

LE LASER, UN OUTIL AU RENDEZ-VOUS DE LA MEDTECH DE DEMAIN

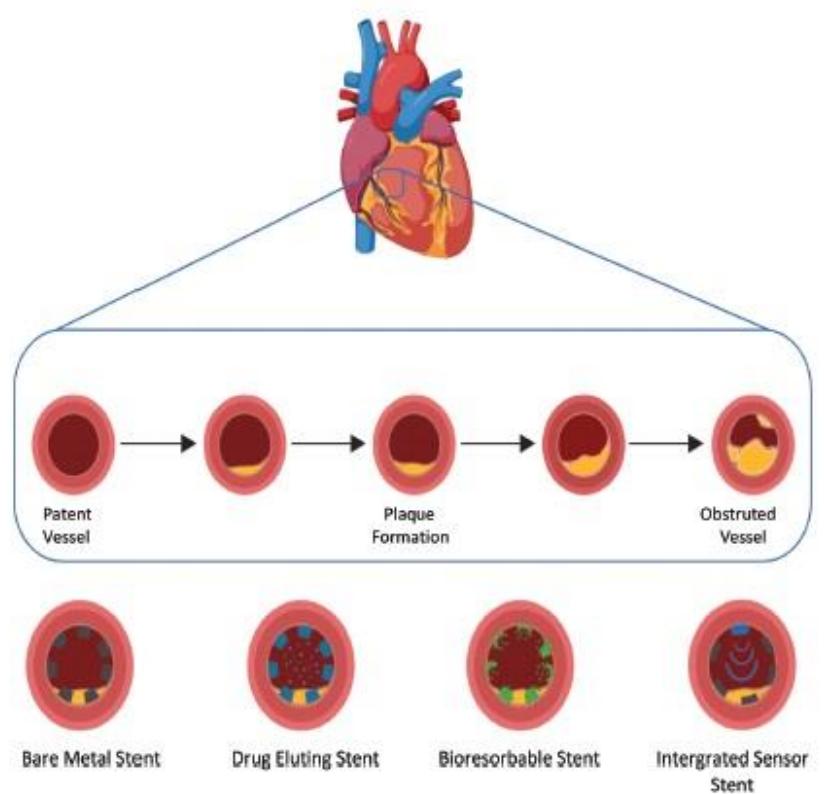
→ Alain Biernaux | Business Dev Mgr | Optec S.A.



Game changers

- ▶ Transformation de la société
- ▶ Innovation
- ▶ Personnalisation
- ▶ Cycle de vie des produits: turnover important
- ▶ Industrialisation
- ▶ MIS
- ▶ Outsourcing
- ▶ Flow Chain: Prevent, Diagnose, Treat and care
- ▶ IT Health: Big Data (Apple, Alphabet,...)
- ▶ Homme réparé, Homme augmenté

Innovation



Schematic of atherosclerosis plaque formation over time and stenting devices within a coronary artery. Created with BioRender.com.

Minimal Invasive Surgery (MIS)

**SMALL INCISION,
BIG IMPACT.**
HOW MINIMALLY INVASIVE
SURGERY IMPROVES
OUTCOMES

Total cost
of MIS =
23%
less than
open
surgery

Colorectal MIS versus open:

- 13.4% lower rate of complications⁷
- 53% reduction in blood loss⁸⁻¹³
- 2.5 days shorter hospital stay on average^{7-11,14,15-22}

