



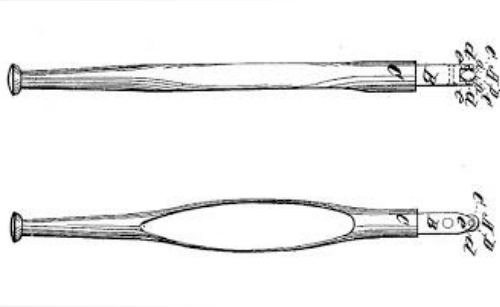
HYPERMEMO LASER

FOR SMART AND ORDINARY GLASS PROCESSING



THERE WAS NO INNOVATION FOR TOO LONG...

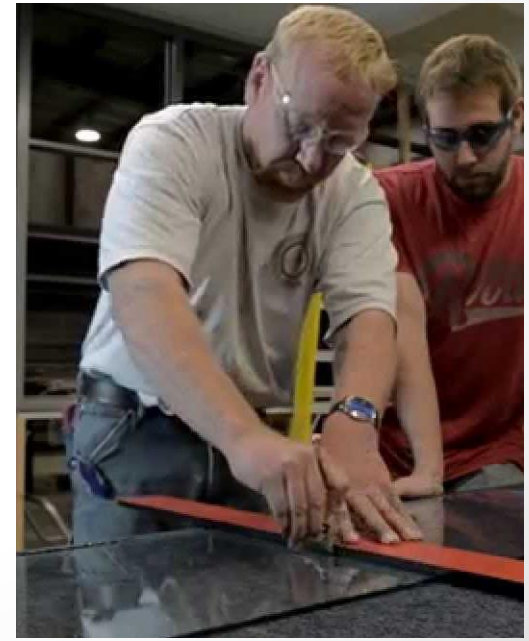
XVII



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XXI



PROBLEMS AND SOLUTION

Today's disadvantages:

- chips (not clean);
- poor edge strength and quality;
- requirement of post processing.

Are similar to mechanical processing of mostly materials.

In many cases they overcome by lasers.

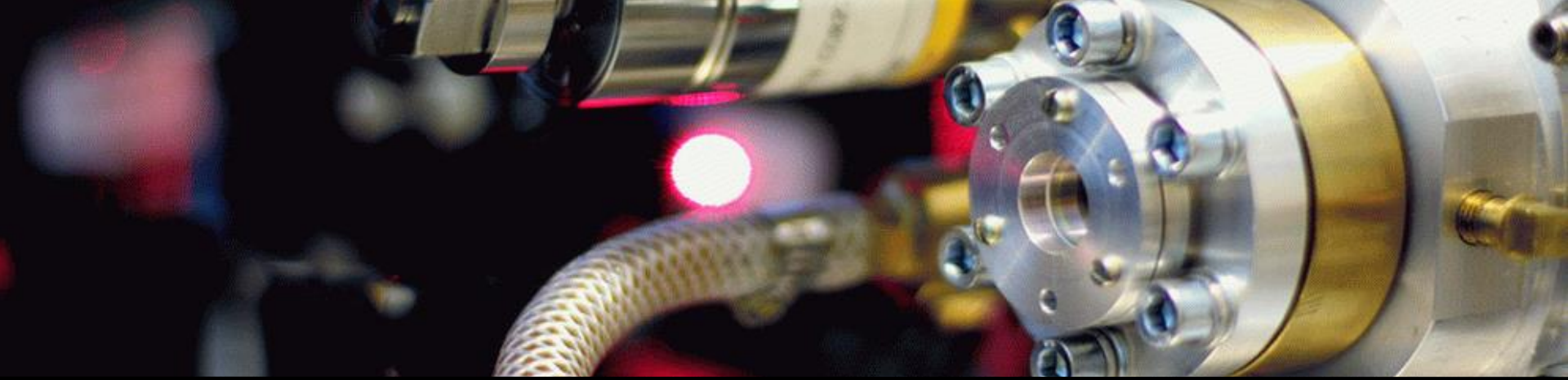
Lasers is a future of glass processing

LASER GLASS CUTTING SOLUTIONS COMPARISON

CHARACTERISTICS	ABLATION CUTTING (532nm or UV laser)	FILAMENT CUTTING BY ULTRASHORT PULSES	HYPERMEMO LASER
Special demands for glass	no	yes	no
Grinding and polishing necessary	no	no	no
Complex profiles (shape) cutting in a single step	yes	yes	yes
Glass strength weakening	yes	no	no
Cutting speed	very low	high	high
Glass thickness, mm	0-20	< 2	0-50
Operational environment	requires stable	requires highly stable	independent
Machinery Costs, k\$	50-150	150-200	40-60

