CLAIMS

1. A laser sealing method for sealing a glass package by heating a glass frit distributed along a predefined path in the glass package, comprising:

activating a laser module so that the laser module generates a laser beam;

activating a laser scanning module so that the laser scanning module projects the laser beam generated by the laser module onto the glass frit;

controlling in real time, by a controller module, a direction in which the laser scanning module projects the laser beam onto the glass frit such that the laser beam scans the glass frit along the predefined path;

controlling in real time, by the controller module, an output power of the laser module such that the generated laser beam has a power profile that matches the predefined path in real time; and

causing the laser beam to scan the glass frit along the predefined path for a plurality of cycles until the glass frit is heated to a melting point thereof,

wherein the laser scanning module is activated prior to the activation of the laser module, and wherein the laser module is activated after the laser scanning module becomes able to project the laser beam onto the glass frit with the laser beam moving at a predetermined speed along the predefined path.

2. The laser sealing method of claim 1, wherein the predefined path comprises one or more straight-line sections and one or more curved sections, wherein the power profile comprises one or more straight-line section heating power profiles corresponding to the respective one or more straight-line sections and one or more curved section heating power profiles corresponding to the respective one or more curved sections, and wherein output powers associated with the straight-line section heating power profiles are different from output powers associated with the curved section heating power profiles.

3. The laser sealing method of claim 1, wherein the plurality of cycles of scanning use a constant output power of the laser module or output powers decreasing cycle by cycle of the laser module.

4. The laser sealing method of claim 1, further comprising: using a temperature measurement module to obtain real-time temperature measurements on a surface of the glass frit and feed the measured temperatureback to the controller module; and adjusting, by the controller module, at least one of a number of scanning cycles, the output power of the laser module and the speed at which the laser beam scans the glass frit along the predefined path such that a temperature of the glass frit varies in accordance with a preset temperature profile.

5. The laser sealing method of claim 4, wherein the speed at which the laser beam scans the glass frit along the predefined path ranges from 1 m/s to 5 m/s.

6. The laser sealing method of claim 1, further comprising immediately deactivating the laser module after the glass frit has been heated to the melting point thereof so that the glass frit cools naturally.

7. The laser sealing method of claim 6, further comprising, subsequent to the deactivation of the laser module, maintaining an operation of the laser scanning module for a further period of time and then deactivating the laser scanning module.

8. The laser sealing method of claim 1, further comprising, after the glass frit has been heated to the melting point thereof, lowering the output power of the laser module to a predetermined value at which further scanning cycles are performed on the glass frit along the predefined path until the glass frit cools to a predetermined temperature.

9. The laser sealing method of claim 8, further comprising, after the glass frit has cooled to the predetermined temperature, natural cooling of the glass frit.

10. The laser sealing method of claim 1, wherein the laser module and the laser scanning module are activated simultaneously, followed by gradually increasing the output power of the laser module, such that at the time when the laser scanning module becomes able to project the laser beam onto the glass frit with the laser beam moving at a predetermined speed along the predefined path, the output power of the laser module reaches a predetermined value.

11. The laser sealing method of claim 10, further comprising, after the glass frit has been heated to its melting point, simultaneously adjusting the output power of the laser module and the speed at which the laser beam scans the glass frit along the predefined path such that the output power and the speed gradually decrease to zero at the same time.