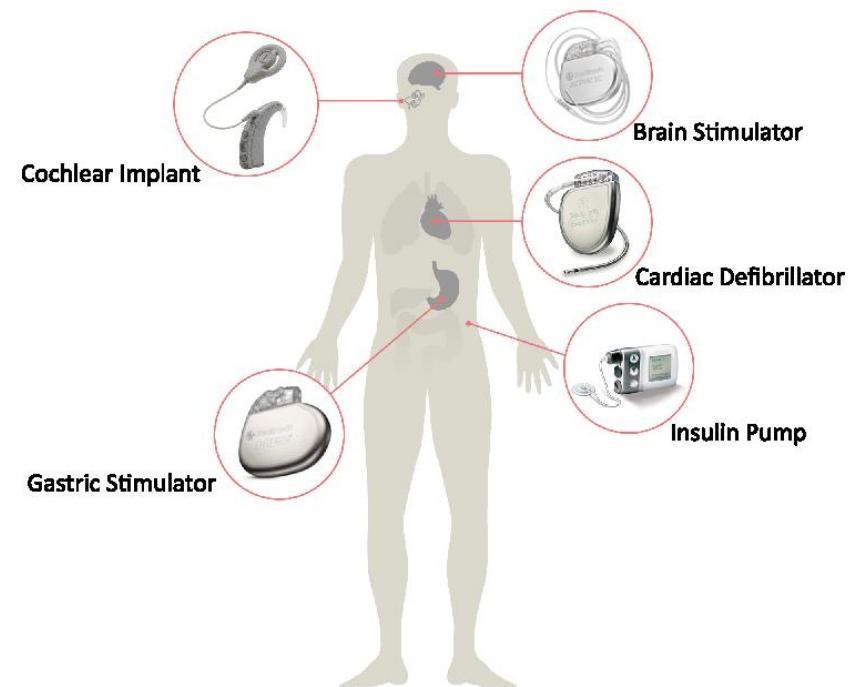
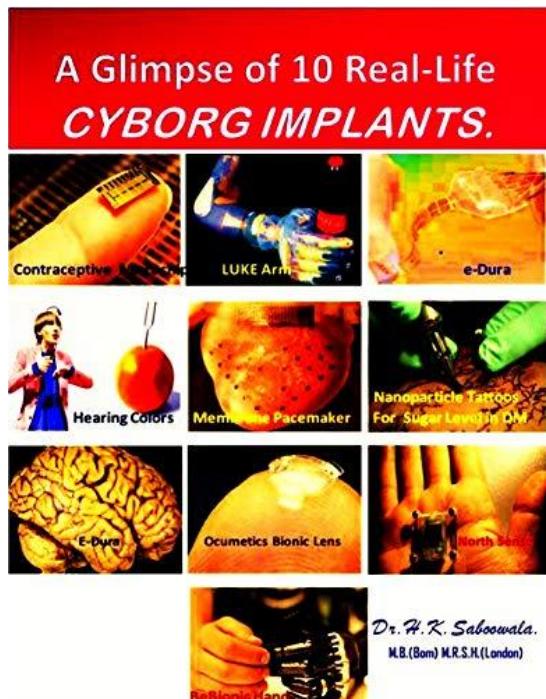
Thoracic MIS versus open:

- 8.5% lower rate of complications²³
- 60% reduction in blood loss²⁴⁻²⁷
- 1.7 days shorter hospital stay on average^{14,24,26,28-35}

Gynecologic MIS versus open:

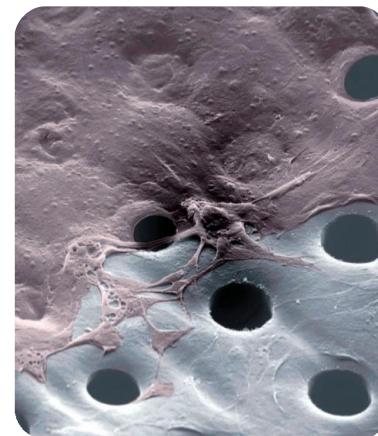
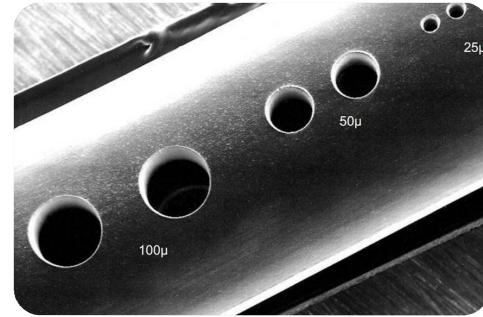
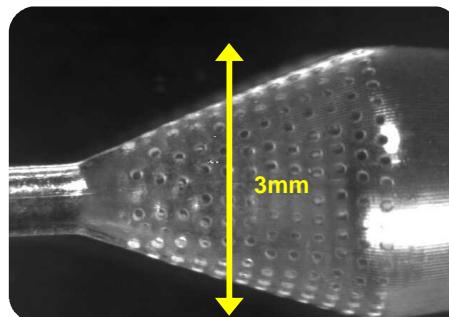
- 8.4% lower rate of complications³⁶⁻⁴¹
- 48% reduction in blood loss^{40,42,43}
- 3.8 days shorter hospital stay on average^{40,42,44}