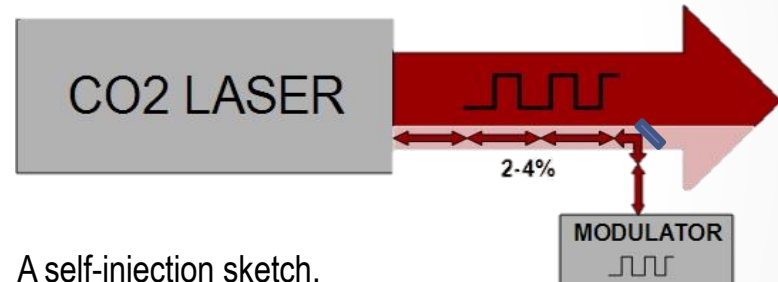
First two solutions are used in glass processing but in specific and costly applications like micromechanics, Gorilla glass processing.

In contrary Hypermemo laser has been specially developed for mass glass processing.

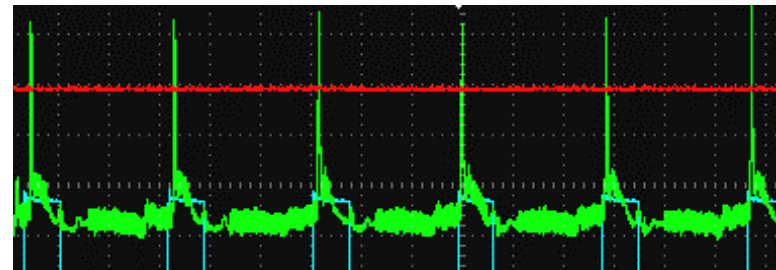


OUR LASER TECHNOLOGY

- Hypermemo Oy is the first and the only one to date company in the world who has made the laser specifically for glass processing, combining the full glass processing operations within one device.
- The laser has inique parameters that allows processing glass precisely, efficiently and over 30 times faster than existing methods.

