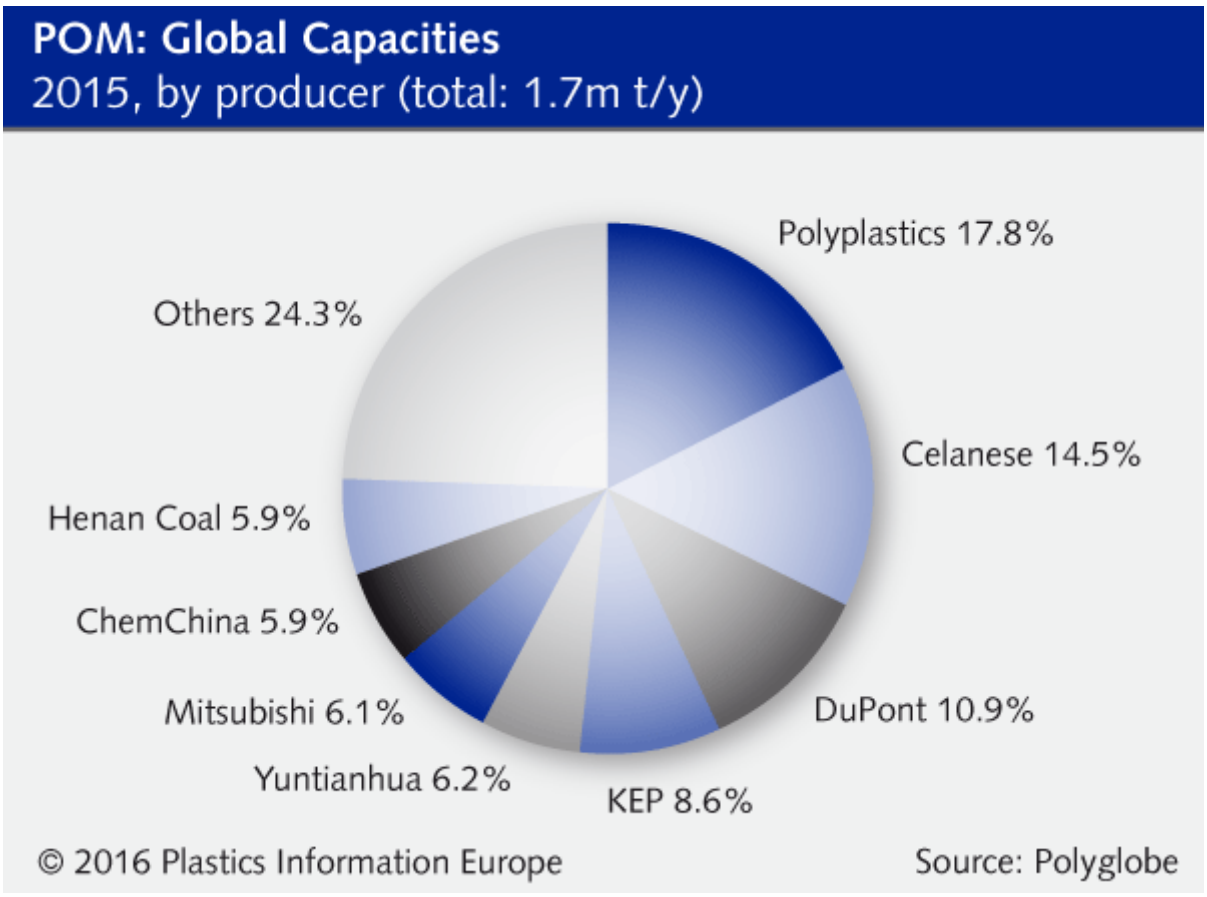
POM

Output grows continuously by 7% a year / Consumption doubled over past decade / Global capacities approach 2m t/y / Situation unclear in China / EU imports pressure recyclate grades

Polyoxymethylene (POM) – also known as polyacetal or polyformaldehyde – has been around for nearly 100 years and was first industrialised by **DuPont** in the 1950s. It is a semi-crystalline thermoplastic characterised by very good mechanical properties over a wide temperature range, a property that has allowed it to conquer numerous technical applications. The POM market continues to see steady growth rates, with prices holding largely stable. While global consumption stood at about 600,000 t/y about 10 years ago, by 2014 demand had more than doubled – translating into annual growth rates of about 6-7%. At the same time, **PIE**'s Polyglobe capacity database (www.polyglobe.net) shows, global production capacities rose from 750,000 t/y to more than 1.7m t/y.

