



REICHLE
TECHNOLOGIEZENTRUM

THE ART OF PERFECTION

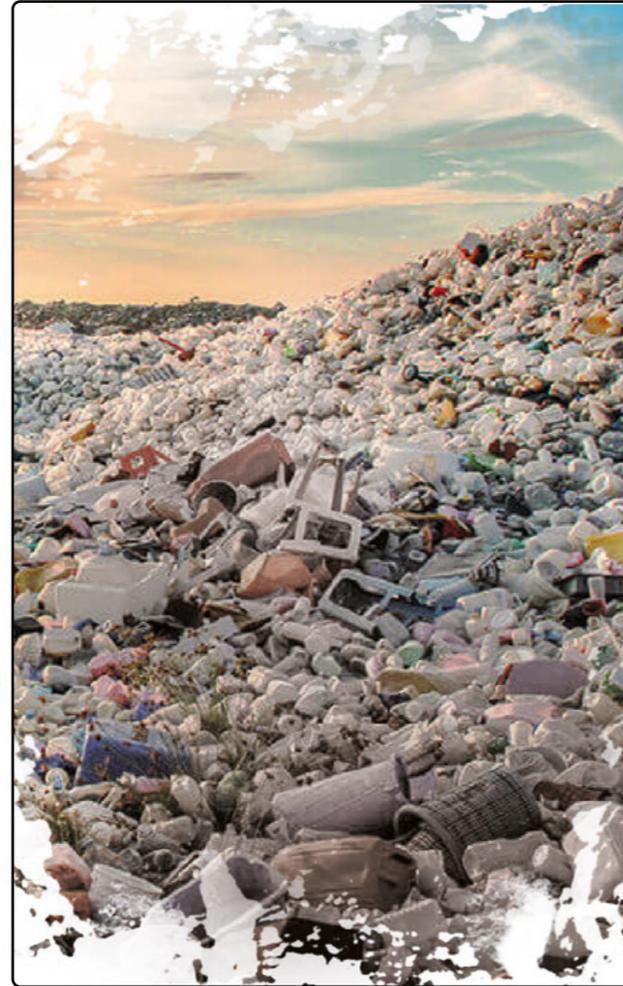
DIGIMARC | 

HIDDEN INFORMATION THROUGH MODERN LASER TECHNOLOGY

DIGITAL WATERMARKS

THE CHALLENGE

In Europe alone, more than 29 million tonnes of plastic waste are generated annually, yet recycling rates are still lower than for many other packaging materials. The reason for this often lies in the complexity and variety of plastic packaging types, making it much more difficult to classify the individual plastic parts during the sorting process at recycling facilities.