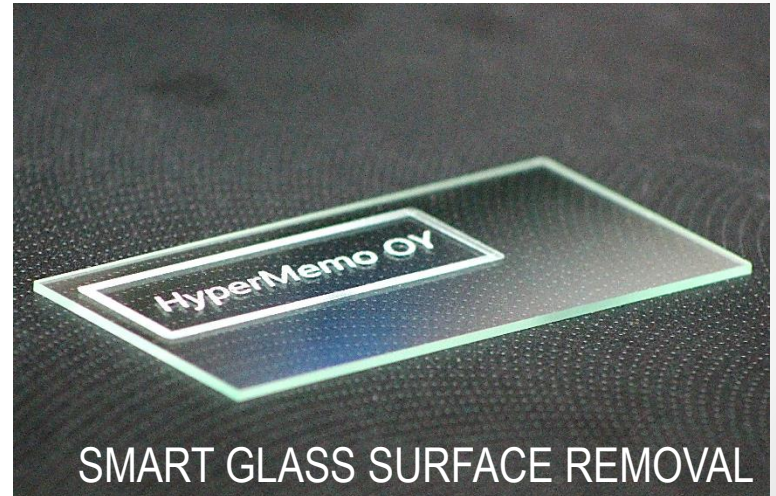
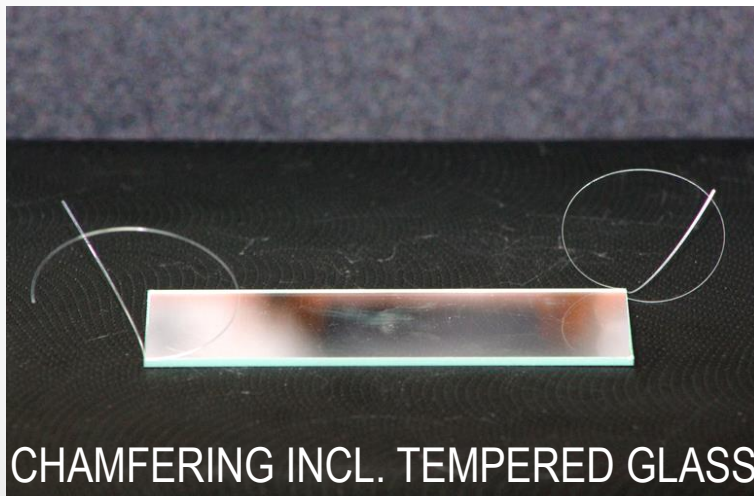
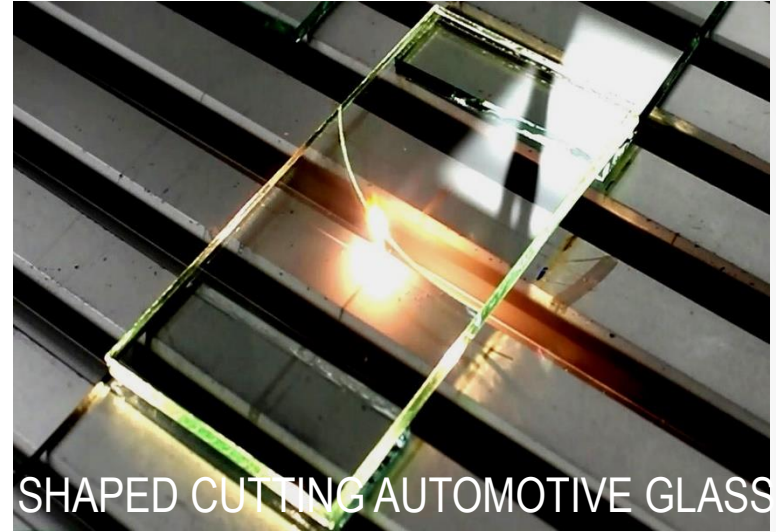
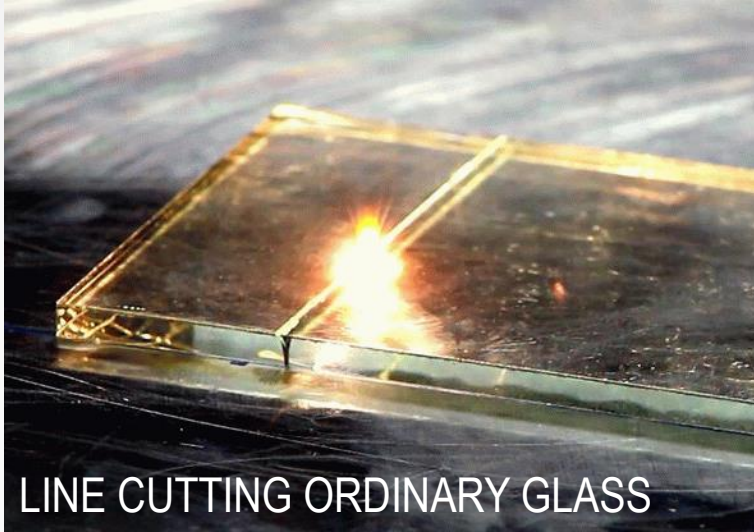


