CLAIMS

1. A well plate sealing process, characterized by comprising: covering a layer of film above blind wells of a well plate and then performing heat sealing, wherein a material forming the film is identical to a material of a portion of the well plate in contact with the film, and heat-sealing conditions comprise: a heat-sealing temperature of 5-65 °C higher than a melting point of the material of the film, and a heat-sealing duration of 0.3-4.5 s;

preferably, the heat-sealing temperature is 10-55 °C higher than the melting point of the material of the film, more preferably 10-50 °C higher than the melting point of the material of the film; and

preferably, the heat-sealing duration is 0.5-4 s, more preferably 0.5-3 s, and further preferably 0.5-1 s or 1-3 s.

2. The well plate sealing process according to claim 1, wherein the material forming the film is a thermoplastic material;

preferably, the thermoplastic material is selected from any one of polyolefin materials, polyester materials, polyamide materials, and polyurethane materials, or a composite material formed from a combination of at least two of the polyolefin materials, polyester materials, polyamide materials, or polyurethane materials;

more preferably, the thermoplastic material is selected from any one of polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyethylene terephthalate, polybutylene terephthalate, polyarylate, polyisopropylene, polymethyl methacrylate, polycarbonate, nylon, fluorinated ethylene propylene, and polychlorotrifluoroethylene, or a composite material formed from a combination of at least two of the polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyethylene terephthalate, polybutylene terephthalate, polyarylate, polyisopropylene, polymethyl methacrylate, polycarbonate, nylon, fluorinated ethylene propylene, or polychlorotrifluoroethylene.

3. The well plate sealing process according to claim 1 or 2, wherein a thickness of the film is 0.04-0.18 mm, preferably 0.04-0.15 mm, and more preferably 0.04-0.1 mm.

4. The well plate sealing process according to any one of claims 1-3, wherein the film is a PP film, a thickness of the PP film is 0.04-0.18 mm, preferably 0.04-0.15 mm, and

more preferably 0.04-0.1 mm; the heat-sealing temperature is 170-215 °C, preferably 180-210 °C; and the heat-sealing duration is 0.5-4.5 s, more preferably 0.5-3 s, and further preferably 1-3 s; or

the film is an FEP film, a thickness of the FEP film is 0.04-0.18 mm, preferably 0.04-0.15 mm, and more preferably 0.04-0.1 mm; the heat-sealing temperature is 250-350 °C, preferably 280-300 °C; and the heat-sealing duration is 0.3-4.5 s, more preferably 0.5-3 s, and further preferably 0.5-1 s.

5. A high-throughput screening method, characterized by comprising the well plate sealing process according to any one of claims 1-4.

6. The high-throughput screening method according to claim 5, wherein the well plate comprises a blister well plate;

preferably, a cross-sectional shape of a blind well of the blister well plate is one selected from a circular shape, a quasi-circular shape, an elliptical shape, and a quasi-elliptical shape; more preferably a circular shape; and

preferably, an entire shape of the blind well of the blister well plate is one selected from a quasi-hemispherical shape and a quasi-semi-ellipsoidal shape, preferably a quasi-hemispherical shape.

7. The high-throughput screening method according to claim 6, further comprising: forming the blister well plate by performing a forming process on a thermoplastic material;

preferably, the high-throughput screening method comprises: forming the blister well plate by performing a thermoforming process on the thermoplastic material; and

preferably, the forming process comprises any one of a blow molding process, a vacuum forming process, and an injection molding process.

8. The high-throughput screening method according to claim 7, wherein the step of forming the blister well plate comprises: heating a thermoplastic material having a thickness of 0.15-0.8 mm to a temperature 5-30 °C lower than a melting point of the thermoplastic material, and then processing a thermoplastic material substrate into a mold shape by using a blow molding process or a vacuum forming process, so as to form the blister well plate;

preferably, the heating temperature is 5-25 °C lower than the melting point of the thermoplastic material, more preferably 5-20 °C lower than the melting point of the thermoplastic material; or

forming the blister well plate comprises: heating a thermoplastic material to a molten state, and then processing a thermoplastic material substrate into a mold shape by using an injection molding process, so as to form the blister well plate having a thickness of 0.15-0.8 mm; and

preferably, the thickness of the thermoplastic material is 0.2-0.6 mm.

