

Tritium Removal System

Patent-Pending Modular Detritiation System (MDS®) is an Innovative Tritium Management Tool for Light-Water Detritiation

The MDS® is a tritium management tool for processing large volumes of light water across a range of concentrations. This technology is based on the working principle of combined electrolysis catalytic exchange (CECE) and releases only clean oxygen and hydrogen with no liquid effluent. The technology builds on proven heavy water solutions, and although developed with a focus on light water, it can also be adapted for use in heavy water detritiation. The system is designed to reduce the volume of tritiated water which allows for reuse and recycling of tritium instead of release to the environment. This process takes dilute tritium and concentrates the tritium so it can be recycled or reused while reducing the amount of tritium released to the environment.



Veolia's Tritium Facility in Richland, WA, USA

We maintain a fully licensed and permitted tritium facility contains the unique operational prototype system utilized to perform experimental testing focused on supporting field deployments. The facility and system were fully constructed and commissioned in 5 months. The MDS® has been in operation for over 1,000 hours in a 9 month period. The facility is available to support verification testing and scoping studies.

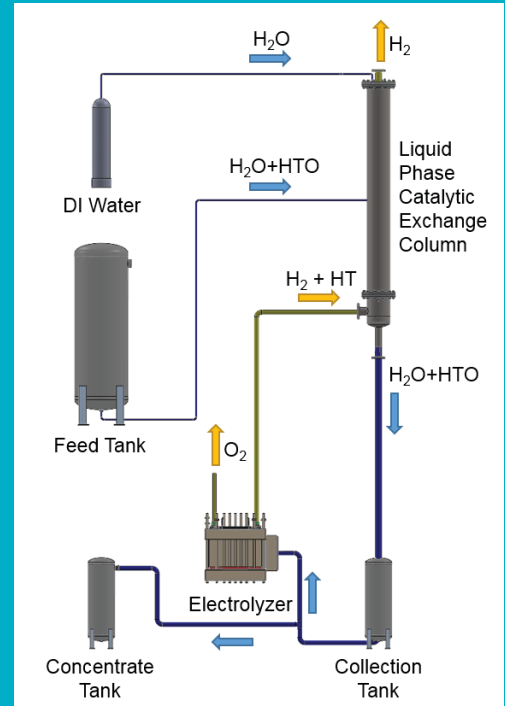
A Unique Decontamination Challenge

The decontamination of tritium (T) is particularly problematic: it is a special form of hydrogen that creates tritiated water (HTO vs. H₂O), which does not lend itself to removal by conventional technologies. This is because instead of the contaminant being carried along in water in suspended or dissolved form, the water molecule itself is modified. As a result, tritiated water is particularly difficult to treat and can spread easily if it escapes into the environment.

HOW DOES THE MDS® WORK?

The MDS® concentrates tritiated water (HTO) and produces clean hydrogen (H₂) and clean oxygen (O₂) via the CECE process utilizing modified commercially available components. Many detritiation solutions operate at low volume/high concentration conditions. By adjusting certain physical and operational parameters, Veolia can modify the system's goals to also successfully process high volume/low concentration water. Proprietary column internal materials ensure a much greater amount of gas flows up the column as compared to liquid flowing down, which results in increased efficiency while ensuring the column releases clean hydrogen at the outlet. The clean oxygen and hydrogen produced can be released to the atmosphere, captured for future use, recycled, or recombined as a clean water source. Veolia's innovative MDS® technology can be tailored to meet a wide range of market needs and client requirements due to the versatility of the design.

Allows Stakeholders' to dispose of large volumes of tritiated water in a socially and environmentally responsible manner via proven industry technologies (e.g., safely absorbed on a metal hydride).



UNIQUE AND PROVEN TECHNOLOGY

A fully integrated MDS® is in operation in Richland, WA. The MDS® is an innovative technology that is exceedingly versatile and effective. The modular system allows for operation over a wide range of concentrations and flow rates.



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