**Claims**

1. Vacuum machining system (1), comprising
- a vacuum chamber (10) which defines an evacuable internal volume for generating a vacuum and for machining a substrate in the internal volume, and
- a vacuum regulating valve (20) for regulating a volume flow or mass flow of a fluid flowing through the vacuum chamber (10) and for interrupting a flow path of the fluid in a gas-tight manner, said valve having
  - a first valve seat (21, 21a), which has a first valve opening (22, 22a) defining a first opening axis (O) and a first sealing surface extending around the first valve opening (O), and
  - a first valve plate (23, 23a) with a first contact surface corresponding to the first sealing surface, and
- a drive unit (30), which is designed in such a way and is coupled to the first valve plate (23, 23a) in such a way that the latter can be moved at least from
  - an open position, in which the first valve plate (23, 23a) and the first valve seat (21, 21a) are not in contact with each other, to
  - a closed position, in which sealing contact between the first sealing surface and the first contact surface exists via a sealing element (25) located therebetween and the first valve opening (22, 22a) is thereby closed in a gas-tight manner,

  and back again,

characterized in that
- the first valve seat (21, 21a) is arranged within the vacuum chamber (10) and divides the vacuum chamber (10) into a main process chamber (11) for machining the substrate and into a secondary process chamber (12),
- the first sealing surface extends orthogonally to the first opening axis (O) and points in the direction of the secondary process chamber (12), and
- the first valve plate (23, 23a) is movably arranged in the secondary process chamber (12).

2. Vacuum machining system (1) according to claim 1, characterized in that
the vacuum regulating valve (20) has

- a second valve seat (21b), which has a second valve opening (22b) defining a second opening axis and a second sealing surface extending around the second valve opening (22b), and
- a second valve plate (23b) with a second contact surface corresponding to the second sealing surface,

wherein

- the second valve seat (21b) is arranged within the vacuum chamber (10) and, together with the first valve seat (21, 21a), divides the vacuum chamber into the main process chamber (11) and the secondary process chamber (12),
- the second sealing surface extends orthogonally to the second opening axis and points in the direction of the secondary process chamber (12), and
- the second valve plate (23b) is movably arranged in the secondary process chamber (12),

wherein a total valve opening of the vacuum regulating valve is formed at least by the first valve opening (22a) as a first valve sub-opening and the second valve opening (22b) as a second valve sub-opening.

3. Vacuum machining system (1) according to claim 2, characterized in that
the vacuum regulating valve (10) has

- a third valve seat (21c), which has a third valve opening (22c) defining a third opening axis and a third sealing surface extending around the third valve opening (22c), and
- a third valve plate (23c) with a third contact surface corresponding to the third sealing surface,

wherein

- the third valve seat (23c) is arranged within the vacuum chamber (10) and, together with the first and second valve seat (21a, 21b), divides the vacuum chamber (10) into the

main process chamber (11) and the secondary process chamber (12),

- the third sealing surface extends orthogonally to the third opening axis and points in the direction of the secondary process chamber (12), and
- the third valve plate (23c) is movably arranged in the secondary process chamber (12),

wherein the total valve opening is additionally formed by the third valve opening (22c) as a third valve sub-opening.

4. Vacuum machining system (1) according to claim 3, characterized in that
the drive unit (30) is coupled to the second and third valve plate (23b, 23c) in such a way that the coupled valve plates (23a-c) can be moved at least from

- a respective open position, in which the respective valve plate and the respective valve seat are not in contact with each other, to
- a closed position, in which axially sealing contact between the respective sealing surface and the respective contact surface exists via a respective sealing element located therebetween and the respective valve sub-opening is thereby closed in a gas-tight manner,

and back again.

5. Vacuum machining system (1) according to any one of the claims 2 to 4,
characterized in that
the vacuum regulating valve (20) has a coupling arrangement, which coupling arrangement mechanically couples the first valve plate (23, 23a) to the second valve plate (23b), and in particular to the third valve plate (23c), in such a way and is connected to the drive unit (30) in such a way that the respective valve plates (23, 23a-c) can be jointly moved by means of the drive unit (30).

6. Vacuum machining system (1) according to any one of the claims 2 to 5,

characterized in that

- the drive unit (30) has at least a first and a second, in particular a third, drive component, in particular respective motors, and
- the first drive component is coupled to the first valve plate (23a) and the second drive component is coupled to the second valve plate (23b), and in particular the third drive component is coupled to the third valve plate.

7. Vacuum machining system (1) according to any one of the preceding claims,
characterized in that
the drive unit (30) and at least the first valve plate (23, 23a) are designed and coupled in such a way that

- at least the first (23, 23a) of the valve plates can be moved along a first movement axis (V), and
- the first movement axis (V) extends transversely relative to the first opening axis (O).

