



**PAGEV**



**TURKISH PLASTICS PROCESSING MACHINERY**  
INDUSTRY FOLLOW-UP REPORT  
**2017**





## — FOREWORD —

The plastics industry is one of the key drivers of the Turkish economy. With over 10 million tons of production, 40 billion dollars in revenue, 5 billion dollars in direct exports and an annual rate of growth that has consistently exceeded 10% over the last decade, the industry is increasingly a major contributor to the economy. The industry has the second highest production capacity in Europe, and sixth in the world. Staying true to our mission of being the "uniting force" of the Turkish plastics industry, we at PAGEV continue to implement projects that will carry our industry forward.

We rely on scientific, proven data showing how plastics constitute an indispensable part of our lives to solve long-standing issues in the industry in a meaningful way, and we realize that having accurate and reliable information is the largest part of the solution. We keep up the research, collect and compile new data, and publish them in reports. We make our reports and position papers containing valuable information available to all plastics industry representatives and stakeholders, and to public institutions.

We developed a set of reports through long and thorough research, which we hope will contribute significantly to our industry. Expert researchers used accurate and reliable data to determine the current position of the Turkish plastics industry, the problems we all face, and what tangible steps we need to take in order to overcome these issues. We believe that the set of reports and position papers we make available to PAGEV members and all stakeholders will help to shape the world of plastics. It delights us further that our work will enable public authorities to access the most current and accurate data regarding the plastics industry.

By offering these reports in English, we hope that our members will be able to share the true potential of the plastics industry in Turkey with their business partners abroad.

It is our pleasure to present you a compendium of current reports and supplemental information, and I would like to take this opportunity to extend my gratitude to everyone who has helped our industry grow into the driving force that it is today.

**Yours sincerely,**

**Yavuz EROĞLU**  
**PAGEV Chairman**

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# – EXECUTIVE SUMMARY –

Turkey is a country which imports about 60-80% of plastic processing machines and parts and accessories and is a net importer in these products and can not provide sufficient added value with low export prices compared to developed western societies. As the plastics industry is growing rapidly, the production of plastic processing machines does not develop parallel to this pace, and the sector can not develop against imports made from cheap machine-maker countries, especially from China. The lack of a state strategy for the plastic processing machinery industry and the inadequate protection of the domestic producers cause the production of plastic processing machines in Turkey not to improve sufficiently.

In the last 5 years covering the years 2013-2017, the plastics industry has invested an average of 850 million dollars in machinery and equipment per year. In this period, presses and other machines shared 36% of total investments, injection 22%, extrusion 18%, thermoforming 5%, blow molding 2% and parts and components 17%.

In 2017, 518 million dollars of production, 583 million dollars of imports, 169 million dollars of exports and 932 million dollars of domestic sales (machinery investment of the plastics industry) has been realized.

In this period, industry gave 414 million dollars of foreign trade deficit and 63% of the investment has been met by imports and export coverage of imports realised as 29%.

Annual average growth rates for the last 5 years covering the years 2013-2017 in plastics processing machinery are 11.2% for production, 2.6% for imports, 6.1% for exports, 6.2% for domestic sales and 1.3% for foreign trade.

In order for the Turkish plastic processing machinery sector to produce and export more value-added machines, the main strategies are as described in the Machinery Sector Export Strategy Document; General Purpose; "Improvement of Machinery Industry and Ensure the Manufacture of High-Tech Products".

## 1. NUMBER OF COMPANIES

598 company produce plastic processing machines and their parts and components in Turkey.

78% of them is in İstanbul, 6% of is in İzmir.

Province	Number	% Share
İstanbul	464	78
İzmir	34	6
Ankara	17	3
Bursa	17	3
Kocaeli	11	2
Konya	10	2
Adana	8	1
Gaziantep	8	1
Manisa	5	1
Others	24	4
Total	598	100

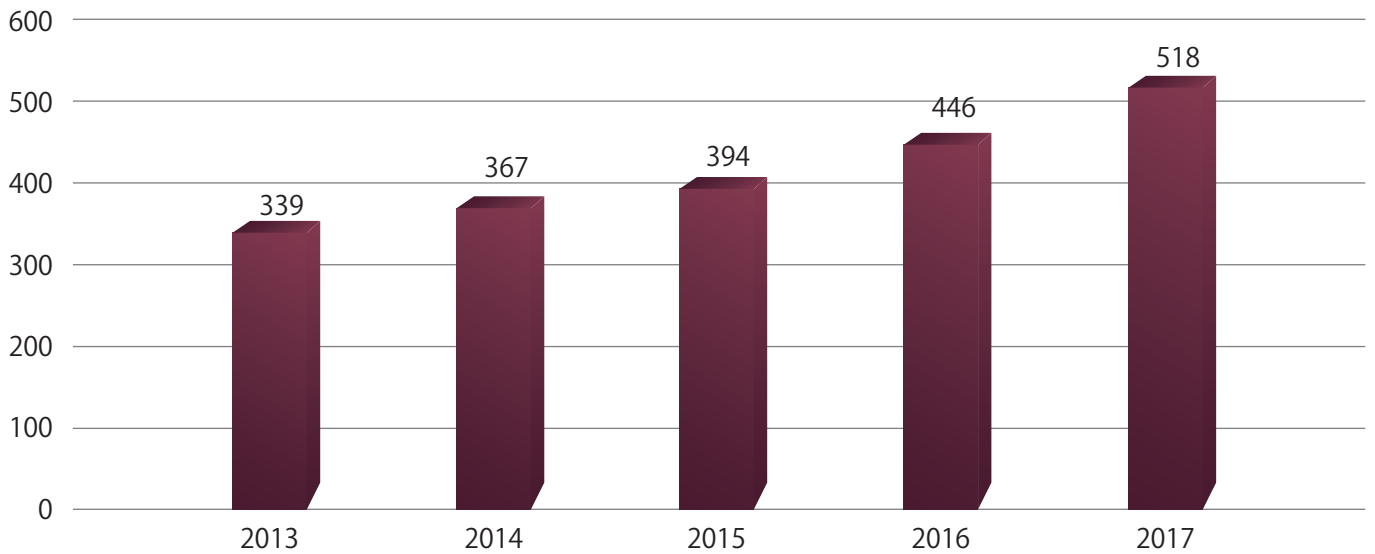
**Table 1: Plastic Processing Machines Producers By The Main Provinces**

Source: PAGEV

## 2. PRODUCTION

Production of plastic processing machines has increased by an average rate of 11.2% a year between 2013 and 2017.

Production realized as 518 million dollars in 2017 increasing by 16% with respect to 2016.



**Graphic 1: Plastics Processing Machines Production (USD Million)**

Source: TurkStat & ITC Trade Statistics

## 2. PRODUCTION

It is seen that production of all machines other than extrusion machines in 2017.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	19.9	23	25	10	5.8
Extrusion Machines	62.5	71	69	-3	2.4
Blow Molding Machines	0.4	1,0	4,9	371	87.0
Thermoform Machines	36.1	47	60	28	13.6
Presses and Other Machines	152.5	154	188	22	5.3
Parts and Components	67.9	151	172	14	26.2
Total	339.3	446	518	16	11.2

**Table 2: Plastics Processing Machines Production (Million \$)**

Source: TurkStat & ITC Trade Statistics

In this period, injection machines accounted for 5%, extrusion machines 13%, blow molding machines 1%, thermoforming machines 13%, presses and other

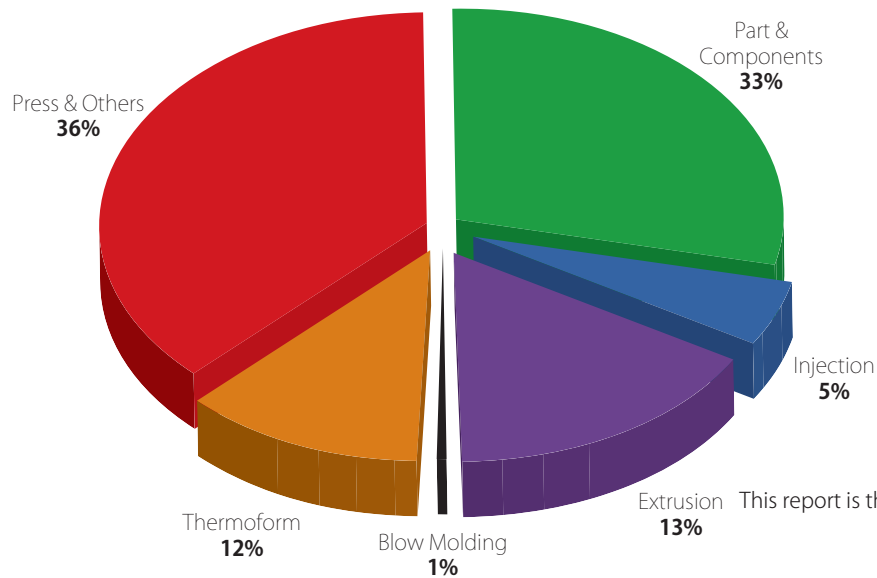
machines 36 % and parts and components 33% of total plastic processing machines production.

