

Tackling Track & Trace with:

imZERT™
world's smallest barcodes



Pharma & Medical

Automotive

Consumer Goods

Do You Recall...?

imZERT Debuts as the World's Smallest Barcode to Tackle Traceability & Recalls

Read time: 4 min., 14 sec.

Can a 1mm² barcode tackle the traceability and counterfeit issues facing the world's makers, including discrete manufacturers (e.g., automakers) and process manufacturers (e.g., pharmaceutical firms)? Danish company Rel8 believes so, and imZERT™, their revolutionary DPM (direct part marking) process, will lead the way.



Rel8's imZERT™ technology arranges nanostructures to engrave DPM barcodes as small as 1mm² into molds.

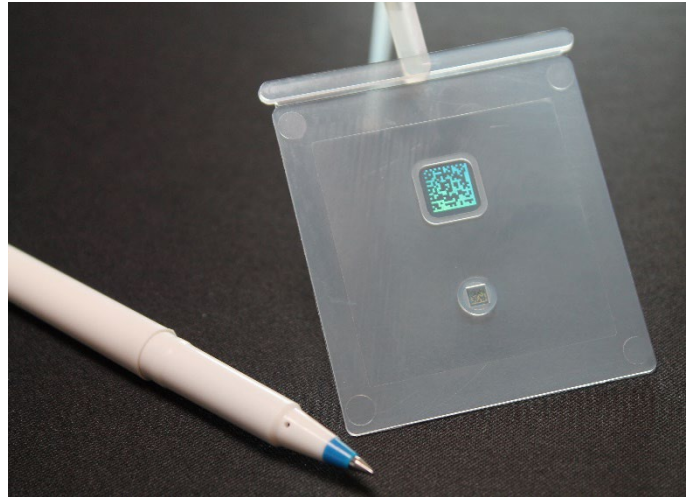
Traceability is “backtracking” to the origin of a component or ingredients. This capability is essential when making consumables or producing component-laden products like electronics. Should an element be flawed, a firm must launch a costly recall campaign to fix, replace, or refund users. But imZERT technology can help by maximizing traceability via barcodes. And not just any barcodes, but ones made from nanostructures—no small feat considering that a strand of human hair is about 60,000 nanometers in diameter.

- imZert technology arranges nanostructures, “engraving” DPM barcodes into a mold. This process presses incredibly sharp, high-contrast 2D barcodes directly

onto a component's surface, instantaneously during molding. When scanned, these DPMs reveal relevant data like the lot number or mold cavity ID for tracking and tracing parts or ingredients through production and use.

TRACEABILITY IS AS CLEAR AS BLACK AND WHITE

Like many innovations, imZERT was born out of necessity. A medical device manufacturer approached Rel8, seeking an ultra-small barcode to prevent "mix-ups" during assembly. And the firm wanted to read these new barcodes without changing its existing vision system.



imZERT™ readily marks plastics and elastomers, such as those used in medical devices, automotive components, electronics, and food or ingredient packaging. The barcodes can assist with recalls.

"The manufacturer had barcode technology in place, but it only worked on a very dark polymer, and they wanted to switch to a white one," explains Guggi Kofod, Rel8 CEO. "They asked if we could achieve a higher contrast with our nanostructures for better scanning. And that's when we realized what was possible."

In sectors such as automotive and electronics, traceability is increasingly important, yet it's challenging to mark plastics and elastomers—particularly for small parts. Most methods are time- and labor-intensive, need additional work cycles, or can contaminate the final product. And some methods carry a large risk of failure. imZERT's relative simplicity makes these all obsolete.

"Most manufacturers rely on barcode labels transferred from packaging or containers," Kofod explains. "But can you imagine if these get switched around or fall off the box? One mistake creates the risk of shipping wrong parts to an assembly line." And this can be costly—especially to sub-suppliers whose profits rely on a few accounts.

"If this goes wrong a few times, that firm won't sell to the auto factory anymore," Kofod cautions.

