Pacific Northwest NATIONAL LABORATORY

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Battelle Number(s):

14936-E

Patent(s) Issued

Available for licensing in all fields

Available Technologies

Small Particle Separation, Inspection and Transport System

SUMMARY

PNNL researchers have developed a device and method for separating and transporting sub-millimeter size particles and providing various inspection means to rapidly characterize individual particles for quality control purposes. The system was successfully proven for inspecting 700-1000 micrometer diameter tri-isotropic (TRISO) fuel particles that contain several sophisticated coating layers. Billions of these coated fuel particles form the basic component for the fuel elements used in several current and proposed gas-cooled reactor designs.

PNNL designed a particle hopper feeder (Fig. 1) and a pneumatic transport line fitted with an induction coil and capacitance sensor (Fig. 2) to provide the quality control measurements without damaging the particles. Particles can then be separated into acceptable or unacceptable bins. The system may be scaled and incorporate other inspection modalities to meet specific client requirements. Potential applications are expected to be broad, including coated microspheres or other particles used in the pharmaceutical, chemical, or food industries.

ADVANTAGES

* Provides extremely fast small particle transport and inspection
* Adapts to various sensor configurations and designs
* Provides a cleaning method for inspecting particles that have dust or debris inherent to their fabrication process

RELATED LINKS

» **Macro Property Measurement Website: Acoustic Evaluation of Liquids in Containers**

http://www.technet.pnl.gov/sensors/macro/projects/es4upecw.stm

U.S. DEPARTMENT OF ENERGY

Patents & Intellectual Property

» Patent #: 7,740,424

Technology Portfolio(s)

» Nuclear & Radiological

» Nuclear

» Physical Sensors

Potential Industry Applications

» Aerospace & Defense

» Agriculture & Mining

» Automotive & Transportation

» Chemicals

» Communications & Media

» Computers & Electronics

» Consumer Products

» Education

» Energy & Utilities

» Entertainment & Recreation

» Fabric & Apparel

» Food, Beverage & Tobacco

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