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CBI Product Factsheet:

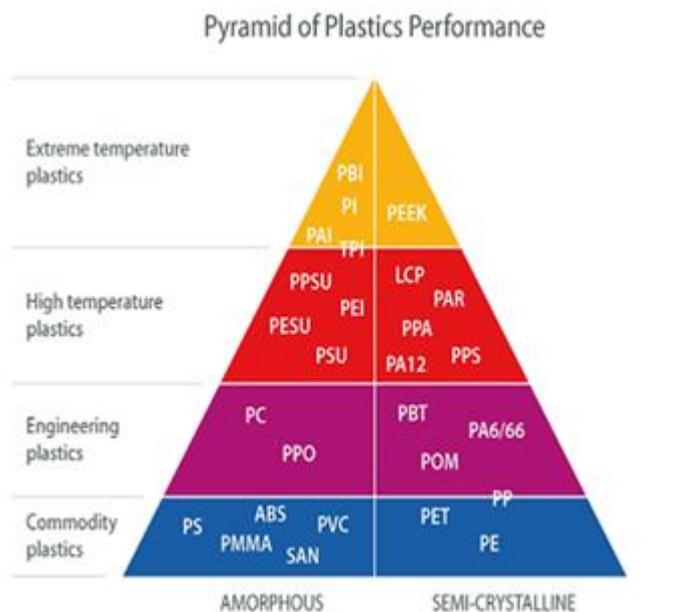
Plastics for vehicles in the European Union

Introduction

One major trend in the automotive industry concerns the reduction of vehicle weight, resulting in an increasing demand for lightweight materials. Advanced materials (e.g. lightweight composites, carbon fibre and different plastics) are increasingly being used to replace or supplement steel, aluminium, with the goal of making vehicles lighter. This trend offers many opportunities to suppliers from developing countries. In this study, we explore these opportunities by looking at the demand for plastics in the automotive industry, as well as trends, buyer requirements, competition and market prices.

Product Description

Plastic is a substance that can be composed of a wide range of materials. Although these materials are usually synthetic, they can also be natural. The primary component in plastics is oil, but other materials are used as well (albeit on a smaller scale). In this study, we use a broad definition of 'plastics', including lightweight composites and carbon fibre. Examples of plastics often used in vehicles include polypropylene (PP), polyurethane (PUR), poly-vinyl-chloride (PVC), polyamide (PA) and many more. Plastics can be generally clustered according to the 'Pyramid of Plastics Performance':



Source: Omnexus, 2016

No separate HS codes are available for plastics used in the automotive industry. Plastics are listed in 'HS codes Chapter 39: Plastics and articles thereof'. This category includes plastics used in the automotive industry, although plastics are used in many other industries as well.

Within the automotive industry, the use of plastics and plastics in combination with metals (hybrid parts) is still increasing. Plastics are used for the powertrain, body/chassis, in the interior (seats, dashboards, bumpers, mirror housings), as well as for the exterior (trunk lids, wheel covers) of a car. The most prominent reasons for increasing the use of plastics involve reducing the weight and material costs of vehicles, although plastics can also be used to increase the quality or design of certain parts.

The quality of the plastic is highly dependent upon its properties, function and the parts in which it is used. Plastics can be used to improve surface (Class A), durability, design flexibility, corrosion resistance, toughness and/or resiliency. Different types of plastics have different functionalities.

Geographic scope

Although the European Union (EU) is treated as a single entity in this report, we also provide deeper insight into six focus countries: Germany, France, Spain, Italy and the United Kingdom. These countries were selected because they are the largest EU economies.

Packaging

In general, packaging is determined by the buyer (i.e. the OEM or the retailer or wholesaler in the after-market). In order to reduce costs and improve the efficiency of packaging operations, OEM suppliers use returnable packaging in most cases. Returnable packaging is not discarded after use, and the empty packaging is recycled by the OEM or by a designated packaging operator. In the after-market sector, the packaging is typically disposable, as it is discarded after being used only once.

In order to export to the EU, product packaging must comply with EU standards and legislation. This means that the packaging is restricted to maximum levels of heavy metals ([Directive 94/62/EC](#)). When shipped, plastic automotive parts are usually packaged in small containers. Larger parts are usually placed in metal racks, whereas smaller parts (e.g. buttons) are packed in boxes with cut foam.

