INNOVATIVE DIRECT LASER MARKING SOLUTIONS FOR BIOMEDICAL AND PHARMACEUTICS PRODUCTS TRACEABILITY

Solutions de marquage laser innovantes pour la traçabilité individuelle des produits biomédicaux et pharmaceutiques

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Qiova

CLP

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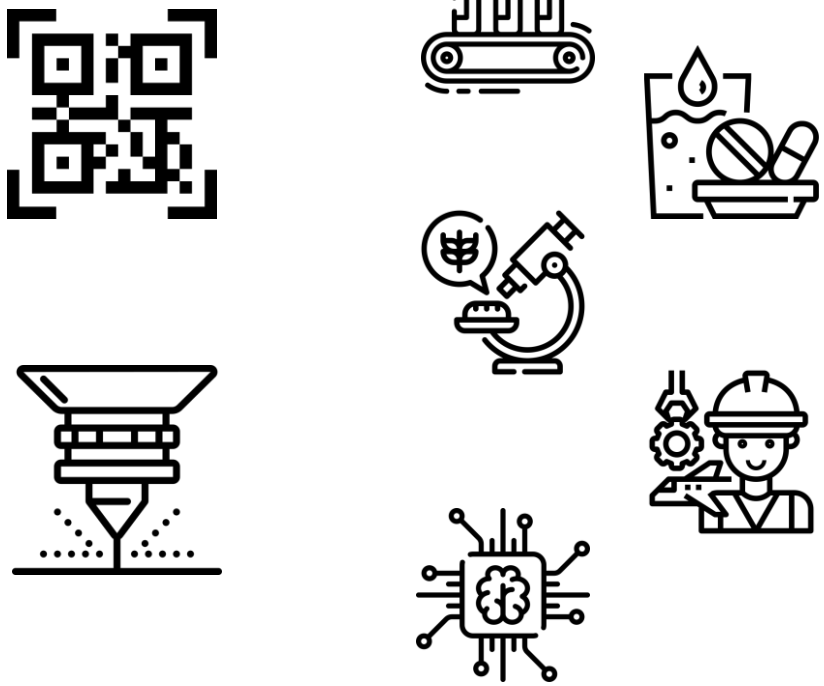
Qiova at a glance

Qiova in a nutshell

Qiova designs and delivers laser processing solutions with superior throughput and efficiency for the industry of the future

Applications

- **Laser marking**
  - Product tracking & tracing
  - Anti-counterfeiting
- **Micromachining**
  - Micro-drilling
  - Surface texturing



Sectors

- Packaging industry
- Pharmaceutics
- Biomedical
- Automotive / Aeronautics
- Consumer electronics

Our main activities

Process development

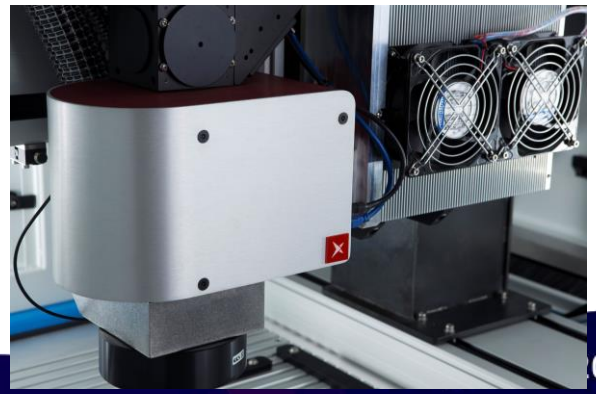
Expertise in laser-matter interaction

- *Faisability studies*
- *Process development*
- *Pre-series / Prototyping*

OEM product line: VULQ1

Patented digital laser beam shaping technology

- *Design and manufacturing*
- *Standard or custom version*
- *Stand-alone or integrated in a laser rail*



What is at stake?

