

WE
CAN
HANDLE
IT

mechatronic
systemtechnik gmbh



AUTOMATED HANDLING SYSTEMS

FOR NON-STANDARD SUBSTRATES AND NON-STANDARD HANDLING REQUIREMENTS

Thin, Warped, MEMS, Glass, Taiko, Panel and Frame

THE CHALLENGE

NON-STANDARD SUBSTRATES,
MULTIPLE TYPES AND/OR SIZES

Substrates:

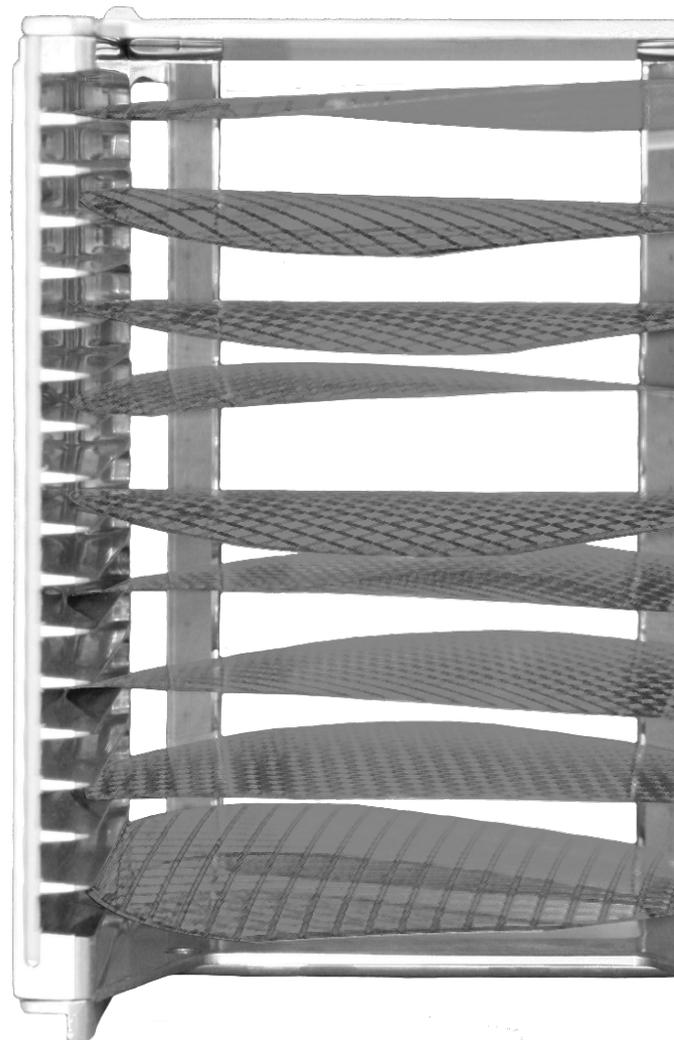
- Critical wafer
- Thin / warped wafer
- FOWLP / eWLB
- MEMS
- Glass wafer
- TAIKO
- Frames
- Panels
- Stacked wafer

Flexibility requirements:

