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14725

**DEVELOPMENT OF  
CAPITAL GOODS INDUSTRIES**

**DP/TUR/76/034**

**TURKEY**

TECHNICAL REPORT NO. XXXIV - TECHNICAL REPORT ON PROPOSED NEW PLANT  
BY MKEK AT ÇORUM FOR INDUSTRIAL PLANT  
AND MACHINERY

Hasan Yilmaz

NISAN 1984

Birleşmiş Milletler Kalkınma Programı

UNITED NATIONS

NATIONS UNIES

DEVELOPMENT PROGRAMME IN TURKEY

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

TURKEY

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BY MİEK AT ÇORUM FOR INDUSTRIAL PLANT  
AND MACHINERY

December 1983

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**UNITED NATIONS DEVELOPMENT PROGRAMMES IN TURKEY**

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**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION**

**RESTRICTED**

**English**

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

**TURKEY**

**Technical Report No. XXXIV: Technical Report on proposed new plant  
by MKEK at Çorum for Industrial Plant and  
Machinery**

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

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

**United Nations Industrial Development Organization  
Vienna**

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DEVELOPMENT PROGRAMME IN TURKEY  
UNIDO-CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

(11)

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DEVELOPMENT PROGRAMME IN TURKEY

UNIDO-CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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CHAPTER I

INTRODUCTION

- 1.1. Capital Goods Development Project in Turkey was visualised for planning long-term perspectives and short-term strategies for this critical sector of economy.
- 1.2. The State Planning Organisation (SPO) has placed heavy emphasis on an analysis by the Capital Goods Development Project of all the major projects conceived for manufacture of different categories of capital goods. One of these was manufacture of different kinds of industrial plant and machinery by Makina Kimya Endustrisi Kurumu (MKEK) in a new plant at Çorum.
- 1.3. This report deals with the demand and capacity for manufacture of items of machinery included in feasibility report at Çorum Plant Project.
- 1.4. Since SPO was keen on detailed analysis of Çorum plant investment plans, as a matter of high priority, the objective of this study was to undertake a detailed analysis on the basis of the latest data of work projections in major SEE's and then conclude how much additional capacity will be needed for these and where this could be done most economically.
- 1.5. Conclusions and recommendations are contained in para 2.3.5., 2.3.6., 2.4, 2 and 2.4.3.

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UNIDO-CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

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- 1.6. This study was conducted by Mr. Hasan Yilmaz, SPO expert, under the direction of Mr. M.M. Luther, Chief Technical Adviser, Capital Goods Development Project.
- 1.7. The project management is grateful to MKEK General Manager Mr. Akin Cakmakci, now Undersecretary, Ministry of Industry and Technology, Mr. Gunay Gungen, deputy General Manager of MKEK who made themselves available for discussions at different stages of the study.
- 1.8. Mr. Vahit Erden, National Project Coordinator of the Capital Goods Project and Head, Sectoral Planning Division, SPO, Mrs. Nimet Ipek and Mr. Fatih Ozatay, experts, SPO, were continuously associated with the study.

  
31.12.83

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CHAPTER IIANALYSIS AND CONCLUSIONS

- 2.1. The proposed capacity and product-mix of MKEK's proposed 'Industrial Plants Machine and Equipment Factory' at Çorum in terms of 5 digit SITC codes is as follows:-

<u>SITC Code</u>	<u>Name</u>	<u>Prop.Cap. (Tonnes/yr)</u>
71262	Condensers	700
72512*	Paper making m/c	1900
72513	Eq. for Cell.Pulp	75(Mixer, Pulper 60T Chipper 15T)
72831*	Vibrating rotary filters(screens & classifiers)	120
72832*	Rotary mills & crushers	4000
74161	Heat exchangers	1500
74163	Rotary furnaces (Heating & cooking equipment)	2000
74164	Dryers	
74165	Reaction vessels	2000
74313*	Compressors	400
74362	Refiners(Filt.Eq. for liquids)	230
74931	Gear boxes	500
<b>TOTAL</b>		<b>13425 tonnes/yr. (rounded of to 15000 T)</b>

(NOTE\*: represents machines items - totally 6420 tonnes, the remaining being plate-fabricated equipment).

