

# An overview of the FRP market in Iran

This article provides a brief review of the current status of the composite industry in Iran. One of the main problems is the lack of reliable information and statistics on various aspects. This does not facilitate things, particularly in the decision-making stages.



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Iran's composite industry has shown significant growth over the past years. In 2006, there were more than 14,300 tonnes in glass fibre imports worth \$18 million, compared to 4,600 tonnes (\$6.5 million) in 2002 (Figure 1).

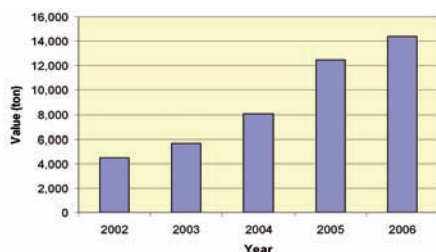


Fig. 1: Glass fibre imports (2002-2006)

This trend also holds for total consumption of fibre-reinforced composites, which shot up from 10,000 tonnes in 2002 to 35,700 tonnes in 2006 (Figure 2). Used mainly in the electrical

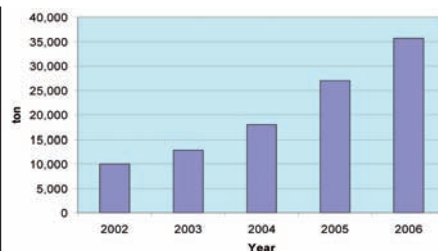


Fig. 2: Total consumption of various composite parts (2002-2006)

and telecommunications industries, bulk moulding compounds (BMC), GRP pipes and pultruded profiles account for a major share of imported finished and semi-finished parts. The figures for these indicate a 39% average annual growth rate for tonnage of composite parts used over the past five years (Figure 3). Both quantitative and qualitative improvements in terms of industrial capabilities were achieved in various sectors of this industry.

Resins and fibres account for the highest consumption volume among the components used to produce composite materials.

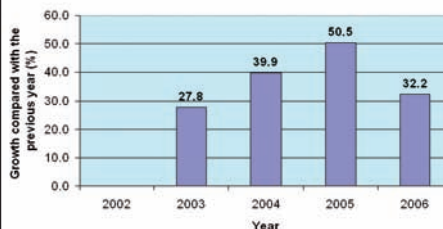


Fig. 3: Growth in the consumption of composite parts (2003-2006).

## Resins

Unsaturated polyester (UP) resins are the most commonly used resins in Iran's

composite industry. However, phenolic and epoxy resins have also found some applications. About ten companies produce resins for the composite industry, the main four producers being Bushehr Chemical Co. (UP resins for various composites processes), Resitan Co. (UP and phenolic resins), Farapaye (UP resins) and Yashm Chemical Industries (UP resins). The main problems encountered by resin producers are the growing production costs related to the inflation rate, the lower price of similar products made by foreign companies as a result of the relative stability of the US dollar, and the low consumption volume of special-grade resins. For instance, the consumption volume of grades for resin transfer moulding (RTM) and pultrusion processes is very low in Iran, so producing them is not economically justified. On the other hand, foreign companies investing in regional countries are exporting better-quality, lower-price products to Iran.

## Fibres

Iran's glass-fibre production plan was halted many years ago. The slow administrative system, the low consumption volume of glass fibres, the existence of glass-fibre production in neighbouring countries (Turkey), and the high-volume production of these fibres at lower price in China are among the major factors that have prevented this plan from moving forward. Considering this, it seems that investing in this area is not economically justified in Iran.

The story for carbon fibre is somehow different. The fact that carbon fibres are a strategic product and that most foreign companies incur sanctions for selling them directly to Iran is one thing that motivates their domestic production. Iran's carbon-fibre production plant is the result of technology transfer from Russia. The plant became operational last year with a nominal capacity of 15 metric tons per year, and produces fibres for the manufacture of pultruded profiles and compression moulded parts. Although Iran also has natural fibres, these have no significant application in the country's composite industry.

## Equipment

Over the past years, several companies have developed or started up activities in Iran's composite sector. The growth of industries such as oil, gas, petrochemical, automotive, electronics, etc., has contributed significantly to the development of companies making composite parts. Most composite manufacturing processes are now available in Iran for making various engineering parts. Although some domestic companies have succeeded in exporting their products, the companies active in this field are facing major challenges that include insufficient orders, low cash reserves and a lack of R&D units.

Iranian companies now have access to and are using the equipment required for almost any composite manufacturing process, including hand lay-up, spray-up, filament winding, compression moulding, RTM, pultrusion, vacuum bag moulding, prepreg manufacturing, continuous laminating, and thermoplastic composite production.

## More information ...

### The Iranian composite market at a glance

- The 37% annual growth of Iran's composite industry offers good investment opportunities, particularly for small companies.
- Given the country's self-sufficiency policy and the existence of private companies producing raw materials and engineering parts, joint ventures with these companies could facilitate market penetration.
- For raw-material producers, establishing an active and expert agent in Iran can be regarded as a winning card in the composite market.
- Considering the rapid growth of Iran's composite industry, training and educational activities constitute a wide-open field, especially for well-known organisations that obtain the appropriate teaching certificates.
- Investors can benefit from Iran's large pool of Iranian experts, specialists and experienced staff in the composite industry.
- One of the main limitations for participation in Iran's composite market is the political challenges. If this were solved, Iran could become the industry's leading country in the region.

