

TECH OFFER

Eco-Friendly Water-Based Air Purification



KEY INFORMATION

TECHNOLOGY CATEGORY:

Environment, Clean Air & Water - Mechanical Systems
Environment, Clean Air & Water - Sanitisation
Sustainability - Sustainable Living

TECHNOLOGY READINESS LEVEL (TRL): TRL6

COUNTRY: SOUTH KOREA

ID NUMBER: TO175129

OVERVIEW

Controlling both outdoor and indoor air pollution is crucial for protecting human health and the environment. Outdoor air pollution from industrial emissions and vehicle exhaust contributes to respiratory and cardiovascular diseases, global warming, and environmental degradation. Indoor air pollution can also cause chronic respiratory conditions and other health issues. According to the World Health Organization (WHO), outdoor air pollution causes approximately 4.2 million premature deaths annually, while indoor air pollution accounts for around 3.8 million premature deaths each year.

Traditionally, wet scrubbers are used to reduce air pollution, ensuring regulatory compliance and protecting human health. However, they have drawbacks such as scaling, fouling, inefficient pollutant removal, and generating solid waste. These issues lead to frequent maintenance, high operational costs, and environmental pollution.

This technology addresses these pain points by utilizing an array of water jets without the need for packing materials. This

innovative solution offers more efficient pollutant removal, reduced maintenance, a compact design, and lower energy consumption, effectively solving the problems associated with traditional wet scrubbers.

The technology owner is seeking collaborations with companies in the chemical/ pharmaceutical/ steel manufacturing sector for test-bedding and research and development (R&D) projects that require an eco-friendly scrubber.

TECHNOLOGY FEATURES & SPECIFICATIONS

The advanced scrubber technology features 3000 high-efficiency water jets that maximize contact area and ensure even water distribution, eliminating the need for traditional packing materials. This design addresses issues like scaling, fouling, and corrosion, resulting in lower maintenance and operational costs. The system is compact, enhancing space utilization within facilities. It operates with a compressed spray, effectively capturing pollutants through vertical collision and inertial force. **Test results demonstrate a significant reduction in pollutants such as ammonia, formaldehyde, and acetic acid.** Additionally, the technology is energy-efficient, reducing power consumption compared to traditional scrubbers, and supports sustainability goals by minimizing solid waste generation.

POTENTIAL APPLICATIONS

This technology has the potential to be applied on these areas, harnessing on its ability to remove pollutants effectively using water as a filter:

- **Chemical Manufacturing:** Handles a wide range of chemical emissions effectively, ensuring compliance with environmental regulations
- **Steel and Metal Processing:** Captures fine particulate matter and metallic dust, improving air quality
- **Food and Beverage Processing:** Improves air quality in processing plants, enhances worker safety, and reduces environmental impact
- **Pharmaceutical Manufacturing:** Ensures high removal efficiency for specific pollutants such as ammonia and formaldehyde

UNIQUE VALUE PROPOSITION

- **High-Efficiency Water Jets:** For maximizing gas-liquid contact, ensuring even water distribution, eliminating issues with uneven waterjet output when compared to traditional systems
- **No Packing Materials:** Does not require packing materials, addressing problems like scaling, fouling and corrosion of traditional scrubbers
- **Statistically Proven:** 100% reduction in pollutants such as ammonia, formaldehyde and acetic acid