- Multiple substrate sizes
- Multiple substrate types

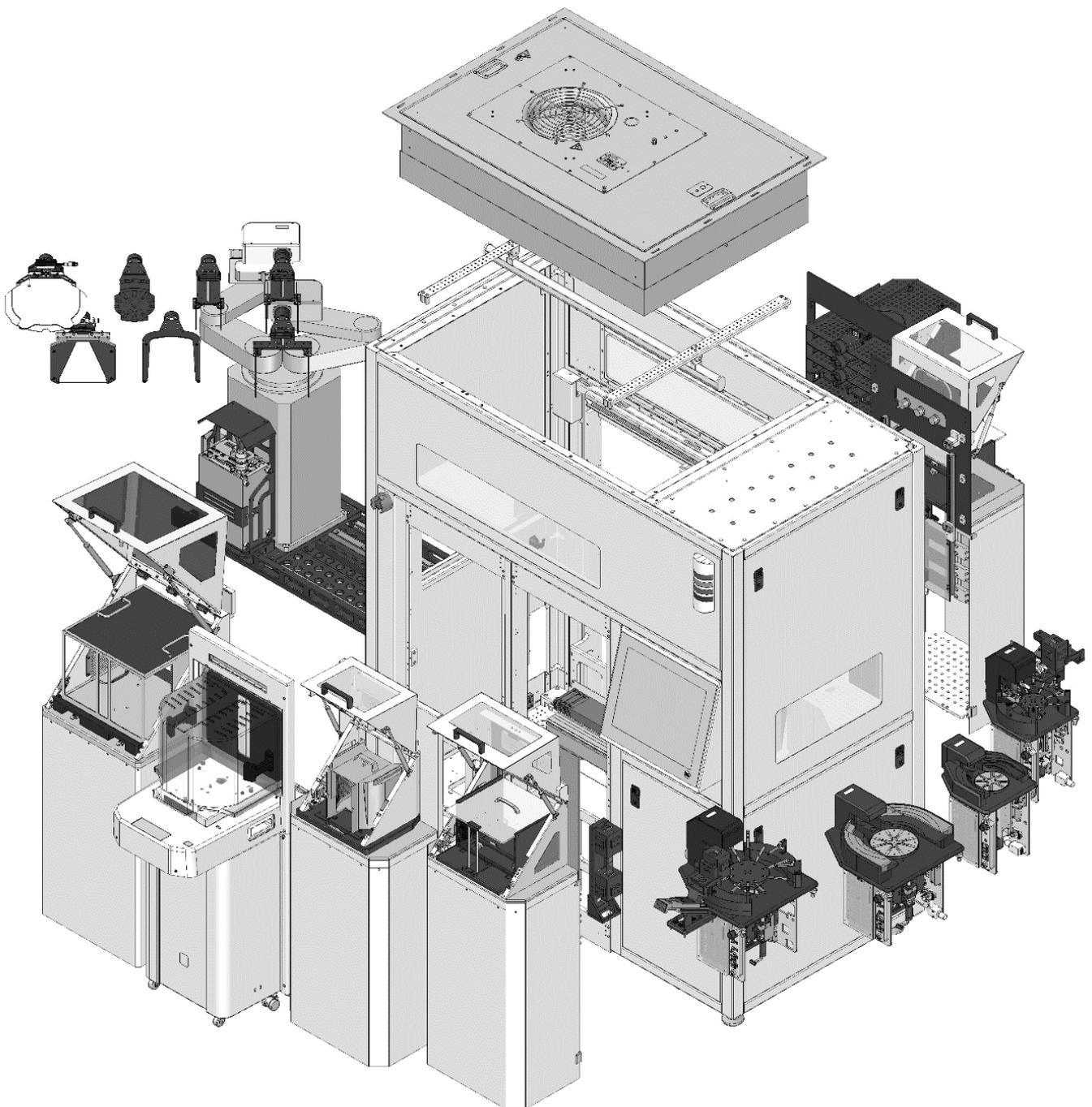
Other challenges and requirements:

- Restrictions from substrate (e.g. no vacuum or nitrogen flow, no touching on certain areas allowed)
- Stress restrictions
- Highest level of substrate protection
- Non-Standard / customized cassettes
- SEMI standard automation (SECS/GEM, E84)



OUR HANDLING SOLUTION

CUSTOMIZED HANDLING SYSTEM WITH
OPTIMIZED CONFIGURATION





PRODUCT PORTFOLIO

STAND ALONE



Packing Tool [mPT]

full automated packing / unpacking of wafers / frames to / from shipping boxes to / from cassettes or FOUPs



Would you like to learn more about the mPT tool? Please scan the QR code



Wafer Sorter [mWS]

sorting, splitting and merging of all types of critical wafers and film frames



Would you like to learn more about the mWS tool? Please scan the QR code



Ring Cutter & Remover [mRR & mCL]

laser cutting and stress free removal of stabilization ring from frame with maximized control



