

WHAT IS CLAIMED IS:

1. A wafer processing method wherein a wafer having a plurality of scheduled division lines formed in a grating on a front face thereof and having a device formed in each of regions thereof partitioned by the scheduled division lines is divided along the scheduled division lines into individual device chips, the wafer processing method comprising:

a protective film forming step of coating liquid-state resin, which is hardened by irradiation of ultraviolet rays thereon, on the front face of the wafer, with the devices thereon, to form a protective film;

a protective film hardening step of irradiating ultraviolet rays upon the protective film to harden the protective film;

a protective tape adhering step of adhering a protective tape on a front face of the hardened protective film, wherein the protective tape adhering step is performed after the protective film hardening step;

a modified layer forming step of irradiating a laser beam of a wavelength having a transparency to the wafer along the scheduled division lines with a focal point thereof positioned in the inside of the wafer to form a modified layer along the scheduled division lines in the inside of the wafer, wherein the modified layer forming step is performed after the protective tape adhering step; and

a back face grinding step of grinding, after the protective tape adhering step and the modified layer forming step are carried out, a back face of the wafer while grinding water is supplied to thin the wafer to a given thickness and divide the wafer into the individual device chips along the scheduled division lines using the modified layer as a start point of the break.

2. The wafer processing method according to claim 1, further comprising:
a step of adhering a dicing tape to the back face of the wafer; and
a step of expanding the dicing tape to divide the wafer into the individual device chips, wherein the expanding step is performed with the hardened protective film on the front face of the wafer.

3. The wafer processing method according to claim 1, wherein the back face grinding step is performed while the hardened protective film and the protective tape are located on the wafer.

4. The wafer processing method according to claim 1, further comprising:
a step of adhering a dicing tape to the back face of the wafer; and
a step of expanding the dicing tape to divide the wafer into the individual device chips, wherein the expanding step is performed with the hardened protective film on the front face of the wafer, such that the protective film is broken and separated during the expanding step.

5. The wafer processing method according to claim 1, wherein the modified layer forming step is performed upon the wafer with the hardened protective film on the front face of the wafer and with the protective tape on the hardened protective film.

6. The wafer processing method according to claim 1, wherein the protective tape adhering step includes the use of a paste to adhere the

protective tape to the hardened protective film.

7. The wafer processing method according to claim 6, wherein the paste comprises an acrylic resin-based paste.

8. The wafer processing method according to claim 6, wherein the protective tape comprises a sheet-like base and the paste is applied to the sheet-like base.

9. The wafer processing method according to claim 8, wherein the paste comprises an acrylic resin-based paste.

10. A wafer processing method wherein a wafer having a plurality of scheduled division lines formed in a grating on a front face thereof and having a device formed in each of regions thereof partitioned by the scheduled division lines is divided along the scheduled division lines into individual device chips, the wafer processing method comprising:

a protective film forming step of coating liquid-state resin, which is hardened by irradiation of ultraviolet rays thereon, on the front face of the wafer to form a protective film;

a protective film hardening step of irradiating ultraviolet rays upon the protective film to harden the protective film;

a protective tape adhering step of adhering a protective tape on a front face of the protective film;

a modified layer forming step of irradiating a laser beam of a wavelength having a transparency to the wafer along the scheduled division lines with a focal point thereof positioned in the inside of the wafer to form a modified layer along the scheduled division lines in the inside of the wafer;

a back face grinding step of grinding, after the protective tape adhering step and the modified layer forming step are carried out, a back face of the wafer while grinding water is supplied to thin the wafer to a given thickness and divide the wafer into the individual device chips along the scheduled division lines using the modified layer as a start point of the break;

an adhesive film breaking step of adhering, after the back face grinding step is carried out, an adhesive film to the back face of the wafer divided into the individual device chips, adhering a dicing tape to the adhesive film, peeling off the protective tape from the front face of the wafer and expanding the dicing tape to break the adhesive film along the individual device chips; and

a protective film removing step of supplying cleaning solution to a front face of the individual device chips after the adhesive film breaking step is carried out to remove the protective film.

11. A wafer processing method wherein a wafer having a plurality of scheduled division lines formed in a grating on a front face thereof and having a device formed in each of regions thereof partitioned by the scheduled division lines is divided along the scheduled division lines into individual device chips, the wafer processing method comprising:

a protective film forming step of coating liquid-state resin, which is hardened by irradiation of ultraviolet rays thereon, on the front face of the wafer

to form a protective film;

a protective film hardening step of irradiating ultraviolet rays upon the protective film to harden the protective film;

a protective tape adhering step of adhering a protective tape on a front face of the protective film;

a modified layer forming step of irradiating a laser beam of a wavelength having a transparency to the wafer along the scheduled division lines with a focal point thereof positioned in the inside of the wafer to form a modified layer along the scheduled division lines in the inside of the wafer; and

a back face grinding step of grinding, after the protective tape adhering step and the modified layer forming step are carried out, a back face of the wafer while grinding water is supplied to thin the wafer to a given thickness and divide the wafer into the individual device chips along the scheduled division lines using the modified layer as a start point of the break,

an adhesive film breaking step of adhering, after the back face grinding step is carried out, an adhesive film to the back face of the wafer divided into the individual device chips, adhering a dicing tape to the adhesive film, peeling off the protective tape from the front face of the wafer and expanding the dicing tape to break the adhesive film along the individual device chips; and

a protective film removing step of supplying cleaning solution to a front face of the individual device chips after the adhesive film breaking step is carried out to remove the protective film,

wherein the liquid-state resin is formed from water-soluble resin, and the protective film removing step is carried out by supplying cleaning water to remove the protective film.