17	Heptane CH ₂ Let	HS: 5.8 m	SD: 1.2 m	TL: 5.12 m	PST	6 mm	I	I	1	42650	42650	37300	37300	1978	74161	04	3	2	3	1	2	0	1	2
18	Precooler	DMITTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	Electric Heater	7.6 m ² /hr	41.4 m ²	Corrosive	CI, N/AI	1.8 tons	I	I	1	9250	9250	11800	11800	1978	74210	20	3	2	5	1	1	1	2	
61	Horizontal Sultry Pump	0.4 m ³ /hr	103.5 m	"	"	0.22 tons	I	I	2	3650	7300	4350	8300	1978	74210	20	1	4	5	1	1	1	2	
62	"	0.2 m ³ /hr	103.5 m	"	"	0.2 tons	I	I	2	3150	6300	3600	7200	1978	74210	20	1	4	5	1	1	1	2	
63	Sultry Circu- lation Pump	90 m ³ /hr	35 m	HDM	ASC	0.55 tons	I	I	2	7900	15800	9100	18200	1978	74220	01	3	2	4	1	1	1	2	
64	"	91.4 m ³ /hr	37.6 m	HDM	ASC	0.55 tons	I	I	3	6350	19050	7300	21900	1978	74220	01	3	2	4	1	1	1	2	
65	"	141.4 m ³ /hr	25.5 m	HDM	ASC	0.5 tons	I	I	2	6200	12400	7350	14300	1978	74220	01	4	2	4	1	1	1	2	
66	"	73.3 m ³ /hr	38 m	HDM	ASC	0.46 tons	I	I	2	6350	12700	7300	14600	1978	74220	01	3	2	4	1	1	1	2	
67	Specialized Pump	27 m ³	18 m	HCLC	ASC	0.2 tons	I	I	2	2500	5000	2850	5700	1978	74220	01	3	1	2	1	1	1	2	
68	Sultry Circu- lation Pump	3.0 m ³ /hr	51.5 m	HDM	CSC	0.18 tons	I	I	2	1900	3800	2200	4400	1978	74220	01	2	3	4	1	1	6	1	2
69	Sultry Circu- lation Pump	180 m ³ /hr	66.5 m	Corrosive	ASC	1.1 tons	I	I	4	10400	41600	11950	47800	1978	74220	01	4	3	5	1	1	7	2	
70	Recovered Sol- vent Pump	24 m ³ /hr	66 m	HDM	CSC	0.26 tons	I	I	2	2800	5600	3200	6400	1978	74220	01	3	4	1	1	6	1	2	
71	Heptane CH ₂ Circulation Pump	24.9 m ³ /hr	50 m	HDM	ASC	1.1 tons	I	I	2	9400	18800	10750	21500	1978	74220	01	3	2	4	1	1	7	2	

Note: a) Max. component weight for machines, plates, thickness for plate fabricated equipments.

Activity Code: 35137244

Item No.	Description	Unit	Qty	Spec. Char. 1	Spec. Char. 2	Spec. Char. 3	Origin	Purchase Cost		T. 18-8 Cost		Year	SITC Code
								Unit	Total	Unit	Total		
27	C ₃ Filter	9.043 T/hr	1	Dia: 0.3 m		SS	I	2800	2800	3200	3200	1979	74362 13 1 0 0 1 6 1 2
28	High pressure Alkyd Al solution filter	4 T/hr	1	Dia: 0.4 m		SS	I	4750	4750	5450	5450	1978	74362 13 4 1 0 0 1 6 1 2
29	NaOH solution filter	4.5 T/hr	1	Dia: 0.1 m		SS	I	950	950	1100	1100	1978	74362 13 1 0 0 1 6 1 2
101	NaOH solution filter	50 Kg/hr	1	Dia: 0.1 m		SS	I	900	900	1050	1050	1978	74362 13 4 1 0 0 1 6 1 2
102	Asetrope Filter	2.64 T/hr	1	Dia: 0.15 m		SS	I	1450	1450	1650	1650	1978	74362 13 1 0 0 1 6 1 2
103	Side-cut Hep tane filter	3.35 T/hr	1	Dia: 0.15 m		SS	I	1400	1400	1600	1600	1978	74362 13 1 0 0 1 6 1 2
104	High pressure Hexane filter	10.9 T/hr	1	Dia: 0.15 m		SS	I	1650	1650	1900	1900	1978	74362 13 2 1 0 0 1 6 1 2
105	C ₂ Filter	2.02 T/hr	1	Dia: 0.25 m		SS	I	2850	2850	3300	3300	1978	74362 13 4 1 0 0 1 6 1 2
106	High pressure Hexane filter	3.4 T/hr	1	Dia: 0.1 m		SS	I	950	950	1100	1100	1978	74362 13 1 0 0 1 6 1 2
107	Main cyclone	4.5 m ³	2	Dia: 1.4 m		SS	I	22000	44000	18000	36000	1979	74361 11 1 0 1 0 1 6 1 2
108	Multi cyclone	OMITTED											
109	Main cyclone	9.5 m ³	1	Dia: 1.8 m		SS	I	55000	55000	45000	45000	1979	74361 11 1 0 1 0 1 6 1 2
110	Multi cyclone	OMITTED											
111	Centrifuge	2 T/hr	1			SS	I	23600	23600	27000	27000	1978	74351 001 0 0 1 6 1 2
112	Screw conveyor	13.3 t/hr	2	Wt: 4589 mm		SS	I	24950	49900	28600	57200	1978	74426 431 5 0 1 1 9 3 2
113	"	13.3 t/hr	1	Wt: 2480 mm		SS	I	24900	24900	27850	27850	1978	74426 421 5 0 1 1 9 3 2
114	"	OMITTED											
115	Polymer cake distributor	0.25 t	1	Wt: 420 mm		Incoloy Alloy	I	INCLUDED IN DRYER					74426 711 1 0 1 1 3 1 2
116	Fuel gas compressor	0.09 m ³ /hr	1	P: 6.3 Kg/cm ²		SS	I	194700	194700	230600	230600	1978	74313 01 2 2 2 3 7 5 2
117	Refrigerator	3.9 Kg/h	1					127200	127200	110600	110600	1978	
118	N ₂ Blower	2 m ³ /hr	1	NO AVAILABLE DATA				INCLUDED IN DRYER					74342 002 5 2 1 1 7 3 2
119	N ₂ Blower	2.8 m ³ /hr	1	P: 20.4 Kg/cm ²		SS	I	INCLUDED IN DRYER					74342 002 5 2 1 2 7 4 2
120	N ₂ Blower	2.9 m ³ /hr	1	P: 17.5 Kg/cm ²		SS	I	INCLUDED IN DRYER					74342 002 5 2 1 2 7 4 2
121	Suction Pit	OMITTED											
122	Flue gas blower	0.812 tons/size	1			SS	I	59500	59500	68300	68300	1978	74525 01 1 0 1 1 1 7 2 2

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

SR No	Basic Machine Description	Major Spec (Capacity)	Major Spec (Optional)	Major Spec (Optional)	Type (Description)	Manufac. Char. 1 (TONS)	Manufac. Char. 2	Manufac. Char. 3	Origin	Purchase Cost		Ct. 1960 Cost		Purch. Year	SIFC Code									
										Unit	Total	Unit	Total		12345	67891011	123456							
72	Heptane draw Orf pump	OMITTED																						
73	Heptane circulation pump	56 m ³ /hr	WH:50 m	OCLC	H	0,22	ASC	0,22 I	I	2	3200	6400	3650	1978	7422001	3	2	1	1	1	7	1	2	
74	Heptane draw Orf pump	OMITTED			H																			
75	Thickener feed pump	25 m ³ /hr	WH:25 m	CDM	H	0,18	CSC	0,18 I	I	1	1600	1600	1800	1978	7422001	3	1	3	1	1	6	1	2	
76	Centrifuge feed pump	2 m ³ /hr	WH:15 m	CDM	H	0,16	CSC	0,12 I	I	1	1400	1400	1600	1978	7422001	2	1	3	1	1	6	1	2	
77	Conc H ₂ O ₄ feed pump	8,4 lt/hr	WH:10 m	Corrosive	H	0,09	CSC	0,09 I	I	1	2250	2250	2600	1978	7421020	1	1	5	1	1	6	1	2	
78	Conc H ₂ O ₄ transfer pump	300 lt/hr	WH:10 m	Corrosive	H	0,2	CSC	0,2 I	I	1	2600	2600	3000	1978	7421020	1	1	5	1	1	6	1	2	
79	Dilute H ₂ SO ₄ charge pump	70 lt/hr	WH: 5 m	Corrosive	H	0,24	PVC	0,24 I	I	1	4250	4250	4850	1978	7421020	1	1	5	1	1	6	1	2	
160	Valve	50 lt/hr	WH:30 m	OCLC	H	0,2	CSC	0,2 I	I	1	2500	2500	2850	1978	7421020	1	2	1	1	1	6	1	2	
161	"	100 lt/hr	WH:20 m	OCLC	H	0,2	CSC	0,2 I	I	1	2600	2600	3000	1978	7421020	1	1	1	1	1	6	1	2	
162	Agitator (con verted)	OMITTED									1150	1150	1300	1978										
163	Agitator (con verted)	OMITTED									1150	1150	1300	1978										
20	Dryer	1/hr			Vacuum	1,1	SS	2 mm	I	1	63000	63000	67000	1978	7416471	0	0	0	2	1	6	1	2	
21	Dryer			Dia:3,4m	SIGILL	27,0	SS	2 mm	I	1	317400	317400	338000	1978	7416450	0	0	2	2	4	6	1	2	
22	Centrifuge	0,66 t/hr			TSB	7,8	SS		I	2	204750	409500	234900	1978	7435130	1	0	2	2	6	0	2		
23	Filter					0,135	SS		I	1	1900	1900	2200	1978	7436213	0	1	0	0	1	6	0	2	
24	H ₂ Filter	1,0 m ³ /hr	Dia:0,2m			0,08	SS	4,5mm	I	1	950	950	1100	1978	7436213	1	1	0	0	1	6	1	2	
25	StonematC	Ms: 352m ²	Sb: 1,85m	Th: 6m	FST	4,8	SS	7mm	I	1	58300	58300	74500	1978	74161	83	4	2	3	1	3	6	1	2

Note: a) Max. component weight for asbestos plate. thickness for plate fabricated equipments.

SP	M	Machine Name	Major Spec (Capacity)	Major Spec (Dimensions)	Major Spec (Temp)	Type (Description)	Manufac. (Tons)	Manufac. Char. 1	Manufac. Char. 2	Manufac. Char. 3	Origin	Q	Purchase Cost		Ct. 1960 Cost		SIVC Code										
													Unit	Total	Unit	Total	Year	1965	67	69	10	11	12	13			
40		Powder Silo	202 m ³	Dia: 4,8m	Temp: 95C	Cy	121	SS			I	3	267 500	215 400	446 270	1978	49211	86	2	1	3	2	6	6	1	2	
41		Powder buffer	14 m ³	Dia: 2,4m	Temp: 95C	Cy	8,9	SS			I	2	57 800	115 600	79 400	1978	49211	86	1	1	3	2	2	6	1	2	
42		Stabilizer storage vessel	0,24 m ³	Dia: 1 m	Temp: 50C	Cy	0,5	SS			I	2	5150	10700	5850	1978	49211	86	1	1	3	2	1	6	1	2	
43		Product pellet silo	296 m ³	Dia: 5,3m	Temp: 50C	Cy	146	CSC			I	4	535000	2380000	107000	1978	49211	86	2	2	3	2	6	1	2		
44		Water buffer vessel	0,35 m ³	Dia: 1 m	Temp: 90C	Cy	0,22	CSC			I	2	1500	3600	1500	1978	49211	87	1	1	3	2	1	2	1	2	
45		Hot water tank	2,44 m ³	Dia: 1,56m	Temp: 105C	Rc	5	SS			I	2	73000	145000	68000	1978	49211	86	1	1	2	1	1	6	1	2	
46		Buffer vessel	1,2 m ³	Dia: 1,5 m	Temp: 195C	Cy	0,99	SS			I	2	3950	17000	11450	1978	49211	86	1	1	2	1	1	6	1	2	
47		Water storage vessel	0,50 m ³	Dia: 1,4 m	Temp: 95C	Cy	0,95	SS			I	4	1700	1700	2150	1978	49211	86	1	1	3	2	1	6	1	2	
48		Hot liquid storage vessel	1,4 m ³	Dia: 1,2 m	Temp: 95C	Cy	2,36	SS			I	4	21400	21900	28000	1978	49211	86	1	1	3	2	1	6	1	2	
49		Hot water tank	1,0 m ³	Dia: 1 m	Temp: 95C	Cy	1,09	SS			I	4	21000	11000	14000	1978	49211	86	1	1	3	2	1	6	1	2	
50		Chamber	0,613 m ³	P: 0,6Kg/cm ²	Temp: 115C	Cy	0,45	SS			I	3	6500	25500	7000	1978	49243	89	1	1	2	1	2	1	6	1	2
51		Hot water tank	0,5 m ³	P: 6 Kg/cm ²	Temp: 95C	Cy	0,3	CSC			I	6	2000	12000	2000	1960	49243	89	1	1	3	2	1	6	1	2	
52		Packaging silo	20 m ³	Dia: 2,7 m	Temp: 90C	Cy	13,1	CSC			I	2	64700	124400	85700	1978	49211	86	1	1	3	2	3	2	1	2	
53		Hot water tank	6 m ³	Dia: 1,8 m	Temp: 90C	Cy	8,9	SS			I	4	71450	71450	82100	1978	49211	86	1	1	3	2	1	6	1	2	
1		Hot water tank	HS: 65,7m ³	SD: 0,65m	TL: 3 m	FST	3,7	SS			I	2	23500	17200	29500	1978	4161	83	3	1	1	1	1	6	1	2	
2		Hot water tank	HS: 2,7m ³	SD: 0,65m	TL: 3 m	FST	3,9	SS			I	2	35700	51400	23400	1978	4161	83	3	1	1	1	1	6	1	2	
3		Hot water tank	HS: 69,6 m ³	SD: 0,6m	TL: 3 m	FST	4,5	SS			I	4	INCLD IN EXTRUDER														
4		Pellet dry- ing air heater	HS: 50 m ³	SD: 1,55m	TL: 3 m	FST	1,3	Alumini			I	4	INCLD IN EXTRUDER														
60		Hot water tank	HS: 132m ³	WH: 25 m	HCLC	H	0,6	SS			I	2	1700	9400	5400	1978	4220	81	4	1	1	1	1	7	1	2	
61		Hot water tank	HS: 0,01m ³ /hr	WH: 85 m	HCLC	H	0,3	SS			I	2	4350	8700	5000	1978	4220	81	4	1	1	1	1	7	1	2	
62		Hot water tank	HS: 0,02m ³ /hr	WH: 85 m	HCLC	H	0,3	SS			I	2	2250	2250	2550	1978	4220	81	4	1	1	1	1	7	1	2	
63		Hot water tank	HS: 0,025m ³ /hr	WH: 85 m	HCLC	H	0,45	SS			I	4	INCLD IN EXTRUDER														
64		Hot water tank	80 m ³ /hr	WH: 25 m	OCLC	H	79,1	Chat std			I	2	928500	1857200	1065200	1978	72842	01	2	5	1	5	9	7	2		
5		Centrifugal mixer	- m ³	MCW: 500kg	-	Conditioner	79,1	Chat std			I	2	INCLD IN EXTRUDER														
6		Extruder	-	Dia: 4,3m	1500Rpm	Screw	54,3	SF			I	2	87900	175800	100850	1978	78933	86	7	7	10	2	3	7	3	2	
7		Conditioner	550 m ³ /h	MW: 110kw	-	Conditioner	6,8	SS			I	2															

Note: a) max. component weight for machine, plate thickness for plate fabricated equipments.

No	M	Basic Machine	Major Spec (Capacity)	Major Spec (Optional)	Major Spec (Optional)	Type	Manufac. (Char. 1)	Manufac. (Char. 2)	Manufac. (Char. 3)	Origin	Q.	Purchase Cost				SITC Code	
												Unit	Total	Unit	Total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
8		M/B Blender	3.0 t/h	MPW:7.5kw	-	Conditioner	4.2	SS	3.2ton	I	2	31400	62800	76000	72000	1978	72833 00 7 2 0 2 1 7 3 2
9		Under water cutter	-	-	-	-	10	SF	54Ton	I	2	1 DIVIDED IN	EXTRUDER	-	-	1978	72781 72 0 0 0 1 3 9 4 2
10		Centrifugal dryer	-	Height 3.1m Dia. 0.6m	-	Water Drum	2	ASC	12 mm	I	2	-	-	-	-	1978	74164 99 0 4 4 5 4 9 4 2
11		Vibrating Screen	-	-	-	-	4.5	SS	2 ton	I	2	-	-	-	-	1978	72831 06 0 0 0 1 1 7 1 2
12		Pallet drying air filter	-	3/4hr	-	-	0.5	SS	-	I	1	-	-	-	-	1978	74361 48 0 1 1 0 1 6 0 0
13		Powder cyclone	-	1/4hr	-	-	0.34	SS	3 mm	I	5	22500	112500	18400	92000	1979	74361 10 0 1 1 0 1 6 1 2
14		Pallet cyclone	-	3/4hr	-	-	0.16	SS	5 mm	I	6	11900	70800	9700	58200	1979	74361 10 0 1 1 0 1 2 1 2
15		Vent gas cyclone	-	1/2hr	-	-	0.25	CS	3.2 mm	I	2	3250	6500	3250	6500	1980	74361 10 0 1 1 0 1 2 1 2
16		Filter	-	2 m	-	-	1	SS	3 mm	I	1	INCLUDED IN	NO: 1 BOWLS BLOWER	-	-	1980	74361 40 0 1 1 0 1 6 1 2
17		NO:1 Bag filter	-	1/4hr	-	-	3	SS	3 mm	I	1	-	-	-	-	-	74362 21 0 1 0 0 1 6 1 2
18		NO:2 Bag filter	-	1/4hr	-	-	3	SS	3 mm	I	1	-	-	-	-	-	74362 21 0 1 0 0 1 6 1 2
19		Blower line filter	-	3/4hr	-	-	0.09	SS	12 mm	I	1	-	-	-	-	-	74361 40 0 1 0 1 1 6 1 2
20		Blower line filter	-	1/4hr	-	-	0.7	SS	12 mm	I	1	-	-	-	-	-	74361 40 0 1 0 1 1 6 1 2
21		Blowing line filter	-	1/4hr	-	-	0.35	SS	12 mm	I	1	-	-	-	-	-	74361 40 0 1 0 1 1 6 1 2
22		Dewatering screen	-	1/4hr	-	-	0.22	SS	0.2 ton	I	1	INCLUDED IN	EXTRUDER	-	-	1979	72831 06 0 0 0 1 1 6 1 2
23		Liquid stage filter	-	1/4hr	-	-	0.13	SS	10 mm	I	1	5450	5450	6250	6250	1978	74362 13 0 1 0 0 1 6 1 2
24		LS filter	-	1/4hr	-	-	0.48	SS	12 mm	I	1	3150	3150	3800	3800	1978	74362 13 0 1 0 0 1 6 1 2
25		Blower suction filter	-	-	-	-	0.15	SS	6 mm	I	1	INCLUDED IN	NO: 1 BOWLS BLOWER	-	-	1978	74361 40 0 1 0 1 1 6 1 2
26		Blower suction filter	-	1/4hr	-	-	0.75	SS	6 mm	I	1	-	-	-	-	-	74361 40 0 1 0 1 1 6 1 2
27		Blower suction filter	-	1/4hr	-	-	0.2	SS	6 mm	I	1	-	-	-	-	-	74361 40 0 1 0 1 1 6 1 2
28		Hot water filter	-	1/4hr	-	-	0.30	SS	-	I	2	INCLUDED IN	EXTRUDER	-	-	1978	74362 70 0 0 0 0 1 6 0 2
29		NO:1 powder rotary feeder	-	9.4 t/h	-	-	0.83	ASC 13	0.8 ton	I	2	INCLUDED IN	NO: 1 BOWLS BLOWER	-	-	1978	74426 76 1 1 0 2 1 7 1 2
30		NO:2 powder rotary feeder	-	10.0 t/h	-	-	0.46	ASC	0.4 ton	I	3	-	-	-	-	-	74426 76 1 1 0 2 1 7 1 2
31		NO:3 pellet rotary feeder	-	5 t/h	-	-	0.24	ASC	0.24ton	I	2	-	-	-	-	-	74426 76 1 1 0 2 1 7 1 2
32		NO:4 pellet rotary feeder	-	51 t/h	-	-	0.81	ASC	0.78ton	I	1	-	-	-	-	-	74426 76 1 1 0 2 1 7 1 2
33		NO:5 pellet rotary feeder	-	17 t/h	-	-	0.41	ASC	0.41ton	I	1	-	-	-	-	-	74426 76 1 1 0 2 1 7 1 2

Note: 1) Max. component weight for machines, plate thickness for plate fabricated equipments.

SR No	M/H	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 2 (Optional)	Major Spec. 3 (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SIC Code									
												Unit	Total	Unit	Total		12345	67	8	9	10	11				
70		Rotary feeder under H 313	1,5 t/h	WD:343 mm	-	PDP	0,33	ASC	0,32Ton	I	2	INCLUDED IN		No: 1	ROOTS BLOWER	1978	74426	76	1	1	0	2	1	7	1	2
71		Rotary feeder under H 314	1,5 t/h	WD:343 mm	-	PDP	0,33	ASC	0,32 Ton	I	2	"	"	"	"	"	74426	76	1	1	0	2	1	7	1	2
72		Screw conveyor under M 301 H.301 Inlet		WD:7800mm	-	PDP	3,5	ASC	3 Ton	I	2	24950	49900	28600	57200	1978	74426	40	1	5	0	2	1	7	3	2
73		rotary feeder	4,7 t/h	wd: 226 mm	-	PDP	0,3	ASC	0,3 Ton	I	2	12150	24300	13950	27300	1978	74426	76	1	1	0	2	1	7	1	2
74		NO:1 roots blower	57 m ³ /min	P:0,54kg/cm ²	BG	Risk type	2,3	GIC	2,3 Ton	I	1	438400	438400	406000	406000	1979	74342	10	4	1	2	1	1	2	3	2
75		NO:2 roots blower	62 m ³ /min	P:0,54kg/cm ²	BG	" "	2,3	GIC	2,3 Ton	I	1	INCLUDED IN		No: 1	ROOTS BLOWER		74342	10	4	1	2	1	1	2	3	2
76		NO: 3 roots blower	17 m ³ /min	P:0,59kg/cm ²	BG	" "	0,8	GIC	0,8 Ton	I	1	"	"	"	"	"	74342	10	3	1	2	1	1	2	1	2
77		NO: 4 roots blower	115 m ³ /min	P:0,5kg/cm ²	BG	" "	4	GIC	4 Ton	I	1	"	"	"	"	"	74342	10	5	1	2	1	1	2	3	2
78		NO:5 roots blower	31 m ³ /min	P:0,6kg/cm ²	BG	" "	1,3	GIC	1,3 Ton	I	1	"	"	"	"	"	74342	10	3	1	2	1	1	2	2	2
79		Pellet drying fan	2 m ³ /sec	WH: -	Air exhausted		0,8	SS	0,5 Ton	I	1	INCLUDED IN		EXTRUDER		74341	10	4	0	1	3	1	7	1	2	
80		Powder weigher	5 t/h	PS:0,66m	Elec.	Fixed	1,6	ASC	1,5 Ton	I	2	57100	114200	67750	135500	1979	74525	05	4	1	2	1	1	7	2	2
81		Mixed stabilizer weigher	0,04 t/h	PS:0,54m	Elec	Fixed	1,1	ASC	1,0 Ton	I	2	57100	114200	67750	135500	1979	74525	05	1	1	2	1	1	7	2	2
82		Stabilizer weigher	0,01 t/h	-	Elec.	Fixed	1,1	ASC	1,0 Ton	I	2	57100	114200	67750	135500	1979	74525	05	1	1	2	1	1	7	2	2
89		Pellet Cyclone	-	Dia. 16m	-	SZ	0,16	SS	5mm	I	2	INCLUDED IN		EXTRUDER		74361	10	0	1	1	0	1	2	1	2	2
101		Vent Gaa Cyclone	-	Dia. 12m	-	SZ	0,25	CS	3,2mm	I	1	"	"	"	"	"	74361	10	0	1	1	0	1	6	1	2

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

Sl. No.	Equip. Name	Major Spec. (Capacity)	Major Spec. (Optional)	Major Spec. (Optional)	Type (Description)	Quantity (Char. 2)	Material (Char. 3)	Origin	Purchase Cost		St. 190 Cost		Furc. Year	SFC 2-4
									Unit	Total	Unit	Total		
1	Basic Machine													
2	Primary Stripper	50 m ³	P:1,9 atm	Temp:115C	PM	71,6	CS	I	444000	444000	470000	400000	1979	74166 07 2 1 4 2 5 2 1 2
3	Azeotropic Stripper	50 m ³	P:2,5 atm	Temp:130C	PB	46,2	CS	I	305000	305000	275000	275000	1979	74166 07 2 1 4 1 4 2 1 1
4	Heptane Tower	44,5 m ³	P:0,5 atm	Temp:115C	PB	40,9	CS	I	256000	256000	240000	240000	1979	74166 11 2 1 4 1 4 2 1 1
5	Azeotropic Tower	6,8 m ³	P:0,5 atm	Temp:107C	PB	11,6	CS	I	87000	87000	78000	78000	1979	74166 11 1 1 4 1 3 2 1 1
6	Butanol Reflux Drum	15 m ³	P:2,3 atm	Temp:130C	PB	21,0	CS	I	138000	138000	138000	138000	1979	74166 11 1 1 4 1 3 2 1 1
7	Stripper	9 m ³	-	Temp:55C	Cy	11,5	CS	I	57500	57500	54700	54700	1978	69241 05 1 0 3 2 3 2 1 1
8	C402 Reflux Drum	2,5 m ³	-	Temp:75C	Cy	2,0	CS	I	1700	1700	12350	12350	1978	69241 05 1 0 3 2 1 2 1 1
9	C403 Reflux Drum	3 m ³	-	Temp:110C	Cy	2,4	CS	I	11450	11450	14550	14550	1978	69241 05 1 0 2 2 1 2 1 1
10	C404 Reflux Drum	1,3 m ³	-	Temp:75C	Cy	2,5	CS	I	11950	11950	15250	15250	1978	69241 05 1 0 3 2 1 2 1 1
11	C405 Reflux Drum	1,7 m ³	-	Temp:75C	Cy	2,9	CS	I	13700	13700	17550	17550	1978	69241 05 1 0 3 2 1 2 1 1
12	Pre-Evaporator	-	SD: 1,5 m	Height:5m	Plate	6,9	CS	I	40500	40500	51750	51750	1978	74162 01 0 1 2 9 2 2 1 1
13	APP Reel	5 m ³	Dia: 1,0m	Temp:300C	Conical	8,2	CS	I	36300	36300	41500	41500	1978	69211 99 1 1 2 9 2 2 1 2
14	Vertical Reflux Drum	1,7 m ³	-	Temp:115C	Cy	1,4	CS	I	7100	7100	8050	8050	1978	69241 06 1 0 2 2 1 2 1 1
15	Stripper	3 m ³	Dia: 1,2m	Temp:115C	Cy	2,3	CS	I	11200	11200	14300	14300	1978	69211 99 1 1 2 2 1 2 1 1
16	Tank Seal	0,5 m ³	-	Temp:50C	SC	0,44	CS	I	3100	3100	4000	4000	1978	69241 08 1 0 3 2 1 2 1 1
17	Vent gas buffer Drum	3,5 m ³	P:1,9kg/cm ²	Temp:55C	Cy	1,8	CS	I	8550	8550	11300	11300	1978	69243 02 1 1 3 2 1 2 1 1
18	Condenser	HS:203 m ²	SD:0,85 m	TL: 6 m	FST	10,7	CS	I	82000	82000	79000	79000	1978	74161 05 4 1 3 1 3 2 1 1
19	Stripper	HS:41,7m ²	SD:0,55 m	TL: 4 m	FST	3,2	CS	I	24000	24000	27000	27000	1978	74161 10 2 1 1 2 1 1 2 1 1
20	Reboiler	HS:151 m ²	SD:0,95 m	TL: 3 m	FST	7,3	CS	I	54000	54000	58000	58000	1978	74161 02 4 1 2 1 2 2 1 1
21	Condenser	HS:36,8 m ²	SD:0,5 m	TL: 4 m	FST	2,7	CS	I	35000	35000	24000	24000	1978	74161 05 2 1 2 1 1 2 1 1
22	Side cut Hep	HS:34,9 m ²	SD:0,5 m	TL: 2 m	FST	2,7	CS	I	25000	25000	21000	21000	1978	74161 03 2 1 1 1 1 2 1 1
23	Reboiler	HS:249 m ²	SD:1,2 m	TL: 3 m	FST	11,9	CS	I	13000	13000	9000	9000	1978	74161 02 4 2 2 1 3 2 1 1
24	Condenser	HS:150 m ²	SD:0,85 m	TL: 4 m	FST	7,7	CS	I	53000	53000	57000	57000	1978	74161 05 4 1 2 1 2 2 1 1
25	Purified Hep	HS:87,4 m ²	SD:0,6 m	TL: 5 m	FST	4,8	CS	I	43000	43000	40000	40000	1978	74161 03 3 1 3 1 1 2 1 1
26	Reboiler	HS:10 m ²	SD:0,3 m	TL: 3,7 m	FST	1,0	CS	I	11000	11000	10500	10500	1978	74161 02 1 1 2 1 1 2 1 1
27	Condenser	HS:19 m ²	SD:0,4 m	TL: 3 m	FST	1,6	CS	I	16000	16000	14500	14500	1978	74161 05 2 1 2 1 1 2 1 1

Note: a) Max. component weight for each piece, plate thickness for plate fabricated equipments.

Activity Code	Activity Description	Material	Capacity	Rate	Spec	Wt	Section	Thick	Manufac	Origin	Purchase Cost		Year	SITC Code
											Total	Unit		
18	Acetylene Cooler	HS:29,6 m ² SD: 0,4 m TL: 5 m			FST	2,3		CS	I	1	23000	22000	1978	74101 03 2 1 3 1 1 2 1 1
19	D-404 Overhead condenser	HS:12,0 m ² SD: 0,4 m TL: 2 m			FST	1,1		CS	I	1	13000	12100	1978	74101 05 2 1 1 1 1 2 1 1
20	C-403 Feed Preheater	HS:60,0 m ² SD: 0,6 m TL: 4 m			FST	3,8		CS	I	1	14000	31000	1978	74101 10 3 1 2 1 1 2 1 1
21	C-405 Reboiler	HS:58,2 m ² SD: 0,6 m TL: 3 m			FST	3,1		CS	I	1	23000	27000	1978	74101 02 3 1 2 1 1 2 1 1
22	Condenser	HS:23,9 m ² SD: 0,4 m TL: 4 m			FST	1,9		CS	I	1	18000	17000	1978	74101 05 2 1 2 1 1 2 1 1
23	Waste water cooler	HS:136,0 m ² SD: 0,75 m TL: 6 m			FST	8,0		CS	I	1	60000	60000	1978	74101 03 4 1 3 1 2 2 1 1
24	Stripper	HS:119,0 m ² SD: 0,75 m TL: 5,7 m			FST	8,1		SS	I	1	31000	27000	1978	74101 10 4 1 3 1 2 6 1 2
25	Stripper	HS:65,9 m ² SD: 0,55 m TL: 5,8 m			FST	4,8		SS	I	1	20500	20500	1978	74101 10 3 1 3 1 1 6 1 2
26	D-406 Preheater	HS:392,0 m ² SD: 1,0 m TL: 5,0 m			FST	16,9		CS	I	1	168000	152000	1978	74101 10 4 1 3 1 3 2 1 1
27	Stripper	HS:104 m ² SD: 1,0 m TL: 7,0 m			FC	22,1		CS	I	1	270000	235000	1978	74220 01 0 1 3 1 3 2 0 2
28	Condenser	HS:117,0 m ² SD: 0,6 m TL: 6,0 m			FST	6,1		CS	I	1	54000	59000	1978	74101 05 4 1 3 1 2 2 1 1
29	Stripper	HS:91,7 m ² SD: 0,6 m TL: 6,0 m			FST	5,3		CS	I	1	44000	41000	1978	74101 03 3 1 3 1 2 2 1 1
30	Stripper	HS:40,6 m ² SD: 0,55 m TL: 3,0 m			FST	2,7		CS	I	1	35000	29000	1978	74101 05 2 1 2 1 1 2 1 1
31	Stripper	HS:36,0 m ² SD: 0,55 m TL: 3,0 m			FST	2,7		CS	I	1	25000	24000	1978	74101 03 2 1 2 1 1 2 1 1
32	Stripper	HS:36,3 m ² SD: 0,55 m TL: 4,7 m			FST	4,0		CS	I	1	13000	15600	1978	74101 10 2 1 3 1 1 2 2 2
33	Pump	18 m ³ /hr			H	0,15		CSC	I	2	3000	2300	1978	74220 01 3 2 2 1 1 6 1 2
34	Pump	17 m ³ /hr			H	0,15		CSC	I	2	1600	3600	1978	74220 01 3 2 1 1 1 6 1 2
35	Pump	38 m ³ /hr			H	0,38		CSC	I	2	2350	4700	1978	74220 01 3 3 1 1 1 6 1 2
36	Pump	15 m ³ /hr			H	0,16		CSC	I	2	1700	3400	1978	74220 01 3 2 2 1 1 6 1 2
37	Pump	26 m ³ /hr			H	0,14		CSC	I	1	2200	2550	1978	74220 01 3 1 2 1 1 6 1 2
38	Pump	50 m ³ /hr			H	0,26		CSC	I	2	3550	5100	1978	74220 01 3 2 2 1 1 6 1 2
39	Pump	8 m ³ /hr			H	0,12		CSC	I	1	2150	2400	1978	74220 01 2 1 2 1 1 6 1 2
40	Pump	3 m ³ /hr			H	0,12		CSC	I	2	1000	1600	1978	74220 01 2 1 2 1 1 6 1 2
41	Pump	5,4 m ³ /hr			H	0,09		CSC	I	2	1500	2100	1978	74220 01 2 1 2 1 1 6 1 2
42	Pump	19,0 m ³ /hr			H	0,18		CSC	I	2	1600	1900	1978	74220 01 2 2 2 1 1 6 1 2
43	Pump	3,0 m ³ /hr			H	0,15		CSC	I	2	1500	1500	1978	74220 01 2 2 2 1 1 6 1 2

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

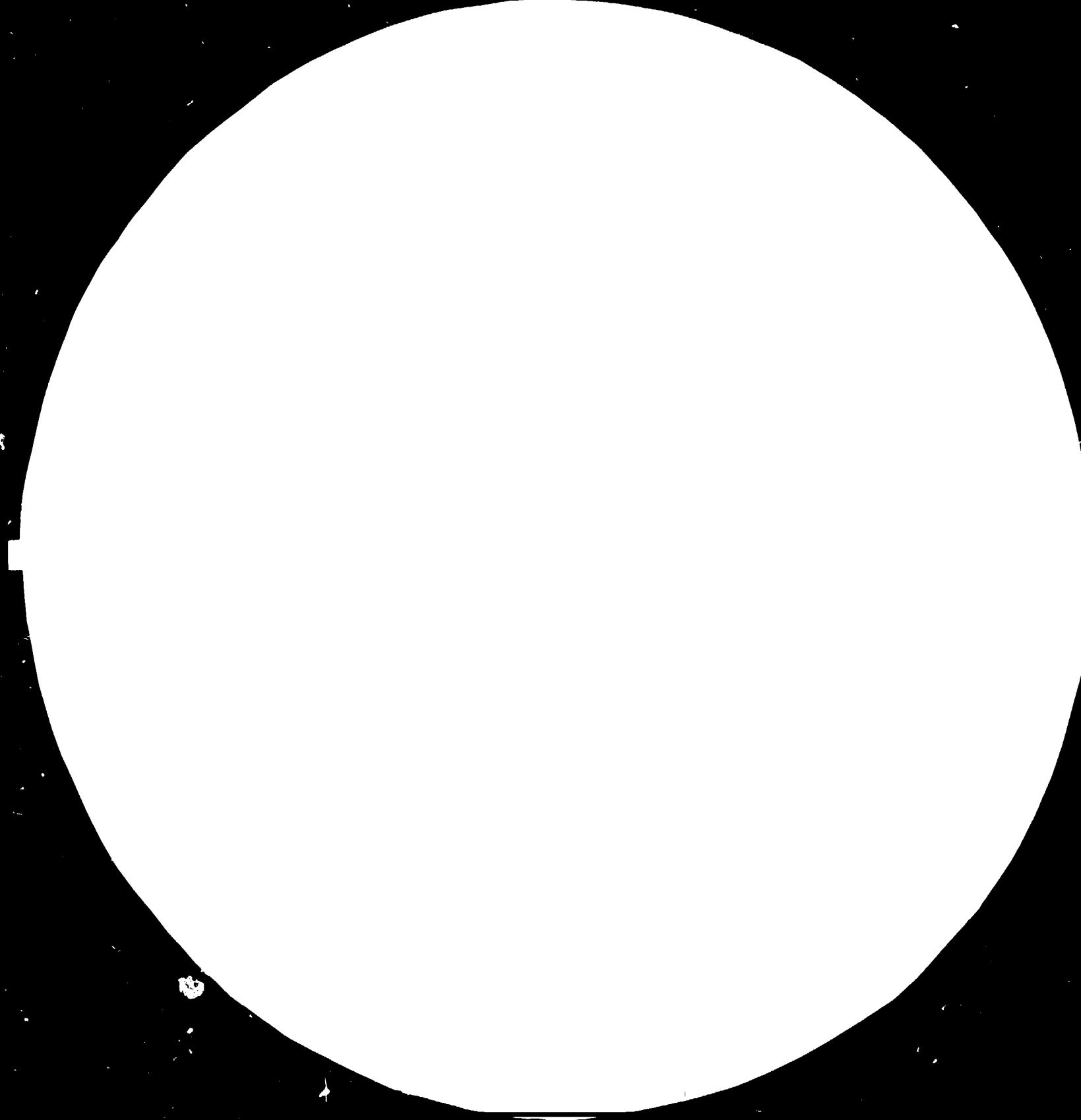
No.	Basic Machine Description	Capacity	Material	Type	No. of Plates	Plate No.	Plate Size	Plate Weight	Orientation	Weight				Year	Inventory											
										Net	Total	Net	Total		1	2	3	4	5	6	7	8	9	10	11	12
71	Recovered butanol tran.	3,0 m ³ /hr	1,3 m	HCLC	H	0,09	CSC	0,09ton	I	1	1400	1400	1600	1600	1978	74220	01	2	1	2	1	1	6	1	2	
72	C-405 bottom draw of pump	19 m ³ /hr	WH: 10 m	HDM	H	0,12	CSC	0,12ton	I	2	2200	1400	2450	4900	1978	74220	01	3	1	4	1	1	6	1	2	
73	D-406 Feed Pump	34 m ³ /hr	WH: 90 m	HCLC	H	0,55	CSC	0,55ton	I	3	3500	10800	4150	12450	1978	74220	01	3	3	2	1	1	6	1	2	
74	E-419 Feed Pump	21 m ³ /hr	WH: 90 m	HCLC	H	1,59	CSC	1,59ton	I	2	5650	18300	7500	15300	1978	74220	01	3	4	2	1	1	6	1	2	
75	APP Transfer Pump	1 m ³ /hr	WH:100 m	HCLC	H	1,15	CSC	1,15ton	I	1	23800	23800	27300	27300	1978	74220	01	2	4	2	1	1	6	1	2	
76	E-419 Stripped Solv. Tran. pump	36 m ³ /hr	WH: 23 m	HCLC	H	0,22	CSC	0,22ton	I	2	2200	4400	2500	5000	1978	74220	01	3	1	2	1	1	6	1	2	
77	Low Pres. Purif. Pump	163 m ³ /hr	WH:78 m	CCLC	H	1,0	CSC	1,0 ton	I	2	3400	6800	3900	7800	1978	74220	01	4	3	1	1	1	6	1	2	
78	High Pres. Purif. Pump	33 m ³ /hr	WH:307 m	CCLC	H	1,4	CSC	1,4 ton	I	2	12150	24300	13950	27900	1978	74220	01	3	6	1	1	1	6	1	2	
79	Side Cut Hept Tran. pump	22 m ³ /hr	WH:146 m	CCLC	H	0,9	CSC	0,9 ton	I	2	4200	8400	4800	9600	1978	74220	01	3	4	1	1	1	6	1	2	
160	Purified aze Pump	9,0m ³ /hr	WH: 43 m	CCLC	H	0,2	CSC	0,2 ton	I	2	1500	3200	1850	3700	1978	74220	01	2	2	1	1	1	6	1	2	
161	Butanol Tran. Pump	3,0 m ³ /hr	WH: 21 m	CCLC	H	0,12	CSC	0,12ton	I	1	1400	1400	1600	1600	1978	74220	01	2	1	1	1	1	6	1	2	
162	Hept. heavy Pump	20 m ³ /hr	WH: 20 m	Viscous	H	0,15	CSC	0,15ton	I	1	1650	1650	1900	1900	1978	74220	01	3	1	6	1	1	6	1	2	
163	D-411 Bottom draw of pump	0,2m ³ /hr	WH: 6,9 m	CDM	-	0,2	CSC	0,2ton	I	1	2600	2600	3000	3000	1978	74210	20	1	1	3	0	1	6	1	2	
164	Cooling water Tran.pump	20 m ³ /hr	WH:39 m	CCLC	H	0,2	CSC	0,2 ton	I	1	1600	1600	1800	1800	1978	74220	01	3	2	1	1	1	6	1	2	
165	T-403 Draw of pump	3,0 m ³ /hr	WH:15 m	CDM	H	0,09	CSC	0,09 ton	I	1	1350	1350	1550	1550	1978	74220	01	2	1	3	1	1	6	1	2	
104	D-406 Mist Separator	0,11 m ³	-	-	SZ	0,3	CS	9 mm	T	1	1650	1650	2100	2100	1978	74361	00	1	0	0	1	1	2	1	1	
105	E-419 Mist Separator	0,35 m ³	-	-	MZ	2,89	CS	20 mm	T	1	13450	13350	17000	17000	1978	74361	00	1	0	0	2	1	2	2	2	
80	APP Cutter	-	-	Mech.	Fixed	6,0	CSC	30Ten	I	2	84300	84300	96700	96700	1978	74522	02	0	0	0	1	1	2	6	3	1
106	C-402 feed solvent filter	- t/h	Dia:0,25m	-	-	0,265	SS	15mm	I	2	1800	3600	2100	4200	1978	74362	13	0	1	0	0	1	6	4	2	
166	Vent gas filter	1,9 m ³ /hr	P:1,2kg/cm	Vent gas	Rootstype	0,6	SS	0,6 ton	I	1	9500	9500	11300	11300	1978	74342	10	2	1	2	1	1	7	1	2	
49	Bur Pit	NO AVAILABLE DATA									OMITTED					59211										
50	CWR Pit	NO AVAILABLE DATA									OMITTED					59211										
51	Decantation Tank	200 m ³	Dia: 5,6m	Temp: 75C	Cy	10,0	CS	7 mm	T	1	81000	81000	72000	72000	1979	59211	07	2	2	3	2	6	2	1	1	
52	Recovered solvent Tank	400 m ³	Dia:7,84m	Temp: 75C	Cy	10,0	CS	9 mm	T	1	121000	121000	109700	109700	1979	59211	07	2	3	3	2	8	2	1	1	
53	Stripped solvent tank	500 m ³	Dia:8,0 m	Temp: 55C	Cy	10,0	CS	9 mm	T	1	137000	137000	129400	129400	1979	59211	07	3	3	3	2	8	2	1	1	
54	Purified Hep tank	500 m ³	Dia:8,0 m	Temp: 55C	Cy	10,0	CS	9 mm	T	1	127000	127000	121900	121900	1979	59211	07	3	3	3	2	8	2	1	1	

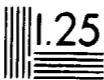
Note: a) Max. component weight for each case, plate thickness for plate fabricated equipments.

No.	Name of Equipment	Capacity (Liters)	Diameter (mm)	Height (mm)	Material	Thickness (mm)	Type of Plate	Weight (kg)	Volume (Liters)	Year	Serial No.	Drawing No.
55	Side Cut Heptane Tank	250 m ³	Dia: 6,2 m	Temp: 55C	CS	7 mm	CS	12,0	Cy	1979	69211	07 2 2 3 2 6 2 1 1
56	Ascope Tank	200 m ³	Dia: 6,1 m	Temp: 55C	CS	7 mm	CS	11,5	Cy	1979	69211	07 2 2 3 2 6 2 1 1
57	Butane Tank	50 m ³	Dia: 4,0 m	Temp: 55C	CS	7 mm	CS	3,0	Cy	1979	69211	07 1 1 3 2 5 2 1 1
58	Heptane Tank	24 m ³	Dia: 2,8 m	Temp: 55C	CS	7 mm	CS	3,0	Cy	1979	69211	07 1 1 3 2 3 2 1 1

Note: a) Max. component weight for machines. plate thickness for plate fabricated equipments.







23 25



MICROSCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS
100 COLLEGE PARK, MARYLAND 20740
U.S. GOVERNMENT PRINTING OFFICE

No.	Basic Machine Name	Capacity	Motor Power (HP)	Voltage (V)	Type	Material	Machine Char.	Capacity (t/h)	Height	Purchase Cost		Est. Inst. Cost		Purch. Year	SIN Code	
										Unit	Total	Unit	Total		12145	671
30	Metal detector	OMITTED														
1	Automatic Pelletizer	20 t/h	Dia: 5,51m		Pallet Drum fixed	CS	0,4	I		150000	150000	180000	1978			
30	Shrink wrap-ping Unit	20 t/h	Vol: 2,67m		etc.	CS	2,5	I		38600	38600	105600	1978	72834	041	0 1 1 6 3 1 8
2	Shrink Oven	30 t/h	Temp: 250C		etc.	CSC	4,5	I		57200	57200	81000	1978	74522	027	1 2 1 1 6 3 2
60	Flat Belt Conveyor	20 t/h	Wd: 4750mm			CS	3,7	I		25000	25000	30300	1978	74163	404	2 5 1 1 2 0 2
61	Belt conveyor with pusher	20 t/h	Wd: 1070mm			CS	0,6	I		4850	4850	5800	1978	74426	011	5 0 2 1 6 1 2
62	Inclined belt conveyor	20 t/h	Wd: 9800mm			CS	0,4	I		7750	7750	8350	1978	74426	241	3 0 2 1 6 1 2
63	Switching Conveyor	20 t/h	Wd: 1650mm			CS	1,2	I		3200	3200	11100	1978	74426	501	5 0 2 1 6 2 2
64	Inclined Roller conveyor	20 t/h	Wd: 1880mm			CS	0,4	I		6200	6200	7450	1978	74426	001	4 0 2 1 6 1 2
65	Equilizer Pellet Pac-King Reigner Flat Belt Conveyor	20 t/h	Wd: 2900mm			CS	0,2	I		1400	1400	1700	1978	74426	301	5 0 2 1 6 1 2
81	Pellet Pac-King Reigner Flat Belt Conveyor	20 t/h	PS m		Mech.	CS	0,6	I		11800	11800	14200	1978	74426	811	5 0 2 1 6 1 2
86	Conveyor	No AVAILABLE DATA				SS	3,0	I		114200	114200	135500	1978	74523	057	0 1 1 1 7 1 2
										OMITTED						

Note: all Max. component weight for machines, plate thickness for plate fabricated equipments.

UNICO / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW POLYPROPYLENE PLANT,CAPACITY = 60 000TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.-A DOLLARS (1980)
ELP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.WE
*****	*****	**	****	*****	****	****	****	****	****	****	****	****	****	****	*****
74522 02712 11632	SHRINK WRAPPING UNIT	1	3.2	81.0				3.2							3.2
74525 01101 11722	TIC13 WEIGHER	1	1.0	68.3				1.0							1.0
74525 05112 11722	STABILIZER WEIGHER	2	1.1	135.5				2.2							2.2
74525 05112 11722	MIXED STABILIZER WEIGHER	2	1.1	135.5				2.2							2.2
74525 05201 20602	ALKYL AL.WEIGHFR	1	.0	9.7				.0							.0
74525 05412 11722	PCWDER WEIGHER	2	1.6	135.5				3.2							3.2
74525 05701 11712	PELLET PACKING WEIGHER	1	3.0	135.5				3.0							3.0

UNICC / SPCIPETKIM
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW POLYPROPYLENE PLANT, CAPAC
 LOCATION-YUMURTALIK
 ANTICIPATED DATE OF COMMISSIONING- 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CC	199
65211 05112 51611	PULVER RECEIVER	1	1.3	17.8	
65211 05113 21611	SEPARATED WATER RECEIVER	1	3.7	13.5	
65211 05113 22211	RECOVERED SOLV. RECEIVER	1	7.2	45.5	
65211 05113 22221	REFRIGERANT G3 RECEIVER	1	9.7	66.8	
65211 06113 22612	POWDER BUFFER SILC	2	8.9	39.8	
65211 06113 23212	PACKAGING SILC	2	13.1	165.4	
65211 06213 26612	POWDER SILC	3	121.0	215.4	
65211 06223 26212	PRODUCY PELLETT SILC	4	146.0	487.0	
65211 07113 11212	EXTRUDER CUTLET VESSEL	2	.2	1.6	
65211 07113 23211	HEPTANE HEAVY END TANK	1	3.0	20.6	
65211 07113 25211	BUTANE TANK	1	5.0	34.3	
65211 07223 26211	SIDE CUT HEPTANE TANK	1	12.0	82.3	
65211 07223 26211	AZEGTRCPE TANK	1	10.5	72.0	
65211 07223 26211	DECANTATION TANK	1	10.5	72.0	
65211 07233 28211	RECOVERED SOLVNT TANK	1	16.0	109.7	
65211 07333 28211	PURIFIED HEPTANE TANK	1	18.0	123.4	
65211 07333 28211	STRIPPED SOLVENT TANK	1	18.0	123.4	
65211 10112 11612	HOT WATER TANK	2	6.0	68.0	
65211 10112 21612	BUFFER VESSEL	2	1.0	11.5	
65211 10113 21211	K2O2 SLURGE VESSEL	1	1.2	7.5	
65211 10113 21211	H2 BUFFER VESSEL	1	.3	2.3	
65211 10113 21611	GAS SEPARATING VESSEL	2	.2	3.5	
65211 10113 21612	OIL-H2SO4 SUBST. VESSEL	1	.6	1.2	
65211 10113 21612	NO:1 LIC. ST. STCR. VESSEL	1	1.0	2.2	
65211 10113 21612	NO:3 LIC. ST. STCR. VESSEL	1	1.1	14.0	
65211 10113 21612	POLYELECTROLYTE VESSEL	2	4.5	2.8	
65211 10113 21612	STABILIZER STGR. VESSEL	2	.5	6.9	
65211 10113 21612	NO:2 LIC. ST. STCR. VESSEL	1	2.4	28.0	
65211 10113 22612	MIXED STABILIZER ST. VESSL.	1	8.9	62.1	
65211 10113 23612	CGAC-H2SO4 STC. VESSL	1	15.0	69.2	
65211 10113 23612	DILUTE H2SO4 ST. VESSEL	1	14.0	7.0	
65211 10113 23612	THICK. COAGULANT VESSEL	1	20.0	17.3	
65211 10113 23642	CATALYST MIXING VESSEL	1	18.0	115.7	
65211 10113 24211	NACH SOLUTION STGR. VESSEL	1	43.5	45.8	
65211 10113 24611	WATER SEPARATION VESSEL	1	34.8	55.0	
65211 10113 91611	TICL3 BUFFER VESSEL	1	.2	2.0	
65211 10114 21212	K2O2 SUCTION BUFFER VESS.	1	1.6	11.0	
65211 11113 22211	SUCTION BUFFER VESSEL	1	8.1	49.9	
65211 14113 22842	DEHYD. SLUDGE HOPPER	1	8.5	6.7	
65211 14113 91611	HOPPER UNDER H2O8	2	.7	10.3	
65211 95112 21211	STRIPPED SOLVENT RECEIVER	1	2.3	14.3	
65211 95112 92212	APP RECEIVER	1	8.2	41.5	
65241 05102 21211	C-403 REFLUX DRUM	1	2.4	14.7	
65241 05103 21211	C-405 REFLUX DRUM	1	2.9	17.6	
65241 05103 21211	C-404 REFLUX DRUM	1	2.5	15.3	
65241 05103 21211	C-402 REFLUX DRUM	1	2.0	12.4	
65241 05103 23211	STR. SOLVENT SEPARATOR	1	11.5	64.7	
65241 06102 21211	CONDENSATE FLASH VESSEL	1	1.4	9.1	
65241 06203 23211	ALKYL AL. DILUTION VESSEL	2	23.4	70.0	
65241 08103 21211	TANK SEAL POT	3	.4	12.0	
65243 02113 21211	VENT GAS BUFFER DRUM	1	1.8	11.3	
65243 95112 21612	CHAMBER UNDER D-301	3	.5	21.0	
65243 95113 21212	CHAMBER UNDER D-304	6	.3	12.0	
72831 06000 11612	DEWATERING SCREEN	1	.2	.0	
72831 06000 11712	VIBRATING SCREEN	2	4.5	.0	
72831 72000 23942	UNDER WATER CUTTER	2	10.0	.0	
72833 00070 25782	CONTINUOUS MIXER	2	70.1	.0	
72833 00720 21732	STABILIZER W/B BLENDER	2	4.2	36.0	
72833 00770 22732	CONTINUOUS POWDER MIXER	2	6.8	201.7	

UNILC / SPC(PETKIM)
 CAPITAL CCOS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW POLYPROPYLENE PLANT,CAPACITY
 100000 TONNALS

ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EGP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991
7421C 1C131 11712	NC:3 LIQ ST.MEASUR.PUMP	2	.3	10.0	
7421C 1C131 11712	NC:2 LIQ ST.MEASUR.PUMP	2	.3	13.5	
7421C 2C111 11612	POLYELECTROLITE CH.PUMP	1	.2	3.0	
7421C 2C113 11612	D-411 BOTTOM DRAW-OF PUMP	1	.2	3.0	
7421C 2C115 11612	CLAC H2SO4 FEED PUMP	1	.1	2.6	
7421C 2C115 11612	CLAC H2SO4 TRANSF. PUMP	1	.2	3.0	
7421C 2C115 11612	DILUTE H2SO4 CHA. PUMP	1	.2	4.9	
7421C 2C121 11612	POLYELECTROLITE CH.PUMP	1	.2	2.9	
7421C 2C145 11612	HOMOMAND.COP.PPAS. PUMP	2	.2	3.6	
7421C 2C145 11812	HOMORAND.COP.MEAS. PUMP	2	.2	4.2	
7421C 2C325 11812	BLOCK COPOL.MEAS. PUMP	1	1.8	11.8	
7422C 01211 11612	BUTANOL TRANSFERE PUMP	1	.1	1.6	
7422C 01211 11712	OKAINAGE PUMP	1	.5	2.6	
7422C 01212 11612	C-403 BOTTOM DRAW-OF PUMP	1	.1	2.5	
7422C 01212 11612	RECOV.BUTANOL TRANS. PUMP	1	.1	1.6	
7422C 01212 11612	C-404 BOTTOM DRAW-OF PUMP	2	.1	4.2	
7422C 01212 11512	C-404 REFLUX PUMP	2	.1	3.2	
7422C 01213 11612	CENTRIFUGE FEED PUMP	1	.2	1.6	
7422C 01213 11612	T-403 DRAW-OF PUMP	1	.1	1.6	
7422C 01221 11612	PURIF-AZEOTR. TRANS. PUMP	2	.2	3.7	
7422C 01222 11612	C-405 REFLUX PUMP	2	.2	3.7	
7422C 01234 11612	SOLITION FEED PUMP	2	.2	2.2	
7422C 01242 11612	APP TRANSFER PUMP	1	.2	27.3	
7422C 01312 11612	STRIPPED SOLV.TRANS. PUMP	2	.2	5.0	
7422C 01312 11612	C-403 FEED PUMP	1	.1	2.6	
7422C 01312 11712	SEP.WATER TRANSFER PUMP	2	.2	2.9	
7422C 01313 11612	THICKENER FEED PUMP	1	.2	1.8	
7422C 01314 11612	C-405 BOTTOM DRAW-OF PUMP	2	.1	4.9	
7422C 01315 11912	DILUTE ALKYL AL.CIRC.PUMP	2	.1	1.3	
7422C 01316 11612	HEPT.HEAVY END TRANS.PUMP	1	.2	1.9	
7422C 01321 11612	COILING WATER TRANS. PUMP	1	.2	1.8	
7422C 01321 11612	STRIPPED SOLV.TRANS. PUMP	2	.2	3.6	
7422C 01321 11712	HEPTANE CIRCULAT. PUMP	2	.2	3.7	
7422C 01322 11612	C-401 FEED PUMP	2	.2	4.6	
7422C 01322 11612	C-405 FEED PUMP	2	.2	3.6	
7422C 01322 11612	C-403 REFLUX PUMP	2	.3	5.8	
7422C 01322 11612	C-402 REFLUX PUMP	2	.2	3.9	
7422C 01324 11712	SLURRY CIRCULATION PUMP	2	.5	7.3	
7422C 01324 11712	SLURRY CIRCULATION PUMP	3	.6	7.3	
7422C 01324 11712	SLURRY CIRCULATION PUMP	2	.6	5.1	
7422C 01324 11722	HEPTANE CIRCULAT. PUMP	2	1.1	10.8	
7422C 01331 11612	C-402 FEED PUMP	2	.4	4.7	
7422C 01332 11612	D-406 FEED PUMP	3	.6	12.5	
7422C 01334 11612	RECOVERED SOLVENT PUMP	2	.3	3.2	
7422C 01341 11612	SIDE CUT HEPT.TRANS. PUMP	2	.9	9.6	
7422C 01342 11612	E-419 FEED PUMP	2	.6	15.3	
7422C 01361 11612	HIGH PUR.HEPT.TRANS. PUMP	2	1.4	27.9	
7422C 01411 11712	PELLET COOL.WATER CIRC.	2	.6	10.8	
7422C 01424 11712	SLURRY CIRCULATION PUMP	2	.5	7.2	
7422C 01431 11612	PURIFIED HEPT.TRANS. PUMP	2	1.0	7.8	
7422C 01435 11722	SLURRY CIRCULATION PUMP	4	1.1	12.0	
74313 01122 23752	FUEL GAS COMPRESSOR	1	12.0	230.6	
74342 01040 31712	PELLET DRYING FAN	1	.8	.0	
74342 0C252 11732	N2 BLOWER	1	3.6	.0	
74342 0C252 12742	NC:1 N2 BLOWER	1	6.0	.0	
74342 0C252 12142	NC:2 N2 BLOWER	1	6.0	.0	
74342 10212 11712	VENT GAS TRANSFER BLOWER	1	.6	11.3	
74342 1C312 11212	NC:3 RECTS BLOWER	1	.8	.0	
74342 1C312 11222	NC:5 RECTS BLOWER	1	1.3	.0	

UNIC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW POLYPROPYLENE PLANT,CAPACITY = 60 000TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.CO
*****	*****	**	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
74522	C2712 11632 SHRINK WRAPPING UNIT	1	3.2	81.0				81.0							81.0
74525	C1101 11722 TICLS WEAIGHER	1	1.0	68.3				68.3							68.3
74525	C5112 11722 STABILIZER WEAIGHER	2	1.1	135.5				271.0							271.0
74525	O5112 11722 MIXED STABILIZER WEAIGHER	2	1.1	135.5				271.0							271.0
74525	O5201 20602 ALKYL AL.WEAIGHER	1	.0	9.7				9.7							9.7
74525	O5412 11722 PCWDER WEAIGHER	2	1.6	135.5				271.0							271.0
74525	O5701 11712 PELLET PACKING WEAIGHER	1	3.0	135.5				135.5							135.5

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry.

