

A further problem in the prior art consists in the fact that minimal deviations from the setpoint position of the alignment marks can arise. Although the positions of the alignment marks are defined with the greatest possible accuracy in the computer, the production of the alignment marks is however limited by the accuracy of the processes and equipment which generate the alignment marks on the substrate surface. Even if the alignment marks were to have no deviation from their ideal geometry, their real position can diverge minimally from the ideal position. The alignment mark deviation lies approximately between 1-100 nm, i.e. in the nanometre range.

Embodiments of the present invention disclose a method with which the accuracy of the alignment of two substrates with respect to one another can be improved.

According to a first aspect of the present invention, there is provided a method for the alignment of two substrates to be bonded, wherein the first substrate includes a first substrate surface with a first substrate surface side and a second substrate surface side which lies opposite the first substrate surface side, wherein the second substrate includes a second substrate surface to be bonded with the first substrate surface, wherein the second substrate surface includes a third substrate surface side and a fourth substrate surface side which lies opposite the third substrate surface side, characterised in that the method includes at least the steps of: detection and storage of first positions of a first alignment mark pair on the first substrate surface of the first substrate, wherein a first alignment mark of the first alignment mark pair is arranged on the first substrate surface side and a second alignment mark of the first alignment mark pair is arranged on the second substrate surface side, detection and storage of second positions of a second alignment mark pair on the second substrate surface of the second substrate, wherein a third alignment mark of the second alignment mark pair is arranged on the third substrate surface side and a fourth alignment mark of the second alignment mark pair is arranged on the fourth substrate surface side, detection and storage of third positions of a third alignment mark

pair on the second substrate surface of the second substrate, wherein a fifth alignment mark of the third alignment mark pair is arranged on the third substrate surface side and a sixth alignment mark of the third alignment mark

pair is arranged on the fourth substrate surface side, detection and storage of fourth positions of a fourth alignment mark pair on the first substrate, wherein a seventh alignment mark of the fourth alignment mark pair is arranged on the first substrate surface side and an eighth alignment mark of the fourth alignment mark pair is arranged on the second substrate surface side, alignment of the two substrates with respect to one another depending on the detected first positions, second positions, third positions and fourth positions.

According to a second aspect of the present invention, there is provided a device for the alignment of two substrates to be bonded with the above method, including: substrate holders for holding and fixing the substrates, movement devices for moving the substrate holders, lens systems for detecting positions of alignment marks on the substrates, a storage device for storing the positions of the alignment marks.

According to a third aspect of the present invention, there is provided a product with two substrates, including at least two alignment marks on each side.

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

Embodiments of the invention describe the alignment of two substrates to be bonded, wherein the first substrate comprises a first substrate surface with a first substrate surface side (also referred to hereinafter as the left-hand substrate surface side) and a second substrate surface side (also referred to hereinafter as the right-hand substrate surface side) which lies