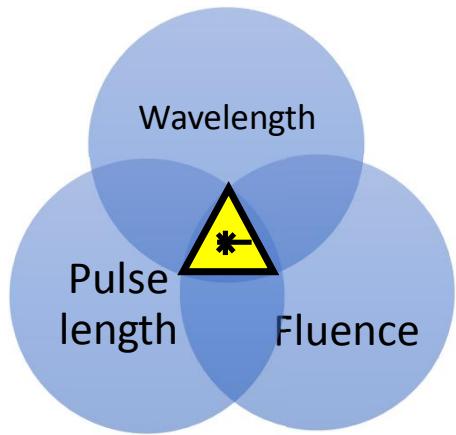
Cyborg & Big Data



Composants

- ▶ Endoscope
- ▶ Guide Wires
- ▶ Rings
- ▶ IOLs
- ▶ Catheters
- ▶ Ballons
- ▶ Stents
- ▶ Bionic Sensors
- ▶ Microfluidics, Lab on a chip
- ▶ Filters
- ▶ Micro coils

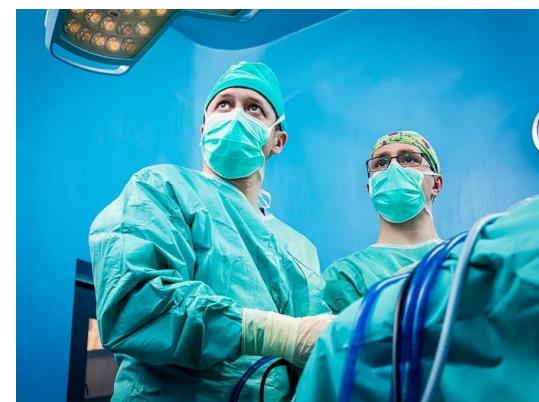


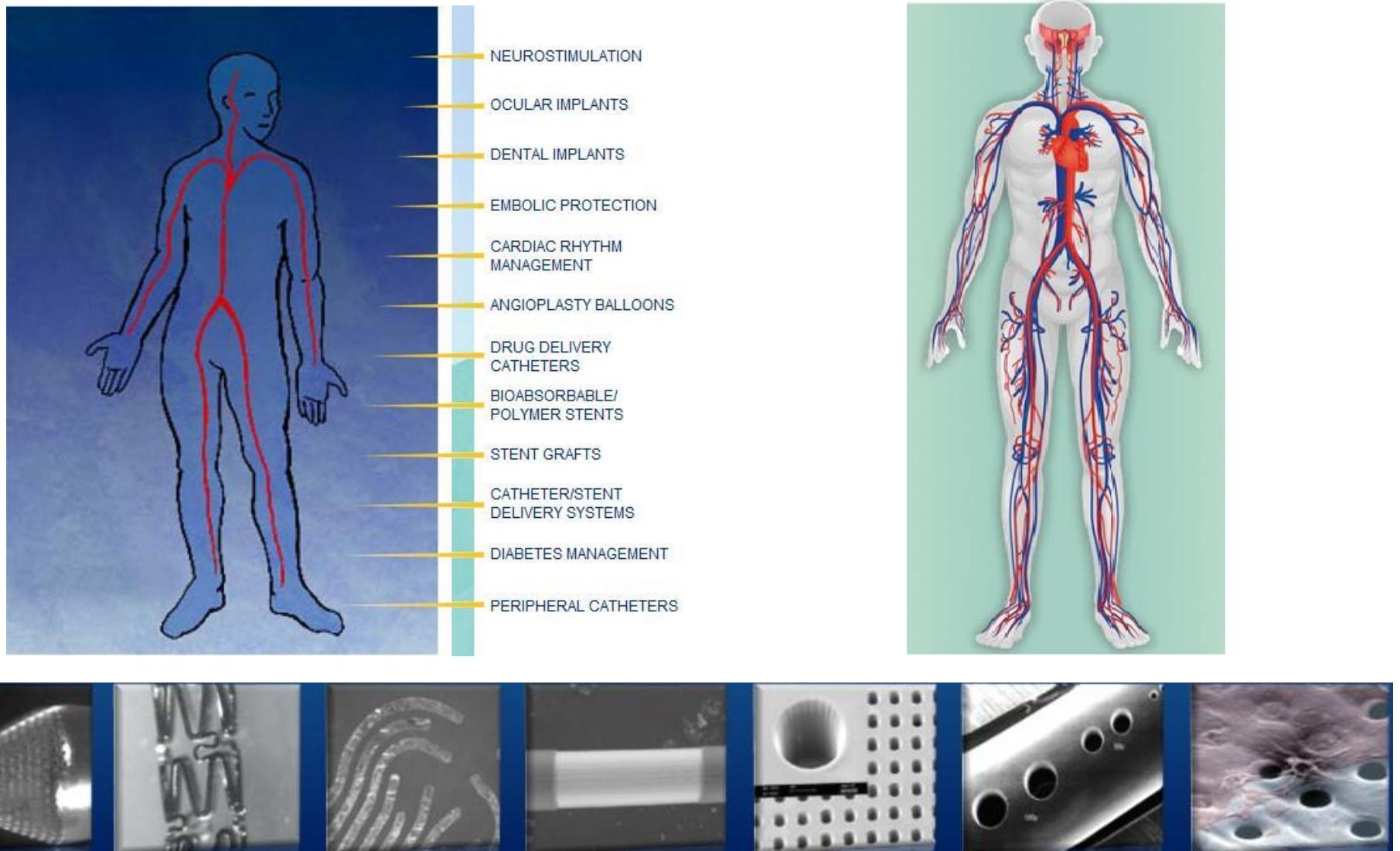


Materials

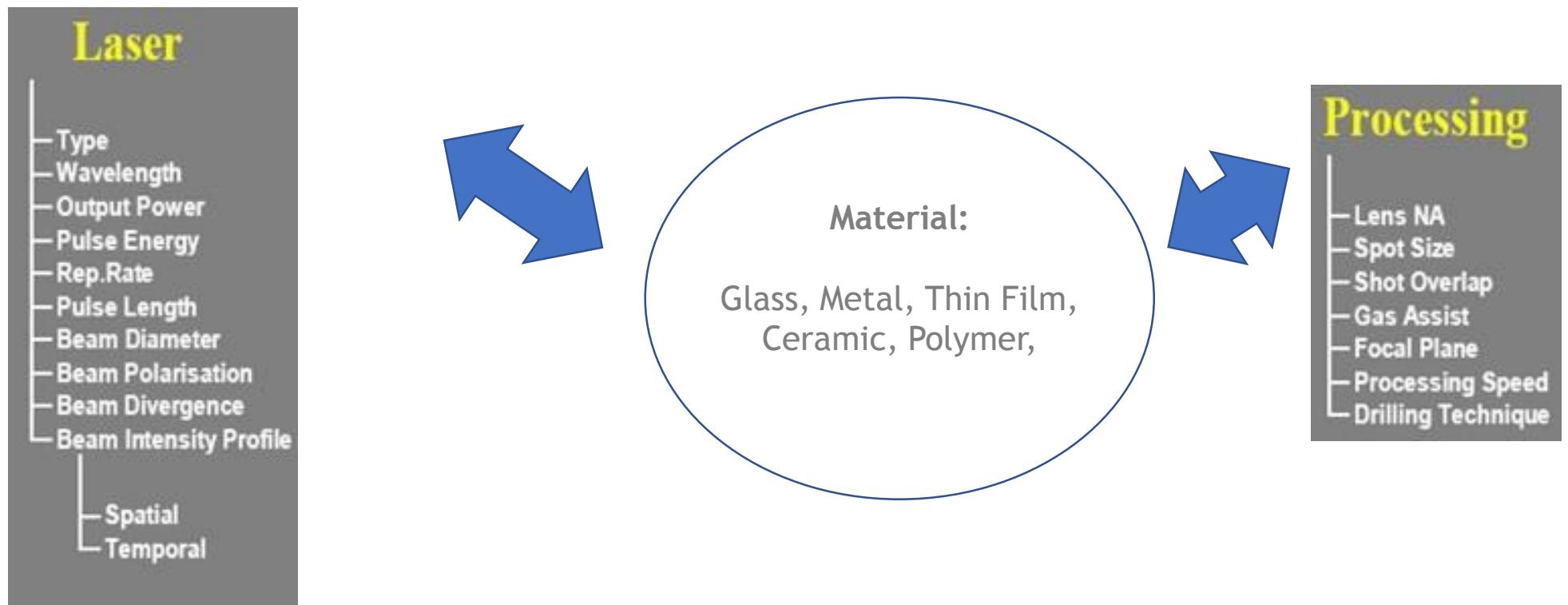
Glasses, Metals, Thin Films,
Ceramics, Polymers,
Bioabsorbables

