

## Security Surface

To cover the surface of Microdots we can utilize wide range of diffractive or non-diffractive surfaces. These quickly validate their authenticity – it can be read by the naked eye or by use of a magnifying glass, microscope or by more or less sophisticated readers. The surface readable by magnifying glass or microscope include:

- 2D – 2D/3D holographic surface – at magnification we can see on the Microdots surface classical holographic surface and it may be 2D or with a background suspended in space, just like we know from holographic foils
- micro flip-flop – different micro pictures seen on a micro particle at different angles
- micro kinetic effect – on each Microdots translational, rotational or expansion effects known from classical holographic foils
- diffractive micro-optical surface – a larger Microdots surface can contain a diffractive circular lens – axicons, or other optical elements
- non diffractive surface structure - on the Microdots surface we will see colorless grey structure with various graphic design as required
- micro text and nano text - Microdots surface can be covered by micro text visible under lower magnification (character size is in the vicinity of tenths of micrometres), or nano texts, visible only at high magnification. Size of nano text characters starts at approximately 80nm. For example: Microdots of a square shape 1mm x 1mm can contain 4,000 letters of a size of 2 x 2 micrometers. This is equivalent of 140 standard pages of typed text.
- micro and nano-graphics – on the surface of Microdots can be any required nano-graphics with vectored lines. This is visible at a lower magnification and aimed at quick validation of authenticity on the micro particle. For forensic examination purposes the Microdots surface may contain nano-graphics, fully vectored and to up to 120,000 dpi. The surface of the Microdots may also be covered by a surface structure, which is readable utilizing a laser reader. This enables authentication of the micro particle without the use of microscope or magnifying lens.

Laser reader- is a simple device, which with a help of a diode laser shows hidden information written on the Microdots surface on a special screen. It can be simple text or a complex bitmap. So in fact the reader can show on its' screen a human face in good resolution

## Means of Application and uses of Microdots

A broad range of uses of Microdots for protection include, security documents, identification documents, but also marking of vehicles, valuables, corporate, public and personal property. DNA PROTECTED is continuously developing a variety of applications, some of which are already used industrially in manufacturing processes. Some are still in various stages of development. Listed on page 3 are some available options and their explanations, which show the potential.

## 1. Microdots Aerosol Spray Canister



As mentioned earlier, Microdots may be added to clear or tinted lacquer and filled into spray cans. All Microdots in a particular batch have the same shape and security surface, however each spray contains micro particles with a different unique code or other variable information. Therefore, one could produce aerosol sprays of Microdots, etched with a vehicle's VIN number, for example.

Another example is a spray, again, containing unique variable information for use at customs. Each spray code is linked to a particular customs officer for marking documents, packages, containers, etc.

His code is in a central database linked to that person. Another example is using the spray for marking corporate, public or personal property. Again the unique codes are linked to a particular person, company or institution and it's property, code and times of application. This is in fact is a simple procedure with an existing easy to use database for passive tracking of property and its' owners.

This can also be used for inventories. In practice it is already used for identification of antiques, paintings, statues, books and many more items.

## 2. Microdots Hot Stamp Foil

This technology is allowing us to use existing polygraphic techniques for production of hot stamp foil containing Microdots. It is a transparent foil whereby its' inner side is applied with Microdots and the foil may be applied on any existing hot stamp foil application machine. In this way we can apply this foil on a specified spot of on a full surface of the marked object, being paper or plastic. For each different application we can control the dispersion rate of Microdots per square area of the foil. This technology is ready and being produced by us industrially. Microdots can be also combined during production of standard holographic hot stamping foil.

## 3. Security Paper with Microdots

DNAproDOC™ security paper is available. It is a high security product made to custom specification only.

## 4. Microdots Print Application

Potentially the simplest application of Microdots locally or on a full surface, will be use of transparent or tinted lacquers or inks containing Microdots by screen printing. DNA Protected cooperates with security printers, printer manufacturers and ink producers on these applications. In existence is a whole range of other potential application of Microdots is self-adhesive materials, toners, adding Microdots adhesives, silicon, marking of explosives and many more.

## 5. Conclusion

Microdots is an effective covert solution for the protection of any security document, asset and product. For its' wide range of security applications, ease of application and use of variable information Microdots is becoming an important security technology to combat counterfeiting globally.