Claims

1. A method for slicing off a multiplicity of wafers from workpieces during a number of slicing operations by means of a wire saw which comprises a wire web (2) of moving wire sections of a sawing wire (3) which is stretched between two wire guide rollers (1), with each of the wire guide rollers (1) being mounted between a fixed bearing (5) and a movable bearing (6), said method comprising
the feeding of one of the workpieces (4) in the presence of a working fluid during each one of the slicing operations along a feed direction against the wire web (2) in the presence of hard substances which act abrasively on the workpiece (4);
the temperature-controlling of the fixed bearing (5) of the respective wire guide roller (1) during the slicing operations according to a temperature profile which mandates a temperature as a function of a depth of cut;
a first switching of the temperature profile in the course of the slicing operations from a first temperature profile with constant temperature course to a second temperature profile which is proportional to the difference of a first average shape profile and a shape profile of a reference wafer, with the first average shape profile being determined from wafers which have been sliced off in accordance with the first temperature profile, and
a further switch of the temperature profile to a further temperature profile, which is proportional to the difference of a further average shape profile of previously sliced wafers and of the shape profile of the reference wafer, with the previously sliced wafers originating from at least 1 to 5 slicing operations which have immediately preceded a current slicing operation, and the further average shape profile being determined on the basis of a cut-related selection of wafers.

2. The method as claimed in claim 1, comprising the using of the first temperature profile during a first of the slicing operations which takes place after a change in at least one feature of the wire saw, of the sawing wire (1) or of the working fluid.

3. The method as claimed in claim 1 or claim 2, comprising the determining of the further average shape profile on the basis of a wafer-based and of a cut-based selection of wafers.

4. The method as claimed in any of claims 1 to 3, comprising the determining of the first average shape profile and of the further average shape profile on the basis of a weighted averaging of the shape profile of wafers.

5. The method as claimed in any of claims 1 to 4, wherein the sawing wire (3) is a hypereutectoid pearlitic steel wire.

6. The method as claimed in any of claims 1 to 5, wherein the sawing wire (3) has a diameter of 70 µm to 175 µm.

7. The method as claimed in claim 5 or claim 6, wherein the sawing wire (3) is provided along a longitudinal wire axis with a multiplicity of protuberances and indentations in directions perpendicular to the longitudinal wire axis.

8. The method as claimed in any of claims 1 to 7, comprising the supplying of a cooling lubricant as working fluid to the wire sections during the slicing operations, with the hard substances consisting of diamond and being fixed on the surface of the sawing wire (3) by electroplate bonding, by synthetic resin bonding or by form-fitting bonding, and the cooling lubricant being free of substances which act abrasively on the workpiece (4).

9. The method as claimed in any of claims 1 to 7, comprising the supplying of the working fluid in the form of a slurry of the hard substances in glycol or oil to the wire sections during slicing operations, with the hard substances consisting of silicon carbide.

10. The method as claimed in any of claims 1 to 9, comprising the moving of the sawing wire (3) in a continual sequence of pairs of directional reversals, with each pair of directional reversals comprising a first moving of the sawing wire (3) in a first longitudinal wire direction by a first length, and a second, subsequent moving of the sawing wire (3) in a second longitudinal wire direction by a second length, with the second longitudinal wire direction being opposite to the first longitudinal wire direction and the first length being greater than the second length.

11. The method as claimed in claim 10, wherein the sawing wire (3) during movement into the by the first length is supplied to the wire web (2) with a first tensile force in the longitudinal wire direction from a first wire stock, and during movement by the second length is supplied with a second tensile force in the longitudinal wire direction from a second wire stock, and with the second tensile force being lower than the first tensile force.

12. The method as claimed in any of claims 1 to 11, wherein the workpiece (4) consists of a semiconductor material.

13. The method as claimed in any of claims 1 to 12, wherein the workpiece (4) has the form of a straight prism.

14. The method as claimed in any of claims 1 to 12, wherein the workpiece (4) has the form of a straight circular cylinder.