



CBI
Ministry of Foreign Affairs

CBI Product Factsheet:

Valves for mining in Europe

Introduction

Europe is one of the largest valve-manufacturing regions in the world. The current revival of the European mining industry provides opportunities for producers of valves for mining from developing countries. Germany, the UK, Spain, Poland and Sweden are the most interesting focus countries. The best opportunity for producers from developing countries is to become a subcontractor of parts for European producers. In some cases, producers from developing countries can also supply finished valves to these manufacturers. Another good option for producers from developing countries would be to target specialised distributors. In all cases, producers from developing countries should focus on just a few special valves within their range of products. Finally, the pricing strategy should be highly competitive.

Product description

Valves are applied in almost all industrial production processes in which liquids are used. The valves covered in this survey are industrial devices for the mining industry that regulate, direct or control the flow of fluids (gases, liquids, fluidised solids or slurries) by opening, closing or partially blocking various passages. The various processes in mining require specific types of valves, as discussed in greater detail in Annex 1.

One chapter in the CN nomenclature refers to valves and valve parts: Chapter 8481. This chapter of codes was selected for this survey. The classifications are presented in Table 1. Note that several of the codes from Chapter 8481 have been excluded from the selection, as they relate to applications other than the processing industry, including pneumatic (including tyres), hydraulic and sanitary applications. Table 1 also shows the Prodcom codes used for the production and demand statistics for valves and valve parts.

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

Subsector and product group	CN code	Prodcom code	Description
Valves			
check valves	848130-91/99	29131172	check valves
safety valves	848140-10/90	29131176	safety or relief valves
pressure-reducing valves	84811005	29131134	pressure-reducing valves combined with filters or lubricators
	84811019	29131135	pressure-reducing valves of cast iron or steel
	84811099	29131139	pressure-reducing valves of base metal
process control valves	84818051	29131313	thermostatically controlled process valves
	84818059	29131315	process control valves
gate valves	84818061	29131333	gate valves
	84818063	29131335	gate valves
	84818069	29131337	gate valves
globe valves	84818071	29131353	globe valves of cast iron
	84818073	29131355	globe valves of steel
	84818079	29131357	globe valves
diaphragm valves	84818087	29131377	diaphragm valves
other valves	84818099	29131380	valves not defined elsewhere
parts thereof	84819000	29132000	parts of valves
a range of valves (quarter turn)	84818081	29131373	ball and plug valves
	84818085	29131375	butterfly valves

Source: *Globally Cool, based on CN and Prodcom Nomenclature (2013)*

The geographic scope is the EU28 area and Norway, although in certain parts of this survey (trade statistics, macro-economic indicators, market channels and segments, and useful sources) the focus is on a selected group of countries: Germany, the United Kingdom, Spain, Poland and Sweden. These countries are among the largest importers of valves in Europe. In this survey, references to 'focus countries' concern the selection of these five countries, unless stated otherwise.

Countries like Germany, the United Kingdom, Poland and Sweden have strong mining traditions. With a view to the challenging economic climate, there is a need in Europe to create jobs (due to the current financial crisis) and to ensure the supply of metals, minerals and other raw materials ('resource efficiency'). This has stimulated a revival of the mining industry, especially in Spain and other countries that have been particularly affected by recession and the accompanying unemployment.

The valve specifications required by European buyers are described below. Illustrations 1–4 display examples of valves sold in Europe, and Illustration 5 provides an example of valve bodies packaged for transport.

Material and design

The material used depends upon the application in the mining process. Materials vary from nodular cast iron or alloy nodular cast iron for processing water and wastewater, to stainless and heat-resistant steel, possibly lined with rubber or plastic (e.g. PTFE and urethane) for chemical applications. The design is according to customer specifications.

Documentation

Valve importers require associated reports about the quality and specification of the material used, registration of critical process parameters and test reports, along with traceability reports for the batches of products manufactured.

Labelling and packaging

Valves are individually packed in crates or boxes, most of which are made of wood. The packaging also depends upon the characteristics of the valve, its level of treatment (100% treated valves require high-protection packaging in order to prevent breakage) and its size. Plastics or coatings are also used for additional packaging purposes.

The European Union sets requirements for [wood packaging materials used for transport \(Directive 2005/15/EC\)](#), including packing cases, boxes, crates, drums, pallets, box pallets and dunnage (wood used to wedge and support non-wood cargo). In practice, this means that the wood must have undergone heat treatment or been fumigated with methyl bromide.

The standard of the valve should be imprinted on the rim, as well as the size, batch number and materials. Highly specialised valves have unique numbers, as they are tested individually.

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. Customers are likely to have their own (additional) packaging requirements and preferences. In most cases, the packaging and labelling requirements are included in the customer's specifications.

Quality and quantity

In Europe, the quality standards of individual companies vary from one country to the next. For example, the quality standards in Northern Europe are higher than those in Central and Eastern Europe. These quality standards have an effect on many aspects, including the finishing and painting of the product (the visual-optical qualities or the appearance of the valve), the packaging requirements and the documentation of accessories.

Order volumes follow the customer's standards and requirements. As a general guideline, transport of standard valves or valve parts from overseas countries to Europe is viable only for full container loads.

