CBI
Ministry of Foreign Affairs

CBI Product Factsheet:

Springs in Europe

Introduction

The European market for springs from developing countries is growing, as reflected by the developing countries' 10% share of total European imports, worth €2.1 billion. The most important end user industries driving imports include the shipbuilding industry and the automotive industry. As Europe's leading importers of springs from developing countries, Germany and the United Kingdom are particularly interesting target markets. Developing country producers possessing the right metal-processing know-how and offering an answer to highly demanding customer requirements will have a better chance of convincing prospects. The relevant trends in the springs market include the demand for light-weight springs and the search for cost reduction, as well as the use of alternative materials.

Product description

A spring is an elastic object that recovers its original shape when released after being pressed or pulled. It is used to store mechanical energy by exerting constant tension or absorbing movement. Springs are used in virtually every industry, ranging from the automotive industry and construction to furniture.

When 'springs' are referred to in this survey, this concerns the selection of products in Table 1 of the Annex (all belonging to chapter CN 7320), unless stated otherwise.

- **Coil or helical spring:** a cylindrical or conical spring, made of a coil or helix of wire. There are several types:
    - *Compression springs* are designed to become shorter when force is applied. When they are in unloaded position, their coils do not touch. They do not need attachment points.
    - *Tension or extension springs* are designed to become longer when force is applied and have a means of attachment at each end. When they are in unloaded position, their coils touch.
    - *Torsion springs* are designed to twist into a tighter spiral when force is applied.
    - *Flat spiral springs* are designed with one end of the spring at the centre of the spiral and the other at its outer edge.
- **Disc or Belleville spring:** a disc-shaped spring, used, for example, to apply tension to a bolt.
- **Leaf spring:** a flat spring, used in, for example, vehicle suspensions.

Geographic scope

The geographic scope of this survey is the European Union. However, in certain parts of this survey, the focus is on a selected group of countries: Germany, France, Czech Republic, the United Kingdom and Poland. These countries are the largest importers of springs in Europe, accounting for 55% of total imports. When 'focus countries' are referred to in this survey, this concerns the selection of these five countries, unless stated otherwise.

Product specifications

Specifications of springs, as required by European buyers, are described below. Pictures 1-6 show some examples of springs.

- Material and quality: Springs are generally made from spring steel. Spring steel is ferrous material, generally low-alloy, medium-carbon or high-carbon steel with very high yield strength. The steel can be heat-treated for high hardness and toughness. While small coil springs can be wound from pre-hardened steel, larger springs are generally made of more flexible, annealed steel and hardened after fabrication. As a finishing, springs can be coated, shot peened, ground and/or set. Specific applications may require specific material, e.g. non-ferrous metals like titanium are used for parts requiring corrosion resistance and beryllium copper for springs carrying electrical current.
- Labelling and packaging: The labelling and packaging of springs should enable efficient processing and handling on the customer's premises and protect against damage and contamination. There are several types of packaging that help customers to realise these targets:
    - disposable packaging;
    - plastic pouch - with a fixed number of springs for easy extraction;
    - springs on an adhesive strip - for easy extraction;
    - threaded on wire or rods ('magazinised') - for easy extraction or automatic feed returnable packaging;
    - plastic hose - suitable for automatic feed;
    - honeycomb packaging - for easy extraction, protection from damage and contamination;
    - compartmentalised plastic box with lid, which is suitable for automatic feed and offers protection from damage and contamination

In general, springs can be packed in a carton or a wooden box, depending on the size of the parts. The outer package should include the brand name and type number. The package for ocean transportation is a wooden, steel or plastic pallet, wrapped with plastic sheet and sealed with metal strips. The size of the boxes depends on customer requirements and preferences and is also influenced by the weight per box and handling possibilities.

Note: if you use wood packaging materials to export products to Europe, you must consider health (phytosanitary) requirements set for these materials. In practice this means that the wood must have undergone heat treatment or been fumigated with methyl bromide. Last but not least, packaging is always labelled, not only for the purposes of identification during transport, but also to indicate the quantity, weight, the products themselves and the producer's name.