Machinery Group	2016	2017
Injection Machines	5	5
Extrusion Machines	16	13
Blow Molding Machines	0	1
Thermoform Machines	11	12
Presses and Other Machines	34	36
Parts and Components	34	33
Total	100	100

**Table 3: Share of Machines in Total Production (%)**

Source: TurkStat & ITC Trade Statistics

## 2. PRODUCTION



**Graphic 2: Share of Machines in Total Production (2017)**

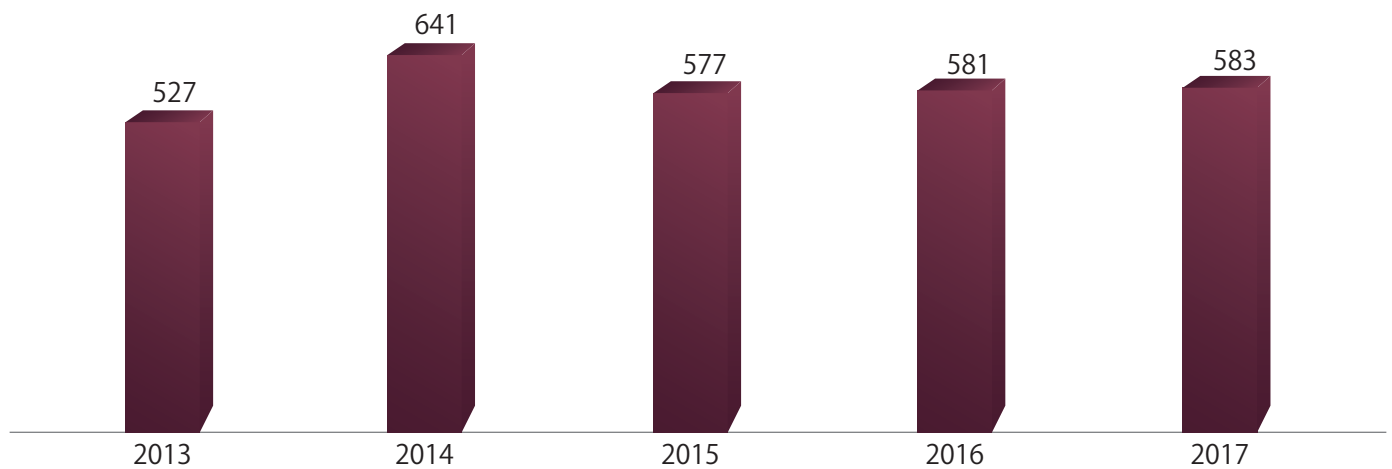
Source: TurkStat & ITC Trade Statistics

## 3. FOREIGN TRADE

### 3.1. IMPORTS

Imports of plastic processing machines has increased by an average rate of 2.2% a year between 2013 and 2017.

Imports of plastic processing machines realized as 583 million dollars in 2017 staying almost at the same level of 2016.



**Graphic 3: Plastics Processing Machines Imports (Million \$)**

Source: TurkStat & ITC Trade Statistics

### 3. FOREIGN TRADE

It is seen that imports of all machines other than extrusion and presses increased in 2017 compared to 2016.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	161	172	186	8	3.7
Extrusion Machines	96	115	99	-14	0.7
Blow Molding Machines	21	23	23	2	2.1
Thermoform Machines	24	15	22	47	-2.5
Presses and Other Machines	181	216	209	-3	3.6
Parts and Components	43	40	44	9	0.7
Total	527	581	583	0	2.6

**Table 4: Plastics Processing Machines Imports (USD Million)**

Source: TurkStat & ITC Trade Statistics

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In this period, injection machines accounted for 32%, extrusion machines 17%, blow molding machines 4%, thermoforming machines 4%, presses and other

machines 36% and parts and components 8% of total plastic processing machines imports.

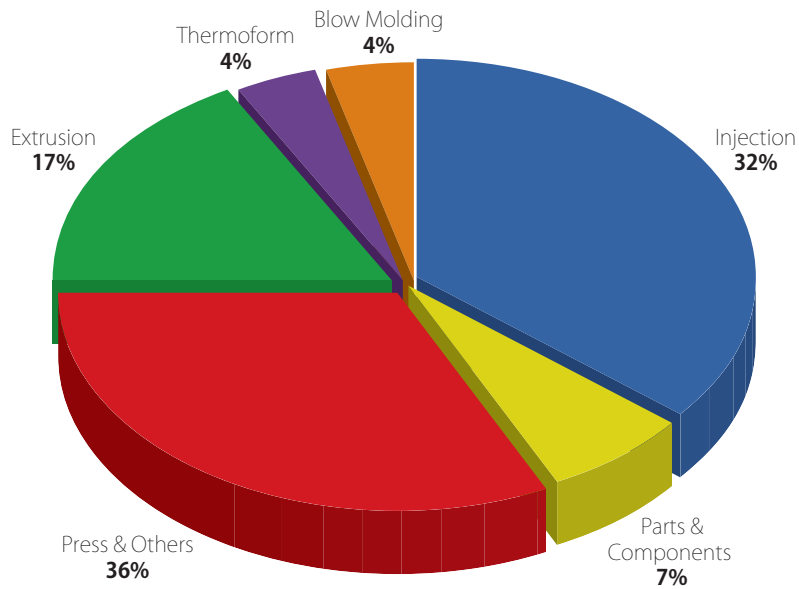
Machinery Group	2016	2017
Injection Machines	30	32
Extrusion Machines	20	17
Blow Molding Machines	4	4
Thermoform Machines	3	4
Presses and Other Machines	37	36
Parts and Components	7	8
Total	100	100

**Table 5: Breakdown of Imports by Machine Types (\$- %)**

Source: TurkStat & ITC Trade Statistics



### 3. FOREIGN TRADE

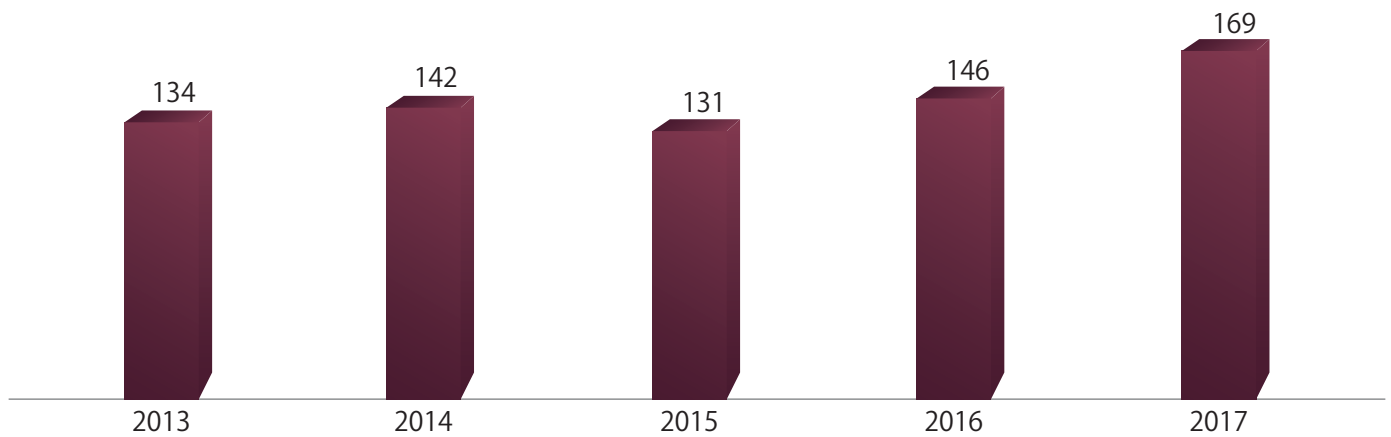


**Graphic 4: Breakdown of Imports by Machine Types (USD - %) (2017)**  
Source: TurkStat & ITC Trade Statistics

#### 3.2. EXPORTS

Exports of plastic processing machines has increased by an average rate of 6.1% a year between 2013 and 2017.