Illustration 1: Slurry gate valve



Illustration 2: Diaphragm valve



Illustration 3: Check valve



Illustration 4: Butterfly valve



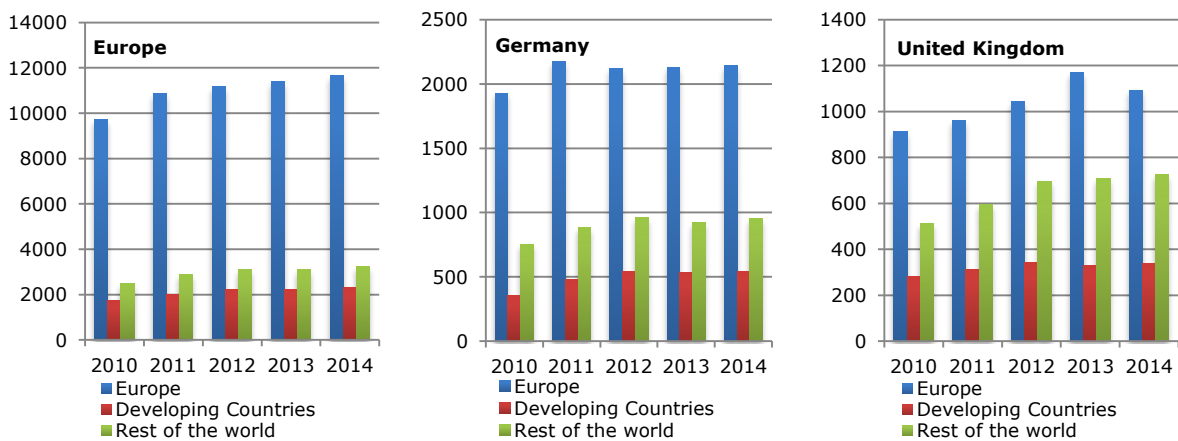
Illustration 5: Example of valve bodies ready for transport

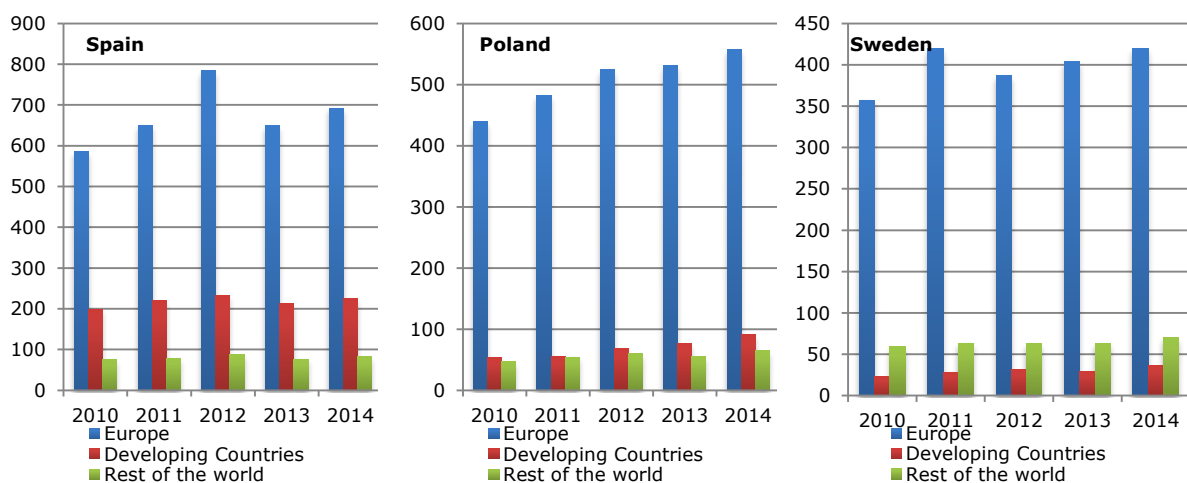


What is the demand for valves in the European market?

It is important to note the following before continuing onto the figures: the trade and production figures in this section serve only as an indication of the total value of valves. They cannot be specified by segments (e.g. the mining industry). This means that the values presented in this section represent the valves market as a whole, and they do not refer specifically to valves for mining.

Figure 1-6: Imports of valves to Europe and focus countries by main origin (2010–2014), in € million,