8. Vacuum machining system (1) according to any one of the preceding claims,
characterized in that
the main process chamber (11) encloses a main internal volume and the secondary process chamber (12) encloses a secondary internal volume, the main internal volume being larger than the secondary internal volume.

9. Vacuum machining system (1) according to any one of the preceding claims,
characterized in that
the vacuum machining system (1) has an electrostatic holding device (15), in particular a chuck, arranged in the main process chamber (11).

10. Vacuum machining system (1) according to claim 9,
characterized in that

- the vacuum regulating valve (20) has at least the first valve seat (21, 21a) and at least two further valve seats

(21b-c), and the valve seats (21, 21a-c) define a first valve opening (22, 22a) and at least two further valve openings (22b-c), and

- the valve seats (21, 21a-c) are arranged symmetrically around the electrostatic holding device (15).

11. Vacuum machining system (1) according to claim 10, characterized in that
the valve seats (21, 21a-c) and/or the valve openings (22, 22a-c) are ring-segment-shaped and are arranged in such a way that respective inner arcs or outer arcs of the ring-segment-shaped valve seats and/or valve openings lie on a common circle.

12. Vacuum machining system (1) according to any one of the claims 6 to 11,
characterized in that
the vacuum machining system (1) comprises a control unit, in particular a regulating unit, and the drive unit can be actuated on the basis of a control signal provided by the control unit, in particular on the basis of a regulating variable.

13. Vacuum machining system (1) according to claim 12, characterized in that
each drive component of the drive unit can be actuated individually by means of the control signal.

14. Vacuum machining system (1) according to claim 12 or 13, characterized in that
the control unit has a flow functionality configured in such a way that, upon execution thereof, at least one of the valve plates (21, 21a-c) coupled to the drive unit (30) is moved to an intermediate position between the open position and the closed position.

15. Vacuum machining system (1) according to claim 14, characterized in that
the at least one coupled valve plate (21, 21a-c) can be moved linearly along a movement axis (V) and a distance between the

contact surface of said valve plate and the corresponding sealing surface in the intermediate position is smaller than in the open position and greater than in the closed position.

16. Vacuum machining system (1) according to claim 14 or 15, characterized in that

- the vacuum regulating valve (20) has at least
  - the first and the second valve seat (21, 21a-c),
  - the first and the second valve plate (23, 23a-c),
  - the first drive component, which is coupled to the first valve plate, and the second drive component, which is coupled to the second valve plate, and
- the flow functionality is configured in such a way that the valve plates (23, 23a-c) can be individually positioned between the respective open position and the respective closed position as a function of flow information.

17. Vacuum machining system (1) according to claim 16, characterized in that

the flow information comprises at least one of the following items of information:

- a mass flow or volume flow of the fluid through the main process chamber and/or the secondary process chamber,
- a flow velocity of the fluid in the main process chamber and/or secondary process chamber,
- a flow velocity distribution with respect to an internal volume cross-section for the main process chamber and/or the secondary process chamber,
- a pressure difference between the main process chamber and the secondary process chamber,
- a fluid inflow into the main process chamber,
- a fluid outflow out of the secondary process chamber.

18. Vacuum machining system (1) according to claim 16 or 17, characterized in that

the valve plates (23, 23a-c) can be positioned in such a way that a symmetrical fluid flow through the main process chamber (11) can be provided as a function of the flow information.

19. Vacuum machining system (1) according to any one of claims 16 to 18,
characterized in that
the positioning of the valve plates (23, 23a-c) can be individually dynamically adjusted and thus the fluid flow through the main process chamber (11) can be continuously regulated.

20. Vacuum machining system (1) according to any one of claims 16 to 19,
characterized in that
a defined flow behaviour can be set and/or regulated by the vacuum regulating valve (20), in particular by at least two valve sub-openings (22a-c), in particular wherein the flow behaviour can be set by the vacuum regulating valve in an asymmetric manner with respect to a central axis of the vacuum regulating valve (20) and the central axis extends through a valve centre.

21. Vacuum machining system (1) according to any one of claims 16 to 20,
characterized in that
if there is an inhomogeneous fluid flow through the main process chamber (11), a symmetrical fluid flow can be set by executing the flow functionality.

22. Vacuum machining system (1) according to any one of claims 16 to 21,
characterized in that
the vacuum machining system (1) comprises at least one sensor unit, which is designed in such a way that the flow information can be detected by means of the sensor unit.

23. Vacuum machining system (1) according to any one of the preceding claims,
characterized in that

the flow path connects the main process chamber (11) and the secondary process chamber (12), and the main process chamber (11) can be separated from the secondary process chamber (12) in a gas-tight manner by the vacuum regulating valve (20).