Would you like to learn more about the mRR & mCL ? Please scan the QR code

PRODUCT PORTFOLIO

EFEM



Wafer Loader, EFEM [mWL]

loading and unloading of wafers and frames from cassette / FOUP to an OEM system



Would you like to learn more about the mWL tool? Please scan the QR code



Wafer loader [mWL.neo]

a highly modular and flexible tool in combination with independent module placement and fast integration



Would you like to learn more about the mWL neo tool? Please scan the QR code



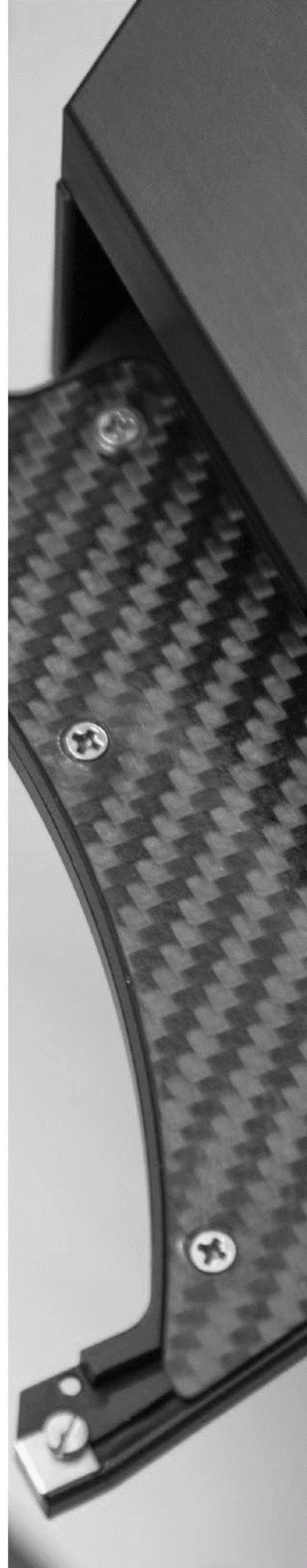
Panel loader [mPL]