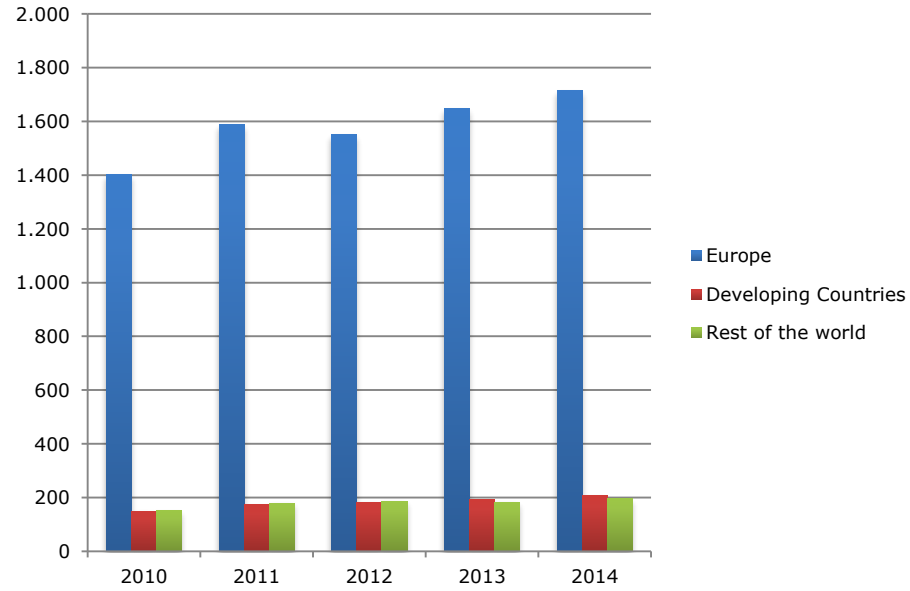
Tip:

- If you work with a professional forwarder, they can advise you on the proper packaging materials.

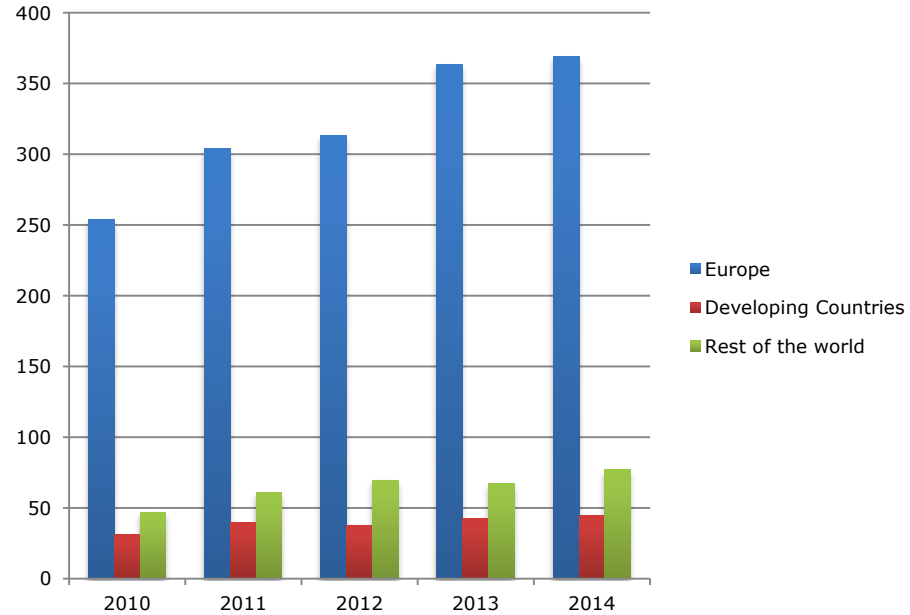
Imports

Figure 1-6: Imports of springs to Europe and focus countries by main origin, € million, 2010-2014