Exports of plastics processing machines realized as 169 million dollars in 2017 increasing by 16% compared to 2016.



**Graphic 5: Plastics Processing Machines Exports (Million \$)**  
Source: TurkStat & ITC Trade Statistics

### 3. FOREIGN TRADE

In this period exports of all machines other than blow molding increased.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	10	11	12	10	5.8
Extrusion Machines	31	35	34	-3	2.4
Blow Molding Machines	0	0	2	371	87.0
Thermoform Machines	14	19	24	28	13.6
Presses and Other Machines	61	57	73	28	4.7
Parts and Components	17	23	23	2	8.2
Total	134	146	169	16	6.1

**Table 6: Plastics Processing Machines Exports (Million \$)**

Source: TurkStat & ITC Trade Statistics

In this period, injection machines accounted for 7%, extrusion machines 20%, blow molding machines 1%, thermoforming machines 14%, presses and other

machines 43% and parts and components 14% of total plastic processing machines exports.

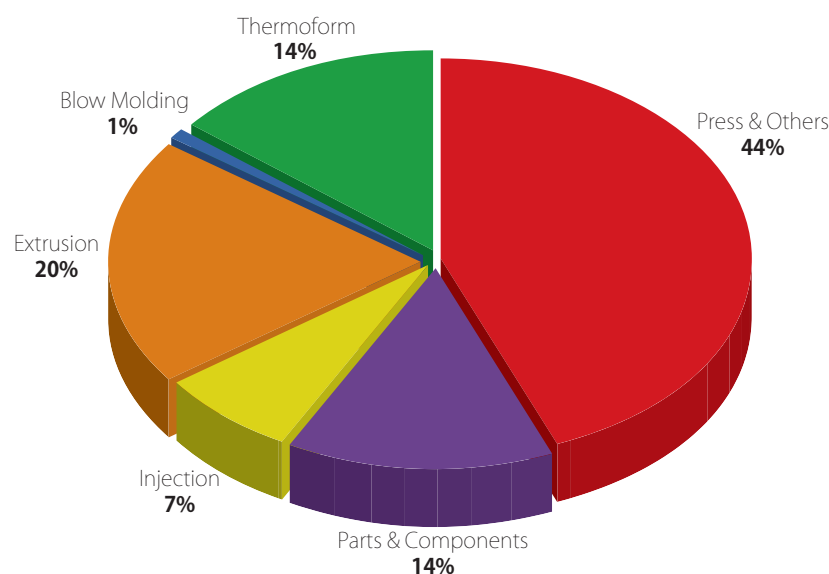
Machinery Group	2016	2017
Injection Machines	8	7
Extrusion Machines	24	20
Blow Molding Machines	0	1
Thermoform Machines	13	14
Presses and Other Machines	39	43
Parts and Components	16	14
Total	100	100

**Table 7: Share of Machines in Total Machine Exports (\$ - %)**

Source: TurkStat & ITC Trade Statistics



### 3. FOREIGN TRADE



**Graphic 6: Share of Machines in Total Machine Exports (\$ - %) (2017)**  
Source: TurkStat & ITC Trade Statistics

#### 3.3. IMPORT AND EXPORT BY COUNTRIES

In 2017, plastics processing machines and components imports from the 10 main countries constituted the 91% of the total imports. China, Germany, Italy are the first 3 countries from which Turkey imports plastics processing machines most. These countries shared 63% of imports on value base.

On the other hand, exports to the 10 main countries received a share of 43% on value base in 2017. The first 3 countries to which Turkey has conducted plastics processing machines exports in this period are Russian Fed., Iran and Algeria. These countries shared 19% of exports on value base.

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
China	157.2	31	Russian Fed	11.9	7.0
Germany	122.6	20	Iran	11.1	6.5
Italy	89.5	13	Algeria	9.6	5.7
Austria	52.9	7	Germany	7.8	4.6
Japan	38.6	6	Bulgaria	6.2	3.6
Taiwan	25.9	4	Romania	6.1	3.6
Switzerland	16.3	3	Corlu Avr. Free Trade Zone.	5.1	3.0
USA	10.0	3	Iraq	4.8	2.8
S.Korea	9.9	2	Uzbekhistan	4.8	2.8
Tailand	8.1	2	S.Africa Rep.	4.7	2.8
10 Countries Total	530.9	<b>91</b>	10 Countries Total	<b>72.0</b>	<b>42.5</b>
Others	52.3	<b>9</b>	Others	<b>97.3</b>	<b>57.5</b>
Total	583.2	<b>100</b>	Total	<b>169.3</b>	<b>100.0</b>

**Table 8: Plastics Processing Machines Foreign Trade by Countries(2017)**  
Source: TurkStat & ITC Trade Statistics

## 3. FOREIGN TRADE

### 3.4. IMPORT AND EXPORT PRICES

In 2017, average unit import prices of plastics processing machines and parts and components realized as

11.2 \$/kg, decreasing by 9% with respect to 2016.



**Graphic 7: Average Import and Export Prices Of Plastics Processing Machines (\$/kg)**

Source: TurkStat & ITC Trade Statistics

In this period, average import prices for extrusion, blow molding and thermoform machines increased and the

others declined compared to 2016.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	6.6	6.6	6.3	-5	-1.1
Extrusion Machines	22.9	20.2	20.8	3	-2.3
Blow Molding Machines	26.6	21.0	22.6	7	-4.0
Thermoform Machines	20.4	15.7	20.3	29	-0.1
Presses and Other Machines	16.5	17.7	14.7	-17	-2.9
Parts and Components	55.2	38.6	33.7	-13	-11.6
Total	12.4	12.4	11.2	-9	-2.5

**Table 9: Average Import Prices By Plastics Processing Machines (\$/kg)**

Source: TurkStat & ITC Trade Statistics

In 2017, average unit export prices of plastics processing machines and parts and components realized as 11.1 \$/kg, increasing by 3% with respect to 2016.

In this period, average export prices declined for machines other than injection, blow molding and presses compared to 2016.

### 3. FOREIGN TRADE

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	4.64	4.55	4.9	7	1.3
Extrusion Machines	16.26	14.03	13.1	-7	-5.3
Blow Molding Machines	9.19	4.04	8.5	110	-2.0
Thermoform Machines	20.90	19.02	18.5	-3	-3.0
Presses and Other Machines	11.89	8.92	10.3	16	-3.5
Parts and Components	12.78	22.19	15.7	-29	5.2
Total	11.91	10.77	11.1	3	-1.8

**Table 10: Average Export Prices By Plastics Processing Machines (\$/kg)**

Source: TurkStat & ITC Trade Statistics

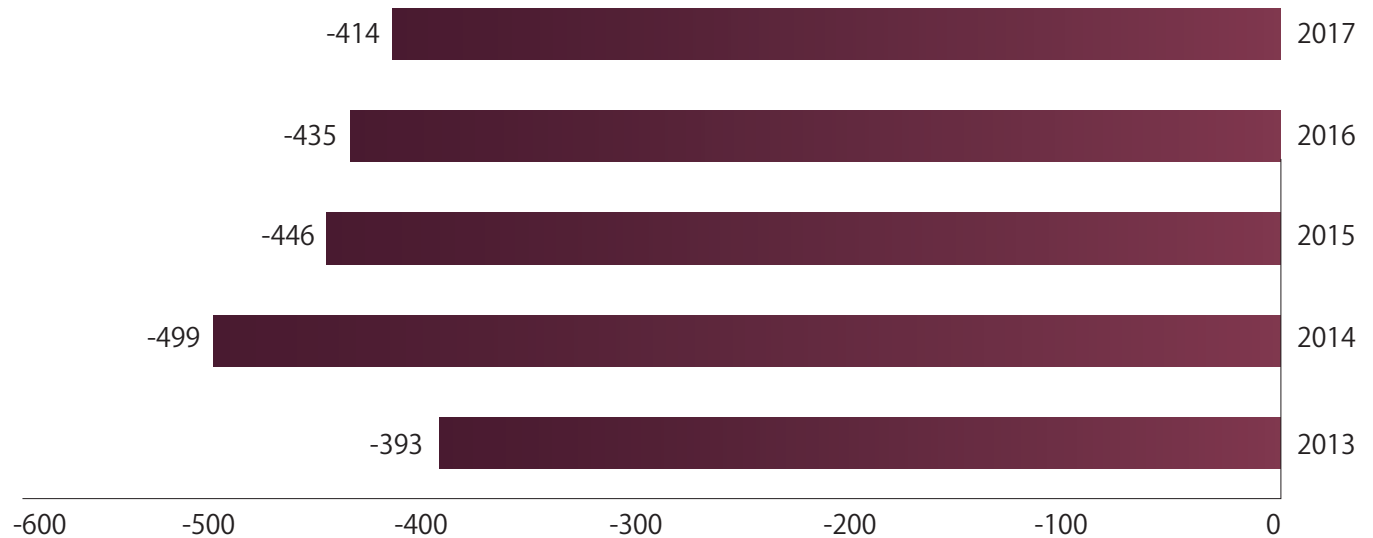
In this period, the average unit export and import prices

for plastics processing machines are almost equalized.