Process
Cutting
Drilling
Ablation/Patterning
Texuturation
Marking
Welding



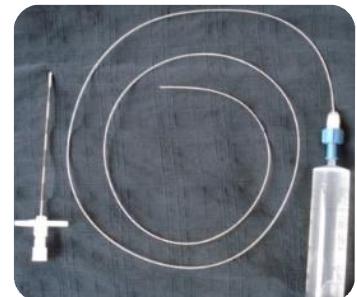


Traitement des matériaux par laser

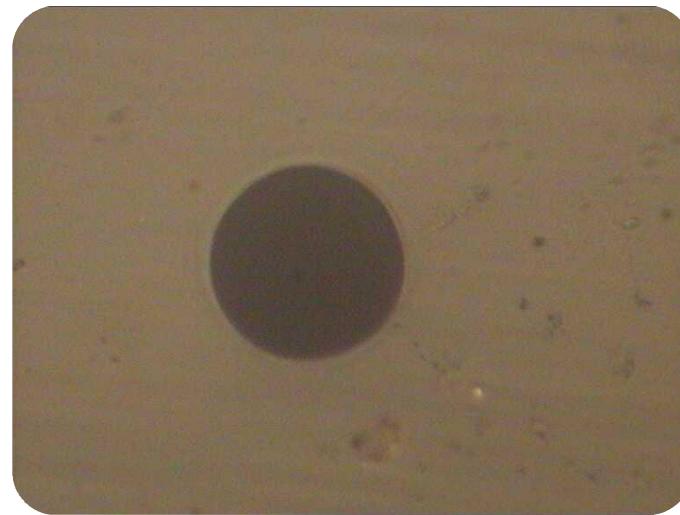


Quelle longueur d'onde?

...35µm dia. holes in a catheter wall (Pebax)..

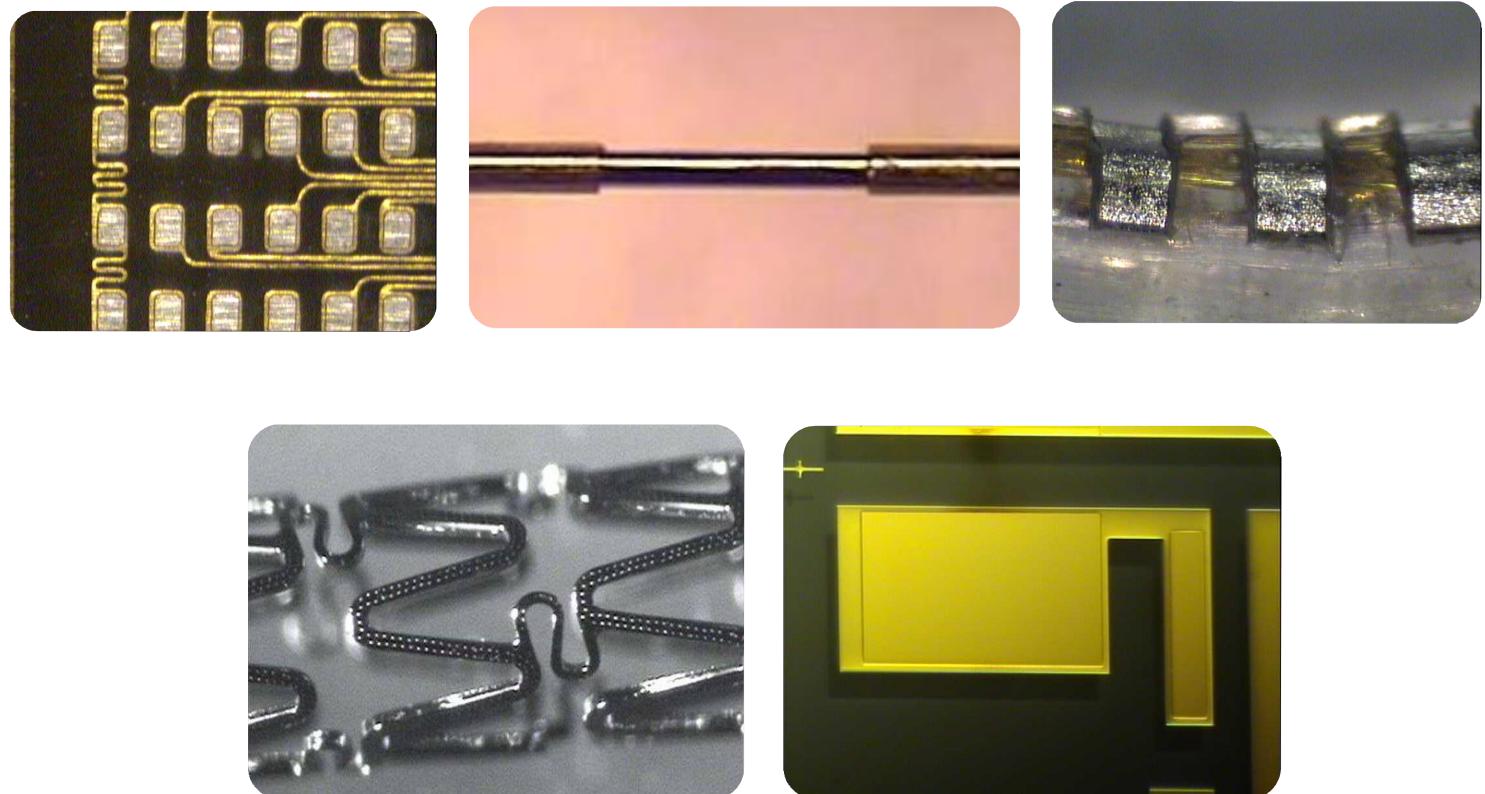
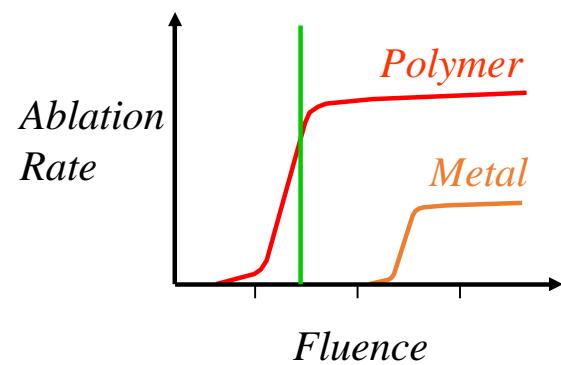


