Data-Matrix-Code made by laser marking

Data-Matrix-Code made by dot marking

DATA-MATRIX-CODE

Data matrix code or 2D code

It has become quite common for products to be tracked and identified long after they leave the factory doors. In order to follow articles throughout their entire life cycle, manufacturers use two dimensional (2D) codes which are marked directly on the articles themselves, allowing them to be tracked during and after production. This process is known as DPMI (direct part mark identification).
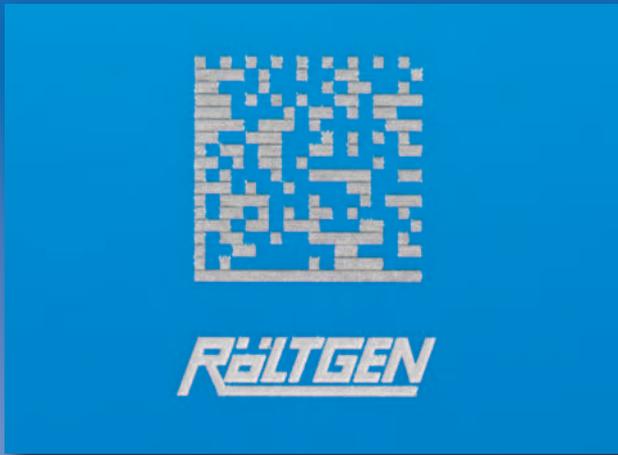
Being able to track parts can contribute to improvements in quality as it allows manufacturers to ensure that the right processing steps are happening in the right order. DPMI is key to efforts to recognise faults and reduce defects. Not only does DPMI avoid the element of human error involved in the manual entry of part numbers during production, it also facilitates and simplifies the filing of data for safety, liability and warranty matters. It eases compliance with legal regulations which require that articles which are at high risk of theft or counterfeiting be easily identifiable.

However, if a part is to be identifiable throughout its entire life, the code must be equally durable. The mark's required durability is, however, relative given that the individual industries have their own rules when it comes to setting product life cycles.

Machine readable DPMI symbols are typically applied using dot marking and laser systems. The relevant considerations when selecting the method used include the required life cycle, the material, environmental factors and production volumes. The surface structure, the quantity of data to be coded, the available space and the position of the marking on the article should also be considered.

Dot marking involves hitting the material surface with a marking stylus with a carbide metal tip to apply the marking. Dot marking has the advantage of not being expensive, of not requiring any consumables and of creating very durable, heat resistant marks. Dot marking is often used in the automotive, aviation and space industry due to the high life cycle requirements in these sectors.
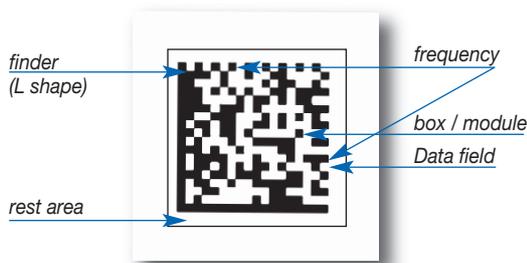
Laser engraving creates markings by melting the surface of the material using a laser beam. Laser engraving has a number of advantages, including high speed and great precision. It is therefore ideal for the application of small, high density (i.e. high data volume) 2D codes.

finder (L shape)

frequency

box / module

Data field

rest area
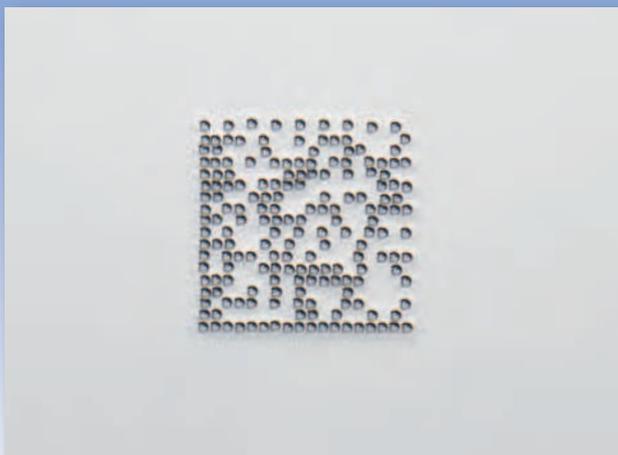
Explanation of the single parts of a Data-Matrix-Code.