2.2. The demand for these items as conceived in the feasibility reports is expected to arise from AZOT Sanayi, SEKA, PETKIM, CIMENTO,SEKER FABRIKASI, ETIBANK and TICI. The future demand of capital goods of all these enterprises has been studied by the Capital Goods Development Project and recently updated on the basis of projections by SPO in the context of preparation of the 5th. Five Year Development Plan. The national demand of the proposal product-mix of Çorum factory is given in Table I.

2.3. PLATE FABRICATED EQUIPMENT

2.3.1. Demand of each enterprise for these items has been analysed by CGDP on the basis of the permutation of 12th., 13th., and 14th. digits of the corresponding 15 digit code evolved by CGDP on the basis of SITC code. Annexure I gives a typical 15 digit code for plate fabricated equipment. Annexure II gives permutation of weight, material thickness of plate-fabricated items in MKEK's proposed product-mix according to enterprises. Annexure III gives classification of the permutation results according to each 5 digit SITC code. A summary is in Table II.

2.3.2. As in the original feasibility report of MKEK, this detailed analysis does not cover the demand of TEK.

2.3.3. The total demand, yearly average demand between 1985-1994 and demand/capacity balance for MKEK's proposed Çorum plant product-mix is given in Table III.

2.3.4. A statement of capacity for steel fabrication at present available in public and private sectors including Gerkonsan is in Table VI.

2.3.5. In view of the large capacity for this type of work already available it is recommended that MKEK should give up its plans for manufacture of plate fabricated equipment, namely condensers, equipment for cellulose pulp, heat exchangers, heating and cooling equipments, dryers, reaction vessels, filtering equipment for liquids.

2.3.6. This data is being supplied to Gerkonsan, which is being set up for a capacity of 10.000 tonnes of technological structures of the type of items foreseen by MKEK for its proposed Corum plant. It is recommended that Gerkonsan should make a further study of its planned capacity considering the weight, material and the thickness of the items covered in this report. This should cover in particular limiting factors of production capacity such as capacity of cranes, bending machines, guillotines. e.t.c.

#### 2.4. MACHINERY

2.4.1. The five items considered by MKEK (Paper making machinery screens and classifiers, crushers and grinding mills, compressors and gearboxes) require different kinds of facilities considering their range of weight and complexity as well as manufacturing operations. Some capacity is already available in public sector units for manufacture of these items not only in existing plants of MKEK but also in plants of SEKER MAKINA FABRIKASI and private sector units.

2.4.2. Considering this as well as the facts that

(i) the total demand is limited

(ii) a large part of the future demand is expected upto 1990 by which time any factories planned now will barely reach optimum capacity.

(iii) the sizes and specifications of the items have not yet been determined, it is felt that existing units in public and private sector should be encouraged to fill the gap between demand and capacity.

2.4.3. It is recommended that paper-making machinery and screens and classifiers should in any case, be taken up by Seker Makina Fabrikasi while crushers and grinders should be included in the product-mix of the proposed new plant at Polatli for manufacture of earth moving machinery.

2.4.4. Now that national demands with detailed specifications as coded by the Capital Goods Development Programme are available a comparison of the figures as previously computed and these latest projections is at Table IV. The revised figures, however, do not change the conclusions.

