Focus on Quality

ISIS sentronics

SemDex® AR13

Fully-automated, very compact LED Wafer Inspection Metrology System

ISIS sentronics has developed a fully automated optical metrology system **SemDex AR13** to inspect LED Wafers from 2" to 8".

The system can measure wafer flatness (bow and warp), substrate thickness, TTV and coating thickness, surface roughness, simultaneously if required.

In order to achieve various applications a wide range of unique sensors can be combined differently.

Maximum three sensors for top side inspection:

- StraDex t10 (coating thickness)
- StraDex f24 (coating thickness and profile)
- StraDex a (roughness)

optional: HD-camera system with fiducial recognition

Maximum two sensors for bottom side inspection:

- StraDex f (substrate thickness and profile)

optional: HD-camera system with fiducial recognition

The inspection cell contains a wafer sorter module with 3 open-cassette-stations (2", 4", 6", 8"), a wafer aligner and a cleanroom wafer robotics. Factory automation control software complies with SECSII/GEM/HSMS and barcode or OCR recognition.

Throughput rate achieves 100 wafers per hour based on 8 measurement site on a 6" wafer.

SemDex AR13 with 3 cassettes for inspection of sapphire wafers

Benefits:

- High flexibility: 2", 4", 6", 8" wafer
- Simultaneous measurements possible in one step
- Very compact - valuable floorspace can be saved
- High precision measurements
- Very high throughput rate - time efficient
- Reasonable acquisition costs

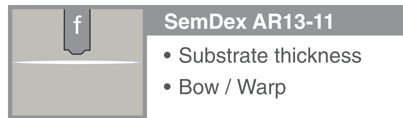
Measurement of:

- Wafer flatness (bow and warp)
- Substrate thickness and TTV
- Coating thickness
- Surface roughness

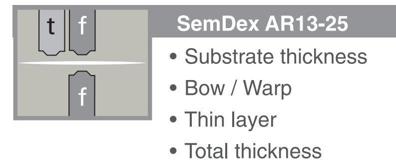
Throughput rate:

- 100 wafers/hour (8 measurement site on a 6" wafer)

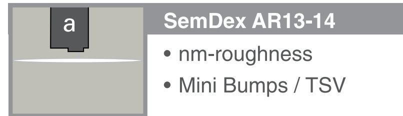
Typical Sensor Configurations:



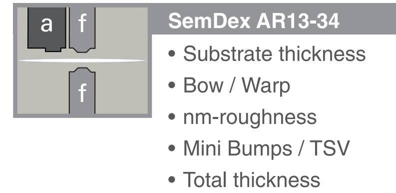
SemDex AR13-11
- Substrate thickness
- Bow / Warp



SemDex AR13-25
- Substrate thickness
- Bow / Warp
- Thin layer
- Total thickness

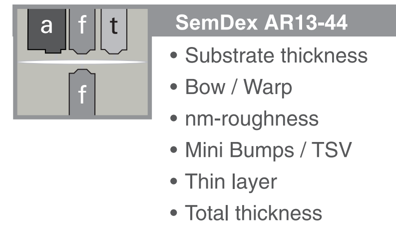


SemDex AR13-14
- nm-roughness
- Mini Bumps / TSV

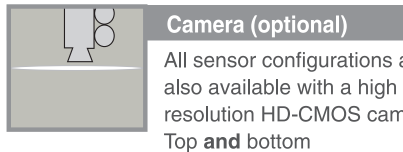


SemDex AR13-34
- Substrate thickness
- Bow / Warp
- nm-roughness
- Mini Bumps / TSV
- Total thickness

SemDex AR13-15
- Thin layer

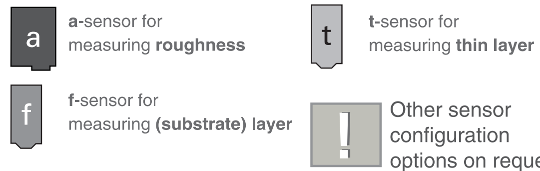


SemDex AR13-44
- Substrate thickness
- Bow / Warp
- nm-roughness
- Mini Bumps / TSV
- Thin layer
- Total thickness



Camera (optional)

