JP 2005 329506 A2 discloses a method in which a cooling gas is blown as a coolant onto the sawing wire. In this way, the viscosity of the cutting suspension can likewise be impaired and the quality of the cut degraded. Furthermore, gases are only very limitedly suitable for cooling since their relatively low heat capacity does not ensure sufficient dissipation of the amounts of heat usually produced during the cutting.

Embodiments~~It was an object~~ of the invention seek to develop a method which ensures optimal cooling during the wire sawing of a workpiece made of semiconductor material and at the same time does not affect the properties of the cutting suspension (sawing slurry, slurry).

According to an aspect of the invention, there is provided~~This object is achieved by~~ a method for cooling a cylindrical workpiece made of semiconductor material having a surface consisting of two end faces and a lateral face, during wire sawing, the wire web consisting of wire sections arranged parallel penetrating into the workpiece during the sawing by an oppositely directed relative movement of the wire sections and the workpiece, and the temperature of the workpiece being controlled during the wire sawing by a liquid coolant, wherein wipers bear on the workpiece surface, the liquid coolant is applied onto the workpiece above the wipers bearing on the workpiece surface and the liquid coolant is removed from the workpiece surface by the wipers bearing on the workpiece and the wire sections of the wire web penetrate into the workpiece below the wipers bearing on the workpiece. The method according to the invention also makes it possible to cool a crystal in such a way that the warp and nanotopography product properties of the resulting semiconductor wafers are improved. Furthermore, the method according to the invention makes it possible to use a coolant which can be selected independently of the cutting suspension.

A cylindrical workpiece is a geometrical body having a surface consisting of two parallel plane faces (end

Patent Claims:

1. A method for cooling a cylindrical workpiece made of semiconductor material having a surface consisting of two end faces and a lateral face, during wire sawing, the wire web consisting of wire sections arranged parallel penetrating into the workpiece during the sawing by an oppositely directed relative movement of the wire sections and the workpiece, and the temperature of the workpiece being controlled during the wire sawing by a liquid coolant, wherein wipers bear on the workpiece surface, the liquid coolant is applied onto the workpiece above the wipers bearing on the workpiece surface and the liquid coolant is removed from the workpiece surface by the wipers bearing on the workpiece.

2. The method as claimed in claim 1, wherein the liquid coolant is applied onto the lateral face above the wipers bearing on the lateral face of the workpiece.

3. The method as claimed in claim 1, wherein the liquid coolant is applied onto the end faces above the wipers bearing on the end faces of the workpiece.

4. The method as claimed in one of claims 1 to 3, wherein the wire sections of the wire web penetrate into the workpiece below the wipers bearing on the workpiece.

5. The method as claimed in one of claims 1 to 4, wherein during penetration of the wire sections of the wire web into the workpiece, the wipers bear on the lateral face or the end faces until a freely selectable penetration depth of the wire web into the workpiece is reached, and when this penetration depth is reached the application of the coolant is

ended and the wipers are removed from the workpiece surface.

6. The method as claimed in one of claims 1 to 5, wherein a cutting suspension, which contains loose abrasives, is applied onto the wire sections of the saw web.

7. The method as claimed in claim 6, wherein the cutting suspension contains a glycol as a carrier material.

8. The method as claimed in one of claims 6 and 7, wherein the liquid coolant consists of the carrier medium for the cutting suspension.

9. The method as claimed in one of claims 1 to 5, wherein the wire sections contain firmly bound abrasives.

Patent Claims:

1. A method for cooling a cylindrical workpiece made of semiconductor material having a surface consisting of two end faces and a lateral face, during wire sawing, the wire web consisting of wire sections arranged parallel penetrating into the workpiece during the sawing by an oppositely directed relative movement of the wire sections and the workpiece, and the temperature of the workpiece being controlled during the wire sawing by a liquid coolant, wherein wipers bear on the workpiece surface, the liquid coolant is applied onto the workpiece above the wipers bearing on the workpiece surface and the liquid coolant is removed from the workpiece surface by the wipers bearing on the workpiece and the wire sections of the wire web penetrate into the workpiece below the wipers bearing on the workpiece.

2. The method as claimed in claim 1, wherein the liquid coolant is applied onto the lateral face above the wipers bearing on the lateral face of the workpiece.

3. The method as claimed in claim 1, wherein the liquid coolant is applied onto the end faces above the wipers bearing on the end faces of the workpiece.

4. The method as claimed in one of claims 1 to 3, wherein during penetration of the wire sections of the wire web into the workpiece, the wipers bear on the lateral face or the end faces until a freely selectable penetration depth of the wire web into the workpiece is reached, and when this penetration depth is reached the application of the coolant is ended and the wipers are removed from the workpiece surface.

5. The method as claimed in one of claims 1 to 4, wherein a cutting suspension, which contains loose abrasives, is applied onto the wire sections of the saw web.

6. The method as claimed in claim 5, wherein the cutting suspension contains a glycol as a carrier material.

7. The method as claimed in one of claims 5 and 6, wherein the liquid coolant consists of the carrier medium for the cutting suspension.

8. The method as claimed in one of claims 1 to 4, wherein the wire sections contain firmly bound abrasives.