

# FemtoGLASS

Glass & sapphire cutting workstation  
for industry



High speed



Irregular shapes



Thin glass & sapphire



## Features

- Ultra-fast thin (30  $\mu\text{m}$  to 2 mm) glass & sapphire cutting
- High process speeds - up to 1000 mm/s
- Irregular shapes
- Inner and outer contours
- Easy breaking for non-tempered glass and self-breaking for tempered glass

## Type of glass

- Non-tempered glass
- Tempered glass
- Sapphire

## Quality of cut

- Cut width less than 1  $\mu\text{m}$
- Low chipping <20  $\mu\text{m}$
- No post-processing required

### Get in touch

[www.wophotonics.com](http://www.wophotonics.com)

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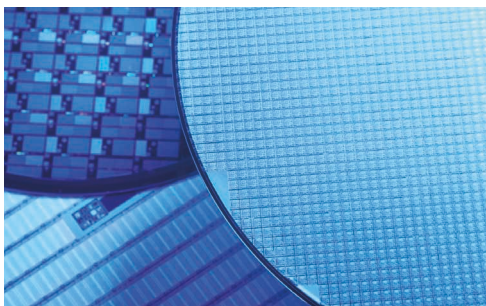
# WOP Glass cutting workstation **outperforms** other glass-cutting methods

	Blade Dicing	Stealth Laser	WOP Laser
Glass thickness	2 – 19 mm	200 $\mu$ m – 10 mm	30 $\mu$ m – 2 mm
Glass type	All Types	Non-tempered Sapphire	Tempered Non-tepered Sapphire
Cutting Speed	Up to 100 mm/s	Up to 300 mm/s	Up to 1 000 mm/s
Possible shapes	Straight cuts only	T-shape and circular shapes possible	Any shape possible
Surface Chipping	<200 $\mu$ m	<50 $\mu$ m	<10 $\mu$ m

Our technology is used for:



Mobile phones sapphire buttons



Microoptics elements



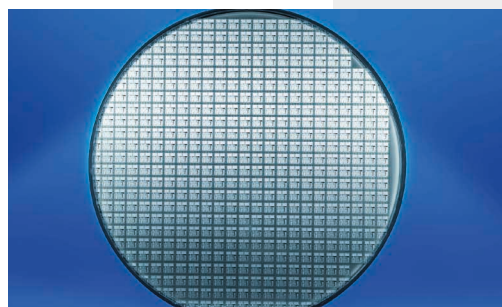
Augmented reality, smart glasses screens



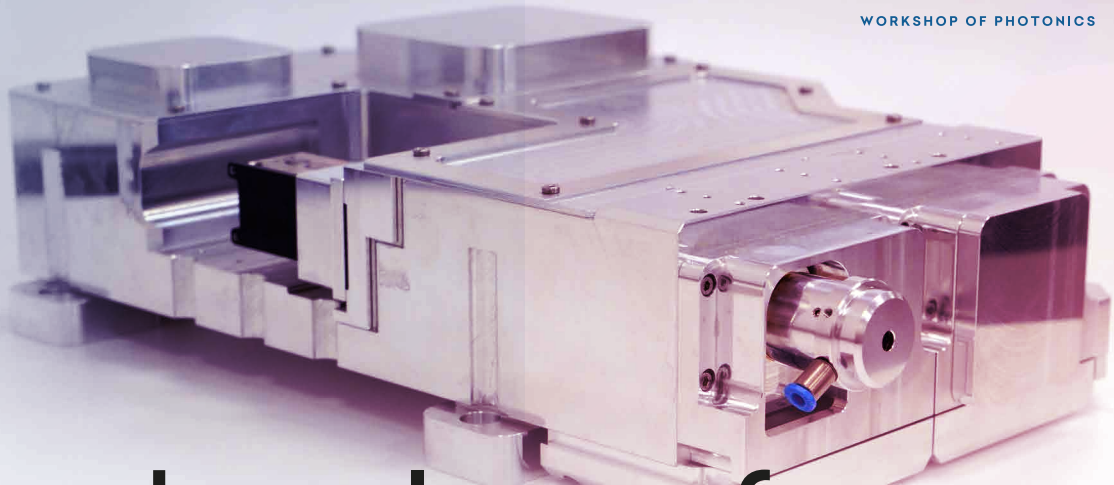
Mobile phone sapphire screens



Mobile phones camera lenses



Wafer level glass product dicing



# Technology for cutting glass & sapphire



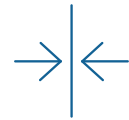
High speed



Irregular shapes



Ultra-high  
precision results



Thin glass & sapphire

## Features

- Ultra-fast thin (30  $\mu\text{m}$  to 2 mm) glass & sapphire cutting
- High process speed up to 1000 mm/s
- Irregular shapes
- Inner and outer contours
- Easy breaking for non-tempered glass and self-breaking for tempered glass
- High bending strength
- Low chipping <10  $\mu\text{m}$
- Smooth side walls after breaking, Ra <1  $\mu\text{m}$