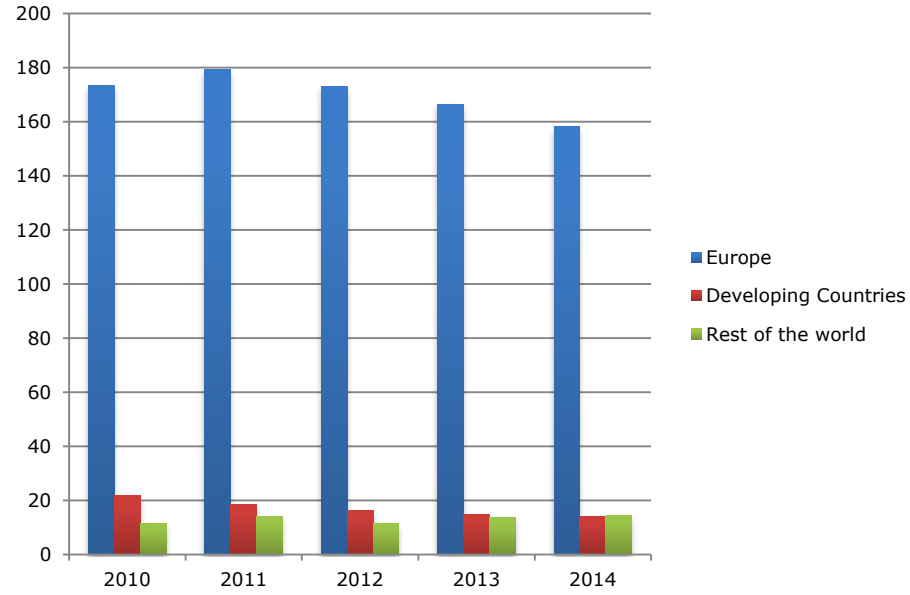
Europe



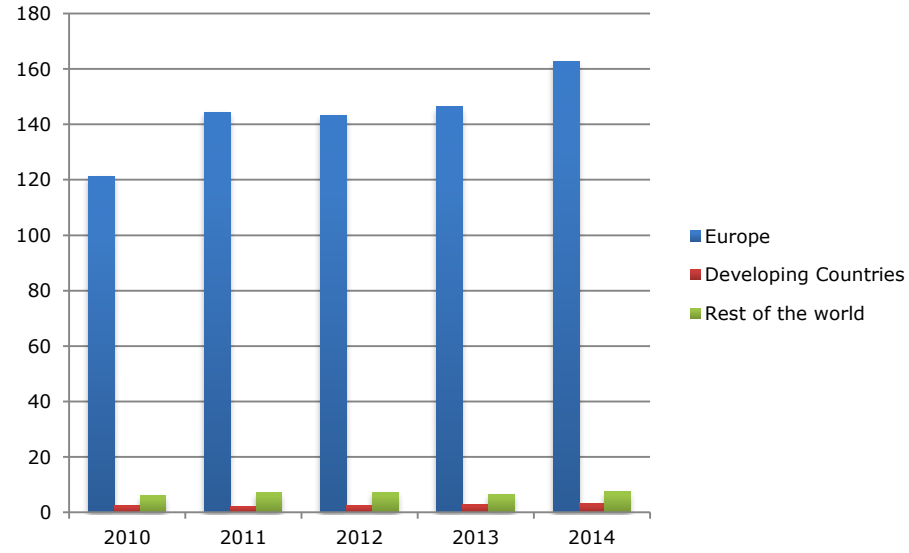
Germany



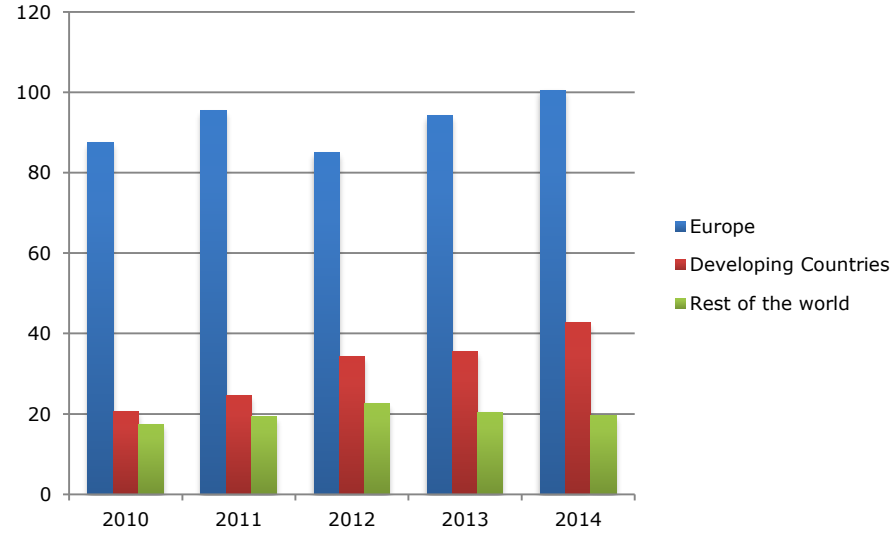
France


200
180
160
140
120
100
80
60
40
20
0
2010
2011
2012
2013
2014
Europe
Developing Countries
Rest of the world

