



## Semiconductor Equipment Industry Report, 2009

Nov/2009

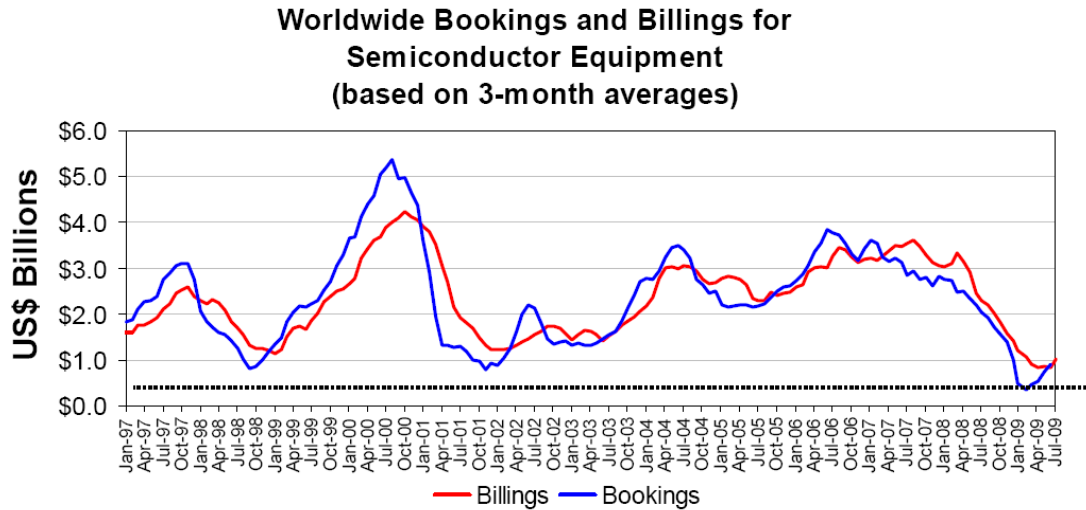


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**1.1 Current Situation**

**Ratio of Global Semiconductor Order to Shipment, Jan 1997- Jul 2009**



**Ratio of Order to Shipment of North American Semiconductor Manufacturers, Jan 2007 – Sep 2009**

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The semiconductor industry is undoubtedly a sector with sharp fluctuations, while semiconductor equipment fluctuates more sharply.

**2. Semiconductor Equipment Industry and Market**

**2.1 Semiconductor Equipment Market**

**Market Scale of Global Semiconductor Equipment, 2006-2012E**

	2006	2007	2008	2009	2010	2011	2012
Market Scale (\$m)	37,880	42,760	****	****	****	****	****
Annual Growth Rate		12.9%	****	****	****	****	****

**Global Semiconductor Equipment Capital Expenditure, 1987-2010E**

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**Global Semiconductor Materials Revenue, 1987-2010E**

See in the full report

**3.2 Regional Distribution of Semiconductor Industry**

**Output Value of Semiconductor Industry by Region, 2009**

Europe	North America	Japan	Others
****	****	****	****

The United States is the birthplace of semiconductor industry. In 1960s, the United States started to produce semiconductors; meanwhile, it was also leading in semiconductor equipment industry with advanced science and technology. Japanese semiconductor equipment companies obtained considerable advanced technology from the United States through cooperation and purchase, and gradually established their own industrial bases. By virtue of their original science, technology and innovation, Japanese companies got breakthroughs in key areas, such as lithography equipment where they even surpassed the United States. In late 1980s, the focus of the global semiconductor industry shifted to Japan. NEC, Toshiba, Hitachi, OKI and other companies established their leading positions in the global semiconductor industry through strict production management and strengthened quality control on DRAM chip production. With the development of Japan's powerful integrated circuit industry, there were substantially increasing demands for equipment, which created a good opportunity for the development of semiconductor equipment industry. With

their advantages in price, quality, service, etc., Japanese semiconductor equipment companies were attractive to many Japanese and South Korean semiconductor companies that were conducting capacity expansion at that time.