Vol.IX- Technical data for
(STY) Styrene

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. IX- Technical data for
(STY) Styrene

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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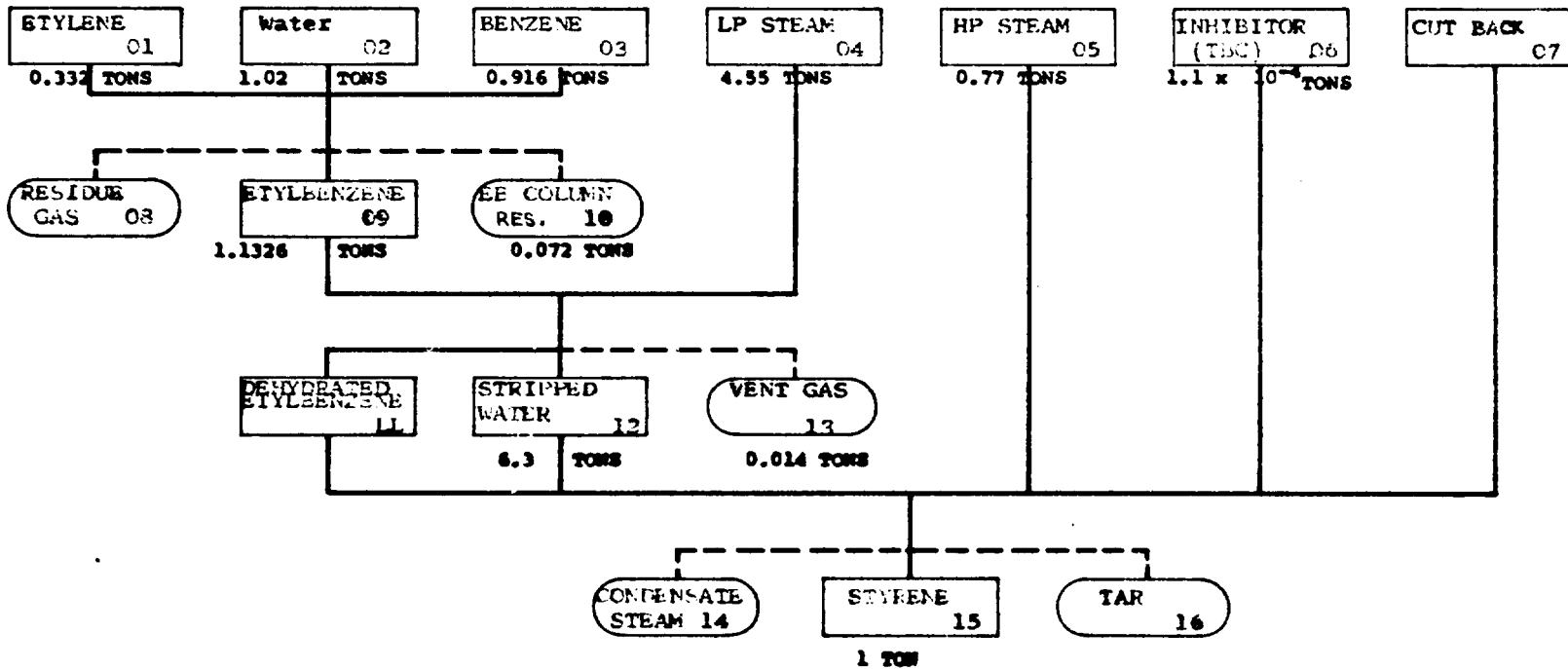
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Rev.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Revizyon: 01 E-9-9-2-1976



SYNTHETIC RESINS PLASTIC MATLS etc	IND.CODE
STYRENE	3513,8
MÜHÜR/İMZA (MÜHÜR) CAP. G. REV. FİDOL	
CHECKED BY	APPROVED BY



PETKİM PETROKİMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS
AND ACTIVITIES FOR STYRENE PLANT

01 TO 09 ETHYLBENZENE PRODUCTION
09 TO 11 ETHYLBENZENE DEHYDROGENATION
11 TO 15 STYRENE PURIFICATION

Rev.	Tarih	İsmi

Revizyon: 113/7/8 B-2/1980

Rev	Tarih	İsmi



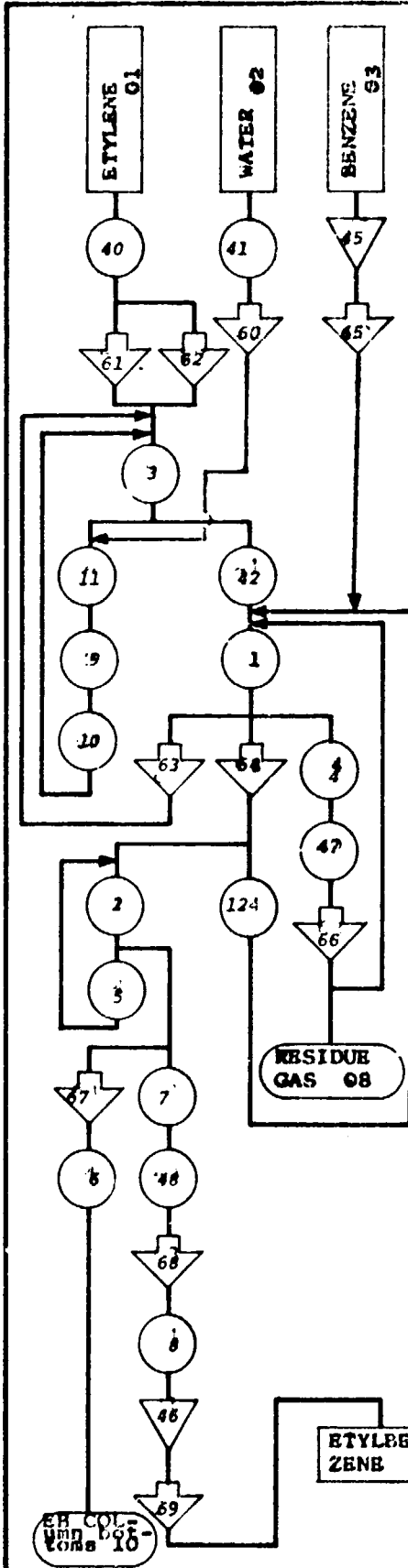
PETKIM PETROKIMYA A.Ş.

UNIDO/SPO (PETKİM) CAPITAL GOODS DEVELOPMENT PROJECT		INDUSTRY ACTIVITIES CHART PART 8 STYRENE			YND CODE: 3513-8 IND NAME: SYN.-THETIC RESINS, PLASTIC MAT'L ETC.		
PROD.C PROD.S	PRODUCT/ NAME STAGE	TECH. CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
09	ETHYLBENZENE PRODUCTION	1	LIQUID PHASE ALKYLATION	ETHYLBENZENE COLUMN	24.65-100 m ³	1	24.65 m ³
						2	40 m ³
						3	65 m ³
						4	100 m ³
		2	VAPOR PHASE ALKYLATION	ETHYLBENZENE COLUMN	25.65-800 m ³	1	25.65 m ³
						2	150 m ³
						3	400 m ³
						4	800 m ³
11	ETHYLBENZENE DEHYDROGENATION	1	ONE ADIABATIC AND ONE HEATED STAGE	ETHYLBENZENE DEHYDROGENATION REACTOR	20-300 m ³	1	20 m ³
						2	62 m ³
						3	200 m ³
						4	300 m ³
		2	TWO ADIABATIC STAGES	ETHYLBENZENE DEHYDROGENATION REACTOR	20-250 m ³	1	20 m ³
						2	100 m ³
						3	150 m ³
						4	200 m ³
15	STYRENE PURIFICATION	1	STYRENE PURIFICATION	STYRENE COLUMN	30-150 m ³	1	30 m ³
						2	65 m ³
						3	90 m ³
						4	120 m ³
						5	150 m ³

PREPARED BY A. AKSU	CHECKED BY	APPROVED BY
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PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY B51P.B	Product 09	TECH 2	CAP 1
10	743623301301212	Catalyst filter		1
42	692410610222222	Acid Settler		1
3	741610124311212	Comp. feed Reac.		2
4	741610545312212	Benzene recycle Clmn. Cooler		1
5	741610224311212	EB Clmn.Reboil.		1
6	741610312211212	EB Clmn.Bottoms Cooler		1
7	741610524312212	EB Clmn. cond.		1
8	741610311111212	EB Clmn.Ovhd. C2		1
11	741610724412212	Reactor charge		1
12	741610240910212	Refluxer clmn.		1
13	742106126111912	Water Injection		2
63	742201037211932	Benzene recycle Clmn. reg. Clmn		2
64	742206041211912	Bottoms reg. Clmn		2
65	742206023111912	Benzene feed P.		2
66	742206033111912	EB Recy. Clmn.		2
67	742206013521912	EB Clmn.bottoms		2
68	742206021511912	EB Clmn.Reflux		2
49	742106012511912	EB Transfer to Reboil. condens		1
9	741650014155292	Reboil.		1
45	692110754326221	Benzene feed		1
46	692110711322227	EB/Benz. Run down		2
1	741660011414222	Benz. Recyc. Clmn.		1
47	692410620222212	Benz. Clmn. Receiver		1
2	741660011512222	Etylbenz. Clmn.		1
48	692410610223212	EB Clmn. Receiver		1

UNIDO /SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
ETHYLBENZ. etc.	ETHYLENE BEN. VAPOR PHASE	
DATE	SAMPLE PLANT CAPACITY	
1.1.1982	YARIMCA	25,65 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AKSU	D.ALTUN	A.AKSU
CHECKED BY	APPROVED BY:	

Rev	Tar.h	İsm.

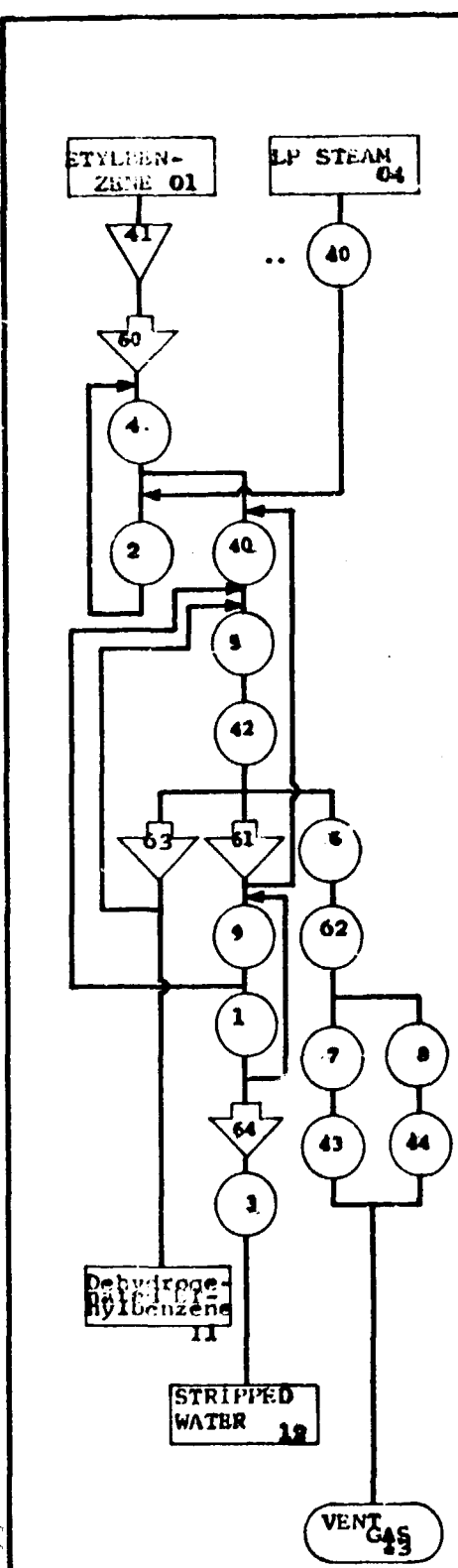
EH COL. Vm. 108-10

ETHYLENE-BENZENE 09

PETKIM PETROKIMYA A.Ş.



Rev	Tarih	İsmi



ETHYLBENZENE DEHYDROGENATION

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP
62	3513.6	11	1	1
NO	MACHINE CODE	MACHINE NAME	Q	
4	74161014221322	Feed reac.trif. Exc.2	1	
9	741610142313213	Reactor product condenser	1	
6	741610411211212	Vent gas chiller	1	
7	741610311211212	1. Stripper	1	
8	741610311311212	2. Stripper	1	
9	741610121211212	3. Stripper	1	
10	74161014221322	1. Stripper	1	
60	742200023511112	Reactor Charge	2	
61	742200021111112	Quench water pump	2	
63	742200022511112	Reac.Prod.Pump	2	
64	742200032111112	Stripped wat. P.	2	
2	741650811153222	Ethylbenz. Dehyd. Reactor	1	
1	741660721412212	Water Stripper	1	
41	6921110734324213	Ethylbenz. P.I.S. Preheater	1	
40	OMITTED	Reactor Preheater	1	
42	692410630222212	Reactor pro. Set	1	
43	692410510221212	Stripper	1	
44	692410510221212	Stripper	1	
3	741660321421212	Carbon Absorber	1	

UNIDO/SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

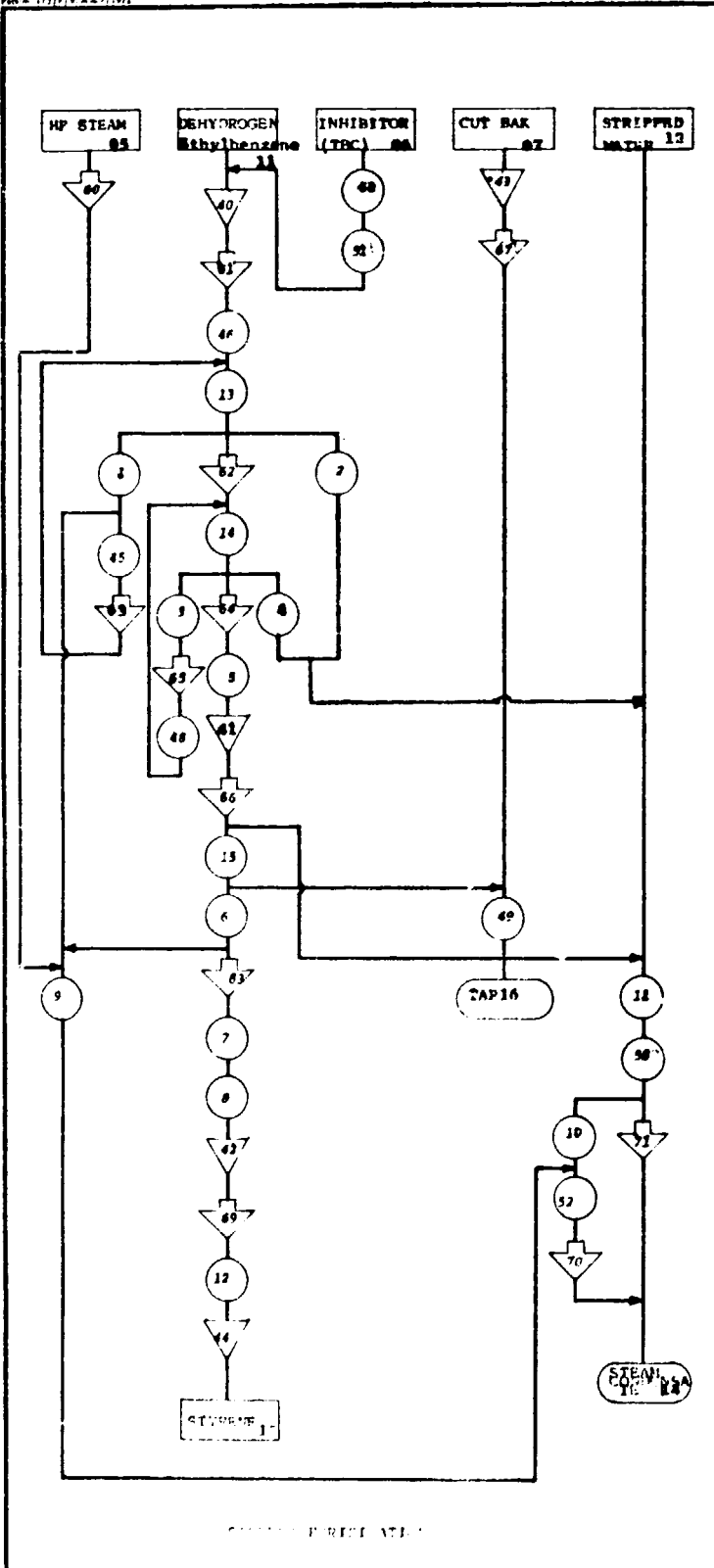
INDUSTRY	PRODUCT	TECHNOLOGY
SYNTHETIC RESIN	DEH. ETHYLBENZ.	ADLAB AND HEAT
DATE	SAMPLE PLANT	CAPACITY
5.1.1982	YARIMCA	
PREPARED BY	DRAWN BY	CHECKED BY
I. YILDIZ	D. ALTUN	S. KESKIN

Rev.	Tarikh	Isim



PETKIM PETROKIMYA A. S.

Rev. 11/1/82 A-71072



ACTIVITY CODE	INDUSTRY	OBJECT	TRCH.	C
	2513.8	13	4	2
NO	MACHINE CODE	MACHINE NAME		Q
1	74161953511221	Benz.Tel.Clmn.C		1
2	74161922011121	Benz.Tol.P		1
3	7416105411121	StyIbenz.2500		1
4	7416102211121	Sty.Clmn.Poly.lek		1
5	74161012511121	CrudeStyr.2 Ter1		1
6	74161053521121	Styrene Clm.co		1
7	74161031331121	StyIbenz.Sty.co		1
8	74161041431121	Finish cond.P		1
9	7416105111121	SP-4J1 condenser		1
10	7416105111121	SP-RJ2 condenser		1
11	74161033431121	Reboiler cond.P		1
12	74161033531121	Styrene stor		1
13	OMITTED	jector.clmn.		1
14	74220002211112	Ben.Tol.Clmn.bo		1
15	74220002211112	Ben.Tol.Clmn.bo		1
16	74220003351112	Sty.Clmn.Oxidp		1
17	74220003251112	Sty.Clmn.Oxidp		1
18	74220002251112	Styrene charge		1
19	74220003311112	Cut Bak Oil pump		1
20	74220002251112	Sty.Clmn.Oxid		1
21	74220003251112	Styr.Prod.ctpump		1
22	74220001211112	jector cond. P		1
23	74220003321112	reboiler cond.P		1
24	74166011414221	Ben.Tel.colum		1
25	7416601314162221	EB Column		1
26	74166011414221	Styrene column		1
27	69211074432821	dehyd.prod.surge		1
28	69211071432521	Crude styr.surge		1
29	69211071142121	Finished styr.		1
30	69211071232621	PolyEB surge T.		1
31	69211075442521	Styr.Stor.Tank		1
32	69241061022121	Ugn.Tpl.Clmn.Re		1
33	69241061022121	Ugn.Tpl.Clmn.Re		1
34	69241061022121	Ben.Tol.Clmn.Pet		1
35	69241061022121	Sty.Clmn.Refl.S.B		1
36	69241050021121	Sty.Clmn.Rebo.		1
37	69241061022121	TWC Inhibitor		1
38	69241061022121	TWC Inhb.Melt T.		1
39	69241061022121	Hot Wall Receiv.		1
40	69241051022121	Steam cond.Drum		1
41	69211072432521	Crude styr.surge		1

MODULAR FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
STYRENE RESINS etc.	STYRENE	PURIFICATION
DATE	SAMPLE PLANT	CAPACITY
5.1.1982	YARLGA	65 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.ARSU	D.ALTUN	A.ARSU
CHECKED BY	APPROVED BY	

STYRENE PURIFICATION

SR No	W/ No	Basic Machine Description	Major Spec. (Capacity)	Major Spec. 1 (Opt. wall)	Major Spec. 2 (Optional)	Type (Description)	Manufacturer Char. 1 (TMS)	Manufacturer Char. 2	Manufacturer Char. 3	Origina	Purchase Cost		Cr. 1980 Cost		Year	SITC Code											
											Unit	Total	Unit	Total		12345	6789	1011	1213	1415	1617	1819	2021				
1	1	Acid settler	3.3 m ³	-	Temp: 316c	Cy	9.1	CS	37 mm	I	1	3950	3950	11700	11000	1972	74161	06	1	0	2	2	2	2	2	2	
2	2	Reactor char pe heater	HS: 39 m ²	SD: 3.6 m	TL: 7.2m	FST	-	CS	5 mm	I	1	15900	15900	44900	44900	1972	74161	07	2	4	4	1	0	2	1	2	
3	3	Benzene column reboiler	HS: 14.2 m	SD: -	TL: -	FST	-	CS	12 mm	I	1	19850	19850	56100	56100	1972	74161	02	4	0	0	1	0	2	1	2	
4	4	Acid settler	HS: 28.15 m	SD: 4.75m	TL: 4.8m	FST	3/2	CS	20 mm	I	2	14850	29700	41950	83900	1972	74161	01	2	4	3	1	2	1	2	1	2
5	5	Acid settler	HS: 34.45m	SD: 3,	TL: 4.8m	FST	4.1	CS	10 mm	I	1	21600	21600	61100	61100	1972	74161	05	4	5	3	1	2	2	1	2	
6	6	Acid settler	HS: 4.3 m	SD: 1.55 m	TL: 3 m	FST	0.2	CS	8 mm	I	1	1000	1000	2800	2800	1972	74161	03	1	2	1	1	2	1	2	1	
7	7	Acid settler	HS: 27.56m	SD: 3.1 m	TL: 4.8 m	FST	9.5	CS	14 mm	I	1	14900	14900	42150	42100	1972	74161	05	2	4	3	1	2	2	1	2	
8	8	Acid settler	HS: 1.3m	SD: 0.53	TL: 0.6m	FST	0.2	CS	8 mm	I	1	1050	1050	2900	2900	1972	74161	03	1	1	1	1	2	1	2	1	
9	9	Acid settler	HS: 14.3m/min	P: 67Kg/cm	Ethylene	H	4	CIC	4 tons	I	1	34450	34450	81500	81500	1972	74313	01	3	5	2	1	1	3	2	1	
10	10	Acid settler	HS: 16 w/min	P: 4Kg/cm	H ₂	H	4	CIC	4 tons	I	1	34450	34450	81500	81500	1972	74313	02	3	2	-	1	1	1	1	2	
11	11	Acid settler	HS: 4.5 w/h	WH: 455 m	Water	H	0.1	SS	0.1 tons	I	2	950	1900	2650	5300	1972	74210	01	2	6	1	1	1	9	1	2	
12	12	Acid settler	HS: 42 w/h	WH: 870 m	HCLC	H	4.7	"	2.1 tons	I	2	37950	75900	90900	181800	1972	74220	10	3	7	2	1	1	9	3	2	
13	13	Acid settler	HS: 150 w/h	WH: 1.4 m	HCLC	H	0.6	"	0.5 tons	I	2	4150	8300	9850	19700	1972	74220	00	4	1	2	1	1	9	1	2	
14	14	Acid settler	HS: 3.4 w/h	WH: 71.2 m	CCLC	H	0.2	"	0.1 tons	I	2	2250	4500	5400	10800	1973	74220	00	2	3	1	1	1	9	1	2	
15	15	Acid settler	HS: 40 w/h	WH: 64.3 m	CCLC	H	0.1	"	0.1 tons	I	2	2700	5400	6450	12900	1973	74220	00	3	3	1	1	1	9	1	2	
16	16	Acid settler	HS: 0.37 w/h	WH: 78 m	Corrosive	V	0.1	"	0.1 tons	I	2	2100	4200	5000	10000	1973	74220	00	1	3	5	2	1	9	1	2	
17	17	Acid settler	HS: 7.5 w/h	WH: 7.6 m	"	H	0.4	"	0.2 tons	I	2	3200	6400	9100	18200	1973	74220	00	2	1	5	1	1	9	1	2	

Note: a) Max. component weight for each plate, place thickness for plate fabricated equipments.

Item No.	Basic Particulars (Capacity)	Major Spec (Optional)	Minor Spec (Optional)	Type Description	Manufac. Char. 1 (TONS)	Manufac. Char. 2	Manufac. Char. 3	Origin	Q.	Purchase Cost		Cr. 1960 Cost		Purch. Year	SFC Code									
										Unit	Total	Unit	Total		12345	678	9	1011	12345					
69	Ethyl benzene feed pump	WH:26 m	Corrosive	H	0.3	SS	0,2 tons	I	1	2000	2000	5700	5700	1972	74210	60	1	2	5	1	1	0	1	2
45	Benzene feed pump	Dia:24,4m	Temp:Amb.	Cy	1516	CS	14,5 mm	T	1	90000	90000	249600	249600	1972	69211	67	5	4	3	2	6	2	2	1
46	Ethyl benzene feed pump	Dia:33m	Temp:Amb.	Cy	5.4	CS	7 mm	T	2	7200	14400	20000	48000	1972	69211	67	1	1	3	2	2	2	2	1

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

S. No.	M. No.	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 2 (Optional)	Major Spec. 3 (Optional)	Type (Description)	Manufac. Char. 1 (TONS)	Manufac. Char. 2	Manufac. Char. 3 (mm)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purch. Year	SITC Code									
												Unit	Total	Unit	Total		12345	67	89	10	11	12	13	14	15	
2		Activation reaction reactor	62 m ³	P:1,4 Kg/cm ²	Catalytic	PB	10,5	CS	22 mm	I	1	32650	32650	101750	101750	1972	74165	081	1	1	5	3	2	2	2	
40		Reactor prod. quench drum	OMITTED							I	1						OMITTED									
43		Reactor prod. settler	42,7 m ³		Temp:121°C	Cy	9,7	CS	9 mm	I	1	8800	8800	24450	24450	1972	69241	083	0	2	2	2	2	1	2	
43		First stage K.O. Drum	0,7 m ³		Temp:177°C	Cy	0,6	CS	6 mm	I	1	650	650	1750	1750	1972	69241	051	0	2	2	1	2	1	2	
44		Second stage K.O. Drum	0,7 m ³		Temp:177°C	Cy	0,6	CS	6 mm	I	1	650	650	1750	1750	1972	69241	051	0	2	2	1	2	1	2	
3		Carbon Absorber	5,5 m ³	P:3,5Kg/cm ²	Temp:149°C	Packed	3,6	CS	7 mm	I	1	5400	5400	16750	16750	1972	74166	031	1	4	2	1	2	1	2	
1		Water Stripper	6,36 m ³	P:3,5Kg/cm ²	Temp:149°C	Plate Baffle	0,6	CS	12 mm	I	1	9900	9900	30900	30900	1972	74166	071	1	4	1	2	2	1	2	
10		Process. steam heater	HS:180 m ³	SD:1,2 m	TL:2,5 m	FST	8	CS	14 mm	I	1	11900	11900	33650	33650	1972	74161	084	2	2	1	2	2	1	2	
10		" " "	HS:180 m ³	SD:1,2 m	TL:2,5 m	FST	8	CS	14 mm	I	1	11900	11900	33650	33650	1972	74161	084	2	2	1	2	2	1	2	
10		" " "	HS:180 m ³	SD:1,2 m	TL:2,5 m	FST	8	CS	14 mm	I	1	11900	11900	33650	33650	1972	74161	084	2	2	1	2	2	1	2	
4		Comp. feed reactor	HS:229,7 m ³	SD:1 m	TL:3,6 m	FST	13,7	Non ferrous	22 mm	I	2	15350	30700	36250	72500	1972	74161	014	2	2	1	3	7	2	2	
5		Reactor products cond.	HS:488 m ³	SD:1,27 m	TL:6 m	FST	19,6	CS	14 mm	I	1	31750	31750	89750	89750	1972	74161	014	2	3	1	3	2	1	2	
6		Vent gas Chiller	HS:4,25 m ³	SD:0,4 m	TL:3,6 m	FST	1,6	CS	0,5 mm	I	1	4300	4300	12250	12250	1972	74161	041	1	2	1	1	2	1	2	
7		First stage CR cooler	HS:3 m ³	SD:0,2 m	TL:3,6 m	FST	0,4	CS	8 mm	I	1	3000	3000	8000	8000	1972	74161	031	1	2	1	1	2	1	2	
8		Second stage CR cooler	HS:7,75 m ³	SD:0,15 m	TL:4,8 m	FST	0,2	CS	8 mm	I	1	2400	2400	6750	6750	1972	74161	031	1	3	1	1	2	1	2	
9		Water stripper	HS:13,20 m ³	SD:0,25 m	TL:4,8 m	FST	0,8	CS	8 mm	I	1	1900	1900	5350	5350	1972	74161	012	1	3	1	1	2	1	2	
62		Vent gas Compressor	960 m ³ /h	P:4 Kg/cm ²	H ₂	H	0,2	CIC	0,2 tons	I	1	3400	3400	11050	11050	1972	74313	025	2	2	1	1	1	1	2	
60		Reactor Charge	4,1 m ³ /h	WH:50 m	Corrosive	H	0,1	CIC	0,1 tons	I	2	1050	2100	3050	6100	1972	72220	003	5	1	1	1	1	1	2	
61		Quench Water	20,4 m ³ /h	WH:35,5 m	CCLC	H	0,3	CIC	0,2 tons	I	2	1400	2800	4000	8000	1972	72220	003	2	1	1	1	1	1	2	
63		Reactor prod. to storage	7,5 m ³ /h	WH:40,2 m	Corrosive	H	0,1	CIC	0,1 tons	I	2	1150	2300	3350	6700	1972	72220	002	2	5	1	1	1	1	2	
64		Stripped water	20,9 m ³ /h	WH:32 m	CCLC	H	0,3	CIC	0,2 tons	I	2	1400	2800	4000	8000	1972	72220	003	2	1	1	1	1	1	2	
41		Ethyl benzene prod.	795 m ³	Dia:12m	Temp:Amb.	Cu	26,5	CS	6,5 mm	T	1	21900	21900	60750	60750	1972	69211	073	4	3	2	4	2	1	2	

Note : a) Max. component weight for machine. plate. thickness for plate fabricated equipments.

No.	Equip. Name	Equip. Code	Equip. Desc.	Equip. Unit	Equip. Type	Equip. Char. 1	Equip. Char. 2	Equip. Char. 3	Equip. Char. 4	Equip. Char. 5	Purchase Cost		Ct. 1968 Cost		Proc. Year	ITC Code										
											Unit	Total	Unit	Total		1245	67	14	10	11	12	13				
43	Benzene-Toluene column	62 m ³	P:3,5Kg/cm ² Temp:149c		PB	35	CS	25 mm	I		1	33350	33350	104000	104000	1972	74166	01	1	1	4	1	4	2	2	2
44	Ethylbenzene column	540 m ³	P:3,5Kg/cm ² Temp:149c		PB	163	CS	25 mm	I		1	127150	127150	396400	396400	1972	74166	01	3	1	4	1	6	2	2	2
45	Styrene-column	65 m ³	P:3,5Kg/cm ² Temp:149c		PB	32	CS	18 mm	I		1	39500	39500	123100	123100	1972	74166	01	1	1	4	1	4	2	1	2
46	Benzene-Toluene Column Receiver	3,5 m ³	Temp:121c		Cy	1,1	CS	11 mm	I		1	3950	3950	11000	11000	1972	69241	06	1	0	2	2	1	2	1	1
47	Benzene-toluene column receiver	2,5 m ³	Temp:121c		Cy	1,4	CS	10 mm	I		1	3200	3200	8800	8800	1972	69241	06	1	0	2	2	1	2	1	2
48	Styrene column receiver	2,5 m ³	Temp:121c		Cy	1,4	CS	10 mm	I		1	2600	2600	7150	7150	1972	69241	06	1	0	2	2	1	2	1	2
49	Styrene Separator	0,4 m ³	SD: 3 m TL:		FST	0,2	CS	17 mm	I		1	2600	2600	7150	7150	1972	69241	05	0	0	2	1	1	2	1	2
50	TBC inhibitor tank	1,2 m ³	Temp:121c		Cy	0,7	CS	7 mm	I		1	1750	1750	4850	4850	1972	69241	06	1	0	2	2	1	2	1	2
51	TBC inhibitor melt tank	0,5 m ³	Temp:121c		Cy	0,3	CS	6 mm	I		1	1500	1500	4100	4100	1972	69241	06	1	0	2	2	1	2	1	2
52	Hot well receiver	2 m ³	Temp:121c		Cy	1,3	CS	7 mm	I		1	2850	2850	7950	7950	1972	69241	06	1	0	2	2	1	2	1	2
53	Steam condensate drum	8 m ³	Temp:121c		Cy	2,4	CS	13 mm	I		1	4650	4650	12850	12850	1972	69241	05	1	0	2	2	1	2	1	2
1	Benzene-Toluene condenser	HS:57,5 m ² SD:7,62 m TL: 4,8 m			FST	5,5	CS	12 mm	I		1	8750	8750	24700	24700	1972	74161	05	3	5	3	1	2	2	1	2
2	Benzene-Toluene condenser	HS:24,2 m ² SD: - TL: 1,9 m			FST	1,1	CS	10 mm	I		1	3950	3950	11200	11200	1972	74161	02	2	1	1	2	1	2	1	2
3	Ethylbenzene condenser	HS:184 m ² SD:1,168 m TL: 4,8 m			FST	9,5	CS	13 mm	I		1	13500	13500	38150	38150	1972	74161	05	4	2	3	1	2	2	1	2
4	Ethylbenzene condenser	HS:78,4 m ² SD:1,06 m TL: 2,7 m			FST	3,2	CS	12 mm	I		1	6500	6500	18350	18350	1972	74161	02	3	2	1	1	2	1	2	1
5	Crude styrene cooler	HS:12,25 m ² SD: 5 m TL: 4,8 m			FST	1,5	CS	8 mm	I		1	2400	2400	6750	6750	1972	74161	03	2	5	3	1	2	1	2	1
6	Styrene condenser	HS:57 m ² SD: 7,6 m TL: 4,2 m			FST	2,5	CS	10 mm	I		1	5400	5400	15300	15300	1972	74161	03	3	5	2	1	1	2	1	2
7	Finished styrene trim cooler	HS: 3 m ² SD: 2 m TL: 4,8 m			FST	0,6	CS	8 mm	I		1	3800	3800	10650	10650	1972	74161	03	1	3	3	1	1	2	1	2
8	Finished styrene trim cooler	HS: 7,6 m ² SD: 3,1 m TL: 6 m			FST	0,8	CS	8 mm	I		1	28600	28600	67250	67250	1973	74161	04	1	4	3	1	1	2	1	2
9	SP-B71 condensers	HS:6,9 m ² SD: 0,3 / 0,2 m TL: 2,4 m			FST	0,4	CS	14 mm	I		3	3400	10200	9950	28650	1972	74161	05	1	1	1	1	1	2	1	2
10	SP-B72 condensers	HS: 1,4 m ² SD: 0,2 m TL: 2,4 m			FST	0,3	CS	14 mm	I		1	3000	3000	8400	8400	1972	74161	05	1	1	1	1	1	2	1	2
11	Styrene condenser	HS: 60 m ² SD:4,4 m TL: 6 m			FST	0,4	CS	2 mm	I		1	2800	2800	7900	7900	1972	74161	03	3	4	3	1	1	2	1	2
12	Styrene storage cooler	HS:71,7 m ² SD: 7,1 m TL: 6 m			FST	0,8	CS	8 mm	I		1	3150	3150	8850	8850	1972	74161	03	3	5	3	1	1	2	1	2
61	Styrene cooler	6,8 m ³ /hr WH:48,2 m CCLC			H	0,1	CI	0,1 ton	I		2	1100	2200	3100	6200	1972	74220	00	2	2	1	1	1	1	1	2
62	Styrene cooler	6 m ³ /hr WH:62,5 m HCLC			H	0,3	CI	0,1 ton	I		2	1400	2800	4000	8000	1972	74220	00	2	3	2	1	1	1	1	2
63	Styrene cooler	5,8 m ³ /hr WH: 33 m CCLC			H	0,1	CI	0,1 ton	I		2	1050	2100	3050	6100	1972	74220	00	2	2	1	1	1	1	1	2

Note: a) Max. component weight for mach. less plate thickness for plate fabricated equipments.

No.	Basic Material Description	Major Size (Original)	Water Loss (Original)	Type (Description)	Manufact. Char. 1. (7-NS)	Manufact. Char. 3. (a)	Origin	Purchase Cost		Cr. 1860 Cost		Misc. Year	SFC Code											
								Unit	Total	Unit	Total		1345	679	1011	2346								
64	Styrene charge	39 m ³ /hr WH: 50 m	Corrosive	H	0,1	CIC	I	2	1050	2100	3050	1972	74220	00	3	5	1	1	1	1	1	1	1	
65	Styrene charge	28 m ³ /hr WH: 37 m	"	H	0,2	CIC	I	2	1600	3200	4850	1972	74220	00	3	2	5	1	1	1	1	1	1	1
66	Styrene charge	4,3 m ³ /hr WH: 39,5 m	"	H	0,2	CIC	I	2	1150	2300	3350	1972	74220	00	2	2	5	1	1	1	1	1	1	1
67	Crackback oil	-	OCLC	H	0,1	CIC	I	1	1000	1000	2850	1972	74220	00	3	1	1	1	1	1	1	1	1	1
68	Styrene prod to storage	9,6 m ³ /hr WH: 32 m	Corrosive	H	0,1	CIC	I	2	1000	2000	2900	1972	74220	00	2	2	5	1	1	1	1	1	1	1
69	Styrene prod to storage	22,7 m ³ /hr WH: 39,5 m	"	H	0,2	CIC	I	1	1200	1200	3450	1972	74220	00	3	2	5	1	1	1	1	1	1	1
70	Styrene prod to storage	0,25 m ³ /hr WH: 36,3 m	OCLC	H	0,1	CIC	I	2	850	1700	2400	1972	74220	00	1	2	1	1	1	1	1	1	1	1
71	Styrene prod to storage	27,3 m ³ /hr WH: 62,2 m	HCIC	H	0,3	CIC	I	2	1600	3200	4650	1972	74220	00	3	2	1	1	1	1	1	1	1	1
72	Styrene prod to storage	1190 m ³	Temp: Amb.	Cy	350	CS	I	1					69211	07	4	4	3	2	8	2	1	1	1	1
73	Styrene prod to storage	56 m ³	Temp: "	Cy	72,1	CS	I	1	6750	6750	18700	1972	69211	07	1	4	3	2	5	2	5	2	1	1
74	Styrene prod to storage	120 m ³	Temp: "	Cy	4,6	CS	I	1	10600	10600	29850	1972	69211	07	2	6	3	2	6	3	2	6	2	1
75	Styrene prod to storage	56 m ³	Temp: 5c	Cy	103,2	CS	I	2	6750	13500	18700	1972	69211	07	1	1	4	2	1	1	1	1	1	1
76	Styrene prod to storage	221 m ³	Temp: Amb.	Cy	72,1	CS	I	1	1200	1200	3300	1972	69211	07	3	2	3	2	6	2	1	1	1	1
77	Styrene prod to storage	2800 m ³	Temp: 5c	Cy	72,1	CS	I	1	250000	250000	693300	1972	69211	07	5	6	4	2	5	2	1	1	1	1
78	Styrene prod to storage	ND AVAILABLE																						

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE PLANT, CAPACITY
 LOCATION-YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING- 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	GR	UN.WE	UM.CO
69211 07113 22221	EB RUN CDMN	2	5.4	20.0
69211 07114 21211	FINISHED STY.RUN DGMN TAN	2	103.2	18.7
69211 07143 25211	CRUDE STYRENE SURGE	1	72.1	18.7
69211 07223 26211	PEB SURGE TANK	1	72.1	3.3
69211 07243 25211	CRUDE STYRENE SURGE	1	4.6	29.9
69211 07343 24212	EB PAGOUCT STORAGE	1	26.5	60.8
69211 07443 20211	DEHYDROGENATED PRGG.SURGE	1	350.0	.0
69211 07543 26221	BENZENE FEED STGRAGE	1	151.6	249.6
69211 07544 25211	STYRENE STORAGE TANK	1	72.1	693.3
69241 05002 11212	STYRENE CLMN.REBCILER DR.	1	.2	7.2
69241 05102 21212	SELCMD STG.COMPR.K.G.DRUM	1	.6	1.8
69241 05102 21212	STEAM CONDENSATE GRUM	1	2.4	12.9
69241 05102 21212	FIRST STG.COMPR.K.G.DRUM	1	.6	1.8
69241 05103 21212	FEED GAS COMP.SUCTION DR.	1	.8	3.5
69241 06102 21212	HCI WELL RECEIVER	1	1.3	6.0
69241 06102 21212	EB.CLMN.REFLUX SULFUR POT	1	1.4	7.2
69241 06102 21212	TBC INHIBITON MELT TANK	1	.3	4.1
69241 06102 21212	BENZENE-TOLUEN CLMN RECE.	1	1.1	11.0
69241 06102 21212	TBC INHIBITOR INJEC.TANK	1	.7	4.9
69241 06102 21212	BENZ-TOLU.CLMN.SULFUR POT	1	1.4	8.8
69241 06102 22241	WATER INJECTION TANK	1	.2	2.2
69241 06102 22222	ACIG SETTLER	1	8.1	11.0
69241 06102 23212	ETHYLBENZENE COLUMN RECE.	1	1.5	7.7
69241 06202 22212	BENZENE COLUMN RECEIVER	1	5.8	76.0
69241 06302 22212	REACTOR PRODUCTION SETT.	1	9.7	24.5
74161 01213 11212	WATER STRIP.FEED.CVMD.EXC	1	.3	5.4
74161 01243 11212	COMB.FEED REACTOR EFF.EXC	2	3.2	42.0
74161 01422 13722	COMB.FEED REAC.EFFL.EXCM.	2	13.7	36.3
74161 01423 13212	REACTOR PRODUCT CONDENSER	1	19.6	49.8
74161 02201 11212	BENZENE-TOL.CLMN.REBOILER	1	1.1	11.2
74161 02243 11212	ETHYLBENZENE CLMN.REBOIL.	1	1.1	10.4
74161 02321 11212	EB CLMN.REBOILER	1	3.2	18.4
74161 02400 10212	BENZENE COLUMN REBCILER	1	.0	56.1
74161 03111 11212	EB CLMN.NET CVMD COOLER	1	.2	2.9
74161 03112 11212	FIRST STG.COMP.OISCH.COOL	1	.4	8.0
74161 03113 11212	SECCMD STG.COMP.OISCH.CO.	1	.2	6.8
74161 03122 11212	EB CLMN.BUITIONS COOLER	1	.2	2.8
74161 03133 11212	FINISHED STYRENE TRIM CO.	1	.6	10.7
74161 03253 11212	CRUDE STYRENE CLMN.COOLER	1	1.5	6.8
74161 03343 11212	REBCILER CONDENSATE COOL.	1	.4	7.9
74161 03352 11212	STYRENE CLMN CONDENSER	1	2.5	15.3
74161 03353 11212	STYRENE STORAGE COOLER	1	.8	8.9
74161 04112 11212	VENT GAS CHILLER	1	1.6	12.3
74161 04143 112.2	FIN.STY.PFRFRIGERENT COOL.	1	.8	67.3
74161 05111 11212	SP-EJI CL DENSERS	3	.4	9.9
74161 05111 11212	SP-EJI CONDENSER	1	.3	8.4
74161 05243 12212	EB CLMN. CONDENSER	1	9.5	42.1
74161 05353 12212	BENZENE-TOLUEN CLMN.COND.	1	5.5	24.7
74161 05423 12212	EB.CLMN.CONDENSER	1	9.5	38.2
74161 05453 12212	BENZENE RECYCLE CLMN.COM.	1	6.9	61.1
74161 07244 10212	REACTOR CHANGE HEATER	1	.0	44.9
74161 08422 12212	PROCESS STEAM SUPERHEATER	1	8.0	33.7
74161 08422 12212	PROCESS STEAM SUPERHEATER	1	8.0	33.7
74161 08422 12212	PROCESS STEAM SUPERHEATER	1	8.0	33.7
74161 08111 53222	EB DEHYDROGENATION REAC.	1	10.5	101.8
74161 08141 55242	CATALYTIC CONDEN. REACTOR	1	78.5	282.9
74166 00114 14222	BENZENE RECYCLE COLUMN	1	44.4	131.5
74166 00115 12222	ETHYLBENZENE COLUMN	1	16.2	67.6
74166 01114 14212	STYRENE COLUMN	1	32.0	123.1

UNICO / SPG(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE PLANT,CAPACITY = 19 000TON/YEAR
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSING= 1994
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.-A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WE
74166 G1114 14222	BENZENE-TOLUEN COLUMN	1	35.0	104.0		35.0									35.0
74166 01314 16222	ETHYLBENZENE COLUMN	1	163.0	396.4		163.0									163.0
74166 03114 21212	CARBON ABSORBER	1	3.6	16.8		3.6									3.6
74166 07114 12212	WATER STRIPPER	1	.6	30.9		.6									.6
74210 00125 11912	EB TRANSFER PUMP	1	.3	5.7			.3								.3
74210 01261 11912	WATER INJECTION	2	.1	2.7			.2								.2
74220 00031 11112	CUTBACK OIL PUMP	1	.1	2.9			.1								.1
74220 00121 11112	EJECTOR CONDENSATE PUMP	2	.1	2.4			.2								.2
74220 00135 21912	EB CLMN. BOTTGMS PUMP	2	.1	5.0			.2								.2
74220 00215 11912	EB CLMN. REFLUX PUMP	2	.4	9.1			.8								.8
74220 00221 11112	BEN-TOL.CLMN.CHARGE PUMP	2	.1	3.1			.2								.2
74220 00221 11112	BEN-TOL.CLMN.OVHD.PUMP	2	.1	6.1			.2								.2
74220 00225 11112	STYRENE CHARGE PUMP	2	.2	3.4			.4								.4
74220 00225 11112	STYRENE CLMN OVHD PUMP	2	.1	2.9			.2								.2
74220 00225 11112	REACTOR PRODUCT TRAN.PUMP	2	.1	3.4			.2								.2
74220 00231 11912	BENZENE FEED PUMP	2	.2	5.4			.4								.4
74220 00232 11112	BEN-TOL.CLMN.BOTTGMS PUMP	2	.3	4.0			.6								.6
74220 00235 11112	REACTOR CHARGE PUMP	2	.1	3.1			.2								.2
74220 00321 11112	QUENCH WATER PUMP	2	.3	4.0			.6								.6
74220 00321 11112	STRIPPED WATER PUMP	2	.3	4.0			.6								.6
74220 00325 11112	EB CLMN OVHD PUMP	2	.2	4.1			.4								.4
74220 00325 11112	STYRENE PRODUCT TO STOR.	1	.2	3.5			.2								.2
74220 00331 11912	BENZENE RECY.CLMN.REFL.P.	2	.1	6.5			.2								.2
74220 00332 11112	REBOILER CONDENSATE PUMP	2	.3	4.7			.6								.6
74220 00335 11112	EB CLMN.BOTTGMS PUMP	2	.1	3.1			.2								.2
74220 00412 11912	BENZENE RECYCLE CLMN BCT.	2	.6	9.9			1.2								1.2
74220 10372 11932	BENZENE RECY CLMN SIDECUT	2	4.7	90.9			9.4								9.4
74313 01352 11132	ETHYLENE FEED GAS COMPR.	1	4.0	81.5			4.0								4.0
74313 02322 11132	ETHYLENE FEED GAS COMPR.	1	4.0	81.5			4.0								4.0
74313 02522 11112	VENT GAS COMPRESSOR	1	.2	11.1			.2								.2
74362 33C13 01212	CATALYST FILTER	1	1.0	6.6				1.0							1.0

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(11 of 17)

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI--Demand for Capital Goods for
Petrochemicals Industry.

Vol. X - Technical data for
(PS) Polystyrene

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. X - Technical data for
(PS) Polystyrene

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey
United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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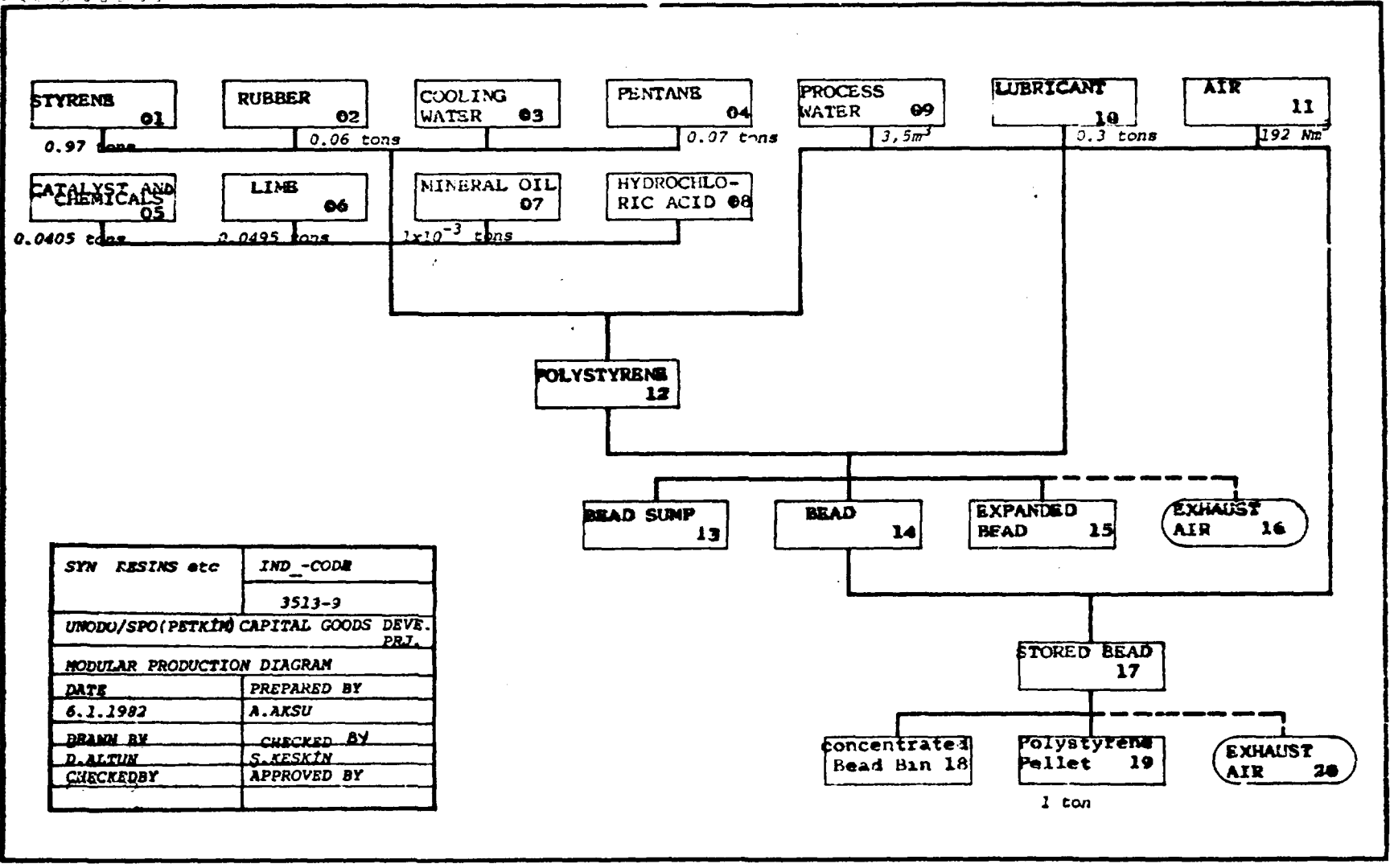
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PETKİM PETROKİMYA A.Ş.



SYN RESINS etc	IND_CODE
	3513-9
UNODU/SPO(PETKİM) CAPITAL GOODS DEVE. PRJ.	
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
6.1.1992	A.AKSU
DRAWN BY	CHECKED BY
D.ALTUN	S.KESKIN
CHECKED BY	APPROVED BY



PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS
AND ACTIVITIES FOR POLYSTYRENE PLANT

- 01 TO 12 POLYMERIZATION
- 12 TO 14 BEAD RECOVERY
- 14 TO 17 BEAD STORAGE
- 17 TO 19 PS BLENDING

Rev.	Tarih	İsmi

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PETKİM PETROKİMYA A.Ş.

UNIDO/SPO(PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

INDUSTRY ACTIVITIES CHART
PART 9 PS

IND CODE: 3513-9
IND NAME : SYNTHETIC RESINS etcPS

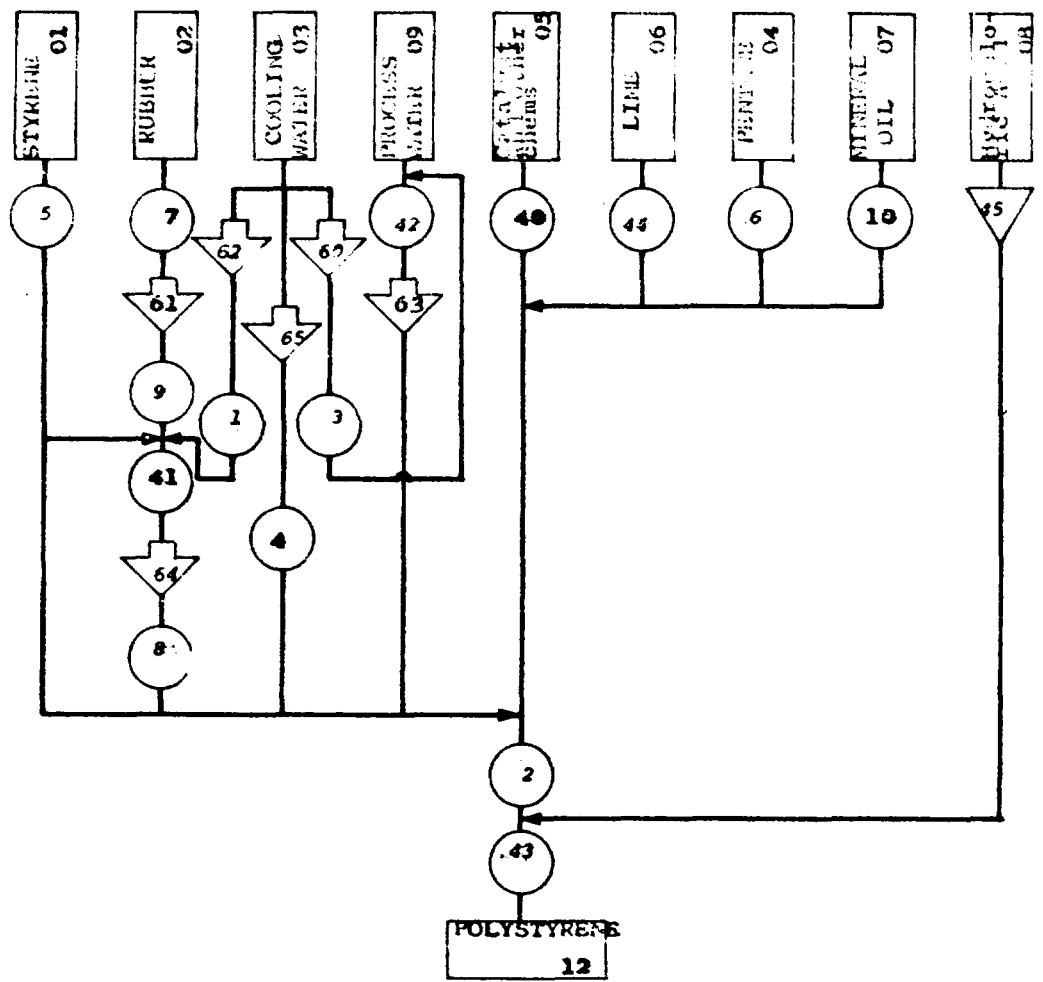
PROD. C PROD. S	PRODUCT / PRODUCTION NAME STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
12	POLYSTYRENE	1	SUSPENSION POLYMERIZATION	POLYMERIZATION REACTOR	29 - 100 m ³	1	29 m ³
						2	50 m ³
						3	75 m ³
						4	100 m ³
		2	BULK POLYMERIZATION	POLYMERIZATION REACTOR	20 - 80 m ³	1	20 m ³
						2	50 m ³
14	BEAD	1	BEAD RECOVERY	ROTARY DRYER	52- 50 t/h	1	5.2 t/h
						2	15 t/h
						3	35 t/h
						4	50 t/h
17	STORED BEAD	1	BEAD STORAGE	BEAD SILO	20 - 300 m ³	1	20 m ³
						2	85 m ³
						3	200 m ³
						4	300 m ³
19	POLYSTYRENE PELLET	1	BLENDING	PELLETIZER	0,2 - 10t/h	1	0.2 t/h
						2	1.1 t/h
						3	4 t/h
						4	7 t/h
						5	10 t/h

PREPARED BY	CHECKED BY	APPROVED BY
T. YILDIZ		

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.