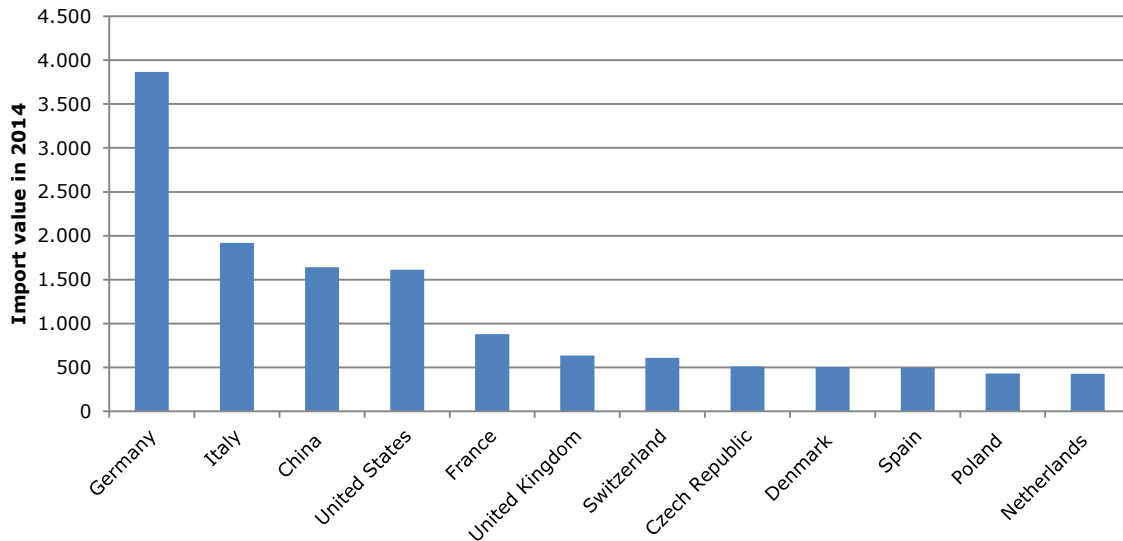


- European imports of valves reached €17 billion in 2014, following an average annual growth of 5.4%. The share of imports from developing countries in total European imports reached 14% in 2014.
- Imports from developing countries are dominated by China, followed at a great distance by India and Turkey. In the years to come, no substantial changes are expected in the list of Europe's suppliers from developing countries. The share of imports from developing countries is expected to remain stable.
- Most imports still originate from intra-European sources (68% of all imports). More specifically, they come from Germany and Italy, the two leading suppliers (and producers) in Europe.
- Imports in the category 'rest of world' consist predominantly of pre-branded valves with a strong reputation in the European market. The USA is by far the largest supplier in the category 'rest of the world', followed at great distance by Japan, Taiwan and South Korea.
- In 2014, the five focus countries represented 47% of all European imports. The leading importer is Germany, followed by the United Kingdom. Spain, Poland and Sweden are in 5th, 10th and 12th place, respectively. Interestingly, however, of the five focus countries, Spain is the leader with regard to the share of imports from developing countries (23%), ahead of the United Kingdom, Germany, Poland and Sweden.
- European valve imports are expected to show a modest growth in the next few years, in the range of 0%–2%.

Tip:

- The focus countries are large importers of valves, and an interesting (but unknown) share of their imports consists of valves for mining applications. Target importers or producers in these countries in order to gain access to these markets.

Figure 7: Leading suppliers of valves to Europe (2014), in € million

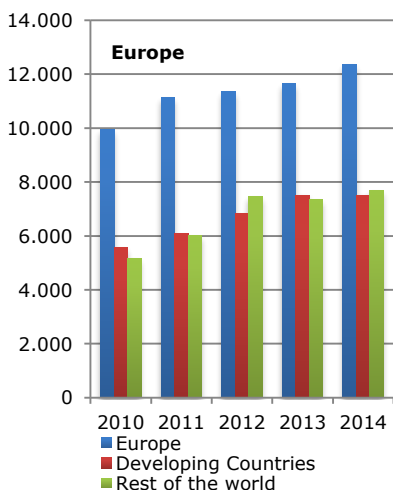


- Figure 7 shows the leading suppliers to Europe. Closer examination of the focus countries reveals that, for all five of these countries, China dominates the list of suppliers from developing countries. This is especially true for Spain, for which China is the second-largest exporter, following Germany. In addition to China, India is another developing country that plays an important role in exports to the focus countries (particularly to the United Kingdom and Spain).
- While China is the second-largest exporter to Spain, it is in only fifth place in Sweden. This reflects the weak market situation and economy in Spain, as characterised by higher demand for inexpensive valves and lower requirements, in contrast to the higher demands and requirements for quality in Sweden. Chinese valve exporters are not the only parties to benefit from the market situation in Spain. Indian valve exports to Spain also performed strongly in the period 2010–2014 (+26% per year).

Tip:

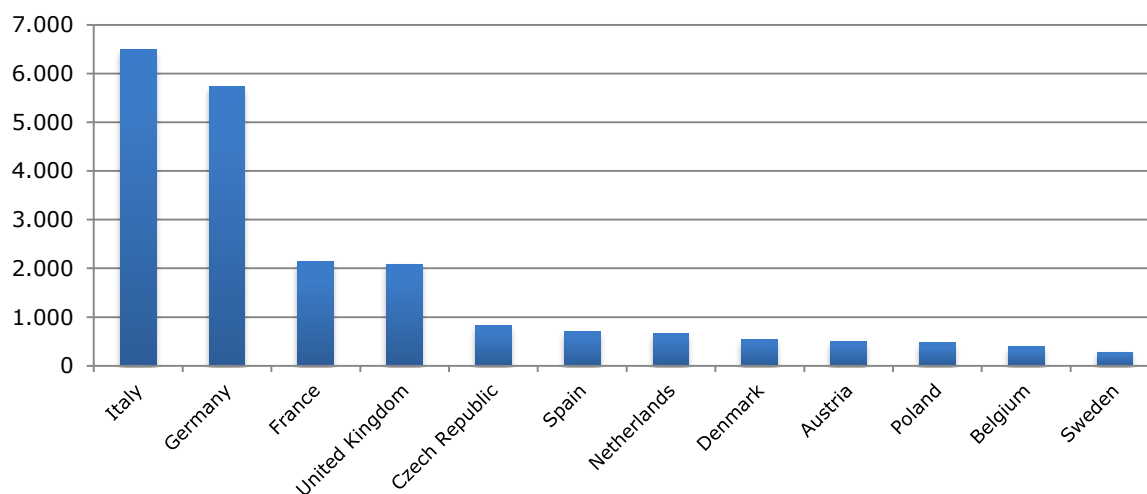
- Benchmark your company against your peers from China and India, as well as against those from other European countries. Several factors should be considered, including market segments served, perceived price and quality levels and countries served. One source that can be used to find exporters of valves by country is the [ITC Trade Map](#).