TABLE I

NATIONAL DEMAND (in tonnes) OF CORUM PRODUCT-MIX - OCTOBER 1983

ITEMS	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
71262 Condensers	3590	1400	1110	-	700	-	1320	250	500	-	-	-	-	-	-	-
72512 * Paper Mak.M/C	-	-	2404	134	-	-	-	-	-	-	-	-	-	-	-	-
72513 Eq.for cell.Pulp	43.2	151	209.1	2851.6	-	-	-	-	-	-	-	-	-	-	-	-
72831 * Screens & class.	2296.7	1630.3	502.7	125.3	278.4	1670	66	33	1056	-	237.5	600	-	95.4	-	-
72832 * Crushers,Grind.mills	5972.9	8691.5	4512.7	248.5	2978.8	11971.8	678	768	1536	-	116	450	100	300	-	-
74161 Heat exchaners	824.1	535.8	873.3	240.5	270.9	468.6	392.9	487	731	117.6	1446.1					
74163 Heating,cooking eq.	300	1318.4	-	245	1264	7722.8	-	-	-	-	-	-	-	-	-	-
74164 Dryers	110	297.1	55	-	-	611.6	-	-	10.5	-	-	-	-	-	-	-
74165 Reaction Vessels	-	463	38	2.4	3506.4	560	628.7	-	234.6	-	1007.9	-	-	-	-	-
74313 * Compressors	324.4	60.9	59.2	20.5	336.5	25.7	-	-	16.5	140	-	-	-	-	-	-
74362 Filt.App.for liquids	756.3	392	208.9	2051.6	298.3	805	138	120	240	-	-	-	-	73	-	-
74931 * Gear boxes	463.4	-	-	-	926.8	-	-	-	-	-	-	-	-	-	-	-

SUMMARY OF DEMAND PROJECTIONS ACCORDING  
 TO MANUFACTURING CHARACTERISTICS

TABLE II

CODE	WEIGHT		MATERIAL		THICKNESS	
	Tons	%	Tons	%	Tons	%
1	417.8	1.43	12442.7	42.70	15652.7	53.71
2	615.0	2.11	9104	31.24	2496.8	8.57
3	4280.3	14.69	150.60	0.52	9741.60	33.43
4	1354.9	4.65	1575.4	5.40	1249.00	4.29
5	1256.50	4.31	-	-		
6	7549.40	25.91	4829.7	16.57		
7	3097.00	10.63	136.0	0.47		
8	-	-	-	-		
9	10569.20	36.27	921.70	3.10		
	29140.1	100.00	29140.1	100.00	29140.1	100.00

Manufacturing Characteristic -1		Manufacturing Characteristic -2		Manufacturing Characteristic -3	
	Weight (tons)		Main body Material		Plate thickness mm
1.	Upto 5	2.	Mild steel upto 0.20 carbon (untested quality)	1.	Upto 20
2.	5-10			2.	20-40
3.	10-25			3.	40-50
4.	25-50	2.	Carbon steel above 0.20 (tested quality)	4.	Over 50
5.	50-100				
6.	100-200	3.	Boiler steel		
7.	200-300	4.	Alloy steel		
8.	300-500	5.	High alloy steel		
9.	Over 500	6.	Stainless steel		
		7.	Non-ferrous materials		
		9.	Others		

TABLE III

DEMAND/CAPACITY BALANCE

(tonnes)

SITC Code	Name	Total demand	Average demand 1985-1998	Proposed cap. of MKEK Corum Plant
71262	Condensers	8870.0	633.6	700
72512 *	Paper mak. M/C	2538.0	181.3	1900
72513	Eq, for cell, pulp	3334.9	238.2	75
72831 *	Screens & class.	8591.3	613.7	120
72832 *	Crush.+Grind.mills	38324.2	2737.4	4000
74161	Heat exchangers	6387.8	456.3	1500
74163	Heating, cook, eq.	10850.2	775.0	} 2000
74164	Dryers	1085.2	77.5	
74165	Reaction vessels	6449.9	460.7	2000
74313 *	Compressors	983.7	70.3	400
74362	Filt.App.for liq.	3910.1	279.3	230
74931 *	Gear boxes	1390.2	99.2	500
	TOTAL	92715.5	6622.5	13425.0

