

What is claimed is:

1. A polishing method for polishing a substrate by pressing the substrate against a polishing pad on a polishing table, comprising:

a polishing pad surface temperature adjustment step of adjusting a surface temperature of the polishing pad; and

a polishing step of polishing the substrate by pressing the substrate against the polishing pad having the adjusted surface temperature;

wherein under a first polishing condition that a polishing rate becomes substantially constant in a radial direction of the substrate when the substrate is polished for a predetermined time by the polishing pad whose surface temperature is not adjusted, the substrate is polished for the predetermined time to obtain a temperature distribution in the radial direction of the surface of the polishing pad, the obtained temperature distribution being used as a reference;

wherein in the polishing pad surface temperature adjustment step, the substrate is polished during the polishing step under the same polishing condition as the first polishing condition while the surface temperature of the polishing pad is adjusted, and the surface temperature of a part of an area of the polishing pad, the area being to be brought in contact with the substrate, is adjusted during the polishing step so that the rate of temperature change, showing a degree of increase, from the temperature in the temperature distribution used as the reference, in a temperature in a radial direction of the surface of the polishing pad after an elapse of the predetermined time from start of the polishing step, becomes constant in the radial direction of the polishing pad.

2. The polishing method according to claim 1, wherein the polishing pad surface temperature adjustment step is carried out by heating or cooling the part of the area of the polishing pad by using a pad contact member which is brought in contact with the surface of the polishing pad.

3. The polishing method according to claim 1 or 2, wherein the rate of temperature change of the temperature ~~profile~~ in the radial direction of the surface of the polishing pad is calculated for each of temperature measurement points on the polishing pad.

4. The polishing method according to any one of claims 1 to 3, wherein the temperature distribution in the radial direction of the surface of the polishing pad is prepared by defining a plurality of areas in the radial direction of the polishing pad, providing at least one temperature measurement point on the polishing pad in each area, and using measured values measured at the temperature measurement points.

5. The polishing method according to claim 4, wherein in the case where a plurality of temperature measurement points are provided in the area, the measured values measured at the plural temperature measurement points are used individually or the average value of the measured values is used.

6. The polishing method according to any one of claims 1 to 5, wherein the part of the area of the polishing pad whose surface temperature is adjusted is variable during the polishing step so that the rate of temperature change of the temperature ~~profile~~ in the radial direction of the surface of the polishing pad becomes constant in the radial direction of the polishing pad.

7. The polishing method according to any one of claims 1 to 6, wherein the temperature measurement of the polishing pad is performed by a thermograph or a radiation thermometer.

8. The polishing method according to any one of claims 1 to 7, wherein the part of the polishing pad whose surface temperature is adjusted is at least one of a plurality of concentric annular areas defined in the radial direction of the polishing pad.

9. The polishing method according to claim 2, wherein the pad contact member is moved in the radial direction of the polishing pad to change the area of the polishing pad whose surface temperature is adjusted during the polishing step so that the rate of temperature change in the radial direction of the surface of the polishing pad becomes constant in the radial direction of the polishing pad.