248nm, showing spatter of ejected material in this weak absorber

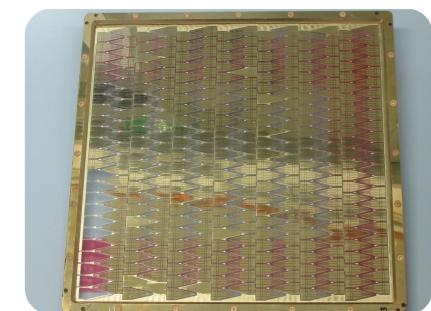
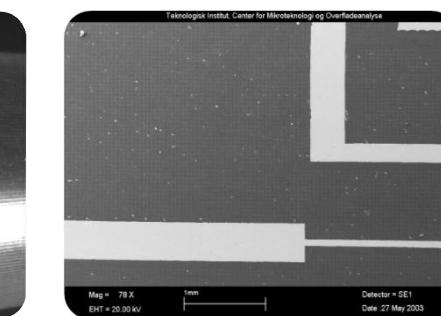
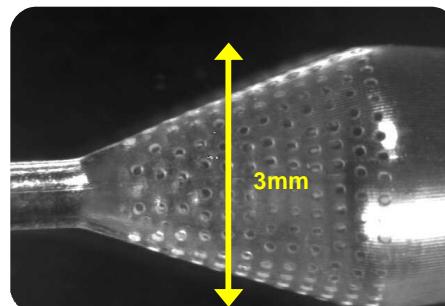
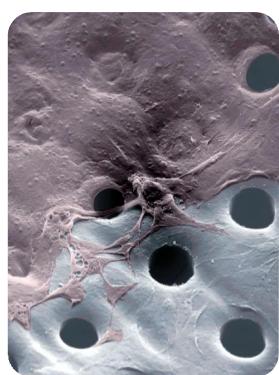
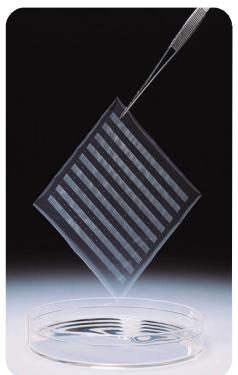
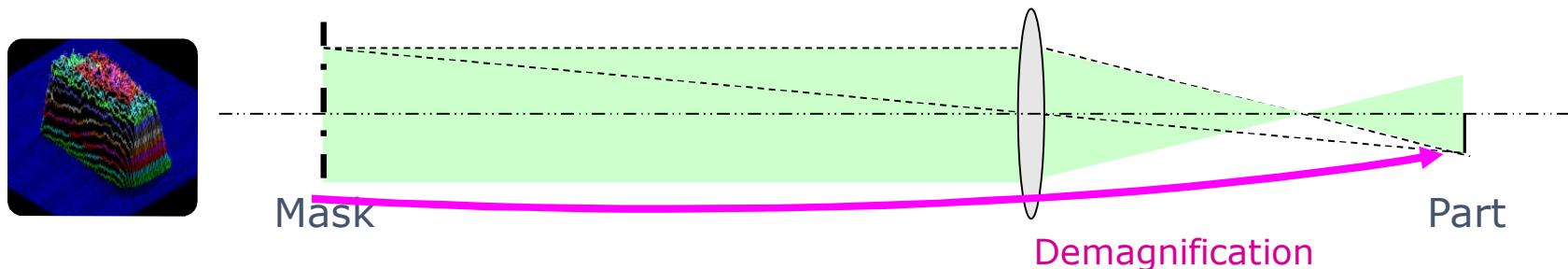