What is the demand for plastics in the European Union?

Macroeconomic statistics

The GDP growth factor is an important economic indicator and therefore a predictor of the production of and demand for plastics in the automotive industry. With a national GDP value of €2.9 trillion, Germany has the largest economy in the EU. Germany is followed by the United Kingdom (€2.2 trillion) and France (€2.1 trillion). Germany is also the most industrious economy. Its manufacturing base (i.e. the part of the GDP added by the manufacturing of goods) amounts to 21%. This is high compared to the other focus countries, which have manufacturing bases between 11% and 15%.

Tip:

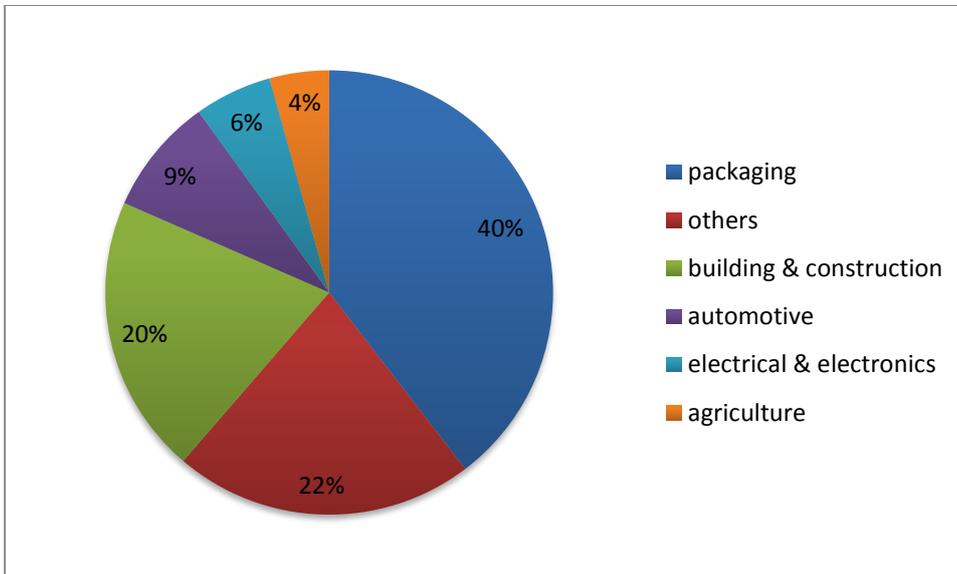
- If you are considering exporting to the European market, this would be a good time to start, as the European economic forecast is quite positive.

Plastics usage in the automotive industry

No specific information on import and export values for plastics usage in the automotive industry, as no HS codes are available for plastics used exclusively in the automotive industry. Import and export values are available for plastics in general.

Europe imports plastics valued at about € 13.5 billion. Of the total demand for plastics, 39.6% is used in the packaging sector. With a share of 8.5% of total demand, the automotive industry is the third-largest plastics sector in Europe. Roughly the size of half the Asian market, Europe is in second place with regard to demand for automotive plastics, far outpacing North America and the rest of the world.

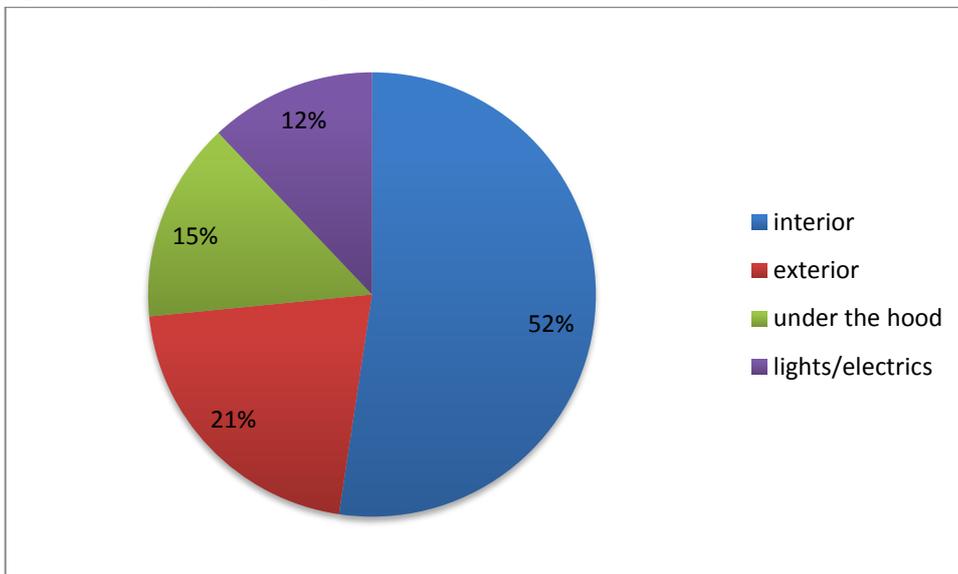
Figure 1: Relative demand for plastics in the EU, by sector



