Fraunhofer

CSP

FRAUNHOFER CENTER FOR SILICON PHOTOVOLTAICS CSP

1 *Wire web and manufactured wafer.*

WIRE AND PROCESS BENCHMARKING

Expertise

Our advanced process data and wafer geometry analysis allows

- The detection of the performance limit of sawing wires
- A process development for all current wafering technologies: diamond wire, structured wire, straight wire

Our Services

For Wafer Manufacturers –
Decrease your wafering costs by optimizing your processes

- Performing wafering runs und detect the wafer geometry
- Process evaluation for all wire and wafering technologies
- Identifying time consuming process steps to save consumables

For Wire Suppliers –
Raise your sales volume with high performance wire

- Performing independent wire benchmark test
- Identifying individual wire performance
- Quantifying the correlation between wire performance and wafer quality

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1 *Optical wafer inspection.*

Quantification Approach for Wire Performance[1]

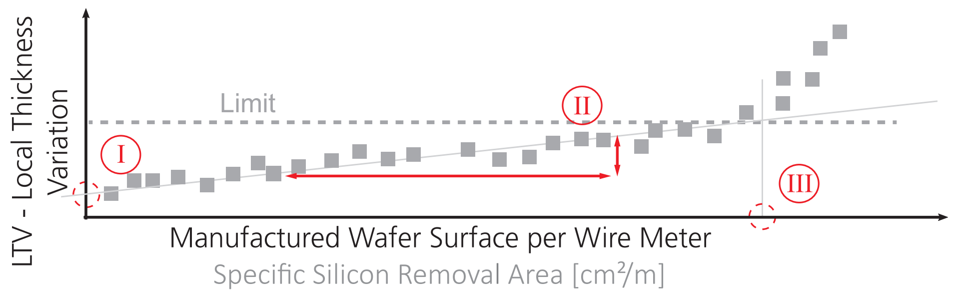
- Wafer geometry data are taken from conventional inspection tools and correlated to a calculated wire usage.
- The wire usage is defined as the amount of new silicon surface that was created by the wire and normalized to the wire length, the so called specific silicon removal area (cm²/m).

The detection of a characteristic correlation between the wire usage and the wafer geometry provides the following performance parameters:

I - LTV_0 - Initial Level of LTV [µm]
Depends on wire type

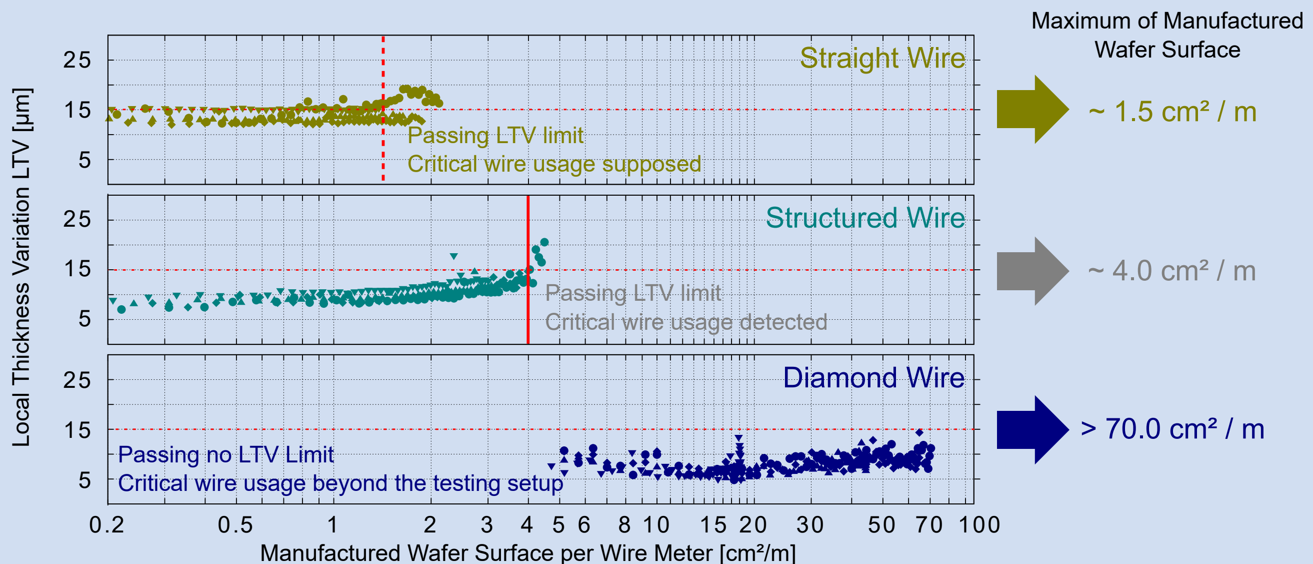
II -m_{LTV} - LTV Gradient [µm / (cm²/m)]
Affected by wire type and process

III - Critical Wire Usage [cm²/m]
Limit of wire performance



[1]*Koepge, R., Brinnig, S., Kaule, F., Schwabe, H., Schoenfelder, S., »Advanced Analysis of Multi Wire Wafering Processes«, 44th IEEE Photovoltaic Specialists Conference (PVSC-44), Washington D.C. (U.S.A.), 2017*

Experimantal Data[2]



2 *Detection of the wire performance with respect to the wafer geometry for three different wafering technologies.[2]*

[2]*Koepge, R., Brinnig, S., Kaule, F., Schwabe, H., Schoenfelder, S., »Advanced Analysis of Multi Wire Sawing Processes and Wire Performance Detection«, 33th EUPVSEC, Amsterdam (Netherlands), 2017*