#### 3.5. FOREIGN TRADE DEFICIT

Turkey has always had foreign trade deficit in plastics processing machines. Its foreign trade deficit, reached it's maximum level with 589 million dollars in 2011,

In 2017 foreign trade deficit realized as 414 million dollars decreasing by 5% compare to 2016.



**Graphic 8: Foreign Trade Deficit in Plastics Processing Machines (Million \$)**

Source: TurkStat & ITC Trade Statistics

### 3. FOREIGN TRADE

Foreign trade deficit decreased for all machines other

than injection machines, presses and other machines in 2017 compared to 2016.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	-151	-161	-174	8	3.6
Extrusion Machines	-65	-79	-65	-19	-0.1
Blow Molding Machines	-21	-22	-21	-5	0.1
Thermoform Machines	-10	4	2	-42	-
Presses and Other Machines	-120	-158	-136	-14	3.0
Parts and Components	-26	-17	-21	19	-5.3
Total	-393	-435	-414	-5	1.3

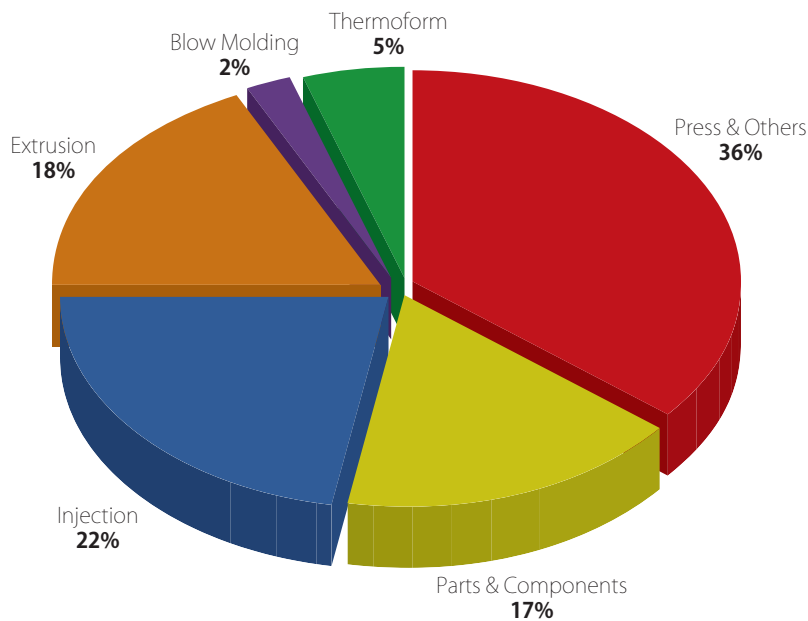
**Table 11: Foreign Trade Deficit in Plastics Processing Machines (Million \$)**

Kaynak: TÜİK ve ITC Trade Statistics

### 4. DOMESTIC SALES (MACHINERY INVESTMENTS OF PLASTICS INDUSTRY)

The plastics industry, in parallel with the increase in its processing capacity, makes investment in machine and equipment with an increasing trend every year. Machinery and equipment investment of plastics industry after

reaching it's maximum level of 885 million dollars in 2011, decreased in following years. But it showed as increasing tendency after 2016 and realized as 932 million dollars in 2017 increasing bu 6% compared to 2016.

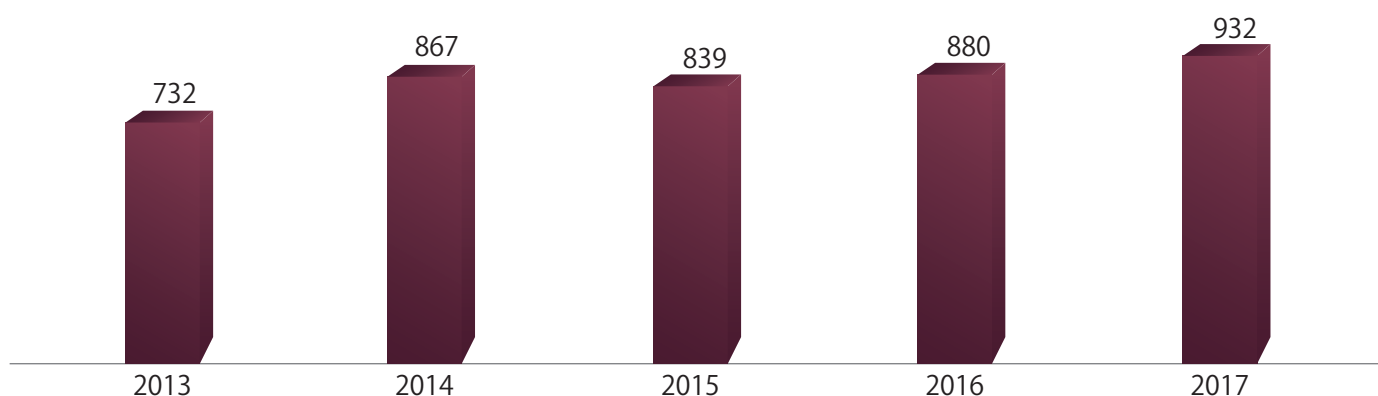


**Graphic 9: Breakdown of Machinery Investments of Plastics Industry for the Last 5 Years**

Source: TurkStat & ITC Trade Statistics



## 4. DOMESTIC SALES (MACHINERY INVESTMENTS OF PLASTICS INDUSTRY)



**Graphic 10: Domestic Sales of Plastics Processing Machines (USD Million)**

Source: TurkStat & ITC Trade Statistics

It is seen that, investment of all machines other than extrusions increased in 2017 compared to 2016.

Machinery Group	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017
Injection Machines	171	184	199	8	3.8
Extrusion Machines	127	150	133	-11	1.1
Blow Molding Machines	22	23	26	12	4.9
Thermoform Machines	46	43	58	35	6.0
Presses and Other Machines	273	312	323	4	4.3
Parts and Components	94	168	193	15	19.8
Total	732	880	932	6	6.2

**Table 12: Domestic Sales of Plastics Processing Machines (USD Million)**

Source: TurkStat & ITC Trade Statistics

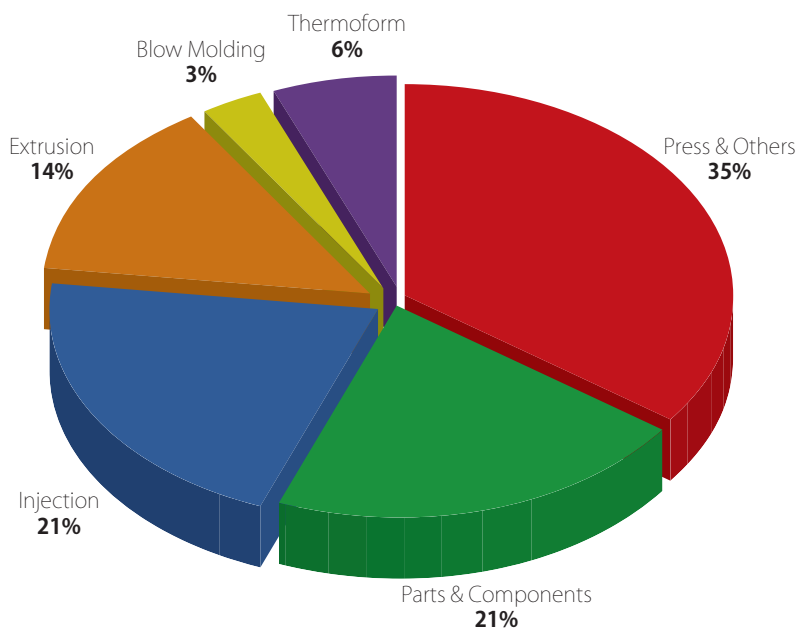
The share of injection realized as 21%, extruders 14%, blow molding 3%, thermoform 6, presses and other machines 35% and parts and components 21% in the total machinery investment of the plastics industry in 2017.