9. The high-throughput screening method according to claim 7, wherein the step of forming the blister well plate comprises: heating a thermoplastic material having a thickness of 0.15-0.8 mm to a temperature 5-30 °C lower than a melting point of the thermoplastic material, maintaining the temperature for 50-100 s, then rapidly conveying the thermoplastic material to above a mold, and vacuum-forming the thermoplastic material in a vacuum environment to form the blister well plate;

preferably, the thickness of the thermoplastic material is 0.2-0.6 mm;

preferably, the heating temperature is 5-25 °C lower than the melting point of the thermoplastic material, more preferably 5-20 °C lower than the melting point of the thermoplastic material; and

preferably, the heating temperature is maintained for 70-90 s; or

the step of forming the blister well plate comprises: placing a thermoplastic material having a thickness of 0.15-0.8 mm above a mold, heating the thermoplastic material to a temperature 5-30 °C lower than a melting point of the thermoplastic material, and blow-molding the thermoplastic material under a pressure to form the blister well plate;

preferably, the thickness of the thermoplastic material is 0.2-0.6 mm; and

preferably, the heating temperature is 5-25 °C lower than the melting point of the thermoplastic material, and more preferably 5-20 °C lower than the melting point of the thermoplastic material.

10. The high-throughput screening method according to any one of claims 7-9, wherein the thermoplastic material is selected from any one of polyolefin materials, polyester materials, polyamide materials, and polyurethane materials, or a composite material formed from a combination of at least two of the polyolefin materials, polyester

materials, polyamide materials, or polyurethane materials; and

preferably, the thermoplastic material is selected from any one of polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyethylene terephthalate, polybutylene terephthalate, polyarylate, polyisopropylene, polymethyl methacrylate, polycarbonate, nylon, fluorinated ethylene propylene, and polychlorotrifluoroethylene, or a composite material formed from a combination of at least two of the polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyethylene terephthalate, polybutylene terephthalate, polyarylate, polyisopropylene, polymethyl methacrylate, polycarbonate, nylon, fluorinated ethylene propylene, or polychlorotrifluoroethylene.

11. The high-throughput screening method according to any one of claims 7-10, wherein the thermoplastic material is a PP material, and the forming process comprises: heating the PP material to 130-165 °C, maintaining the temperature for 50-100 s, and vacuum-forming the PP material in a vacuum environment, wherein a thickness of the PP material is 0.15-0.8 mm;

preferably, the thickness of the PP material is 0.2-0.6 mm;

preferably, the heating temperature is 150-155 °C;

preferably, the heating temperature is maintained for 70-90 s; or

the forming process comprises: heating the PP material to 130-165 °C, and blow-molding the PP material under a pressure not less than 0.4 MPa, wherein a thickness of the PP material is 0.15-0.8 mm;

preferably, the thickness of the PP material is 0.2-0.6 mm; and

preferably, the heating temperature is 140-150 °C.

12. The high-throughput screening method according to any one of claims 7-10, wherein the thermoplastic material is an FEP material, and the forming process comprises: heating the FEP material to 220-260 °C, maintaining the temperature for 50-100 s, and vacuum-forming the FEP material in a vacuum environment, wherein a thickness of the FEP material is 0.15-0.8 mm;

preferably, the thickness of the FEP material is 0.2-0.6 mm;

preferably, the heating temperature is 240-250 °C;

preferably, the heating temperature is maintained for 70-90 s; or

the forming process comprises: heating the FEP material to 220-260 °C, and blow-

molding the FEP material under a pressure not less than 0.4 MPa, wherein a thickness of the FEP material is 0.15-0.8 mm;

preferably, the thickness of the FEP material is 0.2-0.6 mm; and

preferably, the heating temperature is 240-250 °C.

