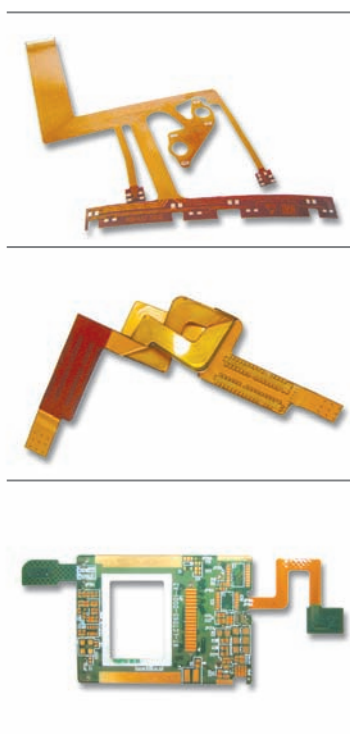


Flexible PCBs



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FLEXIBLE PCB MANUFACTURING IN MAINLAND CHINA, TAIWAN AND HONG KONG

A ground-level view of supplier capabilities and product trends in the flexible PCB industries in mainland China, Taiwan and Hong Kong.

EXECUTIVE SUMMARY

The flexible PCB industry in Greater China currently stands as the world's second largest, clinching 13.3 percent of the global market next to Japan's 28.4 percent. Average annual production growth rates of about 15 percent are expected through 2008, higher than the projected worldwide industry growth rate of 8 percent.

Mainland China alone expects the production value of its flexible PCBs to account for 20 percent of the global output through 2010. Taiwan, which is fourth in terms of world market share at 12.8 percent, registered a production value of \$1.02 billion in 2005.

Although mainland China had only about 10 flexible PCB makers in 2000, low production costs and a widening application range have prompted manufacturers mostly from Japan and the United States to set up factories or establish their subsidiaries on the mainland.

To date, there are more than 100 flexible PCB manufacturers in mainland China, mostly located in or near Guangdong, particularly in Shenzhen, Guangzhou, Huizhou, Zhuhai and Dongguan, and Fujian Province.

Taiwan has 50 makers specializing in flexible PCBs, many of which are based in Taoyuan. Like most electronics and components manufacturers in Asia, Taiwan companies continue to move their main production bases to the mainland to optimize costs and resources.

The following are some of the key findings in the report:

- Many of the companies surveyed expect the telecom and home appliances sectors to remain the leading applications for flexible PCBs. About 48 percent of the makers plan to increase their production by at least 20 percent to cater to growing volume orders for such products.
- Flexible PCBs designed for PCs

and peripherals, LCD TVs, digital cameras and PDAs will continue to be the mainstream products in the tail-end of 2006 and at least until the first half of 2007. Makers will also focus on emerging applications even as they continue to expand their output of standard products.

- R&D will center on HDI (2+N+2/3+N+3) PCBs or flexible PCBs with embedded passives technology; as well as the integration of flexible PCBs with COF, COB and COG technologies for LCD applications.
- Price hikes of up to 10 percent are likely for flexible PCBs from Taiwan

All suppliers were asked to participate in a survey designed to provide insights into product and price trends, and major challenges the industry will face in the next 12 months.

Industry Background discusses the flexible PCB segment in mainland China, Taiwan and Hong Kong. It talks about the major manufacturing bases in the region, industry drivers and challenges, and export markets of the surveyed companies.

Manufacturing Capability looks into the key production processes of the companies. This section describes the makers' capacity utilization, number of production lines and employees, size of their facilities and key production inputs.

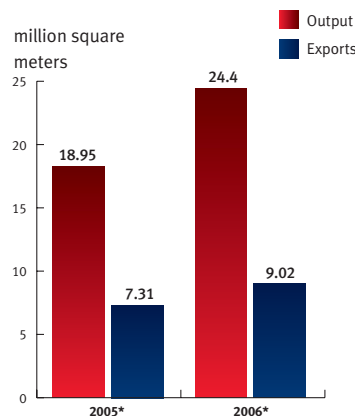
Products and Prices features information on the latest product trends and top areas of application. It discusses the R&D focus of makers and factors affecting pricing.

Outlook gives projections and forecasts on production, exports and prices in the next three to 12 months. It discusses major trends and issues that will likely affect future market trends.

The **Supplier Profiles** section provides a comprehensive description of the manufacturing capabilities, quality standards and product development activities of 20 of the 46 companies included in the report. It also features 60 export models, each with product details and key specifications. Prices and specifications of 60 bestselling export products with full-color images are also included.

The **Supplier Tables** section features tabular outlines of production and export capabilities, as well as R&D and QC facts, of the 26 other surveyed companies.

Production and exports of flexible PCBs in Greater China



Production is growing at an accelerated rate of 15 percent annually, compared to annual global industry estimates of 8 percent.

* Aggregate estimations of surveyed companies
Source: Global Sources

and Hong Kong, spurred by rising raw material costs. Conversely, quotes of mainland China products are expected to drop by at least 5 percent as makers opt to remain price-competitive.