TABLE IV

NATIONAL DEMAND (in tonnes) OF CORUM PRODUCT-MIX - DECEMBER 1983  
 Figures above the line are the latest projections. No additional entries indicate no change

ITEMS	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	85-90	91-2000	GR.TOTAL	
71262 Condensers	250 3690	- 1400	60 1110	660 -	250 700	910 -	500 1320	- 250	700 500	700 -	700 -	- -	- -	- -	- -	- -	2130 6800	2600 2070	4730 8870	
72512 * Paper Mak.M/C	-	-	2404	134	-	-	-	-	-	-	-	-	-	-	-	-	2538.0	-	2538.0	
72513 Eq. for coll. Pulp	43.2	151	289.1	2851.6	-	-	-	-	-	-	-	-	-	-	-	-	3334.9	-	3334.9	
72831 * Screens & class.	2146.7 2296.7	1781.9 1630.3	246 502.7	150.9 125.3	69 278.4	1733.6 1670	92 66	- 33	457.8 1056	457.8 -	495.3 237.5	- 600	- -	94.8 95.4	- -	- -	6127.1 6503.4	1597.7 2087.9	7724.8 8591.3	
72832 * Crushers, Grind. mills	1712.0 5972.9	3257.9 8691.5	278.5 4512.7	857.5 248.5	815.0 2978.8	12048.8 11971.8	1596.0 678	- 768	2941.8 1536	2941.8 -	3057.8 116	- 450	- 100	- 300	- -	- -	19969.7 34376.2	10537.4 394.8	30507.1 38324.2	
74161 Heat exchangers	570.2 824.1	4.0 535.8	432.4 873.3	308.5 240.5	487.0 270.9	1023.6 868.6	1294.9 892.9	- 97	265.9 731	383.5 117.6	2098.9 1446.1	- -	- -	- -	- -	- -	2825.7 3213.2	4043.2 3174.6	6868.9 6387.8	
74163 Heating, cooking eq.	300	1784	-	245	1264	7722.8	-	-	-	-	-	-	-	-	-	-	10850.2	-	10850.2	
74164 Dryers	110	297.1	55	-	-	611.6	-	-	10.5	-	-	-	-	-	-	-	1084.2	-	1084.2	
74165 Reaction Vessels	-	463	38	2.4	3506.4	560	628.7	-	234.6	-	1007.9	-	-	-	-	-	4569.8	1871.2	6441	
74313 * Compressors	209.2 324.4	12.9 60.9	102.2 59.2	20.5 20.5	312.1 336.5	25.7 -	- -	- -	24.0 16.5	304 140	183.4 -	- -	- -	- -	- -	- -	682.6 827.2	511.4 156.5	1194 983.7	
74362 Filt. App. for liquids	918.5 756.3	3.5 392	- 208.9	- 2051.6	235.5 298.3	925 805	376 138	- 120	182.8 240	182.8 -	182.8 -	- -	- -	- 73	- -	- -	2082.5 4512.1	924.4 571	3006.9 5083.1	
74931 Gear boxes	463.4	-	-	-	926.8	-	-	-	-	-	-	-	-	-	-	-	1390.2	-	1390.2	
TOTAL																	UPDATED	79999.4	22085.3	79670.2
																	OLD	79999.4	13879.2	93878.6



UNIDO-CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

TABLE V

CAPACITY FOR PLATE FABRICATED EQUIPMENT MANUFACTURE  
1. PUBLIC SECTOR

HC = High Complex  
LC = Low "

UNITS	CAPACITY	PRODUCT MIX			REMARKS
		Equipment (%)		Structurals (%)	
		HC	LC		
<u>Sugar m/c Factory</u>					
Ankara	13900	100	-	-	
Eskisehir	3100	100	-	-	
Turhal	1500	100	-	-	
Afyon	2000	100	-	-	
Erzincan	1250	100	-	-	
T.D.C.I. GERKONSAN	15000	66	-	33	
T.D.C.I. Karabuk	30000	20	-	80	
T.D.C.I. Iskenderun	25000	-	-	100	
Pendik Shipyards	40000	100	-	-	
T.C.D.D. Workshops					} For Railway needs only } Repair shops
T.K.I. Workshops					
ETIBANK Workshops					

