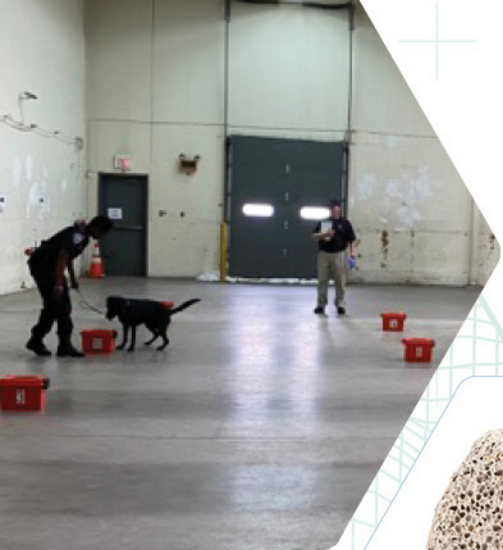




# Science and Technology



## TRANSPORTATION SECURITY & EXPLOSIVES CHARACTERIZATION

# PUMICE RESIDUAL-ODOR MATERIAL NON-DETONABLE CANINE MOTIVATION AIDS

### A PROCESS TO CREATE DISPOSABLE SCENT TRAINING AIDS BY TRAPPING EXPLOSIVE VAPOR MOLECULES IN PUMICE.

Working dogs trained for scent detection can identify trace levels of explosives and target substances but require consistent practice to maintain their on-command detection abilities. Trainers often use real explosives and substances, which involve bulky stationary equipment, limited location options, and exposure risks. When handling training materials, there is also a potential for cross-contamination or ineffective odor release. Disposing of the materials can also be challenging if they are not environmentally benign, non-detonable, or safe for regular disposal.

To eliminate these challenges, researchers at the Transportation Security Administration (TSA) invented the Pumice Residual-Odor Material (PROM) Non-Detonable Canine Motivation Aid. PROM is made by heating the explosive sample within a vacuum and trapping the vapor produced in a pumice stone. The resulting pumice contains trace substances to mimic a real-world scenario but is safe to handle and non-detonable. Once the training aid expires, it can be safely disposed of in regular waste receptacles.

## KEY BENEFITS

- + Reduces cost of explosive detection training
- + Provides safe and accurate training
- + Safe and easy handling and disposal
- + No secure storage required

## STAGE OF DEVELOPMENT

Prototype

## PARTNERSHIP SOUGHT

License

## INVENTORS

Inho Cho

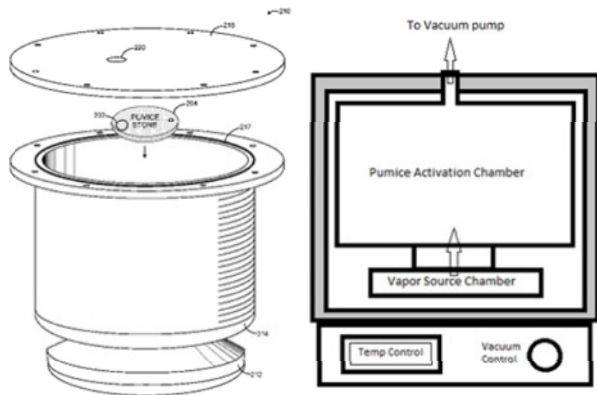
## DHS COMPONENT

Transportation Security Administration

The Technology Transfer and Commercialization Branch (T2C) within the Office of Industry Partnerships (OIP) of the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) serves as the centralized point to manage technology transfer activities throughout DHS and the DHS laboratory network. [T2C@hq.dhs.gov](mailto:T2C@hq.dhs.gov)

## THE TECHNOLOGY

The method to create PROM features a vacuum chamber with a sealable lid that contains separate compartments to hold a pumice stone and the target substance. A vapor source chamber containing an explosive, narcotic or other target substance, sits below the pumice activation chamber. The chamber temperature increases and excites the volatile organic compounds (VOCs) from the target substance. A vacuum pump attached to the top of the vacuum chamber pulls the VOCs into the upper chamber where they embed into the pumice stone pores. The vapor-loaded pumice stone then contains trace amounts of the target substance, which can be detected via scent training, but does not pose an exposure risk to the handler or contacting surfaces.



*The illustration depicts the core components of PROM including the vapor source chamber, the pumice stone and sealable lid.*

## APPLICATIONS

The technology has several potential end users:

- + Border patrol canine teams
- + Transportation security canine teams
- + Search and rescue and forensics teams
- + Canine-assisted cancer detection
- + Canine-assisted hunting

## PATENT INFORMATION

US Patent numbers 11,498,882 and 11,802,091



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**FOR MORE INFORMATION ABOUT THE DHS TECHNOLOGY TRANSFER & COMMERCIALIZATION BRANCH:**

<https://www.dhs.gov/science-and-technology/technology-transfer-program>

