

alignment marks with a second substrate comprising at least two second alignment marks, with a first assignment module for the assignment of the first assignment marks to at least two first characteristic assignment features of the first substrate in an X-direction and in a Y-direction, a second assignment module for the assignment of the second assignment marks to at least two second characteristic assignment features of the second substrate in an X-direction and in a Y-direction and an alignment module for the alignment of the first and second alignment marks in relation to one another in the X- and Y-direction by means of the first and second characteristic alignment features.

All combinations of at least two of the features stated in the description, the claims and/or the figures also fall within the scope of the invention. In the case of the stated value ranges, values lying within the stated limits should also be deemed to be disclosed as limiting values and can be claimed in any combination.

Embodiments of the invention provide a method for the alignment of a first substrate comprising at least two first alignment marks with a second substrate comprising at least two second alignment marks, wherein

- by means of a first assignment, the first alignment marks are assigned to at least two first characteristic alignment features of the first substrate in an X-direction and in a Y-direction,
- by means of a second assignment, the second alignment marks are assigned to at least two second characteristic alignment features of the second substrate in an X-direction and in a Y-direction and
- by means an alignment, the first and second alignment marks are aligned in relation to one another in an X- and Y-direction by means of the first and second characteristic alignment features.

According to the device, embodiments of the invention can be implemented in particular by the following features:

- a first assignment module for the assignment of the first assignment marks to at least two first characteristic assignment features of the first substrate in an X-direction and in a Y-direction,

Claims

1. A method for the alignment of a first substrate (7) comprising at least two first alignment marks (8) with a second substrate (7') comprising at least two second alignment marks (8'), wherein
 - by means of a first assignment, the first alignment marks (8) are assigned to at least two first characteristic alignment features (9) of the first substrate (7) in an X-direction and in a Y-direction,
 - by means of a second assignment, the second alignment marks (8') are assigned to at least two second characteristic alignment features (9') of the second substrate (7') in an X-direction and in a Y-direction and
 - by means an alignment, the first (8) and second alignment marks (8') are aligned in relation to one another in an X- and Y-direction by means of the first and second characteristic alignment features (9, 9').
2. The method according to claim 1, wherein, after the first and second assignment and before the alignment, a transfer of the substrates (7, 7') takes place into a bonding module.
3. The method according to claim 2, wherein the alignment of the substrates (7, 7') takes place under a gas pressure less than 1 bar.
4. The method according to any one of the preceding claims, wherein the first assignment takes place in a first assignment module (3 and the second assignment takes place in a second assignment module (3').
5. The method according to claim 4, wherein the second assignment is in parallel with the first assignment.
6. The method according to any one of claims 4 or 5, wherein the first and second assignments are constituted as locks.

7. The method according to any one of claims 2 to 6, wherein, before the alignment, in the first and/or second assignment module, the gas pressure is reduced to a gas pressure of less than 1 bar.
8. The method according to claim 7, wherein, during the assignment, the gas pressure is reduced to a gas pressure of less than 1 bar.
9. The method according to claim 7 or 8, wherein the gas pressure is reduced to a gas pressure of less than 10^{-3} mbar.
10. The method according to claim 7 or 8, wherein the gas pressure is reduced to a gas pressure of less than 10^{-5} mbar.
11. The method according to claim 7 or 8, wherein the gas pressure is reduced to a gas pressure of less than 10^{-8} mbar.
12. The method according to any one of the preceding claims, wherein the first and/or second characteristic alignment features (9, 9') are each disposed on the lateral edge of the first and second substrate (7, 7').
13. The method according to any one of the preceding claims, wherein one or more of the features listed below are used as first and/or second characteristic alignment features (9, 9'):
 - circular substrate edge section and/or
 - flat substrate edge section and/or
 - notch-shaped substrate edge section and/or
 - points of intersection of the aforementioned features and/or
 - points of intersection of tangents of the aforementioned features.
14. A device for the alignment of a first substrate (7) comprising at least two first alignment marks (8) with a second substrate (7') comprising at least two second alignment marks (8'), with
 - a first assignment module (3) for the assignment of the first assignment marks (8) to at least two first characteristic assignment features (9) of the first substrate (7) in an X-direction and in a Y-direction,
 - a second assignment module (3') for the assignment of the second assignment marks (8') to at least two second

- characteristic assignment features (9') of the second substrate (7') in an X-direction and in a Y-direction and
- an alignment module for the alignment of the first (8) and second alignment marks (8') in relation to one another in the X- and Y-direction by means of the first and second characteristic alignment features (9, 9').
15. The device according to claim 14, wherein the alignment module is constituted as a bonding module.
 16. The device according to claim 14 or 15, wherein the assignment modules are constituted as locks to the alignment module.
 17. The device according to any one of claims 15 to 16, with
 - first detection means for detecting X-coordinates and Y-coordinates of the first and second alignment marks (8, 8'),
 - second detection means for detecting X-coordinates and Y-coordinates of the first and second characteristic alignment features (9, 9'),
 - third detection means (15) for detecting X'-coordinates and Y'-coordinates of the first and second characteristic alignment features (9, 9').
 18. The device according to claim 17, wherein each of first detections means are disposed in the assignment modules (3, 3').
 19. The device according to claim 17, wherein each of the second detection means are disposed in the assignment modules (3, 3').
 20. The device according to claim 17, wherein the third detection means is disposed in the alignment module.