TABLE V

CAPACITY FOR PLATE FABRICATED EQUIPMENT MANUFACTURE  
2. PRIVATE SECTOR (Based on TUSTAS study)

UNITS	CAPACITY	PRODUCT MIX			REMARKS
		Equipment (%)		Structurals (%)	
		HC	LC		
Alamsas	8500	88	-	12	
Cimtas	19900	-	18	82	Both Gemlik & Tuzla plants are considered
Mansur Sahin	6000	-	33	67	
Sungurlar	20000	90	-	10	Three plants are considered
Tekfen	30000	54	-	46	2 plants
Karmasan	1500	50	-	50	
Petniz	1000	100	-	-	
Erna	800	100	-	-	
Erkoc	600	100	-	-	
Desa	3000	83	-	17	
Habas	3000	-	83	17	
Nace	5000	50	-	50	
Kutlutas	12000	-	-	100	
Vildan Guleryuz	2400	63	-	37	
Gama	6000	16	-	84	
Rona Makina	6420	-	22	78	
Kasmak	1000	-	50	50	
Harmak	2500	-	43	57	
Isik Kill. Sti.	4000	-	75	25	
Guris	9000	66	-	33	
Erg	5000	50	-	50	
Gulermak	4500	-	55	45	
Maks	1000	50	-	50	

TABLE V

CAPACITY FOR PLATE FABRICATED EQUIPMENT MANUFACTURE

3. SUMMARY

UNITS	Equipment				Structurals		TOTAL
	HC		LC		TPA	%	
	TPA	%	TPA	%			
Public Sector *	93750	75	-	-	31000	25	124750
Private Sector	61150	40	16900	11	76070	49	154120
TOTAL	154900	55	16900	8	107070	45	278870

\* Excluding TCDD, TKI and ETIBANK workshops - the latter two being only repair shops.

## ANN. I

## Fabricated equipment

SITC Code 69211 - Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquified gas) of iron or steel of a capacity exceeding 300 lt., whether or not lined or heat-insulated but, not fitted with mechanical or thermal equipments.

6-7		8		9		10		11		12		13		14		15	
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 <sup>3</sup> )	Code	Diameter in meters (m)	Code	Temperature °C	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm	Code	
01	Bins	1	Upto 100	1	Upto 5	1	Above 500	1	Rectangular/cubic	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
02	Bunkers	2	100-500	2	5-7.5	2	500-100	2	Circular/cylindrical	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
03	Chests	3	500-1000	3	7.5-10	3	100-0	3	elliptical	3	10-25	3	Boiler steel	3	40-50		
04	Containers	4	1000-2500	4	Over 10	4	0-(-25)	4	Spherical	4	25-50	4	Alloy steel	4	Over 50		
05	Reservoirs	5	2500-7500			5	(-25)-(-50)			5	50-100	5	High alloy steel				
06	Silos	6	7500-15000			6	(-50)-(-100)			6	100-200	6	Stainless steel				
07	Tanks	7	15000-30000			7	(-100)-(-120)			7	200-300	7	Non-ferrous materials				
08	Tubs	8	30000-50000			8	(-120)-(-170)			8	300-500	8	Others				
09	Vats	9	Over 50000			9	Below (-170)			9	Over 500	9					
10	Vessels								9	Others (n/a)							
11	Double-walled vessels																
12	Lined vessels																
13	Storage tanks																
99	Others																

(n/a: not indicated above)

