

Company: Hirata Corporation  
President: Kozo Yoneda  
Securities code: 6258  
Contact: Investor Relations and  
Public Relations Department  
(E-mail: [hirata\\_info@hirata.co.jp](mailto:hirata_info@hirata.co.jp))  
(URL: <http://www.hirata.co.jp>)

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## **Development of Transfer System EFEM for 450mm Wafer**

Hirata Corporation has developed the transfer system EFEM (Equipment Front-End Module) for 450mm wafers, as a production system for semiconductor related equipment. The trial model will be exhibited at SEMICON Japan 2009(\*1).

Hirata Corporation manufactures and sells a variety of production systems for automotive, FPDs (Flat Panel Displays), semiconductors and consumer electronics. In the semiconductor segment, we have earned a high degree of trust and positive reviews from customers, especially for load ports transferring silicon wafers between various processing tools, wafer transfer robots accepting wafers from low-vacuum to high-vacuum environment, and EFEM integrated load ports and wafer transfer robots.

Technical innovation in the semiconductor industry is shifting focus from the current 300mm wafer size to 450mm wafers for future applications.

In order to meet this change, we capitalized on the technology and know-how that we've acquired in the past experience and performance to develop the EFEM corresponding to larger wafer sizes. We will exhibit and demonstrate the trial model at SEMICON Japan 2009.

### 1. Product Features

#### (1) Compatible with miniaturization, high integration

With the increasing diameter of silicon wafers in the semiconductor industry, we also see further advancements in miniaturization and integration. Through means of proprietary airflow control technology in our EFEM, we have achieved a super-clean (\*2) manufacturing environment, capable of handling next-generation semiconductors on the order of 22 nm circuit line width.

#### (2) High-speed, high-stability

To increase overall system productivity, we developed a new controller, capable of processing nearly eight times the volume of previous systems at a high throughput of 500 wafers per hour. Smooth motion control technologies allow for the stable, secure transfer of wafers through the process.

(3) A broad range of variations and customized options

The wafer transfer robot, load port, and aligners comprising the system are all in-house products, and it's possible to put together a structure that meets a variety of customer needs by providing different equipment combinations and a flexible layout.

(4) Eco-friendly system

We designed the wafer transfer robot and load port to be battery-free, which not only improves ease of maintenance, but also leads to reduced scrap. Our innovations in structure simplification have reduced weight, thus offering cost savings in connection with lower energy use.

We have already delivered a system for evaluation (fitted with a robot and aligner) to the ISMI (International SEMATECH Manufacturing Initiative), which is running a 450 mm program. Functional evaluations have been completed at ISMI.

As the next step, a more practical EFEM system (robot, aligner, FOUP opener) for 450 mm wafers for clean level evaluations is expected to be submitted in January of next year.

In the future, we plans to expand beyond EFEM, developing a platform that incorporates a vacuum robot and center vacuum chambers for the transfer system for 450 mm wafers.

## 2. Product Appearance



※The display at SEMICON Japan 2009 is trail model and differ in appearance.

### 3. Impact on Financial Results

The EFEM is expected to contribute to the improvement of financial results for the next fiscal year (FY03/11) by increasing sales of semiconductor production facilities.

\* 1 SEMICON Japan 2009

The largest international exhibition of semiconductor equipment and materials held at Makuhari Messe in Chiba from December 2 to 4, 2009.

\* 2 Super-clean

Ultra clean environment maintained ISO Class below 1. Class indicates unit to define the cleaning level and the less the class number, the higher the cleanliness.