CLAIMS

1. Method for evaluation of heterogeneous deformations in a first wafer (110), said first wafer being bonded by molecular adhesion to a second wafer (120), said evaluation method comprising:

a step (E1) of surveying a plurality of measurement points, each of the measurement points being locally representative of the level of the exposed surface of the first wafer;

a step (E2) of determination of at least one surface profile of the first wafer passing through a plurality of measurement points;

a step (E3) of processing the surface profile of the first wafer to determine therefrom a magnitude characteristic of the processed surface profile; and

a step (E4) of evaluation of a level of heterogeneous deformations in said first wafer as a function of said characteristic magnitude.

2. Evaluation method according to Claim 1, wherein the surface profile is determined by measurement points disposed along a diameter of said first wafer.

3. Measurement method according to Claim 2 wherein the characteristic magnitude is the second derivative of the surface profile.

4. Measurement method according to Claim 3, wherein the evaluation step comprises at least one of the following tests:

- a first test for determining if said second derivative has at least one change of sign; and
- a second test for determining if said second derivative has at least one absolute value greater than a predetermined value.

5. Evaluation method according to Claim 1, wherein the surface profile is determined by measurement points disposed along a circle (R1-R3) the centre whereof coincides with the centre of said first wafer.

6. Evaluation method according to Claim 5 wherein the characteristic magnitude is the spread of the surface profile.

7. Evaluation method according to any one of Claims 1 to 6, wherein the following steps are carried out:

- determination of a plurality of surface profiles (C1-C3) of the first wafer,
- for each surface profile of the plurality of surface profiles, carrying out of a processing step for determining therefrom a magnitude characteristic of the processed profile, wherein, during the evaluation step, the level of heterogeneous deformations is determined as a function of said characteristic magnitudes so determined.

8. Evaluation method according to any one of Claims 1 to 7, wherein the measurement points of each log are measured according to a measurement step, said measurement step being determined as a function of a dimension of at least one pattern of said first wafer.

9. Evaluation method according to Claim 8, wherein said measurement step substantially corresponds to half a dimension of a pattern of said first wafer.

10. Evaluation method according to any one of Claims 1 to 8, wherein the logging of a plurality of measurement points is effected by acoustic microscopy.

11. Method of selection of at least one structure comprising a first wafer (110) bonded by molecular adhesion to a second wafer (120), said selection method comprising:

- a step of evaluation of the heterogeneous deformations in the first wafer of each structure by the evaluation method as defined in any one of Claims 1 to 10; and
- a step (E5) of selection of one or more structures on the basis of the characteristic magnitudes determined for each structure evaluated.

12. Device for evaluation of heterogeneous deformations in a first wafer, said first wafer being bonded by molecular adhesion to a second wafer, said evaluation device comprising:

measuring means for surveying a plurality of measurement points, each of said measurement points being locally representative of the level of the exposed surface of the first wafer;

calculation means for determining at least one surface profile of the first wafer passing through a plurality of measurement points and for determination of a magnitude characteristic thereof; and

evaluation means for evaluating a level of heterogeneous deformations in said first wafer as a function of said characteristic magnitude.

13. Evaluation device according to Claim 12, wherein the characteristic magnitude is the second derivative of the surface profile.

14. Evaluation device according to Claim 13, wherein said evaluation means are configured to execute at least one of the following tests:

- a first test for determining if said second derivative has at least one change of sign; and
- a second test for determining if said second derivative has at least one absolute value greater than a predetermined value.

15. Evaluation device according to any one of Claims 12 to 14, wherein the measurement points of each log are measured along a diameter of said first wafer.

16. Evaluation device according to any one of Claims 12 to 15, wherein said measuring means are configured to produce a plurality of measurement point logs, said logs being spaced from each other and produced in the same direction.

17. Evaluation device according to any one of Claims 12 to 16, wherein said measuring means are configured so that the measurement

points of each log are measured according to a measurement step, said measurement step being determined as a function of a dimension of at least one pattern of said first wafer.

