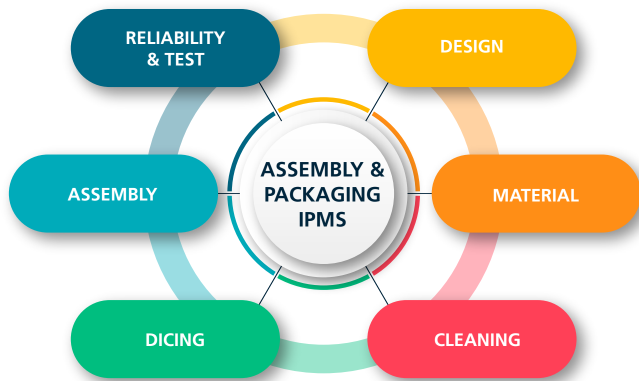

Packaging and Assembly Competencies at Fraunhofer IPMS

- **Packaging for highly sensitive devices**
  Sub-micron range (<1µm @ 3 sigma)
  Defined environment with clean room class ISO 4
- **R&D to pilot manufacturing**
  From design to finished module
  Consulting and process evaluation
  Unit sizes from 1 piece
- **Traceability of materials and components via databases**
- **Possible applications**
  MOEMS Chips of all kinds
  Assembly of laser/photodiodes
  Assembly of (optically) high sensitive assemblies
  Sensor/bio applications and much more.

Contact

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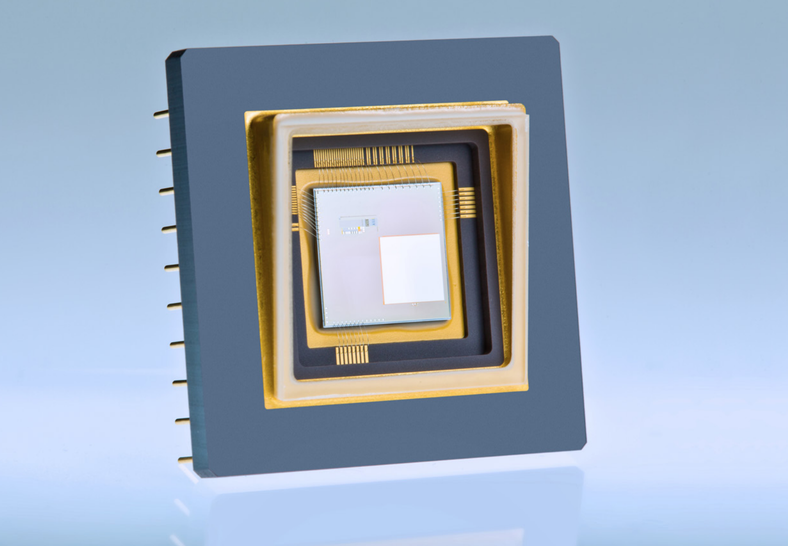
Fraunhofer
IPMS

Assembly and Packaging for MEMS/MOEMS



Design

Development of customized solutions
- Housing, substrates, alignment, encapsulation
- Fixtures for microassembly systems
- Design in 3D CAD
- FEM simulation and strain analysis
- Data provision for suppliers

Standard and hermetic packages
- Various contacting options
- Bonding/packaging
- Optical protection glasses