In 1980s, the market shares of the United States in the global semiconductor equipment industry plummeted from 80% in 1980 to 55% in 1987. Faced with the challenges from Japanese semiconductor equipment and technology, the U.S. Department of Defense united 11 large semiconductor companies to found Semiconductor Manufacturing Technology Industry Alliance (SEMATECH), following the example of Japan to make the government cooperate with the industry. SEMATECH did not produce or sell any product, but used mutual funds to research and develop advanced products. SEMATECH played a significant role in promoting the development of the semiconductor equipment industry in the United States in 1990s. It boosted the cooperation between assembly plants and equipment providers, accelerated the research and development of semiconductor equipment and materials, facilitated process standardization, so that the United States regained its advantageous position in equipment research and development.

As for research and development of 12-inch semiconductor devices, the United States established International 300mm Initiative Alliance which was centering SEMATECH at the end of 1995. 13 semiconductor manufacturers from Europe, Taiwan and South Korea participated in this alliance. To compete with it, 10 major Japanese semiconductor companies set up "Semiconductor Leading Edge Technologies" (SELETE) jointly in 1996. SELETE's R & D center is located in Hitachi Research Institute. Currently, Fujitsu, NEC, Toshiba and Renesas are four core members of the alliance, and they have signed R & D contracts with 13 equipment and photomask manufacturers for the research and development of 45nm/32nm chips, new materials, new process, metal grids, high-K dielectric materials, deep ultraviolet lithography, carbon interconnection and so on.

From the late 1980s, South Korea has been developing its own semiconductor equipment industry, but the current scale of materials and equipment industry still can not rival with that of the United States, Japan and other countries. After South Korea had 10-15% market shares in the global semiconductor equipment industry, it has not made any more progress. In 2007, about 20% of South Korea's semiconductors were made locally, and the localization ratio of pre-processing equipment and post processing equipment was 15% and 44.7% respectively. In South Korea, the leading semiconductor equipment companies include Shinsung, DMS, ADP, KC Tech, Top Engineering and LG Electronics. Shinsung is engaged in the production of CVD equipment and clean room equipment, etc.. DMS produces photomask equipment, wet etching equipment, cleaning equipment, etc.. LG Electronics produces automated test equipment. Overall, South Korean semiconductor equipment companies focus on the field of LCD devices, but in recent years, Shinsung and some other companies have been actively developing solar power equipment.

#### 1 Equipment manufacturers and semiconductor manufacturers cooperate closely.

Most of South Korean semiconductor equipment makers were separated from large domestic semiconductor companies in early years. Equipment industry and semiconductor manufacturing have close relationship in human resources and technology. South Korea's two largest semiconductor manufacturers attach great importance to supporting and cultivating domestic equipment suppliers in order to obtain Second Source of equipment, spare parts and materials. Samsung invites domestic equipment companies to in charge of research and development, and guides the future direction. Besides, Samsung tries to provide chip production lines to equipment companies for their testing. Hynix adopts decentralized equipment procurement to promote technological exchange. In such environments, South Korean companies are enthusiastic about technology investment, and constantly improve product quality and service to meet the complicated and stringent requirements of domestic semiconductor manufacturers.

## 2 Planning and support of the government

To enhance the localization ratio of semiconductor devices, South Korean government formulates the "National Large Semiconductor Equipment Development Project" (also known as Project 2015). This project proposes the semiconductor equipment localization rate should reach 50% in 2015, South Korean semiconductor equipment companies should rank top 10 in the global industry, and the self-development capacities of South Korean semiconductor manufacturers should be further strengthened. South Korean government plans to invest 360 billion won in research and development by three phases during 2007 to 2015, so as to promote the localization of semiconductor devices. In the future, it will set up Core Semiconductor Equipment Development and Preparation Committee to research and develop semiconductor photomask, etching equipment, photomask-use coating equipment, Neutral Beam equipment, stepper lithography machine and other core equipment. The fund is allotted as follows: 90 billion won (30 billion won per year) in the first phase, 120 billion won (40 billion won per year) in the second phase, 150 billion won (50 billion won per year) in the third phase; additionally, matching fund is given to equipment and components manufactures for their R & D.