All sensor configurations are also available with a high resolution HD-CMOS camera Top **and** bottom



a-sensor for measuring **roughness**

t-sensor for measuring **thin layer**

f-sensor for measuring **(substrate) layer**

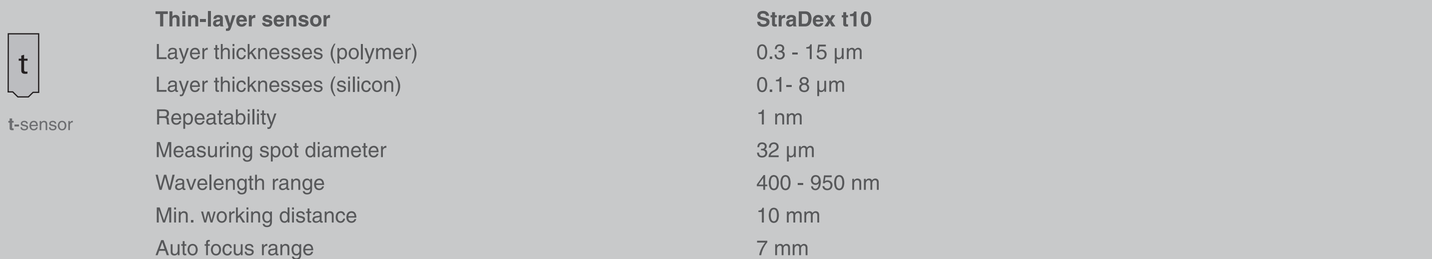
Other sensor configuration options on request!

Specifications SemDex AR13:

Accuracy after pattern recognition	5 µm	
SECS/ GEM capability	yes	
Max. number of metrology sensors	5	
Dimensions	803 x 1900 x 1400 mm^3	

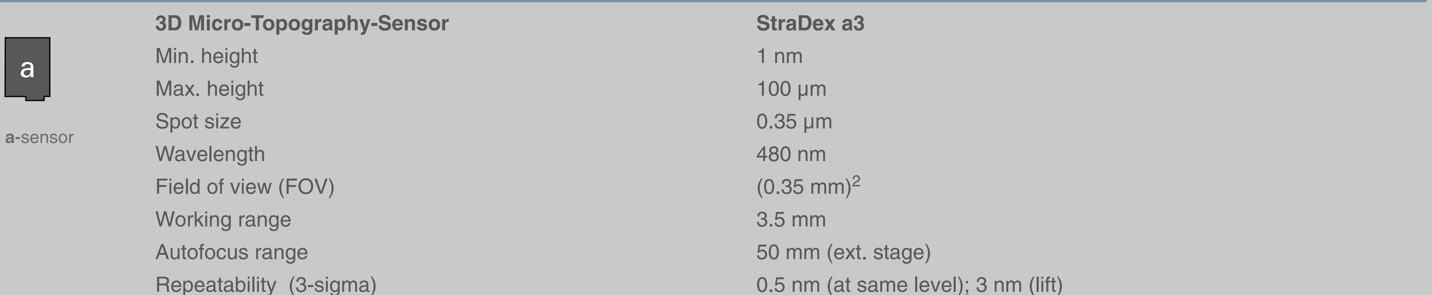
f-sensor

Layer thickness sensor 1 / 2	**StraDex f24 - 300**	**StraDex f2 - 80**
Layer thickness (silicon)	8 - 800 µm	2.5 - 60 µm
Spot size	24 µm	8 µm
Wavelength	1300 nm	830 nm
Working range	24 - 44 mm	2 - 22 mm
Repeatability	0.1 µm	
Field-of-view of integrated camera	ca. 3 x 3 mm^2	



t-sensor

Thin-layer sensor	**StraDex t10**
Layer thicknesses (polymer)	0.3 - 15 µm
Layer thicknesses (silicon)	0.1- 8 µm
Repeatability	1 nm
Measuring spot diameter	32 µm
Wavelength range	400 - 950 nm
Min. working distance	10 mm
Auto focus range	7 mm



a-sensor

3D Micro-Topography-Sensor	**StraDex a3**
Min. height	1 nm
Max. height	100 µm
Spot size	0.35 µm
Wavelength	480 nm
Field of view (FOV)	$(0.35\ mm)^2$
Working range	3.5 mm
Autofocus range	50 mm (ext. stage)
Repeatability (3-sigma)	0.5 nm (at same level); 3 nm (lift)

We are members of: