WHAT IS CLAIMED IS:

1. A method for processing a large-size ultrathin high-precision lithium niobate wafer, comprising steps of slicing, chamfering, grinding 800, blackening, grinding 2000 and polishing; wherein

the step of grinding 800 uses a mortar ground comprising silicon carbide sand GC800#, and the step of grinding 2000 uses a mortar ground comprising silicon carbide sand GC2000#;

a double-sided grinder is adopted in the steps of grinding 800 and grinding 2000, and a staged slow-pressurization mode is adopted in a grinding pressurization mode at 22 ± 2 °C;

wherein, the pressurization mode of grinding 800 is as follows: a 1-min first stage without pressurization; pressurizing for 3 min in a second stage at a rate of 2 g/cm^2 per minute; and pressurizing for 2 min in a third stage at a rate of 3 g/cm^2 per minute and pressurizing for 2 min in a fourth stage at a rate of 4 g/cm^2 per minute to 20 g/cm^2;

the pressurization mode of grinding 2000 is as follows: a 1-min first stage without pressurization; pressurizing for 3 min in a second stage at a rate of 4 g/cm^2 per minute; pressurizing for 2 min in a third stage at a rate of 6 g/cm^2 per minute; and pressurizing for 2 min in a fourth stage at a rate of 8 g/cm^2 per minute to 40 g/cm^2; wherein a flow rate of a mortar is 5 L/cm^2–15 L/cm^2, and a maximum rotation speed of equipment is 6–10 rpm;

a double-sided polishing machine is adopted in the step of polishing, a maximum rotation speed of equipment is 6–10 rpm at 22 ± 2 °C, a polishing solution of SiO_2 is adopted, a specific density is 1.06–1.20, a staged slow-pressurization mode is adopted in a polishing pressurization mode, and the pressurization mode is as follows: a 1-min first stage without pressurization; pressurizing for 4 min in a second stage at a rate of 10 g/cm^2 per minute; pressurizing for 4 min in a third stage at a rate of 15 g/cm^2 per minute; pressurizing for 5 min in a fourth stage at a rate of 20 g/cm^2 per minute to 200 g/cm^2; wherein a flow rate of the polishing solution is 10 L/cm^2–12 L/cm^2.

2. The method according to claim 1, wherein ~~a~~ the mortar ground in the step of grinding 800 consists of: silicon carbide sand GC800#: water: mortar dispersant = 13.5 KG: 30 L: 1.7 L; the mortar ground in the step of grinding 2000 consists of: silicon carbide sand GC2000#: water: mortar dispersant = 13.5 KG: 30 L: 1.7 L.

3. The method according to claim 2, wherein the step of grinding 800 has a grinding effect of TTV ≤ 5 μm and Bow ≤ 30 μm, and the step of grinding 2000 has a grinding effect of TTV ≤ 4 μm and Bow ≤ 25 μm.

4. The method according to claim 1, wherein the step of polishing has a polishing effect of wafer TTV ≤ 3 μm, Bow ≤ 20 μm, WARP < 40 μm and PLTV > 95%., ~~a mirror effect and no stress.~~

5. The method according to claim 1, wherein the lithium niobate wafer is an 8-inch lithium niobate wafer.

6. The method according to claim 1, wherein a clamp adopted in the steps of grinding 800, grinding 2000 and polishing is a planetary wheel, and a wafer placement position in the planetary wheel adopts an eccentric design;

the wafer placement position is circular, and a rubber ring having a diameter of 200.2 mm and a width of 5 mm is arranged at an edge of the wafer placement position;

five circular drainage holes are distributed around the wafer placement position, with one having a diameter of 60 mm, two having a diameter of 40 mm and two having a diameter of 20 mm, a circle having a diameter of 290 mm is made by taking a center of the planetary wheel as a center of the circle, and the wafer placement circle and the drainage holes are internally tangent with the circle, wherein a center of the wafer placement circle and a center of the 60-mm drainage are on the same diameter line and are positioned on two sides, centers of the 40-mm drainage holes are positioned in places obtained by deflecting a reference edge leftwards and rightwards by 60 degrees, respectively, wherein the reference edge is a radium of the circle taking the center of the planetary wheel as the center of the circle and simultaneously passes through the center of the 60-mm drainage hole, and centers of the 20-mm drainage holes are positioned on places obtained by deflecting the reference edge leftwards and rightwards by 110 degrees, respectively, wherein the reference edge is the radium of the circle taking the center of the planetary wheel as the center of the circle and simultaneously passes through the center of the 60-mm drainage hole.

7. The method according to claim 1, wherein the step of slicing specifically comprises cutting a lithium niobate crystal bar into wafers having a thickness of 250–300 μm by utilizing linear cutting equipment at a linear velocity of a steel wire of 400–1000 m/min and at 22 ± 2 °C, with a TTV of the wafers ≤ 10 μm.

8. The method according to claim 1, wherein the step of chamfering specifically comprises chamfering by utilizing a T-shaped grinding wheel, and chamfering a right angle of the lithium

niobate wafer into a fillet of about R 0.1 at a rotation speed of the grinding wheel of 600–1000 rpm/min and at 22 ± 2 °C.

9. The method according to claim 1, wherein the step of blackening specifically comprises placing the wafer in a blackening furnace for blackening, with a temperature of 300–380 °C, a flow rate of protective gas of 3–11 L and a reduction time of 4–24 h.

~~10. A lithium niobate wafer prepared by the method according to any one of claims 1 to 9.~~