18. Evaluation device according to Claim 17, wherein said measurement step substantially corresponds to half a dimension of a pattern of said first wafer.

19. Evaluation device according to any one of Claims 12 to 18, wherein said measuring means comprise an acoustic microscope.

Claims

1. Method for evaluation of heterogeneous deformations in a first wafer (110), said first wafer being bonded by molecular adhesion to a second wafer (120), said evaluation method comprising:

a step (E1) of surveying a plurality of measurement points, each of the measurement points being locally representative of the level of the exposed surface of the first wafer;

a step (E2) of determination of at least one surface profile of the first wafer passing through a plurality of measurement points;

a step (E3) of processing the surface profile of the first wafer to determine therefrom a magnitude characteristic of the processed surface profile; and

a step (E4) of evaluation of a level of heterogeneous deformations in said first wafer as a function of said characteristic magnitude,

wherein the characteristic magnitude is the second derivative of the surface profile,

wherein the evaluation step comprises at least one of the following tests:

a first test for determining if said second derivative has at least one change of sign; and

a second test for determining if said second derivative has at least one absolute value greater than a predetermined value, and

wherein the surface profile is determined by measurement points disposed along a circle (R1-R3) the centre whereof coincides with the centre of said first wafer.

2. Evaluation method according to Claim 1 wherein the characteristic magnitude is the spread of the surface profile.

3. Evaluation method according to any one of Claims 1 to 2, wherein the following steps are carried out:

- determination of a plurality of surface profiles (C1-C3) of the first wafer,
- for each surface profile of the plurality of surface profiles, carrying out of a processing step for determining therefrom a magnitude characteristic of the processed profile, wherein, during the evaluation step, the level of heterogeneous deformations is determined as a function of said characteristic magnitudes so determined.

4. Evaluation method according to any one of Claims 1 to 3, wherein the

measurement points of each log are measured according to a measurement step, said measurement step being determined as a function of a dimension of at least one pattern of said first wafer.

5. Evaluation method according to Claim 4, wherein said measurement step substantially corresponds to half a dimension of a pattern of said first wafer.

6. Evaluation method according to any one of Claims 1 to 4, wherein the logging of a plurality of measurement points is effected by acoustic microscopy.

7. Method of selection of at least one structure comprising a first wafer (110) bonded by molecular adhesion to a second wafer (120), said selection method comprising:

- a step of evaluation of the heterogeneous deformations in the first wafer of each structure by the evaluation method as defined in any one of Claims 1 to 6; and
- a step (E5) of selection of one or more structures on the basis of the characteristic magnitudes determined for each structure evaluated.

8. Device for evaluation of heterogeneous deformations in a first wafer, said first wafer being bonded by molecular adhesion to a second wafer, said evaluation device comprising:

measuring means for surveying a plurality of measurement points, each of said measurement points being locally representative of the level of the exposed surface of the first wafer;

calculation means for determining at least one surface profile of the first wafer passing through a plurality of measurement points and for determination of a magnitude characteristic thereof; and

evaluation means for evaluating a level of heterogeneous deformations in said first wafer as a function of said characteristic magnitude,

wherein the characteristic magnitude is the second derivative of the surface profile,

wherein said evaluation means are configured to execute at least one of the following tests:

a first test for determining if said second derivative has at least one change of sign; and

a second test for determining if said second derivative has at least one absolute

value greater than a predetermined value, and

wherein the surface profile is determined by measurement points disposed along a circle (R1-R3) the centre whereof coincides with the centre of said first wafer.

9. Evaluation device according to claim 8, wherein said measuring means are configured to produce a plurality of measurement point logs, said logs being spaced from each other and produced in the same direction.

10. Evaluation device according to any one of Claims 8 to 9, wherein said measuring means are configured so that the measurement points of each log are measured according to a measurement step, said measurement step being determined as a function of a dimension of at least one pattern of said first wafer.

11. Evaluation device according to Claim 10, wherein said measurement step substantially corresponds to half a dimension of a pattern of said first wafer.

12. Evaluation device according to any one of Claims 8 to 11, wherein said measuring means comprise an acoustic microscope.