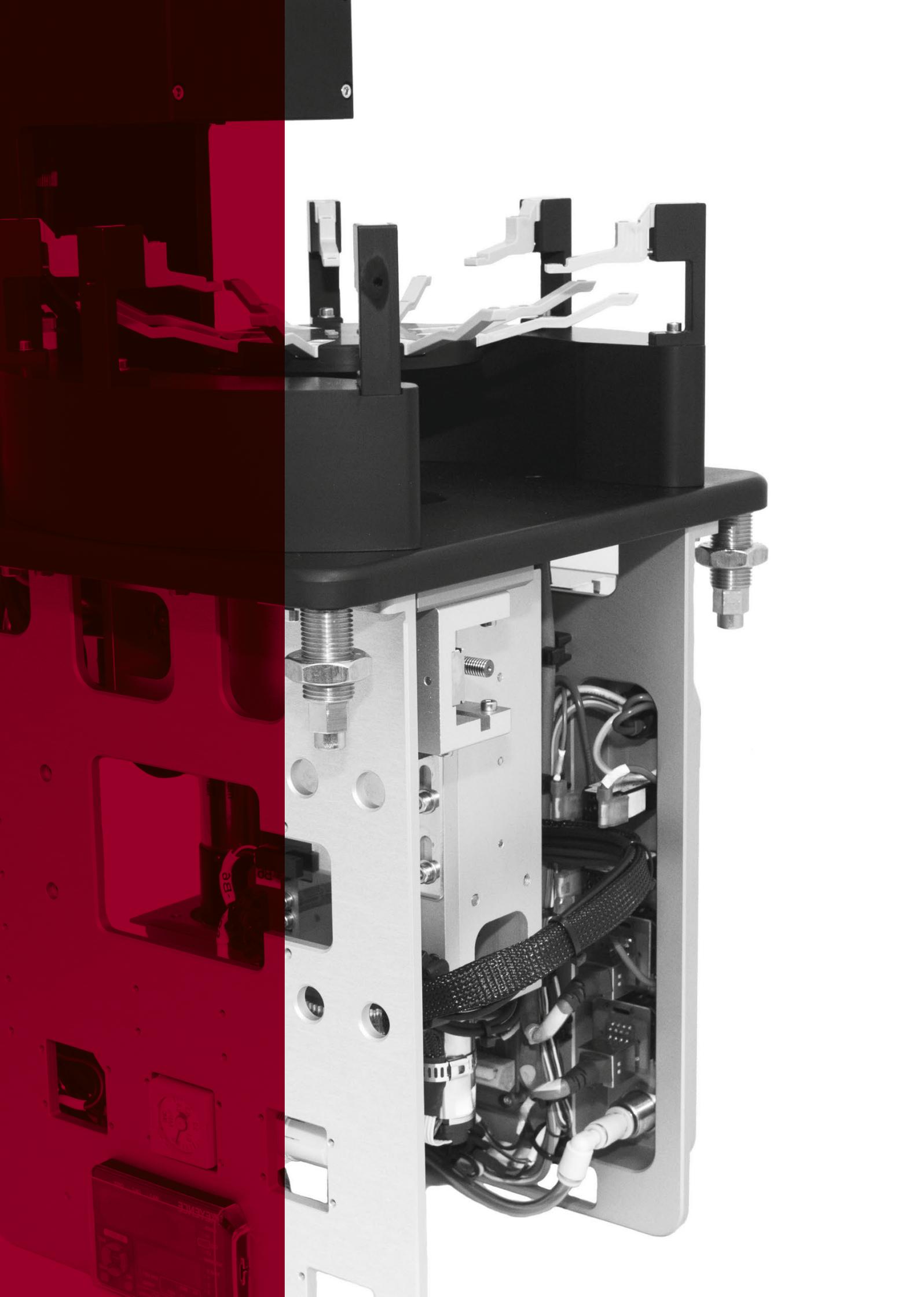
loading and unloading of panels from cassette to an OEM system

KEY ADVANTAGES

AND FEATURES

- **Unique modules and components** (end effectors, pre-aligners, chucks, scanners) being able to handle almost all thin / warped / TAIKO / glass / stacked / FOWLP / frame wafers
- **Unique wafer handling sequence:** Continuous monitoring / sensing of wafers during each step of handling, unique handshake procedures to guarantee no wafer is lost or damaged while handled
- **Versatility:** different wafer types and sizes can be handled in one machine without manual change of end effectors, flipping function available
- **Highest reliability and safety**, reduced stress and contamination to wafers, high throughput
- **Unique software** (SECS / GEM, E84, TCPIP, ..) and hardware integration knowledge (to OEMs and / or Fabs)
- **Back side and front side handling**
- **Reading barcode from each side** including data matrix code ensuring traceability

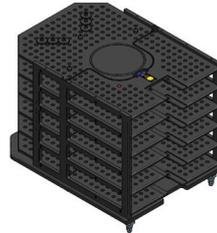




CORE TECHNOLOGIES



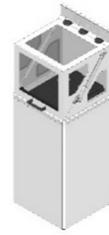
Sankyo Dual Arm Robot
(plus, linear track) for superior handling accuracy in combination with high throughput



End-Effector Change Station
to increase the flexibility of the handling system by allowing automated changing of multiple end effectors (up to 12 End Effectors)



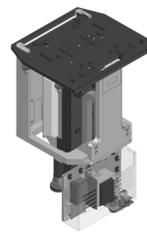
Sinfonia Load Ports
are mainly used for 200mm & 300mm standard substrates, mapping can be integrated into the load port



mechatronic Load Ports
for all other substrate types, specially for wafer sizes 200mm and beyond, frames and panels. Can be upgraded with patented wafer scanning