Machinery Group	2016	2017
Injection Machines	21	21
Extrusion Machines	17	14
Blow Molding Machines	3	3
Thermoform Machines	5	6
Presses and Other Machines	35	35
Parts and Components	19	21
Total	100	100

**Table 13: Breakdown of Machinery Investments by Machine Types in 2017**

Source: TurkStat & ITC Trade Statistics

## 4. DOMESTIC SALES (MACHINERY INVESTMENTS OF PLASTICS INDUSTRY)

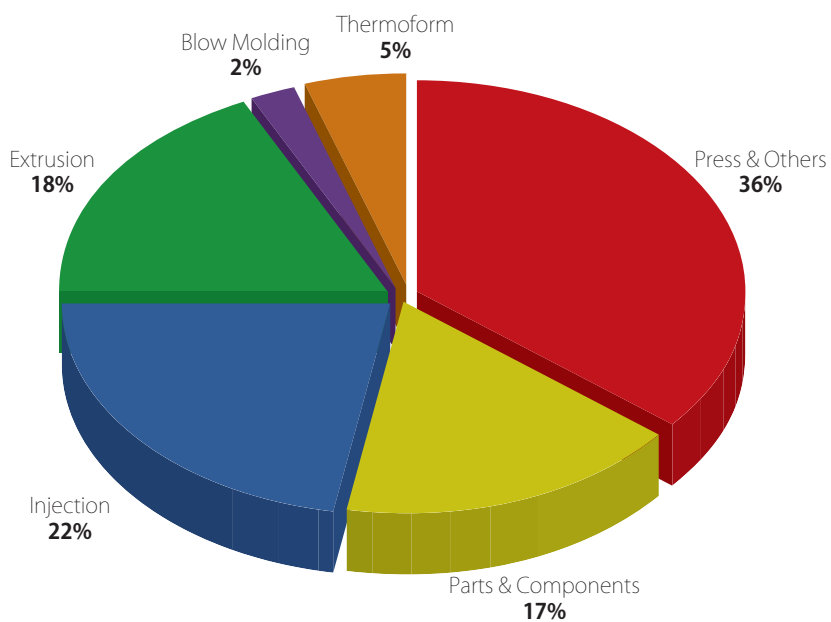


**Graphic 11: Breakdown of Machinery Investments by Machine Types (2017)**

Source: TurkStat & ITC Trade Statistics

In the last 5 years covering the years 2013-2017, the plastics industry has invested an average of 850 million dollars in machinery and equipment per year.

In this period, presses and other machines shared 36% of total investments, injection 22%, extrusion 18%, thermoforming 5%, blow molding 2% and parts and components 17%.



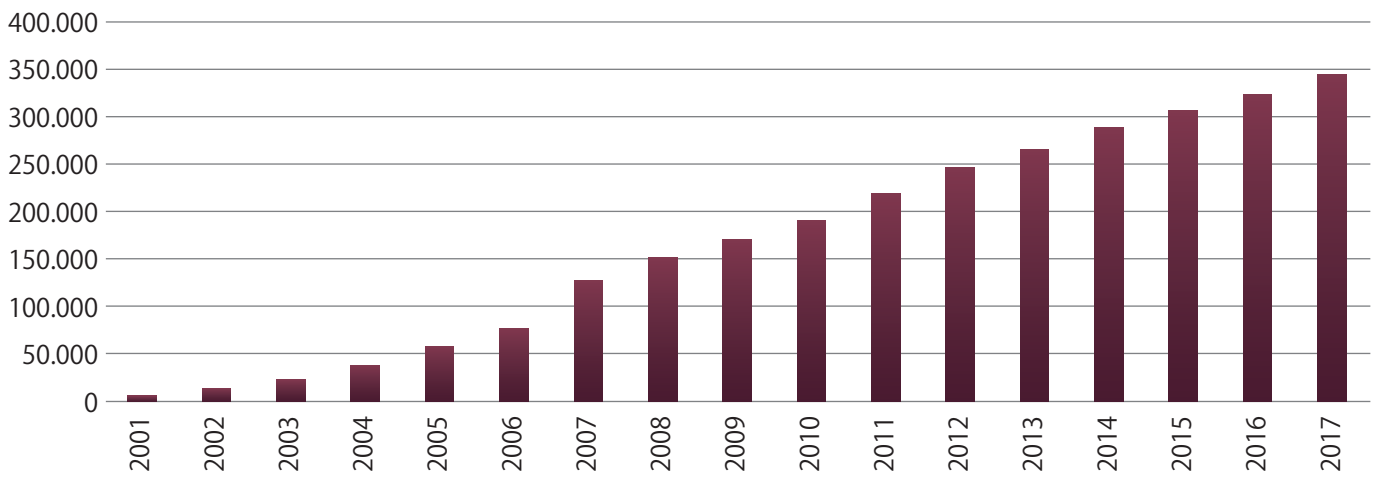
**Graphic 12: Breakdown of Machinery Investments by Machine Types For The Last 5 Years.**

Source: TurkStat & ITC Trade Statistics

## 5. MACHINERY PARK

The process capacity of Turkish plastics industry, which had 2.5 million tons of processing capacity and 5,688 machine parks in 2001, reached to 9.6 million tons by the end of 2017. The machinery park of the industry realized

as about 343 thousand units by the end 2017. Between 2001 and 2017, the plastics industry's processing capacity increased by an average of 7.9% as the machinery park increased 29.2% annually.

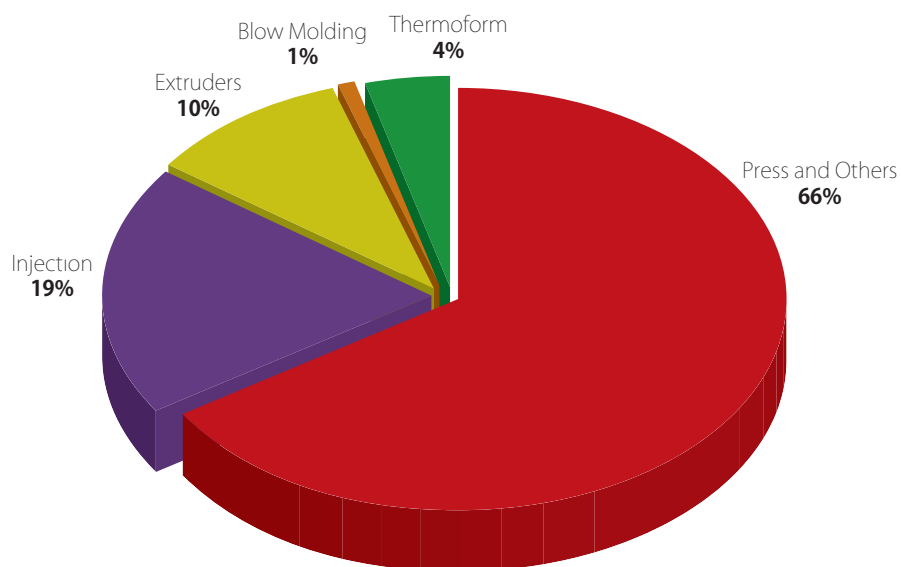


**Graphic 13: Plastics Industry Process Capacity and Machinery Park**

Source: TurkStat & ITC Trade Statistics

As of 2017, 19% of the Turkish plastics processing machinery park consists of injection, 10% extrusion, 1%

blow molding, 4% thermoform and 66% presses and other machines.



**Graphic 14: Machinery Park of Plastics Industry By Machine Types**

Source: TurkStat & ITC Trade Statistics



## 5. MACHINERY PARK

As of 2017, 30% of the total processing machinery park of the Turkish plastics industry is sold by domestic

producers while 70% of it has been imported.

Machinery Group	Units		% Share		
	Domestic Production	Imports	Total Park	Production	Imports
Injection Machines	4,481	60,752	65,233	7	93
Extrusion Machines	4,473	30,268	34,741	13	87
Blow Molding Machines	410	3,344	3,754	11	89
Thermoform Machines	5,168	8,908	14,076	37	63
Presses and Other Machines	87,239	134,114	221,353	39	61
Parts and Components	101,770	237,386	339,156	30	70
Total					

**Table 14: Machinery Park of Plastics Industry**

Source: TurkStat & ITC Trade Statistics

Share of imported machines in total machine park realised as; 93% in injection machines, 87% in extrusion machines, 89% in blowing machines, 63% in thermoforming machines and 61% in others.