Figure 8: Exports of valves from Europe by main destination (2010–2014), in € million



- Europe is a net exporter of valves. The European trade surplus has been further increased as its growth in exports has exceeded its growth in imports.
- The share of exports to developing countries amounted to 27% in 2014. However, most imports originate from intra-European sources (45% of all imports), although this also includes some transit trade of imports originally from developing countries. For the coming years, the share of imports from developing countries is expected to grow to 30%.
- In 2014, the five focus countries represented 47% of all European exports. The leading exporter is Germany, followed by the United Kingdom (in 3rd position), Spain (in 5th position), Poland (in 11th position) and Sweden (in 13th position).
- German exports to developing countries represent 30% of all European exports to developing countries. Of the five focus countries, the United Kingdom is in second position with 12%.
- The European export of valves is expected to show moderate growth in the next few years, in the range of 2%–4%. Given that exports are dependent upon many factors (e.g. exports go to many countries, and there are several competitors in the global market for valves), export growth is expected to show some fluctuation from year to year and from country to country, with growth ranging between -3% and +3% per year.

Figure 9: European production of valves by leading countries (2014), in € million

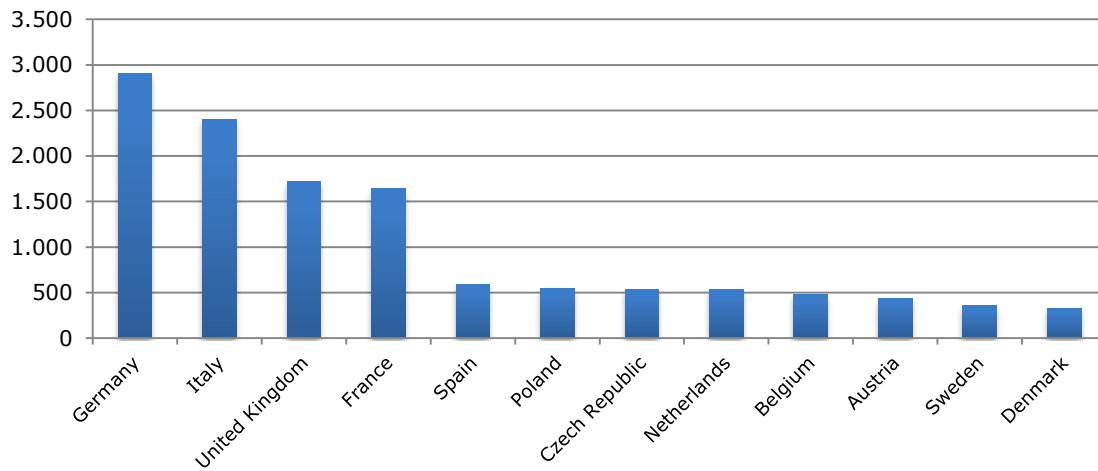


- Total European production amounted to €22 billion in 2014, following an average annual increase of 7.8% in the 2010–2014 period.
- Italy and Germany dominate valve production in Europe. In 2014, they accounted for 29% and 26%, respectively, of total European production.

Tip:

- As indicated in Figure 9, there is considerable production output in the five focus countries. The presence of producers in these countries offers subcontracting opportunities to exporters from developing countries.

Figure 10: European demand for valves by leading country (2014), in € million



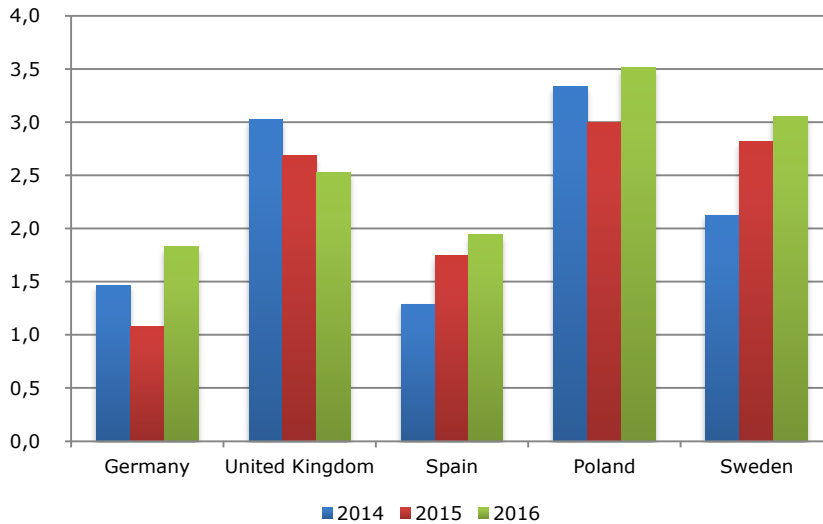
- European apparent demand (production minus exports plus imports) totalled €14 billion in 2014, following an average annual increase of 6.0% in the 2010–2014 period.
- The European market is supplied predominantly (for more than 60%) by locally produced valves (primarily from Italy and Germany). Other developed countries account for >20%, with developing countries accounting for 15%–20%.
- Each focus country has its own specific mining industry profile. The five focus countries can be described as follows.
- Germany is the leading producer in virtually every industry in Europe, including the construction of mining machinery. Its primary mining sector is coal, in which Germany is the European leader, due to its considerable reserves of hard coal (2,500 million tonnes) and lignite (40,500 million tonnes). Although coal is the country’s most important domestic energy source, the current policy in Germany calls for phasing out subsidies of coal production by 2018 in order to comply with European policy. Other important mining sectors in Germany include salt, iron, potash, kaolin, gypsum, sand, feldspar, fluorite, barite, slate and clay.
- The United Kingdom has a rich mining heritage, especially in coal mining. Coal continues to be an important mining sector in the United Kingdom, along with aluminium, iron and steel and industrial minerals, including sand and gravel, limestone and dolomite, salt, igneous rock, potash, clay, sand, chalk, fluorite, barite, gypsum and anhydrite.
- Spain is a leading producer of minerals, metals and quarry products in Europe. It contains the Iberian Pyrite Belt, a geographical area of about 250km long and 30–50km wide from Portugal to Spain, which is especially rich in copper, zinc, lead and precious metals. In addition, Spain possesses hard coal reserves of about 4,500 million tonnes.
- Poland is a world player in the mining industry. It has the second-largest coal-mining industry in Europe (following Germany), with major reserves of hard coal (about 16.9 billion tonnes) and lignite (about 15 billion tonnes). Poland is also one of the world’s 10 leading producers of silver and copper, and one of the 20 leading producers of lead, sulphur, cadmium, zinc, salt, kaolin, gypsum and anhydrite.
- Sweden is the leading producer and exporter of iron ore in Europe, and it ranks among the leading producers of iron, base and precious metals (e.g. gold, copper, lead, molybdenum, silver and zinc). It also produces industrial minerals, including limestone and feldspar.