Mapping integration in Sinfonia Load Port
for 200mm and 300mm standard wafers



Wafer Scanner
for very thin wafers (below 50µm) on mechatronic load ports



Reflection Sensor
for frames and panels



Through Beam Sensor
for mapping of wafers <200µm thickness, high warpage (6mm), glass wafers



Pre-Aligner Edge Grip
touches the substrate only at the edge. It is used for sensitive substrate with back side pattern or for MEMS wafers which are sensitive to vacuum or nitrogen flow



Pre-Aligner Bernoulli Vacuum
contacts the substrates on the back side, it is used for substrates with high warpage and bow in combination with lower stability



End-Effector coupling for automated End-Effector exchange

Protrusion pins to avoid Wafer slide out

Thin needles coated with peek material

Vacuum cups to hold Wafer and to avoid misalignment after Pre-Alignment

Optical sensors to verify Wafer presence

All End-Effectors include wafer detection systems (vacuum, optical capacitive) for safe substrate handling

Flipping option available

Automated coupling mechanism enables fully automatic change of End-Effectors to enable handling of different substrates and sizes



Would you like to learn more about the End-Effector? Please scan the QR code

End-Effector Bernoulli Vacuum (mBV)

for flattening of thin warped wafer vacuum keeps it in position



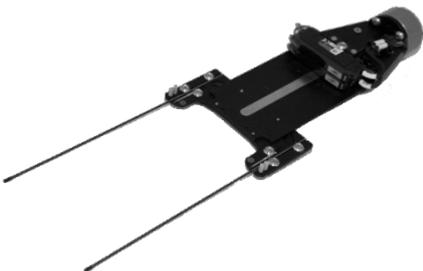
End-Effector Top Grip (mTG)

no contact to active area of the front side, vacuum only used in edge exclusion zone



End-Effector Needle (mNE)

low stress handling capable to handle bow, no flipping possible



End-Effector Vacuum (mV)

for thicker and warped wafers (e.g. eWLB)



End-Effector Contactless (mCL)

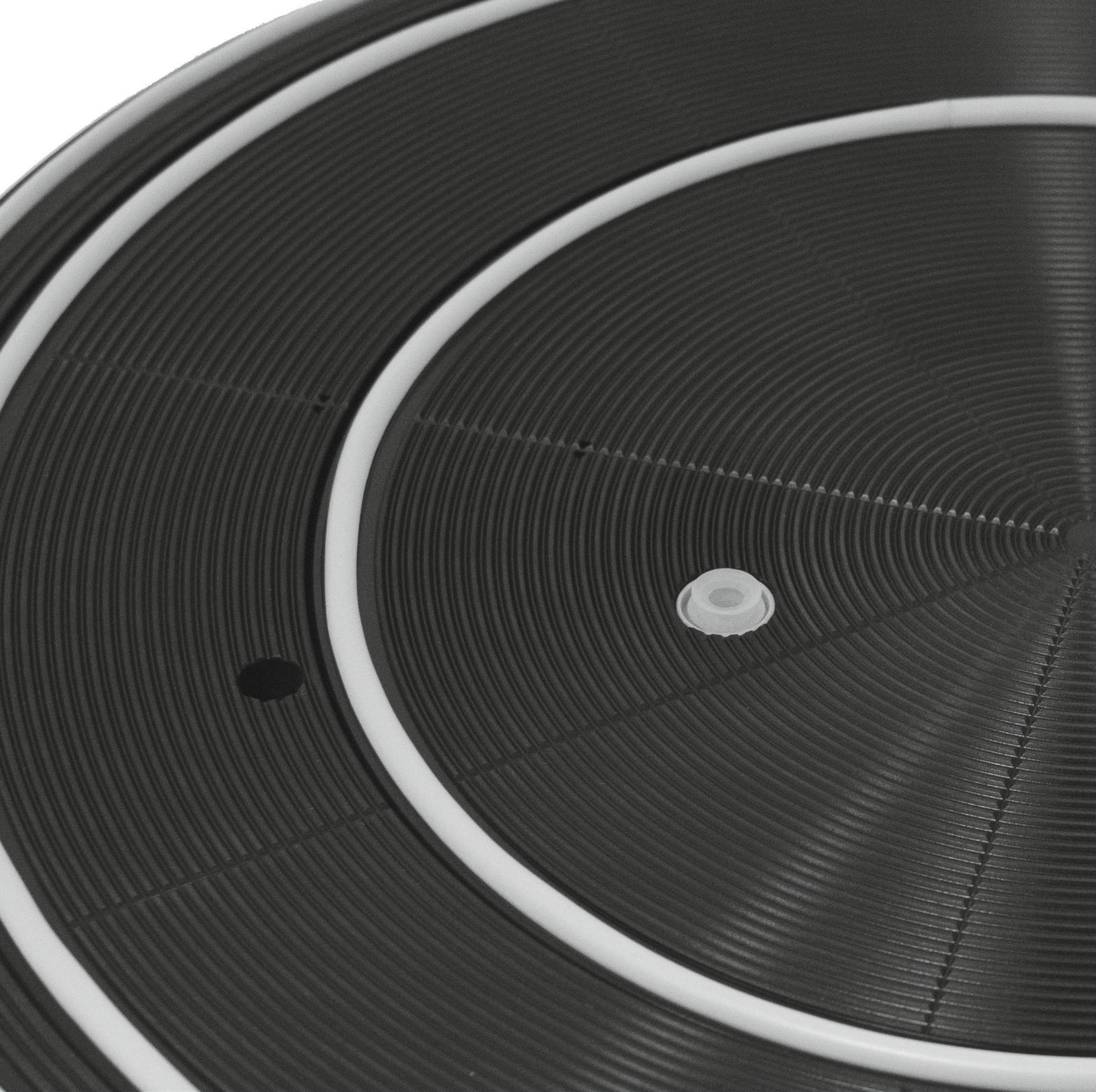
for chip and back side handling, no contact to wafer, wafer held by pins