Material evaluation
- Adhesives, sealants, bonding/packaging

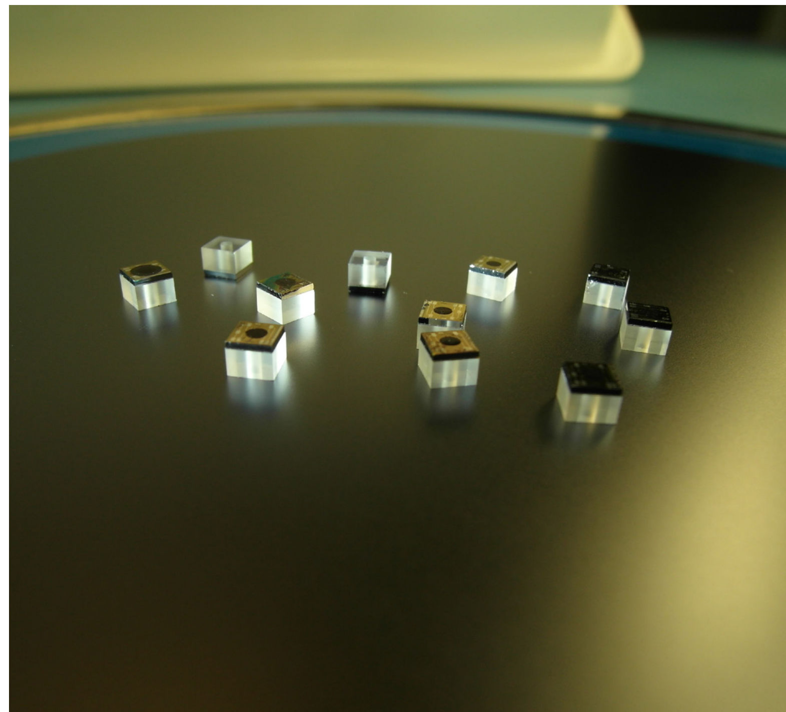
Dicing

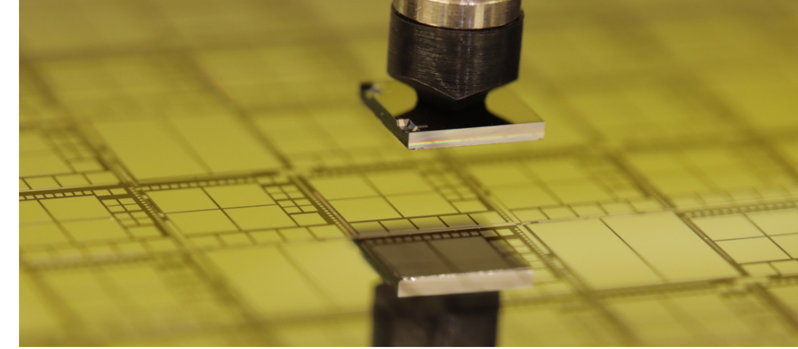
Mechanical cutting process (wafer saw)
- Cutting of silicon, glass, ceramics SOIs and various substrates
- Stepcut in double spindle process
- Manufacturing and opening of cavities

Edge trimming - Circular saws
- Downsizing e.g. (Ø 200mm -> Ø150mm)
- Edge trimming with Trapezoid saw blades

Stealth Dicing
- Laser-based dicing of high-sensitivity MEMS wafers together with external partners

Protection systems during dicing
- Focus: Protection of highly sensitive MEMS wafers
- Wide range of tapes (UV, non-UV, thermo release) and polymers (coatings)



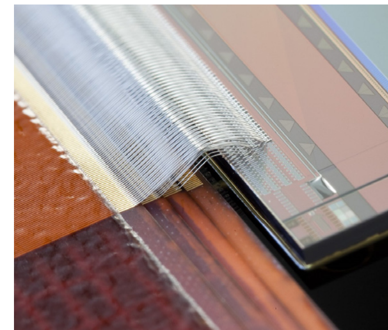


Chip Assembly

Pick and Place
- Automatic, camera-based component placement
- High accuracy (<1 µm @ 3 sigma)

Dispensing
- High precision adhesive dispensing
- Manufacturing of sealant
- Cover for trenches

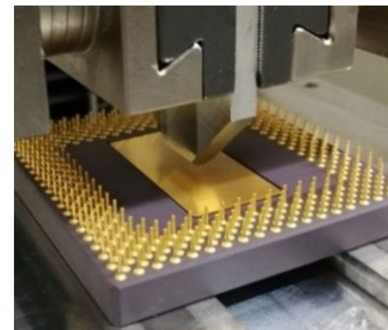
Stamping processes
- Precise and reliable adhesive application



Contacting
- Multi-level wire bonding (together with external partners)
- Conductive bonding

Reliability and Test

Evaluation of Joining technologies
- Adhesives, wafer bonds
- Tensile, shear and compression tests
- Vibration test



Climate studies
- Temperature
- Humidity
- UV irradiation test