PS. POLYMERIZATION SECTION

ACTIVITY CODE	Industry	Product	TECH.	CAP
41	69211071132212	Dissolving Tank	1	1
42	69211071132212	Suspension Tank	1	1
2	74165121221112	Polymerizat. Reac.	2	3
43	69211071132212	Hold Tanks	3	3
40	69241081021112	Water Addition	1	1
44	69241081021112	Line Addit. Pot	1	1
1	74161011341122	Dissolv. T. Exch.	1	1
3	74161010941122	Suspens. T. Exch.	1	1
4	74161010941122	Reac. Exchangers	2	2
60	742200233211912	Resp. Jac Pump	1	1
62	742200233211912	Dissol. Jack Pump	1	1
63	742200233211912	Susp. Trans. Pump	1	1
64	742200233411912	Solution Tran. P.	1	1
45	742200233211912	Reac. Jack Pump	3	3
5	743621341101212	Monomer Alter	1	1
6	743621311001212	Pentane Filter	1	1
8	743523231101212	Seln. Filter	1	1
9	743611111011212	Rubber Cyclone	1	1
10	743621311001212	Mineral oil filt.	1	1
7	722321217111912	Rubber Grinder	1	1
61	743420031211912	Rub. Trs. Blower	1	1
45	69211071132212	HCl Meas. Tank	1	1

UNITO/SPO (PETKIM) CAP. GOODS DEVELOPMENT PRJ.
 MODULAR PROCESS FLOW DIAGRAM

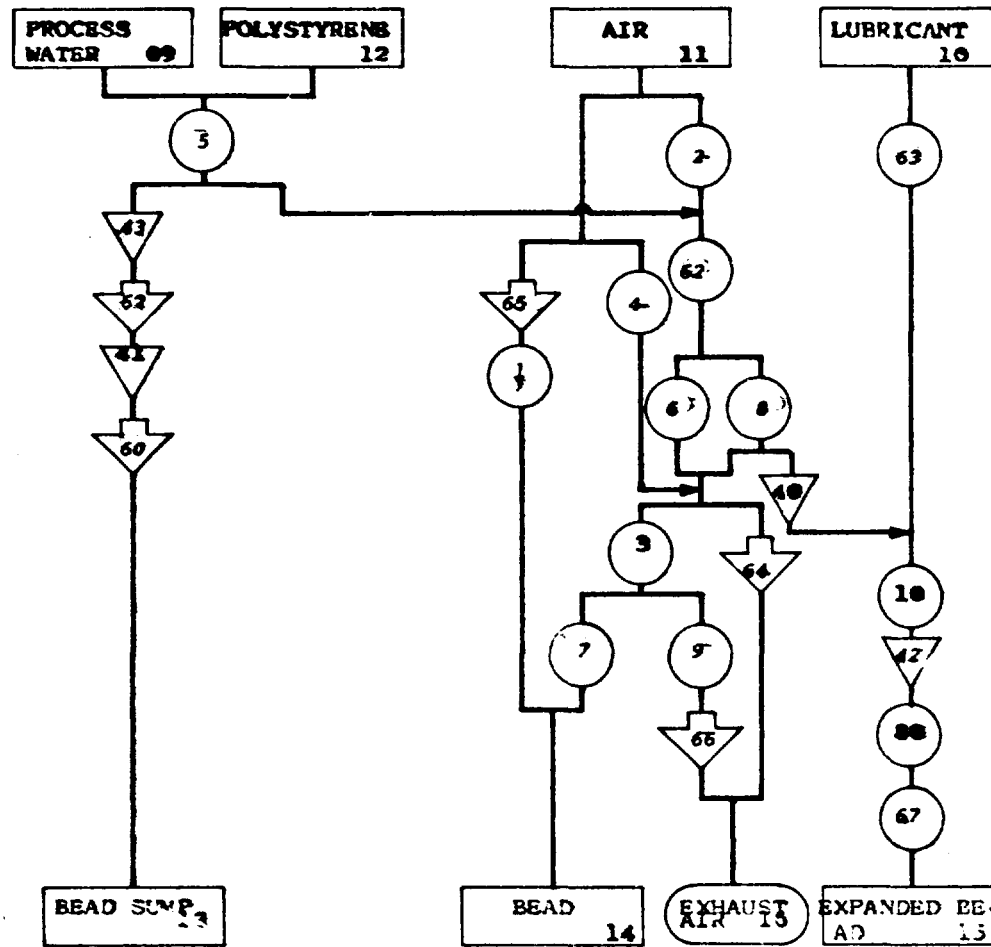
CHECKED BY		APPROVED BY
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc.	POLYSTYRENE	SUSP. POLYMERIZ.
DATE	SAMPLE PLANT	CAPACITY
6.1.1982	YARINCA	22 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	D. ALTUN	A. AKSU

Rev.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Petkim 113/F.9 B-2/1976



PS BEAD RECOVERY SECTION

ACTIVITY CODE	Industry	Product	TECH.	CAP
	3513.9	14	1	1
NO	MACHINE CODE	MACHINE NAME	Q	
1	Incl.in flash Dry	Dryer trans.Co	-	
2	" " " "	Flash dryer air	-	
4	Incl.in flas.Rot.	Rotary dryer air	-	
60	742200232211712	Bead sump pump	2	
61	742200232221712	Centrif. Eff. P.	2	
5-	OMITTED	Centrifuge	-	
4	743611041011612	Flash dryer cyc-	2	
2	728310612011712	Bead Screen	2	
4	743611111011612	Expandable Bin	1	
9	Inclu.in Rot.Dry	Rotary dry.Cycl.	-	
3	741643010042612	Rotary Dryer	2	
10	728310613011712	expan.Bead Scr.	1	
62	OMITTED	Drum conveyor	-	
62	744260015011712	Wet cake Conv.	2	
63	744267511011212	Zinc stearate P.	1	
64	743420041111912	Flash dryer B-	2	
65	743420051111212	Dry,Trans.Blow.	2	
66	Includ.in Rot.	Rot.Dry.Blower	-	
41	692110711311211	Bead Sump Tank	1	
40	692110111321211	Exp.Bead Bin	1	
42	692110111321211	Exp.Bead Sur. Bin	2	
43	692110711311211	Centr. Eff. Tank	1	
80	745250511119002	Exp. Bead weigh	2	

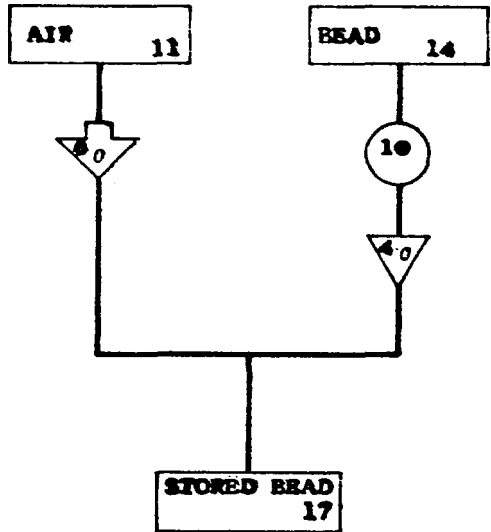
UNIDO/SPO(PETKİM) CAP.GOODS DEVELOPMENT PROJ.
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	BEAD RECOVERY	BEAD RECOVERY
DATE	SAMPLE PLANT	CAPACITY
6.1.1982	YARIMCA	5.2 t/h
CHECKED BY	APPROVED BY	PREPARED BY
		A.AKSU
DRAWN BY	CHECKED BY	
D.ALTUN	A.AKSU	



PETKİM PETROKİMYA A.Ş.

Rev	Tarih	İsmi



70 BEAD STORAGE SECTION

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH.	CAP
	3513.9	17	1	2
NO. MACHINE CODE	MACHINE NAME		Q	
19	743622111901612	Bag filter	8	
60	743421035111112	Bead tran. Blower	8	
40	692110611321212	Bead Silo	8	

UNIDO/SPO(PETKİM) CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

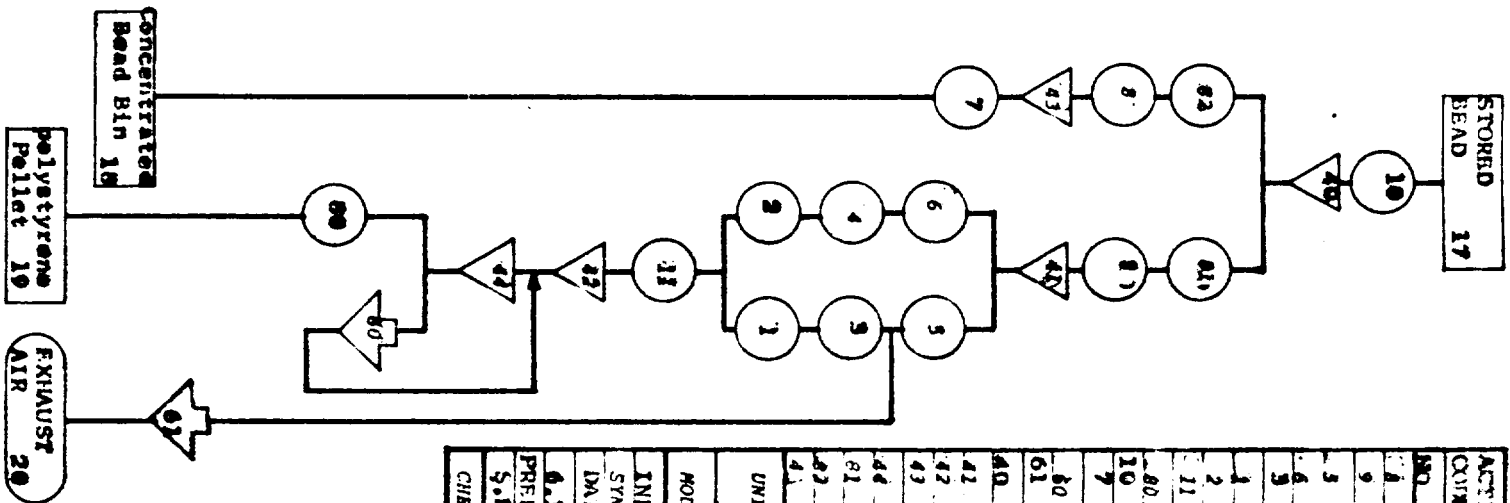
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	STORED BEAD	BEAD STORAGE
DATE	SAMPLE PLANT	CAPACITY
6.1.1982	YARINCA	85 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	D. ALTUN	A. AKSU
CHECKED BY	APPROVED BY:	



PETKIM PETROKIMYA A.Ş.

Rev	Tarih	İsmi

Revizyon: 113 429 B-2-1376



PS BLENDED SECTION

NO	MACHINE CODE	INDUSTRY CODE	INDUSTRY	TECHN.	TECHN.	Cap
1	728317021732	3513.9	Intensive Blend	1	2	0
2	74302241101113	19	Blender on Bl.Filt.	1	2	3
3	728420111412343	19	Strander Lines	1	2	3
4	728420111412343	19	Strander Line	1	2	3
5	741642300031012	19	Strand Dryer	1	2	3
1	728340111011622	19	Pelletizer	1	2	3
2	728340111011622	19	Pelletizer	1	2	3
11	728317021732	19	Blender on Bl.Filt.	1	2	3
80	745220141211713	19	Bag Filter	1	2	3
10	743622111001613	19	Bag Filter	1	2	3
7	728320018711732	19	Scrap Grinder	1	2	3
60	743420201111912	19	Pellet Test Die	1	2	3
61	743410121131612	19	Supplier Die	1	2	3
40	69211011131211	19	Head Line	1	2	3
41	692111141122412	19	Ex.Ed.Hoppers	1	2	3
42	69211011131211	19	Pellet Test Bins	1	2	3
43	692110111011011	19	Concentrate bins	1	2	3
44	692111411311912	19	Pellet Hopper	1	2	3
81	745220141211713	19	Bag Filter	1	2	3
42	745220141211713	19	Bag Filter	1	2	3
41	741642300031012	19	Strand Dryer	1	2	3

UNIDO/SPO/(PETKIM) CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INITIATOR	PRODUCT	TECHNOLOGY
SYN RESINSECT	PS PELLET	BLENDED
DATE	SAMPLE PLANT	CAPACITY
0.1.1982	YARLSCA	1.1 t/h
PREPARED BY	DRAWN BY	CHECKED BY
S.KESKIN	D.ALTON	S.KESKIN

CHECKED BY: APPROVED BY:

ID	Name	Capacity	Material	Type	Temp	Pressure	Diameter	Height	Weight	Material	Finish	Notes	Purchase Price	Purchase Year	JFC Code
41	Dissolving Tank	18.5 m ³	Dia: 2.6 m	Temp: 100°C			7.5			CS			8000	1972	69211 07 1 1 3 2 2 1 2
42	Suspension Tank	4.5 m ³	Dia: 1.8 m	Temp: 100°C			1.8			SS			11700	1972	69211 07 1 1 3 2 1 6 1 2
2	Polymerization Reactors	39 m ³	Pr: 10, Sata	NC			14			CS			41700	1972	7416512 1 2 2 1 3 2 1 2
43	Held tanks	39.7 m ³	Dia: 3.6 m	Temp: 100°C			2.7			Alloy Steel			7000	1972	69211 07 1 1 3 2 2 4 1 2
40	Chemical addition Pot	0.04 m ³		Temp: 100°C			0.075			SS			800	1972	6924108 1 0 3 2 1 6 1 2
44	Line addition Pot	0.04 m ³		Temp: 100°C			0.12			CS			800	1972	6924108 1 0 3 2 1 2 1 2
1	Reactor	46 m ³ /hr	SD: 0.11 m	TL: 6.1 m	DP		0.6			CS			2000	1972	7416101 0 1 4 4 1 2 0 2
3	Reactor	46 m ³ /hr	SD: -	TL: 6.1 m	DP		0.6			CS			2000	1972	7416101 0 0 4 4 1 2 0 2
4	Reactor	46 m ³ /hr	SD: -	TL: 6.1 m	DP		1.2			CS			3950	1972	74161 01 0 0 4 4 1 2 0 2
50	Jacket Pump	46 m ³ /hr	WH: 48 m	HCLC	H		0.3			SF			3150	1972	74220 023 2 2 1 1 9 1 2
52	Jacket Pump	46 m ³ /hr	WH: 48 m	HCLC	H		0.13			SF			3150	1972	74220 023 2 2 1 1 9 1 2
53	Jacket Pump	46 m ³ /hr	WH: 51 m	HCLC	H		0.13			SS			3100	1972	74220 023 3 2 1 1 9 1 2
54	Solution tank	46 m ³ /hr	WH: 51 m	HDM	H		0.10			SF			3050	1972	74220 023 3 4 1 1 9 1 2
55	Reactor	78 m ³ /hr	WH: 69 m	HCLC	H		0.15			SF			5500	1972	74220 023 3 2 1 1 9 1 2
5	Monomer fill tank	62.6t/hr	Dia: 1.4 m				0.3			CS			850	1972	74362 134 1 0 0 1 2 1 2
6	Pentane fill tank	7.5 t/hr	Dia: 0.3 m				0.1			CS			400	1972	74362 131 1 0 0 1 2 1 2
8	Solution fill tank	38.7 t/hr	Dia: 1 m	Pr: 7kg/cm ²			1.6			CS			14700	1972	74362 323 1 1 0 1 2 1 2
9	Rubber cyclone	1900m ³ /hr	Dia: 0.7 m		SZ		0.2			CS			1500	1972	74361 111 1 0 1 1 2 1 2
10	Mineral oil filter	5.8 t/hr	Dia: 0.3 m				0.1			CS			600	1972	74362 131 1 0 0 1 2 1 2
7	Rubber grinder	1.8 t/hr	1460RPM	22 KW Under Pri			3.5			CS			31900	1972	72832 121 7 1 1 1 2 1 2
61	Rubber transfer	31.7m ³ /min	P: 0.9 kg/cm ²	DG	Straight blades		0.3			SF			1050	1972	74342 083 1 2 1 1 9 1 2
45	HCl measuring tank	0.5 m ³	Dia: 0.7 m	Temp: 45°C			0.1			PVC			900	1972	69211 071 1 3 2 1 9 1 2

Note: a) Max. component weight for seamless plate. Thickness for plate fabricated equipments.

SF No	M/N	Basic Machine Nomenclature	Major Spec. 1 (Capacity)	Major Spec. 2 (Optional)	Major Spec. 3 (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Cr. 1980 Cost		Purc. Year	SIPC Code									
												Unit	Total	Unit	Total		12345	67	89	10	11	123	145	167	189	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1									
1		Dryer transfer Cooler	INCLUDED	IN FLASH	DRYER						2	2250	2500	3500	7000	1972	INCLUDED	IN	FLASH	DRYER						
2		Flash dryer Air heater	INCLUDED	IN FLASH	DRYER						2	900	600	800	1600	1972	INCLUDED	IN	FLASH	DRYER						
4		Rotary dryer Air heater	INCLUDED	IN ROTARY	DRYER						2	INCLUDED				1972	INCLUDED	IN	ROTARY	DRYER						
60		Bead Sump Pump	23 m ³ /hr	WH:30 m	HCLC	H	0,1	SS	0,1 ton	I	2	1550	3100	4450	8900	1972	74220	023	2	2	1	1	7	1	2	
61		Centrifuge Pump	12,5m ³ /hr	MH:30 m	HCLC	V	0,1	SS	0,1 ton	I	2	2050	4100	5800	11000	1972	74220	023	2	2	2	2	1	7	1	2
5		Centrifuge Flash dryer Cyclone	OMITTED													1972	OMITTED									
6		Flash dryer Cyclone	3300m ³ /hr	Dia:0,85m	-	SZ	0,2	SS	2 mm	I	2	2950	5900	8150	16300	1972	74361	10	4	1	0	1	1	6	1	2
7		Bead screen	3 t/hr	0,45 mm	-	OT	0,4	SS	0,3tons	I	2	5450	11700	16200	32400	1972	72831	06	1	2	0	1	1	7	1	2
8		Expandable Bin cyclone	3300 m ³ /hr	Dia:0,85m	-	SZ	0,2	SS	2 mm	I	1	1500	1500	4100	4100	1972	74361	11	1	1	0	1	1	6	1	2
9		Rotary dryer Cyclone	INCLUDED	IN ROTARY	DRYER						2	INCLUDED					INCLUDED	IN	ROTARY	DRYER						
3		Rotary dryer	5,2 t/hr	-	-	Parallel Flow	0,0	SS	5 mm	I	2	42500	85000	117900	235800	1972	74164	30	1	0	0	4	2	0	1	2
10		Expandable Bead screen	2,3 t/hr	0,8 mm	-	OT	0,5	SS	0,35tons	I	1	11350	11350	31500	31500	1972	72831	06	1	3	0	1	1	7	1	2
67		Drum conveyor	OMITTED														OMITTED									
62		Met cake conveyor	2,3 t/hr	2900 mm	-	BM	0,5	SS	0,4 tons	I	2	3400	6800	9450	18900	1972	74426	00	1	5	0	1	1	7	1	2
63		Zinc stearate Feeder	0,1 t/hr	425 mm	-	BM	0,1	CS	0,1 tons	I	1					1972	74426	75	1	1	0	1	1	2	1	2
64		Flash dryer Blower	55 m ³ /min	P:1,1Kg/cm ²	Air	Straight Blady	0,6	SP	0,3 tons	I	2	800	1600	2600	5200	1972	74342	00	4	1	1	1	1	9	1	2
65		Dryer transfer blower	217 m ³ /min	P:0,1Kg/cm ²	Air	" "	0,2	CS	0,2 tons	I	2	2700	5400	8800	19600	1972	74342	00	5	1	1	1	1	2	1	2
66		Rotary dryer Blower	INCLUDED	IN ROTARY	DRYER						2	INCLUDED					INCLUDED	IN	ROTARY	DRYER						
41		Bead Sump Tank	19,2 m ³	Dia:1,7 m	Temp: 25c	RRc	2,0	CS	6 mm	T	1	4000	4000	7300	7300	1972	69211	07	1	1	3	1	1	2	1	1
40		Expandable Bead Bin	29 m ³	Dia: 3 m	Temp: 25c	SC	2,0	CS	6 mm	T	1	250	250	650	650	1972	69211	01	1	1	3	2	1	2	1	1
42		Expandable Bead Surge	0,85 m ³	Dia:0,85m	Temp: 25c	SC	0,2	CS	5 mm	T	2	50	100	100	200	1972	6921101	1	1	3	2	1	2	1	1	1
43		Centrifuge Tank	5,3 m ³	Dia:1,2 m	Temp: 25c	RC	1,0	CS	6 mm	T	1	900	900	2500	2500	1972	6921107	1	1	3	1	1	2	1	1	1
80		Rotary dryer	0,2 ton	FS:0,3 m ²	Mech.	fixed	-	-	-	I	2	3800	7600	10450	20900	1972	7452505	1	1	1	1	0	0	0	0	2

Note : a) Max. component weight for machine, plate. thickness for plate fabricated equipments.

Sp. No	M/K	Basic Machine No. and enclosure	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (TCMS)	Manufac. Char. 2.	Manufac. Char. 3. a)	Origin	Q.	Purchase Cost		Cr. 1980 Cost		Purch. Year	SITC Code									
												Unit	Total	Unit	Total		12	13	14	15	16	17	18	19	20	21	22	23	24	25
10		Bag Filter	2,7 t/hr	Dia: 1 m	-	-	0,4	SS	5 mm	I	8	19600	156800	54400	435200	1972	7436221	1	1	0	0	1	6	1	2	
50		Bead Transfer Blower	19,2 m ³ /min	P: 7,9 Kg/cm ²	Air	Straight Blades	0,9	CIC	0,4 tons	I	2	2700	5400	8800	17600	1972	7434210	3	5	1	1	1	1	1	2	
40		Bead Silo	85 m ³	Dia: 3,6 m	Temp: 25c	Cy	8,9	CS	5 mm	T	8	8000	64000	14600	116800	1972	6921106	1	1	3	2	1	2	1	2	

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

No.	Basic Machine Designation	Vol. & Speed (Capacity)	Motor Speed 1 (Optional)	Motor Speed 2 (Optional)	Type (Description)	Manufac. Char. 1. (CENS)	Manufac. Char. 2.	Manufac. Char. 3.	Origin	Q.	Purchase Cost		Ct. 1942 Cost		Purch. Year	IPC Code									
											Unit	Total	Unit	Total		1945	46	47	48	49	50	51	52	53	54
8	Intensive Blender	1 m ³	MP:150 KW	-	Condition	2,5	SS	2 tons	I	1	16550	16550	45900	45900	1972	7283300	1	7	0	2	1	7	3	2	
9	Ribbon blender filter	70 t/hr	Dia:0,8 m	P:7 Kg/cm ²	-	0,8	CS	8 mm	I	3	800	2400	2100	6300	1972	7436230	4	1	1	0	1	2	1	2	
5	Extruder lines	1 t/hr	Dia:0,15 m	133 RPM	Type screw	9,2	CS	8 tons	I	2					1972	7284201	1	1	4	1	2	6	4	2	
6	Extruder line	0,6t/hr	Dia:0,1 m	133 RPM	Screw	5,5	CS	4,3 tons	I	1					1972	7284201	1	1	4	1	2	6	3	2	
3	Strand Dryer	-	-	-	CF1	0,1	SS	3 mm	I	2	7100	14200	13000	26000	1972	74164	23	0	0	0	3	1	6	1	2
4	Strand Dryer	-	-	-	CF1	0,1	SS	3 mm	I	1	7100	7100	13000	13000	1972	74164	23	0	0	0	3	1	6	1	2
1	Pelletizer	0,6 t/hr	Drum Dia: 0,1 m	-	Pallet Drum	1,4	SS	1 tons	I	2	11700	23400	32450	64900	1972	72834	03	1	1	0	1	1	6	2	2
2	Pelletizer	1,1 t/hr	Drum Dia: 0,2 m	-	Pallet Drum	1,2	SS	1 tons	I	1	9100	9100	25300	25300	1972	72834	03	1	1	0	1	1	6	2	2
11	Pellet Screen	1,1t/hr	1,5 mm	-	OT	1,6	ASC	1,2tons	I	3	5300	15900	14650	43950	1972	72831	06	1	4	0	1	1	7	1	2
80	Valve Bagging Machine	7 t/hr	0,1 m	Elec.	Fixed	0,7	ASC	0,5	I	3	7700	23100	21300	63900	1972	74522	01	4	1	2	1	1	7	1	2
10	Bag Filter	4,8 t/hr	Dia: 1 m	-	-	0,5	SS	2,5 mm	I	6	3400	20400	9500	57000	1972	74362	21	1	1	0	0	1	6	1	2
7	Scrap grinder	0,5 t/hr	1500 RPM	2900KW	Under Pr.	2,5	ASC	2 tons	I	1	9600	9600	26700	26700	1972	72832	99	1	8	7	1	1	7	3	2
60	Pellet transfer Blower	22,5 m ³ /min	P:1,1Kg/cm ²	Air	Straight Blades	0,5	SF	0,4 tons	I	3	1900	5700	6100	18300	1972	74342	00	3	1	1	1	1	1	1	2
61	Extruder Die Head Exh. Fan	1,4 m ³ /sec	P:0,9Kg/cm ²	Air	Exhaust	0,4	CSC	0,3 tons	I	1	850	850	2800	2800	1972	74341	01	2	1	1	3	1	6	1	2
40	Bead Bins	7 m ³	Dia:2,1 m	Temp: 25c	Cy	1,3	ACS	5 mm	T	6	2800	16800	5100	30600	1972	69211	01	1	1	3	2	1	2	1	1
41	Extruder Fedded Hoppers	3,3 m ³	Dia:1,4 m	Temp: 25c	SC	0,54	Dr.NISS	4 mm	I	3	1000	3000	2750	8250	1972	69211	14	1	1	3	2	1	4	1	2
42	Pellet Test Bins	9,6 m ³	Dia:2,1 m	Temp: 25c	Cy	1,2	CS	5 mm	T	3	2800	8400	5100	15300	1972	69211	01	1	1	3	2	1	2	1	2
43	Concentrate Bins	3,5 m ³	Dia:0,7 m	Temp: -	Conical	0,4	-	5 mm	T	25	1000	25000	1800	45000	1972	69211	01	1	1	0	9	1	0	1	2
44	Pellet Hopper	0,15 m ³	Dia:0,6 m	Temp: 70c	SC	0,04	Aluminium	3 mm	I	3	300	900	850	2250	1972	69211	14	1	1	3	2	1	9	1	2
81	Automatic color weigher	0,5 ton	PS:1,42 m	Mech.	Fixed	0,8	SS	0,0ton	I	3	12400	37200	34300	102900	1972	74525	04	2	2	1	1	1	7	1	2
82	Intensive Ribbon filter	1,2 tons	PS:2,1 m	Mech.	Fixed	0,2	SS	0,2	I	1	5700	5700	15750	15750	1972	74525	04	3	2	1	1	1	7	1	2

Note: a) Max. component weight for machines, plate. thickness for plate fabricated equipments.

UNICL / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW POLYSTYRENE PLANT, CAPACITY =
 LOCATION-YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING- 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991
*****	*****	**	*****	*****	*****
69211 01110 51012	CONCRETE BINS	25	.4	1.8	
69211 01113 21211	BEAD BINS	6	1.3	5.1	
69211 01113 21211	EXPAN.BEAD SURGE BIN	1	.2	.1	
69211 01113 21211	EXPANSCABLE BEAD BIN	2	2.6	.7	
69211 01113 21212	PELLET TEST BINS	3	1.2	5.1	
69211 06113 21212	BEAD SILE	8	8.9	14.6	
69211 07113 11211	CENTRIFUGE EFF.TANK	1	1.0	2.5	
69211 07113 11211	BEAD SUMP TANK	1	2.6	7.3	
69211 07113 21212	SUSPENSION TANK	1	1.3	32.5	
69211 07113 21212	HCL MEASURING TANK	1	.1	2.4	
69211 07113 22212	DISSOLVING TANK	1	7.5	14.6	
69211 07113 22412	HCLG TANKS	3	2.7	12.9	
69211 14113 21412	EXTRUDER FEED HOPPERS	3	.6	2.8	
69211 14113 21912	PELLET HOPPER	3	.1	.9	
69241 08103 21212	LIME ADDITION PLT	1	.1	1.5	
69241 08103 21212	CHEMICAL HOLD TANKS	1	.1	1.5	
72831 06120 11712	BEAD SCREEN	2	.4	16.2	
72831 06130 11712	EXPANSCABLE BEAD SCREEN	1	.5	31.5	
72831 06140 11712	PELLET SCREEN	3	1.6	14.7	
72831 12171 11212	KOCHER GRINDER	1	3.5	88.5	
72831 59187 11732	SCRAP GRINDER	1	2.5	26.7	
72831 00170 21732	INTENSIVE BLENDER	1	2.5	45.9	
72831 03110 11622	PELLETIZER	2	1.2	25.3	
72831 03110 11622	PELLETIZER	1	1.4	32.5	
72842 01114 12642	EXTRUDER LINES	1	5.5	.0	
72842 01114 12642	EXTRUDER LINES	2	9.2	.0	
74161 0101 41202	REACTOR EXCHANGERS	3	1.2	11.2	
74161 01014 41202	DISSOL.TANK EXCHANGER	1	.6	5.6	
74161 01014 41202	SUSPEN.TANK EXCHANGER	1	.6	5.6	
74164 23000 31612	STAND DRYER	2	.1	13.0	
74164 23000 31612	STAND DRYER	1	.1	13.0	
74164 30100 42612	CLTARY DRYER	2	8.0	117.9	
74165 12122 13212	POLYMERIZATION REACTORS	3	14.0	130.0	
74220 02322 11712	BEAD SUMP PUMP	2	.1	4.5	
74220 02322 11912	SUSPEN.JACKET PUMP	1	.3	9.0	
74220 02322 11912	DISSOL.JACKET PUMP	1	.1	9.0	
74220 02322 21712	CENTRIFUGE EFFLUENT PUMP	2	.1	5.8	
74220 02322 11912	REACTOR JACKET PUMP	3	.2	15.7	
74220 02322 11912	SUSPEN.TRANSFER PUMP	1	.1	8.8	
74220 02324 11912	SOLUTION TRANSFER PUMP	1	.1	8.7	
74341 01211 31612	EXTRUC.DIE HEAD EXH.FAN	1	.4	2.8	
74342 00311 11112	PELLET TRANSFER BLOWER	3	.5	6.1	
74342 00312 11912	RUBBER TRANSFER BLOWER	1	.3	3.4	
74342 00411 11912	FLASH DRYER BLOWER	2	.6	2.6	
74342 00511 11212	DRYER TRANSFER BLOWER	2	.2	8.8	
07434 21035 11112	BAG FILTER BLOWER	2	.9	8.8	
74361 10410 11612	FLASH DRYER CYCLONE	2	.2	8.2	
74361 11110 11212	RUBBER CYCLONE	1	.2	4.1	
74361 11110 11612	EXPANSCABLE BIN CYCLONE	1	.2	4.1	
74362 13110 01212	MINERAL OIL FILTER	1	.1	1.6	
74362 13110 01212	PENTANE FILTER	1	.1	1.1	
74362 13410 01212	MONGMER FILTER	1	.3	2.4	
74362 21110 01612	BAG FILTER	6	.5	9.5	
74362 21110 01612	BAG FILTER	8	.4	54.4	
74362 30411 01212	RIBBON BLENDER FILTER	3	.8	2.1	
74362 32311 01212	SOLUTION FILTER	1	1.8	40.8	
74426 00150 11712	WET CAKE CONVEYOR	2	.5	9.5	
74426 75110 11212	ZINC STEARATE FEEDER	1	.1	.0	
74522 01412 11712	VALVE BAGGINS MACHINE	3	.7	21.3	

13 500TON/YEAR

1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WE
10.0									10.0
7.8									7.8
.2									.2
5.2									5.2
3.6									3.6
71.2									71.2
1.0									1.0
2.6									2.6
1.8									1.8
.1									.1
7.5									7.5
8.1									8.1
1.8									1.8
.3									.3
	.1								.1
	.1								.1
		.8							.8
		.5							.5
		4.8							4.8
		3.5							3.5
		2.5							2.5
		2.5							2.5
		2.4							2.4
		1.4							1.4
		5.5							5.5
		18.4							18.4
	3.6								3.6
	.6								.6
	.6								.6
.2									.2
.1									.1
16.3									16.3
42.0									42.0
	.2								.2
	.3								.3
	.1								.1
	.2								.2
	.6								.6
	.1								.1
	.1								.1
	.4								.4
	1.5								1.5
	.3								.3
	1.2								1.2
	.4								.4
	1.8								1.8
		.4							.4
		.2							.2
		.2							.2
		.1							.1
		.1							.1
		.3							.3
		3.0							3.0
		3.2							3.2
		2.4							2.4
		1.8							1.8
		1.0							1.0
		.1							.1
		2.1							2.1

UNIDO / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW POLYSTYRENE PLANT,CAPACITY = 13 500TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1994
UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EDP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.WE
74525 04221 11712	AUTOMATIC COLOR WEIGHER	3	.8	34.3				2.4							2.4
74525 04321 11712	INTENSIVE BLENDER WEIGHER	1	.2	5.7				.2							.2
74525 05111 10002	EXPAN.BEAD WT.SCALE	2	.0	10.5				.0							.0

UNICC / SPG(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW POLYSTYRENE PLANT, CAPACITY =
 10000 TONS/YEAR
 ANTICIPATED DATE OF COMMISSIONING= 1994
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991
65211	C1110 51012 CONCRETE BINS	25	.4	1.8	
65211	C1113 21211 BEAD BINS	6	1.3	5.1	
65211	C1113 21211 EXPAN-BEAD SURGE BIN	1	.2	.1	
65211	C1113 21211 EXPANDABLE BEAD BIN	2	2.6	.7	
65211	C1113 21212 PELLET TEST BINS	3	1.2	5.1	
65211	C6113 21212 BEAD SILC	8	8.9	14.6	
65211	07113 11211 CENTRIFUGE EFF. TANK	1	1.0	2.5	
65211	07113 11211 BEAD SUMP TANK	1	2.6	7.3	
65211	07113 21612 SUSPENSION TANK	1	1.8	32.5	
65211	07113 21912 HCL MEASURING TANK	1	.1	2.4	
65211	07113 22212 DISSOLVING TANK	1	7.5	14.6	
65211	07113 22412 HCL TANKS	3	2.7	12.8	
65211	14113 21412 EXTRUDER FEED HOPPERS	3	.6	2.8	
65211	14113 21912 PELLET HOPPER	3	.1	.9	
65241	08103 21212 LIME ADDITION PCT	1	.1	1.5	
65241	08103 21612 CHEMICAL HOLD TANKS	1	.1	1.5	
72831	C6120 11712 BEAD SCREEN	2	.4	16.2	
72831	C6130 11712 EXPANDABLE BEAD SCREEN	1	.5	31.5	
72831	C6140 11712 PELLET SCREEN	3	1.6	14.7	
72832	12171 11212 RUBBER GRINDER	1	3.5	88.5	
72832	95187 11732 SCRAP GRINDER	1	2.5	26.7	
72833	CG17C 21732 INTENSIVE BLENDER	1	2.5	55.5	
72834	C3110 11622 PELLETIZER	2	1.2	25.3	
72834	C3110 11622 PELLETIZER	1	1.4	32.1	
72842	C1114 12642 EXTRUDER LINES	1	5.5	.0	
72842	C1114 12642 EXTRUDER LINES	2	9.2	.0	
74161	C1C14 41202 REACTOR EXCHANGERS	3	1.2	11.2	
74161	C1C14 41202 DISSOL. TANK EXCHANGER	1	.6	5.3	
74161	C1C14 41202 SUSPEN. TANK EXCHANGER	1	.6	3.6	
74164	23000 31612 STRAND DRYER	2	.1	13.0	
74164	23000 31612 STRAND DRYER	1	.1	13.0	
74164	3C100 42612 ROTARY DRYER	2	8.0	117.4	
74165	12122 13212 POLYMERIZATION REACTORS	3	14.0	130.0	
74220	Q2322 11712 BEAD SUMP PUMP	2	.1	4.5	
74220	Q2322 11912 SUSPEN. JACKET PUMP	1	.3	9.0	
74220	Q2322 11912 DISSOL. JACKET PUMP	1	.1	9.0	
74220	Q2322 11712 CENTRIFUGE EFFLUENT PUMP	2	.1	5.8	
74220	Q2332 11912 REACTOR JACKET PUMP	3	.2	15.7	
74220	Q2332 11912 SUSPEN. TRANSFER PUMP	1	.1	8.8	
74220	Q2334 11912 SOLUTION TRANSFER PUMP	1	.1	8.7	
74341	01211 31612 EXTRUD. DIE HEAD EXH. FAN	1	.4	2.8	
74342	00311 11112 PELLET TRANSFER BLOWER	3	.5	6.1	
74342	00312 11912 RUBBER TRANSFER BLOWER	1	.3	3.4	
74342	00411 11912 FLASH DRYER BLOWER	2	.6	2.6	
74342	00511 11212 DRYER TRANSFER BLOWER	2	.2	8.8	
74361	21C35 11112 BAG FILTER BLOWER	2	.9	8.8	
74361	10410 11612 FLASH DRYER CYCLONE	2	.2	8.2	
74361	11110 11212 RUBBER CYCLONE	1	.2	4.1	
74361	11110 11612 EXPANDABLE BIN CYCLONE	1	.2	4.1	
74362	13110 01212 MINERAL OIL FILTER	1	.1	1.6	
74362	13110 01212 PENTANE FILTER	1	.1	1.1	
74362	13410 01212 MONOMER FILTER	1	.3	2.4	
74362	21110 01612 BAG FILTER	6	.5	9.5	
74362	21110 01612 BAG FILTER	8	.4	54.4	
74362	30411 01212 RIBBON BLENDER FILTER	3	.8	2.1	
74362	32311 01212 SCLUTION FILTER	1	1.8	40.8	
74426	CG150 11712 WET CAKE CONVEYER	2	.5	9.5	
74426	75110 11212 ZINC STEARATE FEEDER	1	.1	.0	
74522	C1412 11712 VALVE BAGGINS MACHINE	3	.7	21.3	

13 SOCTON/YEAR

1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_CD
45.0									45.0
30.6									30.6
.1									.1
1.4									1.4
15.3									15.3
116.8									116.8
2.5									2.5
7.3									7.3
32.5									32.5
2.4									2.4
14.6									14.6
38.4									38.4
8.4									8.4
2.7									2.7
	1.5								1.5
	1.5								1.5
		32.4							32.4
		31.5							31.5
		44.1							44.1
		88.5							88.5
		26.7							26.7
		45.9							45.9
		50.6							50.6
		32.5							32.5
		.0							.0
		.0							.0
	13.6								13.6
	5.6								5.6
	5.6								5.6
26.0									26.0
13.0									13.0
235.8									235.8
390.0									390.0
	9.0								9.0
	9.0								9.0
	9.0								9.0
	11.6								11.6
	47.1								47.1
	8.8								8.8
	8.7								8.7
	2.8								2.8
	18.3								18.3
	3.4								3.4
	5.2								5.2
	17.6								17.6
	17.6								17.6
		16.4							16.4
		4.1							4.1
		4.1							4.1
		1.6							1.6
		1.1							1.1
		2.4							2.4
		57.0							57.0
		435.2							435.2
		6.3							6.3
		40.8							40.8
		19.0							19.0
		.0							.0
		62.9							62.9

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI - Demand for Capital Goods for
Petrochemicals Industry

Vol. XI - Technical data for
(ACN) Acrylonitrile

UNITED NATIONS DEVELOPMENT PROGRAMME

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF

INDUSTRIAL GOODS

Technical Report No. 10
Industrial Goods for
the Industry,
Capital data for
the mobile

Prepared by the Ministry of Turkey

for the United Nations Industrial Development Organization

As part of the United Nations Industrial Development Programme

United Nations Industrial Development Organization

United Nations Industrial Development Organization

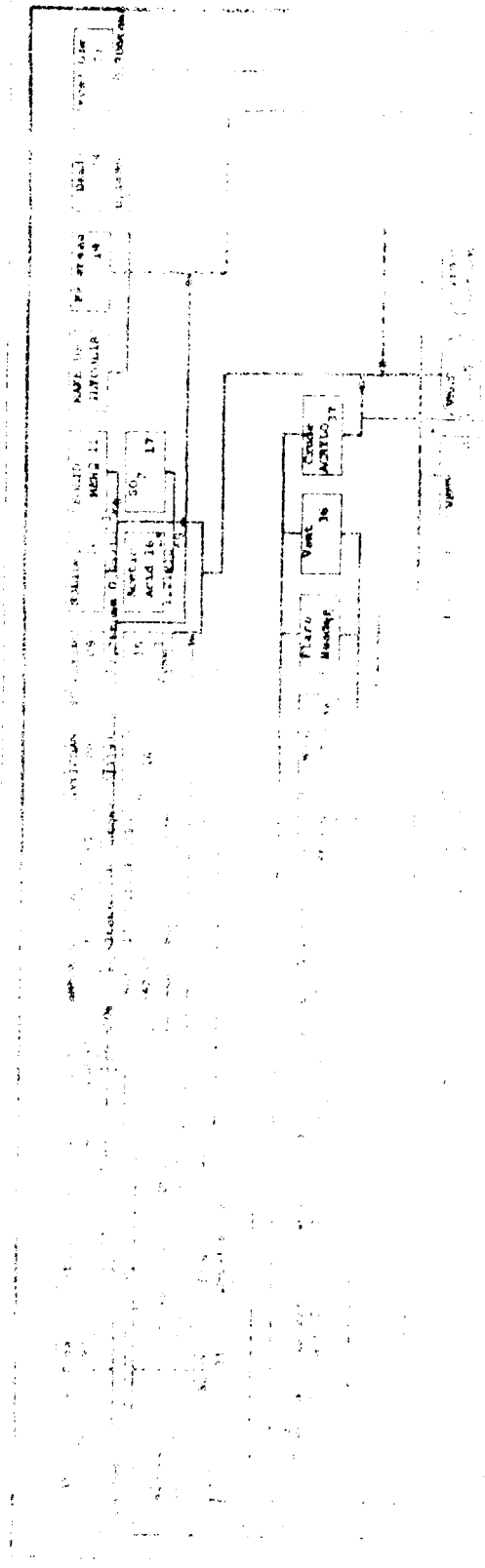
UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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6. Capital Goods Demand, Yearwise (by weight) ..	16-17
7. Capital Goods Demand, Yearwise (by value) ..	18-19



SYSTEM NO. 100000000000 SYSTEM NAME SYSTEM LOCATION	SYSTEM NO. 100000000000 SYSTEM NAME SYSTEM LOCATION
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PETKIM PETROKIMYA A.Ş.

IND. CODE: 2514-1

IND. NAME: SYNTHETIC RESINS, PLASTIC MATERIALS etc..... ACN

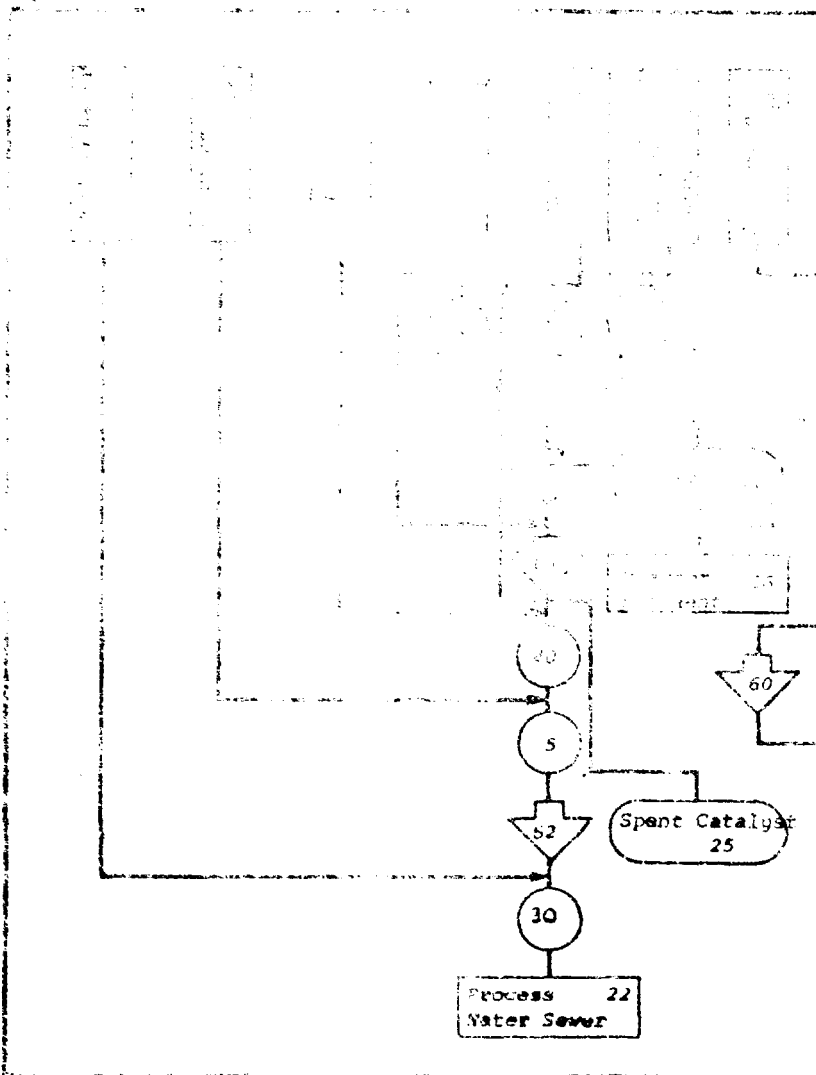
INDUSTRY ACTIVITIES CHART

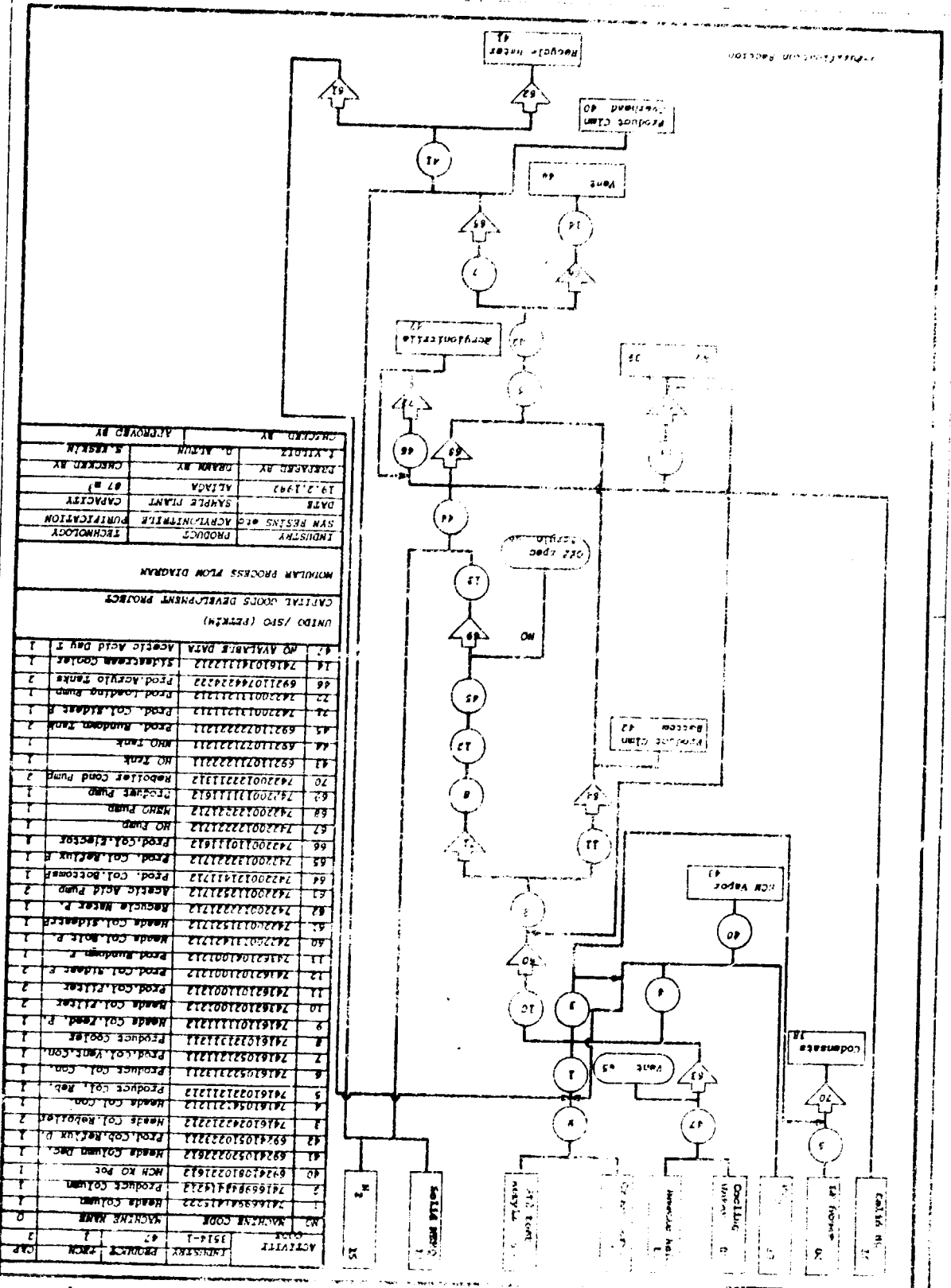
PART 1 ACN

IND. CODE: 2514-1
IND. NAME: SYNTHETIC RESINS, PLASTIC MATERIALS etc..... ACN

NO	UNIT NAME	NO	ACTIVITY NAME	EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
35	REACTOR REPELERE	1	REACTED BY FREE CATALYST	REACTOR	500-1500 m ³	1	500 m ³
						2	1100 m ³
						3	1500 m ³
		2	REACTED BY Zn ²⁺ CATALYST	REACTOR	500-1500 m ³	1	500 m ³
						2	880 m ³
						3	1500 m ³
37	CRUDE ACRYLO	1	RECOVERY	RECOVERY COLUMN	100-400 m ³	1	100 m ³
						2	200 m ³
						3	300 m ³
						4	400 m ³
						5	50 m ³
47	ACRYLONITRILE	1	PURIFICATION	PRODUCT COLUMN	50-150 m ³	1	50 m ³
						2	87 m ³
						3	150 m ³
49	ORGANIC LAYER	1	REFRIGERATION	REFRIGERANT COMPRESSOR	400-1000 m ³ /min	1	400 m ³ /min
						2	770 m ³ /min
						3	1000 m ³ /min
55	RECYCLED CRUDE ACRYLO	1	STORAGE	CRUDE ACRYLO TANK	-12500 m ³	1	822 m ³
						2	-3000 m ³
						3	-6000 m ³
						4	9000 m ³
						5	12500 m ³

PREPARED BY	CHECKED BY	APPROVED BY
F. KESKIN		





NO	MARKING CODE	INDUSTRY	PRODUCT	TRON	Q.P.
1	24668441533		HEADS COLUMN	1	1
2	24668441533		PRODUCT COLUMN	1	1
3	92481981913		MCH KO POT	1	1
4	6924105202232		HEADS COLUMN D.C.	1	1
5	74810202232		PROD. COL. REFLUX D.	2	1
6	74810202232		HEADS COL. REFLUX	2	1
7	74810202232		PROD. COL. VENT. CON.	1	1
8	74810202232		PRODUCT COL. COOL.	1	1
9	74810202232		HEADS COL. REFL. P.	1	1
10	74810202232		HEADS COL. FILTER	2	1
11	74810202232		PROD. COL. FILTER	2	1
12	74810202232		PROD. COL. REFL. P.	2	1
13	74810202232		PROD. RUNDOWN F.	1	1
14	74810202232		HEADS COL. REFL. P.	1	1
15	74810202232		HEADS COL. REFL. P.	1	1
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21	74810202232		HEADS COL. REFL. P.	1	1
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23	74810202232		HEADS COL. REFL. P.	1	1
24	74810202232		HEADS COL. REFL. P.	1	1
25	74810202232		HEADS COL. REFL. P.	1	1
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31	74810202232		HEADS COL. REFL. P.	1	1
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35	74810202232		HEADS COL. REFL. P.	1	1
36	74810202232		HEADS COL. REFL. P.	1	1
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38	74810202232		HEADS COL. REFL. P.	1	1
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40	74810202232		HEADS COL. REFL. P.	1	1
41	74810202232		HEADS COL. REFL. P.	1	1
42	74810202232		HEADS COL. REFL. P.	1	1
43	74810202232		HEADS COL. REFL. P.	1	1
44	74810202232		HEADS COL. REFL. P.	1	1
45	74810202232		HEADS COL. REFL. P.	1	1
46	74810202232		HEADS COL. REFL. P.	1	1
47	74810202232		HEADS COL. REFL. P.	1	1

ACTIVITY CODE 351-1 47

INDUSTRY PRODUCT TRON

MARKING NAME

MARKING CODE

INDUSTRY PRODUCT TRON

Q.P.

UNIDO / SMO (SPEKTR)

CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY PRODUCT TECHNOLOGY

SWAN RESINS & ACRYLONITRILE CORPORATION

SAMPLE PLANT CAPACITY

DATE 19.2.1993

ALINDA 87 M²

DRAWN BY S. RESKRI

CHECKED BY

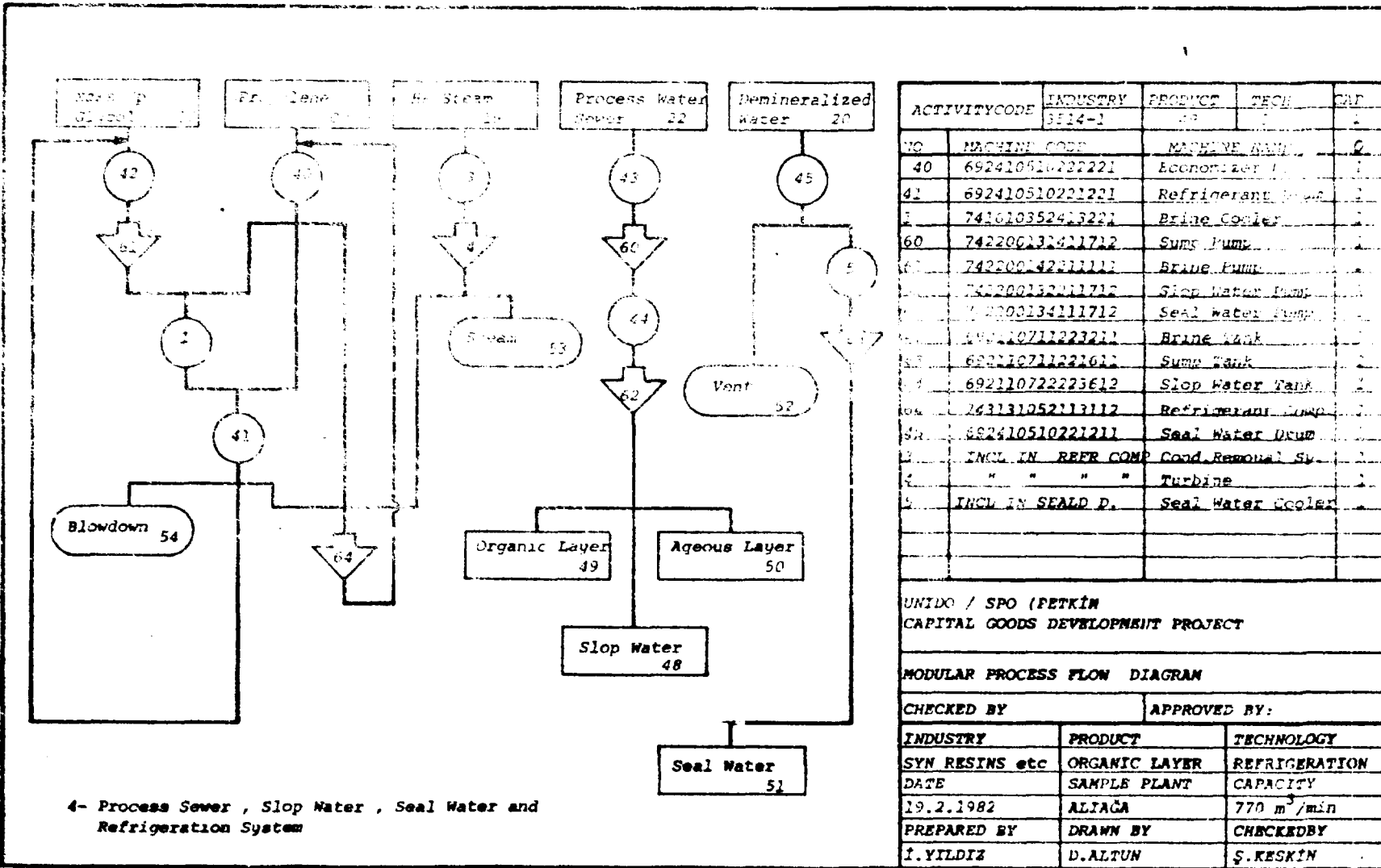
APPROVED BY



Rev.	Date	Iss.



PETKIM PETROKIMIYA A.Ş.



4- Process Sewer , Slop Water , Seal Water and Refrigeration System

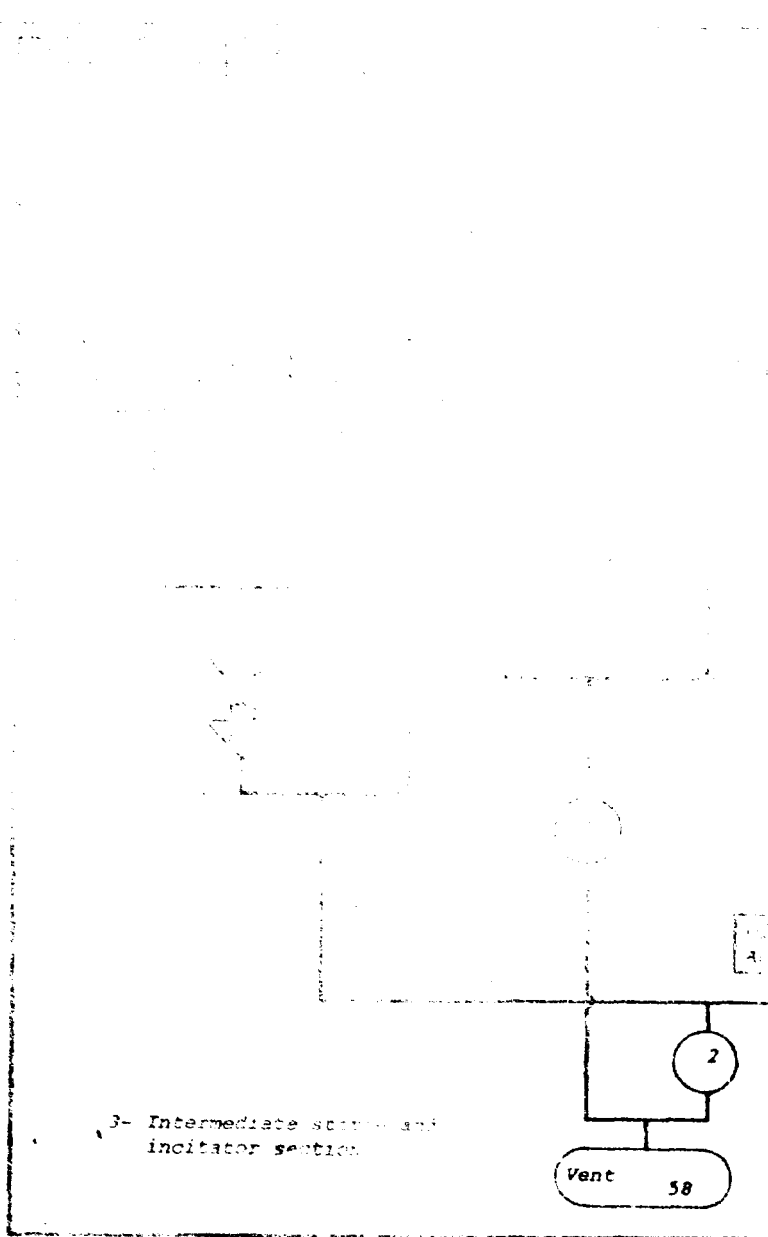
ACTIVITYCODE	INDUSTRY	PRODUCT	TECH	CAP
NO	MACHINE CODE	MACHINE NAME		
40	69241051022221	Economizer		2
41	692410510221221	Refrigerant Comp		2
42	741010352413221	Brine Cooler		2
60	742200132411712	Sump Pump		2
61	742200142311111	Brine Pump		2
62	741200132411712	Slop Water Pump		2
63	742200134111712	Seal Water Pump		2
64	190110711222212	Brine Tank		2
65	6921107112221612	Sump Tank		2
66	692110722223612	Slop Water Tank		2
67	243131052113112	Refrigerant Comp		2
68	692410510221211	Seal Water Drum		2
69	INCL IN REFR COMP	Cond. Removal Sy.		2
70	" " " "	Turbine		2
71	INCL IN SEALD P.	Seal Water Cooler		2

UNIDO / SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

CHECKED BY: APPROVED BY:

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	ORGANIC LAYER	REFRIGERATION
DATE	SAMPLE PLANT	CAPACITY
19.2.1982	ALIAGA	770 m ³ /min
PREPARED BY	DRAWN BY	CHECKEDBY
I.YILDIZ	D.ALTUN	Ş.KESKIN

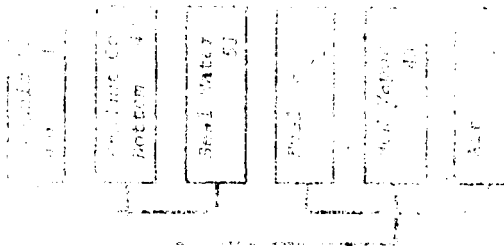


3- Intermediate steam and
indicator section.