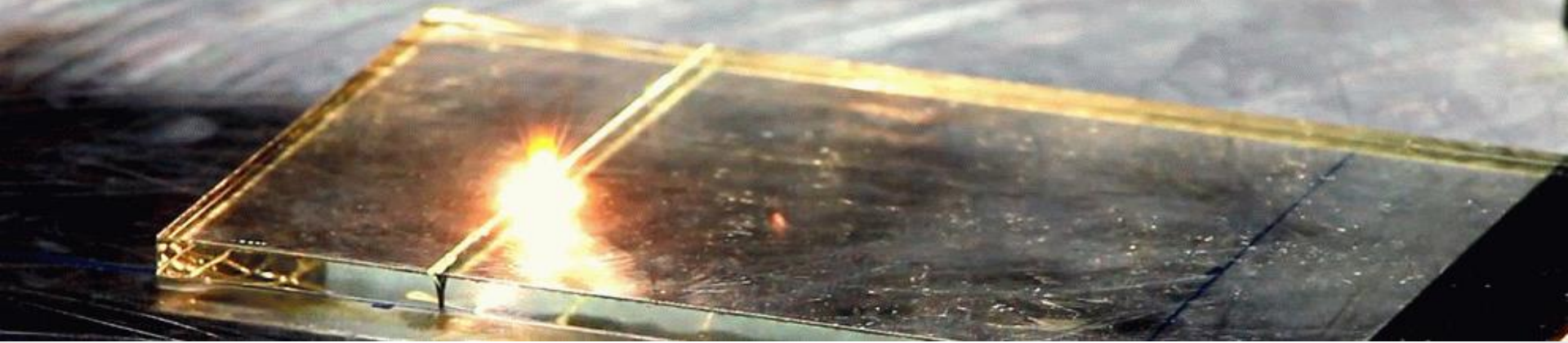
A self-injection sketch.



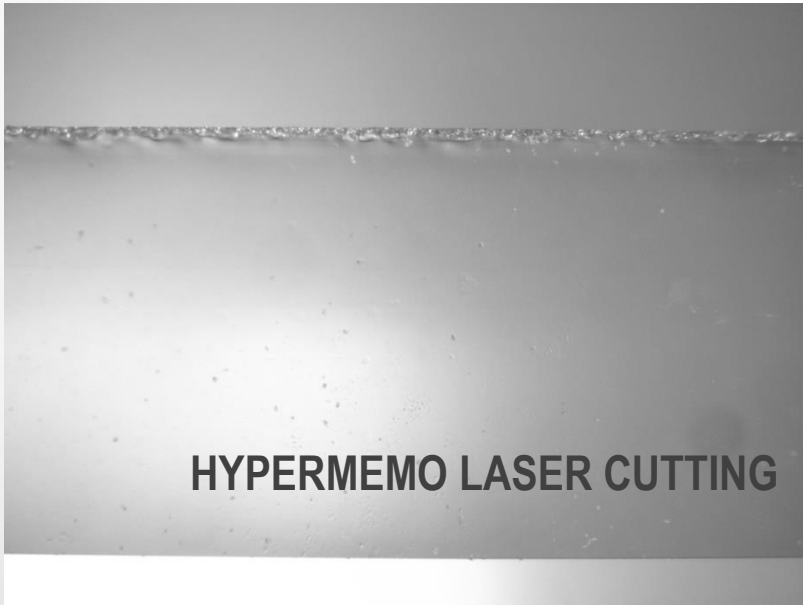
Short-pulsed CO2 lasing with around 15 times exceed of a peak over an average power.

ONE HYPERMEMO LASER FOR ALL GLASS PROCESSING





HYPERMEMO LASER and MECHANICAL cutting comparison



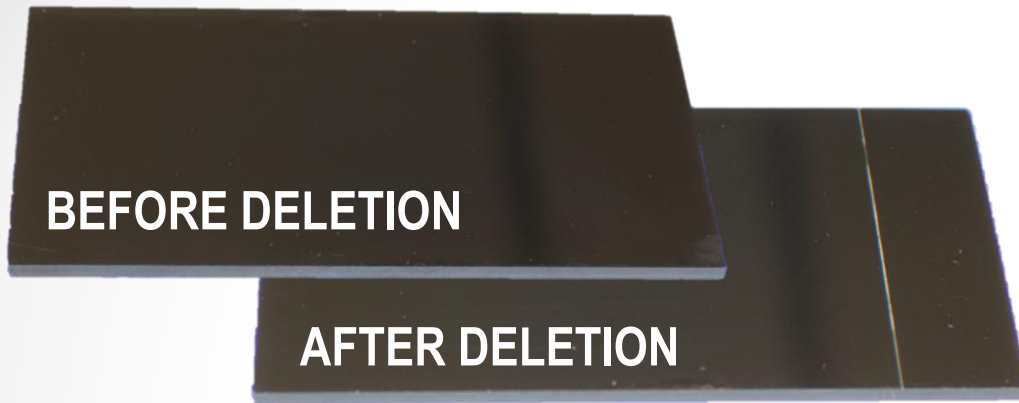


HYPERMEMO TECHNOLOGY VIDEO DEMONSTRATION

- Hypermemo's Laser Glass processing technology is based on a operation with a unique **CO2 laser** running in a **short-pulsed mode** along with a **continuous wave mode**. Currently existing CO2 lasers are not working in a short-pulse Q-switched mode.