10 countries share 96.5% of total imported machines park. China shared 43.7% of Injection, 63.3% of extrusion, Italy shared 30.5% of blow molding and Germany shared 21% in the imported machines park.

In other words, the share of domestic produced machineries within the total park is; 7% in injection machines, 13% in extrusion machines, 11% in blow molding machines, 37% in thermoforming machines and 39% in presses and other machines.

Injection		Extrusion		Blow Molding		Thermoform	
Countries	% Share	Countries	% Share	Countries	% Share	Countries	% Share
China	43.7	China	63.3	Italy	30.5	Germany	21.0
Germany	18.1	Germany	13.8	Germany	21.5	China	18.8
Italy	9.6	Italy	7.3	China	9.4	Italy	14.9
Taiwan	8.9	Taiwan	4.3	France	8.4	Taiwan	10.0
Austria	6.2	Austria	3.9	Japan	7.2	France	5.7
Switzerland	2.8	S.Korea	1.6	Taiwan	4.5	Israel	5.1
France	2.7	India	1.1	UK	4.0	Switzerland	4.5
Japan	2.4	Japan	0.8	Switzerland	3.5	USA	4.2
S.Korea	1.2	USA	0.8	Austria	3.0	S.Korea	3.4
India	0.9	UK	0.7	Belgium	2.8	Austria	2.8
10 Countries	96.5	10 Countries	97.5	10 Countries	94.9	10 Countries	90.4
Others	3.5	Others	2.5	Others	5.1	Others	9.6

**Table 15: Imported Machinery Park By Countries**

Source: TurkStat & ITC Trade Statistics

## 5. MACHINERY PARK

10 countries shared 97.5% in imported extrusion machinery park while, 63.3% of the park is made up of China, 13.8 % of Germany, 7.3% of Italy, 4.3% of Taiwan and 3.9% of Austrian machinery.

10 countries shared 94.9% in imported blow molding machinery park while, 30.5% of the park is made up of Italy, 21.5 % of Germany, 9.4% of China, 8.4% of Italy and 7,2% of Japanese machinery.

10 countries shared 90,4% in imported thermoform machinery park while, 21% of the park is made up of Germany, 18,8 % of China, 14,9% of Italy, 10% of Taiwan and 5.7% of France machinery.

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

### 6.1. TOTAL INDUSTRY

In 2017, 518 million dollars of production, 583 million dollars of imports, 169 million dollars of exports and 932

million dollars of domestic sales (machinery investment of the plastics industry) has been realized.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	339	446	518	16	11,2	576
Imports	527	581	583	0	2,6	598
Exports	134	146	169	16	6,1	180
Domestic Sales	732	880	932	6	6,2	995
Foreign Trade Deficit	-393	-435	-414	-5	1,3	-419
Imports/Domestic Sales(%)	72	66	63			60
Exports/Imports (%)	25	25	29			30

**Table 16: Plastics Processing Machines Supply & Demand Balance (Million \$)**

Source: TurkStat & ITC Trade Statistics

In this period, industry gave 414 million dollars of foreign trade deficit and 63% of the investment has been met by imports and export coverage of imports realised as 29%.

Annual average growth rates for the last 5 years covering the years 2013-2017 in plastics processing machinery are 11.2% for production, 2.6% for imports, 6.1% for exports, 6.2% for domestic sales and 1.3% for foreign trade.

In 2018, plastic processing machinery production is expected to be 576 million dollars, imports 598 million dollars, exports 180 million dollars, domestic sales 995 million dollars. In this period, the industry is expected to give 429 million dollars of foreign trade deficit.

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

### 6.2. PLASTICS INJECTION MACHINES

In 2017, 25 million dollars of production, 186 million dollars of imports, 12 million dollars of exports and 199 million dollars of domestic market sales (injection machines investment of plastics industry) realized. In this period foreign trade deficit of plastics injection machines realised as 174 million dollars.

It can be observed that 94% of the domestic sales (injection machines investment of the industry) was provided by imports and export coverage of imports realized as 7% in this period.

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 5.8% for production, 3.7% for imports, 5.8% for exports, 3.8 for domestic sales and 3.6% for foreign trade deficit.

The expectations for 2018 are; 26 million dollars of production, 193 million dollars of imports, 13 million dollars of exports, 207 million dollars of domestic sales and 180 million dollars of foreign trade deficit.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	20	23	25	10	5.8	26
Imports	161	172	186	8	3.7	193
Exports	10	11	12	10	5.8	13
Domestic Sales	171	184	199	8	3.8	207
Foreign Trade Deficit	-151	-161	-174	8	3.6	-180
Imports/Domestic Sales(%)	94	94	94			94
Exports/Imports (%)	6	7	7			7

**Table17: Injection Machines Supply& Demand Balance (Million \$)**

Source: TurkStat & ITC Trade Statistics

In 2017, injection machines imports from the first 10 countries accounted to 99% of total imports. China received a share of 47% in total imports. Apart from China, Germany, Austria, Japan and Taiwan are the countries from which Turkey imports the most.

In the same period, 63% of the exports of plastics injection machines destined to 10 countries. Algeria, Pakistan and Turkmenistan with a total of 33% share, have been the biggest markets to which Turkey has exported plastics injection machines.



## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
China	87.8	47.1	Algeria	1.8	14.4
Germany	27.0	14.5	Pakistan	1.6	12.6
Austria	24.4	13.1	Turkmenistan	0.8	6.1
Japan	11.3	6.1	Bulgaria	0.7	5.4
Taiwan	9.5	5.1	S.Arabia	0.6	5.0
Italy	7.3	3.9	Romania	0.5	4.3
S.Korea	7.0	3.8	Russian Fed.	0.5	4.2
Switzerland	4.1	2.2	Iraq	0.5	3.8
Canada	3.4	1.8	Poland	0.5	3.8
France	2.2	1.2	S.Korea	0.4	3.2
10 Countries Total	184.0	98.7	10 Countries Total	7.8	62.8
Other Countries	2.5	1.3	Other Countries	4.6	37.2
Total	186.5	100.0	Total	12.4	100.0

**Table 18: Plastics Injection Machines Imports & Exports by Countries (2017)**

Source: TurkStat & ITC Trade Statistics

### 6.3. PLASTICS EXTRUSION MACHINES

In 2017, 69 million dollars of production, 99 million dollars of imports, 34 million dollars of exports and 133 million dollars of domestic sales (injection machines investment of plastics industry) were realized in the plastics extrusion machines. In the same period, foreign trade deficit of extrusion machines realized as 65 million dollars.

It can be observed that the 74% of the domestic sales (injection machines investment of the industry) was met by imports and export coverage ratio of imports has been realized as 35% in the same period.

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 2.4% for production, 0.7% for imports, 2.4% for exports, 1.1% for domestic sales. On the other hand foreign trade deficit decreased by 0.1% annually in the same period.

The expectations for 2018 are; 70 million dollars of production, 100 million dollars of imports, 35 million dollars of exports, 135 million dollars of domestic sales and 64 million dollars of foreign trade deficit.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	63	71	69	-3	2.4	70
Imports	96	115	99	-14	0.7	100
Exports	31	35	34	-3	2.4	35
Domestic Sales	127	150	133	-11	1.1	135
Foreign Trade Deficit	-65	-79	-65	-19	-0.1	-64
Imports/Domestic Sales(%)	75	76	74			74
Exports/Imports (%)	33	31	35			35

**Table 19: Supply & Demand Balance in Extrusion Machines ( Million \$)**

Source: TurkStat & ITC Trade Statistics

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

In 2017 the extrusion machines imported from 10 countries accounted for 99% of total imports. The countries from which Turkey imports most are Germany, Italy and China with a total share of 71%. In the same

period 56% of extrusion machines exports destined to 10 countries. Algeria, Uzbekistan and Germany with a shared 24% of total exports are the main export partners in these machines.