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UNITED STATES DEPARTMENT OF COMMERCE



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95	02110730224705	WASTE WATER TREATMENT	1
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100	02110730224710	WASTE WATER TREATMENT	1

UNITED STATES DEPARTMENT OF COMMERCE

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UNITED STATES DEPARTMENT OF COMMERCE
 CAPITAL GOODS DEVELOPMENT PROJECT
 MONITOR PROGRESS FLOW DIAGRAM

CHECKED BY: _____ APPROVED BY: _____

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	RECYCLED ACRYLE	STORAGE
DATE	SAMPLE PLANT	CAPACITY
19.2.1982	ALTAGA	822 m ³
PREPARED BY	DRAWN BY	CHECKED BY
J. WILSON	M. ALLEN	G. PASKIN

SR No	U/H	Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufas. Char. 1. (TONS)	Manufas. Char. 2.	Manufas. Char. 3. (L)	Origin	Q.	Purchase Cost		CG. 1980 Cost		Proc. Year	SIC Code									
												Unit	Total	Unit	Total		10	11	12	13	14	15	16	17	18	19
40		Evaporator Drum	9,74 m ³	-	Temp:120°C	Cy	7,2	CS	22 mm	T	1	45400	45400	45400	45400	1980	6904105	1	0	2	2	2	2	2	2	
41		Refrigerant Drum	4,53 m ³	-	Temp:120°C	Cy	4,45	CS	21 mm	T	1	20100	20100	20100	20100	1980	6904105	1	0	2	2	2	2	2	2	
1		Brine Cooler	NS:736 m ³	SD:1,87 m	TL:16,09 m	FST	22,79	CS	20 mm	T	1	143000	143000	143000	143000	1980	7416103	5	2	4	1	2	2	2	1	
60		Sump Pump	12 m ³ /hr	WH: 18 m	NEM	H	0,536	SS	0,4 ton	I	1	16200	16200	19000	19000	1978	7422001	3	1	4	1	1	7	1	2	
61		Brine Pumps	225 m ³ /hr	WH:48,8 m	OCLC	H	0,3	CIC	0,2	T	2	2000	2000	2000	4000	1978	7422002	4	2	2	1	2	1	1	1	
62		Slop Water Pumps	12 m ³ /hr	WH:42,7 m	NCLC	H	0,293	SS	0,2	I	1	4200	4200	3000	3000	1978	7422001	3	2	2	1	1	7	1	2	
63		Seal Water Pumps	14 m ³ /hr	WH:106,5m	OCLC	H	1,083	SS	0,7	I	1	9300	9300	11400	11400	1978	7422001	3	4	1	1	1	7	1	2	
42		Evaporator Drum	75 m ³	Dia: 4 m	Temp:120°C	Cy	10	CS	10 mm	T	1	62100	62100	62100	62100	1980	6921107	1	1	2	2	2	2	1	1	
43		Sump Tank	9,74 m ³	Dia: 1,5m	Temp:120°C	Cy	1,32	SS	10 mm	T	1	16500	16500	23000	23000	1977	6921107	1	1	2	2	1	6	1	1	
44		Slop Water Tank	292,3 m ³	Dia: 7 m	Temp:120°C	Cy	21	SS	10 mm	I	1	54000	54000	66500	66500	1978	6921107	3	2	2	2	3	6	1	2	
64		Refrigerant Compressor	770, m ³ /min	P:4,57 kg/cm ²	Air	H	21	CI	10 mm	I	1	653000	653000	794000	794000	1978	7421100	5	2	1	1	3	1	1	2	
45		Seal Water Drum	1,57 m ³	-	Temp:100°C	Cy	1,3	CS	12 mm	T	1	8400	8400	8400	8400	1980	6924105	1	0	2	2	1	2	1	1	
3		Cond. Return System	INCLUDED IN REFRIGERANT COMPRESSOR																							
4		Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5		Seal Water Cooker	-	-	SEAL WATER DRUM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

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(13 of 17)

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034.

**Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry**

Vol. XII - Technical data for

(SBR) Styrene-Butadiene Rubber

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034

TURKEY

**Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. XII- Technical data for
(SBR) Styrene-Butadiene Rubber**

**Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme**

**Based on the work of
Capital Goods Development Project Team in Turkey
United Nations Industrial Development Organization
Vienna**

**This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND
ACTIVITIES FOR SRR PLANT

06 TO 28 MONOMER BLENDING
09 TO 30 ADDITIVES PREPARATION
28 TO 35 EMULSION POLYMERIZATION
35 TO 38 MONOMER RECOVERY
38 TO 40 SBR FINISHING

Rev.	Tarih	İsmi

Petkim 113/F/9 B.2/1980

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

UNİDO/SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

IND.CODE: 3514-3
IND.NAME: SYNTHETIC RESINS, PLASTIC
MAT'L, etc.....SBR

INDUSTRY ACTIVITY CHART
(PART 12 SBR)

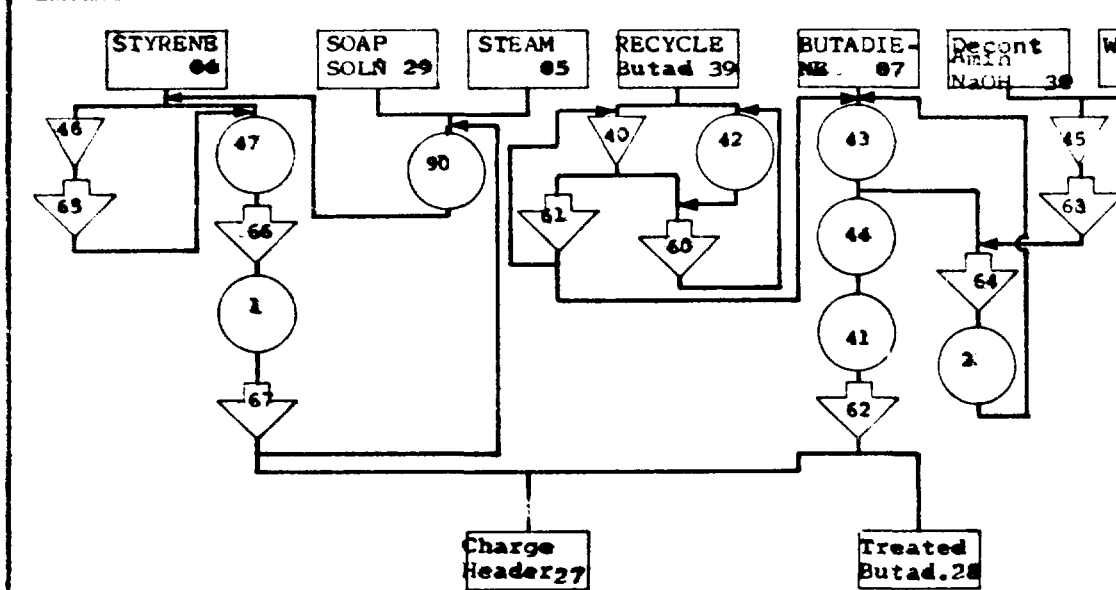
PROD. S	PRODUCT NAME / PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
28	TREATED BUTADIENE	1	MONOMER	STYRENE DEAERATOR COLUMN	1.54 -10 m ³	1	1.54 m ³
						2	3.5 m ³
						3	6.5 m ³
						4	10 m ³
30	DECONTAMINATED NaOH	1	ADDITIVES PREPARATION	STORAGE TANK	10.36 -100 m ³	1	10.36 m ³
						2	43.2 m ³
						3	67.0 m ³
						4	100 m ³
35	LATEX	1	EMULSION POLYMERIZATION	REACTOR	5-50 m ³	1	5 m ³
						2	21.6 m ³
						3	50 m ³
		2	SOLUTION POLYMERIZATION	REACTOR	5-50 m ³	1	5 m ³
						2	21.6 m ³
						3	50 m ³
38	STRIPPED LATEX	1	LATEX DEGASSING AND MONOMER RECOVERY	LATEX STRIPPING COLUMN	148.4 -300 m ³	1	148.4 m ³
						2	200 m ³
						3	250 m ³
						4	300 m ³
40	FINISHED SBR	1	SBR FINISHING	LATEX BLEND TANK	100-2000 m ³	1	200 m ³
						2	800 m ³
						3	1200 m ³
						4	2000 m ³

PREPARED BY	CHECKED BY	APPROVED BY
S.KESKİN		

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.



06 TO 28 MONOMER BLENDING AND CHARGING

ACTIVITY CODE	Industry	Product	tech.	Cap
3514.3	28	1	1	
NO	WORLD BANK CODE	WORKING NAME	Q	
1	74160911421211	Sty. Prod. Heater	1	
40	69241021323211	Recycle BD Stor.	1	
41	692410540323211	Uninhibited BD S.	1	
42	692410540323211	Spare for BIST	1	
43	692410510321211	BD caustic Decan.	1	
44	692410510321211	BD water decan.	1	
60	742200133121612	Recy. BD trans. P.	1	
64	742200123111612	Recy. BD P. Spares	2	
62	742200134121612	Recy. BD charger	2	
63	742200123521112	Caustic P. to Dec.	1	
64	742200131520602	Caustic circulation pump	2	
65	742200121120602	Recy. Sty. Trans.	1	
66	742200121120602	Blend Sty. fr. P. Spare	2	
67	OMITTED	Sty. charge Man.	-	
3	741610721341242	Caustic heater	1	
40	OMITTED			
45	692410711321211	Dilute caustic heater	1	
46	692410711321211	Recy. Sty. Stor.	1	
47	692410711421211	Blend Sty. Stor.	1	

UNIDO/SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

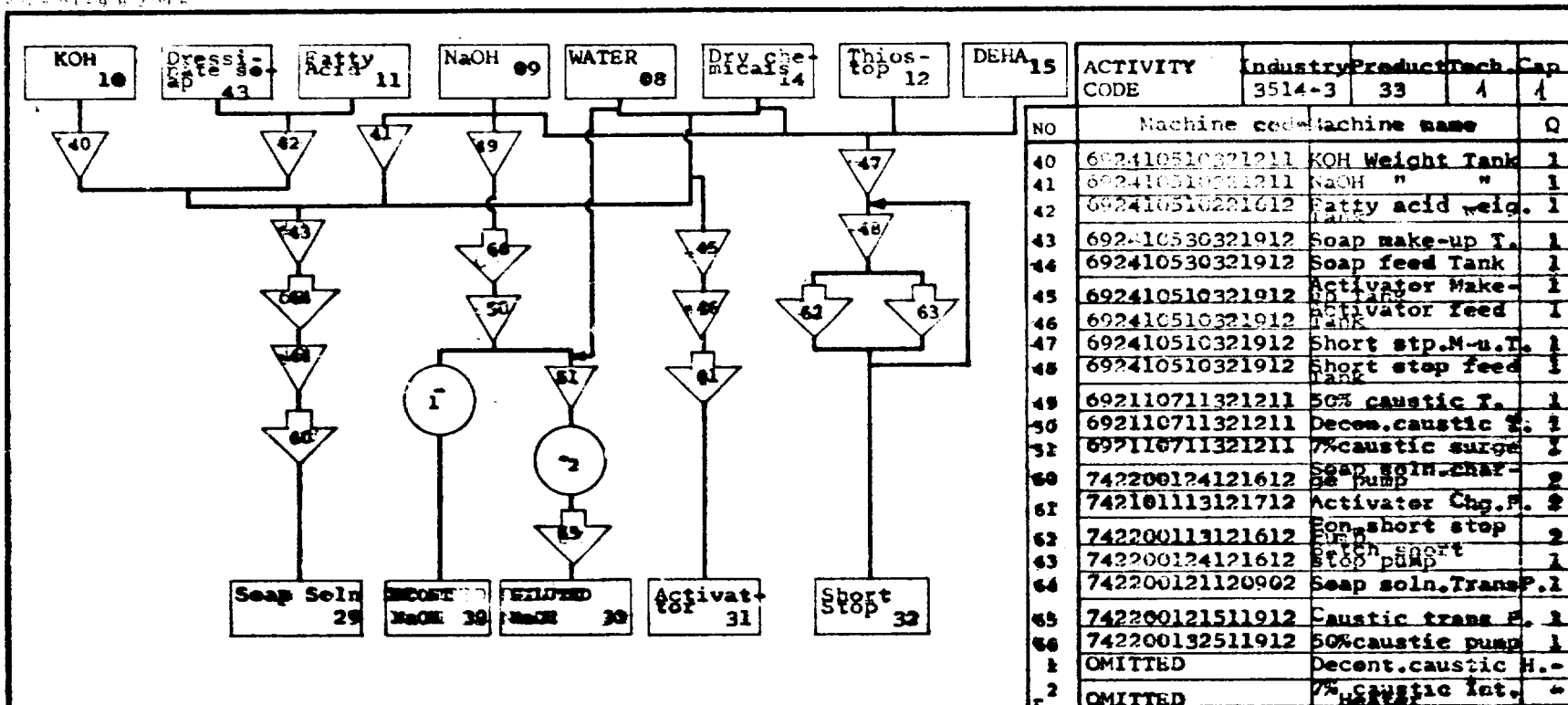
INDUSTRY	PRODUCT	TECHNOLOGY
STY. RESIN	TREATED BUTADIENE	MONOMER BLEND
DATE	SAMPLE PLANT	CAPACITY
18.12.1981	YARINCA	1.54 m ³

CHECKED BY	APPROVED BY	PREPARED BY	DRAWN BY	CHECKED BY
		I. YILDIZ	D. ALTUN	S. KESKIN

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.



ACTIVITY CODE	Industry	Product	Tech.	Cap
	3514-3	33	4	4
NO	Machine code	Machine name	Q	
40	692410510321211	KOH Weight Tank	1	
41	692410510321211	NaOH " "	1	
42	692410510321612	Fatty acid weig.	1	
43	692410530321912	Soap make-up T.	1	
44	692410530321912	Soap feed Tank	1	
45	692410510321912	Activator Make-	1	
46	692410510321912	Activator feed	1	
47	692410510321912	Short stop.M-u.T.	1	
48	692410510321912	Short stop feed	1	
49	692110711321211	50% caustic T.	1	
50	692110711321211	Decom.caustic T.	1	
51	697110711321211	7%caustic surge	1	
60	742200124121612	Soap soln.char-	2	
61	742101113121712	Activator Chp.F.	2	
62	742200113121612	Non-short stop	2	
63	742200124121612	Batch short	1	
64	742200121120902	Soap soln.Trans F.	1	
65	742200121511912	Caustic trans F.	1	
66	742200132511912	50%caustic pump	1	
1	OMITTED	Decent.caustic H.-		
2	OMITTED	7%caustic int.		

00 TO 32 ADDITIVES PREPARATION

UNIDO/SPO (PETKİM)

CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
PETROKİMYA	BECOND NaOH	ADDITIVES PREP
DATE	SAMPLE PLANT CAPACITY	
28.12.1981	YARINCA -10.36 m ³	

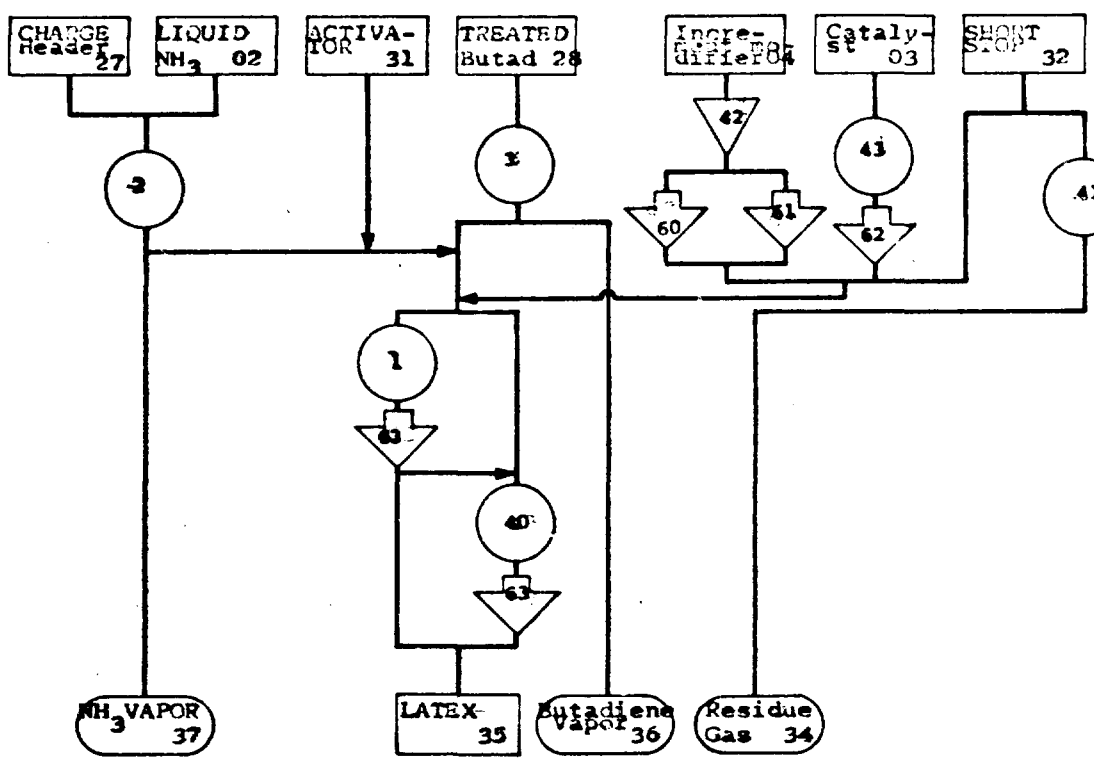
CHECKED BY	APPROVED BY	PREPARED BY	DRAWN BY	DESIGNED BY
		A.AKSU	D.ALTUN	S.KESKİN

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.

Revizyon: 03/03 8-2/1978



26 TO 35 REACTION

ACTIVITY CODE	INDUSTRY	Product	Tech.	Cap
35.14.3	35.14.3	35	1	2
MACHINE CODE	MACHINE NAME	NO		
741650812112212	Reactor	3		
692410540323221	Cold latex surge	1		
692410530322211	6000 Knock-out Drum	1		
741610332492202	Charge precooler	1		
741610001311202	ED Vaporiser	1		
742101114121712	COND separator	2		
742101114121712	INSTR.modify.char	1		
742101114121712	Catal.char,P.Sp.	2		
742200132621612	Lat.trans,P.Sp.	2		
692110711321512	Modif.char.Task	1		
692110711321512	Catalyst charge Tank	1		

UNIDO/SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

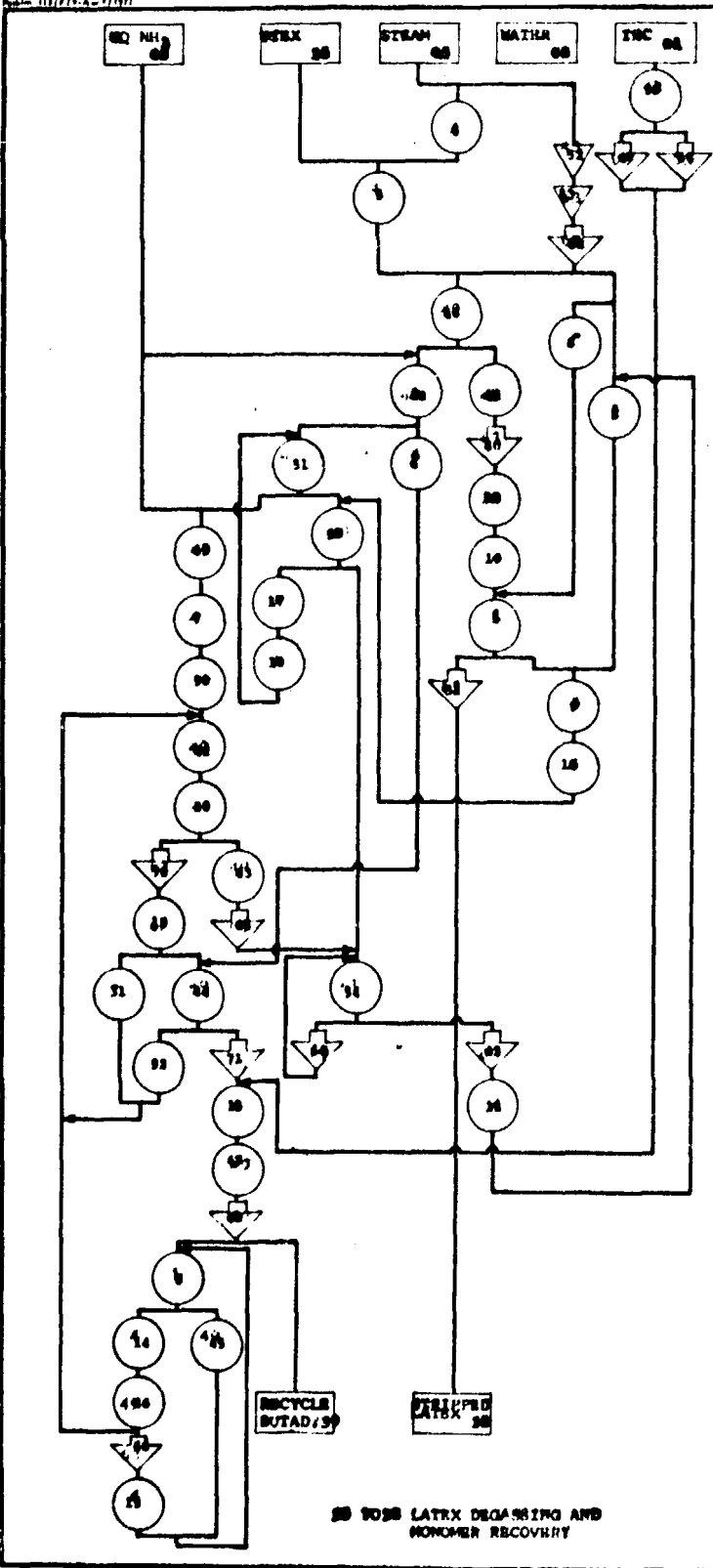
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN.RESINS.etc	LATEX	EMUL.POLYMER
DATE	SAMPLE PLANT	CAPACITY
18.12.1981	YARIMCA	21.6 m ³
PREPARED BY	DRAWN BY	CHECKED BY
I.YILDIZ	D.ALTUN	Ş.KESKİN
CHECKED BY	APPROVED BY	

No.	Tarih	Isim



PETKIM PETROKIMYA A.Ş.

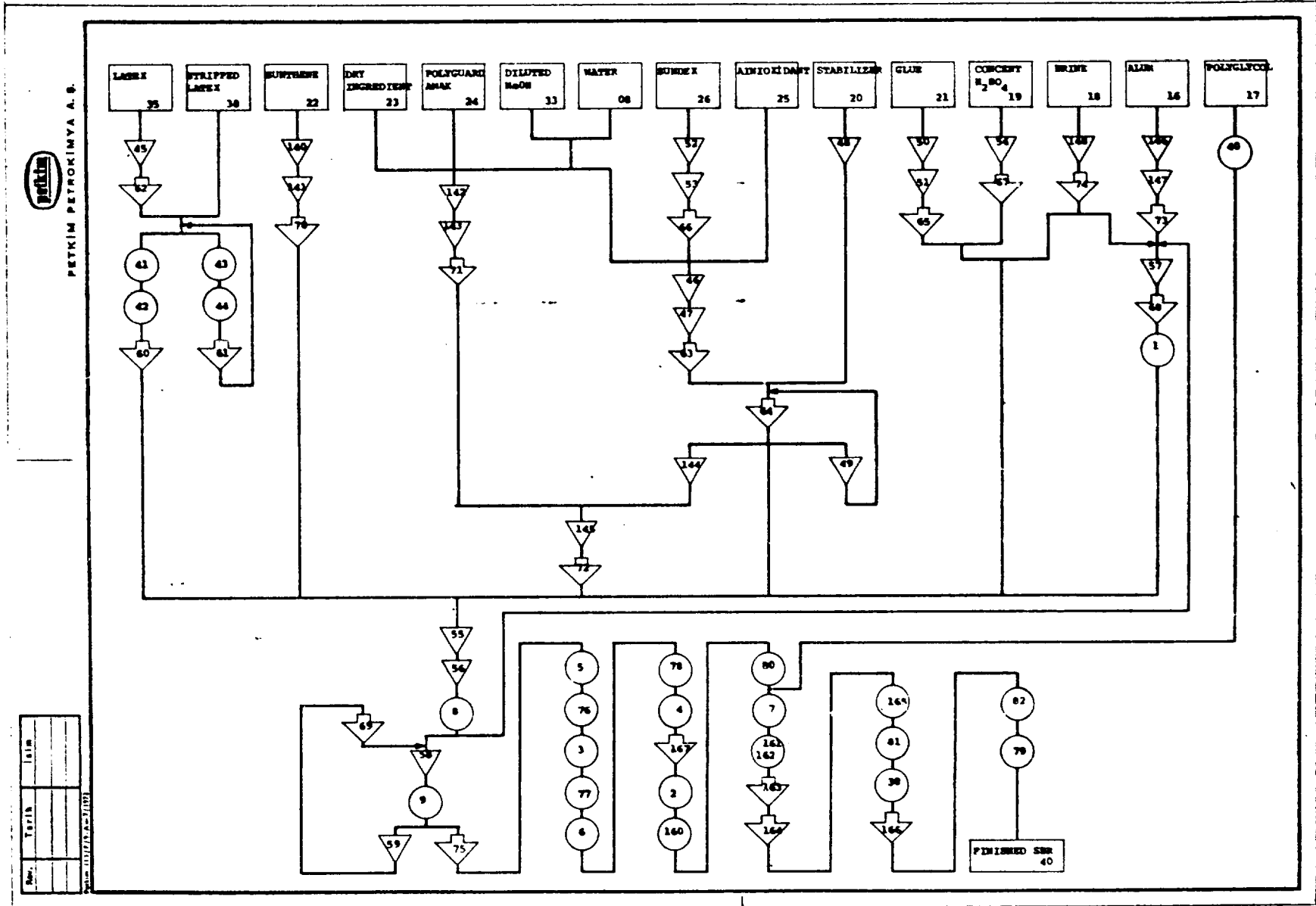


ACTIVITY	INDUSTRY	PRODUCT	TECH	CAP
3514-3	30	1	7	
MACHINE CODE	MACHINE NAME			
1 74160072141211	Latex stripping			
2 74160071142121	Latex Strainer			
3 74160031142121	BD Abes, Clm.			
40 69241055032321	Latex Flash Dr.			
41 69241055032321	Lat. vac. fla. Dr.			
42 69241051032121	180mm Knack Out			
43 69241061032021	Condens. Receiv.			
44 69241051032121	180mm K.O. Dr.			
45 69241051032121	180mm Knack Out			
46 69241051032121	Desorber oil Suk.			
47 69241061032121	Butadiene Receiv.			
48 69241051032121	Separator of V.			
49 69241051032121	Separator of V.			
50 69241051032121	180mm Cond. Su-			
51 69241051032121	Booster cond. S.			
52 74161080091211	Strip. Desuper			
53 74161070119021	Latex Heater			
54 74161032121121	Flash D. vapor co			
55 74161032121121	Strip. F.D.V. co			
56 OMITTED	Steam Dep. heat.			
57 74161055213211	Latex Clm. VAC.			
58 74161055213211	180mm Clm. Boos-			
59 74161051221221	Strip. Feed pre-			
60 74161100009021	Strip. Feed pre-			
61 74161031111121	Comp. after cool.			
62 74161032131121	Abs. oil cooler			
63 74161070001121	Desorb. oil heat.			
64 74161052231121	Butadiene cond.			
65 74161055241321	180mm Clm. VAC.			
66 74240010010061	Boos. cond. Jet. B.			
67 OMITTED	Evacuation Jet			
68 74220013362191	Lat. Clm. Feed P.			
69 74220012322111	Strip. Latex P.			
70 74230001312161	Deaerax Pump			
71 74220012211060	Decan. water P.			
72 74220012211060	Recycle Styrene P.			
73 74220012211060	Cond. Receiver			
74 74220012427060	Abs. Oil Pump			
75 74210113521912	TBC metering P.			
76 74210113521912	TBC metering P.			
77 74220012312010	Recyc. BD Pump			
78 OMITTED	Float-Trap			
79 OMITTED	Float-Trap			
80 OMITTED	Float-Trap			
81 74367700000100	Latex Strainer			
82 OMITTED	Latex Strainer			
83 74313011526100	180mm compressor			
84 74313012326100	180mm compressor			
85 69211071132121	Deaerax Tank			
86 69211071132121	Deaerax Tank			
87 69241051032221	Styrene agent.			
88 69211101132121	TBC soln. Storage			

UNIDO/SPO (PETKIM) CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN. RESINS, etc	STRIPPED LATEX	NON. RECOVERY
DATE	SAMPLE PLANT	CAPACITY
10.12.1981	YARDIGA	148.44 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A. ARSU	D. ALTUN	S. KESKIN
CHECKED BY	APPROVED BY	



Rev.	Tarikh	Isim



PETKIM PETROKINYA A. S.

Petkim 1117/1982 - 711972

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP	NO	MACHINE CODE	MACHINE NAME	Q
	4514-7	40	1	1				
1	741610100090001	Steam Serum Mixer		1	167	743421010120902	Airveyor Dryer Disc	1
60	742200132821112	Coagulation Fe.L.P.		2	41	692410590324211	Latex Blend Tank	1
61	742200132821112	Latex Transfer Pump		1	42	692410590324211	Latex Blend Tank	1
62	742200132821112	Latex Col. Return Pump		1	43	692410580323211	Latex Blend Tank	1
63	742200121121112	Anti-ox.emul.trans.P		1	44	692410580323211	Latex Blend Tank	1
64	742200113121112	Anti-ox. emul.Fe.P.		2	45	692110711321912	Latex Calibration	1
65	742200113121112	Glue Feed Pump		2	46	692110711221632	Anti-ox make-up wof. T	1
66	742300023621612	Sundex Feed Pump		2	47	692110711222231	Anti-ox emul.makeup T	1
67	74220012121612	Sulphric Acid Pump		2	48	692110711321211	An-ox emul.calib.T.	1
68	742200132521112	S ₂ Pump		2	49	692110711321211	An-ox.holding Tank	1
69	742200131221112	Reslurry Pump		2	50	692110711321211	Glue Make-up Tank	1
70	742300023621612	Sunthene Trans Pump		2	51	692110711321211	Glue Holding Tank	1
71	742200121211112	NS A/O emul.trans.P		1	52	692110711321211	Sundex Calib Tank	1
72	742200121211112	NS A/O emul. FeedP		2	53	692110711221211	Sundex Feed Tank	1
73	742200122521712	Hum Feed Pump		2	54	692111311321211	H ₂ SO ₄ Stor. Tank	1
74	742200122521112	Brine Transfer Pump		2	55	692110711321912	Coagulation Tank	1
2	728314300020700	Cyclone Separator		1	56	692110711321912	Soap Conversion Tank	1
81	OMITTED	Rale Film Wrapper		-	57	692110711321912	Serum Tank	1
30	OMITTED	Rale Metal Detec.		-	58	692110711321912	Reslurry Tank	1
3	728321218221022	Hammer Mill(Dryer (Seed))		1	59	692110711321912	Reslurry Ov. Fe. Tank	1
4	728321218221022	Hammer Mill		1	140	692110711321212	Sunthene Calib.Tank	1
5	OMITTED	Dewatering Extruder		-	141	692110711221211	Sunthene Feed Tank	1
6	741641117036612	SBR Rubber Dryer		1	142	692110711221611	NS A/O Weigh Tank	1
7	OMITTED	Rubber Baler		-	143	692110711222211	NS A/O Emul. Make Up	1
8	728310640010702	Primary Dewater. con.		1	144	692110711321211	NS A/O calib Tank	1
9	728310530010702	Secondary Dewater S.		1	145	692110711321211	NS A/O Hold Tank	1
75	744264015010702	Dewatering Ext con.		1	146	692110711321912	Alum Make up Tank	1
76	744264015011712	Chopper con.		1	147	692110711321912	Alum Holding Tank	1
77	744267515011712	Vibrating Conveyor		1	148	69211071121012	Purified Brine St.T	1
78	744264015011712	Chopper Conv. Fe drv		1	80	745250110101012	Baler Weigh Scale	1
160	744260311020002	Weigh scale Fe.Conv.		1	82	745250110101012	Baler Check.W.Scale	1
161	744263012020601	Gravity conveyor		1	162	744263012021601	Gravity Conveyor	1
163	744263011020601	Power Conveyor		1	40	692410510321211	Polyglycol Tank	1
164	744263014020001	2 Way Transfer Conv.		1				
165	744163012020001	Gravity Surge Conv.		1				
166	74426301720001	Reject Conveyor		1				
79	OMITTED	Leveling Tables		-				

UNIDO/SPO (PETKIM) CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

CHECKED BY		APPROVED BY	
INDUSTRY	PRODUCT	TECHNOLOGY	
SYN RESINS etc	FINISHED SBR	SBR FINISHING	
DATE	SAMPLE PLANT	CAPACITY	
5.1.1982	YARINCA	1000 M ³	
PREPARED BY	DRAWN BY	CHECKED BY	
A. BERSU	D. ALTUN	S. RESKIN	

Eq. No.	Basic Machine Description	Motor Spec (Capacity)	Motor Spec (Dimensions)	Water Spec (Optional)	Type (Description)	Manufac. Char. 1 (PNSI)	Manufac. Char. 2	Manufac. Char. 3	Origin	Q.	Purchase Cost		Gr. Inv. Cost		Purch. Year	SITC Code							
											Unit	Total	Unit	Total		12145	6719	1111	11241				
39	Recycle BD	1.54 m ³	P: 3.5 atm	Temp: 52c	PM	0,9	C.S.	9 mm	I	1	5150	5150	11550	1971	74166	981	1	4	2	1	2	1	1
40	Recycle BD	118,97 m ³	Dia: 13,2m	Temp: 52c	Cy	23,13	C.S.	16 mm	I	1	82150	82150	146000	1970	69211	182	1	3	2	3	2	1	1
41	Uninhibited BD surge	33,07 m ³	-	Temp: 52c	Cy	10,2	C.S.	14 mm	I	1	33700	33700	64400	1970	69241	054	0	3	2	3	2	1	1
42	Spare for D-102-D101	33,07 m ³	-	Temp: 52c	Cy	10,2	C.S.	14 mm	I	1	33700	33700	64400	1970	69241	054	0	3	2	3	2	1	1
43	Decanter	9,69 m ³	-	Temp: 52c	Cy	3,25	C.S.	9 mm	I	1	11700	11700	20500	1970	69241	051	0	3	2	1	2	1	1
44	Decanter	9,69 m ³	-	Temp: 52c	Cy	3,25	C.S.	9 mm	I	1	11700	11700	20500	1970	69241	051	0	3	2	1	2	1	1
45	Caustic Heater	MS16,2m	SD: 19,8 m	TL: 14,97m	DP	0,11	C.S.	60 mm	I	1	400	400	800	1971	74161	072	1	3	4	1	2	4	2
46	OMITTED														OMITTED								
47	Recycle BD pump-spate	27,3m ³ /h	45 m	OCLC	V	0,2	C.S.	0,1 ten	I	1	800	800	1800	1971	74220	013	2	1	2	1	6	1	2
48	Blend BD c-charge-spare	4,5 m ³ /h	WH: 70 m	OCLC	H	0,3	C.S.	0,2 ten	I	2	2200	4500	5000	1971	74220	012	3	1	1	1	6	1	2
49	Caustic pump to decanter	12,5 m ³ /h	WH: 150 m	OCLC	V	0,4	C.S.	0,3 ten	I	2	5150	10700	11450	1971	74220	013	4	1	2	1	6	1	2
50	Caustic circulation pump	9,1 m ³ /h	WH: 60 m	Corrosive	V	0,25	CIC	0,12ton	I	1	800	800	1700	1971	74220	012	3	5	2	1	1	1	2
51	Caustic circulation pump	11,4m ³ /h	WH: 30 m	Corrosive	V	-	C.S.	-	I	2	1100	2200	5000	1971	74220	013	1	5	2	0	6	0	2
52	Caustic circulation pump	0,8 m ³ /h	WH: 24 m	OCLC	V	-	C.S.	-	I	1	600	600	1300	1971	74220	012	1	1	2	0	6	0	2
53	Caustic circulation pump	2,7 m ³ /h	WH: 24 m	OCLC	V	-	C.S.	-	I	2	700	1400	1500	1970	74220	012	1	1	2	0	6	0	2
54	Caustic circulation pump	3,85 m ³	Dia: 1,4m	Temp: 52c	Cy	1,2	C.S.	7 mm	I	1	4100	4100	7750	1970	69211	071	1	3	2	1	2	1	1
55	Blend styrene in storage	49,46 m ³	Dia: 3 m	Temp: 52c	Cy	3,0	C.S.	5 mm	I	1	8450	8450	22700	1970	69211	071	1	3	2	1	2	1	1
56	Styrene charge pump	49,46 m ³	Dia: 3 m	Temp: 52c	Cy	3,0	C.S.	5 mm	I	1	8450	8450	22700	1970	69211	071	1	3	2	1	2	1	1
57	NO AVAILABLE DATA														NO AVAILABLE DATA								

Note: a) Net component weight for machines, plate thickness for plate fabricated equipments.

Item No.	Description	Capacity	WH	Material	Type	Spec. Ref.	Spec. Ref.	Capacity	Origin	Purchase Cost		St. Inv. Cost		Proc. Year	Inventory Code	
										Unit	Total	Unit	Total			
51	soap solution charge pump	5,7 m ³ /h	WH:110,0m	CCLC	V	0,25	C.S.	0,2ton	I	2	750	1500	1650	3300	1970	74220 012 4 1 2 1 6 1 2
52	Continuous charge pump	0,17 m ³ /h	WH: 85,0m	CCLC	V	0,12	S.S.	0,1 ton	I	2	500	1000	1100	2200	1970	74210 111 3 1 2 1 7 1 2
53	Batch charge pump	0,368m ³ /h	WH: 60,0m	CCLC	V	0,16	C.S.	0,1 ton	I	2	350	700	800	1600	1970	74220 011 3 1 2 1 6 1 2
54	Soap solution pump	5,7 m ³ /h	WH: 20,0m	CCLC	V	-	SF	-	I	1	550	550	1250	1250	1971	74220 012 1 1 2 0 9 0 2
41	KOH weigh tank	0,35 m ³	-	Temp:52°C	Cy	0,13	C.S.	5 mm	T	1	750	750	900	900	1970	6924105 1 0 3 2 1 2 1 1
42	NaOH weigh tank	0,13 m ³	-	Temp:52°C	Cy	0,075	C.S.	5 mm	T	1	900	900	900	900	1970	6924105 1 0 3 2 1 2 1 1
43	Fatty acid weigh tank	2,65 m ³	-	Temp:175°C	Cy	2,045	S.S.	10 mm	I	1	4400	4400	1500	1500	1970	6924105 1 0 2 2 1 6 1 2
44	Soap make-up tank	25,43 m ³	-	Temp: 90°C	Cy	1,68	FRP	16 mm	I	1	900	900	1000	1000	1970	6924105 3 0 3 2 1 9 1 1
45	Soap feed tank	25,43 m ³	-	Temp: 80°C	Cy	1,0	FRP	10 mm	I	1	900	900	1000	1000	1970	6924105 3 0 3 2 1 9 1 1
46	Activator Make-up tank	2,31 m ³	-	Temp: 80°C	Cy	0,33	FRP	6 mm	I	1	100	100	100	100	1970	6924105 1 0 3 2 1 9 1 1
47	Activator feed tank	2,46 m ³	-	Temp: 52°C	Cy	0,14	FRP	6 mm	I	1	400	400	400	400	1970	6924105 1 0 3 2 1 9 1 1
48	Shortstop Make-up tank	3,51 m ³	-	Temp: 80°C	Cy	0,38	FRP	16 mm	I	1	1050	1050	1000	1000	1970	6924105 1 0 3 2 1 9 1 1
49	Shortstop Feed tank	3,8 m ³	-	Temp: 52°C	Cy	0,17	FRP	6 mm	I	1	100	100	100	100	1970	6924105 1 0 3 2 1 9 1 1
50	Caustic trans fer pump	5,7 m ³ /h	WH:20,0 m	Corrosive	H	0,35	SF	6 mm	I	1	-	-	100	100	1970	7422001 2 1 5 1 1 9 1 2
51	50% caustic trans. pump	10,0 m ³ /h	WH:42,0m	Corrosive	H	0,35	SF	7 mm	I	1	0	550	2150	2150	1970	74220 013 2 5 1 1 9 1 2
52	50%caustic Stor. tank	25,75 m ³	Dia:2,7m	Temp: 50°C	Cy	2,9	CS	7 mm	T	1	700	700	1000	1000	1970	69211 071 1 3 2 1 2 1 1
53	Decont. caust. tank	10,36 m ³	Dia:2 m	Temp: 65°C	Cy	2,8	CS	7 mm	T	1	500	500	1000	1000	1970	69211 071 1 3 2 1 2 1 1
54	7% Caust. Make-up surge	2,40 m ³	Dia:1,4 m	Temp: 50°C	Cy	0,75	CS	7 mm	T	1	500	500	500	500	1970	69211 071 1 3 2 1 2 1 1
1	Decont caust. hot heater	OMITTED	coil)												OMITTED	
2	7% C.soda Int. Heater	OMITTED	coil)												OMITTED	

Note: a) Max. component weight for machined plate thickness for plate fabricated equipments.

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No.	S	Basic Machine Description	Capacity	Operating Pressure	Operating Temp.	Type Description	Manufac. Char. 1	Service Char. 1	Manufac. Char. 2 a)	Main	Q	Purchase Cost		Cst. 1977 Cost		Yr.	SITC Code									
												Net	Total	Unit	Total		1745	67	9	10	11	12	13			
1		Reactors	21,6 m ³	P:10 atm.	Catalytic	SM	9,4	C.S.	14 mm	I	8	32700	261000	59300	474400	1970	74165	08	1	2	1	1	2	2	1	2
0		Cold latex Surge	63,6 m ³	-	70°C	Cy	15,3	C.S.	25 mm	T	1	11500	11500	13500	13500	1971	69241	05	4	0	3	2	3	2	2	1
11		Foam knock-out Drum	49,49 m ³	-	66°C	Cy	7,2	C.S.	10 mm	T	1	12350	18950	45500	45500	1971	69241	05	3	0	3	2	2	2	1	1
2		Charge Precooler	97,12 m ³	Dia:1,2m	TL: 6,7m	Kettle Reboiler	7,1	C.S.	-	I	1	40800	40800	56700	56700	1970	74161	03	3	2	4	9	2	2	0	2
3		BD Vaporizer	-	SD:0,4 m	TL: 5 m	FST	1,8	C.S.	-	I	1	4800	4800	11800	11800	1970	74161	09	0	1	3	1	1	2	0	2
40		Modifier charge pump	0,017 m ³ /h	WH:110,0m	C.C.L.C	V	0,029	S.S.	0,02	I	2	400	800	800	1700	1970	74210	11	1	4	1	2	1	7	1	2
1		Increment charge pump	0,00227 m ³ /h	WH:110,0m	CCLC	V	0,029	S.S.	0,02	I	1	400	400	800	800	1970	74210	11	1	4	1	2	1	7	1	2
2		Catalyst charge pump	0,0136 m ³ /h	WH:110,0m	CCLC	V	0,013	S.S.	0,01	I	2	350	700	800	1600	1970	74210	11	1	4	1	2	1	7	1	2
13		Latex trans-spars	28,4 m ³ /h	WH:450 m	Viscous	V	0,7	C.S.	0,5	I	2	1100	2200	2400	4800	1971	74220	01	3	2	6	2	1	6	1	2
12		Modifier charge tank	0,57 m ³	Dia:0,5m	52°C	Cy	0,1	S.S.	4 mm	I	1	330	330	700	700	1970	69211	07	1	1	3	2	1	5	1	2
11		Catalyst charge tank	0,12 m ³	Dia:0,5 m	52°C	Cy	0,08	S.S.	4 mm	I	1	300	300	500	550	1970	69211	07	1	1	3	2	1	5	1	2

Note : a) Max. component weight for machines, plate thickness for plate fabricated equipments.

QTY	Basic Machine Description	Major Spec (Capacity)	Major Spec (Temp/Atm)	Major Spec (TL)	Description	Material Class. (C.S.)	Mater. Char. 1	Mater. Char. 2	Part No.	Qty	Purchase Cost		Unit	Total	Year	STK Code
											Unit	Total				
1	Latex strip-ping column	148,44 m ²	P:2,5 atm; Temp: 85C	TL: 2,6m	PS	34,15	C.S.	9,5 mm		1	112850	215600	215600	1970	74166 07 2 1 4 1 4 2 1 1	
2	Decanting column	2,6 m ²	P:2 atm; Temp: 85C	TL: 3,6m	PS	4,5	C.S.	5 mm		1	14900	28400	28400	1970	74166 07 1 1 4 2 1 2 1 1	
3	SD Absorber Column	0,8 m ²	P:6 atm; Temp: 100C	TL: 3,6m	PS	1	C.S.	7,9 mm		1	3350	3350	3350	1970	74166 03 1 1 4 2 1 2 1 1	
4	Latex Flash Drum	39,55 m ²	Temp: 74C	TL: 2,6m	Cy	10,1	C.S.	14 mm		1	36000	36000	36000	1970	59241 05 5 0 3 2 3 2 1 1	
5	Latex vacuum Flash Drum	39,55 m ²	Temp: 58C	TL: 2,6m	Cy	10,1	C.S.	14 mm		1	15900	15900	15900	1970	59241 05 5 0 3 2 3 2 1 1	
6	180mm Knock-out Drum	3,6 m ²	Temp: 66C	TL: 2,6m	Cy	1,3	C.S.	8 mm		1	4400	4400	4400	1970	59241 05 1 0 3 2 1 2 1 1	
7	Condensate Receiver	0,4 m ²	Temp: 32C	TL: 2,6m	Cy	0,4	C.S.	7 mm		1	1250	1250	1250	1970	59241 06 1 0 3 2 1 2 1 1	
8	220mm K.O. Drum	3,6 m ²	Temp: 66C	TL: 2,6m	Cy	1,3	C.S.	8 mm		1	4550	4550	4550	1970	59241 05 1 0 3 2 1 2 1 1	
9	Absorber Vent Drum	0,61 m ²	Temp: 52C	TL: 2,6m	Cy	0,49	C.S.	7 mm		1	1750	1750	1750	1970	59241 05 1 0 3 2 1 2 1 1	
10	Desorber oil surge and PD	2,1 m ²	Temp: 94C	TL: 2,6m	Cy	1,6	C.S.	9 mm		1	3400	3400	3400	1970	59241 05 1 0 3 2 1 2 1 1	
11	Butadiene Receiver	3,6 m ²	Temp: 52C	TL: 2,6m	Cy	1,6	C.S.	11 mm		1	5550	5550	5550	1970	59241 06 1 0 3 2 1 2 1 1	
12	Steam separator	0,13 m ²	Temp: 36C	TL: 2,6m	Cy	0,26	C.S.	12 mm		1	900	900	900	1970	59241 05 1 0 3 2 1 2 1 2	
13	Steam separator	0,18 m ²	Temp: 36C	TL: 2,6m	Cy	0,26	C.S.	12 mm		1	900	900	900	1970	59241 05 1 0 3 2 1 2 1 2	
14	Vapor cooler	0,19 m ²	Temp: 53C	TL: 2,6m	Cy	0,6	C.S.	6 mm		1	2100	2100	2100	1970	59241 05 1 0 3 2 1 2 1 2	
15	Vapor cooler	0,24 m ²	Temp: 55C	TL: 2,6m	Cy	0,4	C.S.	6 mm		1	1400	1400	1400	1970	59241 05 1 0 3 2 1 2 1 2	
16	Steam separator	HS: -	SD: -	TL: -	SA	-	C.S.	7 mm		1					74161 06 10 0 0 0 0 2 1 2	
17	Latex heater	HS: -	SD: 0,6 m ²	TL: 2,6m	DC	-	C.S.	9 mm		1					74161 07 0 1 1 0 0 2 1 2	
18	Flush drum vapor cooler	HS: 15,8 m ²	SD: 0,55 m ²	TL: 3,6 m	FST	1,5	C.S.	5 mm		1	4250	4250	4250	1970	74161 03 2 1 2 1 1 2 1 2	
19	Vacuum F. drum vapor cooler	HS: 16,74 m ²	SD: 0,55 m ²	TL: 3,6 m	FST	1,5	C.S.	10 mm		1	4250	4250	4250	1970	74161 03 2 1 2 1 1 2 1 2	
20	Steam separator	OMITTED													OMITTED	
21	Steam separator	HS: 22,07 m ²	SD: 1,9 m ²	TL: 4,9 m	FST	17,0	C.S.	6 mm		2	141000	282000	282000	1970	74161 05 5 2 3 1 3 2 1 2	
22	Latex heater	HS: 0,6 m ²	SD: 1,2 m ²	TL: 3,6 m	FST	5,95	C.S.	7 mm		1	36000	36000	36000	1970	74161 05 1 2 2 1 2 2 1 2	
23	Latex heater	HS: -	SD: -	TL: -	FST	-	C.S.	7 mm		1	3100	3100	3100	1971	74161 10 0 0 0 0 0 2 1 2	
24	Compressor after cooler	HS: 0,2 m ²	SD: 0,5 m ²	TL: 2,43 m	FST	1,1	C.S.	6 mm		1	4250	4250	4250	1971	74161 03 1 1 1 1 1 2 1 2	
25	Absorber oil cooler	HS: 23,1 m ²	SD: 0,6 m ²	TL: 5,5 m	FST	0,9	C.S.	8 mm		1	7800	7800	7800	1971	74161 03 2 1 3 1 1 2 1 2	
26	Desorber oil heater	HS: -	SD: -	TL: -	FST	0,4	C.S.	7 mm		1	300	300	300	1971	74161 07 0 0 0 0 1 1 2 1 2	

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

No.	Basic Machine Description	Major Item Capacity	Major Item Dimensions	Major Item Weight	Material	Finish	Paint	Origin	Purchase Cost		Total Cost		Purch. Year	JIT Code
									Unit	Total	Unit	Total		
15	Butadiene Condenser	HS115, 1.1 m SD; 1.1 m TL; 4.9 m			C.S.	3.7		I	1	7800	7800	16500	1970	74161 05 2 2 9 1 1 2 1 2
16	Booster cond	HS1736, 2 SD; 1.5 m TL; 6.1 m			C.S.	11.95		I	1	54900	54900	75450	1970	74161 05 5 2 4 1 3 2 1 2
17	Jet ejector	281 kg/hrSD; -			C.S.	-		I						74240 01 0 0 1 0 0 6 1 2
90	Evacuation Jet recovery	OMITTED												OMITTED
50	Jet recovery	25 m ³ /hr WH; 45 m			Viscous	0.7		I	2	1100	2200	2400	1971	74220 01 3 3 6 2 1 9 1 2
51	Booster pump and spare	2.5 m ³ /hrWH; 50 m			HCLC	0.7		I	2	1100	2200	2400	1971	74220 01 2 3 2 2 1 1 1 2
52	Booster pump and spare	0.341 m ³ /hrWH; 60 m			CCLC	4.2		I	2	350	700	850	1970	74220 00 1 3 1 2 1 6 3 2
53	Booster pump and spare	5 m ³ /hr WH; 35 m			CCLC	-		I	2	700	1400	1500	1971	74220 01 2 2 1 1 0 6 0 2
54	Booster pump and spare	3.4 m ³ /hr WH; 25 m			CCLC	-		I	2	700	1400	1500	1971	74220 01 2 2 1 1 0 6 0 2
55	Booster pump and spare	2.3 m ³ /hr WH; 28 m			CCLC	-		I	2	450	900	1000	1971	74220 01 2 2 1 2 0 6 0 2
56	Booster pump and spare	2.3 m ³ /hr WH; 110 m			HCLC	-		I	2	850	1700	1900	1971	74220 01 2 4 2 2 0 6 0 2
57	TBC metering pump	0.00681 m ³ /hr WH; 85 m			Corrosive	0.013		I	1	350	350	850	1970	74210 11 1 3 5 2 1 9 1 2
58	TBC metering pump	0.00681 m ³ /hr WH; 85 m			Corrosive	0.013		I	1	350	350	850	1970	74210 11 1 3 5 2 1 9 1 2
59	TBC metering pump	4 m ³ /hr WH; 66 m			CCLC	-		I	2	1100	2200	2350	1970	74220 01 2 3 1 2 0 1 0 2
18	Latex strainer	OMITTED												OMITTED
70	Latex strainer	0.475 m ³ /hr P; 84 kg/cm ² DG				2		I	2	6500	13000	18300	1970	74313 01 1 5 2 0 1 0 0 2
71	Latex strainer	3.5 m ³ /hr P; 78kg/cm ² DG				2		I	2	8900	17800	25100	1970	74313 01 2 5 2 0 1 0 0 2
52	Defogging tank	0.65 m ³ Dia; 0.8 m Temp: 100C			Cy	0.23		I	1	700	700	1600	1970	69211 07 1 1 1 3 2 1 2 1 1
53	Defogging tank	0.65 m ³ Dia; 0.8 m Temp: 100C			Cy	0.23		I	1	700	700	1600	1970	69211 07 1 1 1 3 2 1 2 1 1
54	Styrene de-cantair	2.14 m ³ Temp: 45C			Cy	0.28		I	2	1000	2000	1800	1970	69241 06 1 0 3 2 4 2 1 1
55	TBC sealer Storage	0.38 m ³ Dia; 0.8 m Temp: 45C			Cy	0.16		I	1	500	500	1100	1970	69211 10 1 1 3 2 1 2 1 1
30	Float Trap	OMITTED												OMITTED
31	Float Trap	OMITTED												OMITTED
32	Float Trap	OMITTED												OMITTED

Note: a) Max. component weight for machines, plate thickness for plate fabricated equipments.

S/N	Basic Machine S-nomenclature	Major Spec (Capacity)	Major Spec (Optional)	Major Spec (Optional)	Type (Description)	Manufac. Char. 1. (22NS)	Manufac. Char. 2. (S.S.)	Manufac. Char. 3. (S.S.)	Origin	Purchase Cost		Avr. Year	SFC Code							
										Unit	Total		Unit	Total	13	14	15	16		
76	Gravity con table	6,130 t/h	WH:3500		BM	1	S.S.	0,8 ton	I	1	4400	1970	74426	40	1	50	1	7	1	2
77	Gravity con table	6,130 t/h	WH:6300mm		BM	0,7	S.S.	0,6 ton	I	1	3100	1970	74426	75	1	5	0	1	7	1
78	Gravity con table	6,130 t/h	WH:6500mm		BM	1,2	S.S.	0,9 ton	I	1	5200	1970	74426	40	1	5	0	1	7	1
79	Leveling table	OMITTED											OMITTED							
100	Gravity con veyor	0,130 t/h	min. length		PDP	0,3	C.S.	-	I	1	2000	1971	74426	01	1	0	2	1	0	0
151	Gravity con veyor	0,130 t/h	WD:71,2mm		PDP	0,3	C.S.	-	I	1	2000	1971	74426	30	1	2	0	2	1	0
152	Gravity con veyor	0,130 t/h	wd:711,2mm		PDP	0,3	S.S.	-	I	1	2000	1971	74426	30	1	2	0	2	0	0
153	2 way trans- fer conveyor	0,130 t/h	wd:355,6mm		PDP	1,6	C.S.	-	I	1	6800	1971	74426	30	1	1	0	2	0	0
154	Gravity sur- face conveyor	0,130 t/h	wd:1066,0		PDP	0,8	C.S.	-	I	1	4350	1971	74426	30	1	4	0	2	0	0
155	Reject conveyor	0,130 t/h	wd:711,2mm		PDP	1,0	C.S.	-	I	1	3750	1971	74426	30	1	2	0	2	1	0
156	Reject conveyor	0,130 t/h	wd:711,2mm		PDP	0,3	C.S.	-	I	1	2450	1971	74426	30	1	2	0	2	0	0
157	Roll film wrapper	OMITTED											OMITTED							
158	Roll metal detector	OMITTED											OMITTED							
159	Airway dis- charge	3,36m ³ /min			Propeller type	-	S.S.	-	I	1	11100	1971	74342	10	1	0	1	2	0	0
41	Latex blend Tank	1000 m ³			Cy	36,5	C.S.	5 mm	I	1	84600	1970	89241	05	0	3	2	4	2	1
42	Latex blend Tank	1000 m ³			Cy	36,5	C.S.	5 mm	I	1	84600	1970	89241	05	0	3	2	4	2	1
43	Latex blend Tank	200 m ³			Cy	10	C.S.	5 mm	I	1	33400	1970	89241	05	0	3	2	4	2	1
44	Latex blend Tank	200 m ³			Cy	10	C.S.	5 mm	I	1	33400	1970	89241	05	0	3	2	4	2	1
45	Latex calib- ration tank	3,65 m ³	Dia: 1,8 m	Temp: 175°C	Cy	0,35	FRP	6 mm	I	1	10700	1980	89211	07	1	1	2	1	9	1
46	Latex calib- ration tank	3,17 m ³	Dia: 1,5 m	Temp: 175°C	Cy	2	S.S.	44,4 mm	I	1	4400	1970	89211	07	1	1	2	1	0	2
47	Latex calib- ration tank	9 m ³	Dia: 2,1 m	Temp: 175°C	Cy	5,6	C.S.	44,4 mm	I	1	4650	1971	89211	07	1	1	2	2	2	2
48	Latex calib- ration tank	0,15 m ³	Dia: 0,5 m	Temp: 52°C	Cy	0,38	C.S.	5 mm	I	1	850	1970	89211	07	1	1	2	1	2	1
49	Latex calib- ration tank	7,7 m ³	Dia: 2,0 m	Temp: 56°C	Cy	1,3	C.S.	5 mm	I	1	4000	1970	89211	07	1	1	2	1	2	1
50	Latex calib- ration tank	3,5 m ³	Dia: 1,5 m	Temp: 66°C	Cy	0,9	C.S.	7 mm	I	1	2650	1970	89211	07	1	1	2	1	2	1
51	Latex calib- ration tank	4,08 m ³	Dia: 1,7 m	Temp: 66°C	Cy	0,78	C.S.	5 mm	I	1	2550	1970	89211	07	1	1	2	1	2	1
52	Latex calib- ration tank	0,4 m ³	Dia: 0,8 m	Temp: 66°C	Cy	0,2	C.S.	5 mm	I	1	600	1970	89211	07	1	1	2	1	2	1

Note: (a) Net. component weight for machines, plates, thickness for plate fabricated equipments.