SMART GLASS SELECTIVE SURFACE REMOVAL

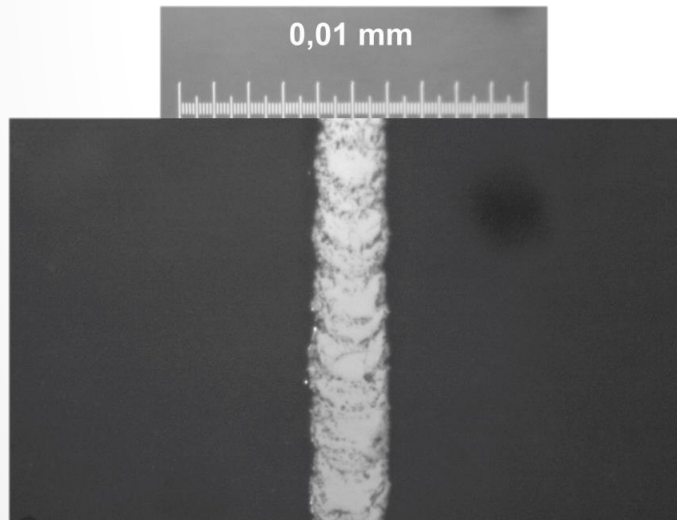


Smart glass:

ITO 50nm

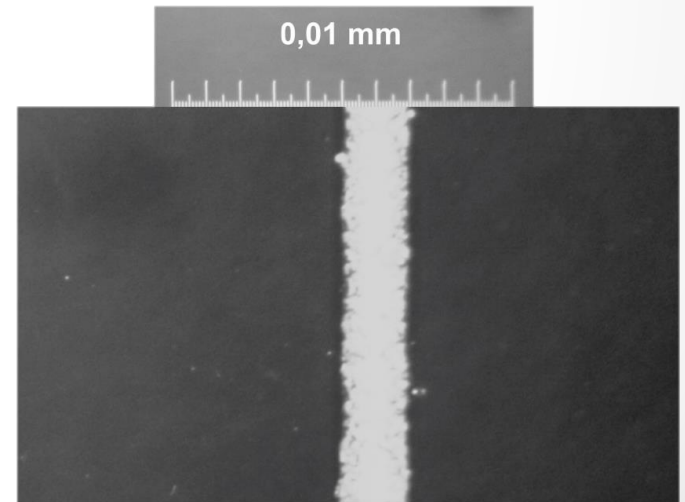
SiO₂ 20nm

Soda-lime glass 3mm



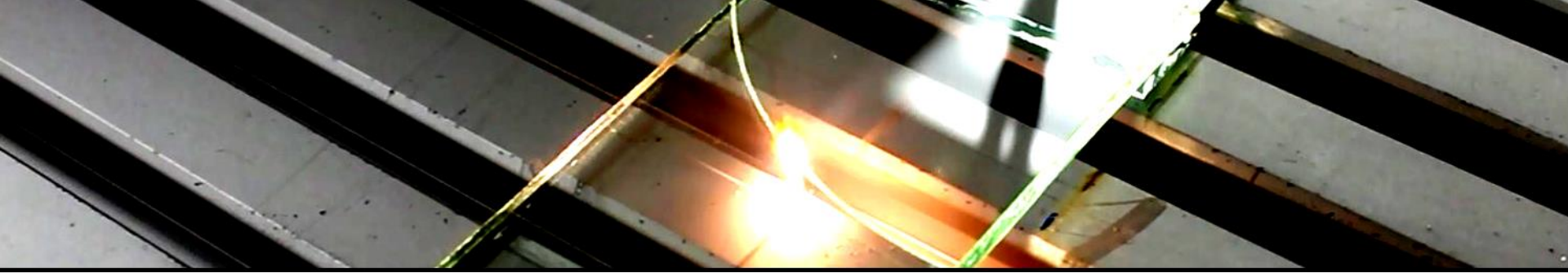
$v = 12 \text{ m/s}$ (speed)