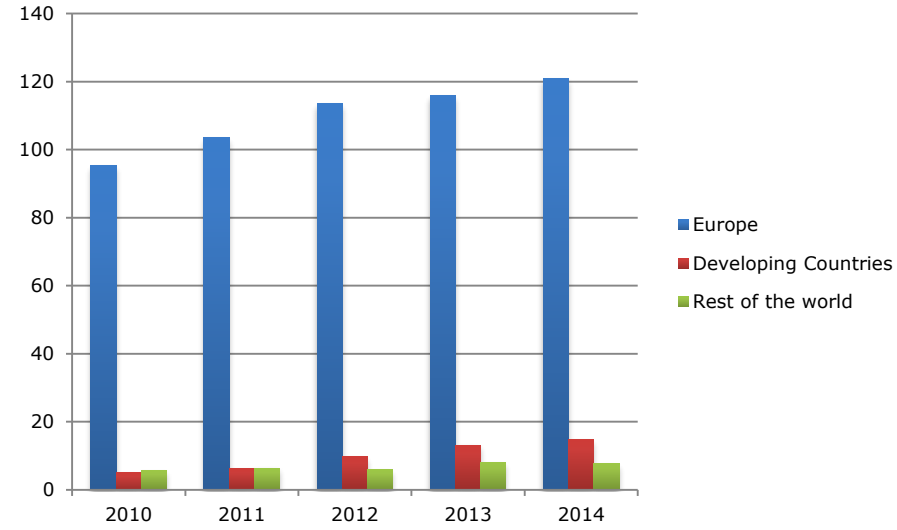
Czech Republic



United Kingdom

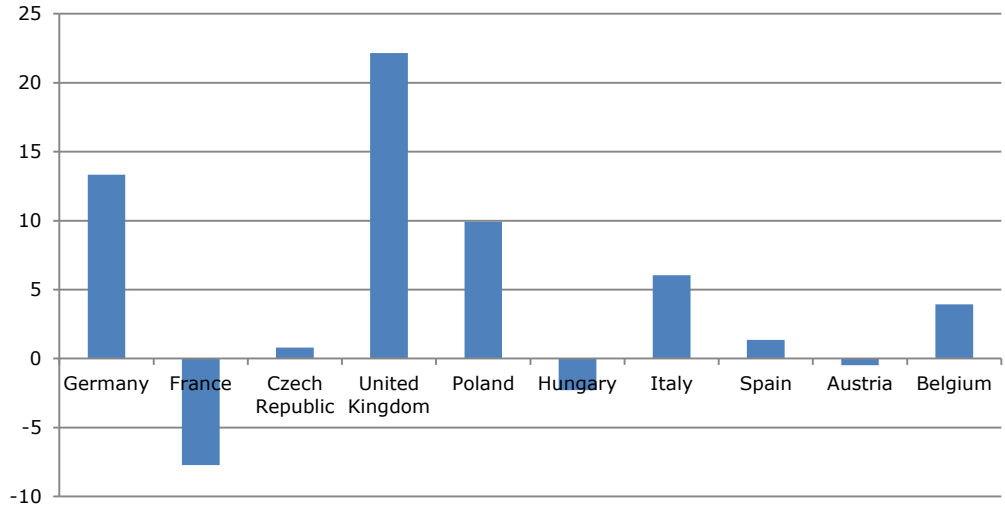


Poland



Source: Trademap

Figure 7: Absolute developing country import growth of springs 2010-2014, € million (countries in range of largest importers)



Source: Trademap

- European imports of springs reached €2.1 billion in 2014. Average annual growth in 2010-2014 was 5.6%, mainly driven by increasing spending activity in the end-user industries.
- Most imports originate from intra-European sources (81% of all imports). The developing country share of European imports peaked in 2014 at 10%. For the coming years, the developing country share is forecast to grow slightly.
- The five focus countries represent 55% of European imports in 2014.
- The leading importer is Germany, followed by France, the Czech Republic, the United Kingdom and Poland. In terms of developing country imports, Germany is in the lead, ahead of the United Kingdom, Italy, Poland and France.
- Imports of springs are expected to continue to show moderate growth in the next few years.

Leading suppliers

- Most leading suppliers of springs to Europe are developed countries. Germany, the Czech Republic, France, Spain and Italy are the top five leading suppliers.
- Turkey is the main supplier from developing countries (30% share), followed by China, Tunisia and India.
- Switzerland, the United States and Japan are the largest suppliers in the 'rest of the world' category.

Tip:

- Benchmark your company against your peers from European countries, Turkey, China, Tunisia and India. Several factors can be taken into account, such as market segments served, perceived price and quality level and countries served.
- A useful source for finding exporters/producers of chains in each country is the ITC Trademap.

Exports

Figure 8: Exports of springs from Europe by main destination, € million, 2010-2014

