Highly diffuse market

98 % of Chinese powder coatings manufacturers are SME's

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To what extent does the market structure of the powder coatings industry in China differ from the world market? The answer is provided as part of a study, to be published by Duke University's Center on Globalization, Governance & Competitiveness (CGGC). The researchers also identified market challenges specific to China.

As a part of the review of the technological and product market developments in powder coatings from 1950-2000, CGGC looked at today's Chinese powder coatings industry.

Diffuse powder coating market

Powder coating manufacturing is highly diffuse in China. Over 2,000 powder coating manufacturers exist in China, and as of 2006 98 % of them are SMEs with production levels under 1,000 MT per year (see *figure 1* for annual production). Only 40 companies in China produce more than 1,000 MT per year. Ten large foreign firms produce 20 % (142,000 MT) of Chinese powder coatings, with the largest three producing 100,000 metric tons per year. They are:

» AkzoNobel Powder Coatings (~60,000 MT, 5 factories)
» Dupont Huajia Chemicals (~20,000 MT, 4 factories)
» Nippon Paint Co. (~20,000 MT from 3 factories)

Other foreign-owned powder coatings firms sharing 42,000 MT of annual production are: Valspar, PPG, Orica, BASF, Jotun, Rohm Haas, Tiger Werke, and 3M. Foreign firms have also increased their Chinese market share through mergers and acquisitions. Nippon Paint and Dow Chemical are recent examples of this M&A activity.

Powder coating production equipment

China has a large and well developed powder coating manufacturing equipment market. Only 10 of the roughly

600 powder coating manufacturing equipment purchased annually during 2006 in China were imported from abroad. Most of the powder manufacturing equipment is produced in Yantai, Shandong Province. Domestic powder coating manufacturing equipment suppliers include: Hkorl Machinery Co, Yantai Sanli Machinery, Donghui Powder Processing Equipment, and Yantai Ling Yu Powder Processing. Some limitations exist, however, on technologically advanced components for manufacturing equipment.

Powder coating application equipment

Domestic production of powder application equipment (booths, guns, integrated and automated powder lines) is more limited than powder coating manufacturing equipment. Mid-to-high-end application equipment is imported from oversees. Major suppliers are ITW Gema, Wagner, Nordson, and Sames. Domestic producers of medium-to-low-end coating equipment are Yutung Engineering, Liush Machninery, and Fung Yu Group.

Specialized powder coating production

As a percentage of total production, the domestic Chinese powder coating manufacturing industry is more specialized in pure epoxy and polyester-TGIC powder coatings than the world at large. TGIC-free powder coatings and epoxy-polyester hybrids are not produced as much in China than in the rest of the world, while polyurethanes and acrylics are about equal to world production (*figure 2*).

Foreign firms play key role in R&D

Foreign firms play a key role in the research and development of powder coatings to new product markets in China. Large foreign powder manufacturers developed R&D facilities to study and develop powder coating applications for new product markets. For example, AkzoNobel opened the Powder Coatings Technology Center in Ningbo, Zhejiang province to further develop powder coating in automotive, architectural, furniture, domestic appliance, IT, and industrial end-product markets.

Rapid growth

The Chinese market has experienced rapid growth since 1995 and continues to grow faster than the US and European markets. By volume, Asia makes up 51 % of 2008 world powder consumption, Europe makes up 27 %, while North and South America make up 14 % (8 % ROW). By value, Asia makes up 38 % of the world powder coating market, Europe 33 %, and the Americas 20 % (9 % ROW) in 2008. From 1995 to 2000, Chinese powder coating production grew 195 % (39 % average annual growth) from 40,000 MT to 118,000 MT. From 2001 to 2006, powder coating production grew 320 % (64 % average annual growth) from 150,000 MT to 630,000 MT. This rate of growth is extremely high, and will likely slow to 12-15 % annual growth rates for the next several years. In comparison, US annual growth rates were between -1.5 % to 4.2 % from 2000-2007 and are unlikely to grow more than the annual growth rates in overall US industrial production in the upcoming years.

Challenges of the Chinese market

The most important challenges of the Chinese market for powder coatings are

» **Consistent powder quality:**
Specialty pigments and additives are expensive and provide incentives for the increased use of powder coating extenders. This reduces the cost of the powder coating but also reduces the area that can be covered by a quantity of powder. Substitution of environmentally compliant powder inputs with cheaper heavy metals such as lead also has been reported. "Sometimes the Chinese will play a shell game," stated one interviewed industry expert. "They send you a sample of their powder and it tests great. Then, once you get your product, you realize that it has no relation to the sample they sent." The effect is increased monitoring and testing costs for product manufacturers and retailers.

» **Importing additives and equipment:**
"The Chinese just won't import" stated one industry expert. "For example, if they need titanium dioxide as pigment or additive and have to import it from overseas, they'll find some way around it or just go without." The data, however, show that China imported 67 million kilograms at a value of more than USD 124 million of titanium dioxide in 2007. Still, looking at relevant import duties the perception is that China is not as open to imports necessary to producing high-end powder coatings as it could be.

» **Limited product market experience:**
China has experience primarily in powder coating metal furniture and household appliances since the mid-1990s. The Chinese also have some experience with powder coating automotive parts and components, lighting fixtures, aluminum architectural profiles, and oil and gas pipelines. Emerging product markets are: wood, plastic, and paper products; marine applications; car bodies; and the steel industry.

» **Environmental standards and practices:**
Four areas of environmental concern are raised: the use of heavy metal inputs (lead) and carcinogenic curing compounds in powder coating chemistries, the use and release of toxic pretreatment chromates and phosphates, reliance on TGIC polyester, and limited environmental standards and practices in China regulating VOCs and waste emissions.

More info on markets: www.european-coatings.com/markets/

Figure 1: China Powder Coating Production 1995-2007 (1,000 metric tons)

Year	1,000 Metric Tons	% change
1995	40	
1996		
1997		
1998		
1999		
2000	118	195,0 %
2001	150	27,1 %
2002	270	80,0 %
2003	340	25,9 %
2004	410	20,6 %
2005	510	24,4 %
2006	630	23,5 %
2007 (est)	710	12,7 %

Source: Chemical Industry and Engineering Society of China (CIESC)

Figure 2: 2006 China Powder Coating Production, by type

	China (%)	World (%)	China-over/(under)
Epoxy Polyester hybrid	45,4	51,3	(5,90)
Polyester TGIC	26,7	20,5	6,20
Polyester /TGIC free	6	16	(10,00)
Pure Epoxy	17,9	6,5	11,40
Others	4	3,8	0,20

Source: US Dept of Commerce, Commercial Service