

SOLUTIONS FOR THE SEMICONDUCTOR INDUSTRY

As a global solutions provider for advanced water and wastewater treatment, Gradiant's solutions expertise in water helps brand owners and manufacturers maximize production and achieve sustainability goals.

SEMICONDUCTORS

In today's fast-paced digital age, data and information have become the lifeblood of our interconnected world. Real-time communications, cloud computing, and exponential growth of connected devices rely on the processing power of semiconductors. As demand increases, so too has the urgency for more innovative approaches to treating and managing valuable water resources. Gradiant is leading the way to bring innovative, reliable solutions for ultrapure water (UPW), resource recovery (such as for IPA), wastewater treatment, and zero liquid discharge (ZLD).

Water is critical in fabricating semiconductor wafers, microchips, and components. These manufacturing processes require large volumes of ultrapure water to maintain yields. Demand is increasing rapidly, driven by the surging global market. However this must be balanced with increasingly stringent regulation on wastewater discharge standards, the need for reliability in production, and sustainable supply chains to reduce the water and carbon footprint.

Our innovative membrane and resource recovery systems help manufacturers maximize water recovery, reduce freshwater withdrawals, recover valuable minerals and reagents, and optimize overall water usage in existing and new fabs.

Finding optimal solutions that are cost-effective and meet site-specific requirements are Gradiant's passion – we excel at creating groundbreaking solutions to complex problems.



WE HAVE PROVEN KNOW-HOW TO:

- 1 **Maximize Water Recovery to Reduce Freshwater Withdrawals**
- 2 **Reduce Energy and Chemical Consumption yet Maintain Mission-Critical Reliability**
- 3 **Yield the Highest Quality of Ultrapure Water**
- 4 **Recover Valuable Minerals and Reagents such as Copper and IPA**
- 5 **Design and Operate Facilities with Access to the Latest AI Technologies**
- 6 **Ensure Environmental Discharge Compliance for Business Continuity**

DIFFERENT BY DESIGN

Unlike traditional water companies, Gradiant offers more than just technologies – we provide solutions that make a difference in your operations.

Our relentless focus on value ensures that whatever solution we develop will address your specific challenges and will do so at an optimized total cost of operation.

This approach not only considers capital costs but also the operational costs that endure over time.

We have the technical know-how, project delivery expertise, and AI and machine learning to ensure your facility is designed and operated at its best across its lifetime.

OUR SOLUTIONS ENABLE UNPRECEDENTED PERFORMANCE

compared to conventional technologies:



Increased Process Yield



Reduced Water and Carbon Footprints



Lower Capital and Operational Costs



Flexibility for Integration into Existing Water and Wastewater Processes



Opportunity to Reclaim Valuable Materials



Higher Operating Efficiencies



GRADIANT'S RO INFINITY WITH CFRO

Many of today's water and wastewaters cannot be efficiently treated with conventional membrane or thermal technologies. Gradiant has developed RO Infinity, an advanced platform of membrane-based solutions for complex water and wastewater challenges that combines our patented CFRO technology with innovative reverse osmosis (RO) membrane processes. ROI solutions enable customers around the world to achieve aggressive water recycling, wastewater treatment, and ZLD to reduce their water and carbon footprints and achieve sustainability goals.

RO Infinity systems are built with commercially available membranes and components for low-cost and easy maintenance. These units are designed and assembled in modular form factors with proprietary process and control technologies and backed by one of the most experienced engineering and service teams in the industry.



BENEFITS OF RO INFINITY



Minimize Capital and Operating Costs

Recovers up to 99% final brine concentrations to the saturation limits of salt (TDS up to 260,000 mg/L NaCl). This reduces the required capacity of downstream ZLD systems with cost savings of 60% versus thermal systems.



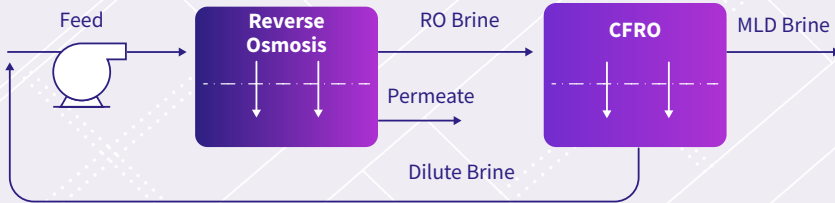
Maximize Production

Extract more fresh water, recover higher concentrations of valuable resources, and minimize waste disposal — all at lower pressures and energy usage which reduces the total water cost.



Maximize System Availability

RO Infinity systems are intelligent, adjusting for varying feedwater and operating conditions to tolerate highly variable feedwater quality, and experience less fouling and scaling than conventional systems.



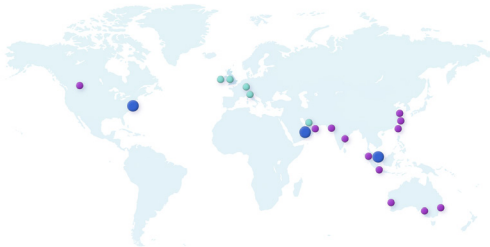
PFID of RO Infinity for Brine Concentration and MLD



RO Infinity at a US project site for a Fortune 500 industrial client.

CONTACT US

Gradiant serves its clients around the world from our global headquarters in Boston, regional headquarters and Global Innovation Centers in Singapore and Abu Dhabi, and offices located in 18 countries.



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