UNICC / SPC(PETKIM)
 CAPITAL GCCCS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE BUTADIENE RUBBER
 LOCATION-YULGHATALIK
 ANTICIPATED DATE OF COMMISSIONING- 1995
 UNIT HEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITE CODE	BASIC MACHINE NAME	GR	UN.HT	UN.CC
69241	C5403 23221	1	15.3	13.5
69241	05503 23211	1	10.1	63.8
69241	05503 23211	1	10.1	63.8
69241	C5603 23211	1	10.0	63.1
69241	05603 23211	1	10.0	63.1
69241	C5903 24211	1	36.5	230.4
69241	05903 24211	1	36.5	230.4
69241	06103 21211	2	.3	1.9
69241	06103 21211	1	.4	2.8
69241	06103 21211	1	1.6	10.5
72031	C6300 10702	1	.0	.0
72031	C6400 10702	1	.0	.0
72031	43000 20700	1	.0	7.0
72032	12102 21022	1	3.0	19.8
72032	12102 21022	1	3.0	19.8
74161	C1000 90001	1	.0	.0
74161	03111 11212	1	1.1	8.9
74161	C3212 11212	1	1.5	8.9
74161	03212 11212	1	1.5	8.9
74161	G3213 11212	1	.9	16.3
74161	G3324 52202	1	7.1	56.7
74161	05122 12212	1	6.0	61.0
74161	05223 12212	1	3.7	10.5
74161	05523 13212	2	17.0	376.0
74161	05524 13212	1	12.0	75.5
74161	C7003 11212	1	.4	.7
74161	C7011 50212	1	.0	.0
74161	C7213 41242	1	.1	.8
74161	G8000 90212	1	.0	.0
74161	C9013 11202	1	1.8	11.9
74161	10000 90212	1	.0	6.5
74164	11170 30612	1	100.0	46.1
74165	C8121 12212	1	9.4	59.3
74166	G3114 21211	1	1.0	6.9
74166	G7114 21211	1	4.5	28.4
74166	C7214 14211	1	34.2	215.4
74166	95114 21211	1	.9	11.5
74210	11131 21712	2	.1	1.1
74210	11135 21512	1	.0	.9
74210	11141 21712	2	.0	.8
74210	11141 21712	1	.0	.9
74210	11141 21712	2	.0	.9
74220	01131 21112	2	.3	.6
74220	01131 21612	2	.2	.8
74220	01211 20602	1	.0	1.3
74220	01211 20602	2	.0	1.5
74220	01211 20902	1	.0	1.3
74220	01211 21112	1	.4	3.0
74220	01211 21112	2	.3	.4
74220	01215 11912	1	.4	2.1
74220	01221 10602	2	.0	1.5
74220	01221 10602	2	.0	1.5
74220	01221 20602	2	.0	1.0
74220	01225 21112	2	.4	2.2
74220	01225 21712	2	.4	3.1
74220	01231 11612	2	.3	5.0
74220	01231 20102	2	.0	2.8
74220	01232 21112	2	.7	2.4
74220	01235 21112	1	.3	1.7

PLANT CAPACITY = 32 000TON/YEAR

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTALE
0.0	0.0	0.0	15.3							15.3
			10.1							10.1
			10.1							10.1
			10.0							10.0
			10.0							10.0
			36.5							36.5
			36.5							36.5
			.6							.6
			.4							.4
			1.6							1.6
				.0						.0
				.0						.0
				.0						.0
				3.0						3.0
				3.0						3.0
			.0							.0
			1.1							1.1
			1.5							1.5
			1.5							1.5
			.9							.9
			7.1							7.1
			6.0							6.0
			3.7							3.7
			34.0							34.0
			12.0							12.0
			.4							.4
			.0							.0
			.1							.1
			.0							.0
			1.8							1.8
			.0							.0
100.0										100.0
75.2										75.2
1.0										1.0
4.5										4.5
34.2										34.2
.9										.9
			.2							.2
			.0							.0
			.0							.0
			.0							.0
			.0							.0
			.6							.6
			.4							.4
			.0							.0
			.0							.0
			.0							.0
			.4							.4
			.6							.6
			.4							.4
			.0							.0
			.0							.0
			.8							.8
			.8							.8
			.6							.6
			.0							.0
			1.4							1.4
			.3							.3

UNIOC / SPG(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE BUTADIENE RUBBER PLANT,CAPACITY
 LOCATICA-YUMURTALIK
 ANTICIPATED DATE OF COMMISSINGING= 1995
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EDP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993
74220 01241 21612	SOAP SOLUTION CHARGE PUMP	2	.3	1.7			
74220 01241 21612	BATCH SHORSTOP CHAR. PU.	1	.3	1.4			
74220 01242 20602	ABSGRBER OIL PUMP	2	.0	1.9			
74220 01312 21112	RESLURRY PUMP	2	.4	4.7			
74220 01315 20602	CAUSTIC CIRCULATION PUMP	2	.0	2.5			
74220 01321 21612	RECY.BD RECIR.TRANS.PUMP	1	.2	1.8			
74220 01325 11912	50 PERCENT CAUSTIC TR.PU.	1	.4	2.2			
74220 01325 21112	SERUM PUMP	2	.7	5.8			
74220 01326 21612	LATEX TRANSFER PUMP	2	.7	2.4			
74220 01328 21112	LATEX CALIB.RETURN PUMP	1	.7	2.4			
74220 01328 21112	COAGULATION FEED LATEX PU	2	.7	2.4			
74220 01328 21112	LATEX TRANSFER PUMP	1	.7	2.4			
74220 01336 21912	LATEX CLMN FEED PUMP	2	.7	2.4			
74220 01341 21612	BLEND BC CHARGE PUMP	2	.4	11.5			
74220 03121 21112	NS A/C EMULSION FEED PUMP	2	.3	2.2			
74220 03121 21612	SULPHRIC ACID PUMP	2	.3	1.6			
74220 03131 21112	GLUE FEED PUMP	2	.3	.7			
74230 00131 21632	DEFORMER PUMP	2	4.2	.9			
74230 00236 21612	SUNDEX FEED PUMP	2	.3	1.2			
74230 00236 21612	SUNTHENE TRANS. PUMP	2	.3	1.2			
74240 01001 00612	BCCST.CGND.JET EJECTOR	1	.0	.0			
74313 01152 01002	180 MM COMPRESSOR	2	2.0	18.3			
74313 01252 01002	820 MM COMPRESSOR	2	2.0	25.0			
74342 10101 20902	AIRVEYOR DRIER DISCHARGE	1	.0	28.4			
74362 70000 01002	LATEX STRAINER	1	.3	1.9			
74426 01110 21602	WEIGH SCALE FEED CONVEYCR	1	.3	4.2			
74426 30110 21601	POWER CONVEYOR	1	1.6	11.0			
74426 30120 21601	GRAVITY CONVEYOR	1	.3	4.2			
74426 30120 21601	GRAVITY CONVEYOR	1	.3	4.2			
74426 30120 21601	REJECT CONVEYOR	1	.3	5.1			
74426 30120 21601	GRAVITY SURGE CONVEYOR	1	1.0	6.5			
74426 30140 21601	2 WAY TRANSFER CONVEYOR	1	.8	5.7			
74426 40150 11712	CHOPPER CONVEYOR	1	1.0	6.9			
74426 40150 11712	DEWAT.EXTRAUDER FEED COND.	1	1.0	6.9			
74426 40150 11712	CHOPPER CONVEYCR	1	1.2	8.2			
74426 75150 11712	VIBRATING CONVEYCR	1	.7	4.8			
74525 01101 01012	BALER WEIGH SCALES	1	2.0	13.3			
74525 01101 01012	BALER CHECK WEIGH SCALES	1	2.0	17.6			

= 32 000TON/YEAR

1994	1995	1996	1997	1998	1999	2000	TOT_WE
*****	*****	*****	*****	*****	*****	*****	*****
.6							.6
.3							.3
.0							.0
.8							.8
.0							.0
.2							.2
.4							.4
1.4							1.4
1.4							1.4
.7							.7
1.4							1.4
.7							.7
1.4							1.4
.8							.8
.6							.6
.6							.6
.6							.6
8.4							8.4
.6							.6
.6							.6
	.0						.0
4.0							4.0
4.0							4.0
.0							.0
	.3						.3
	.3						.3
	1.6						1.6
	.3						.3
	.3						.3
	.3						.3
	1.0						1.0
	.8						.8
	1.0						1.0
	1.0						1.0
	1.2						1.2
	.7						.7
	2.0						2.0
	2.0						2.0

UNICC / SPEC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE BUTADIENE RUBBER PLANT, CAPACITY = 32 000
 LCCATICA-YUPURTALIK
 ANTICIPATED DATE OF COMMISSIONING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CA	UN-WE	UN-CD	1991	1992	1993	1994
45211	G7112 21211 SUNCEX FEED TANK	1	1.1	7.5				7.5
45211	G7112 21211 SUNTHENE FEED TANK	1	1.0	7.1				7.1
45211	G7112 21411 NS A/C WEIGH TANK	1	2.9	2.7				2.7
45211	G7112 21432 ANTIGAYC.MAKE UP WEIGH.T.	1	2.0	15.7				15.7
45211	G7112 22211 NS A/C EMULSION MAKE UP T	1	5.5	5.5				5.5
45211	G7112 22231 ANTIOR.EMUL.MAKE UP TANK	1	5.6	5.5				5.5
45211	G7113 21312 PURIFIED BRINE STGR. TANK	1	1.2	8.2				8.2
45211	G7113 21211 ANTIOR.EMUL.MCLDING TANK	1	1.3	8.6				8.6
45211	G7113 21211 GLLE MCLDING TANK	1	.8	5.4				5.4
45211	G7113 21211 DILUTE CAUSTIC MAKE UP T.	1	1.2	7.8				7.8
45211	G7113 21211 RECYCLE STYRENE STCRAGE	1	3.6	22.7				22.7
45211	G7113 21211 DEFORMER MAKE UP-FEED T.	1	.2	1.6				1.6
45211	G7113 21211 NS A/C CALIBRATICA TANK	1	.4	2.4				2.4
45211	G7113 21211 BLEND STYRENE STCRAGE	1	3.6	22.7				22.7
45211	G7113 21211 ANTIOR.EMUL.CALIB. TANK	1	.6	2.4				2.4
45211	G7113 21211 7 PC. CAUSTIC MAKE UP SUR	1	.7	5.2				5.2
45211	G7113 21211 SUNTHENE CALIBRATIGN TANK	1	.2	1.4				1.4
45211	G7113 21211 DEFORMER MAKE UP-FEED T.	1	.2	1.6				1.6
45211	G7113 21211 DECCM.CAUSTIC TANK	1	2.0	13.2				13.2
45211	G7113 21211 SUNGER CALIBRATIGN TANK	1	.2	1.4				1.4
45211	G7113 21211 50 PERCENT CAUSTIC ST.T.	1	2.9	19.1				19.1
45211	G7113 21211 NS A/C MCLDING TANK	1	1.3	9.2				9.2
45211	G7113 21211 GLLE MAKE UP TANK	1	.9	6.2				6.2
45211	G7113 21312 CATALYST CHARGE TANK	1	.1	.6				.6
45211	G7113 21312 MCCIFIER CHARGE TANK	1	.1	.7				.7
45211	G7113 21511 RESLURRY TANK	1	.5	3.1				3.1
45211	G7113 21511 COAGULATION TANK	1	.5	3.4				3.4
45211	G7113 21911 SERUM TANK	1	.3	2.2				2.2
45211	G7113 21911 LATEX CALIBRATIGN TANK	1	.4	1.0				1.0
45211	G7113 21911 SOAP CCONVERSION TANK	1	1.3	9.2				9.2
45211	G7113 21911 ALLM MAKE UP TANK	1	1.1	9.7				9.7
45211	G7113 21911 RESLURRY OVERFLCb TANK	1	.0	.7				.7
45211	G7113 21911 ALLM MCLDING TANK	1	.5	3.4				3.4
45211	10113 21211 TBC SCLUTION STCRAGE	1	.2	1.1				1.1
45211	10213 23211 RECYCLE BD STCRAGE	1	23.1	146.0				146.0
45211	13113 21211 SULPHRIC ACID STCRAGE T.	1	4.2	26.5				26.5
45241	05162 21612 FATTY ACID WEIGH TANK	1	2.0	15.7				15.7
45241	05163 21211 DESCREER OIL SURGE DRUM	1	1.6	10.5				10.5
45241	05163 21211 180 MM. KNECK OUT DRUM	1	1.3	8.6				8.6
45241	05163 21211 POLYGLYCOL TANK	1	.3	2.3				2.3
45241	05163 21211 KOM WEIGH TANK	1	.1	.9				.9
45241	05163 21211 BD WATER DECANTER	1	3.3	20.5				20.5
45241	05163 21211 820 MM. KNECK OUT DRUM	1	1.3	8.6				8.6
45241	05103 21211 BD CALSTIC DECANTER	1	3.3	20.5				20.5
45241	05163 21211 ABSORBER VENT DRUM	1	.5	3.4				3.4
45241	05163 21211 NACH WEIGH TANK	1	.1	.6				.6
45241	05163 21212 SEPARATOR AT VACUUM FL.DRM	1	.3	1.8				1.8
45241	05163 21212 VACUUM CONDENSER SEPAR.	1	.6	4.1				4.1
45241	05103 21212 BECSTER CONDENSER SEPAR.	1	.4	2.8				2.8
45241	05163 21212 SEPARATOR AT FLASH DRUM	1	.3	1.8				1.8
45241	05103 21611 ACTIVATOR MAKE UP TANK	1	.3	2.3				2.3
45241	05163 21911 SHCRTSTCP MAKE UP TANK	1	.6	2.6				2.6
45241	05103 21911 SHCRTSTCP FEED TANK	1	.2	1.2				1.2
45241	05163 21911 ACTIVATOR FEED TANK	1	.1	1.0				1.0
45241	05363 21911 SOAP MAKE UP TANK	1	1.7	10.8				10.8
45241	05363 21911 SOAP FEED TANK	1	1.0	6.9				6.9
45241	05363 22211 FOAM KNECK OUT DRUM	1	7.2	45.5				45.5
45241	05463 23211 SPARE FOR DRUMS	1	10.2	64.4				64.4
45241	05463 23211 UNIMMULATOR BD SURGE	1	10.2	64.4				64.4

TON/YEAR

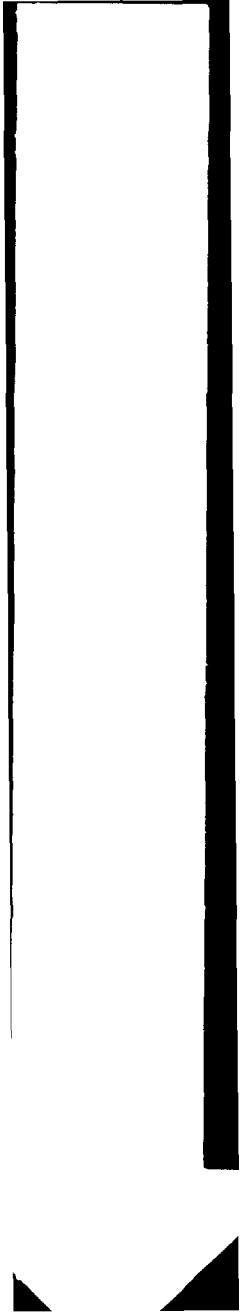
1995	1996	1997	1998	1999	2000	TOT_CO
.....
						7.5
						7.1
						2.7
						15.7
						5.5
						5.5
						8.2
						8.6
						5.4
						7.8
						22.7
						1.6
						2.4
						22.7
						2.4
						5.2
						1.4
						1.6
						13.2
						1.4
						19.1
						4.2
						6.2
						.6
						.7
						3.1
						3.4
						2.2
						1.0
						9.2
						4.7
						.7
						3.4
						1.1
						146.0
						26.5
						15.7
						10.5
						8.6
						2.3
						.4
						20.5
						8.6
						20.5
						3.4
						.6
						1.8
						4.1
						2.8
						1.8
						2.3
						2.6
						1.2
						1.0
						10.8
						6.9
						45.5
						64.4
						64.4

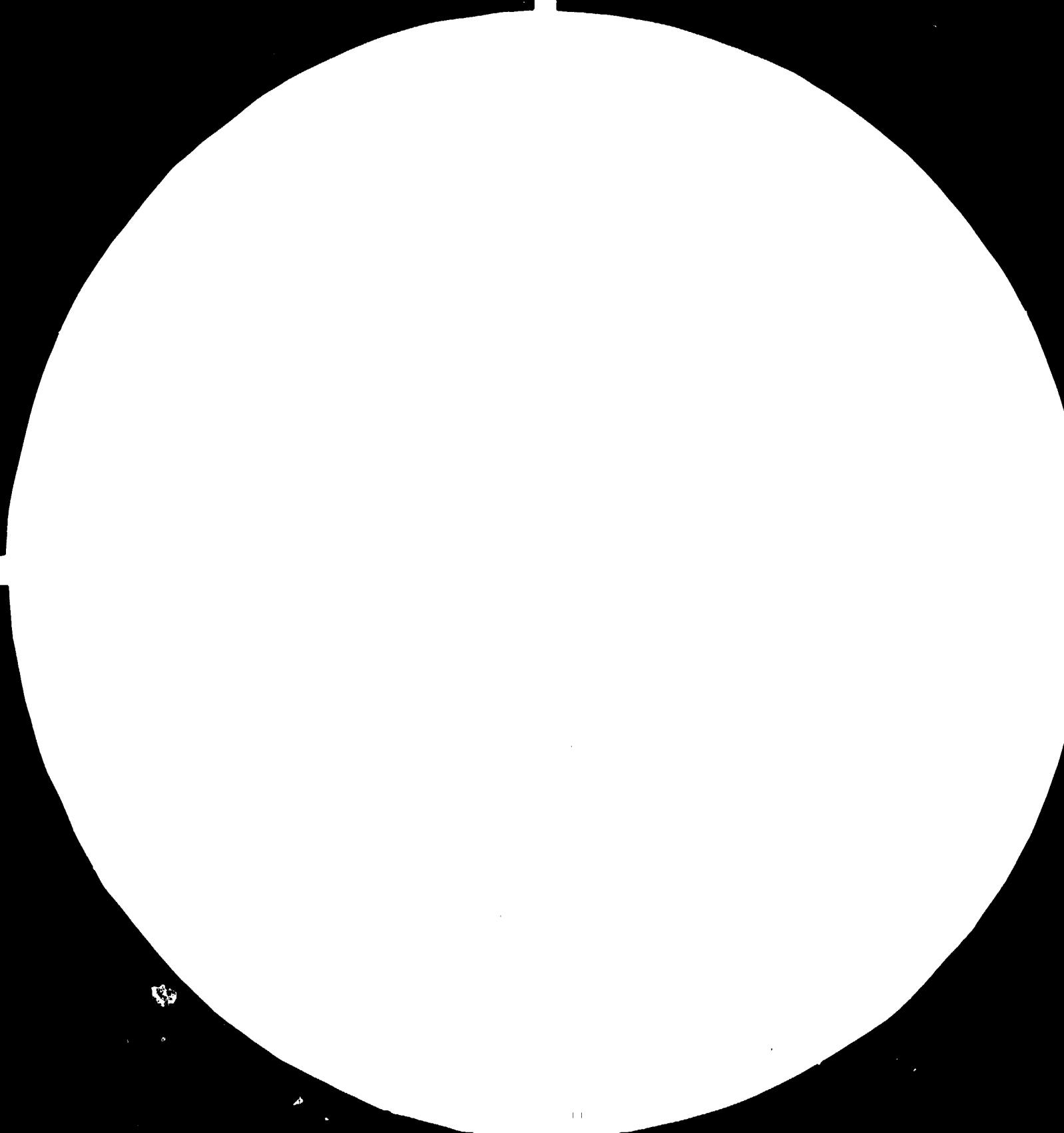
UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW STYRENE BUTADIENE RUBBER PLANT, CAPACITY
 LOCATION=YUMURTALIK
 ANTICIPATED DATE OF COMMISSING= 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CO	1991	1992	1993
74220 01241	21612 SCAP SOLUTION CHARGE PUMP	2	.3	1.7			
74220 01241	21612 BATCH SHORTSTOP CHARG. PU.	1	.3	1.4			
74220 01242	20602 ABSORBER OIL PUMP	2	.0	1.9			
74220 01312	21112 RESLURRY PUMP	2	.4	4.7			
74220 01315	20602 CALSTIC CIRCULATION PUMP	2	.0	2.5			
74220 01321	21612 RECY.BD RECIR.TRANS.PUMP	1	.2	1.9			
74220 01325	11912 50 PERCENT CAUSTIC TR.PU.	1	.4	3.0			
74220 01325	21112 SERUM PUMP	2	.7	5.6			
74220 01326	21612 LATEX TRANSFER PUMP	2	.7	2.0			
74220 01328	21112 LATEX CALIBR. RETURN PUMP	1	.7	2.0			
74220 01328	21112 COAGULATION FEED LATEX PU	2	.7	2.0			
74220 01328	21112 LATEX TRANSFER PUMP	1	.7	2.0			
74220 01336	21612 LATEX CLAR. FEED PUMP	2	.7	2.0			
74220 01341	21612 BLEND B.C. CHARGE PUMP	2	.4	3.1			
74220 03121	21112 NS A/O EMULSION FEED PUMP	2	.3	2.0			
74220 03121	21612 SULPHURIC ACID PUMP	2	.3	2.0			
74220 03121	21112 GLE FEED PUMP	2	.3	2.0			
74230 00131	21632 DEFORMER PUMP	2	4.2	1.0			
74230 00236	21612 SUNDEX FEED PUMP	2	.3	1.0			
74230 00236	21612 SUNTHENE TRANS. PUMP	2	.3	1.0			
74240 01001	00612 BCCST. CONVEYER. EJECTION	1	.0	1.0			
74312 01152	01002 180 MM COMPRESSOR	2	2.0	1.0			
74313 01252	01002 820 MM COMPRESSOR	2	2.0	2.0			
74342 10101	20902 AIRVEYER DRAIN DISCHARGE	1	.0	1.0			
74362 70000	01002 LATEX STRIPPER	1	.0	1.0			
74426 01110	21602 WEIGH SCALE FEED CONVEYOR	1	.3	1.0			
74426 30110	21601 POWER CONVEYOR	2	1.0	1.0			
74426 30120	21601 GRAVITY CONVEYOR	1	.3	1.0			
74426 30120	21601 GRAVITY CONVEYOR	1	.3	1.0			
74426 30120	21601 REJECT CONVEYOR	1	.3	1.0			
74426 30120	21601 GRAVITY SURGE CONVEYOR	1	1.0	1.0			
74426 30140	21601 2 MAN TRANSFER CONVEYOR	1	.8	1.0			
74426 40150	11712 CHEFFER CONVEYOR	1	1.0	1.0			
74426 40150	11712 DECAT. EXTRUDER FEED CONDO.	1	1.0	1.0			
74426 40150	11712 CHEFFER CONVEYOR	1	1.2	1.0			
74426 75150	11712 VIBRATING CONVEYOR	1	2.7	1.0			
74525 01101	01012 BALER WEIGH SCALES	1	.0	13.0			
74525 01101	01012 BALER CHECK WEIGH SCALES	1	2.0	13.0			

= 32 000TON/YEAR

1994	1995	1996	1997	1998	1999	2000	TOT_CO
3.4							3.4
1.4							1.4
3.8							3.8
9.4							9.4
5.0							5.0
1.8							1.8
2.2							2.2
11.6							11.6
4.8							4.8
2.4							2.4
4.8							4.8
2.4							2.4
4.8							4.8
23.0							23.0
4.4							4.4
3.2							3.2
1.4							1.4
1.8							1.8
2.4							2.4
2.4							2.4
	.0						.0
36.6							36.6
50.0							50.0
28.4							28.4
	1.9						1.9
	4.2						4.2
	11.0						11.0
	4.2						4.2
	4.2						4.2
	5.1						5.1
	6.5						6.5
	5.7						5.7
	6.9						6.9
	6.9						6.9
	8.2						8.2
	4.8						4.8
	13.3						13.3
	17.6						17.6







40 28

25

32

22

36

4

20



18



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-
STANDARD REFERENCE MATERIAL 1900A
1963-A (PREVIOUS TEST CHART No. 2)

12167

(14 of 17)

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034**

**Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry**

**Vol. XIII - Technical data for
(EO) Ethylene Oxide
(EG) Ethylene Glycol**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034
TURKEY

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. XIII - Technical data for
(EO) Ethylene Oxide
(EG) Ethylene Glycol

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey

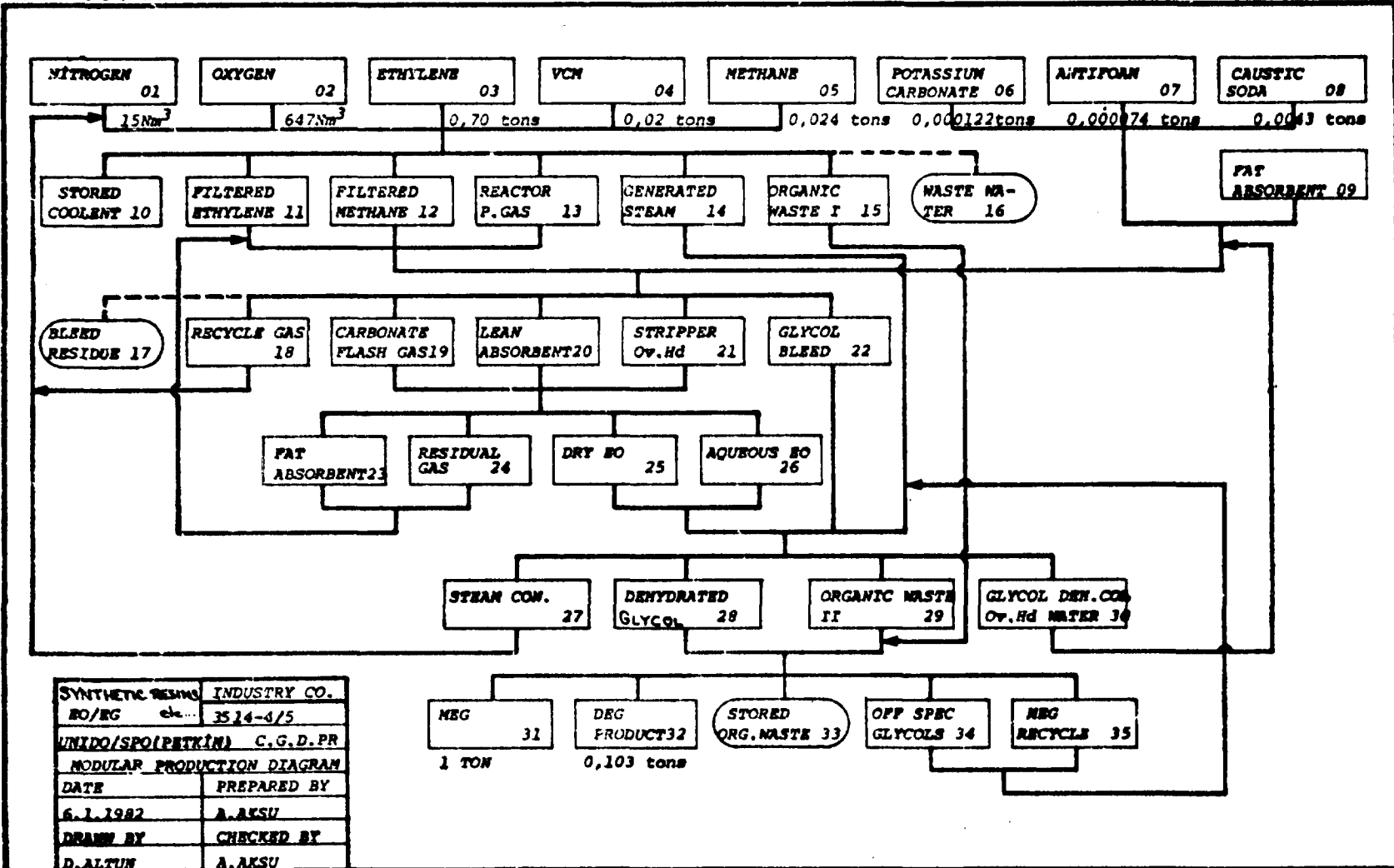
United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial Development Organization which does not, therefore, necessarily share the views presented.

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.



SYNTHETIC RESINS	INDUSTRY CO.
BO/EG	3514-4/5
UNİDO(SPO(PETKİM))	C.G.D.PR
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
6.1.1982	A.AKSU
DRAWN BY	CHECKED BY
D.ALTUN	A.AKSU

MEG	DEG	STORED	OFF SPEC	MEG
31	PRODUCT	ORG.WASTE	GLYCOLS	RECYCLE
1 TON	0,103 tons	33	34	35

Rev.	Terik	Isi

Form 113/70 B-2/1980

25 50 27
27 50 31
NO REAKSI
NO FOLIOKASION



PETKİM PETROKİMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND
ACTIVITIES FOR SO/MS PLANT

01 TO 12

NO REACTION

13 TO 20

NO RECOVERY

20 TO 25

NO PURIFICATION

Rev.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Form No: H3.9.9 B-2/1978

**UNIDO /SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT**

**INDUSTRY ACTIVITIES CHART
Part 13 and 14 EO/EG**

IND CODE : 3514-3 and 3514-4
IND NAME : SYNTHETIC RESINS of
EO/EG

PREP BY	CHECKED	APPR BY

PROD S	PRODUCT NAME / PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
12	REACTOR PRODUCT GAS	1	EO REACTION BY DIRECT OXIDATION USING OXYGEN	TUBULAR EO REACTOR	119-250 m ³	1	119 m ³
						2	186 m ³
		2	EO REACTION BY DIRECT OXIDATION USING AIR	PURGE EO REACTOR	150-250 m ³	1	150 m ³
						2	200 m ³
20	STRIPPER OVERHEAD	1	EO RECOVERY BY SCRUBBING	EO STRIPPER	190-500 m ³	1	190 m ³
						2	350 m ³
						3	500 m ³
		2	EO RECOVERY BY FLASHING	EO STRIPPER	200-500 m ³	1	200 m ³
						2	350 m ³
						3	500 m ³
		3	EO RECOVERY BY DOUBLE SEPARATION	EO STRIPPER	200-500 m ³	1	200 m ³
						2	350 m ³
						3	500 m ³
25	AQUEOUS EO	1	EO PURIFICATION BY INTERMEDIATE STRIPPING	EO PURIFICATION COLUMN	22-200 m ³	1	22 m ³
						2	100 m ³
						3	150 m ³
						4	200 m ³
		2	EO PURIFICATION BY WASHING	EO PURIFICATION COLUMN	22-200 m ³	1	22 m ³
						2	100 m ³
						3	150 m ³
						4	200 m ³
27	DEHYDRATED GLYCOL	1	EG REACTION AND DEHYDRATION	GLYCOL REACTOR	13,5-50 m ³	1	13,5 m ³
						2	25 m ³
						3	35 m ³
						4	50 m ³
31	NEG	1	EG PURIFICATION	NEG PURIFICATION COLUMN	100-300 m ³	1	100 m ³
						2	180,5 m ³
						3	250 m ³
						4	300 m ³

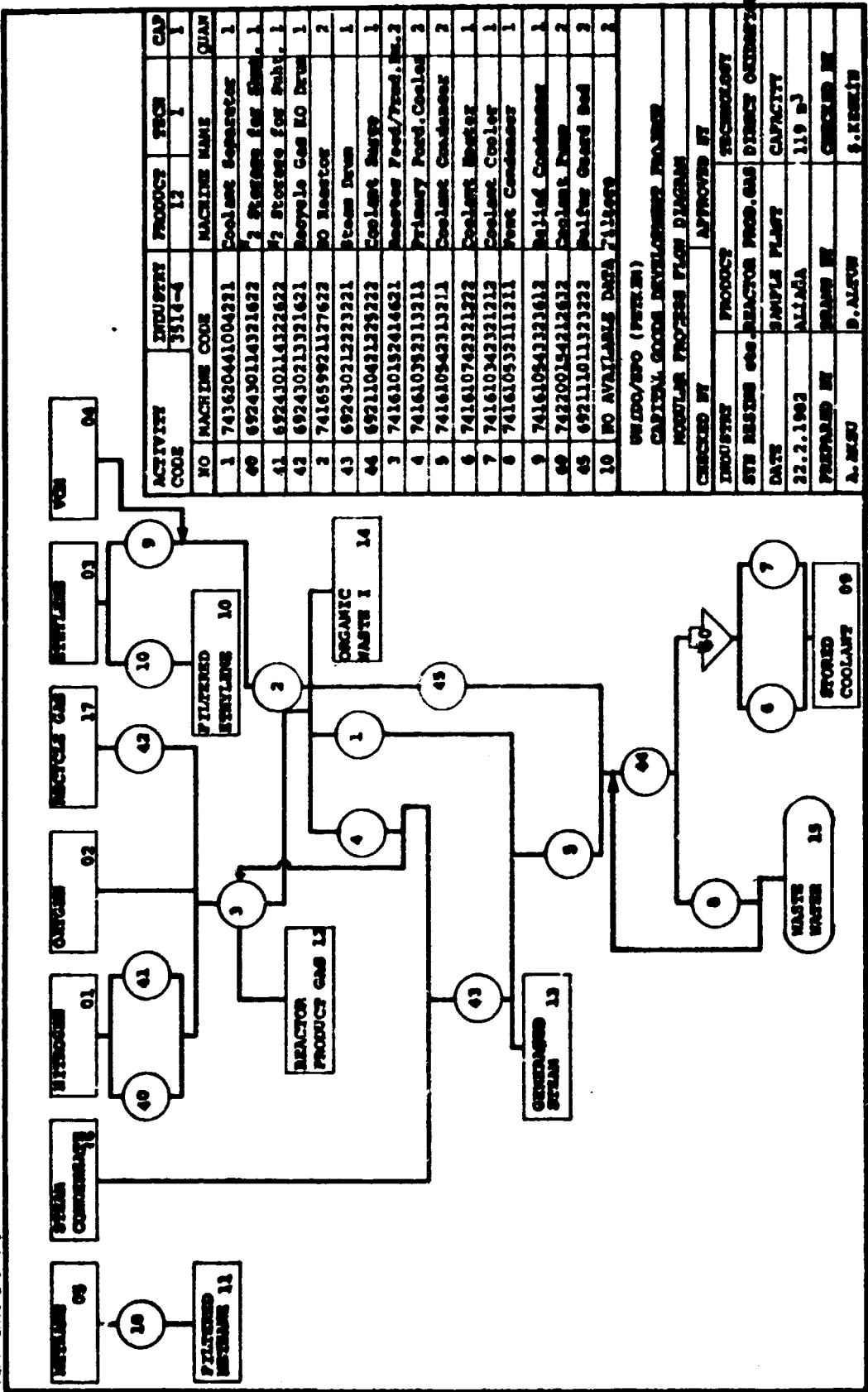


PETKIM PETROKIMYA A.Ş.

-4-

Rev.	Tarih	İsmi

Şişim 11/1979 B-2-1976



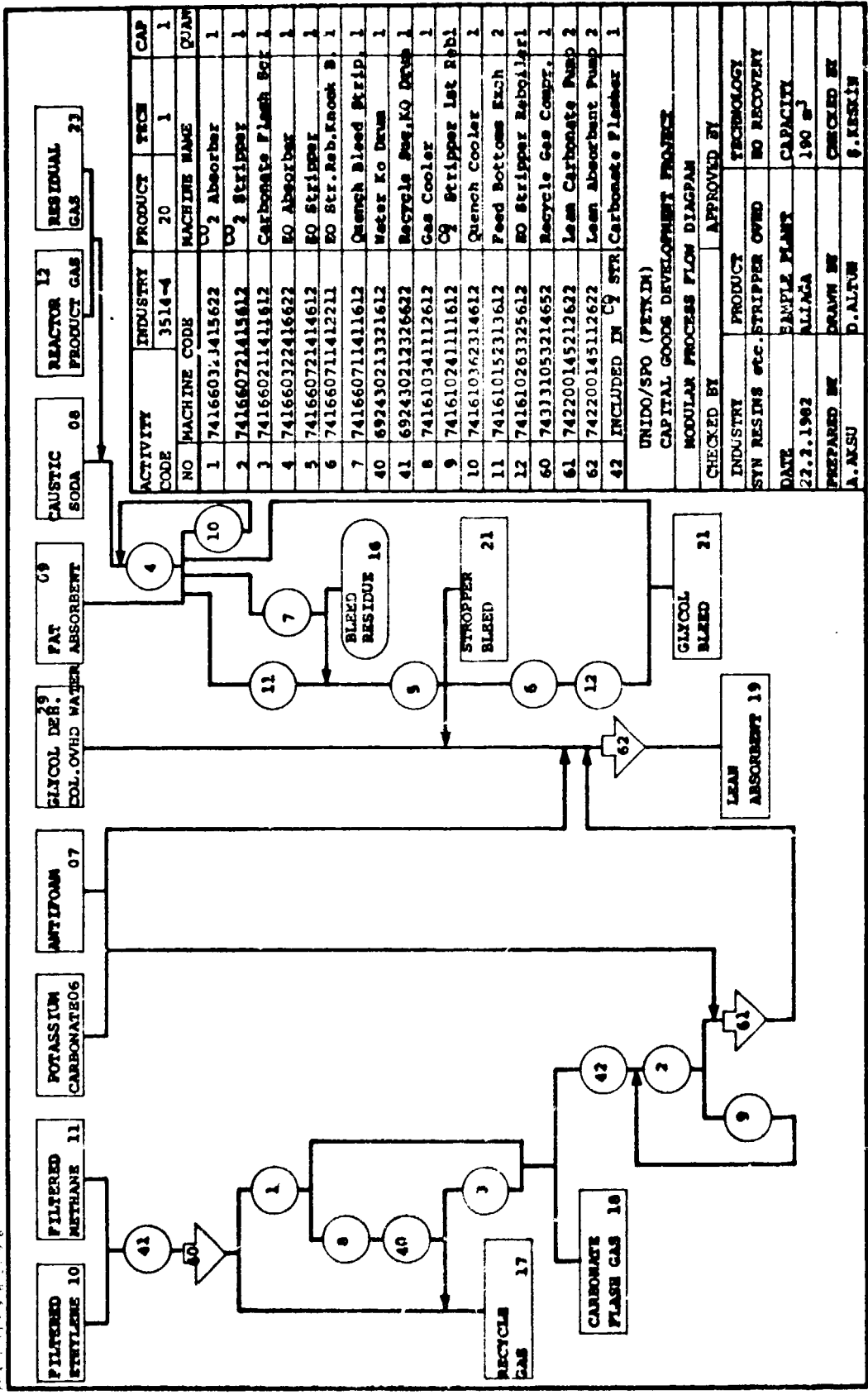
ACTIVITY CODE	INDUSTRY CODE	PRODUCT	TECH	CAP
3514-4	3514-4	13	1	1
NO	MACHINE CODE	MACHINE NAME	QUAN	
1	741620441004221	Coolant Separator	1	
00	6924301143221622	2 Storage for Sph.	1	
41	6924301143222622	2 Storage for Sph.	1	
42	6924302133221621	Recycle Gas IO Drum	1	
2	741659921127622	20 Reactor	2	
43	692430212223221	Steam Drum	1	
44	692110423223222	Coolant Sump	1	
3	741610152414621	Reactor Feed/Prod. M.	2	
4	74161058213211	Primary Prod. Cooler	2	
5	74161094213211	Coolant Condenser	2	
6	74161074213211	Coolant Mixture	1	
7	74161034213211	Coolant Cooler	1	
6	74161093213211	Feed Condenser	1	
9	74161054213211	Ballied Condenser	1	
00	742200154212622	Coolant Pump	2	
05	692111011223222	Ballied Guard Bed	3	
10	NO AVAILABLE DATA	7116222	1	

DESIGN/DEVELOPER (PETKIM)	
CAPITAL CODE DEVELOPMENT PROJECT	
MODULAR PROCESS FLOW DIAGRAM	
CHECKED BY	APPROVED BY
INDUSTRY	PRODUCT
STE MILLING GAS REACTOR PROD. GAS DIRECT OXYGEN	TECHNOLOGY
DATE	SAMPLE PLANT
22.2.1963	ALMGA
PREPARED BY	CAPACITY
A. NISU	119 B
	CHECKED BY
	S. KEMAL

Rev	Issued	Issued



PETKIM PETROKIMYA A.Ş.



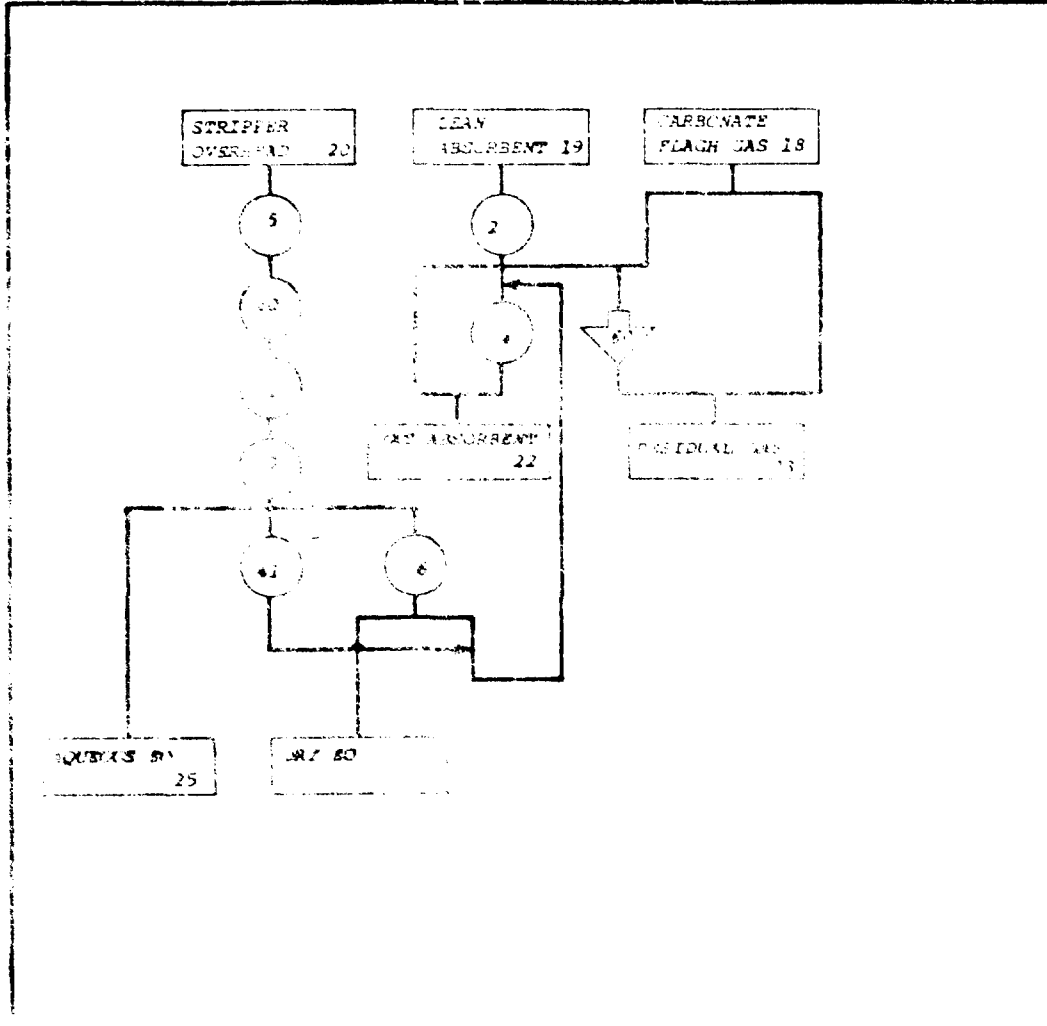
ACTIVITY CODE	INDUSTRY	PRODUCT	TRCH	CAP
NO	3514-4	20	1	1
MACHINE NAME				
1	74166032415622	CO 2 Absorber		1
2	74166072415612	CO 2 Stripper		1
3	74166021414912	Carbonate Flash Scr 1		1
4	74166032415622	CO Absorber		1
5	74166072414612	CO Stripper		1
6	74166071412211	CO Str. Reb. Knock B		1
7	74166071411612	Quench Bleed Strip.		1
40	692430213321612	Water Ko Drum		1
41	692430213326622	Recycle Scr. KO Drum		1
8	741610341112612	Gas Cooler		1
9	741610241111612	CO Stripper 1st Rebl		1
10	741610362314612	Quench Cooler		1
11	741610152313612	Feed Bottoms Exch		2
12	741610263325612	CO Stripper Reboiler		1
60	743331053214652	Recycle Gas Compt.		1
61	742200145212622	Lean Carbonate Pump 2		2
62	742200145112622	Lean Absorbant Pump 2		2
42	INCLUDED IN CO STR.	Carbonate Flasher		1

UNIDO/SPO (PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 MODULAR PROCESS FLOW DIAGRAM
 CHECKED BY: _____ APPROVED BY: _____
 INDUSTRY: _____ PRODUCT: _____ TECHNOLOGY: _____
 SYN RESINS etc. STRIPPER OWED: _____ NO RECOVERY: _____
 DATE: 22.2.1982 SAMPLE PLANT: _____ CAPACITY: 190 g³
 PREPARED BY: D. ALTUN DRAWN BY: _____ CHECKED BY: _____
 A. AKSU S. KESKIN

Rev	Tarikh	Isim



PETKIM PETROKIMYA A S



ACTIVITY CODE	INDUSTRY	PRODUCT	TSPH	UNIT
	0514-4	25	1	1
NO	MACHINE CODE	MACHINE NAME		
1	04106 04114 12612	Light Ends Column		
2	04106 03114 11612	Res EO Absorber		
3	04106 05214 13212	EO Purification		
4	04106 03114 11212	Vent Absorber		
4	04111 04113 24211	EO Stripper Tops		
5	04149 05113 21111	High Purify EO R.		
5	04161 05423 13611	EO Stripper Tops		
6	04161 05413 11212	EO Purification		
6	04112 10112 12612	Residual Gas Comp.		

UNIDO /SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

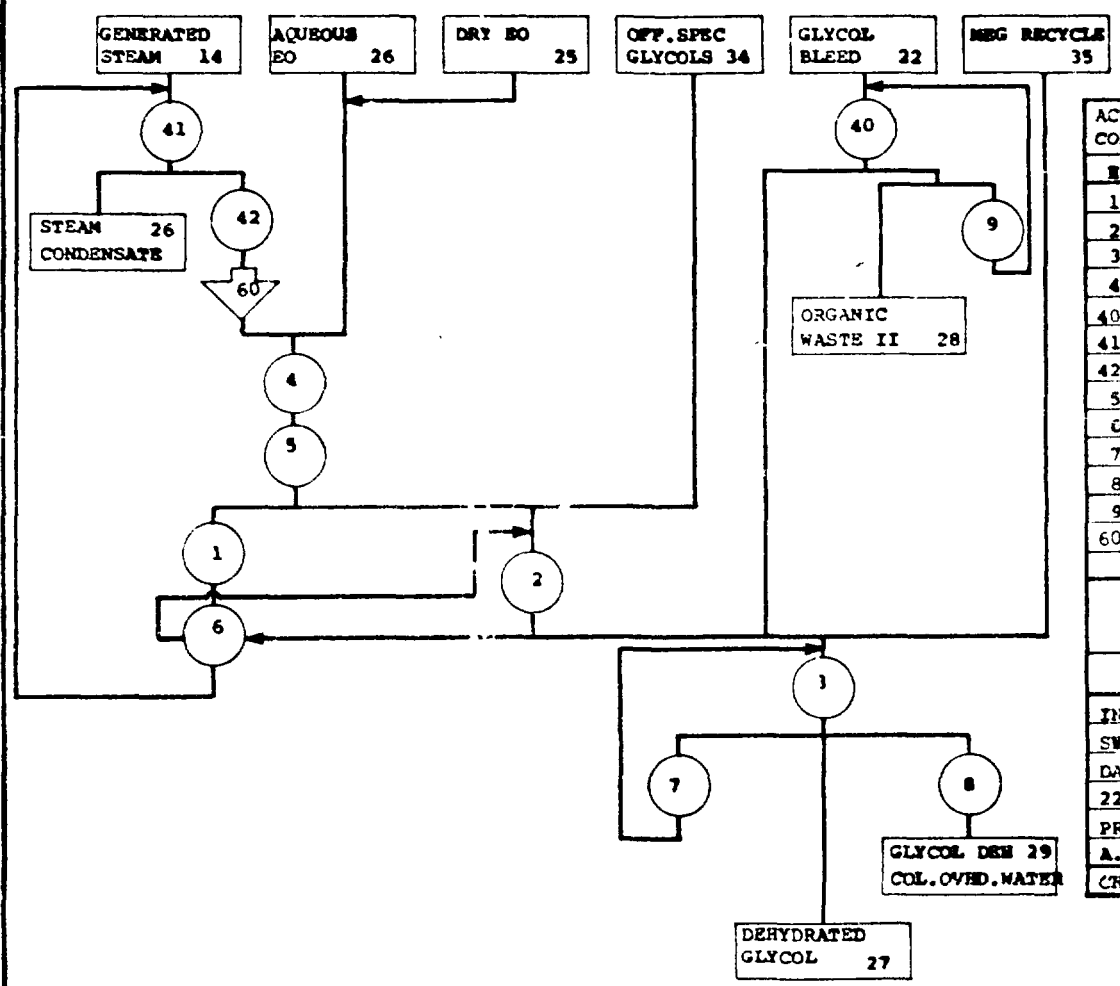
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS, ALK AQUEOUS EO	ALK AQUEOUS EO	EO PURIFICATION
DATE	SAMPLE PLANT	CAPACITY
22.2.2000	PT. PTA	22 MT
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	D. ALIYEV	S. RESKIN
CHECKED BY	APPROVED BY	

Rev	Tarih	İsmi



PETKIM PETROKIMYA A.Ş.

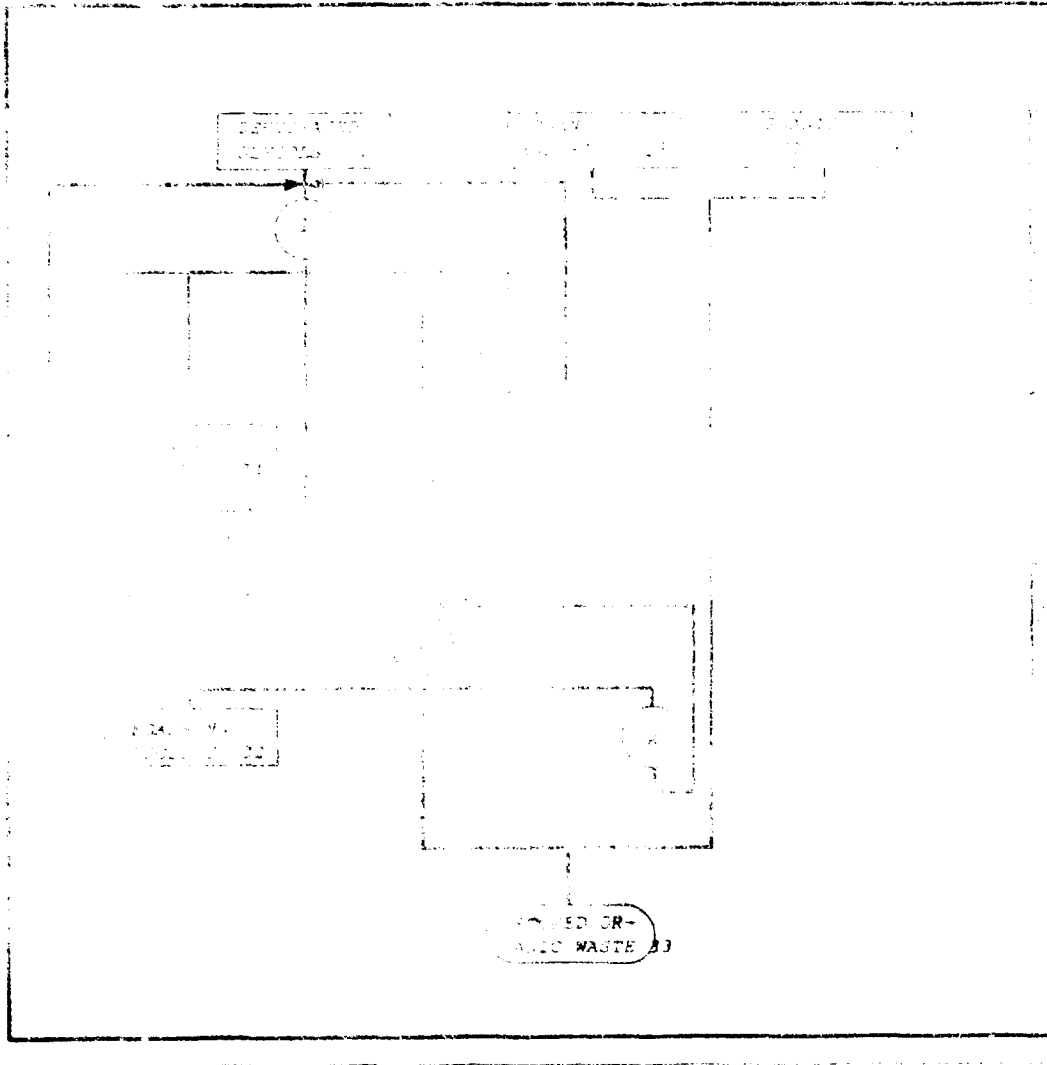


ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3514-5	27	1	1
No	MACHINE CODE	MACHINE NAME	QUAN	
1	741660511413221	Preconcentrator Col.1	1	
2	741660511414211	Glycol Concentrator 1	1	
3	741660511414211	Glycol Dehydrator 1	1	
4	741659911273622	Glycol Reactor 1	1	
40	692111011221211	Glycol Bleed Flash 1	1	
41	692111011222221	Steam Cond. Flash Dr.1	1	
42	692410510225221	Water Storage Drum 1	1	
5	741610763325622	Preconcentrator Hea.1	1	
6	741610263314221	Glycol Conc.Reboiler2	1	
7	741610252313321	Glycol Dehyd Reboiler 1	1	
8	741610542313211	Glycol Dehyd Cond 1	1	
9	741610741312211	Glycol Bleed Fl.Reb.1	1	
60	742200146212632	Water Recycle Pump 1	1	

UNIDO/SPO (PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM		
INDUSTRY	PRODUCT	TECHNOLOGY
SVN RESINS etc.	DEHYDRATED GLY.	REREACTION
DATE	SAMPLE PLANT	CAPACITY
22.2.1982	ALİAĞA	13,5 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AKSU	D.ALTUN	S.PETKİM
CHECKED BY	APPROVED BY	

Area	Part No.	Q'ty





PETKIM PETROKIMYA A.Ş

NO	ADI	GRUP	YER	İL
1	MSP	MSP	...	...
2	MSP	MSP	...	...
3	MSP	MSP	...	...
4	MSP	MSP	...	...
5	MSP	MSP	...	...
6	MSP	MSP	...	...
7	MSP	MSP	...	...
8	MSP	MSP	...	...
9	MSP	MSP	...	...
10	MSP	MSP	...	...

PETKİM

...

...

NO	ADI	GRUP	YER	İL
11	MSP	MSP	...	...
12	MSP	MSP	...	...
13	MSP	MSP	...	...
14	MSP	MSP	...	...
15	MSP	MSP	...	...
16	MSP	MSP	...	...
17	MSP	MSP	...	...
18	MSP	MSP	...	...
19	MSP	MSP	...	...
20	MSP	MSP	...	...

Item	Description	Quantity	Unit	Material	Manufacture	Char. 1	Char. 2	Char. 3	Origin	C	Purchase Cost		CT-1980 Cost		Purch. Year	SITC Code
											Unit	Total	Unit	Total		
1	Coolant	78 t/h	01a3,2m		20,5				I	1	224000	224000	224000	224000	1980	74362 044 1 0 0 4 2 2 1
2	Separator	5,3 m ³	P,40,52		0,9				I	1	9750	9750	12 000	12000	1977	09243 011 4 3 2 1 6 2 2
3	High speed	11 m ³	49,5		14,1				I	1	22750	22750	28100	28100	1977	09243 011 4 3 2 2 6 2 2
4	Recycle Gas	37,3 m ³	1021,0		21				I	1	31100	31100	38400	38400	1977	09243 021 3 3 2 1 6 2 1
5	K.O Drum	119 m ³	P,40,52		23,5				I	2	582000	1044000	620000	1240000	1977	74165 992 1 1 2 7 6 2 2
6	EO Reactor	19 m ³	P,40,52		18,5				I	1	119000	111900	111900	111900	1980	09243 021 2 2 2 2 2 1 1
7	Steam Drum	19 m ³	P,40,52		5A				I	1	340500	340500	330500	330500	1980	09211 042 1 2 2 5 2 2 2
8	Coolant	190 m ³	01a3,2m		37,9				I	2	187100	374200	188350	216700	1977	74161 010 3 4 1 4 6 2 1
9	Surge	0,5 m ³	0,5 m ³		21,5				I	1	19000	19000	19000	19000	1980	74161 010 2 3 1 3 2 1 1
10	Primary pro-	0,5 m ³	0,5 m ³		13,5				I	2	87000	174000	87000	174000	1980	74161 010 2 3 1 3 2 1 1
11	Surge	0,5 m ³	0,5 m ³		1,3				I	1	19300	19300	19300	19300	1977	74161 010 2 3 1 3 2 1 1
12	Primary pro-	0,5 m ³	0,5 m ³		4,3				I	1	15000	15000	15000	15000	1977	74161 010 2 3 1 3 2 1 1
13	Surge	0,5 m ³	0,5 m ³		4,3				I	1	15000	15000	15000	15000	1977	74161 010 2 3 1 3 2 1 1
14	Relief con-	0,5 m ³	0,5 m ³		4,3				I	1	15000	15000	15000	15000	1977	74161 010 2 3 1 3 2 1 1
15	Relief con-	0,5 m ³	0,5 m ³		10,5				I	1	275000	275000	275000	275000	1977	74161 010 2 3 1 3 2 1 1
16	Relief con-	0,5 m ³	0,5 m ³		9,81				I	2	147000	294000	294000	294000	1977	74161 010 2 3 1 3 2 1 1
17	Surge	0,5 m ³	0,5 m ³		19,8				I	2	365400	730800	541000	1485000	1977	09211 101 1 3 2 3 2 2 2
18	Surge	0,5 m ³	0,5 m ³													
19	Surge	0,5 m ³	0,5 m ³													

NO AVAILABLE DATA

Item No.	Description	Quantity	Unit	Material	Price	Total	Order No.	Date
1	100 m Ft. Plate Impeller	8	sq	315	20000	20000	1977 74108 03	2 3 4 1 5 6 7 7
2	244 m Plate Impeller	8	sq	345	197000	197000	1977 74106 07	2 1 4 1 5 6 1 7
3	Carbonate Filter	15	kg	13000	19500	19500	1977 74106 02	1 1 4 1 1 6 1 7
4	Water Absorber	400	kg	11500	47750	47750	1977 74106 03	2 4 1 6 6 2 7
5	Water Absorber	100	kg	14100	14100	14100	1977 74106 07	2 1 4 1 4 6 1 7
6	Water Absorber	15	kg	37500	37500	37500	1980 74106 07	1 1 4 1 2 7 1 7
7	Water Absorber	13650	kg	13650	13650	13650	1977 74106 07	1 1 4 1 1 6 1 7
8	Water Absorber	19450	kg	19450	19450	19450	1977 69743 02	1 3 3 7 1 5 1 7
9	Water Absorber	80000	kg	80000	80000	80000	1977 69743 02	1 3 3 7 1 5 1 7
10	Water Absorber	11000	kg	11000	11000	11000	1977 74106 07	1 1 4 1 2 7 1 7
11	Water Absorber	13650	kg	13650	13650	13650	1977 74106 07	1 1 4 1 1 6 1 7
12	Water Absorber	19450	kg	19450	19450	19450	1977 69743 02	1 3 3 7 1 5 1 7
13	Water Absorber	80000	kg	80000	80000	80000	1977 69743 02	1 3 3 7 1 5 1 7
14	Water Absorber	11000	kg	11000	11000	11000	1977 74106 07	1 1 4 1 2 7 1 7
15	Water Absorber	13650	kg	13650	13650	13650	1977 74106 07	1 1 4 1 1 6 1 7
16	Water Absorber	19450	kg	19450	19450	19450	1977 69743 02	1 3 3 7 1 5 1 7
17	Water Absorber	80000	kg	80000	80000	80000	1977 69743 02	1 3 3 7 1 5 1 7
18	Water Absorber	11000	kg	11000	11000	11000	1977 74106 07	1 1 4 1 2 7 1 7
19	Water Absorber	13650	kg	13650	13650	13650	1977 74106 07	1 1 4 1 1 6 1 7
20	Water Absorber	19450	kg	19450	19450	19450	1977 69743 02	1 3 3 7 1 5 1 7
21	Water Absorber	80000	kg	80000	80000	80000	1977 69743 02	1 3 3 7 1 5 1 7
22	Water Absorber	11000	kg	11000	11000	11000	1977 74106 07	1 1 4 1 2 7 1 7
23	Water Absorber	13650	kg	13650	13650	13650	1977 74106 07	1 1 4 1 1 6 1 7
24	Water Absorber	19450	kg	19450	19450	19450	1977 69743 02	1 3 3 7 1 5 1 7
25	Water Absorber	80000	kg	80000	80000	80000	1977 69743 02	1 3 3 7 1 5 1 7

Water Absorber

Item No.	Description	Unit	Material	Type	Quantity	Unit Cost	Material	Origin	Purchase Cost		Ct. 1980 Cost		Proc. Year	SIC Code											
									Unit	Total	Unit	Total		12345	67	8	9	10	11	12	13	14	15		
1	Light Ends column	9,1 m ³	P:4,35atm	Temp:160C	PB	8	SS	6 mm	I	1	23200	23200	28650	28650	1977	74166	D4	1	1	4	1	2	6	1	2
2	Residual EO Absorber	5,4 m ³	P:4,35atm	Temp:160C	PB	4	SS	5 mm	I	1	15600	15600	19250	19250	1977	74166	D3	1	1	4	1	2	6	1	2
3	EO purification column	22 m ³	P:5,3kg/cm ²	Temp:170C	PB	22	CS	15 mm	I	1	133000	133000	133000	133000	1980	74166	D5	2	1	4	1	3	2	1	2
4	Vent absorber	3,6 m ³	P:3,7 atm	Temp: 60C	PB	4	CS	10 mm	T	1	25800	25800	25800	25800	1980	74166	D3	1	1	4	1	1	2	1	1
40	EO stripper	78 m ³	Dia:3,6 m	Temp: 60C	Cy	27	CS	15 mm	T	1	163000	163000	163000	163000	1980	69211	D4	1	1	3	2	4	2	1	1
4A	Tops surge High purity EO run-down vessel	EO 30 m ³	P:5,3kg/cm ²	Temp: 60C	Cy	15	CS	9 mm	T	3	62800	188400	93050	279150	1977	69243	D5	1	1	3	2	3	2	1	1
5	EO stripper	492 m ²	SD: 1,3 m	TL: 6 m	FST	15,2	SS	12 mm	T	1	92000	92000	92000	92000	1980	74161	D5	4	2	3	1	3	6	1	1
6	EO purification denser	234 m ²	SD: 0,8 m	TL: 6 m	FST	2,6	CS	10 mm	I	1	23200	23200	23200	23200	1980	74161	D5	4	1	3	1	2	2	1	2
60	Residual gas compressor	0,72m ³ /min	P:15,9kg/cm ²		H	4	CSC	3 Ton	I	2	10000	184000	137350	274700	1977	74313	D0	1	3	2	1	2	6	3	2

Note: all has. equipment without 2 machine plate. thickness for plate fabricate equipments.

