

A NOVEL APPROACH TO DRUM VENTING AND DRUM MONITORING

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Abstract

Drum venting is an issue across many industries, including transportation and packaging of nuclear and hazardous wastes. Each year, many unventilated drums pressurize and develop bulges, breaches, or in some cases, even explosions. Installing ventilated lids on drums at the time of packaging is a fairly straightforward process that simply involves the use of lids with vented and sometimes filtered bungs. However, *in-situ* ventilation of a “bulged” drum involves dangerous work with risk of industrial accidents to workers and environmental accidents at worksites.

Two complementary technologies have been developed to address both *in-situ* drum venting and continuous drum monitoring. Both technologies will be discussed in this paper for application to any transportation and packaging application that involves standard Department of Transportation 55-gal drums and associated overpacks.

Drum Venting

The drum-venting technology, presently called, “Hanford–Drum Venting System” (H-DVS)^{Patent Pending} was conceptually developed for *in-situ* venting of Transuranic waste drums at the Hanford Site. The system involves the integrated use of a properly ventilated portable containment with expansion bellows, a simple mechanical advantage ballast system, and a pneumatic ram, sintered metal filter ventilation system. The system allows operators to safely install environmentally compliant drum ventilation in the field on existing drums or newly discovered drums. The system is easily deployable and adds incrementally small costs to the total cost of a modest environmental remediation project that might involve repackaging of drums.

Drum Monitoring

Two new technologies are available for online drum monitoring for pressure and corrosion. Both technologies, the Magnetically Coupled Pressure Gauge (MCPG)_{Patent Pending} and the Magnetically Coupled Corrosion Gauge (MCCG)_{Patent Pending} were developed for use on Spent Nuclear Fuel and Plutonium Oxide canisters across the Department of Energy Weapons Complex. Both of these technologies utilize a sensor to drive a magnet inside a sealed container and a magnetic readout located outside the sealed container to transmit either pressure or corrosion information to a remote location or alarm.

This paper describes the details and specifications associated with both drum venting and drum monitoring technologies. It also describes the current maturity of the existing systems and current applications.