

CLAIMS

1. A method for manufacturing a semiconductor device, the method comprising:

5 a step of preparing a dicing/die-bonding integrated film including an adhesive layer formed of a heat-curable resin composition having a melt viscosity of 3100 Pa·s or higher at 120°C, a tacky adhesive layer, and a base material film in this order;

a step of sticking a surface on the adhesive layer side of the dicing/die-bonding integrated film and a semiconductor wafer together;

10 a step of dicing the semiconductor wafer;

a step of expanding the base material film and thereby dividing the semiconductor wafer and the adhesive layer into individual pieces, to obtain an adhesive-attached semiconductor element formed of the individual piece;

15 a step of picking up the adhesive-attached semiconductor element from the tacky adhesive layer;

a step of laminating the adhesive-attached semiconductor element to another semiconductor element, with an adhesive of the adhesive-attached semiconductor element interposed therebetween; and

20 a step of heat-curing the adhesive.

2. The method for manufacturing a semiconductor device according to claim 1, wherein a storage modulus of the adhesive layer is 70 MPa or higher at 35°C.

25 3. The method for manufacturing a semiconductor device according to claim 1-~~or 2~~, wherein the semiconductor wafer is divided into individual pieces by either stealth dicing or blade dicing, and the

base material film is expanded under cooling conditions.

4. The method for manufacturing a semiconductor device according to ~~any one of claims 1 to 3~~,

wherein the heat-curable resin composition contains a heat-curable resin, a high-molecular weight component having a molecular weight of 100000 to 1000000, and a filler, and

a content of the high-molecular weight component based on a total mass of the heat-curable resin composition is 15% to 66% by mass.

5. The method for manufacturing a semiconductor device according to claim 4, wherein a content of the filler based on a total mass of the heat-curable resin composition is 25% to 45% by mass.

6. The method for manufacturing a semiconductor device according to ~~any one of claims 1 to 5~~, wherein the method is a method for manufacturing a three-dimensional NAND memory.

7. A heat-curable resin composition used for a process for manufacturing a semiconductor device, having a melt viscosity of 3100 Pa·s or higher at 120°C., and

~~8. The heat-curable resin composition according to claim 7, having a storage modulus of 70 MPa or higher at 35°C.~~

98. The heat-curable resin composition according to claim ~~7 or 8~~, comprising a heat-curable resin, a high-molecular weight component having a molecular weight of 100000 to 1000000, and a filler,

wherein a content of the high-molecular weight component based on a total mass of the heat-curable resin composition is 15% to 66% by mass.

~~109.~~ 99. The heat-curable resin composition according to claim 98,

wherein a content of the filler based on a total mass of the heat-curable resin composition is 25% to 45% by mass.

~~11~~10. The heat-curable resin composition according to ~~any one of~~ claims 7 to ~~10~~, wherein the heat-curable resin composition is used for a process for manufacturing a three-dimensional NAND memory.

~~12~~11. A dicing/die-bonding integrated film, comprising:
a tacky adhesive layer; and
an adhesive layer formed of the heat-curable resin composition according to ~~any one of claims 7 to 11~~,

wherein the heat-curable resin composition is used for a process for manufacturing a semiconductor device and has a melt viscosity of 3100 Pa·s or higher at 120°C.

~~13~~12. The dicing/die-bonding integrated film according to claim ~~12~~11, wherein a thickness of the adhesive layer is 3 to 40 μm.

13. The dicing/die-bonding integrated film according to claim 11, wherein a storage modulus of the adhesive layer is 70 MPa or higher at 35°C.

14. The dicing/die-bonding integrated film according to claim 11, wherein the heat-curable resin composition contains a heat-curable resin, a high-molecular weight component having a molecular weight of 100000 to 1000000, and a filler.

15. The dicing/die-bonding integrated film according to claim 14, wherein a content of the high-molecular weight component based on a total mass of the heat-curable resin composition is 15% to 66% by mass.

16. The dicing/die-bonding integrated film according to claim 14, wherein a content of the filler based on a total mass of the heat-curable

resin composition is 25% to 45% by mass.