Source: *PlasticsEurope.org*, 2016

On average, 16% of the total weight of a vehicle (about 115 kilograms) consists of plastics. In 2020, plastics are expected to comprise about 18% of the total vehicle weight, due to the increased use of plastics in vehicle production. In 2012, more than half of all plastics in the automotive industry in Europe was used for the interior of vehicles (52.5%). The rest was used for the exterior (21%), parts under the hood (14.5%) and for lighting and electrics (12%).

Figure 2: European plastics, by vehicle part



Source: *PlasticsEurope.org*, 2013

Parts in which the most plastics are used include the interior trim (roughly 21 kg), seating (roughly 14 kg), bumpers (roughly 9 kg), upholstery, electrical components and dashboards (all about 8 kg).

Some Tier 1 suppliers require high amounts of plastics, although demand varies considerably. For example, manufacturers of trim packages require mostly polypropylene (PP), acrylonitrile-butadiene-styrene (ABS), polyethylene terephthalate (PET) and polyoxymethylene (POM). Seat manufacturers typically buy polyurethane, polypropylene, acrylonitrile-butadiene-styrene and/or polyamide. Product composition can also vary according to application and function. In the automotive industry, most plastics imported by European companies consist of parts, instead of raw materials.

Tip:

- Read the CBI study on [Trade Statistics in the automotive industry](#).

Which trends offer opportunities for plastics in the European Union?

It is currently more difficult to introduce new materials into the automotive industry than was previously the case. Suppliers are looking for cost-efficient methods, while new materials frequently call for new machines and other investments in the production process. Plastics are raising challenges as well. In addition to competing as an often less-expensive alternative to steel and aluminium, and as a constantly developing material, plastics are affected by volatile oil prices and variable production volumes. Because of these factors, the market is characterised by considerable uncertainty.

Despite these global obstacles, the many advantages of plastics have earned them a place in the automotive market. The sustainability and performance characteristics of fibre-reinforced plastics are particularly attractive to European car manufacturers. Although it may seem contradictory, plastics also have an environmentally friendly aspect: thermoplastics.

Environmental trends

One of the most prominent trends in the automotive industry involves making vehicles lighter, thereby reducing their emissions. Heavy-weight steel parts are being replaced by lightweight composites, carbon fibre, glass fibre and other plastics. Although the source is not renewable, the production process itself is more efficient in terms of energy, as compared to steel.

Recycling is another issue in the automotive industry. Despite the industry's excellent record in the area of recycling, re-use and recycling are presenting challenges in the use of all thermoset plastics. In particular, [European regulations](#) require a high rate of re-use and recycling for each vehicle. Importers are therefore likely to exercise considerable caution when importing thermoset plastics.

Trends involving quality

Simply recycling plastics reduces the purity and performance of the material. In recent years, however, fibre-reinforced plastics have been introduced, combining the material characteristics and cost-competitiveness of steel with the recyclability and lightweight characteristics of plastics. For example, natural-fibre composites are currently being used for interior door trims. Wood-plastic composites are used for the rear shelf, as well as for the trunk and spare wheel trims. Roof liners and dashboards are often made of fibreglass-reinforced composites. Pure plastic is used for interior door trim, pillars and trunks.

In addition to their sustainability features, fibre-reinforced plastics offer advantages with regard to performance. Developments in the crash performance and resistance of plastics have made safety an area in which considerable progress could be achieved. In addition, the flexibility of the material is quite welcome in terms of aesthetics, while its stiffness makes plastics suitable for optimising long-term passenger comfort.

Future market developments for natural-fibre reinforced composites remain difficult to predict, as estimates vary widely. Nevertheless, natural-fibre composites have clearly become an integral part of the industry, and they continue to develop in terms of strength, crash performance and stiffness, while remaining light in weight.