The imZERT product traceability system allows manufacturers to quickly identify faulty products (especially during production). If poorly formed parts are discovered during assembly, the manufacturer can go back—not just to the mold but to the individual cavities. Additionally, if a manufacturer expands an existing product's features, it will

perform a revision update in which a mold is easily modified and given a new revision number. imZERT allows all of this to happen without requiring new automation equipment for the new DPM method.

COUNTERING THE COUNTERFEITS

Beyond medical devices and manufacturing, imZERT's tiny barcodes can have an outsized impact on fashion, medication, and consumer electronics.

How?

These sectors need to innovatively fight fakes that shrink profits, pose safety risks, and often fund illegal activities. Take, for instance, frugal fashionistas and chic superfakes. Gone are petroleum-scented fake bags with slightly off logos; superfakes are uncanny replicas that meet (or beat) the quality of designer goods.

While these counterfeiters are practically untraceable, their economic disruption is everywhere. The Organisation for Economic Cooperation and Development [reported a 154 percent increase](#) in counterfeits traded internationally, rising from \$200 billion in 2005 to \$509 billion in 2016.

THERE'S BIG HOPE IN TINY BARCODES

Compared to laser engraving, nanostructures enable creating 1mm² barcodes with much higher contrast and sharper edges. These features make it easy for powerful barcode reading software, such as Code Corporation's [CortexDecoder](#), to scan and decode. Because they're the world's smallest, imZERT barcodes can be easily camouflaged on a fastener or within a bag's interior liner to verify authenticity for a distributor, detective, or end consumer.

Beyond fashion and electronics, imZERT barcodes can be placed inside containers of consumable liquids, such as medications and ingredients. This is because imZERT barcodes withstand 150,000+ molding cycles without degradation and pose no contamination risk. When scanned with a CortexDecoder-equipped smartphone, recalled consumables are caught before use.

SCANNING SUPER SMALL BARCODES

Rel8 found that most barcode scanning technologies couldn't readily scan imZert's ultra-small barcodes. Through trial and error, Rel8's team came across CortexDecoder, which simplifies scanning while providing [industry-leading accuracy](#).

"At the beginning, we used a smartphone to film the barcode, another one to enhance the picture, and the last one, which had software on it, to read the barcode," Kofod recalls. "After this enhancement work, it turned out that we could do that with CortexDecoder. It can also recognize the quality of the barcode in one millisecond; it's that good."



Although reading a 1mm^2 is possible with other scanning SDKs, Kofod added that success boils down to variables like user skill, environment, and smartphone accessories.

"CortexDecoder on a regular smartphone easily decodes imZERT barcodes down to 2mm^2 ; with some attention to detail, even 1mm^2 can be scanned directly," he shares. "Adding a simple macro-lens to the smartphone ensures that 1mm^2 barcodes scan every time [with CortexDecoder]."

Besides traceability and counterfeits, Kofod envisions imZERT for marketing. Thanks to CortexDecoder's quick and accurate scanning, he sees developers leveraging Code Corp's software development kits (SDKs) to make their own iOS or Android apps. Through scanning with a branded app, companies can provide users with conveniences, e.g., links to refill pages.

"It makes a good impression if you are talking to a potential B2B customer when the barcode scans immediately," Kofod adds.

Within industry, smaller almost always means pricier. But compared to any other marking technology, imZERT is very cost-effective.

"We've had an inquiry from an auto manufacturer with two-cavity injection molds that output two parts each cycle. A manual laborer had to pick up the parts and place them in the laser engraving station for each cycle," Kofod explains. "So, one person and one laser engraving station were only doing this. It's a process that we could replace for a tiny fraction of the cost."

Rel8 is blazing a trail with its innovative DPM process that can lead to bigger profits, better operations, and safer products. If it must be tracked and traced, mark it with imZERT.

Are you a manufacturer looking for traceability marking technology? Contact info@rel8.dk.

Interested in incorporating enterprise-grade data capture into your business? Learn more about Code's CortexDecoder SDK capabilities and receive a [free, 30-day demo](#).