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
Germany	27.3	27.6	Algeria	3.0	8.7
Italy	23.7	23.9	Uzbekistan	2.8	8.0
China	19.0	19.2	Germany	2.5	7.1
Austria	10.0	10.1	Russian Fed.	2.4	7.0
Japan	6.6	6.7	Çorlu Avr. Free Zone	1.7	4.9
Switzerland	5.1	5.1	Iraq	1.6	4.6
Taiwan	4.6	4.7	China	1.5	4.5
Netherlands	0.9	0.9	Ukrayna	1.3	3.8
S.Korea	0.7	0.8	Romania	1.2	3.6
India	0.3	0.3	Iran	1.1	3.2
10 CountriesTotal	98.2	99.3	10 CountriesTotal	19.1	55.5
Others	0.7	0.7	Others	15.3	44.5
Total	98.9	100.0	Total	34.3	100.0

**Table 20: Plastics Extrusion Machines Imports & Exports by Countries (2017)**

Source: TurkStat & ITC Trade Statistics

### 6.4. BLOW MOLDING MACHINES

In 2017, 5 million dollars of production, 23 million dollars of imports, about 2 million dollars of exports and 26 million dollars of domestic market sales (blow molding machines investment of plastics industry) were realized. The industry gave 21 million dollars of foreign trade deficit in this period.

It can be observed that the 89 % of the domestic sales (blow molding machines investment of the industry) was provided by imports in the same period and exports coverage ratio of imports realized as 8% in the same period.

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 2.1% for imports, 87% for production and exports, 4.9% for domestic sales and 0.1% for foreign trade deficit.

The expectations for 2018 are; 9 million dollars of production, 24 million dollars of imports, 4 million dollars of exports, 29 million dollars of domestic sales and 20 million dollars of foreign trade deficit.

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	0	1	5	371	87.0	9
Imports	21	23	23	2	2.1	24
Exports	0	0	2	371	87.0	4
Domestic Sales	22	23	26	12	4.9	29
Foreign Trade Deficit	-21	-22	-21	-5	0.1	-20
Imports/Domestic Sales(%)	99	97	89			81
Exports/Imports (%)	1	2	8			15

**Table 21: Supply & Demand Balance in Blow Molding Machines (Million \$)**

Source: TurkStat & ITC Trade Statistics

In 2017, Turkey imported 99% of blow molding machines from 10 countries. Germany, Italy and Switzerland as the main import partners shared 60% of total imports.

In this period, Turkey exported 90% of total blow molding machines to 10 countries and Iraq, Bulgaria and Russian Federation as the main export partners shared 49% of total exports.

Countries	Imports		Exports		
	Million \$	% - Share	Million \$	% - Share	
Germany	10.2	43.7	Iraq	0.4	22.9
Italy	6.9	29.5	Bulgaria	0.3	14.6
Switzerland	1.4	6.0	Russian Fed.	0.2	11.5
Japan	1.1	4.9	Ukrayna	0.2	11.3
China	1.0	4.4	Kayseri Free Zone	0.2	11.0
Taiwan	1.0	4.1	Germany	0.1	5.8
Spain	0.5	2.0	Azerbaijan	0.1	5.1
India	0.4	1.8	Colombia	0.1	3.0
Austria	0.3	1.5	Tunusia	0.1	2.8
Russian Fed.	0.2	0.9	Kazakhstan	0.0	2.0
10 Countries Total	23.0	98.8	10 Countries Total	1.8	90.1
Others	0.3	1.2	Others	0.2	9.9
Total	23.3	100.0	Total	2.0	100.0

**Table 22: Plastic Blow Molding Machines Exports By Countries (2017)**

Source: Turk Stat & ITC Trade Statistics

### 6.5. THERMOFORM MACHINES

In 2017, 60 million dollars of production, 22 million dollars of imports, 24 million dollars of exports and 58 million dollars of domestic market sales (thermoform machines investment of plastics industry) realized. On the other hand, foreign trade deficit of thermoform machines realized as 2 million dollars in this period.

It can be observed that the 38% of the domestic sales (thermoform machines investment of the industry) was provided by imports and export coverage of imports ratio has been realized as about 110% in the same period.



## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 13.6 % for production and exports, 6% for domestic sales. On the other hand, imports decreased by 2.5% per year.

The expectations for 2018 are; 68 million dollars of production, 21 million dollars of imports, 27 million dollars of exports, 62 million dollars of domestic sales and 6 million dollars of foreign trade deficit.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	36	47	60	28	1.6	68
Imports	24	15	22	47	-2.5	21
Exports	14	19	24	28	1.6	27
Domestic Sales	46	43	58	35	6.0	62
Foreign Trade Deficit	-10	4	2	-42	-	6
Imports/Domestic Sales(%)	53	35	38			34
Exports/Imports (%)	60	126	110			129

**Table23: Supply& Demand Balance in Thermoform Machines (USD Million)**

Source: TurkStat & ITC Trade Statistics

In 2017, imports from 10 countries shared 98% of total thermoform imports. Italy, Germany and China shared 72% of total imports.

In this period, 58% of total exports of thermoform machines destined to 10 countries. Russian Federation, Belgium and Indonesia as the main export partners shared 40% of total exports.

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
Italy	9.6	44.2	Russian Fed.	2.9	12.1
Germany	3.6	16.4	Belçika	1.8	7.3
China	2.5	11.3	Indonesia	1.6	6.8
Taiwan	1.8	8.2	Nijerya	1.5	6.2
France	1.6	7.2	Algeria	1.4	6.0
Switzerland	1.1	5.1	Ukrayna	1.1	4.7
India	0.6	2.8	USA	1.1	4.5
Austria	0.2	1.0	Iran	0.9	3.9
Poland	0.2	0.9	UK	0.9	3.7
S.Korea	0.2	0.8	Nertherlands	0.8	3.3
10 CountriesTotal	21.4	98.0	10 CountriesTotal	14.0	58.3
Others	0.4	2.0	Others	10.0	41.7
Total	21.8	100.0	Total	24.1	100.0

**Table 24: Thermoform Machines Imports and Exports By Countries ( 2017)**

Source: Turk Stat& ITC Trade Statistics



## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

### 6.6. PRESSES AND OTHER MACHINES

In 2017, 188 million dollars of production, 209 million dollars of imports, 73 million dollars of exports and 323 million dollars of domestic market sales (presses and other machines investment of plastics industry) realized in presses and other machines industry. In this period foreign trade deficit realized as 136 million dollars.

It can be observed that the 65% of the domestic sales (presses and other machines investment of the industry) was provided by imports and export coverage of imports ratio realized as 35% in this period.

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 5.3 % for production, 3.6% in imports, 4.7% in exports 4.3% in domestic sales and 3% in foreign trade deficit.

The expectations for 2018 are; 198 million dollars of production, 216 million dollars of imports, 77 million dollars of exports, 337 million dollars of domestic sales and 140 million dollars of foreign trade deficit.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	153	154	188	22	5.3	198
Imports	181	216	209	-3	3.6	216
Exports	61	57	73	28	4.7	77
Domestic Sales	273	312	323	4	4.3	337
Foreign Trade Deficit	-120	-158	-136	-14	3.0	-140
Imports/Domestic Sales(%)	66	69	65			64
Exports/Imports (%)	34	27	35			35

**Table 25: Supply & Demand Balance in Presses and Other Machines (Million \$)**

Source: TurkStat & ITC Trade Statistics

In 2017, presses and other machines have been imported from 10 countries shared 59% of total imports. China, Italy and Germany as the main import partners shared 32% of total imports.

In this period, 44% of presses and other machines were exported to 10 countries and Iran, Russian Federation and S. Africa Republic as the main export partners shared 20% of total exports.

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
China	23.1	11.3	Iran	6.9	9.4
Italy	22.2	10.9	Russian Fed.	4.1	5.6
Germany	19.9	9.7	S.Africa Rep.	3.7	5.1
Japan	10.9	5.3	Algeria	3.2	4.3
Austria	10.0	4.9	Bulgaria	3.0	4.0
Germany	7.8	3.8	Romania	2.8	3.8
Tailand	7.6	3.7	Spain	2.5	3.4
USA	7.1	3.5	USA	2.2	3.0
Italy	5.7	2.8	Azerbaijan	2.0	2.7
Austria	5.3	2.6	S. Arabia	1.9	2.6
10 CountriesTotal	119.6	58.5	10 CountriesTotal	32.1	43.9
Others	85.0	41.5	Others	41.1	56.1
Total	204.6	100.0	Total	73.3	100.0

**Table 26: Presses and Other Machines Imports and Export by Countries (2017)**

Source: TurkStat & ITC Trade Statistics

### 6.7. PARTS & COMPONENTS

In 2017, 173 million dollars of production, 44 million dollars of imports, 23 million dollars of exports and 193 million dollars of domestic market sales (accessories investment of plastics industry) were realized in the parts and components industry. On the other hand, foreign trade deficit realized as 21 million dollars in the same period.