$V_s = 2400 \text{ mm}^2/\text{s}$ (area in a second)



$v = 4 \text{ m/s}$

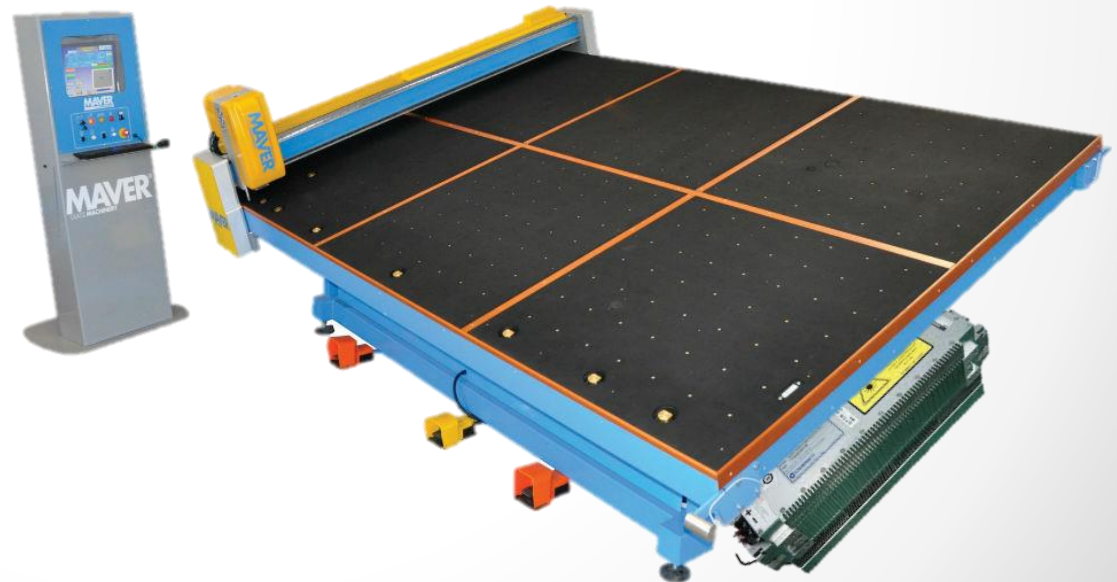
$V_s = 800 \text{ mm}^2/\text{s}$

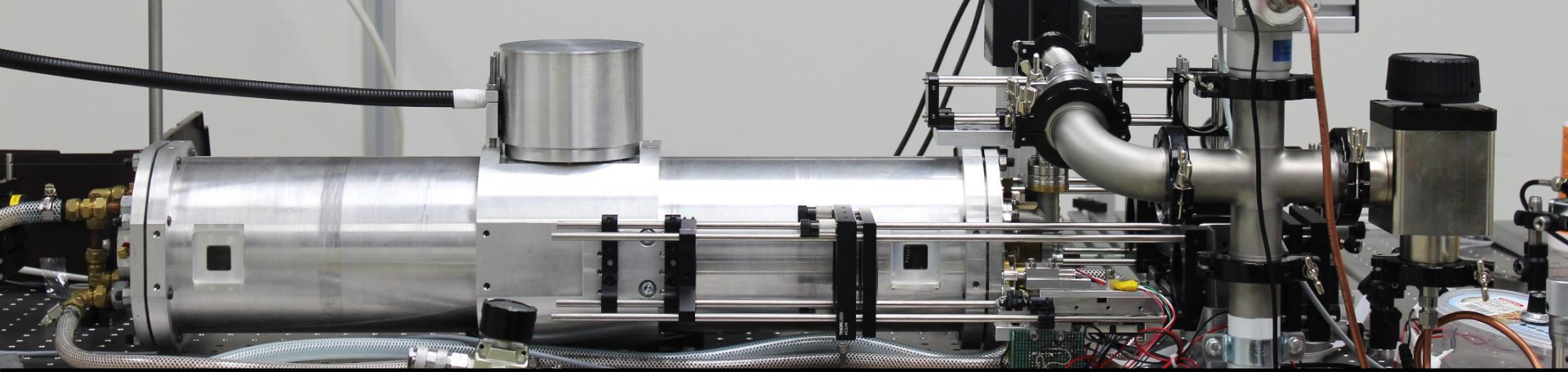


HYPERMEMO LASER INSTEAD OF A DIAMOND WHEEL in currently existing machines

Renovation Option

- Hypermemo Laser can be designed and adapted to existing glass cutting machines (tables), thus replacing diamond wheels.





