Anti-counterfeiting and anti-piracy technology guide

https://euipo.europa.eu/anti-counterfeiting-and-anti-piracy-technology-guide

Electronic Seals

A broken seal is a universal indication that an object has potentially been tampered with. Electronic seals add an extra layer of security by recording advanced product information and allowing for real-time tracking and monitoring. They are frequently used on closed freight containers, as they can store and provide data such as electronic signatures, the complete route information, the container ID and details of the cargo being carried. They also trigger alarms when tampered with. The data contained in an electronic seal can be transmitted, read and verified by third party applications – for example during customs inspections.

Used for

- Authentication
- Tracking/Tracing
- Anti-tampering / Anti-alteration

Suitable for

- Medium-sized products
- Large products

Goes on

- Product
- Packaging

Can be used for

- Physical products

Visibility

- Invisible

Reading device needed

- Yes

Connection to server

- Yes

Description

Electronic seals, also called eSeals, are embedded into mechanical seals or barrier systems. They build on RFIDs to provide digital data capture, storage and readability functions in addition to their physical anti-tampering functions. This means they are able to offer higher security and control than normal mechanical seals, as they are able to self-monitor and be monitored in real time.

The two main objectives of an electronic seal are to guarantee:

- integrity – by clearly showing that the container to which it is applied has been opened; and
- identity – by uniquely identifying the container to which it is applied.

In some cases, the seal may also have a degree of mechanical strength that makes it difficult to remove.

The quality of an electronic seal can be assessed according to the following characteristics:

- non-duplicability – a quality seal is not easily duplicated;
- reliability – once opened, it should not be possible to reseal and it should be clear that it has been opened;
- verifiability – an operator must be able to verify the authenticity and integrity of a seal, either visually or by using a specific device.

Uses

eSeals are used mostly to guarantee the integrity of goods during transport. They are generally designed to seal large packing units (e.g. freight containers) as they reveal possible tampering and alterations of the goods

during the journey. The integrity of the seal can be checked either through visual inspection of its mechanical component or by using ad hoc devices (readers) that access the information stored in the electronic section of the seal.

Implementation

You do not need to make any changes to the production process if you want to use electronic seals, as this technology is mainly applied during product transportation.

Cost

The costs associated with electronic seals will depend on the type of RFID tag(s) used (passive, active, semi-passive) and the individual functions that the eSeals deliver.

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