CLAIMS

1. An arrangement to quantify a wafer bow of a wafer, said arrangement being positioned within a plasma processing system that includes a set of process modules, the arrangement comprising:

a support mechanism being configured to hold said wafer; and

a first set of sensors being configured to collect a first set of measurement data of a plurality of data points on said wafer that quantify said wafer bow of said wafer, said first set of sensors being positioned in a first location, said first location being outside of said set of process modules of said plasma processing system.

2. The arrangement of claim 1 wherein said support mechanism is one of

a robotic arm, and

an electrostatic chuck.

3. The arrangement of claim 1 wherein said location of said first set of sensors is positioned at one of

between a front opening unified pod (FOUP) and an atmospheric transfer module (ATM),

between said ATM and an aligner,

within said aligner,

between said ATM and an airlock module,

between said airlock module and a vacuum transfer module (VTM), and

within said VTM.

4. The arrangement of claim 1 wherein said first set of sensors is a single sensor.

5. The arrangement of claim 1 wherein said first set of sensors include having a plurality of sensors.

6. The arrangement of claim 1 wherein said wafer is moving in a first direction while said first set of sensors is stationary, wherein said first direction includes one of a linear z direction and a rotating direction.

7. The arrangement of claim 1 wherein said first set of sensors is moving in a first direction while said wafer is stationary, wherein said first direction includes one of a linear z direction and a rotating direction.

8. The arrangement of claim 1 wherein said wafer is rotating while said first set of sensors is moving in a linear z direction.

9. The arrangement of claim 1 wherein said first set of sensors is collecting said first set of measurement data when another wafer is being processed in a process module of said set of process modules.

10. The arrangement of claim 1 further includes a second set of sensors,

said second set of sensors being configured to collect a second set of measurement data, wherein said second set of measurement data include a measurement datum that corresponds to at least one date point of at least said plurality of data points measured by said first set of sensors, and

said second set of sensors being positioned in a second location within said plasma processing system, said second location being opposite of said first position, wherein a gap exists between said first set of sensors and said second set of sensors, thereby enabling said wafer to be positioned between said first set of sensors and said second set of sensors.

11. The arrangement of claim 10 wherein said second set of sensors is directly parallel to said first set of sensors.

12. The arrangement of claim 11 wherein a wafer thickness of said wafer is determined by comparing said first set of measurement data to said second set of measurement data.

13. An arrangement to quantify a bow of a substrate, said arrangement being positioned within a plasma processing system that includes a set of process modules, the arrangement comprising:

means for supporting said substrate while said substrate is within said plasma processing system; and

means for collecting a first set of measurement data for a plurality of data points on said substrate, said first set of measurement data quantifying said bow of said substrate, said means for collecting said first set of measurement data being positioned at a first location, wherein said first location is outside of said set of process modules of said plasma processing system.

14. The arrangement of claim 13 wherein said means for supporting said substrate is one of

a robotic arm, and

an electrostatic chuck.

15. The arrangement of claim 13, wherein said means for collecting a first set of measurement data is a set of sensors, wherein said set of sensors being one of a set of contact sensors, a set of capacitive sensors, a set of inductive sensors, a set of laser sensors, a set of ultra sonic sensors, a set of reflective sensors, and a set of through beam sensors.

16. The arrangement of claim 15 wherein said set of sensors is positioned at one of

between a front opening unified pod (FOUP) and an atmospheric transfer module (ATM),

between said ATM and an aligner,

within said aligner,

between said ATM and an airlock module,

between said airlock module and a vacuum transfer module (VTM), and

within said VTM.

17. The arrangement of claim 15 wherein said substrate is moving in a first direction while said set of sensors is stationary, wherein said first direction includes one of a linear z direction and a rotating direction.

18. The arrangement of claim 15 wherein said set of sensors is moving in a first direction while said substrate is stationary, wherein said first direction includes one of a linear z direction and a rotating direction.

19. The arrangement of claim 15 wherein said substrate is rotating while said set of sensors is moving in a linear z direction.

20. The arrangement of claim 13 further includes means for collecting a second set of measurement data, wherein

said second set of measurement data includes a measurement datum that corresponds to at least one data point of at least said plurality of data points measured by said means for collecting a first set of measurement data, and

said means for collecting a second set of measurement data being positioned at a second position, wherein said second position being opposite of said first position, wherein a gap exists between said first position and said second position such that said substrate is position between said first position and said second position.

