

# INTERNATIONAL COLLABORATION DELIVERS ULTRAPURE WATER FOR WORLD-LEADING MICROELECTRONICS MANUFACTURER

CASE STUDY | Microelectronics



To meet the expanding needs of a leading microelectronics manufacturer, Veolia has designed and installed a tailored ultrapure water (UPW) system at the company's production and innovation facility located in the Republic of Ireland. Veolia's solution not only ensures a reliable and robust UPW supply but also supports the circular economy by capturing and reusing wastewater from the UPW stream, aligning with the client's sustainability goals.

## | The client's needs

Ultrapure water is essential in developing and producing microelectronic components, serving multiple purposes throughout the manufacturing process. To meet rapidly growing fabrication capacity demands, the world-leading microelectronics company required a 70 m<sup>3</sup>/hr expansion of its ultrapure water (UPW) supply.

Following a competitive bid, Veolia quickly developed a proposal and system design, securing selection as the manufacturer's partner, building on successful delivery of previous projects for the client. Veolia's global expertise in microelectronics was a key factor, enabling access to the specialist team in Singapore to incorporate the latest design best practices. This international collaboration saw the Singapore team lead system design, while the Ireland team managed project execution, equipment commissioning, and ongoing maintenance.

## | The solution

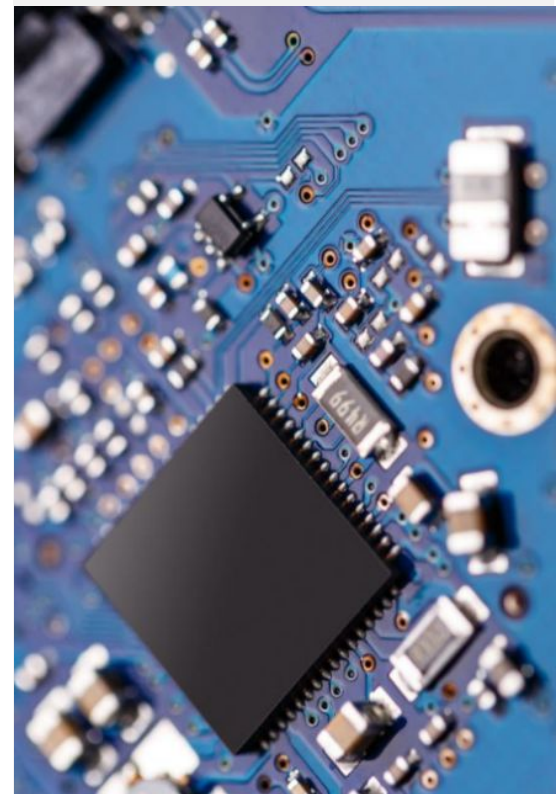
Given the critical role of ultrapure water (UPW) in microelectronics production, ensuring the highest reliability was paramount. To achieve this, the system was engineered with two independent water treatment trains, providing N+1 redundancy. This design allows one train to be shut down for maintenance or in case of an issue without disrupting site operations. However, limited site space required a compact design that incorporates all necessary elements within the smallest possible footprint.



*Republic of Ireland*

## | The client

**Ireland** -- A leading microelectronics manufacturing facility located in the Republic of Ireland.



Veolia's custom solution features a range of water treatment technologies to ensure both consistent quality of ultrapure water (UPW) and reliable operation of the treatment equipment. Each train begins with pre-treatment using a Filtraflo\* FCP 22-25 multi-media filtration unit, organic scavenger treatment, activated carbon filters, and an IonSoft\* Mega softener. This is followed by a Sirion\* Mega HF providing first-pass reverse osmosis (RO) to remove up to 98% of dissolved particles, and a Terion\* 25000 for the second-pass RO to further reduce the ionic and organic content of the water. Downstream of this, the water undergoes polishing to achieve the UPW standard using continuous electrodeionization (CEDI), ultraviolet (UV), and ultrafiltration (UF) treatment. Together, these advanced technologies deliver high performance and sustainability, ensuring operational efficiency and peace of mind for our customers.



## | The benefits

The service and support provided by Veolia is also a key factor in ensuring a dependable supply of UPW. Veolia's expert service team works closely with the client to support the in-house engineers. The manufacturer also invested in Veolia's Hubgrade\* digital monitoring system to assist with predictive maintenance, troubleshooting and scheduling of routine inspections. Hubgrade utilises digital sensors installed on key pieces of water treatment equipment to deliver real-time monitoring and alerts as well as process optimisation in partnership with Veolia's engineers. The securely collected and stored data is displayed on a dashboard, which can be tailored to the specific needs of the site and accessed using any computer, smartphone or tablet.

Due to the potentially large volumes of water required in microelectronics manufacturing, the client has made commitments to minimise the water footprint of the facility as a whole and measures the litres of water used per cm<sup>3</sup> of water produced. To help achieve this, the reject stream from each of the new water treatment trains is directed back for reuse.

*This was a project where our experience, resources and diverse range of technologies were central to its successful delivery. In a rapidly developing industry such as microelectronics, it is essential for a solution to be formulated and implemented as quickly as possible to help ensure manufacturers can respond to new opportunities.*

*Hugh Cullen, Senior Project Manager at Veolia*



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