Traceability: a major stake with global benefits

Enabling traceability of manufactured products delivers major benefits at every level

- Sectors→ Supports competitiveness with smart supply chain management
- Companies → optimize operational efficiency
- Brands → fight against counterfeiting and parallel market
- Consumer → information and guarantee of origin

Product traceability in pharmaceutical and biomedical sectors = protecting people health

- Counterfeit drugs is a global business >200 B$ (2011)
- Drug counterfeiting is a booming business: +90%, 2005 → 2010
- Drug counterfeiting kills 100 000s people every year
- Other medical product like prothesis, implants.. are also subject to dramatic impact of non-quality

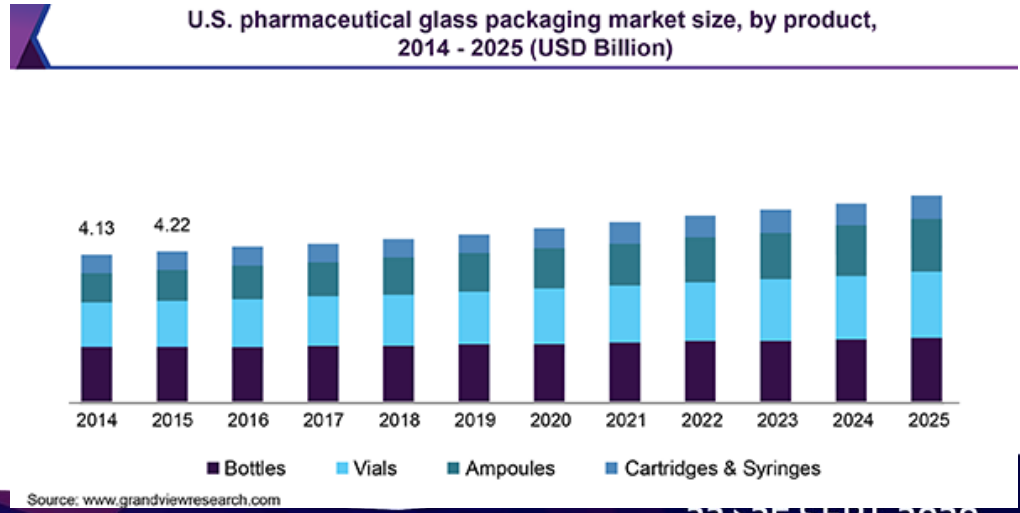
UDI Act (2007): enabling end-to-end traceability at the individual product level

Eric Przyswa. Counterfeit medicines and criminal organisations. [Research Report] Rapport d'étudeIRCAM: http://www.iracm.com/, IRCAM. 2013, 129 p. hal-00958233
https://www.europeanpharmaceuticalreview.com/article/29919/the-cost-of-drug-counterfeiting/

UDI Act: direct marking of individual device

- Enabling traceability requires marking the target product!

- Direct marking of individual medical device is a challenging task:
  - High volume needs high marking rate
    - 50 Billions glass containers supplied every year
  - Packaging use challenging materials: glass, polymers
    - Need to be chemically inert
    - Biocompatibility
  - Small products need high resolution
    - Ear implants, intra-ocular implants