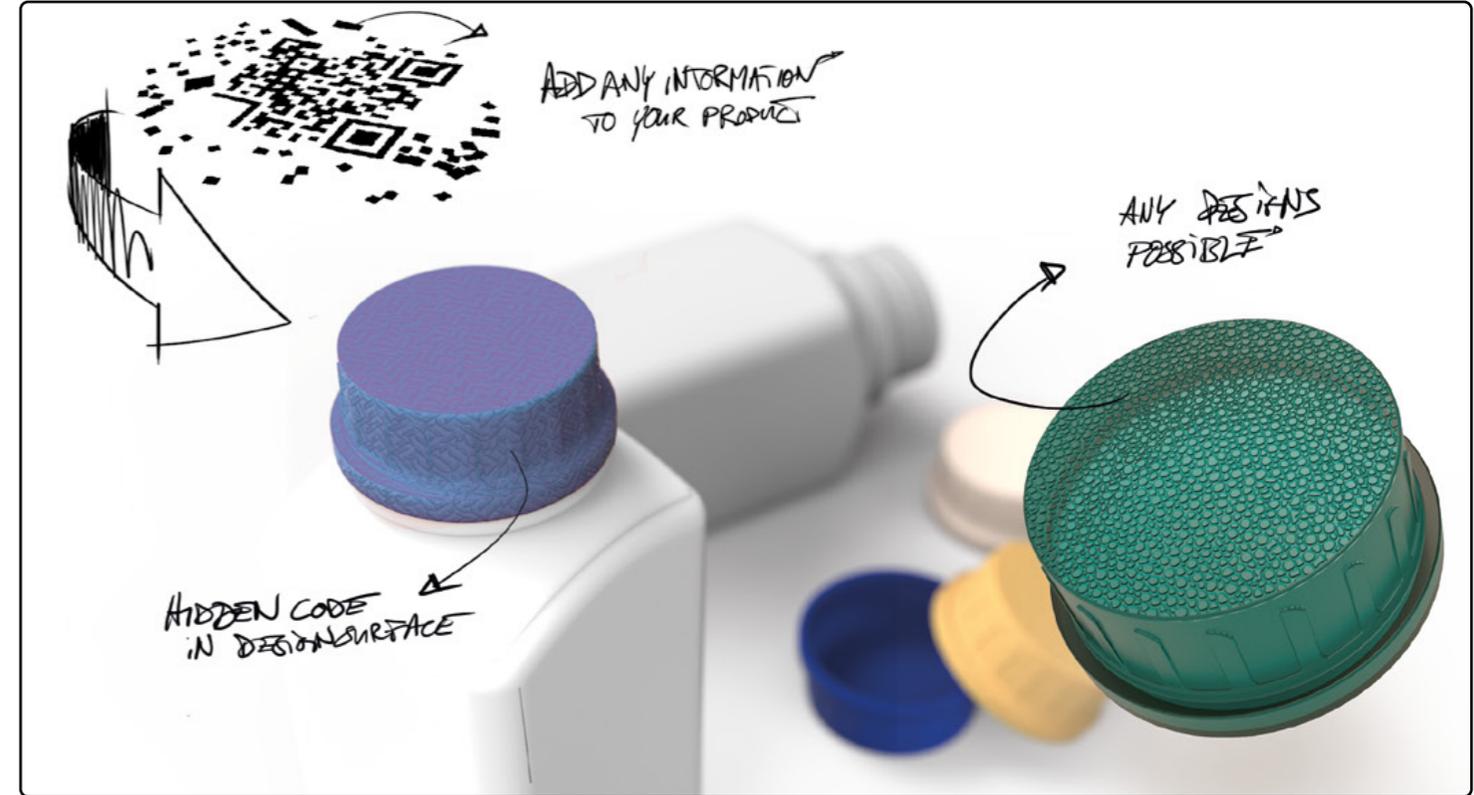


OUR SOLUTION

Together with Digimarc, the leading provider of digital watermarks, Reichle Technologiezentrum GmbH is tackling precisely this challenge. By using the latest laser technology, Reichle integrates digital watermarks into the surfaces of tools and moulds and thereby sustainably improves the recycling process in the packaging sector.

WHAT IS A DIGITAL WATERMARK?

An invisible code about the size of a postage stamp that covers the surface of products and can be seamlessly integrated into existing and custom texture designs. Each watermark is unique and connects to a database with a variety of product attributes and other information. The watermark can be read by image processing systems, including smartphones.



HOW TO APPLY DIGITAL WATERMARKS?

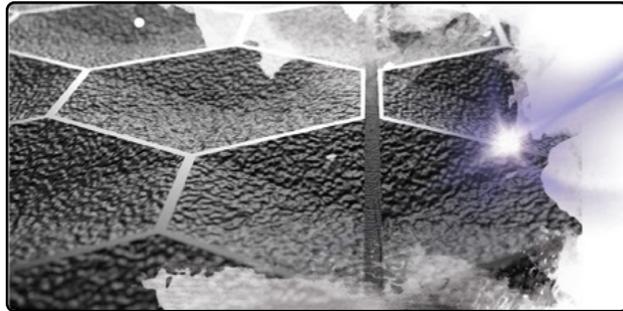
When integrating the digital watermark, particular attention must be paid to two aspects: readability by the cameras of the plastic sorting systems and the preservation of the product aesthetics. For this purpose, a pixel-based watermark is generated that is repeatedly applied on the product surface – even on complex product geometries. The resulting redundancy ensures the readability of the code also in the event of damage, fragmentation, or soiling. The digital watermark is invisibly integrated into existing fine and design structures by the Reichle Design and Development Centre. The surface concept can have a minimum depth of 1µm, but no limit when it comes to maximum depth. Even almost high-gloss surfaces can be achieved with integrated watermarks.

WHY LASERTEXTURE?

The structures with integrated digital watermarks can no longer be realised using conventional processes such as eroding and etching. Due to the required level of detail of the textures and codes and the high-precision implementation, the integration of Digimarc watermarks is only possible using state-of-the-art laser technology.

Advantages of the technology:

- ▶ Absolute reproducibility
- ▶ Fully digital processes
- ▶ Worldwide quality standardisation
- ▶ Efficient manufacturing processes
- ▶ Almost limitless design freedom
- ▶ Sustainable manufacturing process



ADVANTAGES OF THE INTEGRATION OF DIGITAL WATERMARKS:

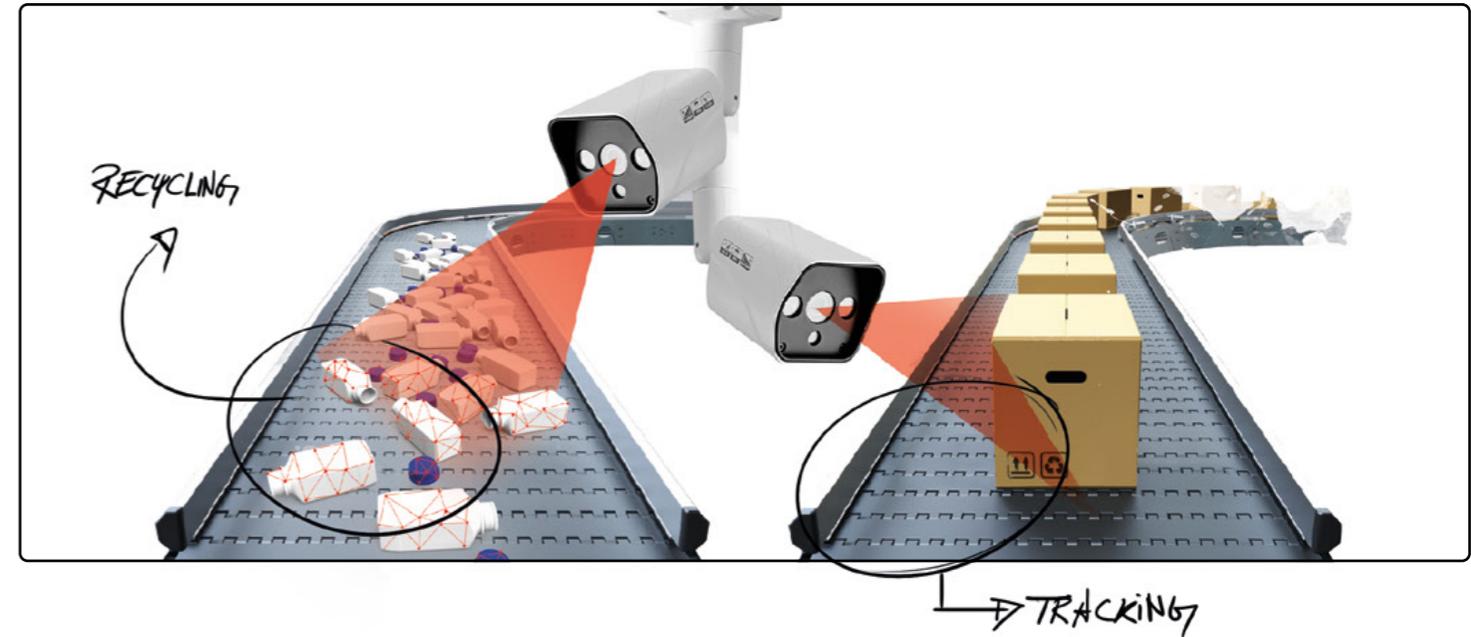
Brand integrity: The Digimarc watermark can be an essential part of anti-counterfeiting efforts for businesses and consumer brands. This can ensure the integrity of the product and maintain its reputation in the market.

Transparency for end customers: In addition to important information for the sorting process, the digital watermarks can also be linked with any type of information for the end consumer. For example, marketing promotions, nutritional information or other important notices can be made available, thus creating a new level of transparency.

MORE ADVANTAGES:

Improving the recycling process: For plastic packaging, a laser-textured digital watermark works across all shaping technologies and can identify the following properties by using the Digimarc Illuminate platform:

- ▶ Manufacturer
- ▶ Type of pellets, colour + weight
- ▶ Use (e.g., food vs. non-food plastic packaging)
- ▶ Recyclable vs. non-recyclable
- ▶ Single-layer vs. multi-layer packaging
- ▶ Carbon black, opaque, difficult to recycle packaging
- ▶ Introduction of new materials (PCR vs. virgin)



The collaboration between Digimarc and Reichle Technologiezentrum GmbH is aimed at revolutionising plastics recycling as part of the HolyGrail 2.0 project. Together, the sorting of plastics and the accuracy of recycling will be improved, and the quality of recyclates will be enhanced. As a result, a greater percentage of plastic packaging can be diverted from incineration and landfills. The combination of Digimarc digital watermarking and tool-side application using state-of-the-art laser technology from Reichle Technologiezentrum GmbH proves itself even in severe conditions and environments with a positive recognition rate of 99 % and an effective sorting rate of 95 % or higher.

PROCESS FLOW

Consulting at the Advanced Design & R+D Centre:

The Reichle Technologiezentrum GmbH advises you on the integration of digital watermarks into existing product surfaces or in newly developed textures.

Delivery of the Digimarc watermark:

The watermark, which is already linked to your product information in the cloud, is delivered as a TIF file to Reichle for integration.

Application of the watermark into the existing product design:

The lasertexturing team at the Reichle Technologiezentrum GmbH adds the watermark data to the existing surface to ensure maximum readability and preserve the existing product aesthetics.

Tool-side integration of the watermark:

Using state-of-the-art and precise laser machines, the product surface including the digital watermark is integrated into your mould.



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