## Training and human resources

In Iran, candidates for courses in composite materials are trained for BSc, MSc and PhD degrees at various universities with faculties in polymer engineering (materials, processing and mechanics) and mechanical engineering (processing and mechanics). Some of these institutions also offer short training courses on composite materials. The Polymer Engineering faculty of the Amir Kabir University (Tehran Polytechnique) is the oldest educational institute active in this field. Other important education and research centres are the Composites department of the Iran Polymer and Petrochemical Institute (IPPI), the Iran Composites Institute of the Iran University of Science and Technology (IUST), the Tarbiat Modarres University, the Isfahan University of Technology and the Abadan Institute of Petroleum. In addition, Iran Composites Association, founded in 2004, has started

some activities for organizing training courses with the collaboration of domestic companies.

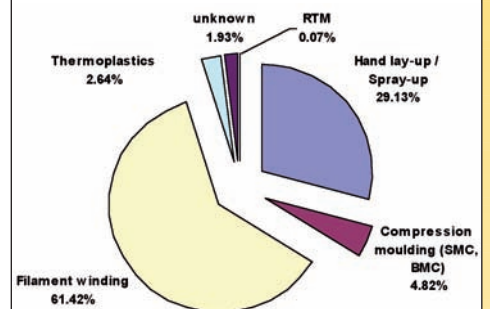


Fig. 4: Composite processing methods by market share in 2005 (no statistics available for pultrusion).

## Composite processing methods by market share

The volume of fibres consumed by each process cannot be determined separately. However, this can be estimated based on the fibre types imported and the companies involved. In recent years, the market share of the different processes

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changed considerably, mainly due to the growth of industries using composite parts. While hand lay-up accounted for the biggest market share in 2002, this shifted to more automated processes, particularly filament winding, in 2005 (Figure 4). This trend is due to the construction of new FRP pipe factories and to the creation of new market segments in the oil, petrochemical, and water industries (Figure 5). In general, it appears that automated processes have a higher growth rate than non-automated ones. With the exception of volume production of pipes and joints, most of the composite market is still dominated by hand lay-up and spray-up processes. The rapid growth of the thermoplastic composites market is driven by the car industry. Modern cars (either imported or produced domestically) have been gaining access to Iran's market in recent

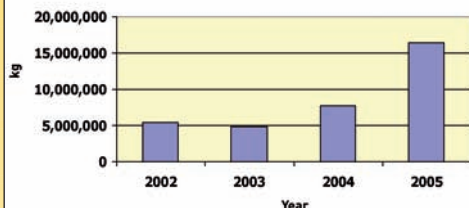


Fig. 5: Production volumes of filament-wound composite parts (2002-2005).

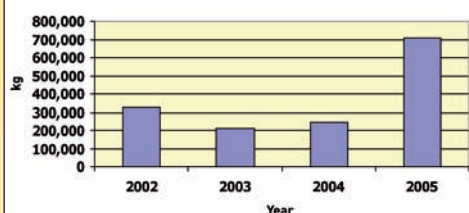


Fig. 6: Production volumes of fibre-reinforced thermoplastics (2002-2005).

years (Figure 6).

Production and quality-control standards also improved greatly, resulting in an increased demand for the production of reinforced-thermoplastic engineering parts. The production of particulate thermoplastic composites is also noticeable.

### Glass-fibre import sources

European and South-East Asian countries are the main sources that supply glass fibres to the Iranian composite market. These sources have also changed considerably over the past years, due to changes in the world composite market. Since China entered the glass-fibre export market - increasing both its production capacity and fibre quality - it seems to have taken over the Iranian market. According to the statistics, China's share of the Iranian composite market has risen from 11.5% in 2001 to 61% in 2005, mainly because Chinese fibres are cheap. Nevertheless, these fibres are suited to Iran's composite industry, which is not regarded as high-technology. The share of various countries in glass-fibre exports to Iran is shown in Figures 7 and 8. These statistics show that Iran's composite industry currently benefits from the drop in raw material prices. On the other hand, the composite parts produced are economically competitive with their foreign counterparts because the technical knowledge and the skilled labour required are cheaper in Iran. Therefore, when competing with foreign suppliers, domestic suppliers are at low risk for sudden decreases in the price of composite products. For instance, the

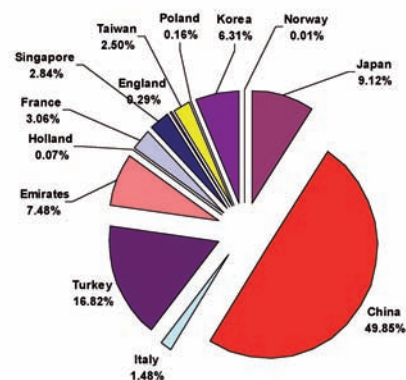


Fig. 8: Share of various countries in glass fibre exports to Iran in 2006 (9 months).

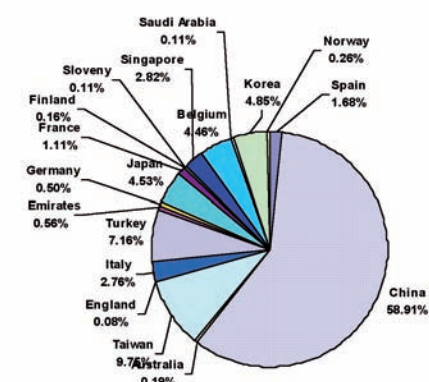


Fig. 7: Share of various countries in glass fibre exports to Iran in 2005.

lowest price of pultruded profiles imported from China in 2004 was \$2.11/kg, compared to \$1.65/kg for producing similar profiles domestically, an advantage of about \$0.5/kg. The price of profiles imported from Korea, Italy and France ranged from \$4.3/kg to \$8.5/kg. ■

More information:  
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