ACTIVITY CODE: 301452744

ITEM	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	DATE	YEAR	PURCH CODE	SITC CODE	CE, 1960 CODE		FURNITURE CODE		ELECTRICAL CODE		MECHANICAL CODE		PLUMBING CODE		PAINTING CODE		OTHER CODE	
										14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Pre-conc- 21.4 m ² P:10.0 date Temp:205c	13	CS	14600	184600	184600	1980	4166 DS	1.4.1.3.2.1														
2	Glycol con- 03 m ³ P: 6.9 date Temp:195c	31	PB	187500	187500	187500	1980	4166 DS	1.1.4.1.4.2.1														
3	Hydrator 91.25 m ³ P: 0.1 date Temp:190c	40	PB	242000	242000	242000	1980	4166 DS	1.1.4.1.4.2.1														
4	Glycol bleed 13.5 m ³ P: 4.1 atm. NC	17.5	SS	41600	41600	41600	1977	4165 09	1.1.2.7.3.6.2														
5	Glycol bleed 6.5 m ³ DIA: 2.5m Temp:190c	7	CS	44200	44200	44200	1980	09211 10	1.1.3.2.1.2.1														
6	Blow down 23.5 m ³ DIA: 1.0m Temp:190c	16	CY	96800	96800	96800	1980	09211 10	1.1.3.2.2.2.1														
7	Water storage 60 m ³	56	CY	339000	339000	339000	1980	09241 05	1.0.2.3.5.2.2.1														
8	Pre-conc 15:1569 : SD: 2.0m DIA: 6 m	78	SS	307600	307600	307600	1977	4161 07	6.3.3.5.6.2.2														
9	Water heater	2	CS	215000	430000	430000	1980	4161 02	6.3.3.1.4.2.2.1														
10	Glycol bleed 45.5 m ³ SD: 2.45m DIA: 6 m	1	CS	82300	82300	82300	1980	4161 02	5.2.3.1.3.2.2.1														
11	Glycol bleed 13.6 m ³ SD: 1.6 m DIA: 6 m	1	CS	82300	82300	82300	1980	4161 02	5.2.3.1.3.2.2.1														
12	Glycol bleed 14.2 m ³ SD: 1.1 m DIA: 6 m	1	CS	85900	85900	85900	1980	4161 05	4.2.3.1.3.2.1.1														
13	Glycol bleed 4.28 m ³ SD: 0.45m DIA: 6 m	1	CS	39400	39400	39400	1980	4161 07	4.1.3.1.2.2.1.1														
14	Water recycle 102 m ³ DIA: 1.38 m	1	CSC	30700	30700	30700	1977	48050	48050	48050	1977	74220 01	4.6.2.1.6.3.2										

ACTIVITY CODE: 301452744

UNICE / SPECIFIKING CAPITAL GOODS DEVELOPMENT PROJECT EQUIPMENT REQUIREMENT OF THE NEW ETYLENE GRIDE/GLYCOL PLANT, CAPACITY = 68 000TON/YEAR ACCATIARA-VULMURALIA

ANTICIPATED DATE OF COMMISSING= 1993 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.-A DOLLARS (11900) EGP-DEPARTMENT-PEIKIN / ANKARA

Table with columns: S1IC CODE, BASIC MACHINE NAME, QTY, UN-CO, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 101_ME. Rows list various equipment items like STRIPPERS, RECYCLERS, and HEATERS with their respective quantities and costs over time.

UNICC / SPEC (ETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW ETHYLENE OXIDE/GLYCOL PLANT, CAPACITY = 68 000 TON/YEAR
LOCATION=YUPLATLIK
ANTICIPATED DATE OF COMMISSINING= 1995
UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
EGP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	GR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_ME
74362 04410 04221	COCLANT SEPARATOR	1	26.5	224.0					26.5						26.5

UNICEL / SOCIETRIUM
 CAPITAL DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE METHYLENE CHLORIDE/ETHYLENE GLYCOL PLANT CAPACITY = 68 COST/TON/YEAR

UNIT	DATE	CF	COMMISSIONING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTL
NO.	CDR	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S. DOLLARS (1980)																				
UNICEL CODE	BASIC MACHINE NAME	CF	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
6211	6211 0413 20211 EC STRIPPER TOPS SURGE	1	27.0	103.0																103.0
6211	6211 0413 20221 GULLANT SURGE	1	50.0	330.5																330.5
6211	6211 0413 21211 GYCLC W/EE FLASHER	1	7.0	44.2																44.2
6211	6211 0413 22211 STEAM CONC. FLASH DRUM	2	14.0	94.8																94.8
6211	6211 0413 23211 STEAM CONC. FLASH DRUM	2	19.0	55.0																110.0
6241	6241 0312 23221 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23222 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23223 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23224 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23225 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23226 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23227 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23228 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23229 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23230 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23231 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23232 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23233 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23234 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23235 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23236 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23237 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23238 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23239 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23240 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23241 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23242 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23243 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23244 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23245 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23246 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23247 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23248 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23249 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23250 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23251 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23252 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23253 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23254 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23255 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23256 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23257 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23258 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23259 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23260 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23261 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23262 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23263 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23264 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23265 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23266 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23267 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23268 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23269 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23270 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23271 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23272 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23273 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23274 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23275 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23276 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23277 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23278 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23279 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23280 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23281 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23282 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23283 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23284 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23285 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23286 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23287 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23288 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23289 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23290 WATER STORAGE DRUM	1	14.2	25.1																25.1
6241	6241 0312 23291 WATER STORAGE DRUM	1	14.2	25.1																

UNICC / SPC(PETKIM)
CAPITAL GOODS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW ETHYLENE OXIDE/GLYCOL PLANT, CAPACITY = 68 000TON/YEAR
LOCATION=YUMURTALIK
ANTICIPATED DATE OF COMMISSINING= 1995
UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
ECF-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTAL
74362 04410 04221	COCLANT SEPARATOR	1	26.5	224.0					224.0						224.0

12167
(15 of 17)

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry.

Vol. XIV - Technical data for
(BDX) Butadiene Extraction

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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July 82

English

DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. XIV- Technical data for
(BDX) Butadiene Extraction

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of
Capital Goods Development Project Team in Turkey
United Nations Industrial Development Organization
Vienna

This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily share
the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY
CAPITAL GOODS DEVELOPMENT PROJECT INTURKEY

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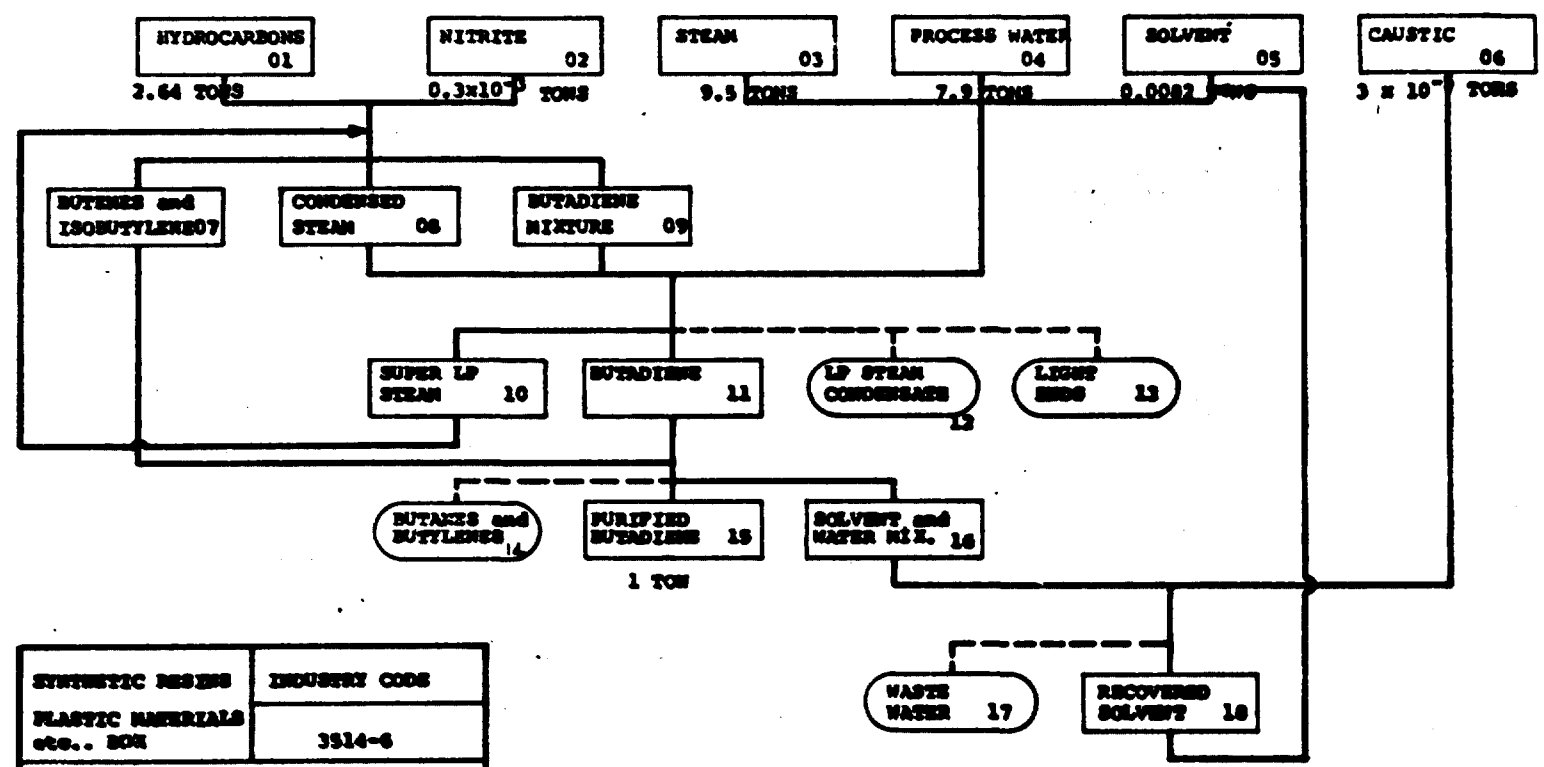
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Rev.	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

Proje No: P-3/1978



SYNTHETIC RESINS	INDUSTRY CODE		
PLASTIC MATERIALS etc.. BOK	3514-6		
MODULAR PRODUCTION DIAGRAM			
DATE	PREP. BY	DRAWN BY	CHECKED BY
10.3.1982	A. AKSU	D. ALTUN	E. KESKİN
CHECKED BY		APPROVED BY	



PETKIM PETROKIMIA A.S.

**RELATIONSHIP BETWEEN FLOW DIAGRAMS AND ACTIVITIES
FOR BOK PLANT**

- 01 TO 09 EXTRACTIVE DISTILLATION
- 09 TO 11 SOLVENT STRIPPING
- 11 TO 15 BUTADIENE PURIFICATION
- 16 TO 18 SOLVENT RECOVERY

Rev.	Tarih	Isi

Revisi 11/27/78 2-4/1980

Rev.	Tarih	İsmi



PETKIM PETROKİMYA A.Ş.

Petkim 113/619 B-2/1976

**UNİDO /SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT**

**INDUSTRY ACTIVITIES CHART
PART 15 BDX**

IND CODE : 3514-6
IND NAME : SYNTHETIC RESINS
PLASTIC MATERIALS AND MANUFACTURING
BDX

PROD.S	PRODUCT/ NAME	PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
09	BUTADIENE MIXTURE		1	OXIDATIVE DEHYDROGE- NATION	CATALYTIC BED REACTOR	10-50 m ³	1	10 m ³
							2	30 m ³
							3	50 m ³
			2	EXTRACTIVE DISTILLATION	EXTRACTIVE DISTILLATION COLUMN	20.1-60 m ³	1	20.1 m ³
							2	45 m ³
							3	60 m ³
11	BUTADIENE		1	SOLVENT STRIPPING	SOLVENT STRIPPER	26.2-83.4 m ³	1	26.2 m ³
							2	51.4 m ³
							3	83.4 m ³
15	PURIFIED BUTADIENE		1	BUTADIENE PURIFICATION	POST FRACTIONATOR	76-280 m ³	1	76 m ³
							2	179.5 m ³
							3	280 m ³
18	RECOVERED SOLVENT		1	SOLVENT RECOVERY	SOLVENT RECOVERY COLUMN	12.5-56 m ³	1	12.5 m ³
							2	26 m ³
							3	38 m ³
							4	56 m ³

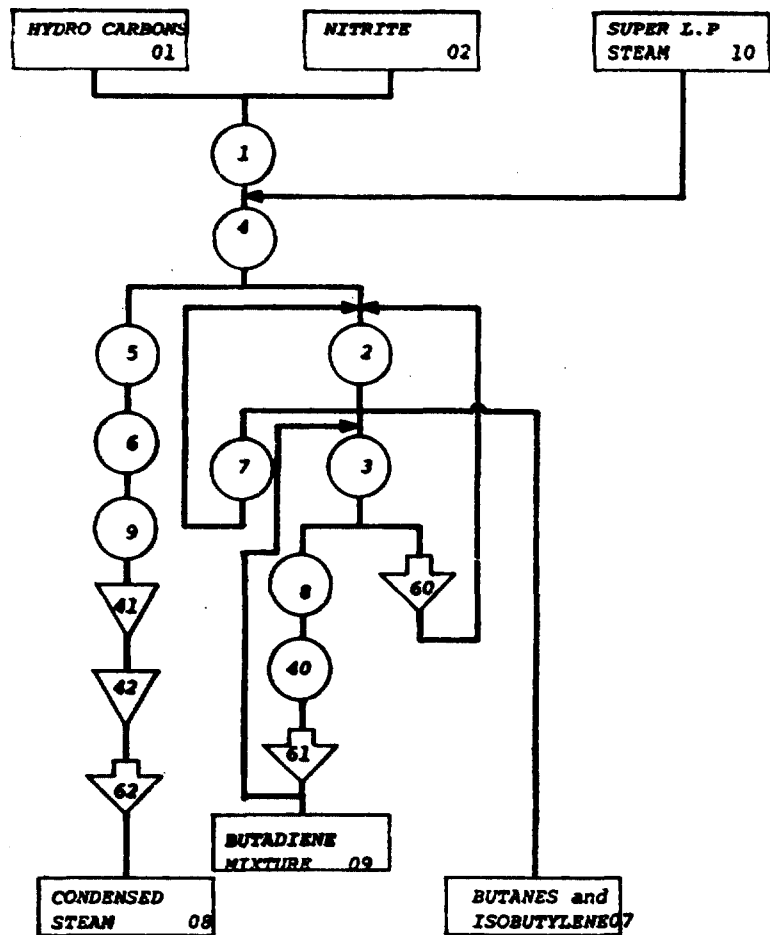
PREPARED BY	CHECKED BY	APPROVED BY
S. KESKİN		

Rev.	Tarih	Ismi

Rev. No. 11/1/79 B-2/1976



PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3514-6	09	2	1
NO	MACHINE CODE	MACHINE NAME	Q	
1	741660411411212	Feed Contactor	1	
2	741660121414212	Extr Distil Clm	1	
3	741660121414212	Extr. Distil. Clm	1	
40	692410520322212	E. D. Clm Rfx Dr.	1	
4	741610731311212	Feed Vaporiser	1	
5	741610331311212	Standby Solv. Cool.	1	
6	741610242412212	Main Solv. Cooler	1	
7	741610242412212	E. D. Clm Reboiler	2	
8	741610542412212	E. D. Clm. Con.	1	
9	741610341311212	Solv. Rec. Clm. Cool.	1	
60	742200143511212	E. D. Inter Clm. P.	1	
61	742200133511212	E. D. Reflux Pump	1	
62	742200131121912	Solv. Make Up. P.	1	
41	692110720313211	Rec. Solv. Stpr. T.	1	
42	692110720313211	Fresh solv. stor. T.	1	

UNIDO/SPO(PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

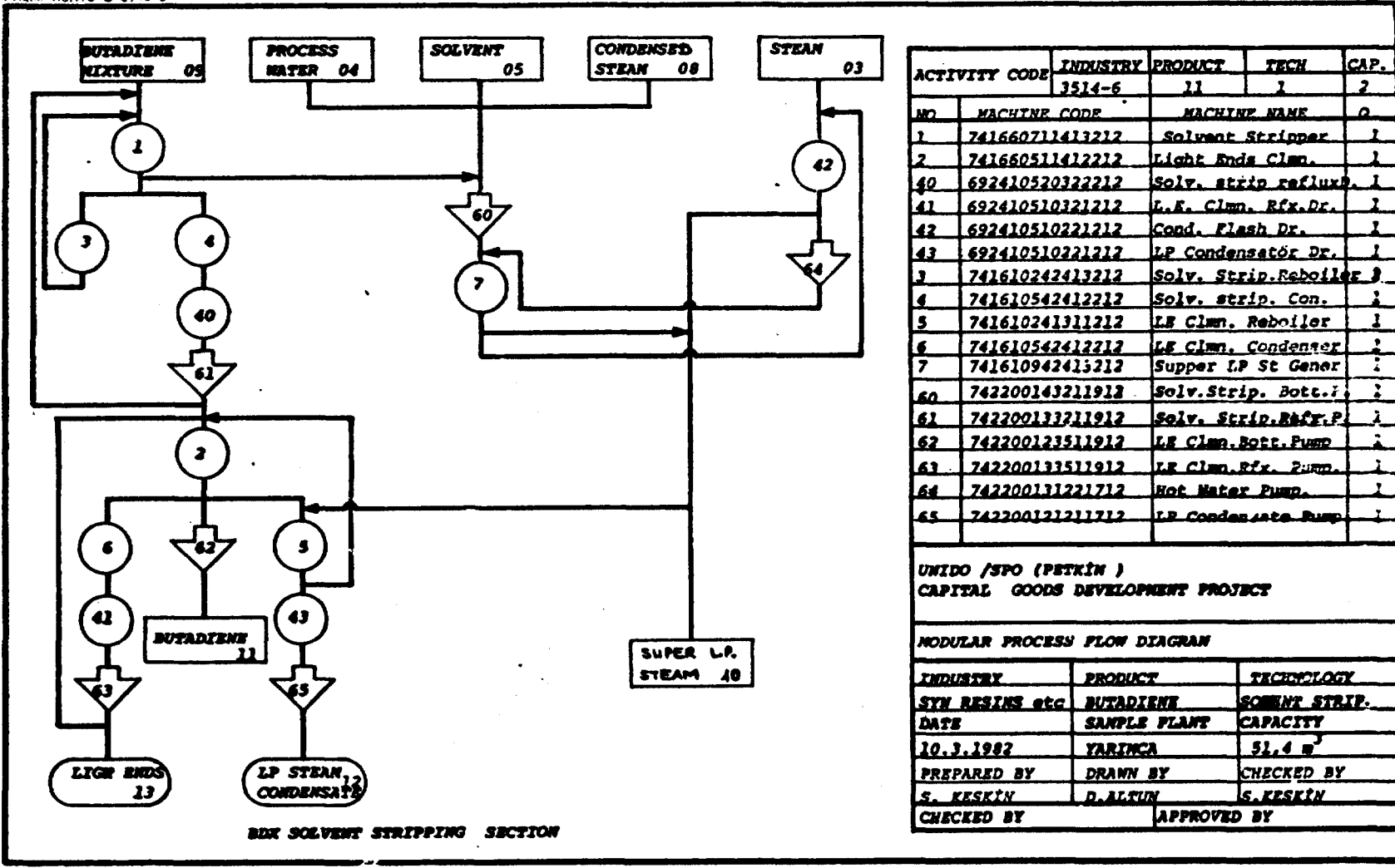
INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINE etc	BD MIXTURE	EXTRAC. DIST.
DATE	SAMPLE PLANT	CAPACITY
10.3.1982	YARINCA	20.1 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A. AKSU	D. ALTUN	A. AKSU
CHECKED BY		APPROVED BY:

Rev.	Tarih	İsmi

Petkim 113/F/9 B-2/1976



PETKİM PETROKİMYA A.Ş.



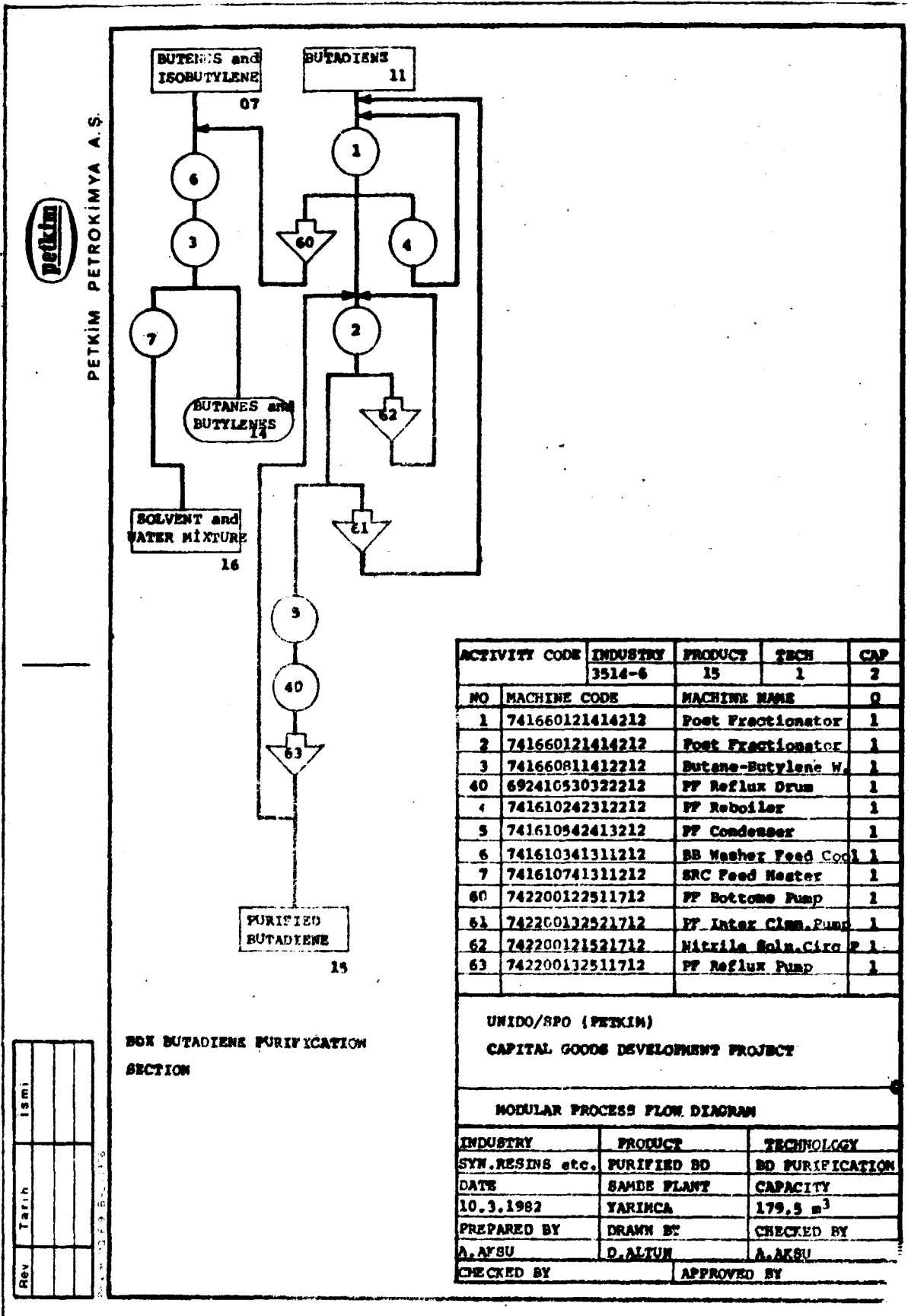
BUX SOLVENT STRIPPING SECTION

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP.
	3514-6	11	1	2
NO	MACHINE CODE	MACHINE NAME	Q	
1	741660711413212	Solvent Stripper	1	
2	741660511412212	Light Ends Clm.	1	
40	692410520322212	Solv. strip reflux	1	
41	692410510321212	L.E. Clm. Rfx. Dr.	1	
42	692410510221212	Cond. Flash Dr.	1	
43	692410510221212	LP Condensator Dr.	1	
3	741610242413212	Solv. Strip. Reboiler	3	
4	741610542412212	Solv. strip. Con.	1	
5	741610241311212	LE Clm. Reboiler	1	
6	741610542412212	LE Clm. Condenser	1	
7	741610942413212	Supper LP St Gener	1	
60	742200143211912	Solv. Strip. Bott. i	1	
61	742200133211912	Solv. Strip. Ref. P.	1	
62	742200123511912	LE Clm. Bott. Pump	1	
63	742200133511912	LE Clm. Rfx. Pump	1	
64	742200131221712	Hot Water Pump	1	
65	742200121211712	LP Condensate Pump	1	

UNIDO /SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN RESINS etc	BUTADIENE	SOLVENT STRIP.
DATE	SAMPLE PLANT	CAPACITY
10.3.1982	YARINCA	51.4 m ³
PREPARED BY	DRAWN BY	CHECKED BY
S. KESKİN	D. ALTUN	S. KESKİN
CHECKED BY	APPROVED BY	



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3514-6	15	1	2
NO	MACHINE CODE	MACHINE NAME	Q	
1	741660121414212	Post Fractionator	1	
2	741660121414212	Post Fractionator	1	
3	741660811412212	Butene-Butylene W.	1	
40	692410530322212	PP Reflux Drum	1	
4	741610242312212	PP Reboiler	1	
5	741610942413212	PP Condenser	1	
6	741610341311212	BB Washer Feed Cool	1	
7	741610741311212	SRC Feed Heater	1	
60	742200122511712	PP Bottoms Pump	1	
61	742200122521712	PP Inter. Circ. Pump	1	
62	742200121521712	Nitrile Soln. Circ. P.	1	
63	742200122511712	PP Reflux Pump	1	

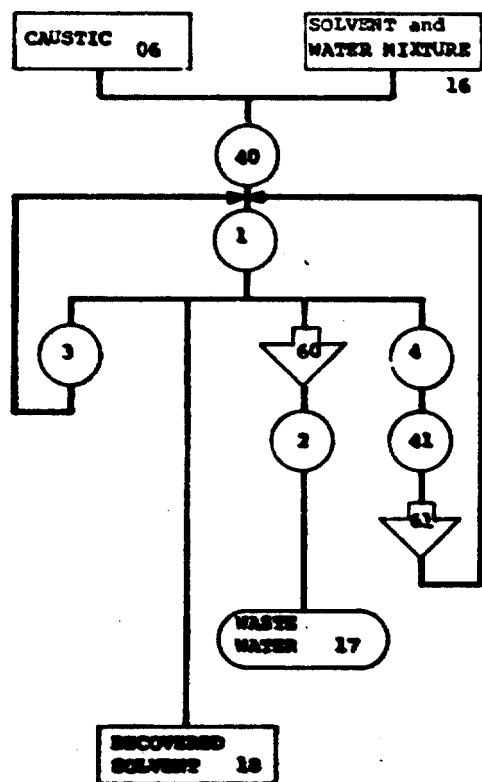
Rev	Tarih	Isim

Rev.	Tarih	İsmi

Revizyon: 03/1979 B-2/1975



PETKİM PETROKİMYA A.Ş.



BOX SOLVENT RECOVERY SECTION

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3514-6	18	1	1
No	MACHINE CODE	MACHINE NAME	Q	
1	741660421412212	Solvent Rec.Clm.	1	
40	692410910321212	SRC Feed Surge	1	
41	692410910321212	SRC Reflux Drum	1	
2	741610345311212	Wash Water Cooler	1	
3	741610241111212	SRC Reboiler	1	
4	741610941411212	SRC Condenser	1	
60	742200131211712	SRC Bottoms Pump	1	
61	742200121211712	SRC Reflux Pump	1	

UNIDO/SPO (PETKİM)
CAPITAL COS. 8 DEVELOPMENT PROJECT

MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
SYN.RESINS etc.	RECOVERED SOLV.	SOLVENT REC.
DATE	SAMPLE PLANT	CAPACITY
10.3.1982	YARIMCA	12.5 m ³
PREPARED BY	DRAWN BY	CHECKED BY
A.AKSU	D.ALTON	Ş.KESKİN
CHECKED BY		APPROVED BY

SR No	M/N	Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufac. Char. 1. (YONS)	Manufac. Char. 2.	Manufac. Char. 3. (s)	Origin	Q.	Purchase Cost		Cr. 1960 Cost		Proc. Year	SUNC Code											
												Unit	Total	Unit	Total		1345	67	8	9	10	11	12	13	14	15		
1		Feed contactor	3,93 m ³	P: 8,4Kg/cm ²	Temp: 30C	FB	2,8	CS	10 mm	I	1	38777	38777	90000	90000	1970	74166	04	1	4	1	1	2	1	2			
2		Reflux drum	201 m ³	P: 6,7Kg/cm ²	Temp: 67C	FB	38	CS	13 mm	I	1	69935	69935	206400	206400	1970	74166	01	2	1	4	1	4	2	1	2		
3		" " "	201 m ³	P: 6,3Kg/cm ²	Temp: 53C	FB	34,8	CS	19 mm	I	1					1970	74166	01	2	1	4	1	4	2	1	2		
40		E.D. column	MS: 20 m ²	-	Temp: 46C	CY	6,8	CS	14 mm	I	1	8239	8239	23400	23400	1970	69241	05	2	0	3	22	2	1	2			
4		Feed vaporizer	MS: 84 m ²	SD: 0,8 m	TL: 5,9m	FST	3,2	CS	8 mm	I	1	14240	14240	35900	35900	1970	74161	07	3	1	3	1	1	2	1	2		
5		Standby solvent cooler	MS: 84 m ²	SD: 0,8 m	TL: 5,9 m	FST	3,2	CS	8 mm	I	1	14240	14240	35900	35900	1970	74161	03	1	1	3	1	1	1	1	2		
6		Main solvent cooler	MS: 2 948	SD: 1,5 m	TL: 6,1 m	FST	7,7	CS	11 mm	I	1	15142	15142	38150	38150	1970	74161	03	4	2	2	1	2	2	1	2		
7		E.D. column Reboiler	MS: 198m ²	SD: 1,5 m	TL: 8 m	FST	25,0	CS	11 mm	I	2	14454	28908	36400	72800	1970	74161	02	4	2	4	1	4	2	1	2		
8		E.D. column Condenser	MS: 254 m ²	SD: 1,3 m	TL: 6,2 m	FST	8,8	CS	12 mm	I	1	19780	19780	49850	49850	1970	74161	05	4	2	4	1	2	2	1	2		
9		Solvent feed cooler	MS: 300 m ²	SD: 0,5m	TL: 5,6 m	FST	1,5	CS	9,5 mm	I	1	2065	2065	5200	5200	1970	74161	03	4	1	3	1	1	2	1	2		
60		E.D. Inter column pump	158 m ³ /hr	SD: 07 m	Corrosive	H	0,6	SP	0,4 tons	I	1	2164	2164	5600	5600	1970	74220	014	3	5	1	1	0	1	2			
61		E.D. reflux Pump	61,3m ³ /hr	SD: 56 m	"	H	0,4	SP	0,2 tons	I	1	2000	2000	5200	5200	1970	74220	031	3	5	1	1	0	1	2			
62		Solvent Make up pump	22,7m ³ /hr	SD: 1,3 m	CCLC	V	0,4	SP	0,2 tons	I	1	2000	2000	5200	5200	1970	74220	013	1	1	2	1	0	1	1	2		
41		Reflux tank	227 m ³	Dia: -	Temp: 38C	Rc	10,8	CS	8 mm	T	1	8190	8190	23250	23250	1970	69211	072	0	3	1	3	2	1	1			
42		Fresh solvent Storage tank	227 m ³	Dia: -	Temp: 38C	Rc	10,8	CS	8 mm	T	1	8190	8190	23250	23250	1970	69211	072	0	3	1	3	2	1	1			

at least, equipment weight for machines, plate columns for plate fractionated equipments.

SI	Machine Description	Major Spec. (Capacity)	Major Spec. (Optional)	Major Spec. (Optional)	Type (Description)	Manuf. Char. 2 (Type)	Manuf. Char. 3 (Type)	Origins	Purchase Cost		G. 1960 Cost		SITC Code		
									Q.	Unit	Total	Unit	Total	Year	17165	67161	111231	12127
1	Solvent Recr. very column	12.54 m ²	P:1.5kg/cm ²	Temp: 87c	PS	7.5	PLATETH: 10 mm	I	1	8686	28600	25400	1970	74100	04 2 1 4 1 2 2 1 2
40	Surge Drum	6.5 m ³	-	Temp: 76c	Cy	2.0	PLATETH: 8 mm	I	1	8215	23350	23350	1970	69241	05 1 0 3 2 1 2 1 2
41	S/C Reflux	3.0 m ²	-	Temp: 76c		1.5	CS 10 mm	I	1	1755	5000	5000	1970	69241	05 0 3 2 1 2 1 2
2	Water	MS1300 m ²	SDI: 6.2 m	TL: 5.8 m	PST	2.4	PLATETH: 8 mm	I	1	7571	19100	19100	1970	74101	03 4 5 3 1 1 7 1 2
3	Reboiler	MS1190 m ²	SDI: 0.7 m	TL: 4.5 m	PST	3.1	PLATETH: 8 mm	I	1	7571	19100	19100	1970	74101	02 4 1 3 1 1 2 1 2
4	S/C Condens.	MS1190 m ²	SDI: 0.8 m	TL: 6.0 m	PST	3.2	PLATETH: 8 mm	I	1	7571	19100	19100	1970	74101	05 4 1 4 1 1 2 1 2
60	S/C Bottoms	16.8m ² /hr	MHI 12 m	MCLC	H	0.4	MaxCompWT	I	1	1755	4350	4350	1970	74230	01 1 2 2 1 1 7 1 2
61	S/C Reflux	9.1m ² /hr	MHI: 8.4 m	MCLC	H	0.2	0.2 30mm	I	1	1315	3400	3400	1970	74230	01 2 1 2 1 1 7 1 2

SI 11-14: Maximum weight for heating plate.
SI 11-15: Plate fabricated equipment.

UNICCO SLOPETRINI
CAPITAL FOCUS DEVELOPMENT PROJECT
EQUIPMENT REQUIREMENT OF THE NEW BUTADIENE EXTRACTION PLANT CAPACITY = 33 000TON/YEAR
LCCATICA-VULTRIALIA

ANTICIPATED DATE OF COMMISSING= 1995

UNIT WEIGHTS IN TONS UNIT COSTS IN 1000 U.S.A DOLLARS (1980)

EDP-DEPARTMENT-PETRI IN / ANKARA

SITC CODE	MACHINE NAME	CR	UN-CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	IOI_CO
45211	C1203 13211 REC-SOLV. STORAGE TANK	1	10-8	23.3			22.7							23.3
45211	C1203 13211 FRESH SOLV. STORAGE TANK	1	10-8	23.3			22.7							23.3
45241	C3102 21212 CONDENSATE FLASH DRUM	1	3-1				5.4							5.4
45241	C3102 21212 L.P. CONDENSATE DRUM	1	1-5				7.6							7.6
45241	C3103 21212 L.E. COLUMN REFLUX DRUM	1	1-5				5.0							5.0
45241	C3103 21212 SRC REFLUX DRUM	1	1-5				23.4							23.4
45241	C3103 21212 SRC SURGE DRUM	1	2-0				23.4							23.4
45241	C3203 22212 E.C. CLMN REFLUX DRUM	1	6-8				20.8							20.8
45241	C3203 22212 SOLVENT STRIP-REFLUX DRUM	1	7-3				25.0							25.0
45241	C3103 21212 HF REFLUX DRUM	1	2-3				13.9							13.9
45241	C3103 21212 L.E. COLUMN REBILERS	1	3-1				19.1							19.1
74181	C2413 11212 SRC REBILERS	1	1-0				38.2							38.2
74181	C2413 11212 PF REBILERS	1	1-0				45.6							45.6
74181	C2413 11212 SOLVENT STRIP- REBILERS	2	25-0				72.8							72.8
74181	C2413 11212 E.C. CLMN REBILERS	2	25-0				12.2							12.2
74181	C3113 11212 STANBY SOLVENT COOLER	1	1-5				35.9							35.9
74181	C3113 11212 HW WASHER FEED COOLER	1	1-5				5.2							5.2
74181	C3113 11212 SOLV. REC-CLMN TOP COOLER	1	1-5				38.2							38.2
74181	C3113 11212 MAIN SOLVENT COOLER	1	7-7				19.1							19.1
74181	C3113 11212 SRC CONDENSER	1	3-2				91.1							91.1
74181	C3113 11212 SOLV. CONDENSER	1	5-5				33.0							33.0
74181	C3113 11212 L.E. COLUMN CONDENSER	1	8-8				49.9							49.9
74181	C3113 11212 E.C. CLMN CONDENSER	1	13-8				60.4							60.4
74181	C3113 11212 PF CONDENSER	1	3-2				35.9							35.9
74181	C3113 11212 SRC FEED HEATER	1	2-7				14.8							14.8
74181	C3113 11212 SUPER L.P. STEAM GENERATOR	1	13-0				52.1							52.1
74181	C3113 11212 WASH WATER COOLER	1	2-4				19.1							19.1
74181	C3113 11212 PGST FRACTIONATOR	1	28.2				206.4							206.4
74181	C3113 11212 EXTRACTIVE DISTILLAT-CLMN	1	34-8				322.5							322.5
74181	C3113 11212 POST FRACTIONATOR	1	28-7				90.8							90.8
74181	C3113 11212 FEED CONTRACTOR	1	7-5				25.4							25.4
74181	C3113 11212 SOLVENT RECOVERY CLMN	1	7-7				36.9							36.9
74181	C3113 11212 LIGHT ENDS COLUMN	1	21-7				68.0							68.0
74181	C3113 11212 SOLVENT STRIPPER	1	6-5				8.0							8.0
74220	C3113 11712 BUTANE-BUTYLENE WASHER	1	1-3				4.4							4.4
74220	C3113 11712 SRC REFLUX PUMP	1	1-2				3.4							3.4
74220	C3113 11712 NITRITE SOLV. CIRC. PUMP	1	1-2				4.3							4.3
74220	C3113 11712 PF BOTTOMS PUMP	1	1-3				4.3							4.3
74220	C3113 11712 L.E. COLUMN BOTTOMS PUMP	1	1-4				5.2							5.2
74220	C3113 11712 SRC BOTTOMS PUMP	1	1-4				4.4							4.4
74220	C3113 11712 SRC BOTTOMS PUMP	1	1-3				4.4							4.4
74220	C3113 11712 HGT WATER PUMP	1	1-6				5.5							5.5
74220	C3113 11712 HGT WATER PUMP	1	1-6				5.5							5.5
74220	C3113 11712 PF REFLUX PUMP	1	1-7				4.3							4.3
74220	C3113 11712 PF INTERCOLUMN PUMP	1	1-4				4.3							4.3
74220	C3113 11912 SOLV. STRIP-REFLUX PUMP	1	1-3				4.3							4.3
74220	C3113 11912 L.E. COLUMN REFLUX PUMP	1	1-4				5.2							5.2
74220	C3113 11912 E.C. REFLUX PUMP	1	1-4				5.2							5.2
74220	C3113 11912 SRC REFLUX PUMP	1	1-0				5.6							5.6
74220	C3113 11912 SRC REFLUX PUMP	1	1-0				5.6							5.6
74220	C3113 11912 E.C. INTERCOLUMN PUMP	1	1-6				5.6							5.6

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034

Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry.

Vol. XV - Technical data for
(PTA) Pure Terephthalic Acid
(MA) Methanol

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

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DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES

DP/TUR/76/034

TURKEY

Technical Report No. XI- Demand for Capital Goods for

Petrochemicals Industry,

Vol. XV- (PTA) Pure Terephthalic Acid

(MA) Methanol

Prepared for the Government of Turkey .

by the United Nations Industrial Development Organization

acting as executing agency for the United Nations Development Programme

Based on the work of

Capital Goods Development Project Team in Turkey

United Nations Industrial Development Organization

Vienna

This report has not been cleared with the United Nations Industrial Development Organization which does not, therefore, necessarily share the views presented.

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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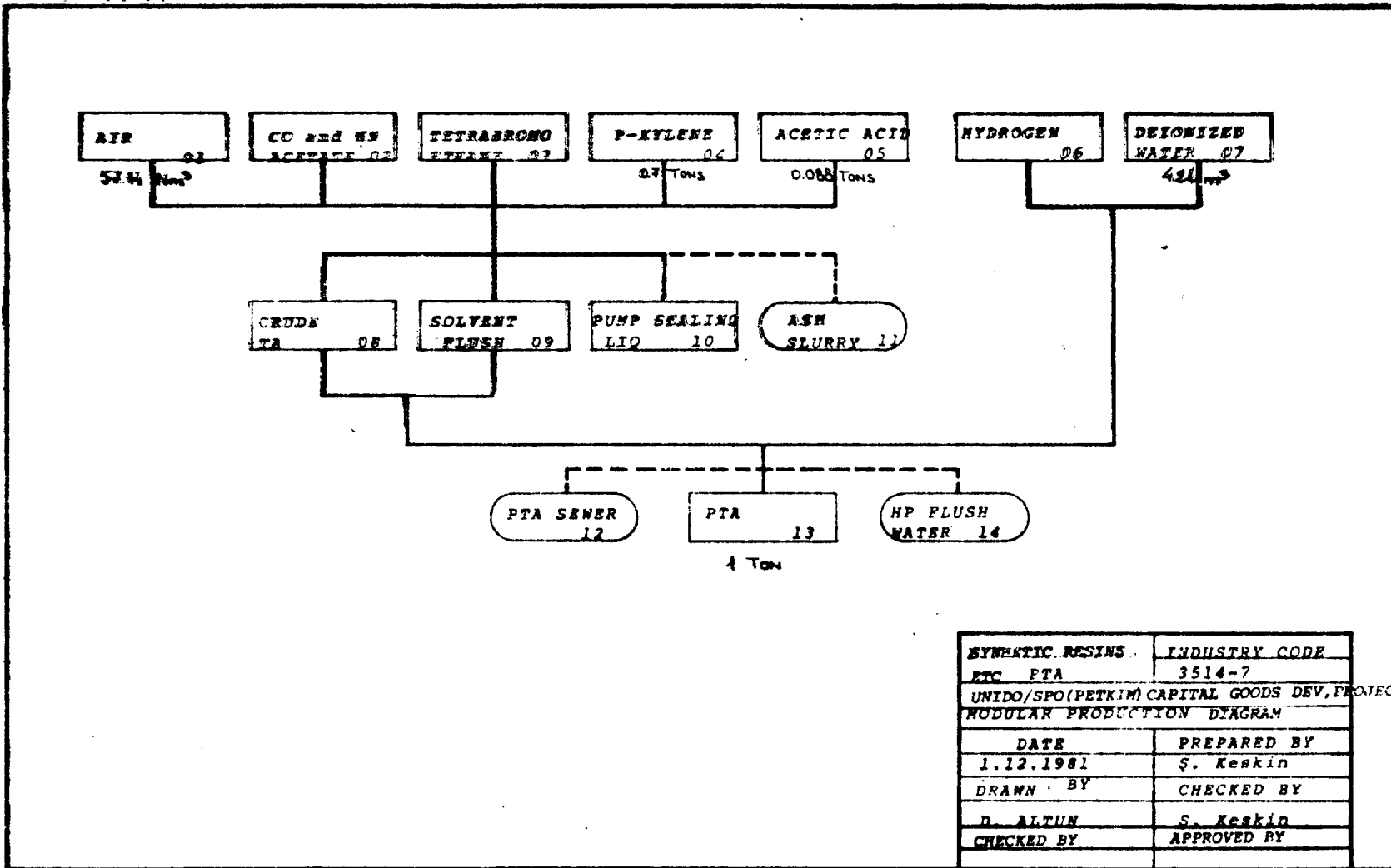
VOL. XV

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Rev	Date	Issn



PETKIM PETROKIMYA A.Ş.



SYNTHETIC RESINS	INDUSTRY CODE
ETC PTA	3514-7
UNIDO/SPO (PETKIM) CAPITAL GOODS DEV. PROJECT	
MODULAR PRODUCTION DIAGRAM	
DATE	PREPARED BY
1.12.1981	S. Keskin
DRAWN BY	CHECKED BY
D. ALTUN	S. Keskin
CHECKED BY	APPROVED BY



PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS AND
ACTIVITIES FOR PTA PLANT

01 TO 08 OXYDATION

08 TO 13 CRYSTALLIZATION

Rev.	Tarih	İsmi

Petkim 11307/9 B-2/1990

Rev	Tarih	İsmi



PETKİM PETROKİMYA A.Ş.

UNİDO / SPO (PETKİM)
CAPITAL GOODS DEVELOPMENT PROJECT

INDUSTRY ACTIVITIES CHART
PART 16 PURE TEREPHTHALIC ACID

IND CODE 3514 -7
IND NAME : SYNTHETIC RESINS
PLASTIC MATERIALS ETC _ PTA

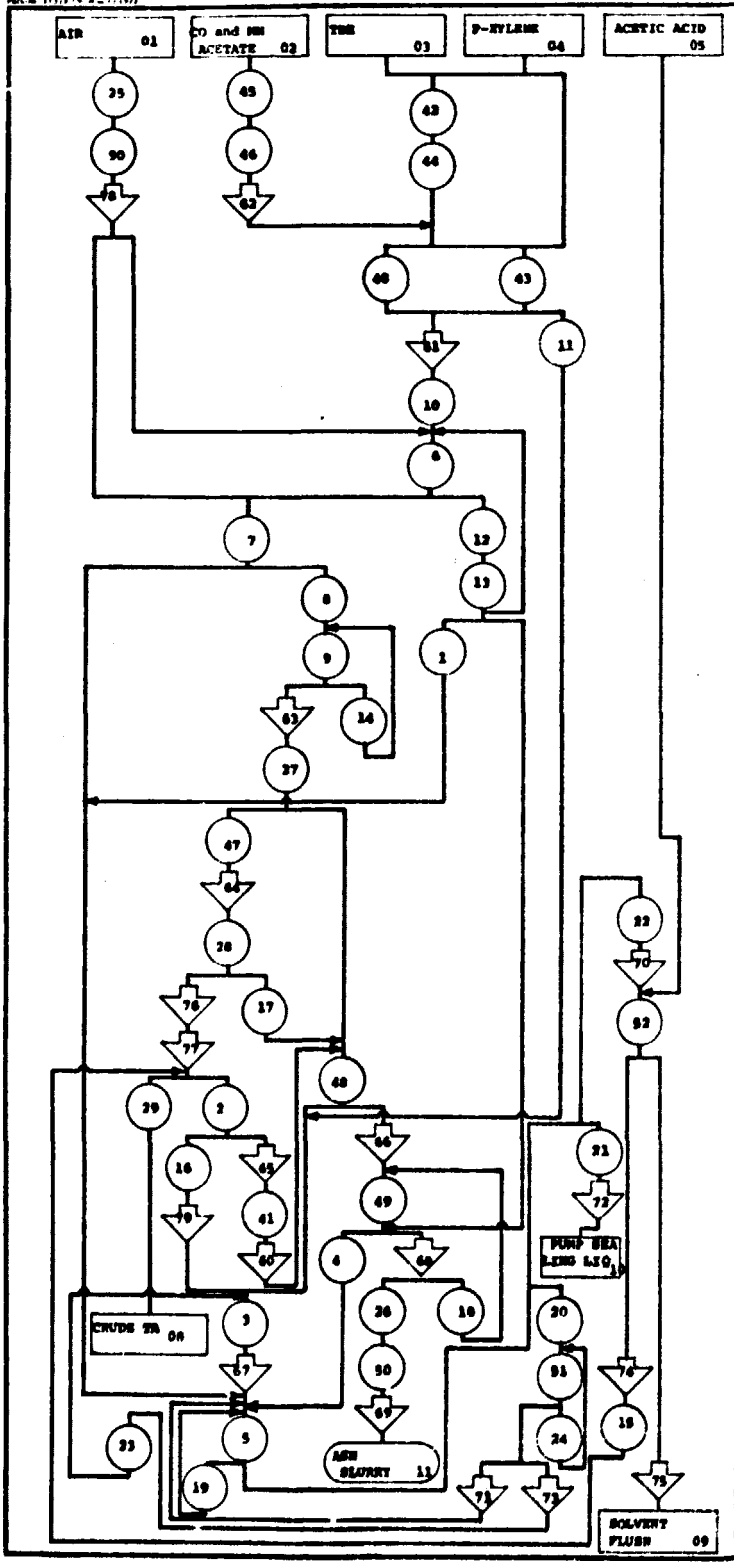
PROD.S.	PRODUCT NAME	PRODUCTION STAGE	TECH CODE	TECHNOLOGY NAME	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
08	CRUDE TA		1	MANGANESE DOMINANT CATALYST SYSTEM	OXYDATION REACTOR	30-200 m ³	1	30 m ³
							2	90 m ³
							3	110 m ³
							4	200 m ³
			2	COBALT DOMINANT CATALYST SYSTEM	OXYDATION REACTOR	50-300 m ³	1	50 m ³
							2	150 m ³
							3	230 m ³
							4	300 m ³
13	PTA		1	CRYSTALLIZATION BY COOLING	CRYSTALLIZER	10-50 m ³	1	10 m ³
							2	25 m ³
							3	35 m ³
							4	50 m ³
			2	CENTRIFUGE AND WASHING	CENTRIFUGE	10-100 t/h	1	10 t/h
							2	40 t/h
							3	70 t/h
							4	100 t/h

PREPARED BY	CHECKED BY	APPROVED BY
S. KESKİN		

Rev.	Tarih	Isim



PETKIM PETROKIMYA A.Ş.



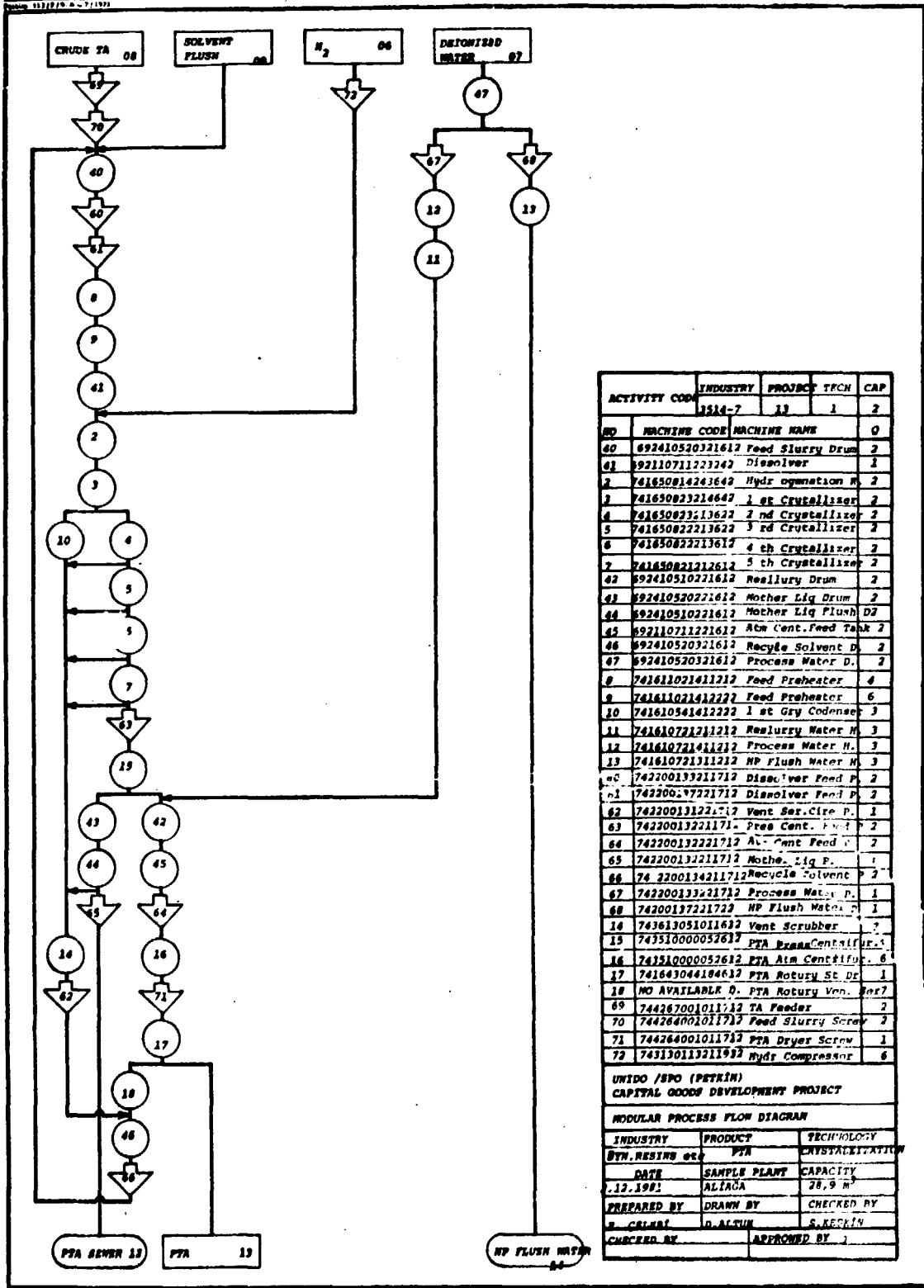
ACTIVITY CODE	INDUS.	PRODUCT	TRCH	CAP
	0514-7	08	1	3
NO	MACHINE CODE	MACHINE NAME		Q
1	741640223412612	SP Absorb ber		2
2	741640221411612	Dryer Scrubber		2
3	741640311411612	Am Absorber		2
4	741640221411612	Solvent Strippor		2
5	741641241415601	Solvent Dehyd To		2
40	432410510121611	Coz. St. noCh. Drum		2
41	6924105201221611	Solvent Charge D.		2
42	692410510121614	APT-Pw Mix Drum		2
43	4324105202221611	Feed Mixing Drum		2
44	692410510121611	APT-Pw Cal. S. Dr.		2
45	432410510121612	Cata. Mix. Drum		2
46	432410510121612	Cata. Making Dr.		1
6	741650831219202	Oxidation Reac.		1
7	741650822219222	1st. Crystallizer		1
8	741650822219222	2nd Crystallizer		1
9	741650822219222	1st Crystallizer		2
47	6924105202221611	Resluxry Drum		2
48	6924105202221611	Mother Lig. Drum		2
49	6924105202221611	Stripper Still P.		2
50	6924105102221611	Residue Slurry Dr		2
51	6924105103221611	Dehyd. Tow. Cond Dr		2
52	6924105302221611	Dehyd Sol. Drum		2
10	741610721411217	Start-Up Heater		2
11	741610520011612	Feed Vond. Cond.		4
12	74161052411212	Reactor Condenser		2
13	74161055211212	Reactor Vent. Cond		2
14	741610521211612	1st Cryst. Cond.		1
15	741610321441212	Scrubber Cooler		6
16	741610710141212	Gas Heater		9
17	741610511211212	Centrifuge V. Cond		1
18	741610741411212	Stripper Reboiler		2
19	741610242212121	Dehyd. Tow. Reboiler		2
20	74161055142412	Dehyd. Tow. Cond.		1
21	741610511111212	Seal System Cond.		1
22	741610311111212	Solvent Cooler		1
23	741610314141212	Absorber P. Cooler		4
24	741610531111212	Dehyd. Tow. V. Cond.		1
60	74220013211712	Solvent Char. Pump		2
61	74220013251712	Reactor Feed Pump		2
62	742200121621712	Catalyst C. Pump		2
63	74220013221712	Initial Centrif. P.		2
64	74220013221712	2nd Cent. Feed P.		2
65	74220013221712	Scrub. Slurry Pump		2
66	74220013221712	Mother Lig. Pump		2
67	7422001221712	Absorber Circ. Pump		1
68	74220014221712	Stripper Circ. Pump		2
69	74220012341712	Residue Slurry P.		2
70	74220013221712	Solvent Bottom P.		1
71	74220013221712	Dehyd. Tow. Ref. Pump		2
72	74220012311712	Pump Seal P. Pump		2
73	74220012821712	Absorber Feed Pump		2
74	74220013221712	Dehyd. Sol. Pump		2
75	74220013421712	Solvent Flush Pump		1
25	743619031641212	Inter Air Filter		6
90	NO AVAILABLE D.	Steam Turbine		1
27	743510020052612	Initial TA Centrif.		6
28	743510010058412	Sec. Stage TA Cent.		6
29	741643010083512	Oxidation Rot. St. M.		1
26	74162011131612	Residue Evaporat.		2
76	744264011011712	TA Dryer Feed No.		1
77	744264011011712	TA Dryer No.		1
78	743130154113612	Oxid. Air Comp. L.		2
79	743420051211712	Scrubber Blower		2

UNIDO/EPO (PETKIM) CAPITAL GOODS DEVELOPMENT PROJECT			
MODULAR PROCESS FLOW DIAGRAM			
INDUSTRY	PRODUCT	TECHNOLOGY	
SYN. RESINS	CRUDE OIL	CATALYTIC SYSTEMS	
DATE	SAMPLE PLANT	CAPACITY	
2.12.1961	ALIAGA	82.75 m ³	
PREPARED BY	DRAWN BY	CHECKED BY	
A. AKSU	D. AKTUN	B. KUTUN	
CHECKED BY	APPROVED BY		

No.	Tarih	Isim



PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY	PROJECT	TPCH	CAP
	1214-7	12	1	2
NO	MACHINE CODE	MACHINE NAME		
40	892410520321612	Feed Slurry Drum	2	
41	892110711223242	Dissolver	1	
2	741650814243642	Hydr operation M	2	
3	741650823214642	1 st Crystallizer	2	
4	74165082313622	2 nd Crystallizer	2	
5	74165082313622	3 rd Crystallizer	2	
6	741650822213612	4 th Crystallizer	2	
7	741650821212612	5 th Crystallizer	2	
42	892410510221612	Reslurry Drum	2	
43	892410520221612	Mother Liq Drum	2	
44	892410510221612	Mother Liq Flush D2		
45	8921107112221612	Atm Cent. Feed Tank	2	
46	892410520321612	Recycle Solvent D.	2	
47	892410520321612	Process Water D.	2	
8	741611021411212	Feed Preheater	4	
9	741611021412222	Feed Preheater	6	
10	741610541612222	1 st Gry Condense	3	
11	741610721411212	Reslurry Water H.	3	
12	741610721411212	Process Water H.	3	
13	741610721311212	NP Flush Water H.	3	
48	742200133211712	Dissolver Feed P.	2	
49	742200133211712	Dissolver Feed P.	2	
62	742200132211712	Vent. Ser. Circ. P.	1	
63	742200132211712	Pres. Cent. Feed P.	2	
64	742200132221712	Atm. Cent. Feed P.	2	
65	742200132211712	Mother Liq P.	1	
66	742200134211712	Recycle Solvent P.	2	
67	742200133211712	Process Water P.	1	
68	742200137211722	NP Flush Water P.	1	
14	743613051011432	Vent. Scrubber	2	
15	743513000052612	PTA Exam. Centrifuge		
16	742510000052612	PTA Atm. Centrifuge	6	
17	741643044184612	PTA Rotary St. Dr.	1	
18	NO AVAILABLE D.	PTA Rotary Vent. Fan?		
69	744267001011122	TA Feeder	2	
70	744264001011122	Feed Slurry Screw	2	
71	744264001011122	PTA Dryer Screw	1	
72	743130113211932	Hydr. Compressor	6	

UNIDO /SPO (PETKIM)		
CAPITAL GOODS DEVELOPMENT PROJECT		
MODULAR PROCESS FLOW DIAGRAM		
INDUSTRY	PRODUCT	TECHNOLOGY
BYN. RESINS etc.	PTA	CRYSTALLIZATION
DATE	SAMPLE PLANT	CAPACITY
12.1982	ALFACA	28,9 m ³
PREPARED BY	DRAWN BY	CHECKED BY
S. CELIKCI	U. ALTUN	S. KEKICIN
CHECKED BY	APPROVED BY	

No.	Basic Machine Classification	Major Equip. (Capacity)	Major Equip. (PSI/Min)	Major Equip. (Temp)	Major Equip. (Control)	Time (Duration)	Material (Char.)	Surface (Mat. 2)	Surface (Mat. 3)	Origin	Purchase Cost		Cr. 1981 Cost		SVC Code									
											Unit	Total	Unit	Total	Year	Year	12745	6	4					
1	HP Absorber	56,72 m ³	P: 2.26 Kg/cm ²	Temp: 49c		PB	6,1	SS	16 mm	I	1	31550	31550	31550	1980	74166	038	3	4	1	2	6	1	2
2	Dryer	66,78 m ³	P: 1 atm.	Temp: 107c		PB	1,8	SS	4 mm	I	1	18100	18100	18100	1980	74166	072	1	4	1	1	6	1	2
3	Atm. absorber	0,97 m ³	P: 1 atm.	Temp: 87c		PB	1,8	SS	4 mm	I	1	9200	9200	9200	1980	74166	031	1	4	1	1	6	1	2
4	Solvent Stripper	10,01 m ³	P: 0,85 Kg/cm ²	Temp: 133c		PB	4,1	SS	9 mm	I	1	12700	12700	12700	1980	74166	071	1	4	1	1	6	1	2
5	Reboiler	222,87 m ³	P: 0,47 Kg/cm ²	Temp: 129c		PB	71,2	SS	-	I	1	443950	443950	443950	1980	74166	124	1	4	1	5	0	1	
40	Catalytic St. Drum	0,06 m ³	-	Temp: 90c		Cy	0,2	SS	4 mm	I	1	1900	1900	1900	1980	69241	051	0	1	2	1	6	1	1
41	Solvent char. Drum	16,68 m ³	-	Temp: 97c		Cy	3,2	SS	6 mm	I	1	22700	22200	22200	1980	69241	052	0	1	2	1	6	1	1
42	BST. Mix Drum	0,95 m ³	-	Temp: 35c		Cy	0,6	SS	4 mm	I	1	6450	6450	6450	1980	69241	051	0	1	2	1	6	1	1
43	Feed mixing Drum	24,67 m ³	-	Temp: 86c		Cy	3,9	SS	7 mm	I	1	24550	24550	24550	1980	69241	052	0	3	2	1	6	1	1
44	BST. Mix Drum	0,26 m ³	-	Temp: 28c		Cy	0,3	SS	4 mm	I	1	1750	1750	1750	1980	69241	051	0	1	2	1	6	1	1
45	Catalyst Mix Drum	1,7 m ³	-	Temp: 90c		Cy	0,8	SS	4 mm	I	1	8200	8200	8200	1980	69241	051	0	1	2	1	6	1	2
46	Catalyst testing Drum	3,22 m ³	-	Temp: 90c		Cy	0,9	SS	4 mm	I	1	8300	8300	8300	1980	69241	051	0	1	2	1	6	1	2
46	Oxidation Reactor	82,75 m ³	P: 27 Kg/cm ²	NC		SM	57,2	CS	-	I	1	749100	749100	749100	1980	74165	043	3	2	1	5	0	2	
6	1-Crystallizer	28,93 m ³	P: 13,6 Kg/cm ²	NC		SM	12,1	CS	20 mm	I	1	355700	355700	355700	1980	74165	042	2	1	3	2	2	2	
7	2-Crystallizer	11,95 m ³	P: 3,5 Kg/cm ²	NC		SM	7,8	CS	10 mm	I	1	318700	318700	318700	1980	74165	042	1	2	1	2	2	1	2
8	3-Crystallizer	33,85 m ³	P: 0,02 Kg/cm ²	NC		SM	4,8	SS	8 mm	I	1	43200	43200	43200	1980	74165	042	1	2	1	6	1	2	
47	Reboiler Drum	10,08 m ³	-	Temp: 105c		Cy	8,3	SS	6 mm	I	1	21050	21050	21050	1980	69241	032	0	2	2	2	0	1	1
48	Wether liquor Drum	28,93 m ³	-	Temp: 107c		Cy	4,9	SS	5 mm	I	1	26900	26900	26900	1980	69241	053	0	2	2	1	6	1	1
49	Stripper	16,98 m ³	-	Temp: 133c		Cy	5,5	SS	13 mm	I	1	40900	40900	40900	1980	69241	032	0	2	2	0	7	6	1
50	Residue Still Pot	3,54 m ³	-	Temp: 216c		Cy	1,5	SS	7 mm	I	1	16350	16350	16350	1980	69241	051	0	2	2	1	6	1	1
51	Dehyd. Tower	4,31 m ³	-	Temp: 92c		Cy	1,6	SS	4 mm	I	1	10500	10500	10500	1980	69241	051	0	3	2	1	6	1	1
52	Dehydrator	28,93 m ³	-	Temp: 104c		Cy	3,8	SS	5 mm	I	1	26200	26200	26200	1980	69241	053	0	2	2	1	6	1	1
60	Solvent Drum	15,21,2 m ³	SD: 0,64	TL: 6 m		FST	1,8	CS	7 mm	I	3	16350	49050	16350	1980	74161	072	1	4	1	1	2	1	2
11	Heat vent Condenser	15,38 m ³	SD: -	TL: -		ST	0,55	SS	7 mm	I	4	6800	27200	6800	1980	74161	051	0	0	7	1	6	1	2
12	Reactor Condenser	15,640 m ³	SD: 1,2	TL: 6,6 m		FST	42,2	CS	12 mm	I	1	297700	297700	297700	1980	74161	055	2	4	1	3	2	1	2
13	Reactor vent Condenser	15,543 m ³	SD: 1,6	TL: 3,7 m		FST	11,6	CS	13 mm	I	1	377800	377800	377800	1980	74161	055	2	2	1	3	2	1	2

1. All Mat. Equipment shown in Schedule, Plate. Thickness for plate indicated elsewhere.

354/70012

Item #	Part Name	Qty	Unit	Material	Spec	Notes	Orig	Q	Unit	Price	Total	Q	Unit	Price	Total	Q	Unit	Price	Total	Q	Unit	Price	Total
25	Solvent Pumps	19.2m/hr	WH131	MCLC	H		I	1	0.17 tons	17200	17200	17200	17200	17200	17200	17200	17200	17200	17200	17200	17200	17200	17200
26	Initial TA Centrifuge	10.6 t/h			Solid Bowl		I	2	10 mm	190450	380900	190450	380900	190450	380900	190450	380900	190450	380900	190450	380900	190450	380900
27	Second Stage TA Centrifuge	3.8 t/h			Solid Bowl		I	2	10 mm	191700	383400	191700	383400	191700	383400	191700	383400	191700	383400	191700	383400	191700	383400
28	Headline Eva-porator	NS: 4 m ²	SD: 0.4m	height: 4.5	Wiped Film		I	1	10 mm	228300	228300	228300	228300	228300	228300	228300	228300	228300	228300	228300	228300	228300	228300
29	TA Dryer Pa-nd Screw	13 t/h	width: 380 mm		BM		I	1	0.8 tons	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800
30	18" Dia. Filter	10 t/h	width: 380 mm		BM		I	1	0.7 tons	11100	11100	11100	11100	11100	11100	11100	11100	11100	11100	11100	11100	11100	11100
31	Old Air Comp. 424.4	Pr: 29.9	Ko/Co	Air	Coordination		I	2	80 mm	452100	904200	452100	904200	452100	904200	452100	904200	452100	904200	452100	904200	452100	904200
32	1st casing	Pr: 0.97	Ko/Co	NS	Straight		I	2	80 mm	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000
33	Scrubber	346.4	Ko/Co	NS	Straight		I	2	80 mm	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000
34	Blower	474	Ko/Co	NS	Straight		I	2	80 mm	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000	9500	19000

Note: a) VARI Component unless for sepians, plate thickness for plate fabricated equipment.