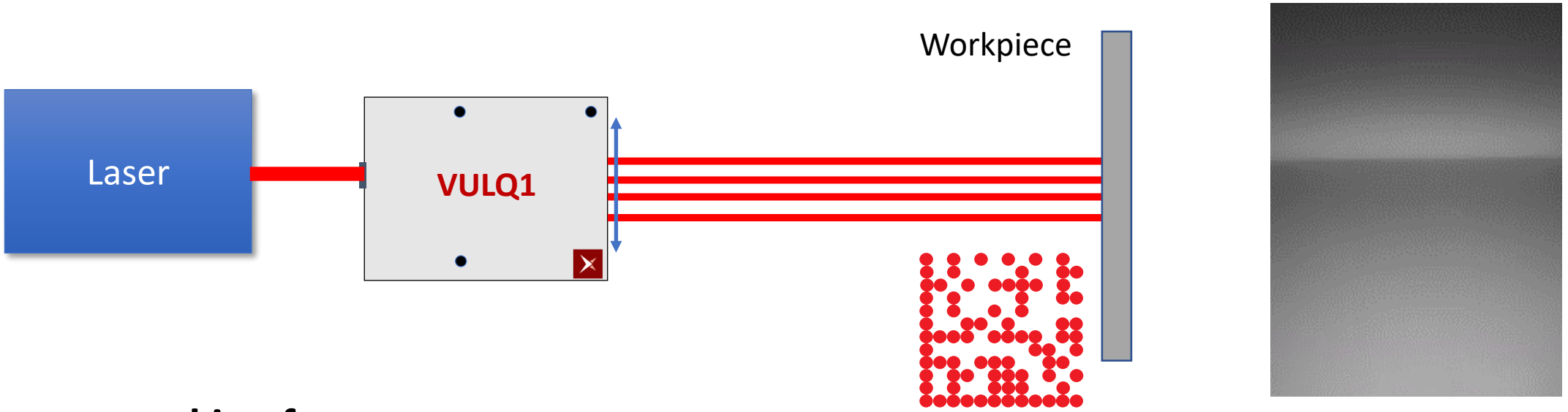
A solution :
Laser marking boosted by digital beam shaping technology

Digital laser beam shaping creates flexible productivity

VULQ1 digital beam shaping technology allows to **generate 10, 100 or 1000 laser beamlets on-demand,** from one single laser beam**.**
The beamlets are **independently controlled** by **software**, in a **dynamic** manner.
They are applied to the material **simultaneously, scaling up process throughput** while **conserving the quality** of the single beam interaction with the material.

Why using only one beam when you can have many?

Stamp marking combines productivity and resolution



- **Stamp marking features:**
  - Ultra-high-speed marking: up to 100s 2D codes per second with optimal quality
  - Ideal for small parts: perfect readability for code size below 1mm
  - Straightforward integration in-line
  - Compatible with any NIR or green industrial lasers

Application case: Enabling mobile traceability

MATERIAL:
PVC

MICRO-DATAMATRIX:
- Size: 570 µm
- Dots: 16X16

LASER:
- Pulsed industrial IR laser

For **Pharmaceutical industry**

- 77 000 parts marked per hour
- **Readable with smartphone to provide on-site product information to the customer**

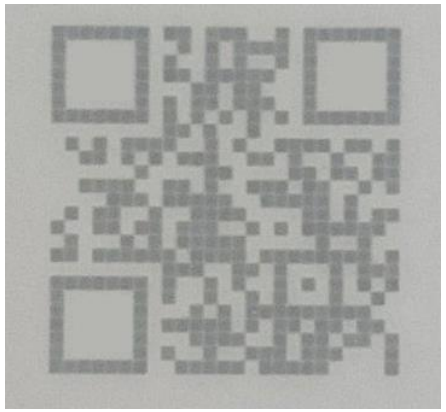
Application case: Creating connection with customers

