



Energetic Material Provides Security for Sensitive Data and Technology

Confidential data and proprietary technology are challenging to safeguard when contained in easily portable devices such as cellphones, laptops, tablets and other transient electronics. Although technology exists that is intended to wipe data from phones and tablets, in actual use, data may not always be completely eradicated. Sometimes it would be preferable to physically destroy a device rather than let it fall into the wrong hands.

At Idaho National Laboratory, researchers are investigating ways to conclusively destroy data and circuitry when a device is lost, stolen or becomes obsolete, to protect sensitive data and proprietary technology from unauthorized access. Constructing a device including one or more of these energetic technologies would greatly enhance security of data/proprietary technology because an energetic reaction could be easily initiated

by built-in trigger or remote detonation.

Energetic Potting Material

INL researchers developed a patent-pending energetic potting material that will ignite upon command and burn until potted electronics are destroyed and data on them is no longer accessible. Energetic potting material will protect devices during normal use just as conventional potting material would. But when the device is no longer needed, or has been stolen or lost, the energetic components can be ignited to destroy the material and the device. Ignition and destruction could occur by intentional detonation, or be set to be triggered by a signal indicating an unauthorized user is attempting access, such as a set number of incorrect password attempts or the device housing being forced open.

Combustible Structural Composites

INL researchers have developed a patented method of including self-destructing capability within the structure of a device by combining a combustible material with structural-reinforcing fibers to create a sturdy composite material that can form load-bearing components of devices and structures. The material contains sufficient combustible components to be capable of partial or complete destruction by self-sustaining combustion. A variety of ignition sources could be used.

Self-protecting Electronic Circuit

Researchers at INL have designed a patent-pending self-protecting electronic circuit, which includes energetic material within the substrate of the circuit itself. Electronic circuitry, including initiation

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The Energy of Innovation

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For more information

Ron Heaps

(208) 526-0147

Ron.Heaps@inl.gov

Nikki Rasmussen

(208) 526-0250

Nikki.Rasmussen@inl.gov

Reston Condit

(208) 526-9883

Reston.Condit@inl.gov

Mark Kaczor

Senior Commercialization
Lead

(208) 526-1340

mark.kaczor@inl.gov

A U.S. Department of Energy
National Laboratory



circuitry, would be integrated into the energetic substrate. Ignition of the energetic component of the circuit would result in burning, melting and/or shattering the circuit to the extent that the circuit could not be repaired, data could not be recovered, the circuit could not be reverse-engineered, and the original form could not be deciphered, repaired or replicated. In addition, because the energetic material would be part of the substrate, it could not be removed without destroying the circuit.

Hard Disk Drive (HDD) Destroyer

Scientists at INL have designed this patent-pending method and device for

permanently and completely destroying hard drives and data. HDD Destroyer will be a portable, easy-to-use device that uses cartridges of pyrotechnic material to melt and deposit metal directly onto the hard drive platen, piercing the hard drive case, destroying magnetic particles on the platen, heating the platen to a temperature that will destroy all stored data, and melt holes into the platen. HDD Destroyer operation may be triggered by nonelectric means in the event of a power outage.

Technology benefits:

- Complete destruction of device and data is assured
- Device destruction could be easily initiated by built-in trigger or remote detonation

- Self-protecting Electronic Circuit includes fully integrated fireset, and a flexible, easily tailored design
- HDD Destroyer uses multiple methods to ensure data is destroyed, provides immediate visual confirmation, works quickly and is portable

Applications:

Military; police; personal electronics, unmanned aerial vehicles; robotics