SITC Code = 71262

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT

ANN. II

Name = Condensers

AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
421	AZOT			60.0													

SITC Code = 72513

Name = Eq. for cell-Pulp

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. II

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 1 1	SEKA		33.8	6.9	25.5												
1 6 1	SEKA		4.8	71.8	39.4												
2 1 1	SEKA	6.0	18.7	6.0	117.0												
2 6 1	SEKA		9.0	59.5	40.7												
3 1 1	SEKA		41.8	48.0	300.0												
3 1 2	SEKA		15.2														
3 6 1	SEKA			67.9	85.0												
4 1 1	SEKA	37.2	27.7	-	268.0												
4 6 1	SEKA			29.0													
5 1 1	SEKA				458.0												
6 1 1	SEKA				820.0												
7 1 1	SEKA				698.0												

SITC Code = 74161

Name = Heat Exchangers

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. XI

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 1 1	AZOT			2.0													
	CEMENT		2.0				4.0										
	SEKA		2.0	-	12.0			21.4			5.0						
	PETKIM																
1 2 1	AZOT			14.5								64.8					
	SEKA				7.8												
	SUGAR PETKIM						9.0				0.6						
1 4 1	AZOT										4.0						
1 4 2	AZOT										0.4						
1 6 1	AZOT			9.9								9.6					
	SEKA	3.2			33.2												
2 1 1	PETKIM							39.5									
2 2 1	AZOT							42.0				25.56					
	SUGAR						14.0										
2 4 2	AZOT											4.7					
2 6 1	AZOT							18.0				14.8					
	SEKA					7.5											
2 6 2	AZOT											36.00					

SITC Code = 74161

Name = Heat Exchangers (cont.)

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. XI

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
3 2 1	AZOT			120.0				28.0				513.0					
	SUGAR	60.0					441.6										
3 2 2	AZOT											220.0					
3 3 2	AZOT											13.6					
3 4 1	AZOT							40.0				16.5					
3 6 1	AZOT			106.0				52.0				112.3					
	SEKA				24.0												
3 7 1	ETIBANK	20.0			116.0												
4 1 1	ETIBANK				4.0												
4 2 1	AZOT											217.5					
4 2 2	AZOT											36.0					
4 2 3	AZOT							80.0									
4 6 1	AZOT			180.0													
5 1 1	PETKIM										112.0						
5 2 2	AZOT											126.5					
6 2 2	AZOT											281.0					
6 3 2	AZOT											137.0					



SITC Code = 74165 (Cont.)

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

Name = Reaction Vessels

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 1 1	PETKIM							0.4									
1 6 1	AZOT		10.0														
	PETKIM									2.6							
2 1 1	PETKIM							6.0									
2 6 1	AZOT		27.0														
	AZOT		10.0														
2 9 1	PETKIM							12.2									
3 1 1	PETKIM							180.0									
6 1 2	PETKIM									232.0							



SITC Code = 74164

Name = Dryers

ADM. II

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 2 1	ETIBANK PETKIM		0.3							10.0							
1 6 1	AZOT			3.0													
1 9 1	PETKIM									0.5							
2 2 1	AZOT			6.0													
3 2 1	SUGAR						18										
4 2 1	AZOT			47.0													
5 4 2	ETIBANK	110.0															
6 4 2	CEMENT		196.8				593.6										

SITC Code = 74163

ANN. II

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT

Name = Heating, Cooking and Roasting Equip~~ment~~ PARAMETERS OF MANUFACTURING CHARACTERISTICS

PERMUTATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
3 2 1	SUGAR						260										
5 4 1	ETIBANK				90.0												
6 2 1	SEKA				155.0												
9 1 1	ETIBANK	300.0				1264.0											
9 1 3	CEMENT		1318.4				2636.8										
9 2 3	TDCI						5050										