Tip:

- Each of the focus countries has a large market for valves, and an interesting (but unknown) share of their markets consists of valves for mining applications. Target importers or producers of valves in these countries in order to gain access in these markets.

Macro-economic indicators

Figure 11: Real GDP, Germany, UK, Spain, Poland and Sweden (2014–2016), % change from previous year



Source: OECD Economic Outlook 96 database

- The major factor determining the demand for mining valves is spending activity in the mining industry. In the 2012–2015 period, Europe’s development in the mining industry differed from that in most other world regions. The need to create jobs due to the current financial crisis and to ensure the supply of raw materials (e.g. metals and minerals) has recently stimulated a revival of the mining industry in Europe with new or re-launched mining and smelting projects.

Tip:

- The current revival of the European mining industry provides opportunities for producers of valves for mining from developing countries.

- The profitability of mining valves is influenced by the €:USD exchange rate, as many engineered parts sourced globally are paid in USD. While the €:USD exchange rate was not expected to surpass 0.80 until 2020, this occurred in 2015, with the exchange rate even rising above 0.90. This is having a major effect on the price level of imports. This situation is likely to have a negative impact on the level playing field of European imports paid in USD relative to local European production, especially if it persists for several years. This would thus also have a negative impact on the competitive position of exporters from developing countries.

Tip:

- Although GDP growth forecasts are improving, pricing is and will continue to be one of the most important factors influencing competition. Competitive pricing is essential for exporters from developing countries planning to enter the European market.

What trends offer opportunities on the European market for mining valves?

The most important trends in the European valve sector (including mining valves) can be categorised in terms of ‘technological drivers’, ‘environmental drivers’ and ‘economic drivers’.

Technological drivers

- Automated valves: European valve manufacturers have specialised in expensive automated valves and actuators. These valves include technologically advanced automated valves with greater efficiency through advanced predictive and preventative maintenance abilities, as well as through improved controls involving pneumatic, solenoid, electric, hydraulic or digital mechanisms. These valves can be used in remote or hazardous environments (e.g. the mining

industry). Such specialised products constitute a growing market segment for European valve makers, although they also incur costs in the form of materials research, product design and testing, in addition to more sophisticated production methods. To date, producers in developing countries have not been able to supply such specialised valves.

- Cost-reduction: European producers will continue to implement new technologies in order to reduce production costs and to secure their competitive edge.
- High-tech valves: The demand for high-tech valves that require advanced casting, working and finishing techniques will continue to increase in the next few years. Star performers will continue to be the highly advanced or specialised products (e.g. valves with predictive and preventative maintenance abilities and valves with improved controls involving pneumatic, solenoid, electric, hydraulic or digital mechanisms).

Tip:

- The segment for specialised products provides opportunities for producers from developing countries who are able to supply high-tech valves or parts for such valves. For the mining industry, examples could include pinch valves or valves with self-cleaning seats.

Environmental drivers

- Environmental legislation and awareness are stimulating the search for energy efficiency and the limitation of emissions in the mining industry. This has led to the increased use of innovative production techniques, resulting in greater efficiency and less waste. Companies currently evaluate products on environmental aspects, in addition to such aspects as price, quality and standards. One of the effects of this trend has been an increase in the demand for certain types of valves (e.g. non-discharging valves).

Tip:

- The trend towards greater energy efficiency provides opportunities for producers from developing countries who are able to supply certain types of low-emission valves or parts for such valves.

Economic drivers

- European recession: Some countries in Southern Europe that have been particularly affected by the recent recession and accompanying unemployment have a rich mining heritage. In these countries (e.g. Spain, Portugal and Greece), there has been a revival of the mining industry in order to create new jobs.
- Resource efficiency: Europe is primarily dependent upon Africa and Asia for its supply of metals, minerals and other raw materials, although competition from domestic markets and emerging markets (e.g. China) has been increasing with regard to these resources. For this reason, attention has been shifting towards 'resource efficiency', thus stimulating the mining industry in Europe.
- Declining ore grades: Due to declining ore grades, it has become necessary to process more materials in order to extract decent amounts of valuable minerals from the ore. This makes the processing more intensive and more expensive.
- Mining revival: In recent years, the Nordic countries and Poland together accounted for two-thirds (€288 million) of total exploration expenditures in Western Europe. Smaller exploration programmes are underway in the remaining mining countries of the European Union (e.g. Spain). As a result, European mining investments are expected to increase in the next few years. Signals of progress in the mining industry will create favourable conditions for valve suppliers in and to Europe in the next few years.