SP No	M No	Basic Machine Name/Description	Major Spec (Capacity)	Major Spec (Dimensions)	Major Spec (Weight)	Type (Description)	Material (Char. 1)	Material (Char. 2)	Material (Char. 3)	Origin	Purchase Cost			Cr. 1990 Cost			Purch. Year	SYTC Code
											Unit	Total	15	Unit	Total	17		
60		Disintegrator for Dissolver feed pump	48 m ³ /hr	MH172.8 m	HCLC	H	0.3	SS	0.2 tons	I	2	3950	7900	3950	7900	1980	74320	01 3 3 2 1 1 7 1 2
61		Disintegrator for pump	42 m ³ /hr	MH1760 m	HCLC	V	0.76	SS	0.76	I	2	4200	8400	4200	8400	1980	74320	01 3 7 2 2 1 7 1 2
62		Vent scrubber	65 m ³ /hr	MH1231.7 m	HCLC	V	0.3	SS	0.23	I	1	4000	4000	4000	4000	1980	74320	01 3 1 2 2 1 7 1 2
14		Vent scrubber	52.168 m ³ /hr	Dia: 1.4 m	-	SZ	2.86	SS	5 mm	I	1	45200	45200	45200	45200	1980	74361	30 5 1 0 1 1 0 1 2
15		Centrifuge	-	-	-	Solid bowl	6.6	SS	10 mm	I	2	195850	391700	195850	391700	1980	74351	00 0 0 0 5 2 0 1 2
16		PTA rotary steam dryer	-	-	-	Solid bowl	6.0	SS	10 mm	I	2	138800	216600	138800	216600	1980	74351	00 0 0 0 5 2 0 1 2
17		PTA rotary steam dryer	19.307 m ³ /hr	L:115.5 m Dia:2.4 m	-	Steam tube	39.0	SS	10 mm	I	1	901700	291750	901700	291750	1980	74164	30 4 4 1 0 4 0 1 2
18		PTA dryer vent scrubber	-	-	-	-	-	SS	-	I	2	13400	74800	13400	74800	1980	74361	30 0 0 0 0 0 0 0 0
19		PTA Feeder	-	-	-	RM	1.1	SS	0.8 tons	I	2	13400	74800	13400	74800	1980	74426	70 0 1 0 1 1 7 1 2
20		PTA rotary steam dryer	-	-	-	BM	0.9	SS	0.6 tons	I	2	2200	12000	2200	12000	1980	74426	40 0 1 0 1 1 7 1 2
21		PTA dryer feed screen	-	-	-	BM	1.3	SS	0.9 tons	I	1	1000	10000	1000	10000	1980	74426	40 0 1 0 1 1 7 1 2
22		Hydrogen Compressor	0.47 m ³ /min	1.1kg/2.5 Hydrogen	-	H	4.7	Parted Steel	5/2	I	2	19200	31000	19200	38000	1980	74313	01 3 2 1 1 0 3 2

UNICC / SPECIPETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW PURE TEREPHTHALIC ACID PLANT, CAPACITY = 70 000 TON/YEAR
 LOCATION = YUMURTALIK
 ANTICIPATED DATE OF COMMISSIONING = 1995
 UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S. DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	QR	UN.WE	UN.CC	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT.WE
45211 07112 21612	ATM.CENTR.FEED TANK	1	2.7	13.5				2.7							2.7
45211 07112 23242	DISSOLVER	1	14.4	203.6				14.4							14.4
49241 05101 21611	CATALYST ST.UP CHAR. PUM	1	.2	1.9					.2						.2
49241 05101 21611	BST.PX MIX DRUM	1	.6	6.5					.6						.6
45241 05101 21611	BST.PX CAL.SUNGE CRUM	1	.3	1.8					.3						.3
45241 05101 21612	CATALYST MIX DRUM	1	.9	8.3					.9						.9
49241 05101 21612	CATALYST MIX DRUM	1	.8	8.2					.8						.8
49241 05102 21611	RESIDUE SLURRY DRUM	1	1.5	16.4					1.5						1.5
45241 05102 21612	RESLUHMY DRUM	1	3.9	21.0					3.9						3.9
49241 05102 21612	MOTHER LIQ.FLASH DRUM	1	1.7	5.4					1.7						1.7
49241 05103 21611	DEHY.TGN.CON.DRUM	1	1.6	10.5					1.6						1.6
49241 05201 21611	SOLVENT CHARGE DRUM	1	3.2	22.2					3.2						3.2
45241 05202 21612	MOTHER LIQVOR DRUM	1	.8	7.0					.8						.8
49241 05203 21611	FEED MIXING DRUM	1	3.9	24.6					3.9						3.9
45241 05203 21612	PROCESS WATER DRUM	1	2.1	10.5					2.1						2.1
45241 05203 21612	RECYCLE SOLVENT DRUM	1	3.8	19.3					3.8						3.8
49241 05203 21612	FEED SLURRY DRUM	1	3.6	12.2					3.6						3.6
49241 05302 21611	DEHY.SOLVENT DRUM	1	3.8	26.2					3.8						3.8
74161 02414 11212	STRIPPEN REBOILER	1	.4	8.1					.4						.4
74161 02422 12212	DEHY.TGN.REBOILER	1	6.0	162.6					6.0						6.0
74161 03111 11212	SOLVENT COOLER	1	.4	8.0					.4						.4
74161 03141 41212	ABSOR.FEED COOLER	1	.3	3.5					.3						.3
74161 03214 41212	GAS HEATER	1	1.0	12.5					1.0						1.0
74161 05111 11212	SEAL SYSTEM CONDENSER	1	.4	8.4					.4						.4
74161 05112 11212	CENT.VENT CONDENSEM	3	.2	2.9					.6						.6
74161 05200 71612	FEED VENT CONDENSEM	4	.6	6.8					2.4						2.4
74161 05212 11612	SCRUBBER COOLER	2	1.0	13.8					2.0						2.0
74161 05311 11212	DEHY.TGN.VENT CONDENSER	1	2.0	25.7					2.0						2.0
74161 05414 12222	FIRST CRY.S CONDENSER	1	6.0	34.5					6.0						6.0
74161 05522 11212	THIRD CRY.S CONDENSER	1	11.6	377.8					11.6						11.6
74161 05524 11212	REACTOR CONDENSER	1	12.2	297.7					12.2						12.2
74161 05551 82612	DEHY.TGN.CONDENSER	1	9.8	181.1					9.8						9.8
74161 07212 11212	RESLUHMY WATER HEATER	1	.7	5.1					.7						.7
74161 07212 11212	PROCESS WATER HEATER	1	1.7	14.6					1.7						1.7
74161 07214 11212	START-UP HEATER	3	1.8	16.4					5.4						5.4
74161 07214 11212	HP FLUSH WATER HEATER	2	1.4	11.7					1.4						1.4
74161 10214 11212	FEED PREHEATER	2	3.4	26.6					6.8						6.8
74161 10214 12212	FEED PREHEATER	3	6.0	72.0					18.0						18.0
74162 01111 91612	RESIDUE EVAPORATOR	1	2.2	22.8			2.2								2.2
74164 30441 84612	PTA ROTARY STEAM DRYER	1	3.9	291.8				3.9							3.9
74165 08142 43642	HYDROGENATION REACTOR	1	20.3	289.7				20.3							20.3
74165 08212 11612	FIFTH CRYSTALLIZER	1	6.1	30.4					6.1						6.1
74165 08212 11612	THIRD CRYST LLIZER	1	4.8	43.2					4.8						4.8
74165 08212 12212	SECOND CRYSTALLIZER	1	7.8	118.7					7.8						7.8
74165 08222 12512	FOLKTH CRYSTALLIZER	1	10.6	114.4					10.6						10.6
74165 08222 13222	FIRST CRYSTALLIZER	1	12.1	359.7					12.1						12.1
74165 08222 13612	THIRD CRYSTA LIZER	1	12.7	59.8					12.7						12.7
74165 08232 13612	SECOND CRYSTALLIZER	1	20.6	88.8					20.6						20.6
74165 08232 13612	FIRST CRYSTALLIZER	1	34.8	126.8					34.8						34.8
74165 08332 15202	OXIDATION REACTOR	1	57.2	749.1					57.2						57.2
74166 02141 11612	DRYER SCRUBBER	1	1.8	18.1					1.8						1.8
74166 03141 11612	ATM. ABSORBER	1	1.1	9.2					1.1						1.1
74166 03241 22612	HP ABSORBER	1	6.1	31.6					6.1						6.1
74166 07141 11612	SOLVENT STRIPPER	1	4.1	12.7					4.1						4.1
74166 12414 15801	SOLVENT DEHYD.TGNER	1	71.2	444.0				71.2							71.2
74166 30100 83512	OXID.ROCTARY STEAM DRYER	1	2.1	22.2			2.1								2.1
14220 01218 21712	CATALYST CHARGE PUMP	2	.1	2.7					.2						.2
14220 01221 21712	ABSORBER CIRCULATION PUMP	1	.2	3.1					.2						.2
74220 01231 11712	PUMP SEAL FLUID PUMP	2	.2	4.0					.4						.4

UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW PURE TEREPHTHALIC ACID PLANT, CAPACITY = 70 000TON/YEAR
 LOCATICA=YUMURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT HEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CC	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_WE
74220 01312 11712	SCLVENT CHARGE PUMP	2	.6	3.0				1.2							1.2
74220 01312 21712	VENT SCRUB.CIRC.PUMP	1	.2	4.0				.2							.2
74220 01322 11712	PRESS.CENTR.FEED PUMP	2	.3	4.1				.6							.6
74220 01322 11712	SECCNO CENT.FEED PUMP	2	.3	4.2				.6							.6
74220 01322 11712	SCRUBBER SLURRY PUMP	2	.4	2.7				.8							.8
74220 01322 11712	MOTHER LIQUOR PUMP	2	.4	3.1				.8							.8
74220 01322 11712	MOTHER LIQUOR DRUM	1	.5	2.7				.5							.5
74220 01322 21712	DEHYDRATED SOLVENT PUMP	2	.3	3.3				.6							.6
74220 01322 21712	SOLVENT BOTOM PUMP	1	.2	3.2				.2							.2
74220 01322 21712	ATM.CENTR.FEED PUMP	2	.3	3.9				.6							.6
74220 01322 21712	INITIAL CENT.FEED PUMP	2	.3	4.2				.6							.6
74220 01325 21712	REACTGR FEED PUMP	2	1.6	12.0				3.2							3.2
74220 01332 11712	DISSOL.FEED BOOSTER PUMP	2	.2	4.0				.4							.4
74220 01332 21712	DEHLDR.TOWER REFLUX PUMP	2	.2	3.7				.4							.4
74220 01332 21712	PROCESS WATER PUMP	1	.4	3.8				.4							.4
74220 01342 11712	SOLVENT FLUSH PUMP	1	.2	17.2				.2							.2
74220 01342 11712	RECYCLE SOLVENT PUMP	2	.5	4.4				1.0							1.0
74220 01372 21712	HP FLUSH WATER PUMP	1	2.0	30.2				2.0							2.0
74220 01372 21712	DISSOL.FEED PUMP	2	.8	4.2				1.6							1.6
74220 01422 21712	STRIPPER CIRCULATION PUMP	2	.4	14.3				.8							.8
74220 01621 11712	ABSCRBER FEED PUMP	2	.2	8.8				.4							.4
74313 01132 11932	HYDRGGEN COMPRESSOR	2	4.7	19.3				9.4							9.4
74313 01541 33612	OXID.AIR COMP.SECCNO CAS.	1	22.0	452.1				22.0							22.0
74313 01541 33612	OXID.AIR COMP.FIRST CAS.	1	22.0	452.1				22.0							22.0
74342 00512 11712	SCRUBBER BLOWER	2	.4	19.0				.8							.8
74351 00000 52612	PTA ATM.CENTRIFUGE	2	6.0	261.6					12.0						12.0
74351 00000 52612	PTA PRE. CENTRIFUGE	2	6.5	195.9					13.0						13.0
74351 00100 52612	SECCNO ST.TA CENTRIFUGE	2	6.5	38.3					13.0						13.0
74351 00200 52612	INITIAL TA CENTRIFUGE	2	6.5	38.1					13.0						13.0
74361 30510 11612	VENT SCRUBBER	1	2.9	45.2					2.9						2.9
74361 50310 21212	INLET AIR FILTER	1	2.1	10.0					2.1						2.1
74426 40010 11712	FEED SLURRY DR.FEED SCR.	2	.9	6.0					1.8						1.8
74426 40030 11712	PTA DRYER FEED SCREW	1	1.3	10.6					1.3						1.3
74426 40110 11712	TA DRYER GUT.REVERS SCREW	1	.9	11.1					.9						.9
74426 40110 11712	TA DRYER FEED SCREW	1	1.4	19.8					1.4						1.4
74426 70010 11712	TA FEEDER	2	1.1	13.4					2.2						2.2

UNIGG / SPG(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW PURE TEREPHTHALIC ACID PLANT,CAPACITY = 70 000TON/YEAR
 LOCATION=YUNURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1995
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 EOP-DEPARTMENT-PETKIM / ANKARA

SITC CODE	BASIC MACHINE NAME	CR	UN.WE	UN.CO	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOT_CO
*****	*****	**	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
74220	01312 11712 SOLVENT CHARGE PUMP	2	.6	3.0				6.0							6.0
74220	01312 21712 VENT SCRUB.CIRC.PUMP	1	.2	4.0				4.0							4.0
74220	01322 11712 PRESS.CENTR.FEED PUMP	2	.3	4.1				8.2							8.2
74220	01322 11712 SECNGN CENT.FEED PUMP	2	.3	4.2				8.4							8.4
74220	01322 11712 SCRUBBER SLURRY PUMP	2	.4	2.7				5.4							5.4
74220	01322 11712 MOTHER LIQUOR PUMP	2	.4	3.1				6.2							6.2
74220	01322 11712 MOTHER LIQUOR DRUM	1	.5	2.7				2.7							2.7
74220	01322 21712 DEHYDRATED SOLVENT PUMP	2	.3	3.3				6.6							6.6
74220	01322 21712 SOLVENT BOTTOM PUMP	1	.2	3.2				3.2							3.2
74220	01322 21712 ATP.CENTR.FEED PUMP	2	.3	3.9				7.8							7.8
74220	01322 21712 INITIAL CENT.FEED PUMP	2	.3	4.2				8.4							8.4
74220	01325 21712 REACTOR FEED PUMP	2	1.6	12.0				24.0							24.0
74220	01332 11712 DISSOL.FEED BCCSTER PUMP	2	.2	4.0				8.0							8.0
74220	01332 21712 DEM.LDR.TOWER REFLUX PUMP	2	.2	3.7				7.4							7.4
74220	01332 21712 PROCESS WATER PUMP	1	.4	3.8				3.8							3.8
74220	01342 11712 SOLVENT FLUSH PUMP	1	.2	17.2				17.2							17.2
74220	01342 11712 RECYCLE SOLVENT PUMP	2	.5	4.4				8.8							8.8
74220	01372 21712 HP FLUSH WATER PUMP	1	2.0	30.2				30.2							30.2
74220	01372 21712 DISSOL.FEED PUMP	2	.8	4.2				8.4							8.4
74220	01422 21712 STRIPPER CIRCULATION PUMP	2	.4	14.3				28.6							28.6
74220	01421 11712 ABSORBER FEED PUMP	2	.2	8.8				17.6							17.6
74313	01132 11932 HYDROGEN COMPRESSOR	2	4.7	19.3				38.6							38.6
74313	01541 33612 OXID.AIR COMP.SECCND CAS.	1	22.0	452.1				452.1							452.1
74313	01541 33612 OXID.AIR COMP.FIRST CAS.	1	22.0	452.1				452.1							452.1
74342	00512 11712 SCRUBBER BLOWER	2	.4	15.0				38.0							38.0
74351	00000 52612 PTA ATM.CENTRIFUGE	2	6.0	261.6					523.2						523.2
74351	00000 52612 PTA PRE. CENTRIFUGE	2	6.5	195.9					391.8						391.8
74351	00100 52612 SECNGN ST.TA CENTRIFUGE	2	6.5	38.3					76.6						76.6
74351	00200 52612 INITIAL TA CENTRIFUGE	2	6.5	38.1					76.2						76.2
74361	30510 11412 VENT SCRUBBER	1	2.9	45.2					45.2						45.2
74361	50310 21212 INLET AIR FILTER	1	2.1	10.0					10.0						10.0
74426	40010 11712 FEED SLURRY DR.FEED SCR.	2	.9	6.0					12.0						12.0
74426	40030 11712 PTA DRYER FEED SCREW	1	1.3	10.6					10.6						10.6
74426	40110 11712 TA DRYER GUT.REVERS SCREW	1	.9	11.1					11.1						11.1
74426	40110 11712 TA DRYER FEED SCREW	1	1.4	19.8					19.8						19.8
74426	70010 11712 TA FEEDER	2	1.1	13.4					26.8						26.8

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**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES
DP/TUR/76/034**

**Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry.**

**Vol. XVI- Technical data for
(ARO) Aromatics**

UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

RESTRICTED

July 82

English

**DEVELOPMENT OF
CAPITAL GOODS INDUSTRIES**

DP/TUR/76/034

TURKEY

**Technical Report No. XI- Demand for Capital Goods for
Petrochemicals Industry,
Vol. XVI- (ARO) Aromatics**

**Prepared for the Government of Turkey
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme**

**Based on the work of
Capital Goods Development Project Team in Turkey
United Nations Industrial Development Organization
Vienna**

**This report has not been cleared with the United Nations Industrial
Development Organization which does not, therefore, necessarily
share the views presented.**

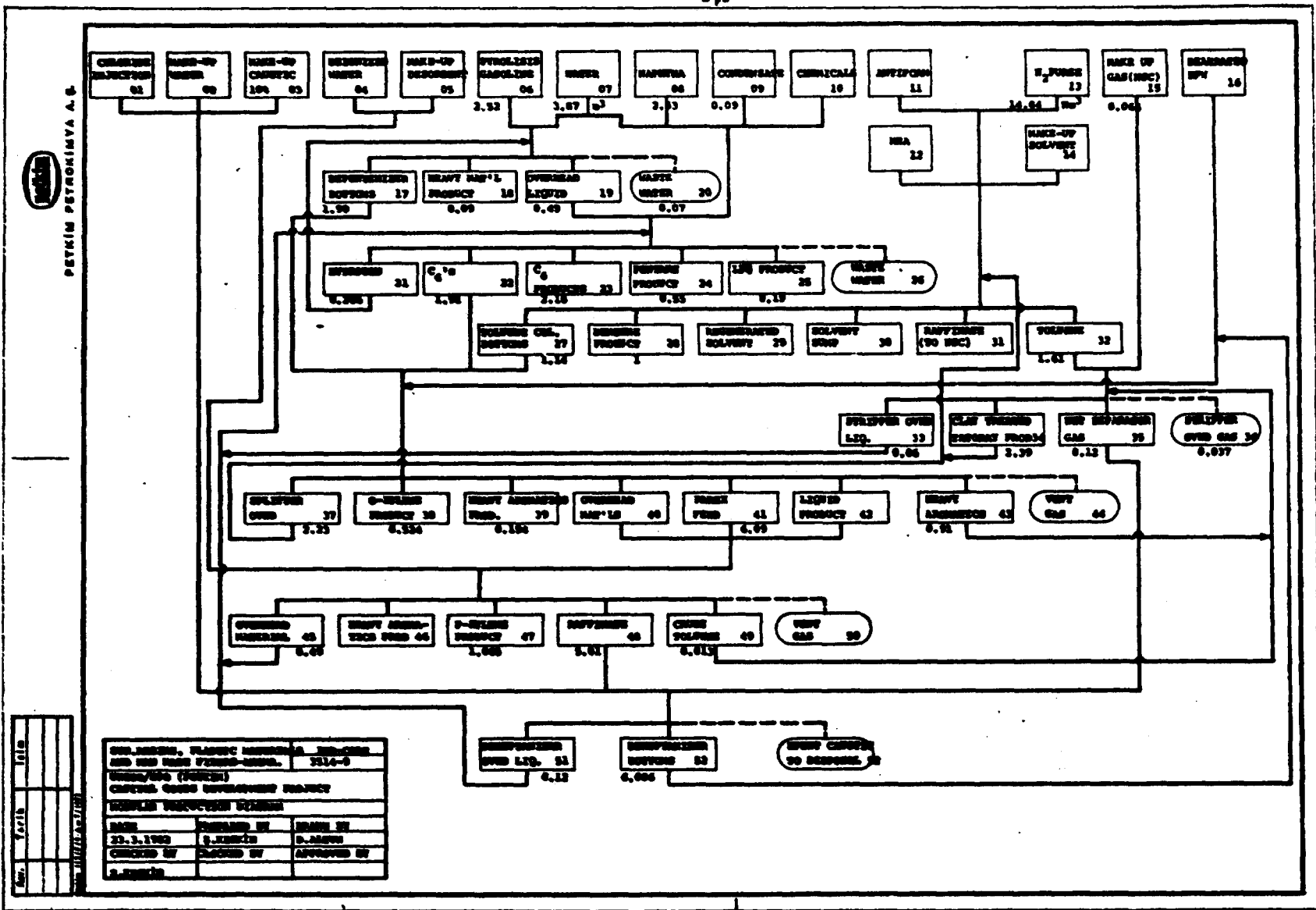
UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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PETKIM PETROKIMYA A.Ş.

RELATIONSHIP BETWEEN FLOW DIAGRAMS
AND ACTIVITIES FOR AROMATICS PLANT

06 TO 19 LP UNIDEN

19 TO 25 FLATFORMING

12 TO 28 SULFOLANE

15 TO 34 TATORAY

17 TO 38 XYLENES FRACTIONATION

41 TO 47 PAREX

48 TO 52 ISOMAR

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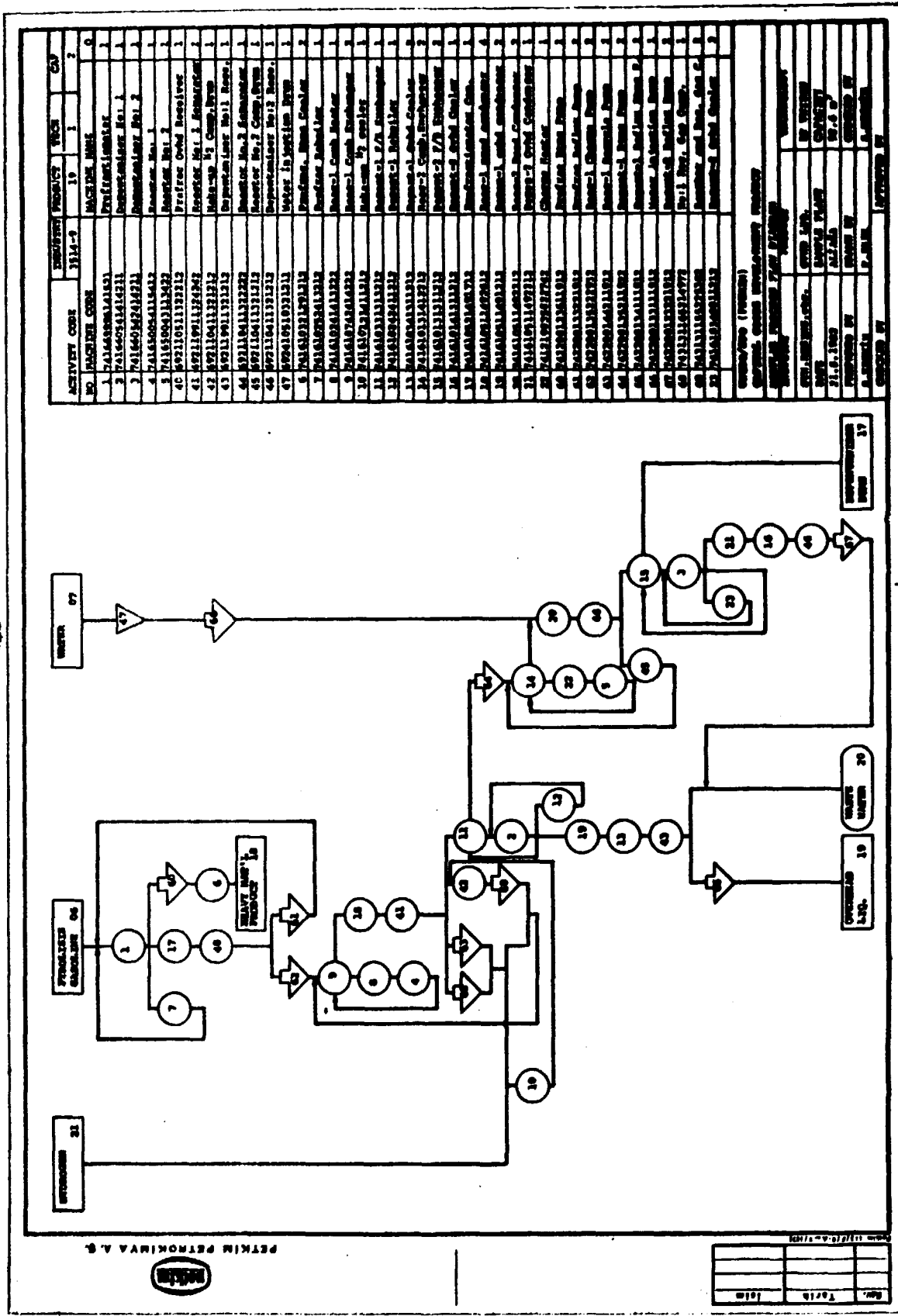
UNIDO/890 (MEXIN) INDUSTRIAL ACTIVITIES CHART
 PART-18 MONOMERS
 DND.CODE: 3514-9
 DND.NAME: SYN.RESINS, PLASTIC MATERIALS
 AND MAN MADE FIBERS, MONOMERS

PETKIM PETROKIMYA A.S.



PROD	PRODC	PRODUCTION	NAME	STAGE	TECH	CODE	TECHNOLOGY	MAIN EQUIPMENT	CAPACITY RANGE	CAPACITY CODE	CAPACITY
19	OVERHEAD LIQUID	1	LE URISON	1	DEBERTINER	60-180 m ³	DEBERTINER	60-180 m ³	1	1	60 m ³
									2	2	92 m ³
									3	3	142 m ³
									4	4	180 m ³
25	1PG PRODUCT	1	PLATFORING	1	PLATFORING	6-38 m ³	PLATFORING	6-38 m ³	1	1	6 m ³
									2	2	19 m ³
									3	3	28 m ³
									4	4	38 m ³
26	REZINS	1	SULFORINE	1	REVERSE OSMOSIS	120-206 m ³	REVERSE OSMOSIS	120-206 m ³	1	1	120 m ³
									2	2	186 m ³
									3	3	222 m ³
									4	4	266 m ³
34	CLAY TREATED SPECIAL PRODUCT	1	SPECIAL	1	REACTOR	3-17 m ³	REACTOR	3-17 m ³	1	1	3 m ³
									2	2	6 m ³
									3	3	10 m ³
									4	4	17 m ³
38	0-ALUMINE	1	ALUMINA	1	FINISHING COLUMN	60-105 m ³	FINISHING COLUMN	60-105 m ³	1	1	60 m ³
									2	2	87 m ³
									3	3	105 m ³
47	P-ALUMINE	1	MAKX	1	SPLITTER	116-253 m ³	SPLITTER	116-253 m ³	1	1	116 m ³
									2	2	148 m ³
									3	3	193 m ³
									4	4	232 m ³
52	DEBERTINER BOTTOMS	1	ISOMAR	1	DEBERTINER	108-186 m ³	DEBERTINER	108-186 m ³	1	1	108 m ³
									2	2	132 m ³
									3	3	186 m ³

APPROVED BY: _____
 CHECKED BY: _____
 PREPARED BY: _____
 S. KESKIN



ACTIVITY CODE	FUNCTION	PRODUCT	QTY	CU
NO. MACHINE CODE	3114-9	MACHINE NAME	1	2
1	7416480010101	PROFILER/GENERATOR	1	0
2	7416480010102	Refrigerant No. 1	1	1
3	7416480010103	Refrigerant No. 2	1	1
4	7416480010104	Refrigerant No. 1	1	1
5	7416480010105	Refrigerant No. 2	1	1
6	7416480010106	Refrigerant No. 1	1	1
7	7416480010107	Refrigerant No. 2	1	1
8	7416480010108	Refrigerant No. 1	1	1
9	7416480010109	Refrigerant No. 2	1	1
10	7416480010110	Refrigerant No. 1	1	1
11	7416480010111	Refrigerant No. 2	1	1
12	7416480010112	Refrigerant No. 1	1	1
13	7416480010113	Refrigerant No. 2	1	1
14	7416480010114	Refrigerant No. 1	1	1
15	7416480010115	Refrigerant No. 2	1	1
16	7416480010116	Refrigerant No. 1	1	1
17	7416480010117	Refrigerant No. 2	1	1
18	7416480010118	Refrigerant No. 1	1	1
19	7416480010119	Refrigerant No. 2	1	1
20	7416480010120	Refrigerant No. 1	1	1
21	7416480010121	Refrigerant No. 2	1	1
22	7416480010122	Refrigerant No. 1	1	1
23	7416480010123	Refrigerant No. 2	1	1
24	7416480010124	Refrigerant No. 1	1	1
25	7416480010125	Refrigerant No. 2	1	1
26	7416480010126	Refrigerant No. 1	1	1
27	7416480010127	Refrigerant No. 2	1	1
28	7416480010128	Refrigerant No. 1	1	1
29	7416480010129	Refrigerant No. 2	1	1
30	7416480010130	Refrigerant No. 1	1	1
31	7416480010131	Refrigerant No. 2	1	1

PETKIN PETROKIMAYA A.B.

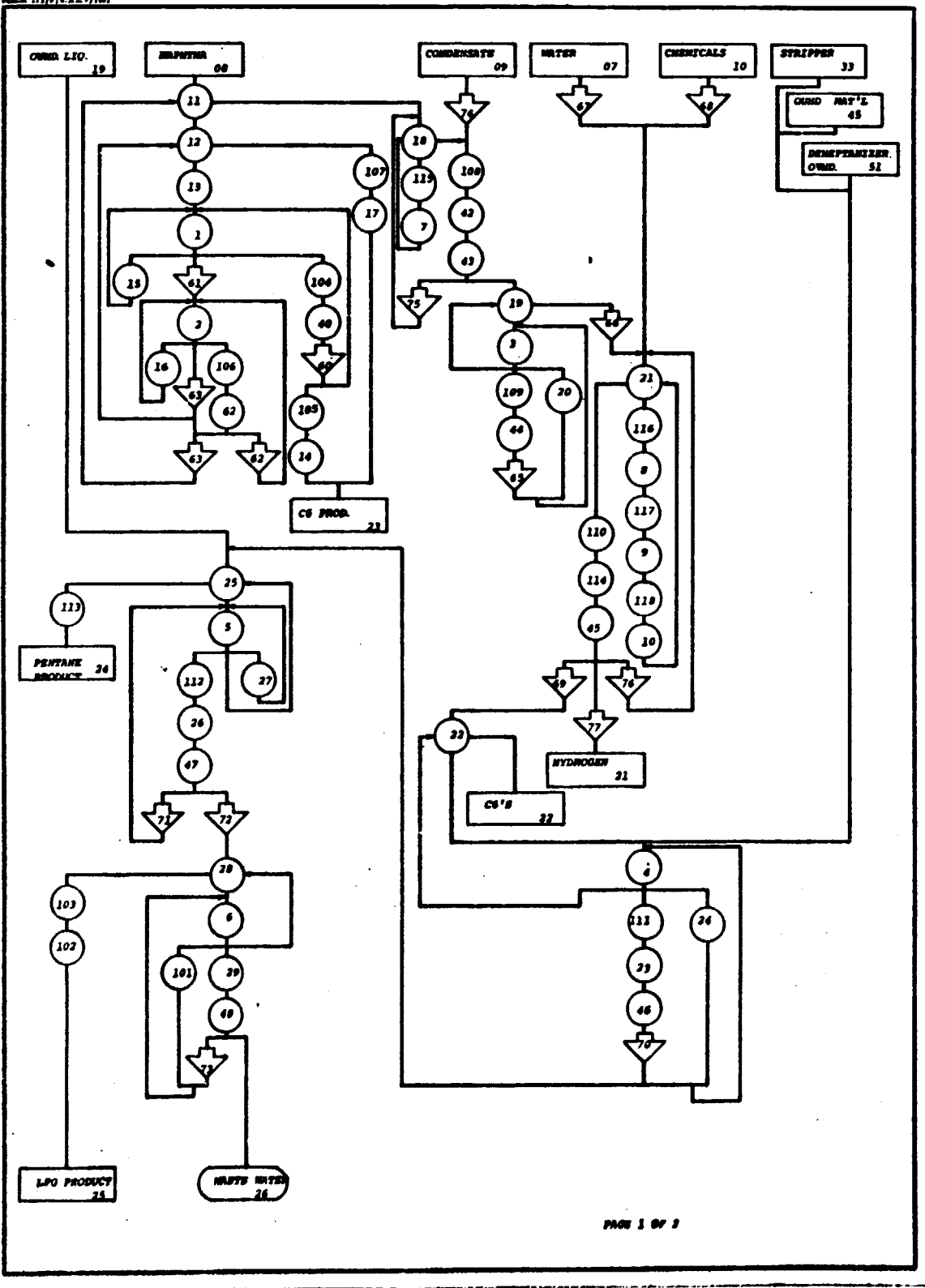


Rev.	Form

No.	Tanggal	Isian



PETKIM PETROKIMYA A.S.



Rev.	Tarikh	Isim



PT. KIM PETROKIMIA A.S.

Form 111/113-A-7/1972

ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	U/P
	1514-9	25	1	2
NO	MACHINE CODE	MACHINE NAME	Q	
1	741660941415211	Prefractionator	1	
2	741669941415211	Berun Column	1	
3	741660732413212	Stripper	1	
4	741661122414211	Depentaniser	1	
5	741661122413211	Debutaniser	1	
6	741661124413212	Deethaniser	1	
7	741659931172222	Hydrotreating Reactor	1	
8	74165082173422	Platforming Reac-1	1	
9	741650842173422	Platforming Reac-2	1	
10	741650842173422	Platforming Rec-3	1	
40	692410530322211	Prefrac.Ovhd Receiver	1	
41	692410520222211	Reflux Receiver	1	
42	692410520322222	Hydrot. Prod. Soper.	1	
43	692410510321212	Hydrot. Recy. Sup. Drum	1	
44	692410510321212	Stripper Receiver	1	
45	692410520322212	Platforming Reac Soper	1	
46	692410510322212	Depent Ovhd Receiver	1	
47	692410510321210	Debutan Ovhd Receiver	1	
48	692410510321211	Deethan Ovhd Receiver	1	
11	741610141311212	Prefrac. F/R Ovhd Exch	2	
12	741610141311212	Refrac. F/R Heat Exch	2	
13	741610141311212	Prefrac Preheater	1	
14	741610321311212	Prefrac Heat Ovhd Cooler	2	
15	741610252413212	Prefrac Reboiler	1	
16	741610242413212	Reflux Reboiler	1	
17	741610241311212	Reflux Steam Trim Cooler	1	
18	741610141422212	Hydrot Comb. Exchanger	2	
19	741610131311212	Stripper F/B Exchanger	2	
20	741610241412212	Stripper Reboiler	1	
21	741610342415212	Reactor Prod. Trim Cool	1	
22	741610121311212	Depent F/B Exchanger	2	
23	741610331311212	Depent Ovhd Trim Cooler	1	
24	741610241312212	Depentaniser Reboiler	1	
25	741610121511212	Debutaniser F/B Exch	1	
26	741610341311212	Debutaniser Ovhd. Cooler	1	
27	741610221211212	Debutaniser Reboiler	1	
28	741610121491212	Deethaniser F/B Exch	2	
29	741610531311212	Deethaniser Ovhd. Cond.	1	
101	741610221111212	Deethaniser Reboiler	1	

102	741610321491212	102 Product Cooler	3	
103	741610311491212	Deethaniser Heat Exch	1	
104	741610561413122	Prefrac.Ovhd. Condenser	2	
105	741610351412212	Prefrac Heat Ovhd Cool.	1	
106	741610561412212	Reflux Condenser	1	
107	741610141414222	Reflux Steam cooler	1	
108	741610561412212	Hydrot Reac. Prod. Cond	1	
109	741610561413122	Stripper Condenser	1	
110	741610561412212	Platforming Reac. cond	2	
111	741610561412212	Depent Ovhd. Condenser	1	
112	741610561413122	Debut. Ovhd. Condenser	1	
113	741610321311422	Low Temp. Prod. cooler	2	
114	741610141414122	Platforming Comb. Exch	1	
115	741322042401402	Hydrotreating Heater	1	
116	741322061401402	Platforming Heater	1	
117	741322061401402	Platform-1 Interheater	1	
118	741322061402402	Platform-2 Interheater	1	
60	742200144211912	Prefrac Ovhd Pump	2	
61	742200143221912	Prefrac. Heat pump	2	
62	742200133221912	Reflux Reflux Pump	2	
63	742200132211912	Hydrotreating Pump	2	
64	742200142211912	Reflux Heat Pump	2	
65	742200132211912	Stripper Reflux Pump	2	
66	742200132411912	Platforming Chem. Pump	2	
67	742200125112702	Water Wash Pump	1	
68	742200114112702	Water Inj. Pump	1	
69	742200113112702	Water Feed Pump	2	
70	742200134112702	Water Ovhd Pump	2	
71	742200121421912	Reflux Reflux Pump	2	
72	742200125221912	Reflux Heat Ovhd Pump	2	
73	742200112121912	Reflux Reflux Pump	2	
74	742200113122702	Water Inj. Pump	1	
75	742200114111912	Water Feed Pump	2	
76	742200112121912	Reflux Reflux Pump	1	
77	742200113121912	Water Inj. Feed Pump	2	

UNION/PROJ. NAME

CAPITAL WORKS DEVELOPMENT REPORT

MODULAR PROJECT FROM	PROJECT	TECHNOLOGY
INDUSTRY		
SYN. REFERENCE	DESIGNER	PLANT/SCALE
DATE	SCALE	CAPACITY
24.5.1982	ASIAN	10.4 M
PREPARED BY	DRAWN BY	CHECKED BY
L. YALDIZ	A. H. H.	S. KRISHN
CHECKED BY	APPROVED BY	

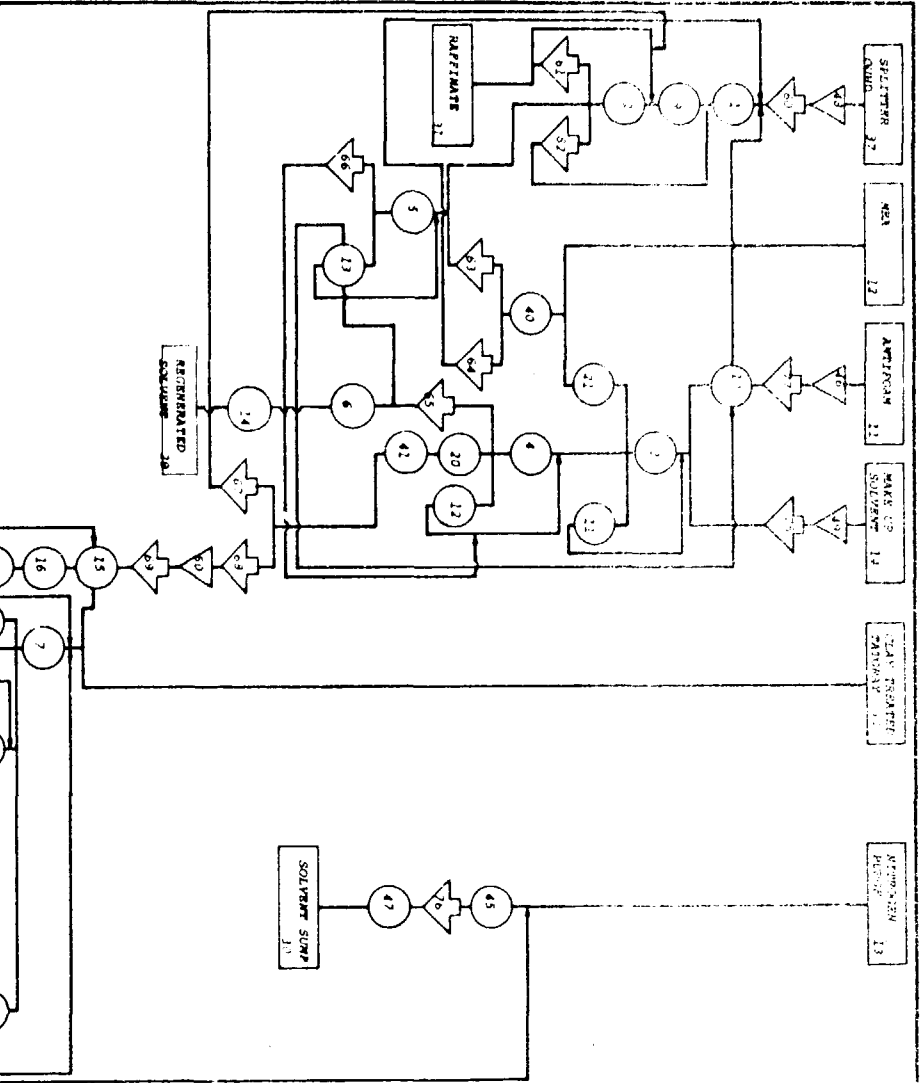


PETKIM PETHOKIMYA A. S.

Rev.	Tarikh	Isim

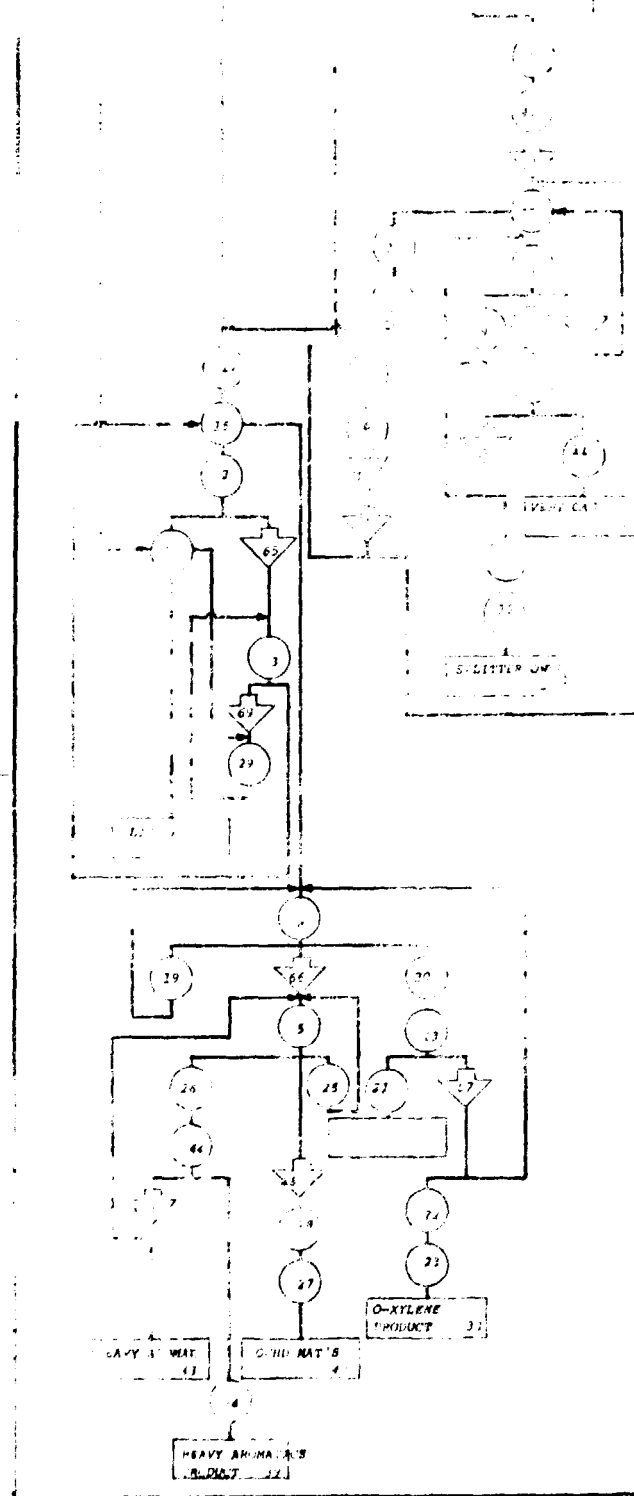
UNIT / SPO / PERFORM /
CAPITAL GOOD DEVELOPMENT PROJECT

INDUSTRIAL PROCESS PLANT	TEKNOLOGI
INDUSTRIAL	INDUSTRIAL
SVL BESIS A/C	SVL BESIS A/C
DATE	DATE
24.5.1982	23.8.82
APPROVED BY	APPROVED BY
F. STANT	S. KESKIN
CHECKED BY	CHECKED BY
A. S. HAN	A. S. HAN



NO.	ACTIVITY CODE	ACTIVITY	PRODUCT	TYPI	CAPACITY
1	74100000000000000000	SETTLER	SETTLER	1	1
2	74100000000000000000	MIXER	MIXER	1	1
3	74100000000000000000	REFINER	REFINER	1	1
4	74100000000000000000	MIXER	MIXER	1	1
5	74100000000000000000	MIXER	MIXER	1	1
6	74100000000000000000	MIXER	MIXER	1	1
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50	74100000000000000000	MIXER	MIXER	1	1

PROJEKT: ...
 NO. ...
 ...



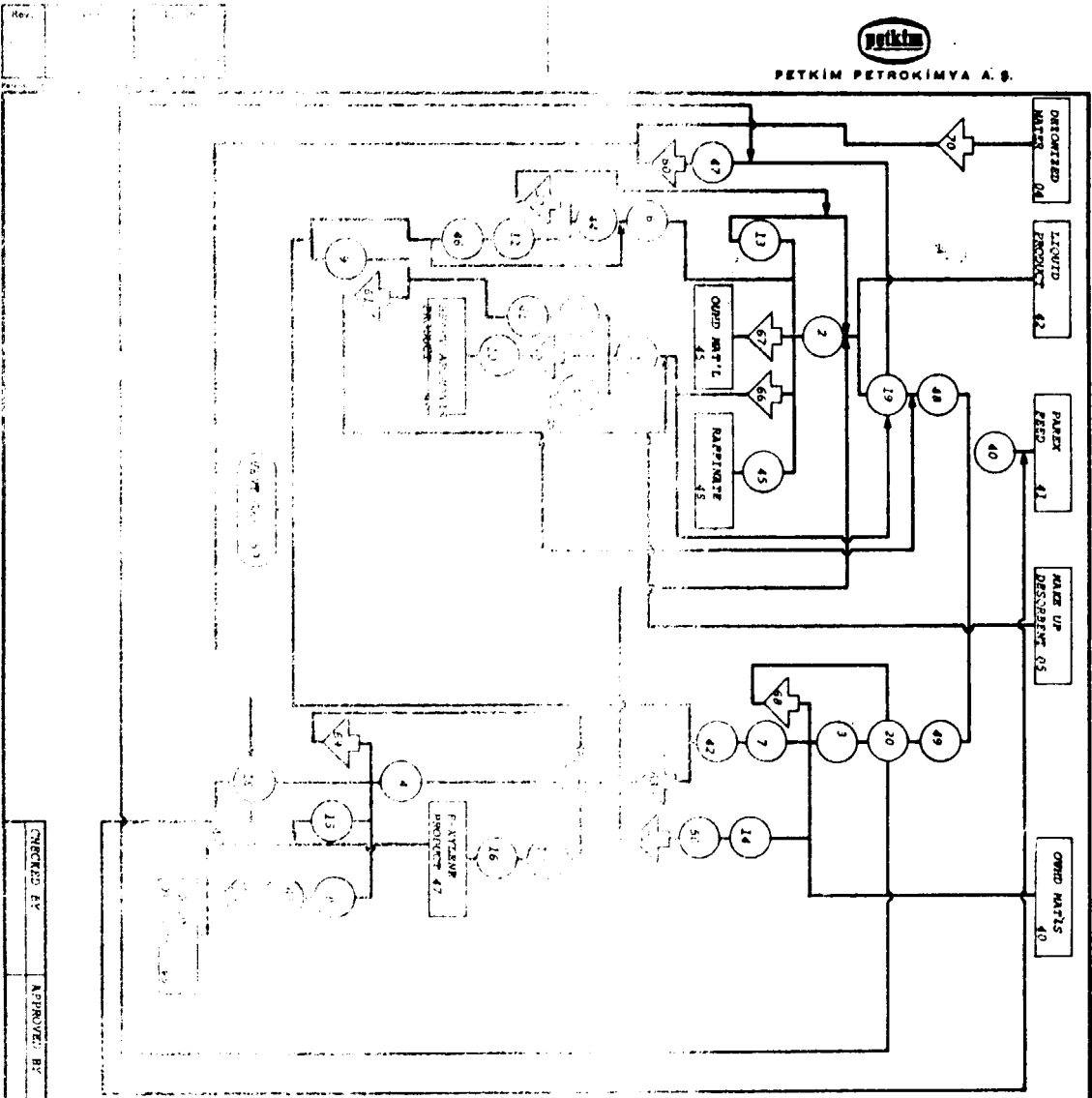
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UNIT: ...
 ALIYAN ...
 ...

DESIGNER	PROJECT	TECHNOLOGY
...	O-XYLENE	XYLENE FRACT
...	SAMPLE PLANT	CAPACITY
...	ALFA	260 m
...	DRAWN BY	CHECKED BY
...	D. ALTUN	S. KESKIN
CHECKED BY	...	APPROVED BY

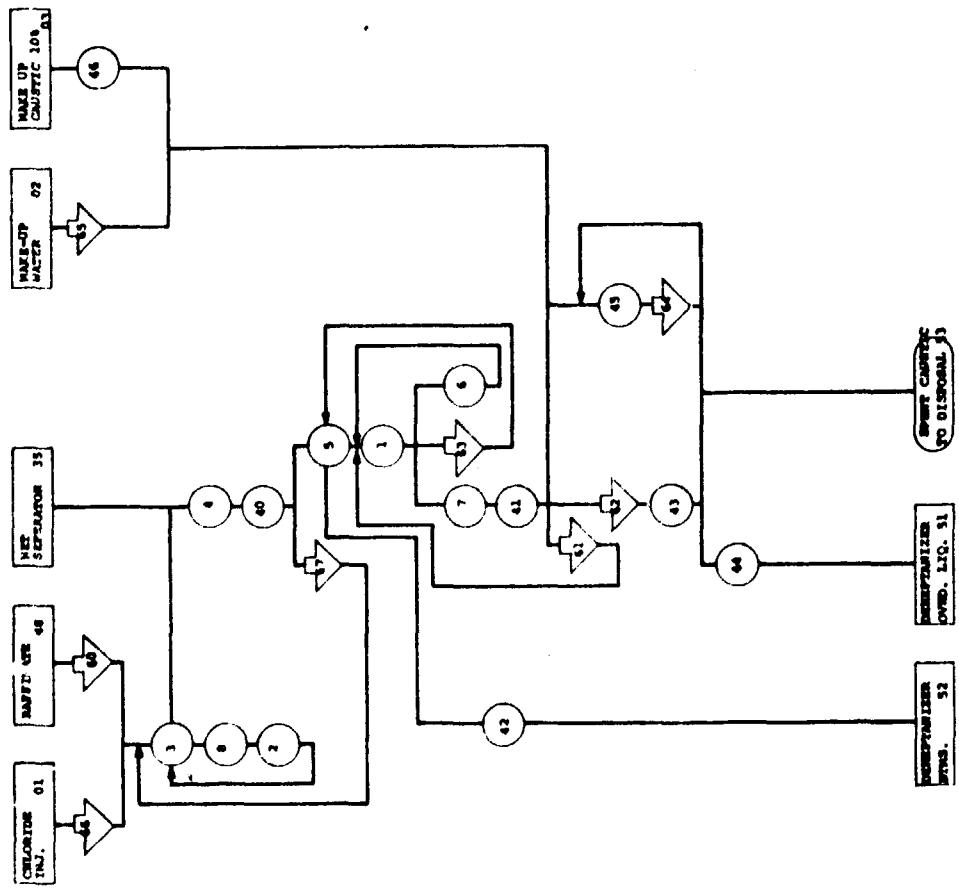


PETKIM PETROKIMYA A.Ş.