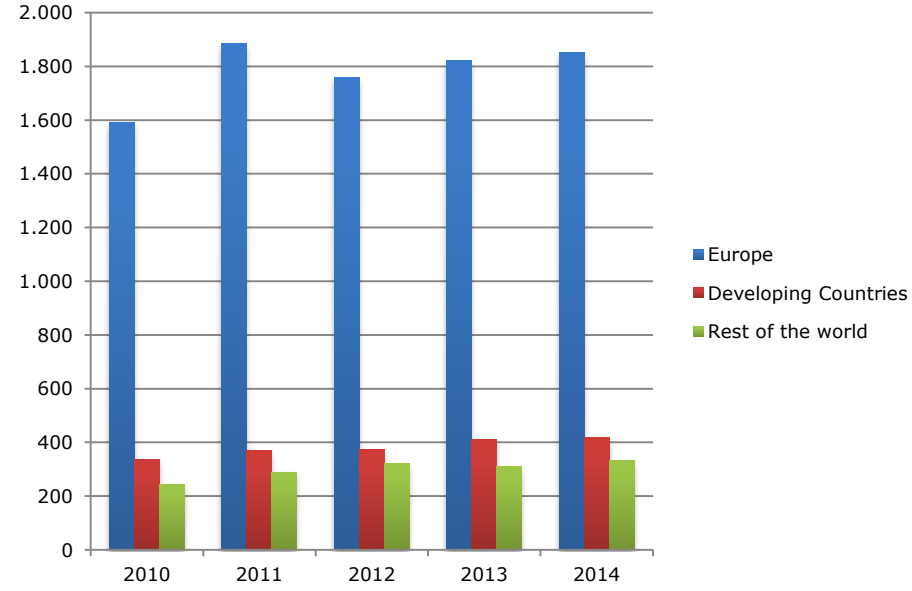
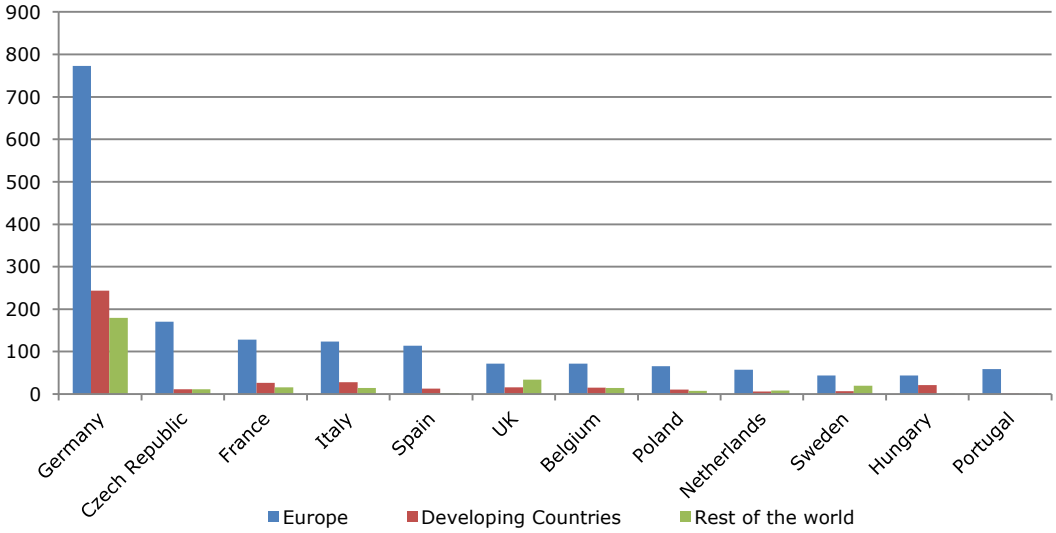


Figure 9: Main exporters of springs, € million, 2014



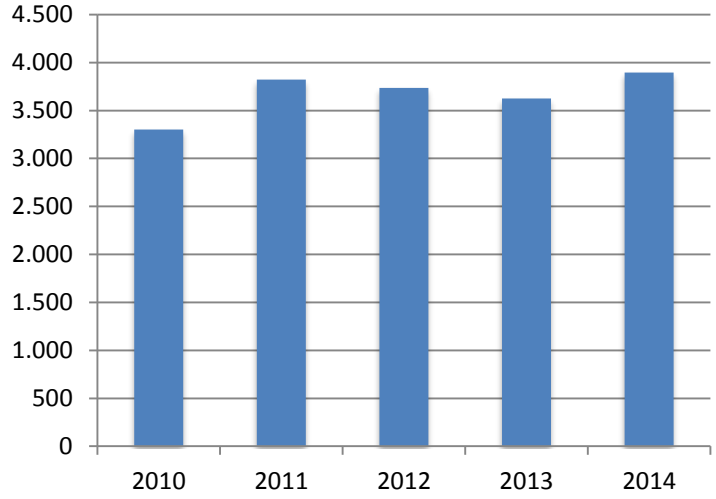
Source: Trademap

- European exports of springs reached €2.6 billion in 2014 and accounted for 50% of world trade. Average annual growth in 2010-2014 was 4.6%.
- As destination markets, the developing country share of European exports peaked at 16% in 2014. Most imports originate from intra-European sources (71% of all imports). Note, however, that this also includes some re-exports of imports originally from developing countries. For the coming years, the developing country share is forecast to be stable.
- The five focus countries represent 68% of European exports in 2014.

- The leading exporter is Germany, accounting for 46% of total exports in Europe. The Czech Republic is in second position (7%), followed by France (7%). The United Kingdom accounts for 5% and Poland 3%.
- German exports to developing countries are massive. They represent 58% of European exports to developing countries and are destined mainly for China, Turkey, Mexico, Brazil, India and South Africa. Italy is in second position, followed by France.
- European exports of springs are expected to show moderate growth in the next few years.