MATERIAL:
- Polymers, coated metals, metalized PET

QR code:
- 8-12mm

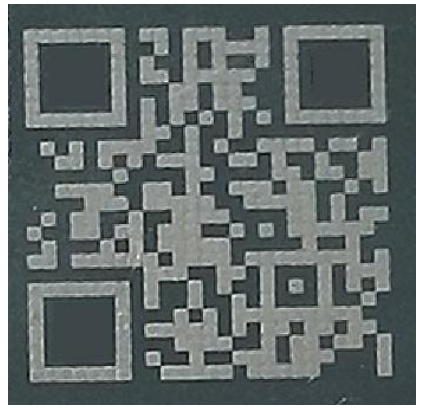
LASER:
- Pulsed green laser

10mm



PolyAmide polymer

10mm



PolyCarbonate polymer

For **Consumer goods, Food&Beverage market,…**

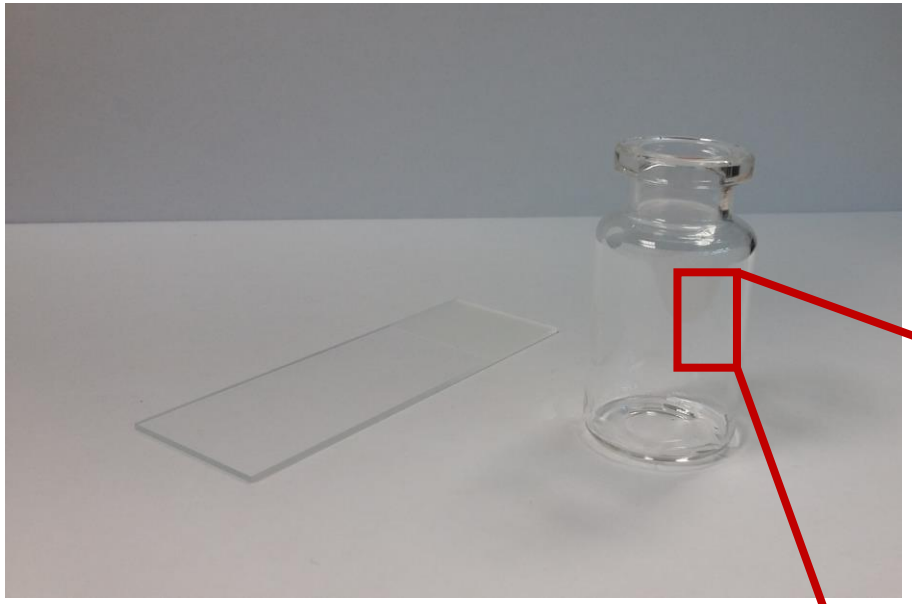
Marking rate 10x higher than standard laser marking
Applicable on a large span of packaging materials
Directly readable by customer smartphone

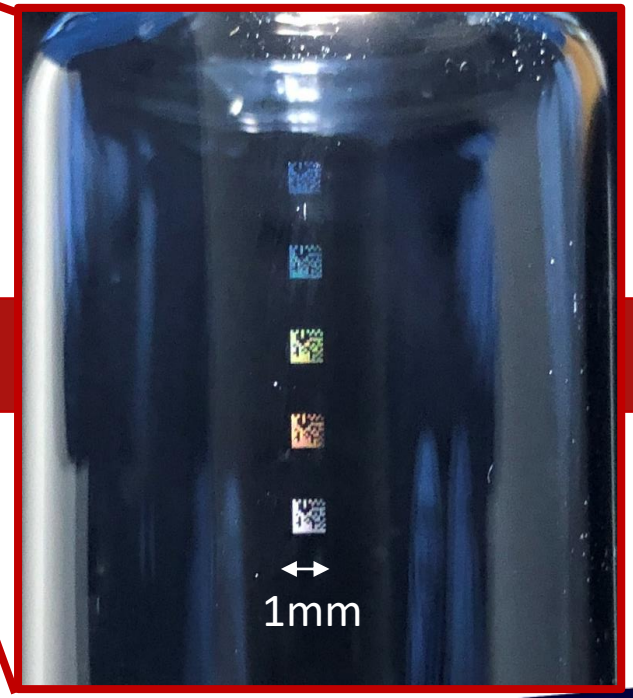
Application case: Enabling end-to-end traceability of drugs to protect public health

MATERIAL:
- Glass

DATAMATRIX:
- 10 digits, DM14x14

LASER:
- Pulsed IR laser





For **Biomedical and pharmaceutical industry**

Combining high quality, high resolution & high marking rate
Readable on site with mobile reading devices
Code contrast engineerable from semi-invisible to visible

Conclusion and outlook

- End-to-end traceability of medical product has the potential to save hundred thousands of lives per year. Also a legal obligation for manufacturers
- Laser is a promising way to direct mark the large span of challenging materials used in this field, like polymers or glass.
- The combination of digital beam shaping with established laser technologies has the potential to offer new solutions to resolve challenging situations.
- Further application of digital beam shaping technology in medical field is work in progress, with the support of European partners.
  - Looking for interested end-user partner for european project call !!

THANK YOU FOR YOUR TIME AND ATTENTION!

Merci pour votre attention!

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