End-Effector Edge Grip (mEG)

for chip and back side handling, no vacuum or compressed airflow





Solutions available for almost all known substrate types

Customization and integration to specific OEM tool requirements using in house design and fabrication capabilities

Dual size Chucks available



Would you like to learn more about the Inspection? Please scan the QR code



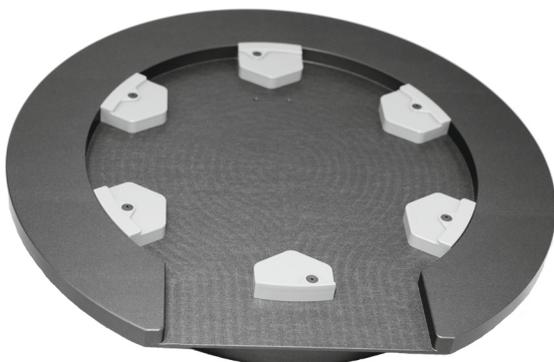
Inspection Plate Needle Ceramic

application where contact & vacuum is allowed (low warpage / stiffness)



Inspection Plate Vacuum Lift Pin

for eWLB wafers (high warpage, low flexibility), where a significant reduction in bow and warpage is required



Inspection Plate MEMS

for MEMS wafers and back side inspection (optional), it only contacts the substrate in the edge exclusion zone