193nm, eliminating spatter

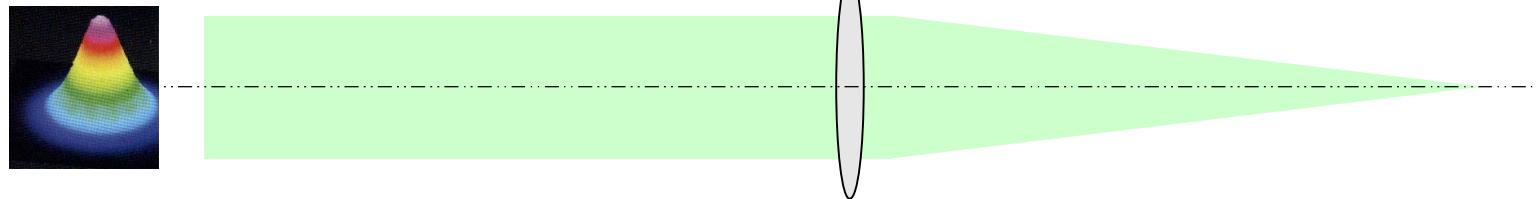
Usinage sélectif



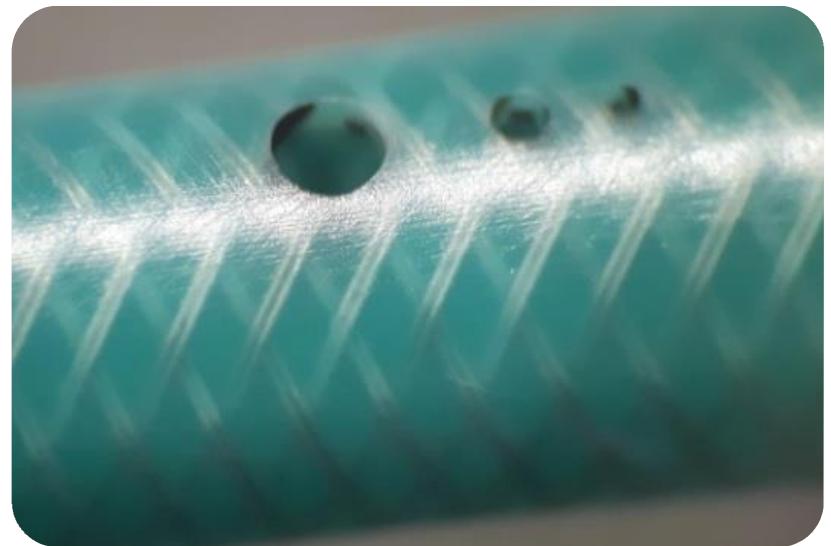
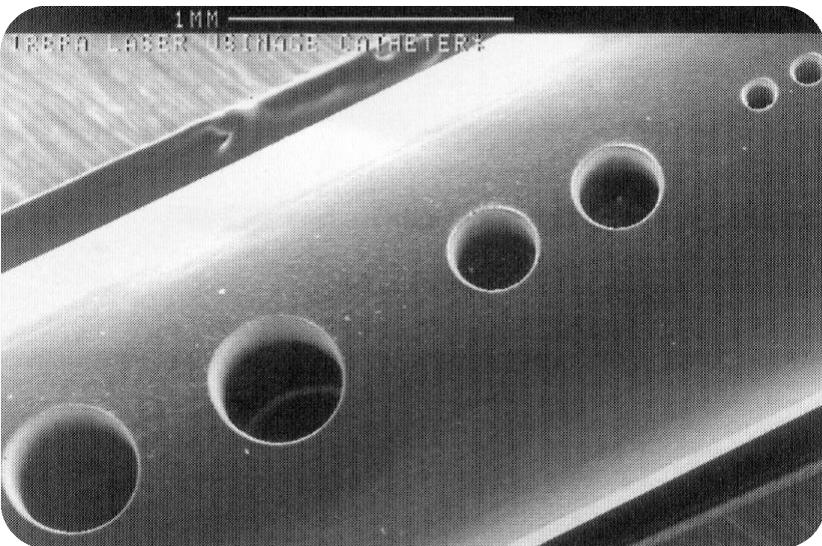
Mode d'usinage: Projection



