

Coatings, Thermosetting Powder

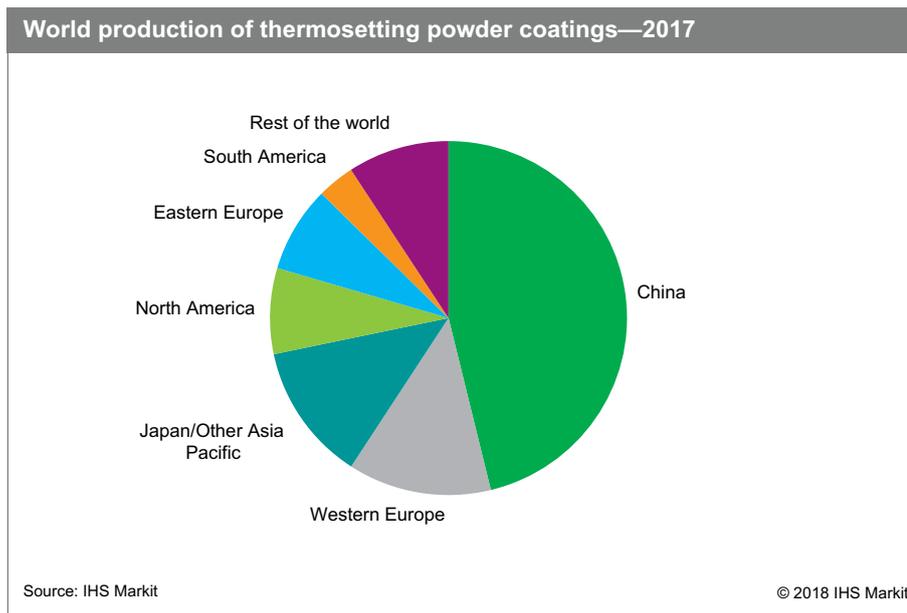
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Abstract

Powder coatings are applied to metal substrates to form highly durable and attractive finishes. They are manufactured and applied without the use of organic solvents; thus, they are highly desirable from an ecological standpoint. The powder coatings industry has endured years of low profitability as the industry increased capacity while demand stagnated in the developed world. Prices have tended to fall as many producers were willing to sell quality powder coatings at low prices. At the same time, users have become more educated and consider many powder coatings to be commodity-like. On the other hand, consumption of powder coatings in less industrialized regions has increased and is expected to continue to increase at a strong rate, with annual growth expected to be about 6–7% in China and 4–5% in other developing nations. There should be some increase in the US market as lower-cost energy supplies will reduce the cost of applying powder coatings, and encourage some end users to relocate their operations from areas with low labor costs.

The profitability of producing powder coatings varies significantly among products, companies, and regions. Barriers to entry are minimal because of the relatively low capital requirements; small producers can compete successfully with larger producers in many markets. The customers for powder coatings are quite diverse. A select few end-use applications require the resources of a large, multinational organization, a notable example being clear coats for automotive bodies.

The following pie chart shows world production of thermosetting powder coatings:



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In China, there are over 500 producers, with many being small-scale operations that supply powder coatings for the local market only. If one excludes the Chinese market, there are three large international producers with about 30% of the global market, with the top nine accounting for about 50%.

There has been some consolidation in the industry in recent years, mainly because powder coatings production has grown more rapidly in areas outside of North America, Western Europe, and Japan—in regions where manufacturers based in these more developed regions have much less of a presence. In China, powder coatings production roughly doubled from 2004 to 2013, with most of the production being by very small enterprises using unsophisticated equipment. China is now the leading powder coatings producer by far. In Europe, there are at least 100 producers with over 80 production sites. In North America, there are an estimated 70 producers.

Powder coatings are used primarily in the following five major markets:

- General metal finishing (e.g., furniture, shelving, electrical equipment)
- Appliances (e.g., washing machine tops and lids, dryer drums)
- Architectural (e.g., window and door frames)
- Automotive (e.g., wheels, oil filters, engine blocks)
- Functional (e.g., oil and gas transmission pipes)

Powder coatings compete with other finishing technologies (such as waterborne and high-solids coatings) as pollution-abating alternatives to conventional low-solids, organic solvent-based coatings. Powders are especially attractive since they are made and applied without any solvent. However, powder coatings have certain technical limitations and thus will never totally displace other technologies. Powder coatings currently account for 10% of the US industrial coatings market; the penetration of powder coating technology into its niche markets (e.g., metal furniture, appliances, automotive underbody parts) is about 25% on an aggregate basis. In Western Europe, the figures are 18% and 30%, respectively, and in Japan, 6% and 15%. In China, powder coatings account for about 13% of the industrial coatings market.

Some of the more important trends and opportunities foreseen for the powder coatings industry are the following:

- Continued consolidation of producers.
- Continued rapid growth, especially in less-developed nations.
- Intense research efforts to provide powder coatings that can be used in more markets, including wood, plastics, and other nonmetallic substrates. UV-curable powders are being developed for medium-density fiberboard (MDF), which is used in interior kitchen construction, office furniture, roofing, and wall panels; to date, however, its use is limited.

As of early 2018, the major issue facing the global powder coatings industry is dealing with much higher raw material costs, which in aggregate rose by 25% in 2017. The prices for two key inputs—epoxy resin and titanium dioxide—rose by 20% and 50%, respectively. There was a substantial negative impact on profitability because of the difficulty in raising prices.

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