HYPERMEMO LASER OPERATING ORIGINAL TABLE

- Hypermemo Oy can design and produce similar to existing diamond wheel machines (tables), but specially developed cutting system with a Hypermemo laser.

Principle new machine



Image is taken for illustration and do not represents the final view of machine

HYPERMEMO LASER SYSTEM INSTEAD OF A WHOLE LINE

Complete innovation

MECHANICAL METHOD (OLD METHOD)



Score machine*



Breaking machine*



Grinding machine**



Wash&drying machine**



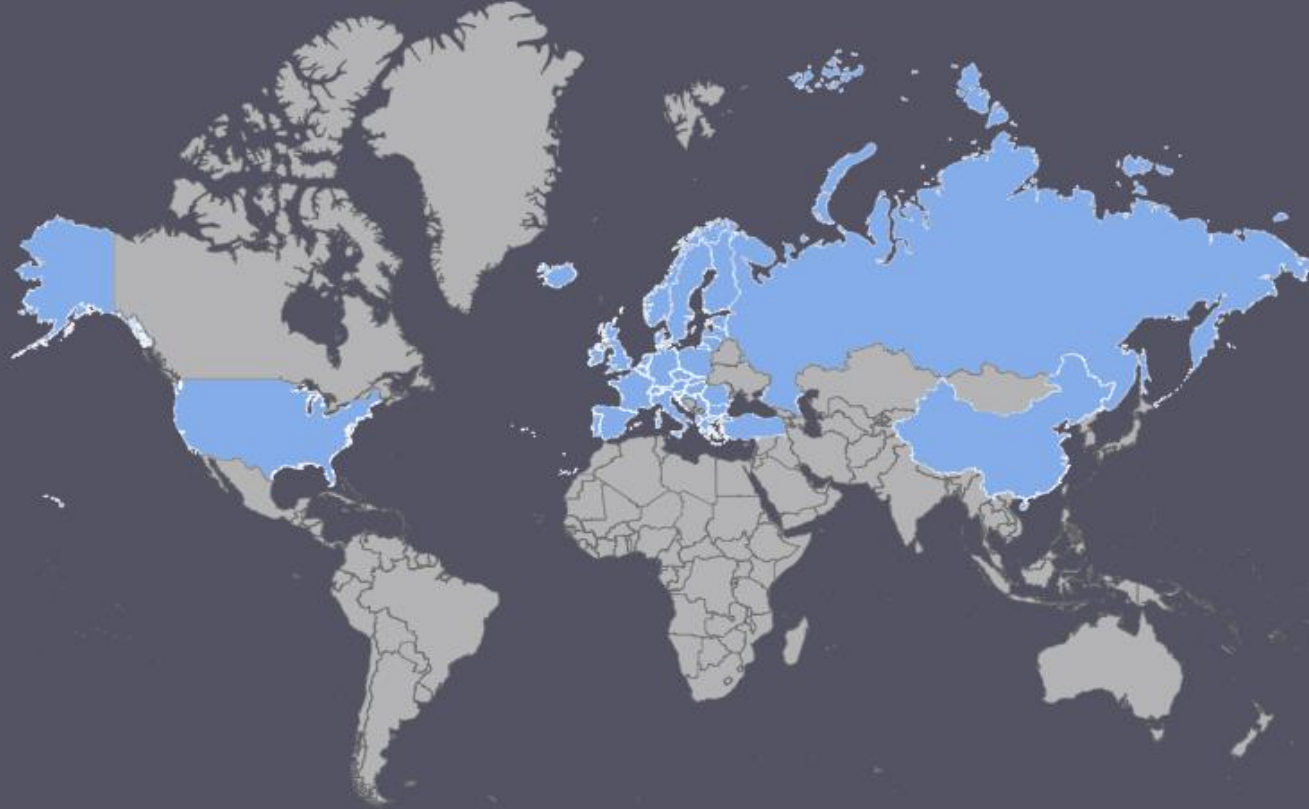
HYPERMEMO'S SOLUTION

HYPERMEMO LASER SYSTEM CAN REPLACE WHOLE LINE



Images are taken for illustration from www.hegla.de* and www.alibaba.com** with minimum prices taken from www.alibaba.com