Tip:

- The current revival of the European mining industry provides opportunities for producers of valves for mining from developing countries.

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

Requirements can be divided into the following categories: (1) musts, which are legal requirements that you must meet 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 that you should meet in order to stay abreast of the market).

A general overview of [EU buyer requirements for pipes and process equipment](#) is available on the CBI Market Intelligence Platform. Additional sources of information on gaining access to the European market include the [EU Export Helpdesk](#) and the [ITC Market Access Map](#).

Musts

For mining valves, the most important legal requirements are compliance with the Essential Safety Requirements of standard setting bodies, including the following:

- the [Pressure Equipment Directive \(PED\) 97/23/EC](#) and
- the [ATEX directive \(Directive 94/9/EC\)](#) applies to valves for use in potentially explosive atmospheres, as is common in mining.

Valve parts are not subject to any specific legal requirements for market access.

Tip:

- To obtain a PED or ATEX certification, valves must be certified by a [notified body](#). In many cases, such notified bodies also offer consultancy services to help producers to meet the requirements. Be aware that notified bodies are often notified for only a part of the conformity assessment procedures, or exclusively for specific sectors (e.g. electrical equipment). Consult the [European ATEX Guidelines for the Valve Industry](#) of the European Valves Committee.

Additional requirements

Many customers demand that suppliers work according to such general organisational quality systems as ISO 9001 (version 2008) and process control. Some may also demand compliance with ISO 14001 (environmental) and OHSAS 18000 (labour standards).

Given that the mining industry's main concern is safety, it requires solutions that comply with demanding safety regulations. In addition, the industry must comply with environmental legislation and reduce its environmental impact, especially in Europe. Mining valves need to perform reliably in challenging environments, in addition to providing long service life and minimising system downtime. They must be highly resistant to abrasion and corrosion, in order to be able to process chemicals and mining slurries.

For safety and reduced environmental impact, valves that come into contact with highly corrosive (chemical) materials should preferably be of the non-discharging variety, with superior sealing and coating. To minimise system downtime, repair or replacement of internal components of the valve should ideally not require taking the valve out of service. Water is used in every type of mining (e.g. in such applications as the transport of solids). Valves for water-based applications might thus be also used for such purposes. For additional information about mining processes and accessory-valve requirements, refer to Annex 1.

Furthermore, mining valves are subject to more or less the same requirements that apply to valves in general. The primary requirements of customers are related to the technical aspects of the valves, many of which are covered in CE or other standards. Basic standards (e.g. EN558 and EN12982) can serve as a starting point. Yet other standards apply to specific types of valves (e.g. EN 13709, 13789 and 1349 for globe and control valves and ISO 5996 for cast-iron gate valves).

For valve parts, material requirements are the most important customer requirements. The material that is used for valve parts must be covered by an international standard and approved with a certificate. In a foundry or forge, the material must be melted or forged in such a way that, after the casting process, the material meets the material standard, which can be stated in a Type-3 EN10204 certificate. This type of certificate is internationally accepted.

While the American ASTM standards link material requirements with applications, this is not the case for the European EN standards. Instead, European customers have their own specific requirements, in addition to the EN standards. Such additional requirements from customers can be NDT (non-destructive testing), surface (MT or magnetic testing, PT or penetrant testing) and section (UT or ultrasonic testing and RT or X-ray testing) tests.

Buyers may also have specific requirements relating to the dimension and surface of the valve parts. In practice, these requirements are highly dependent upon the customer and application. In some cases, buyers ask their suppliers to adhere to the EN ISO 8062 standard and, in other cases, they include their specific dimensional and surface requirements in the technical drawing.

Tips:

- Valves produced for the European mining market must be designed and manufactured with an emphasis on safety, low emissions, simplicity of maintenance, ease of operation and, above all, long and reliable service life.
- Additional details are available on the following websites:
 - [ISO Catalogue](#) - See 'TC 153' (Valves) for an overview of ISO standards.
 - Search EN norms in the [online shop of the British Standards Institution](#).
 - The [CBI Buyers' Black Box](#) offers additional information on topics that can be decisive for buyers when searching for new suppliers.
- The importance of customer satisfaction should not be underestimated. Customers obviously attach considerable importance to product quality, but they also attach great value to compliance with delivery times and delivery volumes.

Import tariffs

For valves and valve parts, [a 2.2% duty](#) is levied on European imports from third countries. Several countries benefit from a preferential 0% tariff, including Indonesia, Pakistan, Vietnam, the Philippines, Bosnia and Egypt. The [TARIC database](#) provides additional details relating to Chapter 8481. Note that a Certificate of Origin is required in order to claim a preferential tariff.

Tip:

- Exporters from countries subject to a preferential 0% tariff have a slight competitive advantage over competitors from countries without such preferential tariffs. Prepare a Certificate of Origin; note that it must be validated by a local Chamber of Commerce. Additional information is available [here](#).

For information on buyer requirements in the European market in general, refer to the [CBI document on EU Buyer Requirements for pipes and process equipment](#).

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

Valve manufacturers are the most prominent targets in Europe. Producers from developing countries can supply these manufacturers with parts as subcontractors and, in some cases, they can supply finished products as well. Producers from developing countries can enhance their opportunities by focussing on a few specialised products. Manufacturers are also the most important targets for specialised products, as some are likely to be interested in subcontracting some of their production to low-cost countries. Distributors are also good targets, as they have good access to the local market.