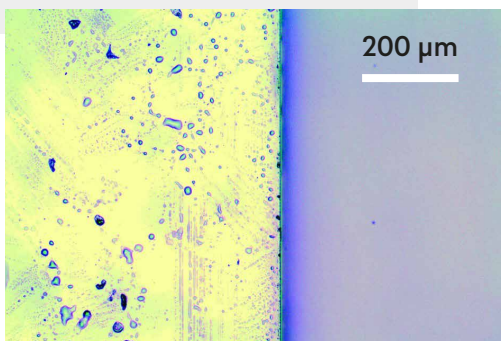
# Solutions for system integrators

- Optimized for 1028-1064 nm wavelength (515-532 on request)
- Sealed monolithic housing
- Integrated monitored linear axis with 15 mm travel (eliminates need for external Z axis)
- Optional external Machine vision unit

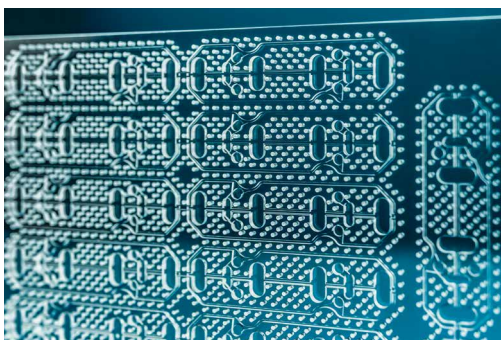
- Optional alignment module for adjustment
- Packages include optical module and technology license
- Dimensions HxWxD: 395x240x95 mm



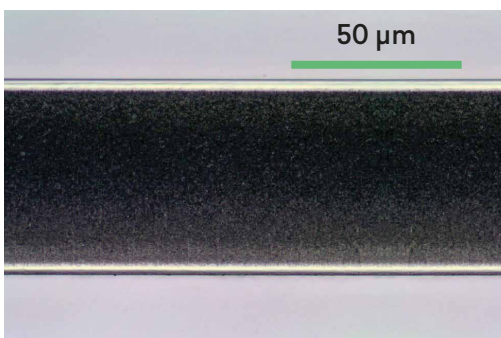
Glass Cutting



Tempered glass 0.55 mm thickness

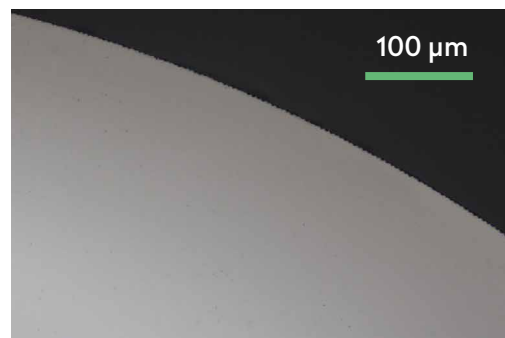


Glass Carrier Wafers

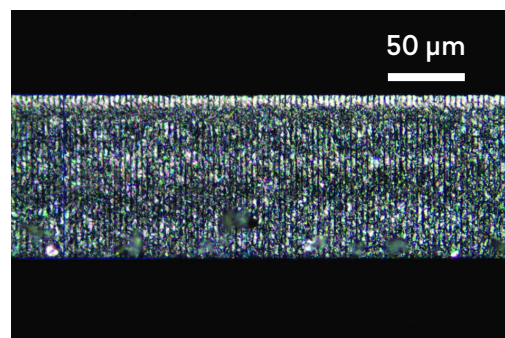


Tempered glass 0.55 mm thickness

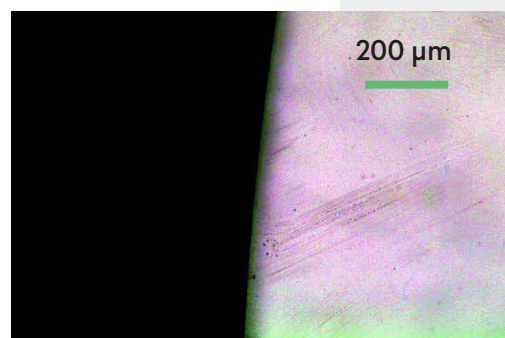
## Transparent material cutting samples



0.6 mm sapphire cutting



Sapphire 0.1 mm thickness. Side view



Sapphire 0.325 mm thickness. Top view

# Glass processing services

## EXCEPTIONAL EXPERTISE IN GLASS

Ultra-high precision & quality

With glass being a demanding material, we offer more than 10 years of experience in glass processing, including drilling, cutting and dicing.



