TAMPER-RESISTANT FASTENER

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SD 14289
Technology Readiness Level: 6-7
Representative of the Deliverable Demonstrated in Relevant Environment(s)

A tamper-resistant, threaded fastener for enhancing the security of vaults, safes, and other high-value physical assets

From public buildings to high-security settings such as military bases, security fasteners are used to protect vaults, safes, and other key features across diverse environments. Security fasteners are specially designed to delay adversaries in the event of a physical attack. Due to the evolving nature of threats, novel types of security fasteners are needed for the continued protection of critical spaces and assets.

Sandia researchers have developed a tamper-resistant, threaded fastener that can enhance the security of vaults, safes, and other physical assets. The fastener consists of a specialized cap and bolt design. The bolt is laterally slotted and includes a cap retaining area. The cap features a square, foot-like section at its base which applies a torsion load to the bolt when rotated, allowing the bolt to be tightened. The necked portion of the cap is designed to shear at full tightening torque, leaving the cap captive yet able to rotate freely within the tightened bolt. The rotating cap prevents access to the bolt. The cap also has a side drilled hole that can be aligned with a hole in the physical barrier base material. This feature allows fiber optic to be laced through, providing optional tamper detection. This specialized fastener protects critical assets by preventing or delaying access by potential attackers.

The tamper-resistant fastener consists of a specialized cap and bolt (at right). The bolt (lower left) is laterally slotted and includes a cap retaining area. The cap (upper left) features a square, foot-like section at its base that applies torsion when rotated.

TECHNICAL BENEFITS

- A new style of security fastener with a specialized cap and bolt design
- Can be used in counterbore and non-counterbore applications
- Optional fiber optic tamper detection
- Delays access by potential attackers
- Protects critical assets

INDUSTRIES & APPLICATIONS

- Physical security across diverse industries and settings
- Radiological security
- Securing transportation assets
- Securement of vaults, safes, and barriers
- Tamper detection for material security

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