It can be observed that the 23% of the domestic sales (accessories investment of the industry) was provided by imports in the same period and export coverage of imports ratio realized as 53% in the same period.

Cumulative aggregated growth rates for the last 5 years covering 2013-2017 realized as: 26.2 % for production, 0.7% in imports, 8.2% in exports, 19.8% in domestic sales. On the other hand, foreign trade deficit decreased by 5.3 annually in the same period.

The expectations for 2018 are; 217 million dollars of production, 44 million dollars of imports, 25 million dollars of exports, 236 million dollars of domestic sales and 19 million dollars of foreign trade deficit.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	68	151	172	14	26.2	217
Imports	43	40	44	9	0.7	44
Exports	17	23	23	2	8.2	25
Domestic Sales	94	168	193	15	19.8	236
Foreign Trade Deficit	-26	-17	-21	19	-5.3	-19
Imports/Domestic Sales(%)	46	24	23			19
Exports/Imports (%)	40	57	53			57

**Table 27: Supply & Demand Balance in Parts and Components (Million \$)**

Source: TurkStat & ITC Trade Statistics

## 6. SUPPLY AND DEMAND AND 2018 EXPECTATIONS

In 2017 59% of parts and components have been imported from 10 countries and Germany, China and Italy, as the main import partners shared % 59 of total imports.

In this period, 44% parts and components were exported to 10 countries and Germany, Iran, and Çorlu Free Trade Zone as the main export partners shared 20% of total exports.

Countries	Imports		Countries	Exports	
	Million \$	% - Share		Million \$	% - Share
Germany	13.4	11.3	Germany	3.8	9.4
China	9.4	10.9	Çorlu Avr. Free Zone	1.8	5.6
Italy	7.5	9.7	Iran	1.8	5.1
Japan	2.4	5.3	Russian Fed.	1.7	4.3
France	2.2	4.9	Romania	1.2	4.0
Austria	2.1	3.8	Bulgaria	0.9	3.8
USA	1.8	3.7	UAE	0.6	3.4
Taiwan	1.2	3.5	Switzerland	0.6	3.0
Luxembourg	1.2	2.8	UK	0.6	2.7
Switzerland	1.0	2.6	Italy	0.6	2.6
10 Countries Total	42.2	58.5	10 Countries Total	13.8	43.9
Others	6.0	41.5	Others	9.5	56.1
Total	48.2	100.0	Total	3.8	9.4

**Table 28: Parts and Components Imports and Exports by Countries (2017)**

Source: Turk Stat& ITC Trade Statistics



## 7. MAIN PROBLEMS OF THE INDUSTRY

General problems in the machinery manufacturing industry, can also be applied to the plastic processing machines industry. In addition to these general problems, the absence of any national strategy and enough protection for domestic manufacturers of machine industry are the major problems faced in the plastics processing machines.

Turkey, as for plastic processing machinery has a very serious investing plastics industry. Thus, Turkey is one of the world's most important market in this area. But 80% of the market is dominated by imported machines.

Turkey is a net importer in the plastics processing machines trade and machines exported are far from providing high added value when compared their unit prices.

The developments in the plastics processing machines and their accessories and parts industry, despite significantly developing the plastics industry and the propensity to invest following the similar pattern, is under constant pressure of the cheap imports conducted in China. Imports receives a higher margin in sharing the increasing demand.

The lack of a state strategy for the plastic processing machinery sector, adequate protection of domestic producers and provide competitive advantages of plastic products manufacturer, they choose the second-hand imports of machinery.

The most important problems encountered in Turkey include plastic processing machinery sector;

- There is not a certain vision of the sector.
- Horizontal and vertical cooperation before competition between firms is not available.
- R&D, P&D, industrial design and product development efforts are insufficient in the industry.
- Patents and trademark investments are not enough in the industry.
- Industry's international technical compliance is insufficient.
- Equity capital and working capital of the companies are inadequate.
- Energy costs are high.
- The industry needs for the marketing customer relationship management.





## 8. PAGEV PROJECTS

PAGEV which is the "Unifying Power" of the Turkish plastics industry develops different projects aiming to solve the problems outlined above. These are in summary: "PAGEV Plastic Center of Excellence" and "International Regional Plastics Production Center".

### 8.1. PAGEV PLASTICS CENTER OF EXCELLENCE

Plastic materials, used in all areas of life, are rapidly taking place of other alternative products, because of their superior properties, in Turkey as well as in all over the world. Plastics, which useage in all sectors Increasing is becoming an indispensable material for the 21st century.

Turkish Plastics Industry which is one of the Moroccotest growing sectors in our country despite being young, is the 6th in the world and the 2nd in Europe. Growing with the goal of leadership in Europe, the Turkish Plastics Sector aims to increase the certification and added value of its products.

PAGEV, "Unifying Power" of the Turkish Plastics industry, is leading the industry with the "PAGEV Plastic Excellence Center" for realizing this purpose. The mission of the PAGEV Center for Plastic Excellence, will include the following activities.

- Research and Development
- Test and Laboratory Services
- Certification
- Training
- Competent Consulting

With the Center of Excellence, the test and laboratory support that the plastic industry needs; will be provided to the industry. So, many problems that lead to loss of time and energy such as high test costs, overseas shipping, customs clearance, long test times will be removed.

The platforms that will provide information to and knowledge sharing in the industry will be developed by the Center and detailed training programs will be prepared and presented for the benefit of the industry. While working on the newest technologies, the Center of Excellence will work together with industry organizations, universities, research institutes, professional associations and non-governmental organizations to work for the Turkish plastics industry to be the world leader with R&D and innovation based work.

Established with the support of the Ministry of Science, Industry and Technology, PAGEV Plastic Center of Excellence will provide to the plastics industry and Turkish economy, especially the development of industrial skills and capabilities that will form the basis of Turkey's national projects.

By PAGEV Plastic Center of Excellence, which will be established by strategic cooperation, it is aimed to grow the plastic industry Moroccotest with its traceable targets, scientific quality and high potential for commercialization,

Upon completion, the Center of Excellence, which will have an area of over 30 thousand m<sup>2</sup>, rises right beside PAGEV Vocational and Technical Anatolian High School in Küçükçekmece, Istanbul. PAGEV Plastic Center of Excellence, which will make Turkey the center of plastic production in the world, will carry out innovative projects.

In addition to this, the Center will create a control mechanism for the products exported abroad. The Center will also contribute to the preservation of the reliability and reputation of the plastic products produced in Turkey. On the other hand, the introduction of poor quality and non-standard goods into the country will be prevented by determining the technical suitability of the plastic products imported from abroad without any definite importation in the laboratories.

With its superior information infrastructure, the Center of Excellence will present the important documents required by the players of the sector more economically and quickly.

By accelerating the development, we will focus on the development of products and production technologies that will increase the competitive power of our firms.

The Center of Excellence, which will develop innovative ideas by following the developments in the world plastic sector, will increase the competitive power of our firms by providing many field consultancy services from the determination of appropriate input materials to the optimization of production process.



## 8. PAGEV PROJECTS

### 8.2. INTERNATIONAL REGIONAL PLASTIC MANUFACTURING CENTER

Although the Turkish plastics sector, with its process capacity reaching 9 million tons, has the 6th largest plastics production capacity in the world and 2nd in Europe, imports more than 85% of the plastic raw material it needs.

One of the most important advantages of the plastics industry in Turkey is that it is located between the Middle East countries which are the main petroleum and plastic raw material producer and the European market which is the main plastic consumer.

PAGEV aims to unify the plastic raw materials potential of Middle East countries with the Turkish plastics industry's competent production capability and experience at the international regional plastic production center, which Turkey aims to establish in South East Anatolia Region.

In the center, to be established with the win - win principle, the plastics raw materials producer countries will be supplying cheap and reliable raw materials having a large volume and reliable market while Turkish plastics industry will have greater competition possibilities in the global markets with its growing production capacity and falling costs.

# CONNECTING POWER OF PLASTICS INDUSTRY



**PAGEV**

PAGEV is member of;

**PlasticsEurope**  
Association of Plastics Manufacturers



[www.pagev.org](http://www.pagev.org)

Halkalı Caddesi No: 132/1 Tez-İş İş Merkezi Kat: 4 Sefaköy- İstanbul  
Tel. +90 (212) 425 13 13 Fax. +90 (212) 624 49 26 E-Mail. [pagev@pagev.org.tr](mailto:pagev@pagev.org.tr)