Claims

1. A device for bonding of substrate pairs with

- at least one pretreatment module (9) for pretreating a substrate pair with a pretreatment chamber (2) which can be exposed to a vacuum and which surrounds a pretreatment space (12), with a first lock door (5),
- at least one primary treatment module (10) with a primary treatment chamber (3) which can be exposed to a vacuum separately from the pretreatment chamber (2) and which surrounds a primary treatment space (13), and in which the substrate pair can be brought into contact and can be bonded, while the pretreatment module (9) can be loaded with a further substrate pair,
- a first primary lock door (6) which connects the pretreatment chamber (2) to the primary treatment chamber (3) vacuum-tight, the pretreatment module (9) being switchable as a lock for the loading of the primary treatment chamber (3) with substrates,
- at least one aftertreatment module (11) with an aftertreatment chamber (4) which can be exposed to a vacuum separately from the primary treatment chamber (3) and which surrounds an aftertreatment space (14), with a second lock door (8) and
- a second primary door lock (7) which connects the primary treatment chamber (3) to the aftertreatment chamber (4) vacuum-tight, the aftertreatment module (11) being switchable as a lock for the unloading of the substrates from the primary treatment chamber (3).

2. The device as claimed in one of the preceding claims, wherein the primary lock doors (6, 7) are transfer valves, which especially can be inserted in a common channel between the respectively adjacent chambers (2, 3, 4) forming a seal.

3. The device as claimed in one of the preceding claims, wherein ~~the~~ a first pretreatment module (9) is provided for pretreatment of ~~the~~ a first substrate of the substrate pair and ~~the~~ a second pretreatment module is provided for pretreatment of ~~the~~ a second substrate of the substrate pair.

4. The device as claimed in one of the preceding claims, wherein other pretreatment modules can be connected upstream to the pretreatment module (9) as locks and/or other aftertreatment modules can be connected downstream of the aftertreatment module (11) as locks.

5. The device as claimed in claim 3, wherein the first and the second substrate can be loaded via separate lock doors to the primary treatment chamber (3).

6. The device as claimed in one of the preceding claims, wherein there is a loading and unloading apparatus, especially at least one robot arm (16, 17) for loading and unloading of the substrates into and out of the primary treatment chamber (3) and/or the pretreatment chamber (2) and/or the aftertreatment chamber (4).

7. The device as claimed in one of the preceding claims, wherein the primary treatment chamber (3) can be loaded at the same time from the pretreatment chamber (2) and can be unloaded into the aftertreatment chamber (4) and/or the pretreatment chamber (2) and the aftertreatment chamber (4) can be loaded at the same time via the first lock door (5) and unloaded via the second lock door (8).

8. A method for bonding substrate pairs with the following steps:

- loading of a pretreatment chamber (2) with a substrate or substrate pair via a first lock door (5),
- pretreatment of the substrate in the pretreatment chamber (2) by exposure to pressure and/or temperature,

- loading of the substrate from the pretreatment chamber (2) via a first primary door lock (6) into primary treatment chamber (3) which can be exposed to a vacuum,
- primary treatment of the substrate in the primary treatment chamber (3) by exposure to pressure and/or temperature, wherein at the same time a further substrate/substrate pair can be loaded into the pretreatment chamber,
- unloading of the substrate from the primary treatment chamber (3) via a second primary lock door (7) into an aftertreatment chamber (4),
- aftertreatment of the substrate in the aftertreatment chamber (4) and
- unloading of the substrate from the aftertreatment chamber (4) via a second lock door (8).

9. The method as claim in Claim 8, wherein before each opening of the primary lock door (6) the pretreatment chamber (2) and before each opening of the primary lock door (7) the aftertreatment chamber (4) are exposed to a pressure p_V or p_N less than the atmospheric and/or ambient pressure p_{ATM} outside the chambers (2, 3, 4) and/or decontaminated, especially flushed with inert gas.