

sensor innovation hub

Call for Interest

Direct Ultrafast Laser Welding for hermetic bonding of Glass-to-Glass and Glass-to-Metal Substrates

Ultrashort Pulse (USP) laser technology

Seeking Swiss industry partners for a co-funded R&D project to generate new process technology. No previous bonding process matches the versatility, precision and long-term stability of direct ultrafast laser welding on glass-glass and glass-metal substrates.

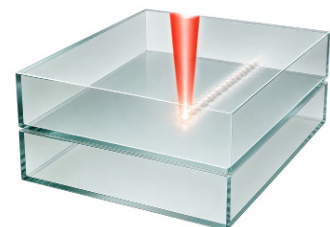
The Technology behind:

Our partner Yalosys AG has developed a direct, adhesive-free welding process for glass substrates using ultrashort pulse (USP) laser technology. Focused laser pulses create localised plasma at the joining interface, bonding glass-glass or glass-metal at room temperature, without intermediate layers, adhesives, or frit. The result is a permanent, hermetically sealed, biocompatible joint at micron-scale precision.



Why ultrafast laser welding?

Conventional joining methods (adhesive bonding, glass frit, anodic bonding) require high temperatures or suffer from outgassing, material creep, and ageing. USP laser welding eliminates all intermediate materials, achieving superior long-term stability, vacuum and fluid tightness, and compatibility with harsh environments.



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Target Application Areas

Precision Optics

Permanent bonding of prism assemblies, optical windows and micro-optical components, with no adhesive-induced birefringence.

MedTech + Implants

Hermetic encapsulation for in-vivo sensors (ICP, cardiovascular, biomarkers): biocompatible, no outgassing.

Vacuum Technology

Pressure-tight glass to metal joints for vacuum systems, replacing brazing or frit sealing with a room-temperature process.

Encapsulation

High-integrity sealed glass containers for aggressive media, sensitive electronics (MEMS, PIC) or clean-room packaging.

Project Roadmap

1

Individual on-boarding of project partners

2

Joint Innosuisse proposal submission

3

Hardware investment and process development at SIH

4

Sampling and pilot production capability at SIH

Our offer to Industry Partners

- Yalosys' proven laser glass welding process know-how
- SIH cleanroom, pulsed laser infrastructure and expert team
- IP protection and confidentiality framework via SIH consortium agreement
- Interdisciplinary project team from academia and industry
- Access to pulsed laser welding infrastructure for prototyping and pilot production
- Innosuisse co-funding covering up to 60% of R&D costs

Your Contribution

- Commercial application with viable business case
- Cash contribution of minimum 10% and in-kind contribution to required work package of 30-40%
- Prototype product design compatible with pulsed laser welding technology (to be jointly verified)
- Innosuisse co-funding covering up to 60% of R&D costs
- Cooperation in interdisciplinary team over 12+ months following jointly agreed milestones

Interested? Let's talk!

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