# Anti-counterfeiting and anti-piracy technology guide

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

## Surface Fingerprint & Laser Surface Analysis

The surface of every product can be unique due to microscopic structural differences caused by physical processes or the use of chemical substances. This technology exploits those differences by assigning to each one a code, in a random and stable pattern like a fingerprint, that identifies the product. The codes are recorded in databases, which can be cross-referenced in order to verify the product's authenticity.

**Used for**

- Authentication
- Anti-tampering / Anti-alteration

**Suitable for**

- Very small products
- Small products
- 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

Surface fingerprint technologies and laser surface analysis are employed to generate a unique identifier based on the effects of a physical random process which, due to its nature, cannot be reproduced or copied.

The composition of the surfaces of the materials is analysed using techniques that identify the structural differences distinctive to each surface. On the basis of these differences, identifiers are generated which allow the product to be uniquely identified.

For example, by analysing the structural differences that are generated on silicon films (so called 'wrinkles'), unique identifying codes can be randomly created. These codes are univocal, like human fingerprints, and reproducing them is technically impossible.

A method based on this principle is used to produce labels that are easily readable with an optical reader. It consists in coating a substrate of nanoparticles with silicon polymers. The desiccation of the substrate causes it to shrink and to produce structural differences or 'wrinkles' on the polymer coating. By analysing these 'wrinkles', it is possible to randomly generate unique identification codes. A special device is needed to read the code and compare it with those previously stored in a reference database.

### Uses

Surface fingerprint technologies and laser surface analysis are applicable to a wide variety of products as the analysis of structural features can be applied to different types of materials.

## Implementation

Changes to the production process depend closely on your product type, which determines the techniques for attaching the marker to the products.

## Cost

The costs of these anti-counterfeiting solutions depend on the particular method used and cannot be calculated precisely in advance.

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