In addition, South Korea Semiconductor Association actively coordinates Samsung Electronics (Samsung), Hynix, DongbuAnam and other major semiconductor companies, academic institutions, research institutions to set up "core semiconductor equipment Development Alliance" to prompt Project 2015.

## 5. Semiconductor Equipment Manufacturers

### 5.1 Applied Materials

Founded on Nov 10, 1967, Applied Materials' fiscal year ends every October. Its revenue was USD5 billion in 2009FY, and the market value was USD17.4 billion. In addition, the R&D expense was up to USD9.34 million as well. With 7,600 patents and 12,600 employees, it headquarters in California, the United States, and has production bases respectively in China, Germany, Israel, Italy, Singapore, Switzerland, Taiwan and the United States.

Since 2000, Applied Materials has become the world's largest semiconductor equipment manufacturer, and it has four divisions, semiconductor devices (silicon), AGS, display and new energy (solar energy). The display division is operated by its subsidiary, Applied Komatsu Technology (AKT) which was co-established by Applied Materials and Komatsu, Ltd in Sep, 1993 with 50% shares each. In Oct, 1999, Applied Materials acquired 50% shares that Komatsu, Ltd held, and then AKT had affiliated to Applied Materials. AKT is the world's TFT-LCD equipment CVD the leading manufacturer.

**Applied Materials Revenue and Gross Profit Margin, 2004-2009FY**

	2004FY	2005FY	2006FY	2007FY	2008FY	2009FY
Revenue (USD1 million)	8013	****	****	****	****	****
Gross Profit Margin	46.2%	****	****	****	****	****

**Applied Materials Revenue by Division, 2006-2009FY**

	2006FY	2007FY	2008FY	2009FY
Silicon	5971	****	****	****
AGS,	2352	****	****	****
Panel Display	824	****	****	****
New Energy	20	****	****	****

**Applied Materials Sales and Operating Profit, Q1-Q4, 2009FY**

See in the full report

**Applied Materials Revenue by Division, Q4 2009FY**

See in the full report

**Applied Materials Orders by Region, Q4 2009FY**

See in the full report

**Applied Materials Order Sum by Region, 2006FY- Q1-Q3 2009FY**

	2006FY	2007FY	2008FY	Q32009FY
Taiwan	2098	****	****	****
North America	1901	****	****	****
Asia Pacific	1272	****	****	****
South Korea	1758	****	****	****
Japan	1823	****	****	****
Europe	1036	****	****	****



**Applied Materials Sales by Region, 2006FY- 2009FYQ1-Q3**

	2006FY	2007FY	2008FY	Q32009FY
Taiwan	2079	****	****	****
North America	1708	****	****	****
Asia Pacific	1157	****	****	****
South Korea	1699	****	****	****
Japan	1518	****	****	****
Europe	1006	****	****	****

**Applied Materials Order Sum by Division, 2006FY-2009FYQ1-Q3**

	2006FY	2007FY	2008FY	Q32009FY
Silicon	6555	****	****	****
AGS,	2413	****	****	****
Panel Display	883	****	****	****
New Energy	37	****	****	****

Applied Materials mainly has following products, atomic layer deposition (ALD), chemical vapor deposition (CVD), physical vapor deposition (PVD), etch, ion implantation, rapid thermal processing (RTP), chemical mechanical planarization(CMP),wafer metrology and inspection, CVD, PVD and CMP.

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**Address: Room 1008, A2, Tower A, Changyuan  
Tiandi Building, No. 18, Suzhou Street, Haidian  
District, Beijing, China 100080**

**Tel: 0086-10-82600828, 82600893**

**Fax: 0086-10-82601570**

**Mail: [report@researchinchina.com](mailto:report@researchinchina.com)**

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