TechBriefs

Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC srnl.doe.gov

At a glance

- Eliminates power supply cross contamination
- Modular components
- Adjustable fan speed
- Ability to scale power outside device
- U. S. Patent 9,610,589 B2

Contact Information

Partnering Opportunities

Savannah River National Laboratory
Bldg. 773-41A
Aiken, SC 29808

Phone: 803.725.8482
E-mail: partnerships@srnl.doe.gov

Modular (Adaptable) Electrostatic Particle Collector (ESP)

Researchers at the Savannah River National Laboratory (SRNL) have developed a method and modular device that significantly enhances the utility of ESP devices and extends the usefulness beyond that of current technology.

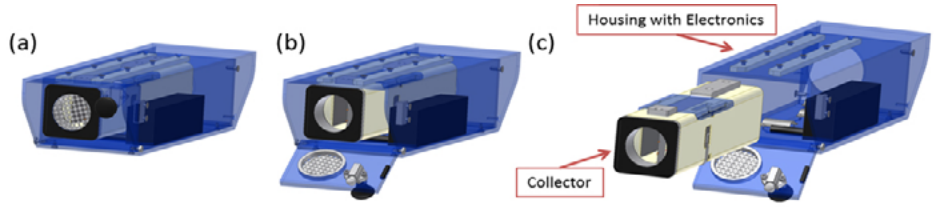

Figure 1: Depictions of (a) the collector cartridge inside the housing, (b) the collector cartridge inside the housing with the door open, and (c) the collector cartridge separated from the housing.

Background

Electrostatic particle collectors (ESPs), also referred to as electrostatic precipitators, are commonly utilized in industry and other applications to provide a means for collecting airborne particles. Generally it is difficult to remove the collector plate(s) from the housing without contacting the collection surfaces of the plate. As a result, there is often some amount of sample loss and/or sample contamination. When replacing the collector plates of an ESP, it is difficult to install accurately and efficiently the plates within the ESP housing.

A Better Alternative

The modular ESP is designed to be integrated with any device that would require/benefit from an air sampling system. The particle collector is a cartridge separated from any electronics and all main components are modular or tuneable including the corona wires, the fan speed and the inlet nozzle. This modular design has segregated removable and non-removable components. Advantages include the ability to scale power from outside the device, eliminating cross contamination between power supplies. The inlet nozzle is designed to be interchangeable to restrict/redirect airflow to meet future needs. The fan speed is adjustable; lower fan speeds have higher collection efficiencies and lower power requirements. High fan speeds collect

Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum of expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRS and SRNL is Savannah River Nuclear Solutions, LLC. SRNS is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

more particles overall; but with lower efficiencies and larger power requirements. This invention incorporates a multi-pin connector suitable for accepting external input giving an external device the ability to remotely activate the ESP and adjust variables such as fan speed and voltages and allow for external data logging of activities.

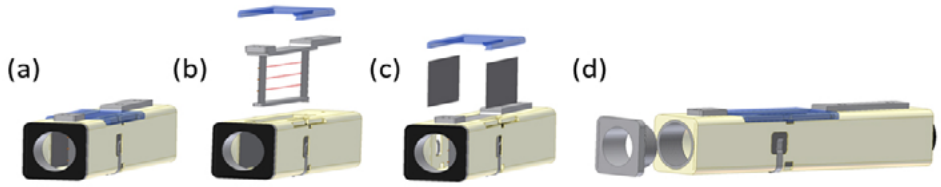

Figure 2: Depictions of (a) the collector cartridge, (b) the corona wire module separated from the collector, (c) the collection plates separated from the collector, and (d) the inlet nozzle separated from the collectors.

Possible Uses

Possible uses for this technology include environmental monitoring, process monitoring, radiological particle monitoring, clean room monitoring and particulate sample preparation (microscopy).

Present work is being done to create a vacuum hose module that will enable the invention to vacuum particles from a surface onto a conductive substrate for analysis.

Partnering opportunities

SRNS invites interested companies with proven capabilities in this area of expertise to develop commercial applications for this process under a cooperative research and development agreement (CRADA) or licensing agreement. Companies interested in licensing will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention. Qualifications should include past experience at bringing similar products to market, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.

SRNL-L1100-2015-46

06.12.2020 13CC00025