Anti-counterfeiting and anti-piracy technology guide

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Chemical Encoding and Tracers

This anti-counterfeiting technology uses miniscule particles with specific chemical or physical properties to authenticate and secure products and packaging. These particles can be attached to any type of surface and are invisible to the naked eye. However, the unique properties of the particles – a colour reaction to light, for instance – can be detected using special equipment. The particles can be applied in specific patterns to serve as a marker of origin, or to certain components to serve as a marker of quality. For example, if an item of clothing is supposed to be 40 % cotton, a chemical tracer could be added to the cotton yarn at the beginning of the production process. Later on, even years after the garment was purchased and used, a special reader would still be able to measure the amount of chemical tracer present to verify the cotton content.

Used for

- Authentication
- Anti-tampering / Anti-alteration

Suitable for

- Very small products
- Small products
- Medium-sized products

Goes on

- Product
- Packaging

Can be used for

- Physical products

Visibility

- Invisible

Reading device needed

- Yes

Connection to server

- Yes

Description

Chemical encoding and tracers work by attaching specific and distinctive tiny chemical particles to raw materials and finished products that, when detected, attest to the material/product's authenticity. They are nanometres (nm), that is, billionths of a metre, in length and can only be identified using specific readers. The chemical particles are coded, with all decoding done in a laboratory.

Several different chemical encoding and tracing methods exist. Some use chemical compounds with optical properties, such as luminescent particles, to authenticate the product, while others use compounds with physical properties, such as magnetically attractable particles.

Uses

This technology has a very broad area of application as the chemical particles it uses can be attached to a wide variety of different materials, including paper, cardboard, plastic, leather, glass, yarn and fabrics.

Implementation

The diversity of applicable materials and methods for chemical encoding and tracers makes it difficult to specify the requirements for implementing this technology. Any changes that need to be made to the production process will depend on your product/material, the method you choose and the particle attachment technique.

Cost

As the resources required for chemical encoding and tracing will depend greatly on the particular method and product used, it is difficult to provide a general idea of the costs involved in implementing this technology.

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