Ultra-high  
precision results



Small feature  
sizes



Irregular shape  
holes

## Typical features

- A variety of glass types and major suppliers - Corning, Schott, Hoya, AGC
- Wafer size up to 200 mm x 200 mm (8")
- Wafer thickness from 30  $\mu\text{m}$  to 10 mm
- Circular, square and other-shaped holes
- Straight hole cross section | no taper
- Low chipping <10  $\mu\text{m}$
- Smooth side walls, Ra <1  $\mu\text{m}$
- Typical min. hole size 20  $\mu\text{m}$  (round)
- Positional accuracy  $\pm 3 \mu\text{m}$
- No debris on back and front surfaces
- No sagging around holes
- Aspect ratio up to 1:100
- High throughput and yield
- Ability to work with metalized glass types (e.g. Au, Pt, Ni, Cr, Mo)
- Minimal or no post-processing is needed

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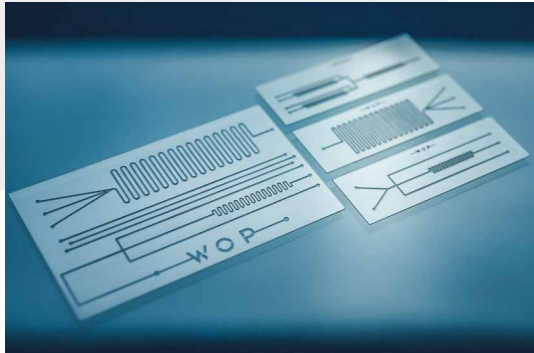
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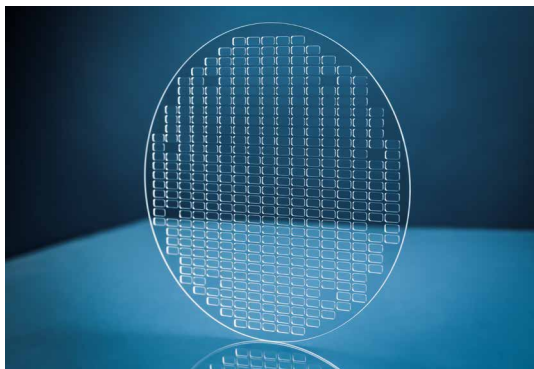


# Applications

- Sensors (image, pressure, gal acceleration and other)
- Advanced packaging applications
- Semiconductors and other functional devices
- MEMS
- Wafer-level optics
- Gyroscopes
- Aerospace applications
- Analytical chips



Microfluidic Chips & Devices

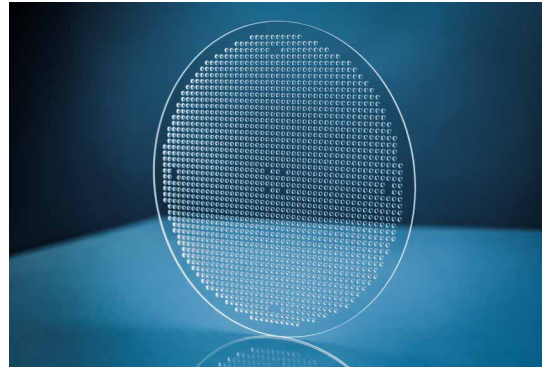


Packaging Glass Products



Glass Cutting

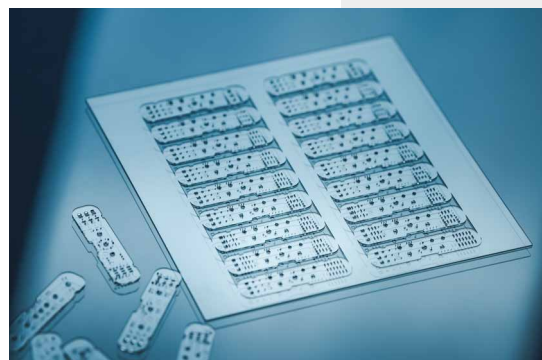
## Assortment



Micro Drilled Glass | Glass Spacers



Glass Carrier Wafers



Glass Guide Plates for Probe Cards