Additional information is available in the CBI documents on 1) [Market Channels and Segments for Pipes and Process Equipment](#) and 2) [Competition for Valves](#). The following is an explanation of the types of prospects, including a few examples of each type. Resources that can be used for finding prospects are included in the section 'useful resources'.

Producers

These companies have strong potential for supplying valve parts, and perhaps for providing some finished valves. Subcontracting offers the best opportunities for specialised products, including some special valves (e.g. knife valves) or parts thereof.

Examples of producers in the European focus countries include the following:

- Germany: [AKO Armaturen & Separationstechnik](#), [KSB](#), [OHE Mining Technology GmbH](#), [Samson](#), [SchuF](#), [VAG Germany](#)
- United Kingdom: [AMOT UK](#), [Conflow](#), [Jamesbury](#), [SchuF UK](#), [Weir Minerals](#)
- Spain: [Acuster](#), [Cauchos Castilla S.L.](#), [JLX VALVE](#)
- Poland: [Andrex](#), [Chemitex](#), [EFAR](#), [Elektrometal S.A.](#), [HUTA MAŁAPANEW](#), [IDMAR](#), [POLNA S.A.](#)
- Sweden: [Alfa Laval Nordic](#), [Flowrox Oy](#) (Finland), [FLSmidth](#) (Denmark), [Stafsjö Valves AB](#)

The leading players on the world market include [Saunders](#) (part of Crane Process Flow Technologies), [ITT Engineered Valves](#), Valves & Controls (part of [Pentair](#)) and the [Weir Group](#) (United Kingdom).

Note that this list is not complete, and it is intended only as an illustration of a particular category of companies.

Distributors

Distributors are attractive targets for exporters from developing countries aiming to export large volumes of commodity-type products (e.g. common valves). This is because distributors often buy and/or import commodities in relatively large quantities on a scheduled basis. In most cases, the distributor is also the importer. Distributors often have their own stock, thus explaining why they are also called 'stockists'. Products must be kept in stock, as they need to be available for urgent deliveries to end-users.

Most distributors offer a range of valves and other pipe-related process equipment for a wide range of industries. Many do not promote specific market segments (e.g. mining).

The following are examples of companies that do advertise as mining-specific suppliers: [CRANE ChemPharma & Energy](#) (Germany), [Industrial Anchillaries](#) (United Kingdom), [Grupo Compas](#) and [The Alloy Valve Stockist](#) (Spain), [GTM Process Valves Sp. z o.o.](#) and [Tranz-Tel sp. z o.o.](#) (Poland), and [Erichs Armatur AB](#) and [Ventim](#) (Sweden).

Note that this list is not complete, and it is intended only as an illustration of a particular category of companies.

Engineering service companies

Engineering service companies, or 'contractors', build and/or maintain and repair machinery and/or plants that contain valves. They buy only from respected brand manufacturers in developing countries, and their customers are mining companies. Note that these mining companies may own and manage mines all over the world, and they are likely to allocate installation or maintenance projects for any of these installations to their European engineering service company. A large share of a service company's activities, engineering, procurement, and commissioning takes place in Europe, while actual installation takes place directly at the relevant location, anywhere in the world.

Useful resources

For each focus country, several useful resources are listed below, specific to mining valves or mining.

Germany

- Finding prospects: [German Commercial Agents Directory](#), [VDMA market](#), [Wer liefert was?](#)
- Associations: [Association of Mining, Geology and Environment](#), [Association of Steam Boiler, Pressure Vessel and Piping Manufacturers](#), [BDI](#), [German Federation of International Mining and Mineral Resources](#), [German Resources and Mining Association](#), [GDMB Society of Metallurgists and Miners](#), [Mining Suppliers Association](#)
- Magazines and news: [Chemie Technik](#), [Industrie](#), [Industrie Anzeiger](#), [Maschinen Markt](#), [Orgalime](#), [Scope](#), [Springer VDI Verlag](#)
- Trade fairs: [bauma](#), [European Metallurgical Conference](#), [GEC Geotechnik - expo & congress](#), [Hannover Messe](#), [Ifat](#), [Maintain Europe](#), [Tube](#), [Valve World Expo](#)

United Kingdom

- Finding prospects: [Applegate Directory](#), [Engineering](#), [Hotfrog](#)
- Associations: [Association of British Mining Equipment Companies](#), [Association of Mining Analysts](#), [British Valve and Actuator Association](#), [Engineering industries association](#), [International Mining & Minerals Association](#), [Mining Association of the United Kingdom](#)
- Magazines and news: [Contractors World](#), [Industry.com](#), [Mining Journal](#), [Mining Magazine](#), [MQWorld.com](#), [Valve User](#)
- Trade fairs: [Mines and Money London](#), [SPE Offshore Europe](#), [Subcon](#)

Spain

- Finding prospects: [High Council of Chambers of Commerce](#), [Industry and Navigation of Spain](#), [Hotfrog](#)
- Associations: [Fluidex](#), [Geological and Mining Institute of Spain](#), [Spanish Manufacturers Association of Construction and Mining Equipment](#)
- Magazines and news: [Tecnologías del Agua](#)
- Trade fairs: [EAGE Conference & Exhibition](#), [FASA](#), [Forum on Sustainable Mining Development](#), [InvEXPORT](#), [MetalMadrid](#), [Smagua](#), [SMOPYC](#)

Poland

- Finding prospects: [Hotfrog](#), [Polish Chamber of Commerce](#)

