Claims

1. A method for producing semiconductor wafers, where
a single-crystal rod of silicon is provided,
the rod is cut into crystal pieces, and
a test wafer is removed from one crystal piece,
where the test wafer is subjected to a first thermal treatment method and
thereafter a second thermal treatment method takes place,
which comprises a heating phase, a holding phase at holding temperature T_h,
and a cooling phase
and which causes a radial temperature difference ΔT between center and edge
on the test wafer during the holding phase,
and after cooling of the test wafer, the wafer of semiconductor material is
analyzed in respect of stress fields, using an SIRD measurement, and
the result is utilized to decide whether the semiconductor wafers obtained from
the crystal piece are used or not.

2. The method as claimed in claim 1, wherein
the temperature of the holding phase, T_h, is between 700°C and 1410°C,
preferably between 900°C and 1100°C.

3. The method as claimed in either of the preceding claims, wherein
the single-crystal rod is pulled by the Czochralski method.

4. The method as claimed in any of the preceding claims, wherein
the single-crystal rod is pulled by the float zone method.

5. The method as claimed in any of the preceding claims, wherein
the heating rate of the heating phase is less than 4 K/s and
the cooling rate of the cooling phase is less than 5 K/s.

6. The method as claimed in any of the preceding claims, wherein
the amount of the temperature difference between center and edge of the test
wafer in the holding phase is between 1 K and 30 K, preferably between 2 K and
5 K.

7. The method as claimed in any of the preceding claims, wherein the atmosphere of at least one thermal treatment step in the first thermal treatment step comprises at least one chemical substance from the list consisting of He, Ar, H_2, O_2, N_2, NH_3, CH_4, $SiHCl_3$, SiH_2Cl_2, SiH_4, $SiCl_4$, CH_4Cl_2Si, and H_2O.

8. The method as claimed in any of the preceding claims, wherein the amount of the radial thermal gradient both in the heating phase and in the cooling phase is smaller than the amount of the radial thermal gradient in the holding phase.

9. The method as claimed in any of the preceding claims, wherein the duration of the holding phase is at least 10 s.

10. The method as claimed in any of the preceding claims, wherein the first thermal treatment method simulates a thermal budget for device processing on the semiconductor wafers.

11. The method as claimed in claim 9, wherein the duration of the holding phase is between 10 s and 10 minutes.

12. The method as claimed in any of the preceding claims, wherein the first thermal treatment method comprises heating the wafer at 780°C for 3 hours followed by heating at 1000°C for 16 hours.