Tips:

- Due to the [binding emission targets](#), European OEMs are searching for innovative ways to decrease emissions. Now would be a good time to approach European OEMs or Tier 1 suppliers.
- Read the [CBI study on trends in the automotive industry](#).

With which requirements should plastics comply in order to be allowed on the European market?

Requirements can be divided into the following categories: (1) 'musts', which must be met in order to enter the market, and (2) 'additional requirements', which consist of the relatively common requirements that most competitors have already implemented (in other words, requirements should be met in order to stay abreast of the market).

Musts

[Whole Vehicle Type Approval](#) (WVTA) is a certification for various types of motor vehicles and their components, including agricultural and forestry tractors. The WVTA is valid in all EU Member States and is required when selling any products within the EU. Many automotive components are not approved until the final assembly, in which case certification of individual components is not necessary. These components must nevertheless comply with type-approval requirements.

The [1958 Agreement](#) of the United Nations Economic Commission for Europe (UNECE) specifies uniform provisions concerning the approval of various parts and functions of vehicles. For plastics, this includes sections for the strength and absorption of seat belts and seats, as well as specifications for tyres, bumpers and many other parts.

The End of Life Vehicles (ELV) Directive aims to avoid environmental pollution during the scrapping process by reducing the use of hazardous materials used in vehicle production. Vehicles must be designed to facilitate proper dismantling and recycling (by coding the components). In particular, Article 7.2b states that, effective 1 January 2015, reuse and recovery must be increased to a yearly minimum of 95% of the average weight per vehicle for all end-of-life vehicles. Re-use and recycling will be increased to a minimum of 85% of the average weight per vehicle and year.

When exporting chemicals, consult the [REACH regulations](#). In the EU, buyers are held responsible for [CE marking](#), which entails additional requirements in the areas of safety, health and environmental protection.

Tip:

- For additional information on the legal requirements applying to your products, we refer to the EU Export Helpdesk.

Additional requirements

Buyers commonly impose their own requirements in addition to those required by law. While these are not obligatory in the legal sense, they are essential to effective competition, as they have been implemented by various competitors in the market. Additional requirements can be imposed by the public sector (e.g. standardisation bodies) or driven by the industry (e.g. buyer requirements and private standards). The use of private standards is increasing in Europe. These standards are industry-led niche or mainstream initiatives intended to enhance quality, traceability and unity in design and dimensional specifications.

In general, two types of standards can be distinguished: those focusing on product quality and those relating to social and environmental issues.

Additional quality requirements

Quality Management: In order to apply for type approval, production processes must meet quality-management criteria. The [ISO TS/16949](#) system focuses on the design, development and production of automotive-related products, while the [ISO 9001](#) quality system is more general in nature. Both are accepted as standard requirements, and EU buyers and manufacturers often insist on them. For the actual plastics, [ISO 25337](#) certification is required. The [ISO 25337](#) scheme prescribes a statistical measurement method for testing the quality of plastics.

Tips:

- Implement [ISO 9001](#) and [ISO TS/16949](#), as they are standard requirements of EU buyers. Producers of plastics should implement [ISO 25337](#).
- Implement an environmental management system (e.g. [ISO 14001](#)), as European buyers are increasingly requiring it.
- Consult with your buyer or with [the approval authority of the country to which you seek to export](#) to learn the specific technical standards that will apply to the parts you are manufacturing.

Additional social and environmental issues

The EU has set [binding emission targets for new cars and vans](#). These targets specify that every new car or van that is sold is permitted a certain amount of CO₂ emissions. The maximum amount of CO₂ emissions for passenger cars was 130 gram of CO₂/km in 2015, and it will be reduced every year until the target level of 95 gram of CO₂/km is reached in 2021. This will increase the demand for lightweight materials and cost-efficient parts from suppliers.

Corporate social responsibility (CSR) and the extent to which buyers expect a certain level of social and environmental performance is becoming increasingly important. The larger EU companies have developed their own CSR policies and require their suppliers (and their sub-suppliers) to conform to them. Signing a supplier code of conduct is often a prerequisite. These codes of conduct generally entail compliance with local laws, protection of worker health and safety, respect for basic labour rights and business ethics. The implementation of an environmental management system is often a requirement for core suppliers.

