

TURKISH COMPOSITE INDUSTRY

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THE COMPOSITE MARKET SIZE

Turkish composite industry, which is comprised of 180 medium- and large-sized companies, plus some 700-800 companies, which are partially engaged in the composite business and roughly employs 8200 people servicing the Turkish composite industry.

Currently; the value of Turkish composite market is 1.4 billion Euros and this value corresponds to a 265,000 tons of composite production per year. The Turkish composite industry, with its vast opportunities, grows by creating new application areas as well as gaining share from the conventional alternative materials such as wood, aluminum, as it is the case in rest of the world.

THE COMPOSITE MARKET GROWTH

The Turkish composite industry grows at a higher rates per annum, compared to European and the global markets. Turkish composite industry has developed rapidly and in the long term, as the case is with the other industries, in line with the global economic developments in the world and leveraging the effects of the dynamics in the country. The industry grew by 8% to 12% on year-to-year basis in Turkey in the recent years in line with the prevailing economic conditions. The growth rate performed in 2016 has been 6% and is expected to grow over 6% again in 2017.

THE COMPOSITE MARKET SHARE

A review of composite consumption amount per capita, which is globally recognized as a "Development Criterion", reveals that Turkey is looking at considerable opportunities in respect of the composite industry. The said amount, which is between 4kg and 10kg globally, is 3.4kg in Turkey. The average unit price, which is around EUR6.9/kg globally, is roughly EUR 5.3/kg in Turkey. Both the consumption amount per capita and the average price in Turkey are considered as advantage for the country's composite industrial growth in the forthcoming periods.

GLOBAL PER CAPITA PRODUCTION

COUNTRY	GR PER CAPITA
USA	7,100
Japan	5,850
Germany	9,100
Austria	4,000
France	3,900
UK/ Ireland	2,300
Spain / Portugal	3,100
Benelux	10,600
Scandinavian countries	4,400
Italy	4,700
Greece	3,250
Turkey	3,400

THE INDUSTRIES COMPOSITE SERVICES

In terms of volume; composite products are most commonly used in the pipe-tank-infrastructure (36%), transportation-automotive(24%) and construction-building (21%) industries in Turkey . The acceleration of the production of high-tech products in Turkey is expected to increase the amount and the percentage of composite materials used, particularly in wind power, aerospace and aviation as well as electrical and electronic goods industries. The leading wind energy companies are investing in various parts of Turkey, seeing the opportunity for the future.

THE GLOBAL INDUSTRIES COMPOSITE SERVICES

	World (%)	Europe (%)	Turkey (%)
Transportation and Automotive	28	30	24
Construction and Building	19	20	21
Electrical - Electronic Goods	16	14	5
Pipe-Tank-Infrastructure	15	13.5	36
Consumer Goods	8	3	3
Wind Power	7	12	7
Maritime	3	5	2
Defense and Aviation	0.5	0.5	-
Other	3.5	2	2

THE PRESENT COMPOSITE MARKET SITUATION

There is yet a considerable distance Turkey should cover in respect of the production of machine-driven and high-tech products. Glass-reinforced plastic (GRP) pipe production leveraging the demand in Turkey and in the surrounding countries, will continue being the driving force of the Turkish composite industry. Pultrusion, sheet molding compound (SMC), bulk molding compound (BMC) and thermoplastic injection processes are expected to increase their market shares in the forthcoming period. Resin transfer molding (RTM) / Infusion will continue its growth especially in wind power, maritime, automotive and transportation as well as recreational composite industries.

THE GROWTH POTENTIAL

Also, for other composite applications that pose high growth potential include carbon fiber applications, pipe applications, automotive and transportation, greenhouse applications, solar panels, construction reinforcement, Polypropylene Random Co-polymer (PPRC) transfer pipes (combi boiler), engineering plastics and maritime applications. According to this potential, new capacities in Glass Fiber, Carbon Fiber, Epoxy resins are being installed.