New Technology Center



mechatronic at a glance

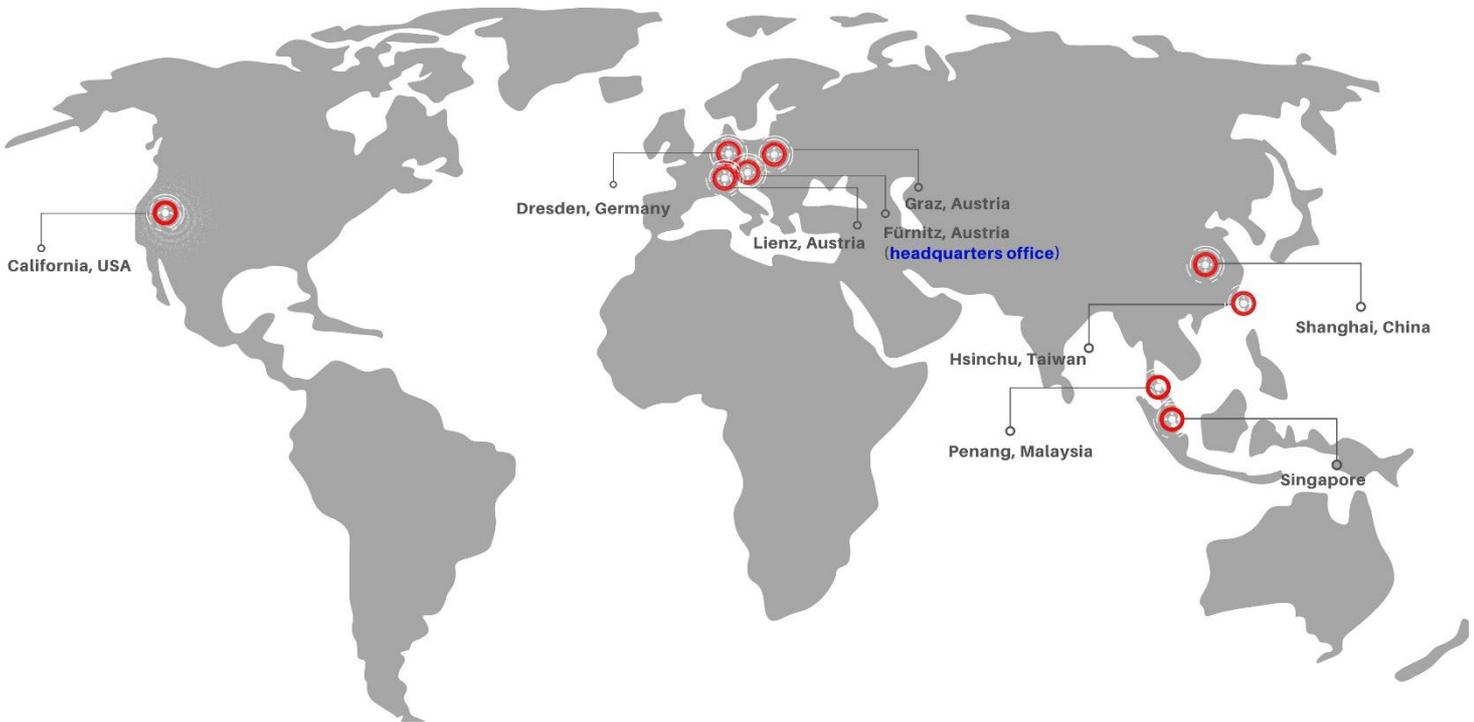
Recognized **global technology leader** for handling of **non-standard substrates and non-standard handling requirements** (thin / warped / TAIKO / glass / stacked / FOWLP / framed wafers) trusted and flexible **partner in automated wafer handling for leading** semiconductor fabs and equipment manufacturers to jointly offer differentiating products or process steps

- Headquarters, development and production in Fürnitz, Austria, Service locations in Dresden (Germany), Penang (Malaysia), Sacramento (USA) , Shanghai (China)
- Our brand-new Technology Center has officially relocated and is now fully operational! This state-of-the-art facility features the latest equipment and amenities, specifically designed to foster innovation and technological advancement.
- Founded in 1998, since 2017 owned by Accuron Technologies (member of the Singaporean Temasek Group)
- Trusted partner to many leading semiconductor FABs, Foundries, OSATs and OEMs
- All critical parts development & manufactured in-house
- More than 500 tools delivered
- ISO 9001 & 14001 certified

