# *a clear edge*

## *Reducing your energy usage with STP maglev turbopumps*

EDWARDS

Vacuum science... product solution.

# *a clear edge*

*technology you can trust*

*Consciously reducing your carbon footprint*

*Reduce your energy usage with the latest technology*

# *STP maglev turbopumps*

**Reducing energy consumption is key to the fight against global warming, and with increased utility costs our customers are under greater pressure to meet their energy reduction targets. Simply switching from a Diffusion pump to the latest STP maglev turbopump can have dramatic and immediate impact on your energy consumption. Edwards energy saving technologies are incorporated into the design phase of our product development to ensure reduced energy consumption with no compromise on quality or performance.**

## Economise by switching to the latest technology

- Maintenance free - eliminating additional maintenance and consumable costs
- Low power and utilities compared to other technologies
- Fast pump down to base pressure with speeds up to 4500 l/s
- Controllable pumping speeds and throughput for process flexibility
- No hot oil or hot surfaces ensure safe operation
- Rapid start up and shut down
- Ultra clean oil-free operation with no oil waste to dispose of

power consumption
reduced by >90%
at ultimate

We recommend replacing 10” diffusion pumps with 2200 l/s maglev turbopumps

| | Edwards HT10 diffusion pump | STP-iXR2206 maglev turbopump | % reduction | $CO_2$ reduction per year (tonnes) |
|---|---|---|---|---|
| Power consumption | 5.1 kW | 0.2 kW* | 96% | 23.1 pa** |
| Water consumption | 400 l/hr | 180 l/hr | 55% | |

We recommend replacing 16” diffusion pumps with 3300 l/s maglev turbopumps

| | Edwards HT16 diffusion pump | STP-iXA3306 maglev turbopump | % reduction | $CO_2$ reduction per year (tonnes) |
|---|---|---|---|---|
| Power consumption | 9 kW | 0.3 kW* | 97% | 40.9 pa** |
| Water consumption | 700 l/hr | 180 l/hr | 74% | |

We recommend replacing 20” diffusion pumps with 4500 l/s maglev turbopumps

| | Edwards HT20 diffusion pump | STP-XA4503C maglev turbopump | % reduction | $CO_2$ reduction per year (tonnes) |
|---|---|---|---|---|
| Power consumption | 12.6 kW | 0.3 kW* | 98% | 57.9 pa** |
| Water consumption | 960 l/hr | 180 l/hr | 81% | |

** at 300 sccm gas load power*
*** energy source units vs kW/h*
*Kg $CO_2$ = kWh 0.537*
*Soure: Department for Environment, Food, Rural Affairs, UK*

## Fully integrated controller and power supply

- Excellent pumping performance with speeds from 300 to 4500 l/s
- Compact design with fully integrated controller and power supply eliminates cabling requirement
- Self-sensing magnetic bearing system will allow installation in any angle
- Can be configured to run in corrosive or harsh processes
- Automatic Balancing System (ABS) as standard
- Automatic Vibration Reduction (AVR) as standard
- Profibus® available
- IP54 rated
- Easy installation

# Edwards STP maglev turbopumps

## Technology you can trust

With a consistent, reliable performance and zero maintenance, the Edwards STP maglev turbopump is the ideal choice for critical and demanding applications. The multi-axis magnetic bearing system is used to suspend the rotor during operation, ensuring there is no risk of contamination while minimising noise and vibration. Advanced Edwards STP Maglev TMP's incorporate built in diagnostic capability that provides real-time information regarding pump health and rotor balance preventing unforeseen maintenance problems, thereby increasing process uptime.

### Ultra high vacuum series

- Pumping speeds of 300 to 1000 l/s
- <$10^{-10}$ mbar (CF flange) ultimate pressure
- Low vibration
- Highest reliability
- Maintenance free
- Harsh process compatible (C version)

### Ultra high vacuum low vibration series

- Pumping speeds of 300 to 450 l/s
- Built-in vibration isolator gives ultra low vibration performance
- Increased pumping performance <$10^{-10}$ mbar (CF flange) ultimate pressure
- Low magnetic field variants
- Highest reliability
- Maintenance free
- Harsh process compatible (C version)

### Advanced high throughput maglev turbopumps

- Pumping speeds from 300 to 4500 l/s, with throughput up to 6 slm.
- Advanced series rotor technology and 3D blade design
- Holweck drag stage with reversed spiral for high gas throughput
- Digital 5-axis control
- Harsh duty compatible
- Class leading performance on ISO250
- Increased $H_2$, $N_2$ and Ar performances

# Application expertise from Edwards

## Coating

Whether for batch or large surface area coating, our advanced vacuum pumps, in-depth applications expertise and global presence allows us to provide you with cost-effective, reliable and environmentally sound solutions to support you during the life of your system wherever you are located. Edwards is your ideal partner for achieving easy installation, high performance, long term uptime, and low cost of ownership.