Tips:

- The CSR policies, supplier codes of conduct and quality demands of OEMs are published on their websites and supplier portals. An internet search for these codes of conduct is likely to yield valuable insight with which to assess your company's performance by comparison.
- Be aware that the requirements stated by your buyer are likely to become even stricter in the future, in order to comply with the binding emission targets for cars and vans.
- A general overview of the [EU buyer requirements for automotive parts and components](#) can be found on the CBI Market Intelligence Platform.
- For additional information on non-legal requirements that are generally accepted in Europe, we refer to the [International Trade Centre's Standards Map](#).
- Determine whether your buyer uses the [International Material Data System \(IMDS\)](#). This is a collective, computer-based data system developed by automotive OEMs to manage environmentally relevant aspects of the different parts used in vehicles. It has been adopted as the global standard for reporting on material content in the automotive industry.

What competition do I face in the European Union?

The European automotive market for plastics is growing. Although this offers opportunities, you should expect a large amount of competition.

Competition in price

One advantage of plastics has to do with its highly objective quality, which can be measured by the exact composition of the plastics. Obtaining [ISO 25337](#) certification could be quite helpful for convincing your buyers about your quality. For suppliers of plastics, this means that the market is very transparent. The focus is on costs, with other factors like image, reputation and capital regarded as less relevant. Competitive advantage is achieved by supplying specific levels of quality at lower cost.

Competition from alternative materials

For plastic suppliers, competition is not limited to competition with other plastic suppliers. They also face competition from the automotive supplier sector as a whole. If other materials provide the same qualities in terms of weight, performance and/or sustainability at lower production costs, buyers will automatically choose these materials over plastics. For example, innovations with lightweight steel, which combine strength with flexibility and weight reduction, continue to pose a threat to plastics and plastic composites for certain areas of cars.

The vehicle industry is highly automated, with a high degree of 'lock-in': moving from one material to another often requires major investments on the assembly line. Successful competition thus depends on intervening early in the production process, lowering production costs to provide a lucrative substitute. The advantage of this lock-in is that it makes it more difficult for manufacturers to change to other substitutes later.

What do the trade channels and interesting market segments for plastics look like in Europe?

The trade channels and segments for plastics differ greatly by type of plastic and part. To describe the market channels for all different plastic types and parts would exceed the scope of this study. In general, plastics follow many tiers before they are sold to OEMs. In many cases, the lower tiers are similar to general OEM tiers. A general overview of the European market channels and segments for automotive parts and components is available on the CBI Market Intelligence Platform.

Tip:

- Read the [CBI study on channels and segments](#) in the automotive industry.

What are the end-market prices for plastics?

Prices for plastics vary widely by type of plastic, moulding, position on the supply chain, amount of plastics supplied, the price of oil and the type of contract. While some plastic parts are of very low cost, other parts are more expensive than their aluminium substitutes.

OEM supply chain	Margin
Tier 1 supplier delivering to OEM	7%–9%
Tier 2 supplier delivering to Tier 1	7%–17%
Tier 3 supplier delivering to Tier 2	11%–27%
After-market Original Equipment Supplier (OES)	Margin
Tier 1 delivering to OEM for OES sales through approved service chain	11%–32%
Tier 1 delivering to OEM for OES sales through independent outlets	11%–

	27%
OEM delivering OES parts through its approved service chain	26%– 67%
OEM delivering OES parts through independent outlets	31%– 42%

Margins in the automotive industry (general)

Differences in the price of branded spare parts are not very large amongst the various countries. Players in several European countries have largely harmonised their prices; any differences in pricing are likely to be related to different logistics and local costs. In the original-equipment segment, the price is set by contracts of four or more years, which usually include price reductions of 3% to 5% each year after the first year. In the after-market, the prices are negotiated every year.

Tips:

- If you are a Tier 2 or Tier 3 supplier, use contracts with variable material costs.
- Include the currency risk in the contract.
- In order to gain a better overview of prices for specific products and models, you should speak directly to wholesalers and national experts within Europe.



CBI Market Intelligence

P.O. Box 93144
2509 AC The Hague
The Netherlands

www.cbi.eu/market-information

marketintel@cbi.eu

This survey was compiled for CBI by Marktonderzoekbureau Molgo
in collaboration with CBI sector expert Peter Nagel

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