Claims

1. A double-sided polishing method for a large-size ultra-thin LN substrate includes the following steps：

a) lap the large-size ultra-thin LN wafer after slicing with ~~the~~ a first abrasive of particle size1～16μm,making large-size ultra-thin LN wafer`s roughness＜200nm,flatness＜10μm, and then make ultrasonic cleaning, obtaining large-size ultra-thin double-side lapped LN wafer with surface coarse structure;

b) double-side thin large-size ultra-thin LN wafer after lapping with ~~the~~ a second abrasive of particle size 2000#～10000# by special thin grinding wheel, making large-size ultra-thin LN wafer's roughness ＜100nm, flatness＜2μm~~. And~~ and then make ultrasonic cleaning, obtaining large-size ultra-thin double-side thinned LN wafer with surface coarse structure;

c) corrode large-size ultra-thin double-side thinned LN wafer in closed container which containing uniform mixing nitric acid, hydrofluoric acid and relievers under the conditions of corrosion temperature 20℃～25℃, corrosion time 12～48 hours, making large-size ultra-thin LN wafer`s warpage＜25μm, roughness＜50nm, flatness＜2μm~~. And~~ and then make ultrasonic cleaning, obtaining large-size ultra-thin LN corroded wafer with random and disordered pit structure on the surface;

d) double-side polish the large-size ultra-thin LN corroded wafer with double-side polisher and polishing liquid under the conditions of polishing unit pressure 200g/cm^2 ～ 1400g/cm^2,polishing temperature 20℃ ～ 25℃,making large-size ultra-thin LN wafer`s roughness ＜ 0.50nm,flatness ＜ 1μm,the lateral dimension of the indentation 0.10μm～0.30μm,vertical depth 0.10nm～0.50nm,20％～80％ of the surface area of large-size ultra-thin LN substrate occupied by the depression~~. And~~ and then make ultrasonic cleaning, obtaining final large-size ultra-thin double-side polished LN wafer~~;~~.

2. As mentioned in Claim 1, the features of the polishing method of large-size ultra-thin LN substrate are: the features of the polishing method of large-size ultra-thin LN substrate are: diameter ≥150mm,surface roughness＜0.5nm,flatness＜1μm,thickness is 150μm～200μm.

3. in the mentioned Step a, the thickness of large-size ultra-thin LN wafer after slicing is 200μm～250μm;the thickness of large-size ultra-thin double-side lapped LN wafer is 170μm～220μm.

4. As mentioned in Claim 1, the feature of the polishing method of large-size ultra-thin LN substrate is: in the mentioned Step a, the abrasive is a mixture of one or more materials which includes boron carbide, diamond, alumina or silicon carbide.

5. As mentioned in Claim 1, the feature of the polishing method of large-size ultra-thin LN substrate is: in the mentioned Step b, the thickness of large-size ultra-thin LN double-side thinned wafer is 160μm～210μm.

6. As mentioned in Claim 1, the feature of the polishing method of large-size ultra-thin LN substrate is: in the mentioned Step c, the warpage of large-size ultra-thin corroded LN wafer is ＜25μm.

7.As mentioned in Claim 1, the feature of the polishing method of large-size ultra-thin LN substrate is: in the mentioned Step d, the polishing liquid is alkaline silica or alumina.