## R&D/Scientific

Edwards has a deep understanding of R&D and the critical role that vacuum plays in many scientific applications. Our class leading products and application know-how, allows us to offer a broad range of solutions enabling you to push the boundaries of modern science. From the smallest school laboratory to huge particle accelerators, our products and services are facilitating education, development and scientific evolution across the globe.

## Metallurgy

Melting, refining and casting processes require vacuum pumps capable of handling large amounts of dust and debris created from oxidised metals formed from the ceramic moulds. High reliability of the vacuum equipment is essential whilst low cost of ownership must be maintained, therefore selecting the right pumping mechanism is a critical decision.

Edwards engineers will work with you to select the right pump package for your application, ensuring best performance and highest system reliability for a range of metallurgy applications.

## Flat Panel Display

Processes using significant volumes of harsh process gases, such as Silane (SiH4) and Nitrogen Tri-Flouride (NF3), create downstream silica powder and fluorine based abatement by-products that have to be managed efficiently from the production facility in order to meet local environmental regulations. As the demand for the LCD panel size and product attributes change it drives new process gas challenges. By combining Edwards vacuum pumps and point-of-use abatement products with downstream management solutions, an optimised turnkey offering can be designed, installed, commissioned and project managed by Edwards.

## Semiconductor

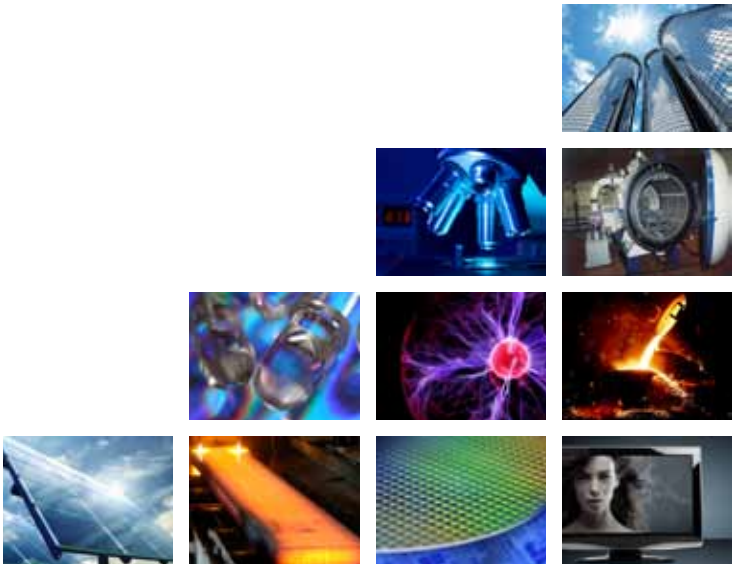
The move towards larger substrates, e.g. 300mm to 450mm silicon wafers, creates a higher level of process technology and logistical challenges. To allow you to focus on the R&D of these new technologies, Edwards can provide the best vacuum and abatement products but can also take care of the hook-up, product facilitisation and the waste downstream gas and liquid management, as a one vendor produced solution.

## LED

Increasingly stringent environmental regulations relating to the by-products from abating MOCVD gases, means existing gas abatement technologies in these industries have to have increased performance levels. In conjunction with Edwards SpectraG air-cooled systems, upgraded turnkey solutions can be developed to help retrofit the existing install to ensure full performance and environmental compatibility when managing the process gas waste streams.

## Solar

In both amorphous silicon (a-Si) panel and crystalline silicon cell production, challenges manifest themselves, such as higher volume process gas destruction, speed of fab production ramp, sufficient technical knowledge base in emerging economies and finding best-in-class suppliers in remote regions or new emerging markets. Edwards global reach and years of electronics' market experience, combined with the additional scope offered in Edwards Turnkey Systems, can provide designed and delivered solutions to these problems.



# Edwards corporate aim

We are committed to minimising our impact on the environment and improving our environmental performance. Our priorities are:

Reduce our customers' carbon footprints

- by providing equipment to abate our customers' emissions
- and introducing high efficiency vacuum and abatement products

Reduce the carbon intensity of our operations

- by reducing carbon consumption in our value chain
- and developing detailed energy efficiency plans at each manufacturing site

Reduce water usage at our facilities

- by minimizing water consumption in all manufacturing processes
- and developing opportunities to implement water recycling

Reduce waste from our facilities

- by eliminating all waste to landfill
- and enabling the reuse of our products through service and remanufacture

Maintain a global Environment Management system and ISO14001 compliance for the business

*the path*
*to a greener future*

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