CLAIMS

What is claimed is:

1. An arrangement for quantifying a wafer bow, said arrangement being positioned within a plasma processing system, comprising:

a support mechanism for holding a wafer; and

a first set of sensors, said first set of sensors being configured to collect a first set of measurement data for a plurality of data points on said wafer, said first set of measurement data indicating a set of distance data between said first set of sensors and said wafer, said first set of sensors being positioned in a first location, said first location being outside of a set of process modules of said plasma processing system, wherein said first set of sensors is moving in a first direction while said wafer is stationary, wherein said first direction includes one of a z direction and a rotating direction.

2. The arrangement of claim 1 wherein said support mechanism is one of

a robotic arm, and

an electrostatic chuck.

3. The arrangement of claim 1 wherein said location of said first set of sensors is positioned at one of

between a front opening unified pod (FOUP) and an atmospheric transfer module (ATM),

between said ATM and an aligner,

within said aligner,

between said ATM and an airlock module,

between said airlock module and a vacuum transfer module (VTM), and

within said VTM.

4. The arrangement of claim 1 wherein said first set of sensors is a single sensor.

5. The arrangement of claim 1 wherein said first set of sensors include an array of sensors.

6. The arrangement of claim 1 wherein said wafer is moving in a first direction while said first set of sensors is stationary, wherein said first direction includes one of a z direction and a rotating direction.

7. The arrangement of claim 1 wherein said wafer is rotating while said first set of sensors is moving in said z direction.

8. The arrangement of claim 1 wherein said first set of sensors is collecting said first set of measurement data when another wafer is being processed in a process module of said set of process modules.

9. The arrangement of claim 1 further includes a second set of sensors,

said second set of sensors being configured for collecting a second set of measurement data, wherein said second set of measurement data include at least one data point of said plurality of data points measured by said first set of sensors, and

said second set of sensors being positioned in a second location within said plasma processing system, said second location being opposite of said first position, wherein a gap exists between said first set of sensors and said second set of sensors, thereby enabling said wafer to be positioned between said first set of sensors and said second set of sensors.

10. The arrangement of claim 9 wherein said second set of sensors is directly parallel to said first set of sensors.

11. The arrangement of claim 10 wherein a wafer thickness for said wafer is determined by comparing said first set of measurement data to said second set of measurement data.

12. A method for quantifying a wafer bow within a plasma processing system, comprising:

transferring a wafer into said plasma processing system;

collecting measurement data for a plurality of data points on said wafer, said measurement data indicating a set of distance data between a set of sensors and said wafer, said set of sensors being positioned outside of a set of process modules of said plasma processing system, wherein said set of sensors is moving in a first direction while said wafer is stationary, wherein said first direction includes one of a z direction and a rotating direction; and

if said measurement data is within a set of pre-determined range, said wafer is moved into a process module of said set of process modules for processing, wherein said measurement data is utilized to adjust a recipe for processing said wafer.

13. The method of claim 12 further include, if said measurement data is outside of said set of pre-determined range, removing said wafer from said plasma processing system.

14. The method of claim 12 wherein said collecting of measurement data is performed at a location outside of said set of process modules, said location being one of

between a front opening unified pod (FOUP) and an atmospheric transfer module (ATM),

between said ATM and an aligner,

within said aligner,

between said ATM and an airlock module,

between said airlock module and a vacuum transfer module (VTM), and

within said VTM.

15. The method of claim 12 wherein said measurement data is employed to determine thickness of said wafer, said measurement data being collected by positioning a first subset of sensors of said set of sensors above said wafer and a second subset of sensors of said set of sensors below said wafer, wherein a first set of measurement data collected by said first subset of sensors is compared against a second set of measurement data collected by said second subset of sensors to determine said thickness of said wafer.

16. The method of claim 15 wherein said second set of measurement data include at least one data point of a plurality of data points measured by said first set of sensors.

17. The method of claim 12 wherein said wafer is moving in a first direction while said set of sensors is stationary, wherein said first direction includes one of a z direction and a rotating direction.

18. The method of claim 12 wherein said wafer is rotating while said first set of sensors is moving in said z direction.