

WHAT IS CLAIMED IS:

1. A workpiece grinding method of grinding a back surface of a workpiece with a grinding stone, the workpiece having a front surface on which each of devices is formed in each of regions partitioned along a plurality of division lines formed in a lattice, the method comprising:

a first surface protection step of covering the regions of the front surface of the workpiece in which the devices are formed, with a workpiece protective member;

a second surface protection step of covering a front surface of a support substrate with a support substrate protective member;

a workpiece unit formation step of attaching a side of the workpiece protective member which covers the regions of the front surface of the workpiece in which the devices are formed and a side of the support substrate protective member which covers the front surface of the support substrate with an adhesive, and by pressing the workpiece against the support substrate, causing the adhesive to spread over a side surface of an outer peripheral portion of the workpiece and to fix the side surface of the outer peripheral portion to the

support substrate, and forming a workpiece unit;

a grinding step of holding the support substrate of the workpiece unit on a holding face of a chuck table, grinding the back surface of the workpiece with the grinding stone which rotates by a rotation shaft orthogonal to the holding face, and thinning the workpiece to a flexible thickness;

a first peeling step of peeling off the workpiece after the grinding step is performed, the workpiece protective member, the adhesive, and the support substrate protective member as one unit from the support substrate in such a manner to turn them over; and

a second peeling step of peeling off the workpiece protective member, the adhesive, and the support substrate protective member as one unit from the workpiece, after the first peeling step is performed,

wherein the side surface of the outer peripheral portion of the workpiece is supported with the adhesive to prevent the outer peripheral portion of the workpiece from peeling off from the support substrate due to a warp of the workpiece.

2. The workpiece grinding method according to claim 1,

wherein the workpiece protective member and the

support substrate protective member are adhesive tapes.

3. The workpiece grinding method according to claim 1,

wherein the adhesive is a liquid resin which is cured by heating or ultraviolet irradiation.

4. The workpiece grinding method according to claim 1,

wherein the workpiece is a sapphire wafer.

5. The workpiece grinding method according to claim 4,

wherein a thickness of the workpiece after the grinding step is performed is 100 μm or less.