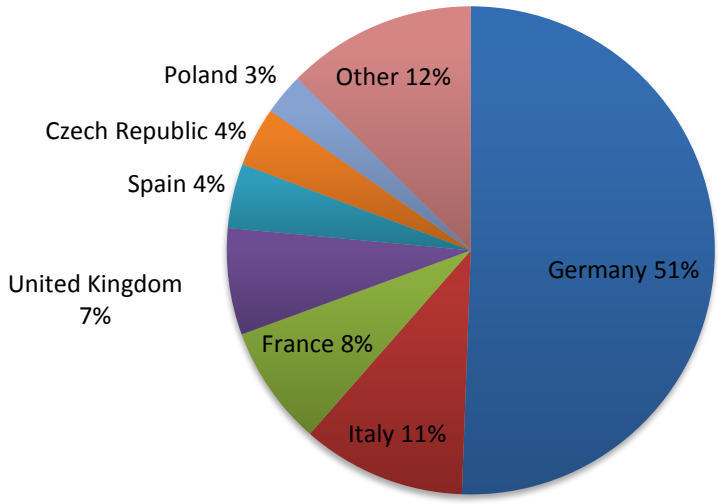
Production and apparent demand

Figure 10: European production of springs, 2010-2014, € million



Source: Eurostat Prodcom

Figure 11: Main European producers of springs, 2013



Source: Eurostat Prodcom

- European production totalled €3.9 billion in 2014, after an average annual increase of 4.2% in the period 2010-2014.
- Germany accounted for 51% of total European production in 2014. Italy is the distant number two. Germany and Italy both have between 170 and 190 companies that make springs. This seems a huge number, but many of these companies are relatively small. In Italy, for example, there are only 15 companies with more than €10 million of sales per year (on average these 15 companies have annual turnover of €25 million). The UK has some 80 spring manufacturers, France 70 (of which 40 are small companies) and the Czech Republic and Poland are home to only

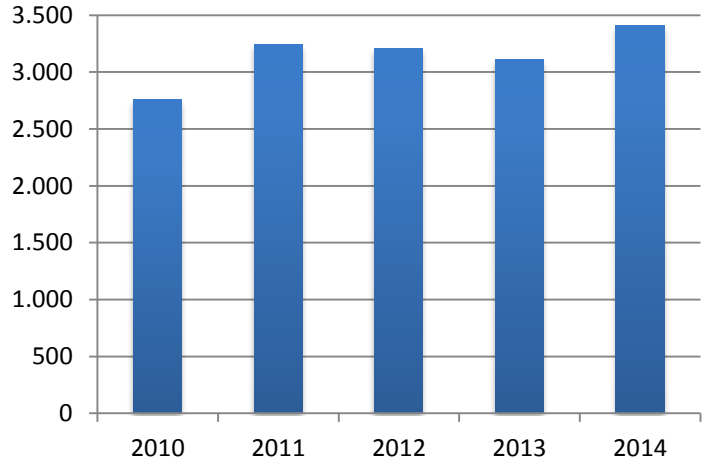
10-20 companies. Western European companies often have production locations in Central and Eastern Europe. In the Czech Republic the seven largest (including several foreign-owned) companies account for 80% of turnover.

- In the focus countries, a total of 18,000 people are employed in the springs industry. 12,000 of these people work in Germany. A common trend in the main spring production countries is a shortage of qualified operators. The European producers consider this as a challenge for the years ahead, as it may threaten their competitive position.
- Each focus country has its own specific market profile. Each of the five focus countries is characterised by its own market profile, which can be described as follows:
    - Germany is the number one producer in virtually every industrial sector in Europe. It is well-known for its output of machinery, cars and electronics. The largest market segment for springs is the automotive industry, followed at some distance by a range of other industries: household equipment, electronic equipment, furniture, machine building, steel construction and general construction (house and office building).
    - France's leading industries produce machinery, automobiles, aircraft and electronics equipment. Of course, the general construction industry is also among the major market segments.
    - Key manufacturing sectors in the United Kingdom include aerospace, automotive, defence equipment, electronics and machinery and equipment. Of course, the general construction industry is also among the major market segments.
    - Poland's dominant manufacturing sectors are car and car parts production, furniture, television sets and other electronic assemblies, shipbuilding and white goods.
    - The Czech Republic has a smaller industrial base than Poland, but it is still significantly larger than in the other Central and Eastern European countries. Number one is car and car parts production, followed by electronic and electric machinery and equipment, furniture, toys, mechanical machinery including pumps and valves, and metal and machinery parts.

Tip:

- Figure 11 reveals that, in addition to Germany and Italy, there is considerable production output in France and the United Kingdom. The presence of producers in these countries offers subcontracting opportunities for developing country exporters.

