Panel#1: The LTEM & Substrate

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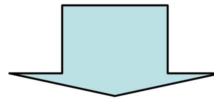
- ✓Introduction
- ✓Topic #1: Critical issue of flatness spec.
- ✓Topic #2: Many requirements

Comment on IEUVL Mask TWG Top technical issues

- **There are two issues on substrate**
  - **Substrate defect**
  - **Substrate flatness and thickness variation**

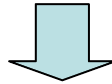


Actually, not separated issues

- **Issue on substrate is only one**
  - **Substrate defect, flatness and thickness variation**

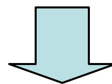
Flatness spec is very tight
30nm - 50nm P-V in 142 mm sq.

- **Most critical issue: Attaining defect free substrate (at 50 nm PSL) with high flatness (30nm – 50nm P-V) in 2009 (first HVM)**



30 – 50 nm flatness is not realistic in HVM

- **Very difficult to obtain lower defects and 30 nm flatness, simultaneously**
- **High cost**
  - **Very low throughput in polishing process**
- **Difficult to guarantee the flatness of 30 nm**
  - **Measured flatness is not absolute value and depends on various factor such as chucking method and tool**



Proposals

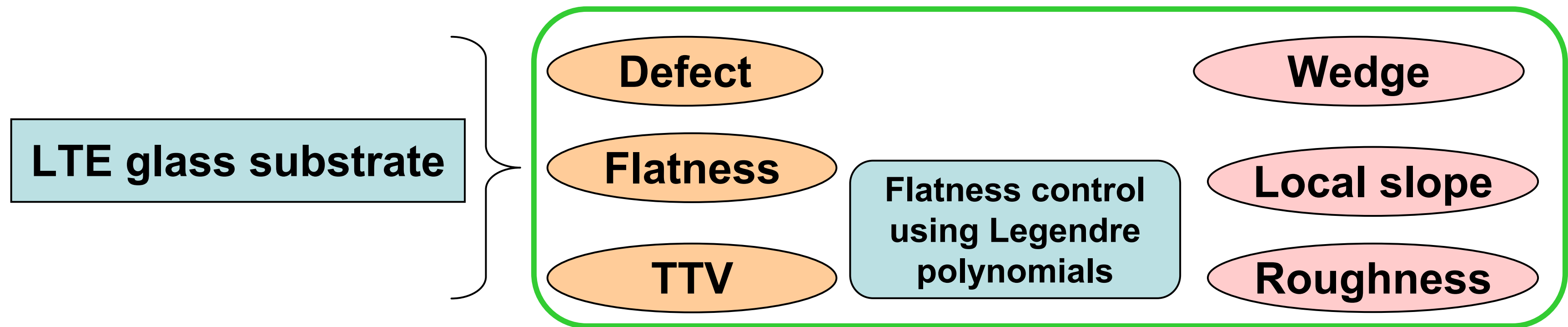
- **Flatness spec should be loosed and/or quality area should be diminished**
- **Feedbacks of experimental test in EUV exposure and E-chuck are needed**
- **Aggressive correction in exposure and EB writing processes is needed**
  - **Flatness affect placement error only in exposure**

Realistic flatness spec: 100nm in first production

Many requirements on substrate

Customer (to glass supplier)

- Can you guarantee CTE meeting SEMI spec?
- Can you define or inspect quality of striae for guarantee?



Supplier

- There are many requirements
  - Do we need to inspect all specs on all substrate?
    - Many measurement lead to increase cost
    - Some properties such as wedge, local slope and roughness should be measured on monitor substrate
  - Standardization of measurement is needed