ACTIVITY CODE	INDUSTRY	PROJECT	TRIAL	CR
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60	3514	01	1	0

CHECKED BY: _____ APPROVED BY: _____
 PREPARED BY: _____
 DATE: _____
 SCALE: _____
 SHEET NO: _____ OF _____
 PROJECT NO: _____
 UNIT: _____
 DRAWING NO: _____
 REVISION: _____
 COMMENTS: _____
 APPROVED BY: _____
 DATE: _____



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
NO	1914-9	52	1	7
1	741200000000000000	MAKE-UP WATER		
2	741200000000000000	MAKE-UP WATER		
3	741200000000000000	MAKE-UP WATER		
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57	741200000000000000	MAKE-UP WATER		

UNIT/SPO (PETKIN)
 CAPITAL GOODS DEVELOPMENT PROJECT
 MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
1914-9	52	1
DATE	24.5.1982	CAPACITY
PREPARED BY	ALINGA	132 m ³
CHECKED BY	D. ALFON	DESIGNED BY
APPROVED BY		SIZE/SCALE

NO.	DATE	REVISION

Item No.	Description	Specs	Type	Manuf. Char. 1	Manuf. Char. 2	Partic. Char. 3	Origin	Q	Purchase Cost		Ct. 1980 Cost		Purch. Year	SINC Code										
									Unit	Total	Unit	Total		1745	67	9	10	11	12					
19	Open. coil	HS: 2.75 m ID 0.7 m	DS	4.07	CS	6 mm	I	2	63000	126000	52500	105000	1979	74161	05	1	1	4	9	1	2	1	7	
20	Prod. condenser	HS: 2.77 m ID 0.57 m	DJ	6.03	CS	6 mm	I	2	46500	93000	38700	77400	1979	74161	05	1	1	1	4	9	2	2	1	2
21	Open. coil	HS: 2.77 m ID 0.57 m	DJ	5.99	CS	6 mm	I	1	41800	41800	34900	34900	1979	74161	05	1	1	1	4	9	2	2	1	7
22	Charge heater	HS: 15.6 t/h	DS	5	SE	5 tons	I	1	124500	124500	104150	104150	1979	74121	99	3	5	0	2	2	7	4	2	
23	Prefrac. bot. pump	HS: 1.43 m ³ /hr	H	0.29	SP	0.15 tons	I	2	6750	13500	7500	15000	1979	74220	01	2	3	6	1	1	9	1	2	
24	Prefrac. reflux pump	HS: 32.01 m ³ /hr	V	0.82	SE	0.39 tons	I	2	5300	10600	5900	11800	1979	74220	01	2	3	2	2	1	1	9	1	2
25	Reactor coil charge pump	HS: 35.64 m ³ /hr	V	1.3	SP	3.5 tons	I	2	35400	70800	39450	78900	1979	74220	01	2	3	5	2	2	1	9	1	2
26	Reactor coil recycle pump	HS: 184.9 m ³ /hr	H	1.35	SE	0.69 tons	I	2	11650	23300	11200	22400	1979	74220	01	2	3	4	2	1	1	9	1	2
27	Bottoms pump	HS: 53.37 m ³ /hr	H	1.1	SP	1.8 tons	I	2	25150	50300	28200	56400	1979	74220	01	2	3	5	2	1	1	9	1	2
28	Bottoms pump	HS: 25.85 m ³ /hr	H	1.22	SE	0.66 tons	I	2	9400	18800	10450	20900	1979	74220	01	2	3	4	1	1	1	9	1	2
29	Water injector	HS: 1.28 m ³ /hr	H	2.5	SP	0.3 tons	I	1	17500	17500	13900	13900	1979	74220	01	2	3	4	1	1	9	1	2	
30	Reflux pump	HS: 34.29 m ³ /hr	V	0.31	SP	0.2 tons	I	2	4000	8000	4500	9000	1979	74220	01	2	3	2	2	1	1	9	1	2
31	Reflux pump	HS: 111 m ³ /hr	H	34.2	SE	29 tons	I	1	379000	379000	379000	379000	1980	74311	11	6	5	2	1	4	9	7	2	
32	Reflux pump	HS: 200 m ³ /hr	H	78.6	SE	61.5 tons	I	2	269810	539620	269810	539620	1980	74311	11	5	2	2	5	1	8	2		
33	Reflux pump	HS: 105 m ³ /hr	H	1.7	SE	6 mm	I	2	2750	5500	2300	4600	1979	74161	01	4	0	1	1	2	3	2		

Note: a) Max. component weight for purchase. piece. thickness for plate fabricated equipments.

Sp No	M	Basic Machine Name/Structure	Mater Spec (Capacity)	Major Spec (Optional)	Plate Spec (Optional)	Type (Description)	Manufac. Char. 1. (TONS)	Manufac. Char. 2. (a)	Negotiac. Char. 3. (a)	Origin	Purchase Chart		Cr. 1960 Chart		Purch. Year	SITC Code
											Unit	Total	Unit	Total		
1	2	Refractometer	107 m ³	Pi: 0.5 atm	Temp: 160°C	PS	64.0	CS	15 mm	T	1	60700	60700	544500	1979	74166 05 6 1 4 1 5 2 1 1
2	2	Merum Column	276.9 m ³	Pi: 2.05 atm	Temp: 200°C	PS	66.0	CS	18 mm	T	1	549000	549000	567350	1979	74166 09 4 1 4 1 5 2 3 1
3	2	Refrigerator	38 m ³	Pi: 11.4 atm	Temp: 236°C	PS	19.7	CS	15 mm	I	1	535900	535900	535900	1980	74166 07 3 2 4 1 3 2 1 1
4	2	Deponitator	56.86 m ³	Pi: 11.2 atm	Temp: 257°C	PS	32.0	CS	14 mm	T	1	156700	156700	151000	1979	74166 11 2 2 4 1 4 2 3 1
5	2	Debutanizer	27.46 m ³	Pi: 14.1 atm	Temp: 145°C	PS	19.0	CS	13 mm	T	1	8150	8150	7850	1979	74166 11 2 2 4 1 3 2 1 1
6	2	Debutanizer	13 m ³	Pi: 31.6 atm	Temp: 117°C	PS	24.6	CS	17 mm	T	1	379000	379000	365900	1980	74166 11 2 4 4 1 3 2 1 2
7	2	Debutanizer	7.1 m ³	Pi: 27.1 atm	Catalytic	PS	6.0	CS	14 mm	I	1	71200	71200	68500	1979	74165 09 3 1 1 7 2 2 2 2
8	2	Platforming Reactor No. 1	8.93 m ³	Pi: 16.6 atm	Catalytic	AS	10.0	AS	32 mm	I	1	57000	57000	54850	1979	74165 08 3 2 1 7 5 4 2 2
9	2	Platforming Reactor No. 2	12.7 m ³	Pi: 16.6 atm	Catalytic	AS	12.5	AS	32 mm	I	1	74800	74800	72100	1979	74165 08 4 2 1 7 4 2 2 2
10	2	Platforming Reactor No. 3	19.4 m ³	Pi: 16.6 atm	Catalytic	AS	16.0	AS	33 mm	I	1	85100	85100	82000	1979	74165 08 4 2 1 7 4 2 2 2
11	2	Refractometer	32.6 m ³	-	Temp: 82°C	CY	8.5	CS	11 mm	T	1	53650	53650	53650	1980	69241 05 3 0 3 2 2 2 1 1
12	2	Merum Receiver	24.1 m ³	-	Temp: 178°C	CY	6.5	CS	10 mm	T	1	41000	41000	41000	1980	69241 05 2 0 2 2 2 2 1 1
13	2	Hydrocracking Products Separator	33.0 m ³	-	Temp: 52°C	CY	33.0	CS	28 mm	I	1	22900	22900	28000	1979	69241 05 2 0 3 2 3 2 2 2
14	2	Hydrocracking Products Separator	0.13 m ³	-	Temp: 52°C	CY	0.4	CS	8 mm	I	1	1650	1650	2000	1979	69241 05 1 0 3 2 1 2 1 2
15	2	Refractometer	4.7 m ³	-	Temp: 49°C	CY	2.5	CS	10 mm	I	1	4070	4070	7100	1979	69241 05 1 0 3 2 1 2 1 1
16	2	Products Separator	13.6 m ³	-	Temp: 16°C	CY	7.4	CS	14 mm	I	1	13500	13500	16500	1979	69241 05 2 0 3 2 2 2 1 2
17	2	Debutanizer	9.2 m ³	-	Temp: 18°C	CY	5.2	CS	16 mm	I	1	11450	11450	14000	1979	69241 05 1 0 3 2 2 2 1 2
18	2	Debutanizer	6.5 m ³	-	Temp: 18°C	CY	4.5	CS	17 mm	T	1	28400	28400	28400	1980	69241 05 1 0 3 2 3 2 1 1
19	2	Debutanizer	1.65 m ³	-	Temp: 18°C	CY	2.8	CS	23 mm	T	1	18400	18400	18400	1980	69241 05 1 0 3 2 3 2 1 1
20	2	Merum Receiver	104.6 m ³	ID: 0.7 m	Temp: 5.7 m	PST	4.9	CS	9 mm	I	2	13500	27000	11900	1979	74161 01 4 1 3 1 3 2 1 1
21	2	Merum Receiver	105.2 m ³	ID: 0.65 m	Temp: 5.5 m	PST	1.5	CS	9 mm	I	2	7800	15600	4500	1979	74161 01 4 1 3 1 3 2 1 1
22	2	Refractometer	31.8 m ³	ID: 0.5 m	Temp: 6.6 m	PST	2.7	CS	9 mm	I	1	7350	7350	6100	1979	74161 01 4 1 3 1 3 2 1 1
23	2	Refractometer	33.2 m ³	ID: 0.45 m	Temp: 5.9 m	PST	1.65	CS	9 mm	I	2	9050	18100	43000	1979	74161 01 4 1 3 1 3 2 1 1
24	2	Refractometer	930 m ³	ID: 1.25 m	Temp: 6.35 m	PST	15.7	CS	16 mm	I	1	37140	37140	31000	1979	74161 01 4 1 3 1 3 2 1 1
25	2	Merum Receiver	341.4 m ³	ID: 1.1 m	Temp: 6.2 m	PST	12.45	CS	14 mm	I	1	25200	25200	21000	1979	74161 01 4 2 4 1 3 2 1 1
26	2	Merum Receiver	143.6 m ³	ID: 0.75 m	Temp: 5.85 m	PST	5.0	CS	9 mm	I	1	10540	10540	8800	1979	74161 01 4 1 3 1 3 2 1 1

Note: (a) Mat. component weight for machines. Plate thickness for plate fabricated equipments.

I	V	MACHINERY	TYPE	SIZE (mm)	MATERIAL	TYPE OF CONNECTION	SERVICING	REPAIR	REPAIR	REPAIR	REPAIR	REPAIR	REPAIR	PURCHASE COST		PURCHASE	SITC CODE
														NET	TOTAL		
19		Hydroc. over- lined feed exc Stripper Feed/ Btt. Reheat.	MS: 137 m ²	DI: 0.65 m	R: 6.28 m	FST	5	CS	13 mm	1	6	20000	120000	16700	100500	1979	74161 01 4 1 4 2 2 2 1 2
20		Stripper reheat	MS: 74.9 m ²	DI: 0.55 m	R: 5.88 m		2.8	CS	9 mm	1	2	9800	19600	7650	15100	1979	74161 01 3 1 3 1 1 2 1 2
21		Stripper reheat	MS: 140 m ²	DI: 0.75 m	R: 6.19 m		5.85	CS	12 mm	1	1	12400	12400	10350	10350	1979	74161 02 4 1 3 1 2 2 1 2
22		Reactor No. 3 Trim Cooler	MS: 485 m ²	DI: 1.25 m	R: 6.41 m		15.35	CS	12 mm	1	1	34000	34000	31700	31700	1979	74161 03 4 2 4 1 1 2 1 1
23		Decontanizer Feed/Btt. Reheat	MS: 29.5 m ²	DI: 0.75 m	R: 5.9 m		1.45	CS	9 mm	1	2	6200	12400	5200	10400	1979	74161 01 2 1 3 1 1 2 1 2
24		Decontanizer Trim Cooler	MS: 92.7 m ²	DI: 0.55 m	R: 5.67 m		3.4	CS	9 mm	1	1	6900	6900	5700	5700	1979	74161 03 3 1 3 1 1 2 1 2
25		Decontanizer Reboiler	MS: 180.1 m ²	DI: 0.85 m	R: 6.2 m		7.45	CS	12 mm	1	1	15150	15150	12600	12600	1979	74161 02 4 1 3 1 2 2 1 2
26		Decontanizer Feed/Btt. Reheat	MS: 21.1 m ²	DI: 0.4 m	R: 5.3 m		1.4	CS	9 mm	1	1	22800	22800	19000	19000	1979	74161 01 2 1 2 1 1 2 1 2
27		Decontanizer Trim Cooler	MS: 127 m ²	DI: 0.6 m	R: 5.56 m		4.2	CS	9 mm	2	1	9400	9400	7600	7600	1979	74161 03 4 1 3 1 1 2 1 2
28		Decontanizer Feed/Btt. Reheat	MS: 19.2 m ²	DI: 1.55 m	R: 1.22 m		1.9	CS	9 mm	1	1	6500	6900	5700	5700	1979	74161 02 2 1 2 1 1 2 1 2
29		Decontanizer Feed/Btt. Reheat	MS: 13 m ²	DI: 0.2 m	R: 6.65 m	Hair Pin	0.6	CS	9 mm	1	2	3700	7400	3050	6100	1979	74161 01 2 1 4 9 1 2 1 2
30		Decontanizer Dew Cond.	MS: 50.1 m ²	DI: 0.55 m	R: 5.85 m	FST	2.4	CS	13 mm	1	1	6900	6900	5700	5700	1979	74161 05 3 1 3 1 1 2 1 2
31		Decontanizer LPG Product Cooler	MS: 20.4 m ²	DI: 0.6 m	R: 1.4 m	FST	0.9	CS	9 mm	1	1	5500	5050	4200	4200	1979	74161 02 2 1 1 1 1 2 1 2
32		Decontanizer Dew Cond.	MS: 23 m ²	DI: 0.2 m	R: 6.69 m	Hair Pin	0.8	CS	9 mm	1	3	3700	11100	3050	9150	1979	74161 03 2 1 4 9 1 2 1 2
33		Vap/LPG Pr. Rea. Prefrac Dew Condenser	MS: 9.3 m ²	DI: 0.2 m	R: 6.60 m	Hair Pin	0.22	CS	9 mm	1	1	3300	3300	2700	2700	1979	74161 01 1 1 4 9 1 2 1 2
34		Prefrac Net Dew Cond.	MS: 5556 m ²	DI: 0.64 m	R: 9.14 m	FST	11.67	CS	6 mm	1	2	90250	140500	75100	150600	1979	74161 05 6 1 4 8 2 2 1 2
35		Prefrac Net Dew Cond.	MS: 800 m ²	DI: 0.64 m	R: 9.14 m	FST	2.23	CS	6 mm	1	1	14100	14100	11800	11800	1979	74161 03 5 1 4 1 1 2 1 2
36		Reflux Cond.	MS: 3765 m ²	DI: 0.64 m	R: 9.14 m		9.32	CS	9 mm	1	1	43100	44200	36950	36950	1979	74161 02 6 1 4 1 2 2 1 2
37		Reflux Bottoms Cooler	MS: 800 m ²	DI: 0.91 m	R: 9.14 m		2.23	CS	4 mm	1	1	14200	14200	11800	11800	1979	74161 02 5 1 4 1 1 2 1 2
38		Prefrac. Reac Prod. Condens.	MS: 2803 m ²	DI: 0.57 m	R: 9.14 m		5.99	CS	4 mm	1	1	24350	24350	20300	20300	1979	74161 03 6 1 4 1 2 2 1 2
39		Stripper Cond. Plate Reac. Prod. Condens.	MS: 1412 m ²	DI: 0.91 m	R: 9.14 m		4.93	CS	4 mm	1	1	39900	39900	33250	33250	1979	74161 05 6 1 4 1 2 2 1 2
40		Reflux Condens. Dew Cond.	MS: 1300 m ²	DI: 0.7 m	R: 9.14 m		2.33	CS	4 mm	1	2	70800	141600	63150	119300	1979	74161 03 6 1 4 1 2 2 1 2
41		Decontanizer Dew Cond.	MS: 2976 m ²	DI: 0.37 m	R: 9.14 m		6.34	CS	4 mm	1	3	39000	39000	32500	32500	1979	74161 02 6 1 4 1 2 2 1 2
42		Decontanizer Dew Cond.	MS: 1509 m ²	DI: 0.91 m	R: 9.14 m		3.64	CS	4 mm	1	1	13000	13000	10850	10850	1979	74161 03 6 1 4 1 1 2 1 2
43		Prefrac Prod. Cooling Plate Reac.	MS: 27.4 m ²	DI: 0.4 m	R: 1.5 m		1.65	MS	9 mm	1	2	386	660	250	568	1979	74161 01 2 1 1 1 1 4 1 2
44		Condens. Feed Str.	MS: 1469 m ²	DI: 1.35 m	R: 13.14 m		47.5	MS	13 mm	1	1	304150	304150	253200	253200	1979	74161 01 6 2 4 1 1 4 1 2

74161 01 6 2 4 1 1 4 1 2

No	N/	Name Machine	Major Spec (Capacity)	Major Spec 1 (Optional)	Major Spec 2 (Optional)	Type (Description)	Number Char. 1 (DMS)	Number Char. 2	Number Char. 3	Unit	Q	Purchase Cost	Total Cost	Ct. 1st Cost	Ct. 2nd Cost	Year	SFC Code	
																		Q
1		Hydrotest	36.9 v/h	36.9 v/h	36.9 v/h		4					110900	110900	115500	115500	1979	74113	20 6 3 4 2 1 1 1 2
115		Charge Motor Platform	58.3 v/h	58.3 v/h	58.3 v/h		12.5					109700	109700	231700	231700	1979	74113	20 6 3 4 2 1 1 1 2
116		Ch. Motor Platform No.1	58.3 v/h	58.3 v/h	58.3 v/h		15.5					121700	121700	201800	201800	1979	74113	20 6 3 4 2 1 1 1 2
117		Interheater Platform No. 2	58.3 v/h	58.3 v/h	58.3 v/h		7.8					142800	142800	174200	174200	1979	74113	20 6 3 4 2 1 1 1 2
118		Interheater Platform No. 3	141 v/h	141 v/h	141 v/h		1.24		0.6 tons			7600	14000	7200	15600	1979	74220	01 4 4 2 1 1 9 1
60		Preheat Batt. Pump	120 v/h	120 v/h	120 v/h		0.57		0.28 tons			6900	13800	7700	15600	1979	74220	01 4 4 2 1 1 9 1 2
61		Preheat Batt. Pump	69.5 v/h	69.5 v/h	69.5 v/h		0.56		0.4			5800	11600	6600	12400	1979	74220	01 3 3 2 1 1 9 1 2
62		Preheat Batt. Pump	60.2 v/h	60.2 v/h	60.2 v/h		1.2		1.8			23150	50700	28200	56400	1979	74220	01 3 3 2 1 1 9 1 2
63		Preheat Batt. Pump	57.5 v/h	57.5 v/h	57.5 v/h		0.79		0.45			6500	13000	7300	14600	1979	74220	01 3 3 2 1 1 9 1 2
64		Preheat Batt. Pump	16.5 v/h	16.5 v/h	16.5 v/h		0.22		0.27			4300	8400	4500	8900	1979	74220	01 3 3 2 1 1 9 1 2
65		Preheat Batt. Pump	60.2 v/h	60.2 v/h	60.2 v/h		0.7		0.4			9300	18600	10350	20700	1979	74220	01 3 3 2 1 1 9 1 2
66		Preheat Batt. Pump	1.87 v/h	1.87 v/h	1.87 v/h							7700	7700	4500	9100	1979	74220	01 3 3 2 1 1 9 1 2
67		Preheat Batt. Pump	0.000 v/h	0.000 v/h	0.000 v/h		0.43		0.31 tons			4400	8800	4900	9800	1979	74220	01 3 3 2 1 1 9 1 2
68		Preheat Batt. Pump	45 v/h	45 v/h	45 v/h		0.61		0.48			6050	12100	6750	13500	1979	74220	01 3 3 2 1 1 9 1 2
69		Preheat Batt. Pump	23.6 v/h	23.6 v/h	23.6 v/h		0.45		0.36			4320	8640	4550	9100	1979	74220	01 3 3 2 1 1 9 1 2
70		Preheat Batt. Pump	9.1 v/h	9.1 v/h	9.1 v/h		0.32		0.27			3900	7800	4380	8760	1979	74220	01 3 3 2 1 1 9 1 2
71		Preheat Batt. Pump	0.0004 v/h	0.0004 v/h	0.0004 v/h		17.6		15.8 tons			8450	16900	8970	17940	1979	74220	01 3 3 2 1 1 9 1 2
72		Preheat Batt. Pump	31.7 v/h	31.7 v/h	31.7 v/h		81.1		35.6			43800	87600	45000	90000	1980	74113	01 3 3 2 1 1 9 1 2
73		Preheat Batt. Pump	116.5 v/h	116.5 v/h	116.5 v/h		90.9		35.2			22200	44400	23160	46320	1979	74113	01 3 3 2 1 1 9 1 2

1. 45. 0.000000 0.000000 0.000000 0.000000

CS	N/	Basic Machine	Weight Spec (Capacity)	Water Spec (Flow/Min)	Water Spec (Flow/Min)	Type (Description)	Material (CS/MS)	Serial No.	No. of Parts	Origins	Q.	Purchase Cost		St. 1980 Cost		Date Year	SIC Code	
												Unit	Total	Unit	Total		1314	6719
1	2	Extractor	111 m ³	Pr:0.404m	Temp:17°C	PS	CS	54130	54130	50500	50500	1979	74166	07.5	1.4	1.2	1.1	1.1
2	2	Wash Column	17.5 m ³	Pr:0.704m	Temp:10°C	PS	CS	11600	11600	30400	30400	1979	74166	08.2	1.4	1.2	1.1	1.1
3	3	Stripper Column	101.9 m ³	Pr:1.134m	Temp:175°C	PS	CS	223700	223700	217400	217400	1979	74166	07.5	1.4	1.2	1.1	1.1
4	4	Recovery Column	109.9 m ³	Pr:0.484m	Temp:147°C	PS	CS	30400	30400	29900	29900	1979	74166	05.5	1.4	1.2	1.1	1.1
5	5	Water Stripper Column	0.528 m ³	Pr:0.494m	Temp:113°C	PS	CS	13300	13300	12800	12800	1979	74166	07.5	1.4	1.2	1.1	1.1
6	6	Solvent Recovery Column	10.1 m ³	Pr:0.494m	Temp:102.1°C	PS	CS	54400	54400	51000	51000	1979	74166	10.2	1.4	1.2	1.1	1.1
7	7	Benzene Recovery Column	222.6 m ³	Pr:1.055m	Temp:36.7°C	PS	CS	419000	419000	403700	403700	1979	74166	09.5	1.4	1.2	1.1	1.1
8	8	Toluene Recovery Column	164.2 m ³	Pr:0.394m	Temp:174.4°C	PS	CS	289900	289900	278400	278400	1979	74166	09.5	1.4	1.2	1.1	1.1
9	9	Stripper Recovery Column	6.6 m ³	Pr:0.214m	Temp:49°C	PS	CS	17750	17750	17750	17750	1980	69243	02.1	1.4	1.2	1.1	1.1
10	10	Recovery Column	9.16 m ³	Pr:0.274m	Temp:18°C	PS	CS	23000	23000	23000	23000	1980	69243	02.1	1.4	1.2	1.1	1.1
11	11	Clay Cover	29.2 m ³	Pr:1.74m	Temp:139°C	PS	CS	34550	34550	47100	47100	1979	69243	02.1	1.4	1.2	1.1	1.1
12	12	Benzene Recovery Column	11.4 m ³	Pr:1.201m	Temp:60°C	PS	CS	26500	26500	26500	26500	1980	69243	02.1	1.4	1.2	1.1	1.1
13	13	Toluene Recovery Column	10.39 m ³	Pr:0.201m	Temp:104.1°C	PS	CS	22700	22700	21700	21700	1980	69243	02.1	1.4	1.2	1.1	1.1
14	14	Vent Tank	7.9 m ³	Pr:0.231m	Temp:104.1°C	PS	CS	19700	19700	19700	19700	1980	69243	04.1	1.4	1.2	1.1	1.1
15	15	Anti-foam Tank	0.61 m ³	Pr:0.424m	Temp:100°C	PS	CS	4450	4450	4450	4450	1980	69243	04.1	1.4	1.2	1.1	1.1
16	16	Solvent Pump Tank	7.35 m ³	Pr:0.201m	Temp:104.1°C	PS	CS	22700	22700	21700	21700	1980	69243	04.1	1.4	1.2	1.1	1.1
17	17	Refrigerate Cooler	NS:70.3m ³	TD:1.75 m	TL:2.0m	PST	CS	3200	3200	2700	2700	1979	74166	01.1	1.1	1.1	1.1	1.1
18	18	Stripper Feed Exchanger	NS:107.1m ³	TD:1 m	TL:5.76 m	PST	CS	18150	18150	15300	15300	1979	74166	01.4	1.2	1.1	1.1	1.1
19	19	Stripper Reboiler	NS:363m ³	TD:2 m	TL:4.87 m	PST	CS	25200	25200	21000	21000	1979	74166	02.4	1.2	1.1	1.1	1.1
20	20	Recovery Column	NS:144.6m ³	TD:1.15 m	TL:2.2 m	PST	CS	14200	14200	11850	11850	1979	74166	02.4	1.2	1.1	1.1	1.1
21	21	Water Stripper Reboiler	NS:86.1m ³	TD:1.05m	TL:7.65m	PST	CS	11900	11900	9900	9900	1979	74166	02.1	1.1	1.1	1.1	1.1
22	22	Solvent Reboiler	NS:36.9m ³	TD:0.75 m	TL:1.42m	PST	CS	16550	16550	8800	8800	1979	74166	02.1	1.1	1.1	1.1	1.1
23	23	Clay Exchanger	NS:23.1m ³	TD:0.4 m	TL:5.9 m	PST	CS	1100	2200	900	1800	1979	74166	01.1	1.1	1.1	1.1	1.1
24	24	Clay Exchanger	NS:23.1m ³	TD:0.4 m	TL:5.9 m	PST	CS	1150	1150	950	950	1979	74166	02.1	1.1	1.1	1.1	1.1
25	25	Benzene Column	NS:401.5m ³	TD:1.1 m	TL:36 m	PST	CS	28900	28900	24100	24100	1979	74166	02.4	1.2	1.1	1.1	1.1
26	26	Benzene Column	NS:49.1m ³	TD:0.25m	TL:6.3m	PST	CS	2200	2200	1900	1900	1979	74166	01.1	1.1	1.1	1.1	1.1

CS: 1.43, 1.45, 1.46, 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.54, 1.55, 1.56, 1.57, 1.58, 1.59, 1.60, 1.61, 1.62, 1.63, 1.64, 1.65, 1.66, 1.67, 1.68, 1.69, 1.70, 1.71, 1.72, 1.73, 1.74, 1.75, 1.76, 1.77, 1.78, 1.79, 1.80, 1.81, 1.82, 1.83, 1.84, 1.85, 1.86, 1.87, 1.88, 1.89, 1.90, 1.91, 1.92, 1.93, 1.94, 1.95, 1.96, 1.97, 1.98, 1.99, 2.00, 2.01, 2.02, 2.03, 2.04, 2.05, 2.06, 2.07, 2.08, 2.09, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 2.17, 2.18, 2.19, 2.20, 2.21, 2.22, 2.23, 2.24, 2.25, 2.26, 2.27, 2.28, 2.29, 2.30, 2.31, 2.32, 2.33, 2.34, 2.35, 2.36, 2.37, 2.38, 2.39, 2.40, 2.41, 2.42, 2.43, 2.44, 2.45, 2.46, 2.47, 2.48, 2.49, 2.50, 2.51, 2.52, 2.53, 2.54, 2.55, 2.56, 2.57, 2.58, 2.59, 2.60, 2.61, 2.62, 2.63, 2.64, 2.65, 2.66, 2.67, 2.68, 2.69, 2.70, 2.71, 2.72, 2.73, 2.74, 2.75, 2.76, 2.77, 2.78, 2.79, 2.80, 2.81, 2.82, 2.83, 2.84, 2.85, 2.86, 2.87, 2.88, 2.89, 2.90, 2.91, 2.92, 2.93, 2.94, 2.95, 2.96, 2.97, 2.98, 2.99, 3.00, 3.01, 3.02, 3.03, 3.04, 3.05, 3.06, 3.07, 3.08, 3.09, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18, 3.19, 3.20, 3.21, 3.22, 3.23, 3.24, 3.25, 3.26, 3.27, 3.28, 3.29, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 3.41, 3.42, 3.43, 3.44, 3.45, 3.46, 3.47, 3.48, 3.49, 3.50, 3.51, 3.52, 3.53, 3.54, 3.55, 3.56, 3.57, 3.58, 3.59, 3.60, 3.61, 3.62, 3.63, 3.64, 3.65, 3.66, 3.67, 3.68, 3.69, 3.70, 3.71, 3.72, 3.73, 3.74, 3.75, 3.76, 3.77, 3.78, 3.79, 3.80, 3.81, 3.82, 3.83, 3.84, 3.85, 3.86, 3.87, 3.88, 3.89, 3.90, 3.91, 3.92, 3.93, 3.94, 3.95, 3.96, 3.97, 3.98, 3.99, 4.00, 4.01, 4.02, 4.03, 4.04, 4.05, 4.06, 4.07, 4.08, 4.09, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.20, 4.21, 4.22, 4.23, 4.24, 4.25, 4.26, 4.27, 4.28, 4.29, 4.30, 4.31, 4.32, 4.33, 4.34, 4.35, 4.36, 4.37, 4.38, 4.39, 4.40, 4.41, 4.42, 4.43, 4.44, 4.45, 4.46, 4.47, 4.48, 4.49, 4.50, 4.51, 4.52, 4.53, 4.54, 4.55, 4.56, 4.57, 4.58, 4.59, 4.60, 4.61, 4.62, 4.63, 4.64, 4.65, 4.66, 4.67, 4.68, 4.69, 4.70, 4.71, 4.72, 4.73, 4.74, 4.75, 4.76, 4.77, 4.78, 4.79, 4.80, 4.81, 4.82, 4.83, 4.84, 4.85, 4.86, 4.87, 4.88, 4.89, 4.90, 4.91, 4.92, 4.93, 4.94, 4.95, 4.96, 4.97, 4.98, 4.99, 5.00, 5.01, 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.09, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 5.32, 5.33, 5.34, 5.35, 5.36, 5.37, 5.38, 5.39, 5.40, 5.41, 5.42, 5.43, 5.44, 5.45, 5.46, 5.47, 5.48, 5.49, 5.50, 5.51, 5.52, 5.53, 5.54, 5.55, 5.56, 5.57, 5.58, 5.59, 5.60, 5.61, 5.62, 5.63, 5.64, 5.65, 5.66, 5.67, 5.68, 5.69, 5.70, 5.71, 5.72, 5.73, 5.74, 5.75, 5.76, 5.77, 5.78, 5.79, 5.80, 5.81, 5.82, 5.83, 5.84, 5.85, 5.86, 5.87, 5.88, 5.89, 5.90, 5.91, 5.92, 5.93, 5.94, 5.95, 5.96, 5.97, 5.98, 5.99, 6.00, 6.01, 6.02, 6.03, 6.04, 6.05, 6.06, 6.07, 6.08, 6.09, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22, 6.23, 6.24, 6.25, 6.26, 6.27, 6.28, 6.29, 6.30, 6.31, 6.32, 6.33, 6.34, 6.35, 6.36, 6.37, 6.38, 6.39, 6.40, 6.41, 6.42, 6.43, 6.44, 6.45, 6.46, 6.47, 6.48, 6.49, 6.50, 6.51, 6.52, 6.53, 6.54, 6.55, 6.56, 6.57, 6.58, 6.59, 6.60, 6.61, 6.62, 6.63, 6.64, 6.65, 6.66, 6.67, 6.68, 6.69, 6.70, 6.71, 6.72, 6.73, 6.74, 6.75, 6.76, 6.77, 6.78, 6.79, 6.80, 6.81, 6.82, 6.83, 6.84, 6.85, 6.86, 6.87, 6.88, 6.89, 6.90, 6.91, 6.92, 6.93, 6.94, 6.95, 6.96, 6.97, 6.98, 6.99, 7.00, 7.01, 7.02, 7.03, 7.04, 7.05, 7.06, 7.07, 7.08, 7.09, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.24, 7.25, 7.26, 7.27, 7.28, 7.29, 7.30, 7.31, 7.32, 7.33, 7.34, 7.35, 7.36, 7.37, 7.38, 7.39, 7.40, 7.41, 7.42, 7.43, 7.44, 7.45, 7.46, 7.47, 7.48, 7.49, 7.50, 7.51, 7.52, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.64, 7.65, 7.66, 7.67, 7.68, 7.69, 7.70, 7.71, 7.72, 7.73, 7.74, 7.75, 7.76, 7.77, 7.78, 7.79, 7.80, 7.81, 7.82, 7.83, 7.84, 7.85, 7.86, 7.87, 7.88, 7.89, 7.90, 7.91, 7.92, 7.93, 7.94, 7.95, 7.96, 7.97, 7.98, 7.99, 8.00, 8.01, 8.02, 8.03, 8.04, 8.05, 8.06, 8.07, 8.08, 8.09, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, 8.19, 8.20, 8.21, 8.22, 8.23, 8.24, 8.25, 8.26, 8.27, 8.28, 8.29, 8.30, 8.31, 8.32, 8.33, 8.34, 8.35, 8.36, 8.37, 8.38, 8.39, 8.40, 8.41, 8.42, 8.43, 8.44, 8.45, 8.46, 8.47, 8.48, 8.49, 8.50, 8.51, 8.52, 8.53, 8.54, 8.55, 8.56, 8.57, 8.58, 8.59, 8.60, 8.61, 8.62, 8.63, 8.64, 8.65, 8.66, 8.67, 8.68, 8.69, 8.70, 8.71, 8.72, 8.73, 8.74, 8.75, 8.76, 8.77, 8.78, 8.79, 8.80, 8.81, 8.82, 8.83, 8.84, 8.85, 8.86, 8.87, 8.88, 8.89, 8.90, 8.91, 8.92, 8.93, 8.94, 8.95, 8.96, 8.97, 8.98, 8.99, 9.00, 9.01, 9.02, 9.03, 9.04, 9.05, 9.06, 9.07, 9.08, 9.09, 9.10, 9.11, 9.12, 9.13, 9.14, 9.15, 9.16, 9.17, 9.18, 9.19, 9.20, 9.21, 9.22, 9.23, 9.24, 9.25, 9.26, 9.27, 9.28, 9.29, 9.30, 9.31, 9.32, 9.33, 9.34, 9.35, 9.36, 9.37, 9.38, 9.39, 9.40, 9.41, 9.42, 9.43, 9.44, 9.45, 9.46, 9.47, 9.48, 9.49, 9.50, 9.51, 9.52, 9.53, 9.54, 9.55, 9.56, 9.57, 9.58, 9.59, 9.60, 9.61, 9.62, 9.63, 9.64, 9.65, 9.66, 9.67, 9.68, 9.69, 9.70, 9.71, 9.72, 9.73, 9.74, 9.75, 9.76, 9.77, 9.78, 9.79, 9.80, 9.81, 9.82, 9.83, 9.84, 9.85, 9.86, 9.87, 9.88, 9.89, 9.90, 9.91, 9.92, 9.93, 9.94, 9.95, 9.96, 9.97, 9.98, 9.99, 10.00, 10.01, 10.02, 10.03, 10.04, 10.05, 10.06, 10.07, 10.08, 10.09, 10.10, 10.11, 10.12, 10.13, 10.14, 10.15, 10.16, 10.17, 10.18, 10.19, 10.20, 10.21, 10.22, 10.23, 10.24, 10.25, 10.26, 10.27, 10.28, 10.29, 10.30, 10.31, 10.32, 10.33, 10.34, 10.35, 10.36, 10.37, 10.38, 10.39, 10.40, 10.41, 10.42, 10.43, 10.44, 10.45, 10.46, 10.47, 10.48, 10.49, 10.50, 10.51, 10.52, 10.53, 10.54, 10.55, 10.56, 10.57, 10.58, 10.59, 10.60, 10.61, 10.62, 10.63, 10.64, 10.65, 10.66, 10.67, 10.68, 10.69, 10.70, 10.71, 10.72, 10.73, 10.74, 10.75, 10.76, 10.77, 10.78, 10.79, 10.80, 10.81, 10.82, 10.83, 10.84, 10.85, 10.86, 10.87, 10.88, 10.89, 10.90, 10.91, 10.92, 10.93, 10.94, 10.95, 10.96, 10.97, 10.98, 10.99, 11.00, 11.01, 11.02, 11.03, 11.04, 11.05, 11.06, 11.07, 11.08, 11.09, 11.10, 11.11, 11.12, 11.13, 11.14, 11.15, 11.16, 11.17, 11.18, 11.19, 11.20, 11.21, 11.22, 11.23, 11.24, 11.25, 11.26, 11.27, 11.28, 11.29, 11.30, 11.31, 11.32, 11.33, 11.34, 11.35, 11.36, 11.37, 11.38, 11.39, 11.40, 11.41, 11.42, 11.43, 11.44, 11.45, 11.46, 11.47, 11.48, 11.49, 11.50, 11.51, 11.52, 11.53, 11.54, 11.55, 11.56, 11.57, 11.58, 11.59, 11.60, 11.61, 11.62, 11.63, 11.64, 11.65, 11.66, 11.67, 11.68, 11.69, 11.70, 11.71, 11.72, 11.73, 11.74, 11.75, 11.76, 11.77, 11.78, 11.79, 11.80, 11.81, 11.82, 11.83, 11.84, 11.85, 11.86, 11.87, 11.88, 11.89, 11.90, 11.91, 11.92, 11.93, 11.94, 11.95, 11.96, 11.97, 11.98, 11.99, 12.00, 12.01, 12.02, 12.03, 12.04, 12.05, 12.06, 12.07, 12.08, 12.09, 12.10, 12.11, 12.12, 12.13, 12.14, 12.15, 12.16, 12.17, 12.18, 12.19, 12.20, 12.21, 12.22, 12.23, 12.24, 12.25, 12.26, 12.27, 12.28, 12.29, 12.30, 12.31, 12.32, 12.33, 12.34, 12.

SN	M	Name	Capacity	Major Spec	Major Spec (Optional)	Major Spec (Optional)	Type	Description	Material (TONS)	Height	Diam	Origin	Q	Purchase Cost			CR 1980 Cost			SVC Cost		
														Unit	Q	Unit	Q	Unit	Q	Unit	Q	
1		Stripper	1.0 m ³				C	Flange	123	27	27	I	1	252550	252550	242200	242200	242200	242200	242200	242200	
2		Reactor	10.1 m ³				C		123	125	125	I	1	560000	560000	521000	521000	521000	521000	521000	521000	
3		Product Separator	10.7 m ³				CY		9.4	29	29	I	1	159300	159300	139000	139000	139000	139000	139000	139000	
4		Stripper	9.13 m ³				CY		3.9	19	19	I	1	176600	176600	218800	218800	218800	218800	218800	218800	
5		Reactor	2.0 m ³				CY		22.5	24	24	I	1	46250	46250	46250	46250	46250	46250	46250	46250	
6		Gas Comp. Svc	0.26 m ³				CY		0.5	9	9	I	1	11000	11000	13450	13450	13450	13450	13450	13450	
7		Combined Feed	15.2 m ³				CY		15.2	26	26	I	3	43000	43000	129000	129000	129000	129000	129000	129000	
8		Reactor Prod. Condenser	HS:6750 m ²				FST		16.9	4	4	I	1	69950	69950	69950	69950	69950	69950	69950	69950	
9		Reactor Prod. Condenser	HS:432 m ²				FST		14.7	20	20	I	1	19450	19450	39450	39450	39450	39450	39450	39450	
10		Stripper	HS:65.6 m ²				FST		2.7	9	9	I	1	1450	1450	2300	2300	2300	2300	2300	2300	
11		Stripper	HS:54.1 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
12		Charge Tank	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
13		Charge Tank	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
14		Charge Pump	HS:4.75 m ³				V		3.2	1	1	I	2	22900	22900	45800	45800	25500	25500	25500	25500	
15		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
16		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
17		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
18		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
19		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
20		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
21		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
22		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
23		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
24		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
25		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
26		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
27		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
28		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
29		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
30		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
31		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
32		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
33		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
34		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
35		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
36		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
37		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
38		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
39		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
40		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
41		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
42		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
43		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
44		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
45		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
46		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
47		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
48		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
49		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
50		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
51		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
52		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
53		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
54		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
55		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
56		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
57		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
58		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
59		Stripper	HS:17 m ²				FST		1	11	11	I	1	5050	5050	4200	4200	4200	4200	4200	4200	
60		Stripper	HS:12.7 m ²				FST		0.3	3	3	I	1	2750	2750	2300	2300	2300	2300	2300	2300	
61		Stripper	HS:104.2 m ²				FST		3.55	9	9	I	1	7900	7900	6500	6500	6500	6500	6500	6500	
62		Stripper	HS:210 m ²				FST		4.44	4	4	I	1	20100	20100	16950	16950	16950	16950	16950	16950	
63		Stripper	HS:17 m ²				FST															

No.	P/N	Basic Machine Description	Major Spec. (Capacity)	Major Spec. 1 (Principal)	Major Spec. 2 (Principal)	Type (Description)	Manufac. Char. 1. (2000)	Manufac. Char. 2.	Manufac. Char. 3. (a)	Origin	Q.	Purchase Cost		Ct. 1980 Cost		Purc. Year	EINC Code										
												Unit	Total	Unit	Total		12	13	14	15	16	17	18	19	20	21	22
22		O-xylene Ovhd cooler	NS:331 m ²	ID:0.57 m	TL:9.14 m	FST	1.16	CS	4mm	I	1	10600	10600	8650	8850	1979	74161	03	4	1	4	1	1	2	1	2	
23		O-xylene Ovhd trim cooler	NS:9.7 m ²	ID:0.4 m	TL:2.36 m	FST	0.9	AS	9 mm	I	2	4150	8300	4150	8300	1980	74161	03	1	1	1	1	1	4	1	2	
24		H.Aromatics Clean Btt. Cool.	NS:6.3 m ²	ID:0.19 m	TL:6.42 m	Hair Fin	0.3	CS	9 mm	I	2	3000	6000	2500	5000	1979	74161	03	1	1	4	1	2	1	2	1	
25		H.Arom. Clean Reboiler	NS:241.4 m ²	ID:0.95 m	TL: 6.2 m	FST	8.9	CS	12 mm	I	1	12800	12800	12800	12800	1980	74161	02	4	1	1	2	2	2	1	1	
26		H.Arom. Clean Condenser	NS:1950 m ²	ID:1950m	TL:9.14m	FST	9.04	CS	4 mm	I	1	34500	34500	28800	28800	1979	74161	05	6	1	4	1	2	2	1	2	
27		H.Arom. Clean Rece-Vent Cond	NS:12.4m ²	ID:0.37 m	TL:2.4 m	FST	0.8	CS	9 mm	I	1	4600	4600	4600	4600	1980	74161	05	2	1	1	1	1	2	1	2	
28		H.Arom. Clean Post-Cooler	NS:300 m ²	ID: 0.57m	TL:9.14m	FST	1.10	CS	4 mm	I	1	11700	11700	9800	9800	1979	74161	03	4	1	4	1	1	2	1	2	
29		Xyl. Splitter Reboiler Heater	16 con. h	Temp:277°C	Liquid	-	-	CS	-	I	1	961600	961600	802200	802200	1979	74132	50	4	2	2	0	3	2	0	1	
30		Feed Pump	12094m ³ /h	MN:67.4m	HCLC	V	0.52	SP	0.34 tons	I	2	5800	11600	6400	12800	1979	74220	01	4	3	2	2	1	9	1	2	
61		Splitter Btt. Pump	41.97m ³ /h	MN:257m	HCLC	H	1.2	SF	0.6 tons	I	2	14900	29800	16500	33000	1979	74220	01	3	5	2	1	1	9	1	2	
62		Splitter Ovhd Pump	109.57m ³ /h	MN:98.6 m	HCLC	H	0.66	SF	0.41 "	I	2	5750	11500	6400	12800	1979	74220	01	4	3	2	1	1	9	1	2	
63		Xyl Splitter Feed Tank E.	34.27m ³ /h	MN:219 m	HCLC	V	1.04	SF	0.55 "	I	2	4700	9400	5200	10400	1979	74220	01	3	5	2	2	1	9	1	2	
64		Xyl Splitter Reboiler P.	1582.2m ³ /h	MN:101.5m	HCLC	H	9.7	SF	5.2 "	I	2	21200	42400	23600	47200	1979	74220	01	6	4	2	1	2	9	4	2	
65		Xyl Splitter Int. Scc P.	1601. m ³ /h	MN:102.0m	HCLC	V	7.7	SF	4.5 "	I	2	19000	38000	21100	42200	1979	74220	01	6	4	2	2	2	9	1	2	
66		O-xylene rec. Clean Btt. P.	27.8 m ³ /h	MN:53.0m	HCLC	V	0.26	SP	0.19 "	I	2	5000	10000	5550	11100	1979	74220	01	3	3	2	2	1	9	1	2	
67		O-xylene Rec. Clean Ovhd	99. m ³ /h	MN:96.1 m	HCLC	V	0.79	SF	0.41 "	I	2	6550	13100	7300	14600	1979	74220	01	3	3	2	2	1	9	1	2	
68		H.Arom. Clean Btt. P.	5.2 m ³ /h	MN:94.2 m	HCLC	H	0.29	SF	0.15 "	I	2	6700	13400	7500	15000	1979	74220	01	3	3	2	1	1	9	1	2	
69		H.Arom. Clean Ovhd Pump	75.4m ³ /h	MN:74.2 m	HCLC	H	0.69	S*	0.41 "	I	2	6200	12400	6200	12400	1979	74220	01	3	3	2	1	1	9	1	2	
45		Xylene Split Feed Tank	6500 m ³	P:4kg/cm ²	Temp:182°C	Cy	149.0	CS	12 mm	T	1	901400	901400	901400	901400	1980	69243	04	5	1	2	2	6	2	1	1	

Note: a) Max. component weight for machines, plate thickness for plate-fabricated equipments.

SR No	Machine No	Machine Description	Major Spec. (Capacity)	Major Spec. 1. (Optional)	Major Spec. 2. (Optional)	Type (Description)	Manufacturer Char. 1. (TONS)	Manufacturer Char. 2.	Manufacturer Char. 3.	Origin	Purchase Cost		Ct. 1980 Cost		Purchase Year	SITC Code											
											Unit	Total	Unit	Total		13	14	15	16	17	18	19	20	21	22	23	24	25
1	2	Deaerator	132 m ³	Pr:105kg/cm ²	Temp:230°C	Vertical	SI	CS	21 mm	F	1	279500	269250	269250	1979	74166	05	3	9	4	1	5	2	2	1		
2	2	Steam Reactor Product Separator	57.6 m ³	Pr:12.3kg/cm ²	Catalytic	Tubular	46	Low alloy steel	52 mm	F	1	635250	612000	612000	1979	74285	00	3	2	1	3	4	4	4	2	2	
40	40	Separator	19.4 m ³	-	Temp:46°C	Cy	15	CS	20 mm	F	1	30500	30500	37300	1979	69241	05	2	0	3	2	1	2	2	2	2	
41	41	Deaerator	6.53 m ³	Pr:95kg/cm ²	Temp:46°C	Cy	33	CS	11 mm	F	1	21700	21700	21700	1980	69243	05	1	6	3	2	3	2	2	2	2	
42	42	Clay Tower	30.35m ³	Dia:2.7m	Temp:350°C	Cy	19.3	CS	28 mm	F	1	41750	41750	51000	1979	69211	99	1	1	2	2	3	2	2	2	2	
43	43	Hot liq. Scrubber	1.45 m ³	-	Temp:46°C	Cy	2.7	CS	11 mm	F	1	17750	17750	17750	1980	69241	99	1	0	3	2	1	3	1	1	1	
44	44	Hot Liquid Scrubber	1.82 m ³	-	Temp:46°C	Cy	3.1	CS	15 mm	F	1	20400	20400	20400	1980	69241	95	1	0	3	2	1	2	2	2	2	
45	45	Hot gas caustic Scrubber	20.84 m ³	-	Temp:20°C	Cy	5.8	CS	20 mm	F	1	9200	9200	11200	1979	69241	99	2	0	3	2	2	2	2	2	2	
46	46	Caustic Scrubber	24.24m ³	-	Temp:20°C	Cy	4.1	CS	8 mm	F	1	26950	26950	26950	1980	69241	95	2	0	3	2	2	2	2	2	2	
3	3	Reactor 8/C Feed F.C.C.	MS:2780m ²	SD:1.62 m	TL:16.12 m	PST	75.0	SS	19 mm	F	1	411450	411450	486500	1979	74161	01	6	2	4	1	5	6	1	2	2	
4	4	Reactor prod. Feed F.C.C.	MS:4350m ²	SD:0.7 m	TL:9.14 m	PST	4.54	CS	4 mm	F	6	266900	1601400	222700	1979	74161	03	6	1	4	1	2	2	1	2	2	
5	5	Deaerator F/B. E.C.H.	MS:56.1m ²	SD:0.4m	TL:5.88 m	PST	2.3	CS'	9 mm	F	1	5500	5500	5500	1979	74161	01	3	1	2	1	1	2	1	2	2	
6	6	Deaerator	MS:386 m ²	SD:1.15 m	TL:6.21 m	PST	13.6	CS	12 mm	F	1	31650	31650	31000	1979	74161	02	4	2	4	1	1	2	1	2	2	
7	7	Deaerator	MS:3100m ²	SD:0.64 m	TL:9.14 m	PST	9.3	CS	4 mm	F	1	51700	51700	43100	1979	74161	05	6	1	4	1	2	2	2	2	2	
8	8	Steam charge heater	235.9tons/hr	Temp:399°C	Combined	-	-	Boiler Steel	-	F	2	291600	291600	243250	1979	74132	50	4	2	4	0	3	0	2	2	2	
40	40	Hot liq. Churn Pump	1.14m ³ /hr	MR:387 m	MCZC	H	5.1	SP	3.2 tons	F	2	4200	4400	9300	1979	74220	01	4	6	1	1	2	1	2	1	2	
41	41	Deaerator Hot/Liq. Pump	45.3m ³ /hr	MR:72 m	MCZC	H	0.64	SP	0.4 tons	F	2	5400	30800	32000	1979	74220	01	3	3	2	2	2	2	2	2	2	
42	42	Deaerator Hot/Liq. Pump	4.33m ³ /hr	MR:163 m	MCZC	H	0.3	SP	0.15 tons	F	2	8700	17400	19400	1979	74220	01	2	4	2	2	2	2	2	2	2	
43	43	Deaerator Hot/Liq. Pump	129m ³ /hr	MR:240m	MCZC	H	1.33	SP	0.67 tons	F	2	10600	21200	23600	1979	74220	01	4	4	2	2	2	2	2	2	2	
44	44	Caustic circ. Pump	1.51m ³ /hr	MR:19.5m	MCZC	H	0.13	SP	0.11tons	F	2	3000	6000	3150	1979	74220	01	2	1	1	1	1	1	1	1	1	
45	45	Hot liq. water Pump	0.09m ³ /hr	MR:70.3m	MCZC	H	-	SS	-	F	1	1500	3500	1700	1979	74220	01	2	3	1	0	1	0	1	0	1	
46	46	Chemical liq. Pump	0.005m ³ /hr	MR:267.2 m	Corrosive	H	-	SS	-	F	1	1300	1300	1400	1979	74220	01	2	5	1	0	7	0	2	2	2	
47	47	Recycle Gas Compressor	3107m ³ /min	Pr:12.3kg/cm ²	DG	H	46.5	SP	39.3 tons	F	1	453150	453150	432000	1980	74113	01	4	3	2	4	4	4	4	4	4	

Note: (3) Net. component weight for machine, plate thickness for plate fabricated equipments.

UNICC / SPECIEMIN) CAPITAL COSTS DEVELOPMENT PROJECT EQUIPMENT REQUIREMENT OF THE NEW ARONGTICS PLANT CAPACITY 124 000TOM/YEAR ANTICIPATED DATE OF COMMISSIONING- 1993

Table with columns: UNIT WEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A. DOLLARS (1980), UN.-WE, UN.-CO, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040. Rows include equipment like REACTOR, STRIPPER, and various tanks.

UNICO / SPICAPETKIM
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW ANOMOTICS PLANT, CAPACITY
 LOCATIONS YUNURTALIK
 ANTICIPATED DATE OF COMMISSIONING- 1993
 UNIT HEIGHTS IN TONS, UNIT COSTS IN 1000 U.S.A DOLLARS (1980)
 ECP-DEPARTMENT-PETKIM / ANKARA

SATIC CODE	BASIC MACHINE NAME	CR	UN. HE	UN. CO	19
74161 02524	13212 EXTRACT COL. REBOILER	1	15.7	44.5	
74161 03111	11412 O-XYL. OVHD. TRIM COOLER	2	.9	4.2	
74161 03111	11412 FEED COOLER	1	.6	3.8	
74161 03114	91212 H. AROMATICS COL. BCT. COOL.	2	.3	2.5	
74161 03212	11212 MAKE-UP GAS SB COOLER	1	1.0	4.2	
74161 03212	91212 PREFRAC. NET BTTS COOL	2	.6	3.1	
74161 03213	11212 PREFRAC. NET OVHD TRIM CO.	2	1.7	4.2	
74161 03213	11212 BENZENE COOLER	1	2.0	1.9	
74161 03213	11412 PENTANE PRODUCT COOLER	2	1.5	.3	
74161 03213	11412 SPLIT. OVHD. TRIM COOLER	2	1.5	9.5	
74161 03214	91212 DESORBENT COL. BTMS COOLER	4	1.1	3.1	
74161 03214	91212 STRIPPER REC. VENT GAS C.	1	.3	2.3	
74161 03214	91212 LPG PRODUCT COOLER	3	.8	3.1	
74161 03311	11212 RAFF. COOLER	2	3.2	2.7	
74161 03313	11212 P-XYLENE TRIM COOLER	1	1.9	7.4	
74161 03313	11212 DEPENT. OVHD TRIM COOLER	1	3.4	5.7	
74161 03313	13212 DEPEN. N01 FEED BTTS EXCH.	1	2.8	3.1	
74161 03400	11212 DEPEN. N02 OVHD COOLER	2	1.7	2.3	
74161 03413	11212 DEBUT. OVHD TRIM COOLER	1	4.2	7.6	
74161 03413	11212 DEPEN. N01 OVHD COOLER	2	4.5	8.1	
74161 03413	11212 CHARGE TANK TRIM COOLER	1	3.6	6.3	
74161 03413	12212 RERUN BOTTOMS TRIM COOLER	1	3.0	4.8	
74161 03414	11212 O-XYL. OVHD. COOLER	1	1.2	8.9	
74161 03414	11222 SPLIT. OVHD. COOLER	1	1.5	9.7	
74161 03414	13212 H. AROM. COL. BOTT. COOLER	1	1.1	9.8	
74161 03424	13212 REACTOR PRODUCT TRIM COOL	1	15.4	31.7	
74161 03424	13222 REACTOR PRD. TRIM COOLER	1	14.7	32.9	
74161 03512	11212 P-XYLENE COOLER	1	2.3	28.8	
74161 03514	11212 PREFRAC. NET OVHD. COOLER	1	2.2	11.8	
74161 03514	11212 RERUN BOTTOMS COOLER	1	2.2	11.8	
74161 03613	12212 CB AROM. COOLER	1	5.1	19.5	
74161 03614	11212 CHARGE TANK COOLER	1	4.4	17.0	
74161 05111	11412 DESORBENT COL. VENT COND.	1	.5	4.6	
74161 05114	12212 STRIP. COL. CONDENSER	1	9.9	40.9	
74161 05114	12212 BENZENE COL. CONDENSER	4	6.1	102.5	
74161 05114	13212 SPLIT. CONDENSER	2	8.7	54.4	
74161 05114	12212 TOLUENE CONDENSER	2	4.8	54.9	
74161 05114	91212 DEPEN. N01 OVHD CONDENSER	2	4.1	52.5	
74161 05114	92212 REACTOR N01 PRODUCTS COND	2	6.0	38.7	
74161 05114	92212 DEPEN. N02 OVHD. CONDENSER	1	6.0	34.9	
74161 05114	92412 REACTOR N01 PRODUCTS COM.	4	9.7	125.2	
74161 05211	11212 O-XYL. REA. COL. RE. VENT CGM	1	.8	3.8	
74161 05211	11212 RAFFINATE COL. VENT COND.	1	.8	1.4	
74161 05211	11212 H. AROM. COL. REC. VENT CGM.	1	.8	4.6	
74161 05211	11212 SPLIT. RECEIV. VENT COND.	1	.8	3.8	
74161 05214	91712 PREFRACTION. OVHD CONDENS.	1	4.2	82.5	
74161 05312	11212 DESORBENT RERUN COL. COND.	1	.6	6.8	
74161 05313	11212 DEETH. OVHD CONDENSER	1	2.8	9.7	
74161 05324	13212 RECOVERY COL. CONDENSER	1	17.0	49.3	
74161 05414	12212 DEBUT. OVHD. CONDENSER	1	3.8	15.9	
74161 05414	11212 STRIPPER CONDENSER	1	5.0	33.3	
74161 05414	12212 PLATFORM. REAC. PRCD. COND.	2	8.5	99.2	
74161 05414	12212 O-XYL. RERUN COL. CONDENS.	1	7.2	29.3	
74161 05414	12212 REACTOR PRD. CONDENSER	4	7.5	222.7	
74161 05414	12212 EXTRACT COLUMN CONDENSER	1	7.3	34.9	
74161 05414	12212 RAFFINATE COL. CONDENSER	4	9.9	129.2	
74161 05414	12212 FINISHING COL. CONDENSER	1	7.0	21.7	
74161 05414	12212 DEPENT. OVHD. CONDENSER	1	4.3	32.5	
74161 05414	12212 HYDROTR. REACTOR PRCD. COND	1	6.8	20.3	

UNICC / SPC(PETKIM)
 CAPITAL GOODS DEVELOPMENT PROJECT
 EQUIPMENT REQUIREMENT OF THE NEW _____ AROMATICS
 LOCATION=YUNURTALIK
 ANTICIPATED DATE OF COMMISSINING= 1993
 UNIT WEIGHTS IN TONS,UNIT COSTS IN 1000 U.S.\$
 EDP-DEPARTMENT-PETKIM / ANKARA

SAPC CODE			BASIC MACHINE NAME	LR
*****	*****		*****	**
74220	01442	11912	REACTOR NO1 RECYCLE PUMP	2
74220	01455	22932	DESCRBENT PUMP	2
74220	01461	12932	ISCHAR CHARGE PUMP	2
74220	01545	12932	CHAMBER CIRCULATING PUMP	3
74220	01642	12942	XY-SPLIT.REBCILER PUMP	2
74220	01642	22942	XY-SPLIT.INT.BOT.PUMP	2
74313	01342	13162	HYDROTR.RECYCLE GAS COMP.	2
74313	01442	13262	MAKE-UP GAS COMPRESSOR	2
74313	01532	15172	PLATFORM BOOSTER GAS CCM	2
74313	01832	14972	RECYCLE GAS COMPRESSOR	1
74313	10532	14972	PLATFORM. RECYCLE GAS CCM	1
74313	11552	25382	BOOSTER AND RECYC.GAS CCM	2
74313	11642	15972	RECYCLE GAS COMPRESSOR	1
74313	11652	14972	REACTOR NO1 RECYC.GAS CCM	1



4.10.03

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