

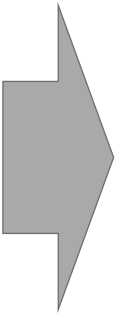


Laser Marking in the Glass Body - implementing 100% secure product authentication through blockchain distributed ledger technology – Dr. Thomas Gering, President of the Board

nano4u

nano4U - the Company

- Setting-Up in 2008 in Switzerland
- Product Solutions and Technology Development in the context of
 - 4 EUREKA Projects, incl. 3 Eurostars (innosuisse), EU-FP7, Swiss CTI and German BMBF
 - Many, many evaluation circles in Europe have seen our work – and it passed!
- Offices and operational locations now in CH, DE and US
- Huge network of trusted collaboration partners incl. in IT and machine integration
- Main philosophy: Mark the product, not only the package
- 2025 shall see pilot implementations especially in pharma – and that means also liquids in glass



The Problem

- Costly serialization systems (in many jurisdictions but especially so in EU and US – including CH and UK) with no true authentication.
- Duplicate codes in the supply chain.

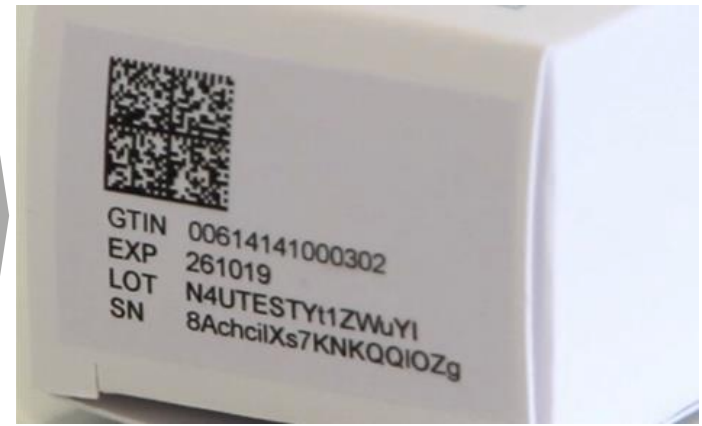


- Negative impact on reputation, cost, and health.
- Organized crime benefits ...
- Product recalls have cost up to 600 M\$



The authentication solution

An unbreakable link between the product itself and standard barcodes on the packaging.



True authentication

- Authenticate the product itself.
- No database or network access required.
- Seamless link with serialization.

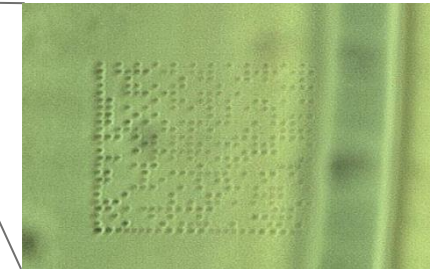


Multiple & multi-level approaches

Authentication and tracking:

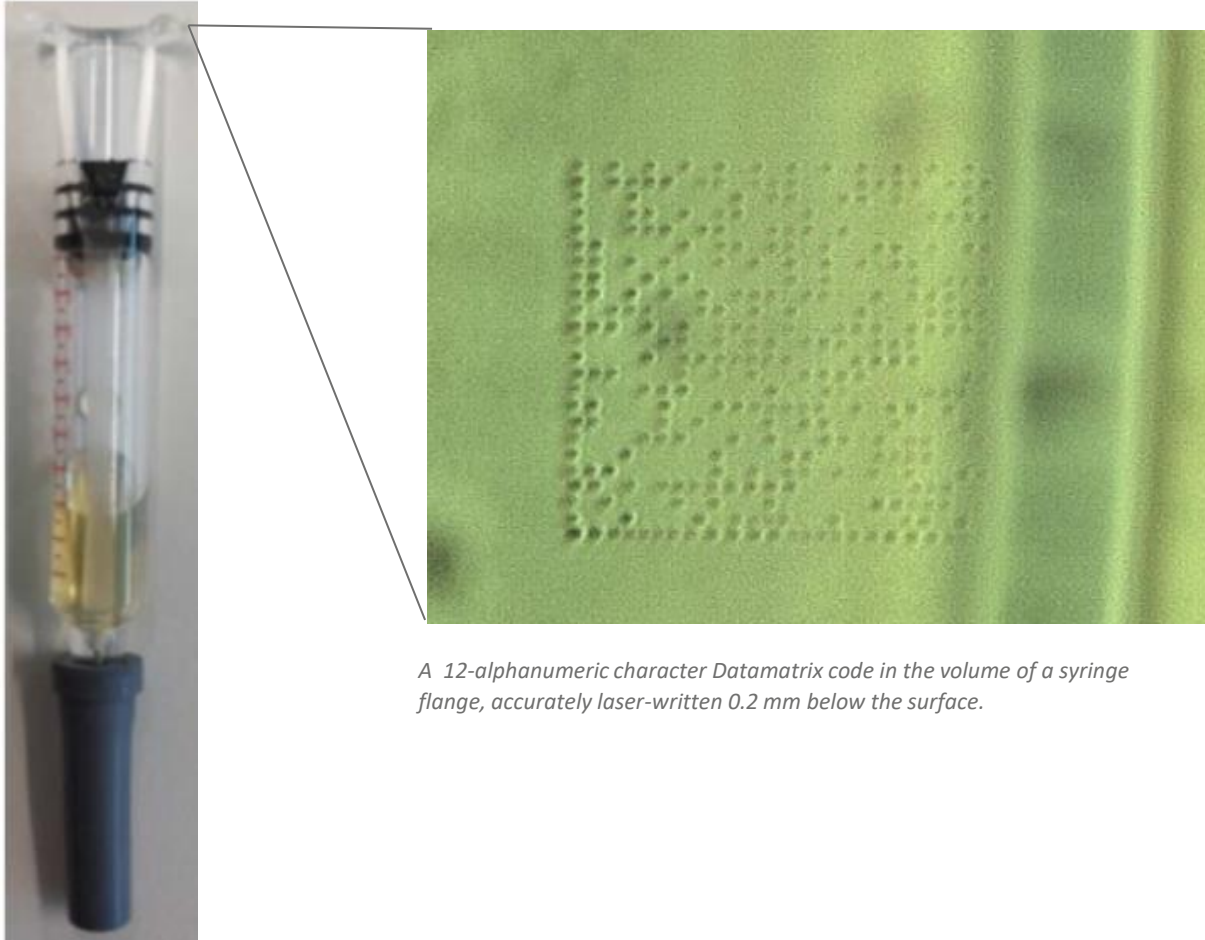
- On the carton (FMD, DSCSA and others).
- On the blister, package content description etc.
- On the tablets, the glass syringes and vials.