- Associations: [Central Mining Institute](#), [Polish Industrial Valves Association \(SPAP\)](#), [Polish Steel Association](#), [State Mining Authority](#)
- Magazines and news: [Journal of Sustainable Mining](#), [PompyPompownie](#), [Projektowanie i Konstrukcje Inzynierskie](#), [Work Safety and Environmental Protection in Mining](#)
- Trade fairs: [Ekotech](#), [HAPexpo](#), [International Exhibition of Hydraulics, Pneumatics, Control and Drives HaPeS](#), [International Fair of Aluminium & Technology](#), [Materials and Non-Ferrous Metal Products](#), [International Fair of Mining](#), [Power Industry and Metallurgy](#), [Rapid Development](#), [SteelMET](#)

Sweden

- Finding prospects: [Commercial Agents Scandinavia](#), [Swedish Association of Agents](#), [Swedish Chamber of Commerce](#)
- Associations: [Swedish Association of Industrial Employers](#), [Swedish Association of Mines, Mineral and Metal Producers](#), [Swedish Association of Suppliers of Water Treatment Equipment](#), [Teknikföretagen](#), [Valves & Fittings of Sweden](#)
- Magazines and news: [Bergsmannen JkA](#), [Branschaktuell](#), [Metaller & Gruvor](#), [Minefocus](#), [Ny Teknik](#)
- Trade fairs: [Elmia Subcontractor](#), [Euro Mine Expo](#), [FinnMateria](#) (Finland), [Scanautomatic & ProcessTeknik](#), [Water and Wastewater Fair](#)

Other general resources

- Finding prospects: [ABC Business Directories](#), [Europages](#), [InfoMine](#), [Kompass](#), [ValvesandSealing.com](#), [World Mining Equipment](#)
- International associations: [EURACOAL](#), [European Association for the Taps and Valves Industry](#), [European Association of Mining Industries](#), [Metal Ores & Industrial Minerals](#), [International Council on Mining and Metals](#), [International Mine Water Association](#),
- International magazines and news: [MINING.com](#), [Valveworld](#)
- Trade fair databases: [AUMA](#), [Eventseye](#)
- Trade statistics: [Eurostat](#), [ITC International Trade Statistics](#)
- Other: [EU Export Helpdesk](#), [Kwintessential](#)



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Annex 1

Requirements by process

The various processes in mining require specific types of valves.

Comminution

In the *comminution* stages, the ore is crushed (e.g. with cone crushers) and milled (ground, as with semi-autogenous 'SAG' mills), **requiring particularly strong valves with wide seats** in order to meet the physical demands of processing slurries with a high percentage of solids and large particles.

This combination of slow and large particles in the slurry, which causes solids to settle at the bottom of valves, is a typical challenge of the mining process. For this reason, mining valves should be designed to be able to clear the flow path and close properly with self-cleaning seats. This is especially important, given that most mining operations need to change their pumps regularly, requiring specific pumps to be isolated by closing their valves.

Hydrocycloning

To separate particles in the slurry, the mining industry uses such processes as *hydrocycloning* (or 'cycloning'), flotation, thickening and filtration. Cyclones separate particles based on size and density, using centripetal force. Valves used in this process should be designed to provide **long service life** in this highly abrasive environment.

Flotation

Flotation uses bubbles to bind particles of valuable minerals and separate them from unwanted gangue minerals by floating them to the surface. To do this, flotation reagents are commonly added to the milled slurry. Examples include activators, blower air, collectors, depressants, deactivators, dispersants, extenders, flocculants and frothers. For use in feed and wash water, **rubber-lined valves can be used**, whereas **plastic-lined valves** are preferred for use with chemical additions.

Thickening and filtration

Thickening and filtration are processes for dewatering flotation concentrates, which is becoming increasingly important as miners try to improve water recovery. *Thickening* uses gravity to separate suspended solids by allowing them to settle in tanks ('thickeners'), creating a thickened underflow and a clear overflow. *Filtration* by vacuum or press filters uses a porous medium (e.g. filter cloth) to separate the minerals from liquids in a slurry. **Rubber-lined or plastic-lined valves can be used**, depending upon the type of liquids and solids to be processed.

Autoclaving

Particularly in precious metal mining, it is sometimes necessary to use an *autoclave* before leaching, in which high-pressure oxidation through a chemical reaction caused by the application of high-pressure steam, water and oxygen to heated slurry. **The valves used in this process must be resistant to the high velocity of the abrasive and corrosive slurry.** Alternatively, a *roaster* (high-temperature oven) can be used to oxidise the ore and drive off volatile substances with heat and air. Materials used for the valves in autoclave and roaster systems include titanium, brick lining, and high-nickel alloys.

Leaching and electrowinning

The cooled slurry can then be *leached*, a process that uses chemicals to extract valuable minerals from refractory ore. For example, gold is leached by adding a cyanide solution to the ore slurry, into which the gold dissolves. The valuable minerals can be extracted from the solution by *electrowinning*, in which an anode and a cathode are placed in the solution. As an electric current passes between them through the electrowinning cell, metal is deposited on the cathode in a process of electroplating. Because the slurry processed in leaching and electrowinning is highly corrosive, the **valves used in these processes should preferably be of the non-discharging variety and lined with heavy-duty liners.**

Tailings disposal

Tailings are the materials rejected from a mill after extracting the valuable minerals from the unusable fraction (gangue) of an ore. They usually consist of crushed or finely ground waste rock in slurry form and are often pumped out to tailings ponds at a remote location. Given that tailings can be very abrasive and corrosive, the **valves used on tailing lines must be resistant to abrasion and corrosion. They should be especially reliable and low-maintenance, as tailings ponds are often situated in remote locations.**