nano and micro architecture

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COMPANY PROFILE

- IQ Structures s.r.o.
  - Star up company, 3,5 years on the market
  - Own nanocenter built in Brno, Production in Jablonec, Head office n Prague
  - Cooperation with Czech Academy of Science
  - Business model - add value and functionality to the plastics, metallic and ceramics materials,
  - Micro and nanostructured materials which reach the needs of our customers
  - Company is mainly financed from private capital of shareholders
  - Cooperation partners from Europe and USA
  - 2015 year revenue around 75 mil. CZK, first profitable year
MORE THAN RANDOM NANOSTRUCTURES
CONTROLLED ARCHITECTURE

- Nano and micro structured materials
- Detail size from 10 to 20,000 nanometers
- Mass production!

 volume

 surface
THE PRODUCTION PROCESS

Design → Master production → Industrial replication
HOW TO MAKE A MASTER

• 1) Lithographic process

• Master production with controlled removal of material
LITOGRAPHY TECHNIQUES

UV lithography

Electron beam lithography
HOW TO MAKE A MASTER

• 2) 3D nano printing process
  • Master production with controlled addition of the material
3D NANOPRINTING

- Technology and machine developed in Czech Republic
HOW TO MASS REPLICATE NANOSTRUCTURES

- Embossing into the plastics
- UV casting
- Electroforming
- Ceramic casting

Special multiplication of 3D structures
SPECIAL MULTIPLICATION OF 3D STRUCTURES
WHERE TO USE NANO AND MICRO STRUCTURED MATERIALS

- Security products against the counterfeiting
- Technical products
SECURITY PRODUCTS

- **Optical security features – visual security**

  Protection against counterfeiting, brand protection.
  Theft prevention.
  Excise tax recovery.
  Systemic protection and Track & Trace.
  Project management and consulting.
  New customized technology development.
SECURITY PRODUCTS

- Plasmonic structures – marked microparticles
SECURITY PRODUCTS

- Fuel marking, tax revenue protection,
TECHNICAL PRODUCTS

Flat optics.

Tissue and organs replacement.

New materials.

Micromechanics.

Microchemical processes.

Printed electronics.

Other applications.
TECHNICAL PRODUCTS

- Flat optics

Replacing this with this
TECHNICAL PRODUCTS

- New materials
TECHNICAL PRODUCTS

• Tissue and organs replacement
TECHNICAL PRODUCTS

• Printed electronics

PragmatIC Planar Nano-Transistor (PNT)
TECHNICAL PRODUCTS

- Microchemical processes

Microchemical production

Sensors

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TECHNICAL PRODUCTS

• Micromechanics
TECHNICAL PRODUCTS

• Other applications

Surface finishes (wrapping, hydrofobity).

Structured surfaces for catalytic processes.

Special electrodes.

Displays.

Optical chips.

etc.
NOT THE FIRST
Nano and micro structures are often inspired by nature, a master of amazing non-conventional solutions.

The nature has always been creating effective solutions, using the mechanism of evolution to perfectly hit the purpose.

Combining the virtue of the nature with our technologies we are able to extend the functionality of structures developed by the evolution.
THANK YOU FOR YOUR ATTENTION

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