SITC Code = 74362

Name = REFINERS

INDUSTRY WISE DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

PERMITATION	INDUSTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 1 1	ETIBANK	4.5			4.0												
1 1 2	ETIBANK		2.0														
1 2 1	AZOT							3.0									
1 6 1	SEKA				3.6												
2 2 1	SUGAR	42.0						40.0									
3 1 1	ETIBANK					5.5											
3 2 1	SUGAR	54.0					145.0	45.0									
3 2 3	ETIBANK					5.5											
3 9 1	PETKIM						170.0										
4 2 1	SUGAR	80.0					40.0										
4 4 1	AZOT							40.0									
5 2 3	ETIBANK	180.0															
6 1 1	ETIBANK	150.0			444.0												
6 9 4	TDCI						450.0										
7 1 1	ETIBANK				1500.0												

NATIONAL TOTALS OF DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. III

PERMUTATION	SITC Co.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 9 1	74164									0.50							
2 1 1	72513	6.00	18.70	6.00	117.00												
	74161							39.50									
	74165							6.00									
2 1 1	74161						14.00	42.00				25.50					
	74164			6.00													
	74362	42.00				5.50		40.00									
2 4 2	74161											4.70					
2 4 3	74165											7.40					
2 6 1	72513		9.00	59.50	40.70												
	74161																
	74165		37.00		7.50			18.00				14.80					
2 6 2	74161											36.00					
2 9 1	74165							12.20									
3 1 1	72513		4180	4800	300.00												
	74165							180.00									
	74362					110											

NATIONAL TOTALS OF DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. III

PERMUTATION	SITC Co.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
3 1 2	72513		15.20														
3 2 1	74161	60.00		120.00			477.6	28.00				513.00					
	74163						50.00										
	74164						18.00										
	74165											30.00					
	74362	45.00					145.0	45.00									
3 2 2	74161											220					
3 2 3	74362	289.00															
3 3 2	74161											13.60					
3 4 1	74161							40.00				16.50					
3 6 1	72513			67.93	85.00												
	74161			106.0				52.00				112.3					
	74165																
3 7 1	74161	20.00				116.00											
3 9 1	74362						170.00										
3 9 2	74165											19.00					

NATIONAL TOTALS OF DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. III

PERMUTATION	SITC Co.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTAL
7 2 4	74165											269.00						269.00
7 6 4	74165											280.00						280.00
7 9 4	74165							250.00										250.00
9 1 1	74163	300.00				1264.00												1564.00
9 1 3	74163		1318.40				2636.80											2955.20
9 2 3	74163						5050.00											5050.00



NATIONAL TOTALS OF DEMAND FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. XII

FENUTATION	SITC Co.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
4 1 1	72513	37.20	27.70		268.00												
	74161				40.00												
4 1 3	74165		180.00														
4 2 1	71262			60.00													
	74161											217.50					
	74164			47.00													
	74362	80.0															
4 2 2	74161										36.00						
4 2 3	74161							80.00									
4 4 1	74362							40.00									
4 6 1	72513			29.0													
	74161			180.0													
	74165											32.50					
5 1 1	72513				458.00												
	74161										112.00						
5 2 1	74165							180.00									
5 2 2	74161											126.50					

NATIONAL TOTALS OF DMENAD FOR FABRICATED EQUIPMENT  
AS PER PARAMETERS OF MANUFACTURING CHARACTERISTICS

ANN. III

PERMUTATION	SITC Co.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 1 1	72513		33.8	6.9	25.5												
	74161		4.00	2.00	12.00		4.00	21.40			5.00						
	74165							0.40									
	74362	4.50			4.00												
1 1 2	74165		3.00														
	74362		2.00														
1 2 1	74161			14.50	7.80		9.00				0.60	64.8					
	74164		0.30						10.00								
	74165				0.40												
	74362	8.00						11.00									
1 4 1	74161											4.00					
	74165				2.00												
1 4 2	74162										0.40						
1 6 1	72513		4.8	71.7	39.4												
	74161			9.90									9.6				
	74164			3.00													
	74165		10.00						2.60								
	74362		1.50		360												