Figure 12: Apparent demand for springs in Europe, 2010-2014, € million

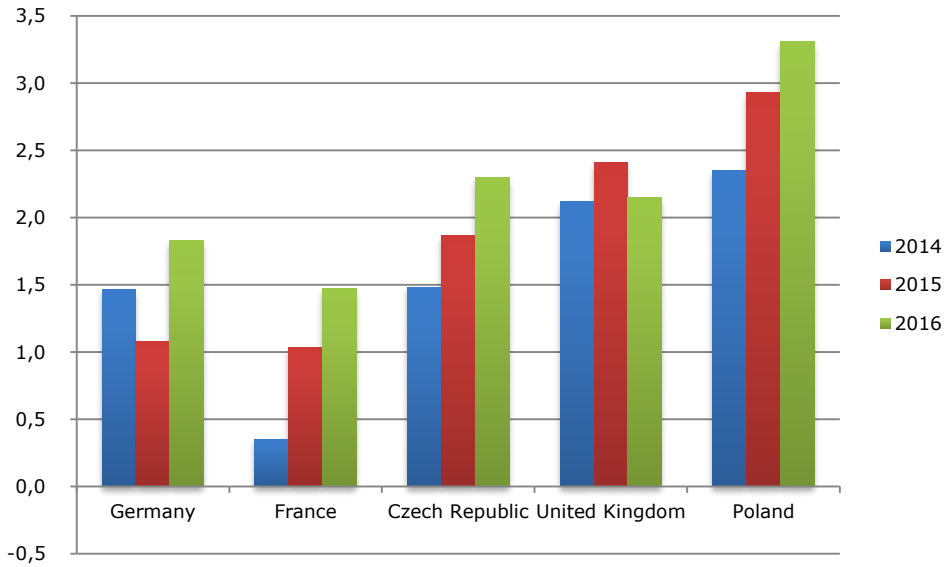


Source: Eurostat Prodcom

- European apparent demand totalled €3.4 billion in 2014, after an average annual increase of 5.4% in the period 2010-2014.
- Germany, Italy, France and the United Kingdom are the dominant springs production countries in Europe, which is rather logical as these countries are also the largest markets for springs in Europe.

Macro-economic indicators

Figure 13: Real GDP, % change from previous year



Source: OECD Economic Outlook 96 database

- The major determinant of springs demand is spending activity in the end-user industries, such as automotive or shipbuilding, but also spending activity among consumers. In turn, this demand is stimulated by economic growth. In each focus country, GDP is expected to show continued growth year on year in the years to come, except for a slight decline in Italy in 2014. Evidently, it is a profound basis for continuous demand and import growth in the coming years.
- The profitability of springs imports is influenced by the EUR:USD exchange rate, as these globally sourced products are paid for in USD. Although the EUR:USD exchange rate was not forecast to go beyond 0.80 until 2020, this actually happened in 2015, with an exchange rate of 0.90 in June 2015. This has a large effect on the price level of imports. Especially if this situation persists for years, it will have a negative impact on the level playing field of European imports paid for in USD versus local European production.

Tip:

- Although GDP growth forecasts are improving, pricing is and will continue to be a leading influential competitive factor. Competitive pricing is elementary for developing country exporters planning to enter the European market.

What trends offer opportunities on the European market for springs?

Although springs can be considered as a traditional market with limited innovation activities, there are a few trends that have had a strong impact on spring demand in the past decade.

- The foremost trend is the increasing demand for light-weight springs. This trend, which originated in the automotive industry and still is mostly present in that industry, has stimulated spring manufacturers to use new lightweight construction technologies, innovative materials and processing methods. More specifically, for example for coil springs, the weight reduction has been obtained by reducing the spring wire diameter and using high-strength steel (cold forming of strain hardened wires, coiling takes place after heat treatments of hardening and tempering). Although it is challenging to form a high-strength material after hardening and tempering, European producers are now managing this processing variant.
- Another trend that is also strongly related to weight gains is the use of a range of materials other than metal, e.g. plastic, glass fibre reinforced polymer, or composite.
- Another important target of spring customers is cost reduction. This has also stimulated the development of lower-weight springs, or springs of cheaper materials. Cost reduction for springs is especially an issue for expensive (heavyweight, expensive materials like copper, titanium) springs.

To meet rising customer requirements, expertise in the field of metal processing is becoming increasingly important for companies to distinguish themselves from the competition. One of Europe's leading manufacturers of springs for the

automotive industry, Sogefi, states it as follows: "Due to our constant progress and total mastery in the fields of high-stress micro-alloyed steels and titanium, anticorrosion and heat treatments, different shot-peening processes specific to high stress coil springs and other advanced development tools, Sogefi's position as the joint European market leader is due to its ability to meet the needs of car manufacturers for all types of vehicles fitted with helical springs."

Tip:
- Developing country producers who can offer an answer to highly demanding customer requirements, will have a better chance of convincing prospects than producers who do not have such state-of-the-art capabilities.

What requirements should springs comply with to be allowed on the European market?

Requirements can be divided into: (1) legal requirements you must meet in order to enter the market and (2) additional requirements, which are those most of your competitors have already implemented, in other words, the ones you need to comply with in order to keep up with the market.

You can find a general overview of the EU buyer requirements for metal parts on the Market Intelligence Platform of CBI. Also refer to the EU Export Helpdesk, the ITC Market Access Map and the ITC Standards Map for more information related to gaining access to the European market.

Musts

For springs in general, there are no specific legal requirements applicable. There are, however, three exceptions: springs intended for use in the construction industry, motor vehicles and aircraft are subject to specific requirements.

The EU Directive 'Liability for defective products' (Directive 85/374/EEC) refers to finished products (in which springs can be used as parts). The Product Liability Directive states that the European importer is liable for the products put on the European market. The European importer, however, can in principle pass on a claim to the producer/exporter.

