

Water Tells Us, We Talk With Them for Our Global Future.



NISHIKATA Kentaro

Corporate Officer
HORIBA, Ltd.
President,
HORIBA Advanced Techno Co., Ltd.
Ph. D.

According to the 2024 United Nations World Water Development Report^[1], roughly half of the global population is affected by water scarcity, a situation projected to worsen due to climate change, population growth, and urbanization. The depletion of water resources and water pollution have severe impacts on drinking water supply, agriculture, industrial activities, and entire ecosystems. Addressing these challenges requires a scientific understanding of water environments and concrete actions to build a sustainable, circular society.

The semiconductor industry exemplifies this issue. Semiconductor manufacturing processes require large quantities of ultrapure water, with a single plant's water usage sometimes equating to that of an entire city. These facilities are implementing thorough purification and recycling measures to utilize water resources effectively. Similarly, the rapidly expanding data center sector is increasing its water usage. To cool high-performance servers, efficient water-cooling systems are being introduced alongside traditional air-cooling methods. While this improves energy efficiency, it also necessitates consideration of regional water usage impacts.

In light of these circumstances, efforts toward realizing a circular society emphasize efficient water use, recycling, and pollution prevention. For instance, the European Union's Circular Economy Action Plan^[2] and groundwater conservation and water quality management technologies advancing in North America and Asia highlight the importance of accurate, data-driven water management. Analytical and measurement technologies supporting these initiatives provide the scientific foundation for understanding water conditions, enabling appropriate management and decision-making.

Electrochemical sensing technologies play a crucial role in water quality monitoring.

Advancements in new electrode materials have enhanced the precision of detecting trace components and pollutants. This progress contributes to monitoring river and lake water quality, optimizing water purification processes, and improving wastewater reuse. Additionally, spectroscopic analysis technologies precisely analyze the concentrations of chemical substances and pollutants in water, serving as powerful tools for real-time monitoring of water quality changes. Combining these technologies with artificial intelligence, machine learning, and big data analysis enables the prediction of water environment changes and the proposal of sustainable management methods.

HORIBA Group's mission, "Shape our future with solutions based on HONMAMON^[3] and Diversity," reflects our commitment to contributing to society through innovative technologies that exceed expectations and a team that leverages diversity. To realize this mission, HORIBA Advanced Techno Co., Ltd., the headquarters for water and liquid measurement within the HORIBA Group, upholds the value of "Water tells us, we talk with them for our global future." This expresses our determination to build a sustainable future by listening to the voice of water through analysis and measurement. Our mission is to develop solutions based on scientific principles, contributing to a circular society and the global environment, thereby shaping our future.

We hope this issue prompts readers to contemplate the future of water environments and leads to concrete actions. Utilizing the power of analysis and measurement, let's achieve Joy and Fun for All!

* Editorial note: This content is based on HORIBA's investigation at the year of issue unless otherwise stated.

References

- [1] UN World Water Development Report 2024
<https://www.unwater.org/publications/un-world-water-development-report-2024>
- [2] EU Circular economy action plan
https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF
- [3] HORIBA website . What is "HONMAMON?" | HORIBA Our Future [Online]. 2024
<https://www.horiba.com/our-future/en/honmamon/>