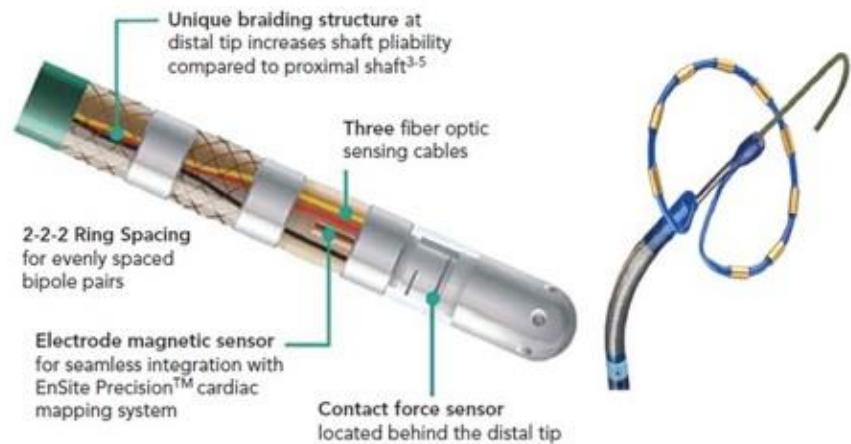
Mode d'usinage: point focal



Design Composant: quel laser?



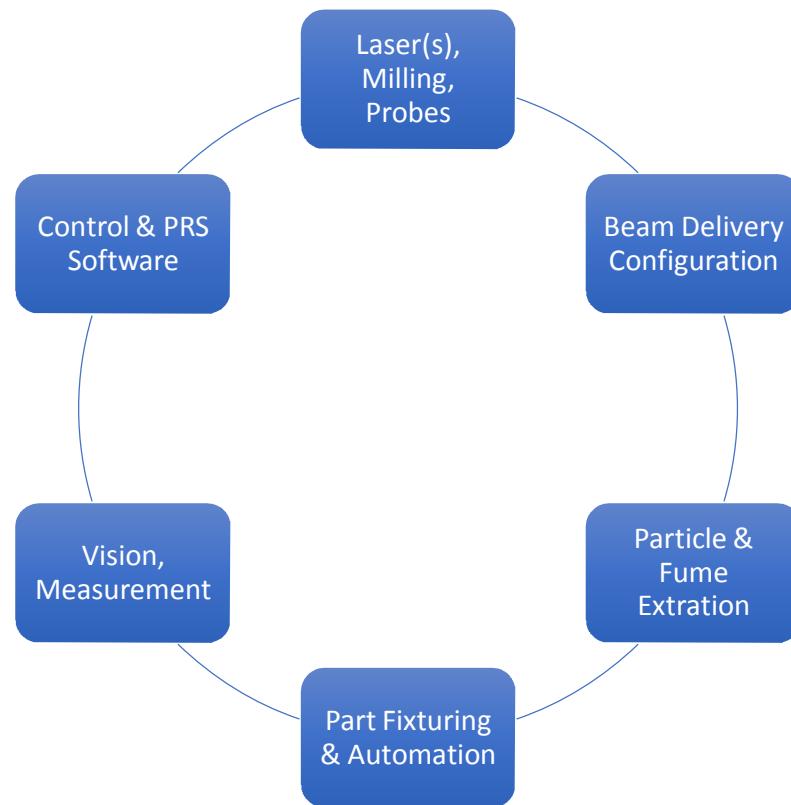
Combinaison de process



Exemples de machines



LASEA Group: notre métier



LASEA Group: notre expertise

- ▶ Des solutions lasers depuis UV profond (excimer) jusqu'à IR lointain (CO2)
- ▶ Du régime impulsionnel fs (USP) au régime continu (CW)
- ▶ Mode d'usinage par masque (photolithographie) ou par écriture directe (point focal)
- ▶ Solutions laser(s) ou hybrides (combinaison lasers et outils non laser (broches, jet d'encre,... analyse in-situ))







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CLP



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22 > 25 SEPT. 2020