Image is taken for illustration and do not represents the final view of machine



PATENTS

PATENT NAME: Powerful pulsed self-seeding CO2 laser

FINLAND (№125097), USA (№9407057), CHINA, RUSSIA, EUROPE

OUR CORE TEAM



Mrs. Natalia Morozova
Head of the Board



Dr. Vadim Kiyko
CEO & CTO



Dr. Slava Vanyukov
COO, Sales&Marketing



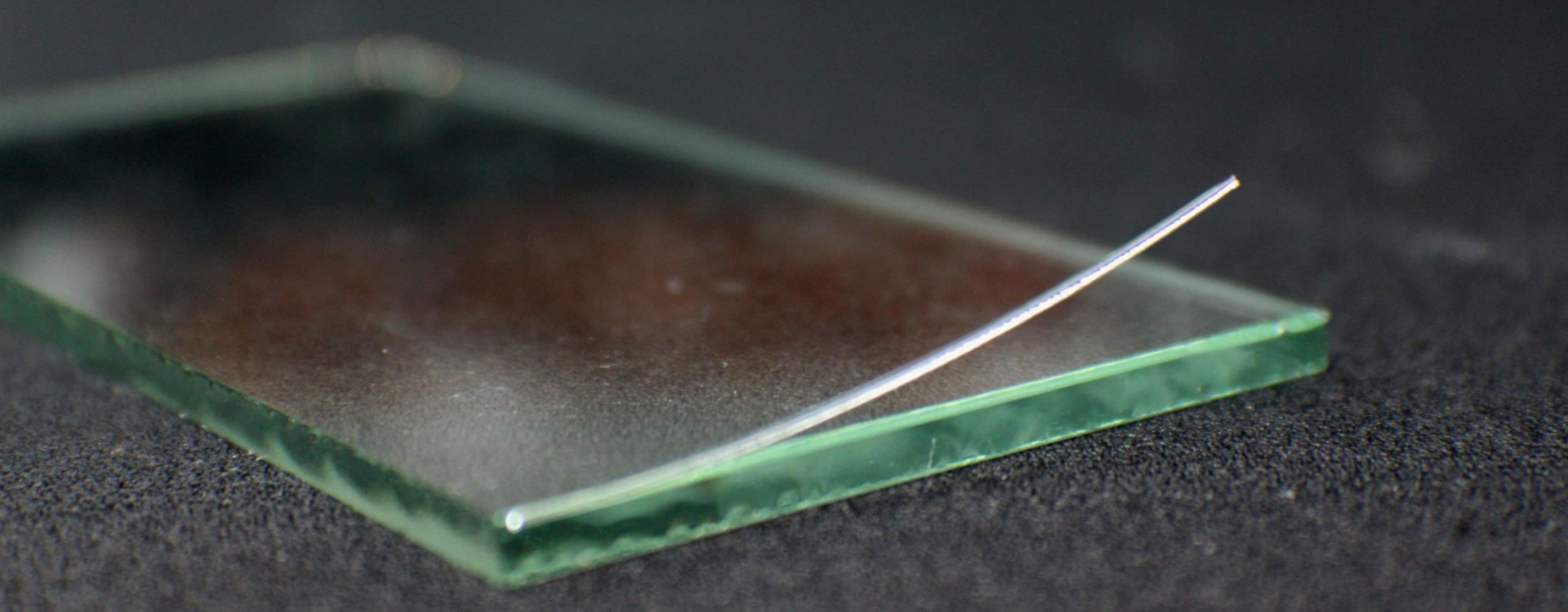
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Production



Dr. JYRKI SAARINEN
ADVISOR
Photonics Finland, Chairman



JUHA PURMONEN
ADVISOR
Photonics Finland, CEO



HYPERMEMO OY

OPEN FOR INDUSTRIAL AND FINANCIAL PARTNERSHIP!

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