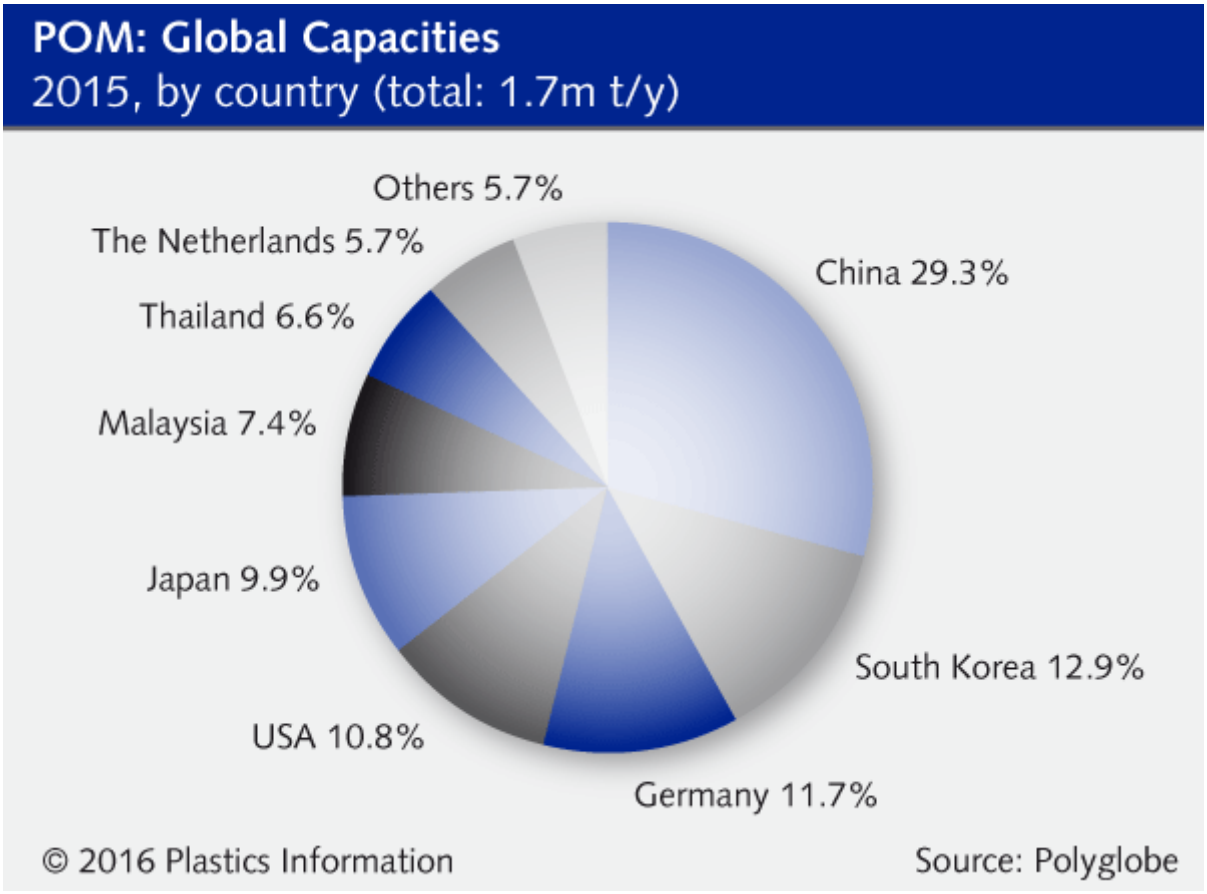
POM, frequently called the "cog wheel material", is characterised by high rigidity, stiffness and hardness, excellent dimensional stability, low friction coefficients and good slip properties. The first POM was a homopolymer (H-POM), produced by the polymerisation of formaldehyde. Aside from higher crystallinity, it also has better mechanical properties, a higher melt point and lower thermal conductivity than POM copolymers (C-POM). The latter's mechanical properties are slightly lower than those of H-POM, but has a higher chemical resistance to alkaline substances. POM copolymers are just as sensitive to strong acids as homopolymers, although both are relatively insensitive to fuels and oils. In addition to injection moulding types, extrusion and blow moulding types are also available. While DuPont has been producing homopolymers ("Delrin"), competitors like **Celanese** ("Hostaform") and **BASF** ("Ultraform") focus on copolymers.