PRODUCTION METHOD COMPARISON

	World (%)	Turkey (%)
Hand Lay-up and Open Molding	23	18
SMC/BMC	12	6
GMT/LFT	3	-
Thermoplastic Injection	23	19
RTM/RIM	10	8
<u>Pultrusion</u>	3	2
Continuous Sheet Manufacturing	3	7
Filament Winding and Centrifugal Casting	9	40
<u>Prepreg</u>	9	-
Others	5	-

The composite materials enjoy a more advantages position relatively to the conventional materials of steel, aluminum and metal alloys for their high level of strength, light weight, design flexibility, capability to maintain their form and functionality, electrical insulation, long service lives for their corrosion-resistance, the ability they offer to mold numerous parts, which are monitored in conventional materials, in a single piece instead of design in multiple pieces and subsequent assemblage as well as the ability to apply the desired color to the product during molding and to use the same for a long period of time without the need for maintenance, and due to the fact that the equipment chosen for production are cheaper irrespectively of the selected molding method, for over 50 thousand successful applications that have so far emerged.

The growth of the composite industry and the increase in the export of the same will enable Turkey, which produces a considerable portion of the relevant raw materials, to gain a more advantageous position in competition.

The state-sanctioned market creation efforts such as the most recent wind power plant tender will accelerate the growth path of the industry, and will offer significant advantages to the companies that operate in the industry.

The composite industry fall into the scope of the chemistry industry on account of polyester, vinyl esters, epoxy and similar other resins, being the main raw material of thermoset products; into the scope of the plastics industry on account of polyamide (PA), polypropylene (PP), polycarbonate (PC) and other similar thermoplastics, being the main raw material of thermoplastic products; into the scope of the textile industry on account of the technical textiles that are manufactured by way of the weaving and knitting of glass fiber, carbon fiber and aramid fiber; into the scope of the glass industry due to the glass fiber production and certain other industries on account of the finished composite products that are employed in automotive, defense, aviation, construction, sports, entertainment, consumer goods and other similar industries.

THE PERCEPTION of COMPOSITES

Composite industry is a crucial industry for Turkey since it produces high added-value products and composite is the material of the future. It would be useful for the governments, local authorities, investors and industrialists to demand and prefer lighter composite material alternatives with longer service lives and higher strength, which offer more contemporary solutions, both in the benefit of such governments, local authorities, investors and industrialists and in the benefit of the national economy. Currently; the decrease in the amount of energy and fossil fuel consumption in both the aviation and aerospace industry and the automotive industry is entirely and directly connected to the penetration of composite materials to those industries.

It is estimated that this process will develop, serving the benefit of the composite industry, being an industry that offers inputs to and generates solutions for almost all industries.

In that regards; it is considered that, as the composite material is used more effectively and prevalently in Turkey, the composite production in Turkey will be able to grow in high added-value industries; that, as the production of advanced composites becomes prevalent in Turkey, Turkey's export potential toward not only Europe but also entire world will increase, whereby the industry will contribute to the coverage of Turkey's trade deficit.

RAW MATERIAL PRODUCERS

- ◉ E- Glass Fiber (Cam Elyaf A.S)
- ◉ Carbon Fiber (Dow Aksa)
- ◉ Polyester Resin /Gelcoat (12 producer)
- ◉ MEK-P (4 producer)
- ◉ Epoxy (3 Modifier)
- ◉ Technical Textiles (Carbon, Glass , Aramid, Basalt) Total of 6 producer.
- ◉ Prepreg (Carbon, Glass) 3+ producer.

MAJOR CONVERTERS

- GRP Pipe 7 factory.
- Wind Mill Blades 3 factory.
- Entertainment Sector (Water Slides)
World leader.
- Automotive Parts from SMC 3 factories .
- Boat Builders (Infusion) 8 major ones.
- Pannels for the Truck Body. 2 factories.
- Pultrusion parts for construction. 3 factories.



TURKISH COMPOSITES
MANUFACTURERS ASSOCIATION

Thank you...

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