



THE PRODUCTION AND BUSINESS IMPACT OF EDWARDS XCEDE DRY PUMP UPGRADES

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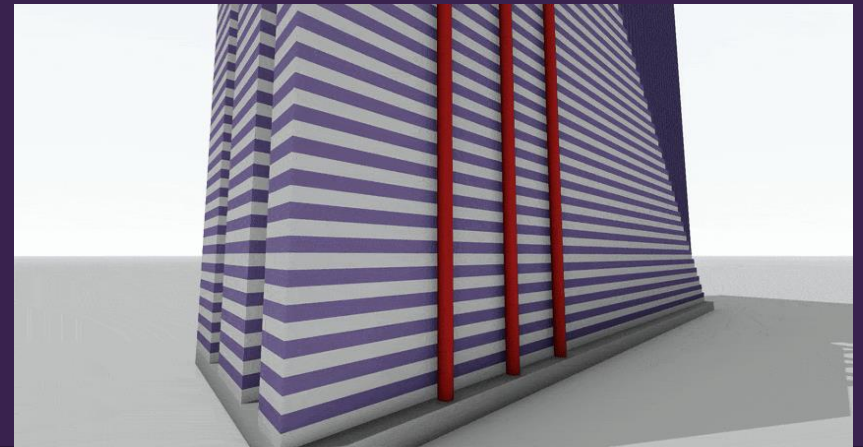
As technology nodes advance so do the vacuum challenges.

Producing the most advanced microchips involves highly complex chemical and physical processes, materials, and gases ...and the care of hazardous by-products.

The more advanced the technology, the more significant the industrial challenges.



The expansion of foundries into more complex semiconductor production with processes such as ALE, and the growing layer count, means the stakes are getting higher. The risks of losses of stock from production interruption and production downtime, mean customers are seeking to constantly improve reliability and efficiencies from support equipment, such as vacuum and abatement systems.



THE EXPANDING PROBLEM

New process applications have pushed the limits of legacy pumping products.

For example, the range of CVD process precursor materials and associated reaction by-products, vulnerable to condensation in chamber vacuum dry pump systems, is expanding.

In this regard, challenging substances include ammonium chlorides, ammonium fluorides, hafnium chlorides, sulphur-based compounds, liquid precursors, and others.

TWO CONCEPTS IN CONFLICT

To some extent, the tendency for materials to condense in most vacuum systems can be reduced by diluting the exhaust with inert gas, as is done to control flammability. If, however, dilution rates are reduced to lower the cost and improve abatement efficiency, *an alternative strategy* is needed to control the condensation of liquids and solids in the process exhaust stream.



CHALLENGING SUBSTANCES

- ammonium chlorides
- ammonium fluorides
- hafnium chlorides
- sulphur-based compounds
- liquid precursors
- and others

THE NEED FOR CONTINUOUS INNOVATION

To stay ahead of all the new vacuum-critical applications, such as Etch, Edwards has developed a stream of successful innovations and new products and technologies. In fact, today we have over 20 different principles for creating vacuum and abating gas and a portfolio of over 2,300 active granted and pending patents.

The very dynamic nature of a high technology industry means frequent assessment and change to respond to new challenges. Being able to develop innovative solutions to these is a critical enabler for Edwards and its customers.

Every moment the customer is not producing, it prevents them performing in their market. They need to be as (or more) competitive and efficient as their rivals.

To be innovative means to be ahead of the times and producing something like nothing experienced or created before. Innovation is the cornerstone of sustained economic growth and prosperity. XCEDE protection technology is just one example of Edwards continuous commitment to improvement and one of the three pillars of our business next to safety and environmental awareness.



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MINIMISING RISK AND SUPPORTING CUSTOMER PRODUCTIVITY TARGETS

On harsh applications like Etch, we can see condensable and corrosive gases in the chamber at the same time. To maintain the vacuum in the chambers and meet productivity expectations, there is a need to manage the impact of corrosive gases on dry pump vacuum performance that could stop wafer throughput.

The real innovation challenge here was to meet the customer objective to increase wafer throughput and productivity while also reducing the total cost of ownership. This was achieved by developing industry leading pump protection technology that could be integrated into normal upgrades and service times using Edwards' global presence.

Using our global service presence and capability, customers will be able to upgrade their product to XCEDE in the normal service lead times, meaning they keep control of their assets and fit the upgrade into their schedules.



Upgrading an Edwards dry pump with XCEDE involves replacing parts treated in a multi-stage surface technology process. This can be done as part of the normal service programme, but yields massively upscaled pump longevity and performance qualities.

As the resulting pump is otherwise identical, there is no need for time consuming requalification.

The upgraded pumps will return to the customer identical apart from the XCEDE technology, ensuring it will be the same form, fit, and function of the original pump, so there is no need to requalify.

XCEDE improves uptime through fewer service events by performing better on corrosive challenges, meaning our customers will get more value from their existing products, resulting in an overall lower total cost of ownership.

IN CONCLUSION – UPGRADING TO XCEDE

GLOBAL PRESENCE

Edwards has a strong global presence, meaning our Service Technology Centres, Applications, and Field Service teams are ready to assist in all regions with access to global resources.

IMPROVED UPTIME

Improved uptime through fewer service events - perform better on corrosive challenges through innovation. Delivered through service. XCEDE upgrades not only let you improve your MTBS, but you are also able to upgrade legacy pumps with no need to requalify a product.

REDUCED COST OF OWNERSHIP

The overall benefits for our customers are reduced CoO, better pump reliability, and better wafer throughput and productivity.

Through the work of our own in-house technologist and our partnerships with world leading scientists, we have developed a class-leading protection technology. This, coupled with our state of the art fully automated XCEDE line in Korea, we can ensure a continuous high-quality supply of XCEDE products to our customers, enabling their innovation.



Louise Hosking, Service Product Manager, Edwards



To upgrade your dry pump fleet with XCEDE talk to Louise at Louise.Hosking@EdwardsVacuum.com



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