

$\mu$ Bench with integrated ppKTP crystal for quantum technology

## AT A GLANCE

HHI's  $\mu$ Bench based on the hybrid integration platform PolyBoard enables the integration of micro-optical functions and elements on photonics integrated circuits (PICs)

### Features

Polymer-based photonic integration platform featuring:

- U grooves:  
F/C coupling, GRIN Lenses, free space sections for crystals
- Slots:  
Thin film elements as  $\lambda/2$  plate,  $\lambda/4$  plate, polarization beam splitter (PBS), filters
- 45° mirrors:  
PD / VCSEL coupling

### Applications

- Telecom / datacom
- Quantum technology
- Microwave photonics
- Sensing and analytics
- Medical and life science

### Micro-Optical Bench ( $\mu$ Bench)

HHI's  $\mu$ Bench demonstrates the capability and flexibility of hybrid photonic integration.

Micro-mechanical structures such as U grooves, slots and vertical mirrors allows for the integration of passive or active optical elements.

Typical passive elements to be integrated: SM fibers, GRIN lenses, crystals,  $\lambda/2$  plates,  $\lambda/4$  plates, PBS, thin film filters

Typical active elements to be integrated: lasers, photo diodes, modulators

## References

### International R&D projects

PHOENICS  
 POETICS  
 POLYNICES  
 QSNP  
 Qu-Test / Qu-Pilot  
 SPRINTER

TERA 6G

TERAMEASURE

TERAWAY

(funded by EU commission)

### National R&D projects

PolyChrome Berlin

PoLiSiQ

QuNET

Silhouette

VOMBAT

(funded by BMBF)

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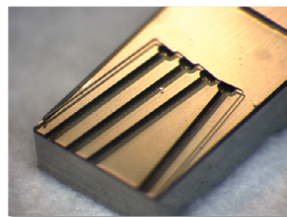
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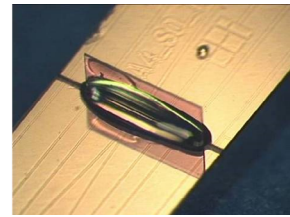
www.hhi.fraunhofer.de/pc

## Features



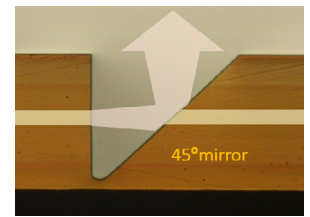
### U grooves

- F/C coupling
- GRIN lenses
- Free space sections



### Slots

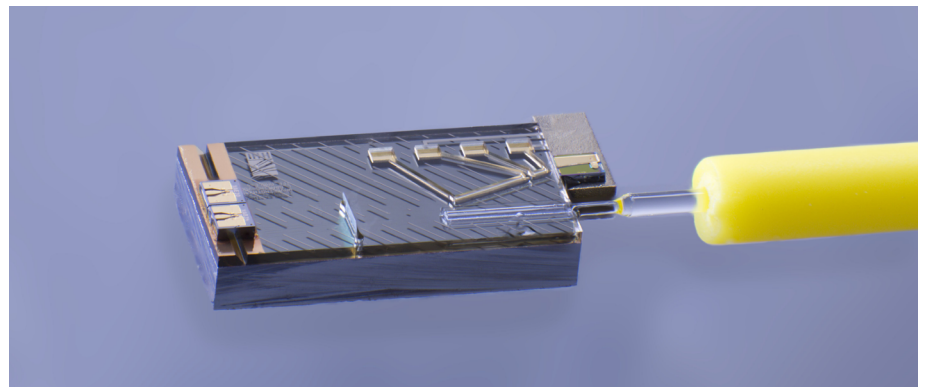
- PBS/PBC
- $\lambda/2$  &  $\lambda/4$  plates
- Filter



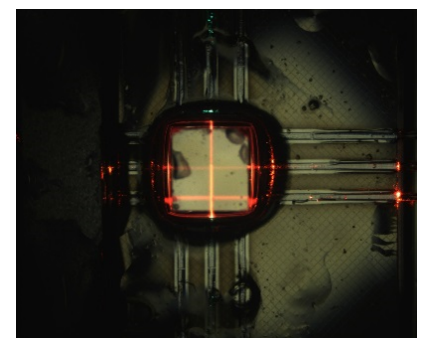
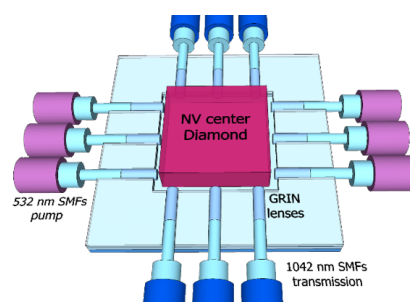
### 45 mirror

- Vertical input/output
- PD coupling
- VCSEL coupling

## Applications



Telecom/Datcom: FTH transceiver based on HHI's optical  $\mu$ Bench



Medicine: Magnetic field measurements w/ NV centre diamonds