To prepare this report, Global Sources' research teams toured the factories of 20 flexible PCB manufacturers and interviewed top-level executives, who discussed their respective companies' performance in 2005 and forecasts for 2006 and 2007.

IN THIS REPORT

20 In-depth Company Profiles
26 Profile Tables of Other Companies
Supplier Index of 46 Flexible PCB Manufacturers-Exporters

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Notes:

All company financial, production and export data, phone and fax numbers, URLs and e-mail addresses in this report were provided by the companies interviewed. While they have been verified wherever possible, Global Sources does not guarantee their accuracy.

Prices quoted in this report are in US dollars, unless otherwise specified. Product prices were provided by the companies interviewed as references only. Buyers seeking firm quotes relating to products mentioned in this report should contact the companies directly.

Data, charts and tables in this report are derived from information provided by supplier-respondents. Where third-party data are used their sources are mentioned.

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Career Technology (Mfg) Co. Ltd

Career Technology (Mfg) Co. Ltd was established in 1992 in Taipei, Taiwan. Career manufactures integrated flexible PCBs, such as COF and COB with wire-bonding PCBs and COG PCBs. Aside from flexible PCBs, the company also offers elastic and integrated services such as IC bonding.

In April 2003, Career merged with Pucka Ind. Co. Ltd, which was founded in 1978. At present, Career claims to be one of the top manufacturers of flexible PCBs in Taiwan and among the top ten makers in the world. The company was listed on the Taiwan Stock Exchange in 2002. It has a workforce of about 5,200 and operates sales channels in mainland China, Hong Kong, Japan, Singapore, Malaysia, South Korea, the United States and Finland.

Career offers OEM and ODM services, which takes up fifty-fifty of production. It exports 48 percent of its total output. The company mainly ships its flexible PCBs to East Asia, which

absorbs 58 percent of its exports; Southeast Asia and the Middle East, 25 percent; and Europe, North and South America, a total of 17 percent. Its major customers include Motorola, Samsung, LG, BenQ, Siemens and Pantech. It also supplies flexible PCBs to Compal, Quanta, Wintek, AUO and Asustek. Career ships its products mainly by airfreight.

In 2005, annual sales reached more than \$219 million. From January to April 2006, sales have so far reached \$67 million. The company projects that at least 38 percent of its 2006 annual sales will come from multilayer and air gap flexible PCBs, while 34 percent from double-sided flexible PCBs, 23 percent from single-sided flexible PCBs, and 5 percent from rigid-flex PCBs.

Manufacturing Capability

Career has six manufacturing plants. Three are in Taipei and the other three facilities are in Kunshan, Suzhou and Shenzhen. The company is currently

building its seventh factory in Taipei. The 42,900-square-meter factory is expected to be completed in the first quarter of 2007.

The company's three factories in Taipei cover a total area of 17,000sqm, while the Kunshan factory covers 28,000sqm; the Suzhou factory, 20,000sqm; and the Shenzhen factory, 8,800sqm. All the facilities are certified to ISO 9001, ISO 9002, ISO 14001, QS 9000 and TS 16949 standards. Career has also been complying with the RoHS directive for flexible PCBs manufacturing since mid-2004. About 97 percent of its flexible PCBs are RoHS-compliant by the third quarter of 2005. Currently, almost all of Career's flexible PCB product lines are RoHS-compliant. The company is also a Sony Green Partner.

Career has about 5,000 production workers and has over 50 SMT lines for flexible PCB production. At present,

Company Background

Year established	1992
Head office location	Taipei, Taiwan
Factory location(s)	Taipei, Taiwan; Kunshan, Suzhou and Shenzhen
Total factory space (sqm)	73,800
Total employees	5,200
Total production lines	50
R&D budget (% of sales of all products)	5

Sales/Export Performance

2005 sales of all products (US\$)	219,304,921
2005 export of all products (US\$)	105,266,362
2005 export value of flexible PCBs (US\$)	105,266,362
Major brands/clients served	Motorola, BenQ, Siemens, Samsung, LG, Pantech, Wintek, AUO, Asustek, HTC
Export ports	C.K.S. Airport
Regions served	Americas, Europe, East Asia

Types of Buyers Served

% OEM	50
% ODM	50

Forecasts

Price forecast for Q4 2006	Increase by 10%
Export forecast in 2006	No change
Production volume forecast in 2006	No change

Manufacturing Index

Year when flexible PCBs were first produced	1992
Total monthly capacity (sqm)	230,000
Technology partners	ITRI, TEEMA
Product approvals	UL, CE, TÜV
Management certifications	ISO 9001, ISO 9002, ISO 14001

In-house/Outsourced Processes

Silkscreen printing	In-house
Photoengraving	In-house
PCB milling	In-house
Patterning	In-house
Laminating	In-house
Drilling	In-house
Solder plating	In-house
Solder resist	In-house
Populating	In-house
Testing	In-house

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