The material is usually compounded specifically for the intended application, and can also be modified with various other plastics, additives and auxiliaries to attain specified properties. Its fields of application are primarily precision injection-moulded parts for mechanical, sensor and actuator technologies, precision engineering, microtechnology and fuel-carrying automotive parts, but they also include machine elements and fittings, instruments, leads, as well as household and kitchen appliances in contact with water or other media.

No expansion plans for POM in Europe

According to Polyglobe, 18 global companies are capable of producing POM, with more than 70% of current output located in Asia. In Europe, Celanese (**Ticona**), DuPont, BASF and Poland's **Zaklady Azotowe** produce POM materials. The last significant capacity change in Europe was the shift in POM production at Ticona, whose old 110,000 t/y plant in Kelsterbach had to make way for the expansion of Frankfurt Airport. To make up for the loss, Ticona built a completely new plant in Frankfurt-Höchst, with nameplate capacity for 140,000 t/y. Commissioned in mid-2011, the facility is the largest POM production plant in Europe. DuPont operates a 90,000 t/y line in Dordrecht / The Netherlands, while BASF runs a 55,000 t/y facility in Ludwigshafen / Germany, and Zaklady Azotowe owns a 10,000 t/y line in Tarnow / Poland. There are currently no reports of any expansion plans for Europe.



Whereas the more established producers built up their capacities in a piecemeal fashion over time, China's progression to the world's leading POM player has been much quicker. The country today accounts for nearly 30% of global POM capacities. In addition, **ChemChina** plans to bring on stream another 160,000 t/y in POM capacity, and **Datong Coal Mine Group**'s plans for a large-scale petrochemical project including 240,000 t/y of coal-based POM.

Generally speaking, however, utilisation of Chinese POM capacities has so far been considered very low. In addition, the realisation of many projects remains doubtful, with rumours of delays or even complete standstills at brand-new facilities. POM intermediate methanol is a by-product of China's coal chemistry, which has come under considerable pressure by the cheap oil prices and is to be pared back in the country's next Five-Year Plan, due to be launched shortly.

Quality of Chinese imports still inferior to European product

China's higher production output has nevertheless already made an impression in Europe. When the first significant imports arrived in 2013, European virgin material producers were forced to make a small price correction. It quickly became clear, however, that most of the simple POM grades from China do not match the level of the European product. By keeping a tight control on quality and compiling lists of specified materials, local suppliers have since managed to keep prices stable.

However, while the virgin compound price has remained stable at around EUR 2,800/t ever since, the gap to European POM recyclate has widened significantly. In the last few months, there have been reports of mounting struggles over both volume and price of these secondary materials, which are increasingly competing with virgin Asian POM.

Polyplastics and Celanese at loggerheads

An equally interesting development for European POM converters is the fact that long-time Asian market leader **Polyplastics** intends to significantly expand its activities in Europe (see PIEWeb of 20.07.2015). For nearly 50 years, the company – founded in 1962 for import and distribution by Japan's **Daicel** and, two years later, restructured into a 55:45 equity joint venture between Daicel and Celanese – supplied only Asian markets with engineering plastics, primarily POM, while Celanese catered to the rest of the world. In 2012, however, the long-term regional marketing arrangement between the two companies ended, even if the financial ownership structure still remains the same. Since then the two players have been locked in a "War of the Roses", with Polyplastics strengthening its presence in Europe and Celanese its footprint in Asia. The Japanese group's POM capacity now exceeds 300,000 t/y, marketed under the "Duracon" brand name. With its own plants in Japan, Malaysia and Taiwan and joint ventures in China and Taiwan, Polyplastics is the world's leading POM producer, holding a 20% share in the global market.

Meanwhile, most producers anticipate that the global POM market will continue to grow by about 7% a year. There is no obvious sign of any potential unrest on the application side, and the market is expected to remain balanced – aside from the occasional stray quantities from bad Chinese planning. It is very likely that its properties will allow the material to conquer further applications without making spectacular headlines, thereby assuring it a firm place in the engineering thermoplastics portfolio.

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