...no additional materials or production steps required.



*A 12-alphanumeric character
Datamatrix code in the volume of a
syringe flange, accurately laser-written
0.2 mm below the surface.*

So how are we marking glass?



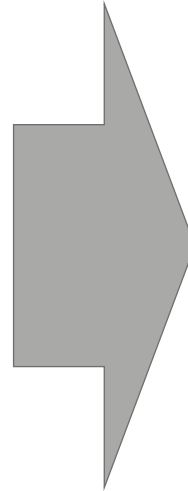
A 12-alphanumeric character Datamatrix code in the volume of a syringe flange, accurately laser-written 0.2 mm below the surface.

- Picosecond laser application
- Writing code in under 0.1 of a second
- Capable of performing to industry standards on automated liquid filling lines
- 100% safeguarding of inside and outside surfaces
- Capable of reading written code on the filling line in another 0.1 seconds

The solution in three steps (forensic and non-forensic spot-checks in the supply chain)

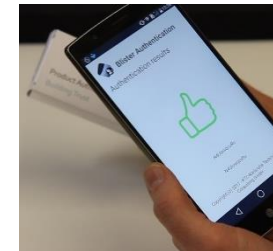
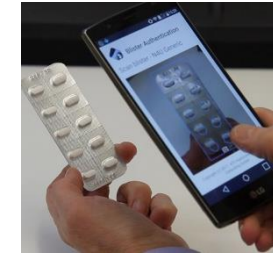
Encryption

1. Capture product data.
2. Encrypt as barcode.
3. Print barcode on blister and/or carton.



Authentication

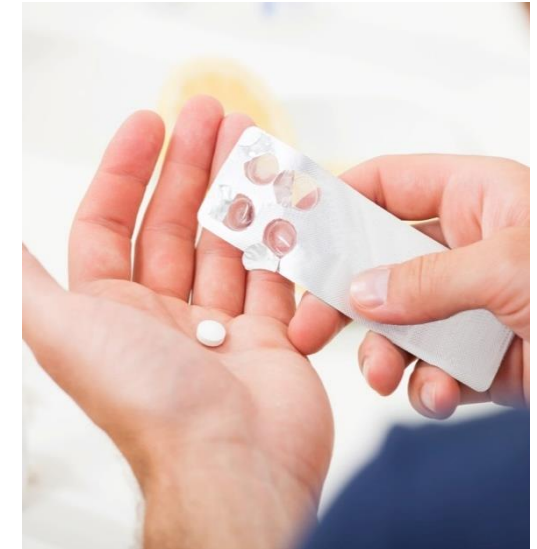
1. Capture product data.
2. Scan barcode.
3. Check barcode against product data.



On the production line – in the distribution chain – at the end user.

Other glass product applications that we pre-tested

- Luxury goods, perfume bottles etc.
- Wine bottles
- Watches
- Art works
- etc., anything really that has a component made of glass



How does this all fit with supply chain authentication efforts more generally

- nano4U is a founding member of the EU's blockchain anti-counterfeiting initiative – see here: <https://www.euipo.europa.eu/en/news/observatory/eu-anti-counterfeiting-blockathon-infrastructure-ebsi-elsa-forum>
- Coding derived from our unique combination of cryptographically secured product/packaging coding is highly usable for the creation of digital twins and non fungible tokens
- We use smart contracts on customer selected blockchain platforms to create true e-pedigree systems



Distributed ledger systems and smart contracts – some definitions re blockchain

- A smart contract is a self-executing contract in which the conditions of the buyer-seller agreement are directly written into lines of code.
- The code and the agreements contained therein exist across a distributed, decentralized blockchain (distributed ledger system) network.
- Transactions are trackable and irreversible.
- Our systems allow for full code aggregation, de-aggregation and re-aggregation of shipments along the length of the supply chain.



Where do we go from here?

- Pilot customer applications in late 2024/early 2025
- Production line count in Pharma up to 10-20 by 2027
- Bringing other glass customer applications outside of Pharma online by 2025/2026
- We are always open for pilot customer inquiries
- Actively in negotiations regarding participation by existing project development partners and outside investors – corporate, family offices, etc.
- Most of our solutions are patent protected, or in the status of patent pending



Product Authentication to Protect your Supply Chain

CONTACT US:

nano4U AG

Dr. Thomas Gering

Brünigstrasse 118

6060 Sarnen,

Switzerland

Tel: +41 (0) 41 – 660-
0927

thomas.gering@nano4u.net

info@nano4u.net

www.nano4u.net

nano4u