13. The high-throughput screening method according to any one of claims 6-12, comprising: adding a reaction solution and/or a solid into a blind well of the blister well plate after forming the blister well plate, sealing according to the well plate sealing process, then performing heating and/or oscillation, and subsequently analyzing a reaction system, wherein

a sealing ring is formed at an opening of each blind well of the blister well plate in the sealing process;

preferably, a shape of the sealing ring is identical to a shape of the blind well of the blister well plate;

preferably, a space for forming the sealing ring is arranged between two adjacent blind wells; and

preferably, an inner contour of the sealing ring covers an outer contour of the blind well or is flush with an outer contour of the blind well.

14. The high-throughput screening method according to claim 13, wherein a device for performing heating and/or oscillation is provided with a boss, when the heating temperature is higher than a boiling point of a solvent, the boss contacts the sealed blister well plate to perform secondary reinforced sealing on the blind well of the blister well plate, and

a diameter of the boss is between an outer diameter and an inner diameter of the sealing ring at the opening of the blind well of the blister well plate.

15. A well plate heat-sealing device (100), characterized by comprising: a support, a transfer plate (140), and a heating component (130), wherein the transfer plate (140) and the heating component (130) are both connected to the support, and the transfer plate (140) and the heating component (130) selectively contact; and

the heating component (130) comprises a hot-pressing head mounting plate (130) and at least one hot-pressing head (133), each hot-pressing head (133) has an annular

structure, one end of the each hot-pressing head (133) is connected to the hot-pressing head mounting plate (134), one side of the hot-pressing head mounting plate (134) relatively close to the hot-pressing head (133) selectively contacts the transfer plate (140), and the other side of the hot-pressing head mounting plate (134) is connected to the support;

optionally, the hot-pressing head mounting plate (134) comprises a hot-pressing head mounting plate body (135), at least one spring (132), and at least one bushing (131), each spring (132) and each bushing (131) are both arranged in the hot-pressing head mounting plate body (135), one end of one bushing (131) is connected to the hot-pressing head mounting plate body (135), the other end of the bushing (131) is connected to one hot-pressing head (133), and one spring (132) is sleeved outside the bushing (131);

optionally, the hot-pressing head mounting plate body (135) is provided with at least one cavity, and the one spring (132) and the one bushing (131) are both arranged in one cavity;

optionally, the heating component (130) further comprises a heating rod configured to heat the hot-pressing head (133), and the heating rod is arranged in the hot-pressing head mounting plate body (135);

optionally, the transfer plate (140) comprises a well plate transfer plate (141), a lower mold plate (142), and a film pressing frame (134), the well plate transfer plate (141) is connected to the lower mold plate (142), and the film pressing frame (143) is connected to the lower mold plate (142), so as to enable a heat-sealing film to flatly cover above a multi-well plate and to ensure that the heat-sealing film does not deviate during a heat-sealing process; and the lower mold plate (142) is connected to the support, and the film pressing frame (143) selectively contacts the hot-pressing head mounting plate (134);

optionally, the lower mold plate (142) is provided with an accommodating cavity configured to place the well plate transfer plate (141);

optionally, mounting members are arranged along a periphery of the lower mold plate (142), and the film pressing frame (143) is connected to the lower mold plate (142) through the mounting members, so as to enable a heat-sealing film to flatly cover above a multi-well plate and to ensure that the heat-sealing film does not deviate during a heat-sealing process;

optionally, the support comprises a telescopic device (120), and the telescopic device (120) is connected to the hot-pressing head mounting plate (134), so as to push the heating

component (130) and the transfer plate (140) to selectively contact;

optionally, the support comprises a fixed mold sliding bottom plate (155) and a bottom fixing plate (113), the fixed mold sliding bottom plate (115) is connected to the transfer plate (140), a slide rail (114) is arranged on the bottom fixing plate (113), and the fixed mold sliding bottom plate (115) is slidably connected to the bottom fixing plate (113) through the slide rail (114).