The general legislation that must be taken into account is:
- Wood packaging materials used for transport (including dunnage) (Directive 2000/29/EC): Europe sets requirements for wood packaging materials, such as packing cases, boxes, crates, drums, pallets, box pallets and dunnage (i.e. wood used to wedge and support non-wood cargo).
- Another packaging-related directive is the general directive on packaging and packaging waste. This directive prescribes the marking of the kind of packaging material used, and the maximum levels of heavy metals in the packaging material.

For springs, a 2.7% duty is levied on European imports from third countries. Several countries benefit from a preferential 0% tariff, for example, Indonesia, Pakistan, Vietnam, the Philippines, Bosnia and Egypt. Note that it is only possible to claim a preferential tariff treatment with a certificate of origin.

Tips:
- Make sure that your wood packaging material qualifies for the European market. If you are not sure, ask your wood packaging material supplier for clarity. Your wood packaging material supplier should take any further action required in order to comply with the directive. If the supplier is not able to do so, you can possibly switch to another supplier.
- Exporters from a country with a preferential 0% tariff have a small competitive advantage over competitors from countries without such a preferential tariff.

The customer's main requirements will be related to the technical aspects of the springs; design, material, dimensions (geometry) and finishing must meet the customer's specifications.
The internationally accepted standard for (compression) spring production is EN 13906, while there can be many more customer specifications, which can deal with different types of layouts and/or geometries (for the transmission of the moment). Such customer requirements can result in very specific designs, such as springs with open coils, right or left winding, double torsion springs or with radial or longitudinal stems.

For the material, spring steel wire is usually used that meets either the EN 10270-1, EN 10270-2, or 10270-3 standard (each has many variations). These standards also prescribe the wire diameter tolerance values. Customers also often need

springs with special mechanical properties and high performance alloys, such as rustproof alloys or heat-resistant (up to 800°C) wire.

There are different kinds of finishings / corrosion protections possible, following customer requirements: galvanisation, painting or plastic-coating. Some more details:

- Standard springs from high carbon spring steel according to EN 10270-1SH/DH do not get a coating, but are lightly oiled after thermic relaxation.
- Standard springs of stainless steel according to EN 10270-3-1.4310 are cleaned after thermic relaxation but not oiled (not necessary).
- Finishing requirements can vary widely: zinc-plating, nickel-plating, tin-plating, silver-plating, gold-plating, gliss-coating, synthetics, Delta Tone, Delta Seal, zinc-flake-coating, phosphatisation, molykoting, colouration, varnishing, powder-coating, and more.

For several years a Technical Committee (ISO/TC 227) has been working on standardisation in the field of metal springs.

Tips:

- Developing country exporters can improve their chances significantly by sending some free product samples along with a quote.
- The importance of customer satisfaction should not be underestimated. Of course, customers consider good quality of the products important, but they also attach great value to compliance with delivery times and delivery volumes.
- Stay informed about ISO TC activities. One website that shares news about it is the European Spring Federation.

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

You can find a general overview of the European market channels and segments for metal parts on the Market Intelligence Platform of CBI. The market channels and segments for springs do not differ significantly from those for the sector in general.

Useful sources

- Associations: European Spring Federation. Some countries have a national association, e.g. Verband der Deutschen Federnindustrie e.V. (Germany) and FIM Ressorts (France).
- Finding prospects: ABC Business Directories, Europages, Kompass.
- Magazines and news portals: Springs Magazine.
- Trade fairs: Hannover Messe – the world's leading trade fair for industrial technology, annual, April, Hannover; Midest – industrial subcontracting fair, annual, November, Paris.
- Trade fair databases: AUMA, Eventseye.
- Trade statistics: Eurostat, ITC International Trade Statistics.
- Other: EU Export Helpdesk, Kwintessential.

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This survey was compiled for CBI by Globally Cool – Creative Solutions for Sustainable Business in collaboration with CBI sector expert Peter Lichthart

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Annex

Ten 8-digit CN codes have been selected for springs. Also refer to Table 1 below for the classification. Table 1 also shows the list of Prodcom codes used for the production statistics of springs.

Table 1: Selected products, based on CN and Prodcom nomenclature

CN code	Prodcom code	Description
73201011		laminated leaf-springs and leaves therefor, of iron or steel
73201019	25931615	leaf-springs and leaves therefor, of iron or steel, hot-worked (excl. laminated)
73201090	25931617	leaf-springs and leaves therefor, of iron or steel (excl. hot-worked)
73202020	25931631	helical springs, of iron or steel, hot-worked
73202081	25931633	coil compression springs, of iron or steel
73202085	25931635	coil tension springs, of iron or steel
73202089	25931637	helical springs, of iron or steel
73209010	25931653	flat spiral springs, of iron or steel
73209030	25931655	discs springs, of iron or steel
73209090	25931660	Other springs and leaves for springs, of iron or steel

Source: CN and Prodcom Nomenclature