

Claims

1. A substrate processing system for removing films on substrate surfaces of a plurality of substrates by soaking the substrates in processing liquid including a heated aqueous solution, the substrate processing system comprising:

a processing bath in which the processing liquid is stored, and the substrates are soaked in the processing liquid;

a circulation unit configured to return the processing liquid drained from the processing bath, to the processing bath;

a processing liquid heating unit configured to heat the processing liquid so that the processing liquid in the processing bath keeps a target temperature;

a sealing unit configured to seal the processing bath;

a pressure sensor configured to measure internal pressure of the processing bath;

a pressure adjustment unit configured to adjust, based on the internal pressure measured by the pressure sensor, internal pressure of the processing bath to target pressure higher than atmospheric pressure, by increasing or decreasing an exhaust amount of water vapor exhausted from an inside of the processing bath to an outside;

a concentration adjustment unit configured to adjust concentration of the processing liquid to be constant, by consecutively adding pure water to the processing liquid via the circulation unit, and increasing or decreasing a water addition amount of the pure water based on the internal pressure measured by the pressure sensor wherein

the substrates are arrayed in the processing bath,

the pressure adjustment unit includes a tubular-shaped exhaust unit disposed along the substrates in a

space above the processing liquid, and communicated with an outside at one end, and

in the exhaust unit, a plurality of openings for sucking water vapor in the processing bath is formed in an array range of the substrates.

2. The substrate processing system according to claim 1, wherein the pressure adjustment unit includes an exhaust valve connected to the exhaust unit, and an exhaust control unit configured to increase or decrease a degree of opening of the exhaust valve based on the internal pressure measured by the pressure sensor.

3. The substrate processing system according to claim 1, wherein each of the substrates is a silicon wafer on which a silicon dioxide film and a silicon nitride film are formed on the substrate surface, and the processing liquid is a phosphoric acid aqueous solution.

4. The substrate processing system according to claim 1, wherein the pressure adjustment unit increases or decreases an exhaust amount of the water vapor based on a varying state of the internal pressure.

5. A substrate processing method for removing films on substrate surfaces of a plurality of substrates by soaking the substrates in processing liquid including a heated aqueous solution, the substrate processing method comprising:

a soaking step of soaking the substrates in the processing liquid stored in a processing bath wherein the substrates are arrayed in the processing bath;

a sealing step of sealing the processing bath;

a circulation step of returning the processing liquid drained from the processing bath, to the processing bath;

a processing liquid heating step of heating the processing liquid so as to keep the processing liquid in the processing bath at a target temperature;

a pressure adjustment step of adjusting internal pressure of the processing bath to target pressure higher than atmospheric pressure, by increasing or decreasing an exhaust amount of water vapor exhausted from an inside of the processing bath to an outside, in accordance with internal pressure of the processing bath wherein the water vapor is exhausted to the outside by being sucked through a plurality of openings that is formed in an array range of the substrates in a tubular-shaped exhaust unit, the tubular-shaped exhaust unit being disposed along the substrates in a space above the processing liquid in the processing bath and being communicated with the outside at one end; and

a concentration adjustment step of adjusting concentration of the processing liquid by consecutively adding pure water to the processing liquid circulated by the circulation step, and measuring internal pressure of the processing bath, and increasing or decreasing a water addition amount of the pure water based on the measured internal pressure.