GLOBAL PRESENCE

| services

Our service locations
worldwide overview



more than

25

years of experience

more than

500

tools installed

more than

500 Mio.

wafer handled

up to

12 mm

waferpage handled

more than

400

customized
end-effectors
& chucks

up to

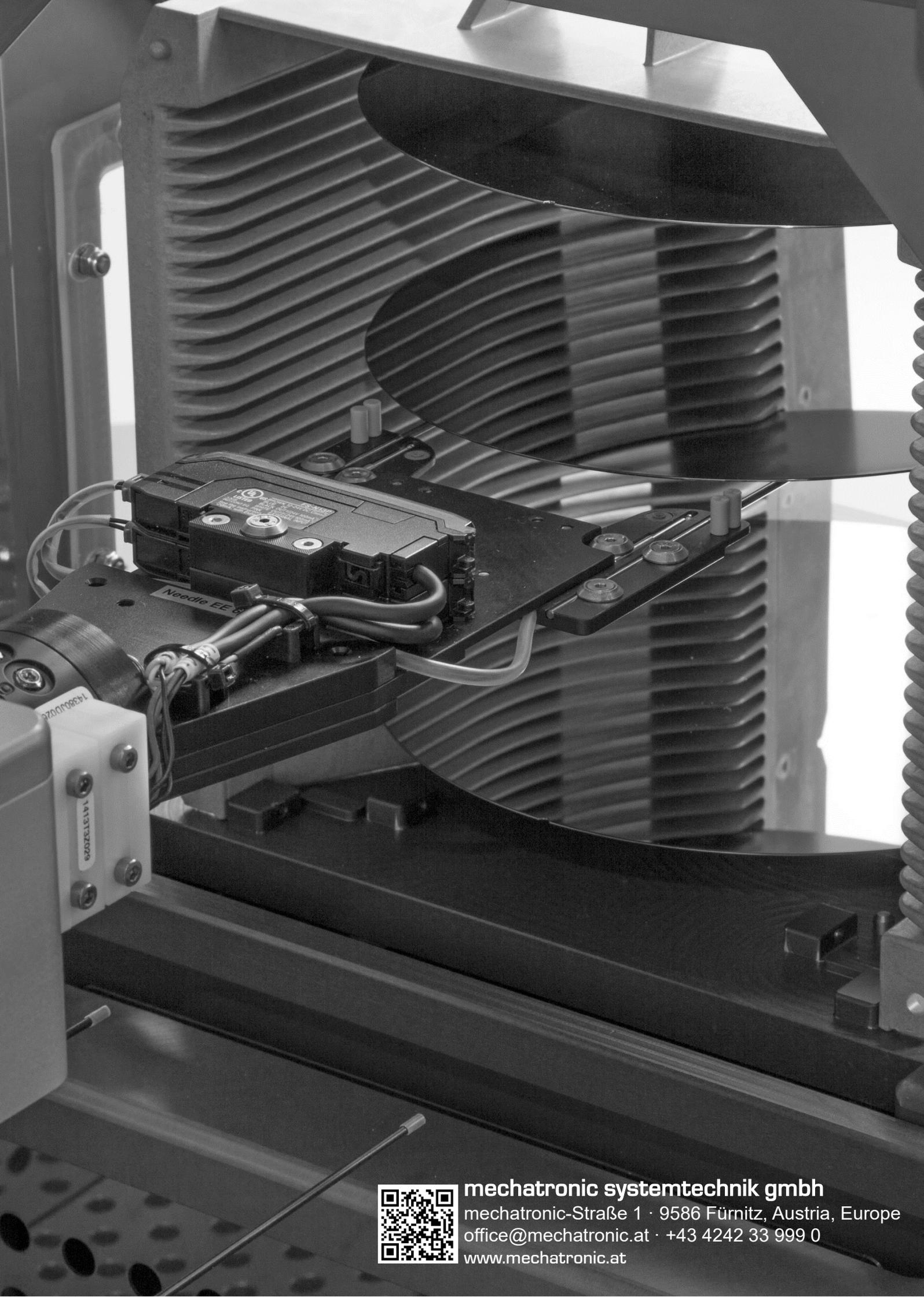
650 X 650mm

panels sizes

substrates

150/200/300mm

various wafer sizes



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