CLAIMS

1. A system (100) for producing an epitaxial monocrystalline layer on a substrate (20) comprising:

an inner container (30) defining a cavity (5) for accommodating a source material (10) and a substrate (20);

an insulation container (50) arranged to accommodate the inner container (30) therein;

an outer container (60) arranged to accommodate the insulation container (50) and the inner container (30) therein; and

heating means (70) arranged outside the outer container (60) and configured to heat the cavity (5),

wherein the inner container (30) comprises a support structure for supporting a solid monolithic source material (10) at a predetermined distance above the substrate (20) in the cavity (5) such that a growth surface of the substrate (20) is entirely exposed to the source material (10),

wherein the support structure comprises one or more first leg members (4) having a first height (H1) and arranged to support the source material (10) along a peripheral edge thereof, and one or more second leg members (3) having a second height (H2) and arranged to support the substrate (20), wherein the first height (H1) is greater than the second height (H2).

2. The system according to claim 1, further comprising at least one container support (32a) having a third height (H3) and being arranged to support the inner container (30) within the insulation container (50).

3. The system according to any one of the preceding claims, wherein the inner container (30), the insulation container (50) and the outer container (60) are cylindrical in shape, and the source material (10) and/or the substrate (20) are disk-shaped.

4. The system according to claim 3, wherein an inner diameter of the inner container (30) is in the range 100-500 mm, preferably 150-300 mm.

5. The system according to any one of the preceding claims, further comprising a heating body (40) made of high-density graphite arranged on top of the inner container (30) in the cavity (5).

6. The system according to any one of the preceding claims, wherein the surface area of the source material (10) is greater than or equal to the surface area of the substrate (20).

7. The system according to any one of the preceding claims, wherein the inner container (30) comprises an upper part (31) with a lower wall section (36) and a lower part (32) with an upper wall section (37) which are arranged to be joined together to form a sealing, leakproof connection.

8. The system according to claim 7, wherein a top portion (34) of the upper part (31) has a first thickness (Tl), and a base portion (33) of the lower part (32) has a second thickness (T2), wherein the first thickness (Tl) is greater than or equal to the second thickness (T2).

9. The system according to claim 7 or 8, wherein an inner diameter of the lower part (32) is smaller than an inner diameter of the upper part (31), forming a ledge (38), wherein a ring-shaped member (1;1') is arranged on the ledge (38).

10. The system according to claim 9, wherein the ring-shaped member (1;1') comprises a plurality of inwardly extending radial protrusions (6) for supporting the source material (10) along a peripheral edge thereof.

11. The system according to claim 9 or 10, wherein the ring-shaped member (1;1') is made of tantalum, niobium, tungsten, hafnium and/or rhenium.

12. The system according to any one of the preceding claims, wherein the insulation container (50) comprises a top part (50a), a middle part (50b) and a bottom part (50c), wherein the insulation container (50) is made of an insulating rigid porous graphite and wherein a fiber direction of the top part (50a) and the bottom part (50c) is orthogonal to a center axis of the insulation container (50), and a fiber direction of the middle part (50b) is parallel to the center axis of the insulation container (50).

13. The system according to any one of the preceding claims, wherein the heating means (70) comprises radiofrequency coils which are movable along the outer container (60).

14. A method of producing an epitaxial monocrystalline layer on a substrate (20) comprising:

- providing an inner container (30) defining a cavity (5) for accommodating a source material (10) and a substrate (20); wherein the inner container (30) comprises a support structure for supporting the source material (10) at a predetermined distance above the substrate (20) in the cavity (5) such that a growth surface of the substrate (20) may be entirely exposed to the source material (10), wherein the support structure comprises one or more first leg members (4) having a first height (H1) and arranged to support the source material (10) along a peripheral edge thereof, and one or more second leg members (3) having a second height (H2) and arranged to support the substrate (20), wherein the first height (H1) is greater than the second height (H2);

- arranging the substrate (20) in the cavity (5) of the inner container (30) on the one or more second leg members (3);

- arranging a solid monolithic source material (10) in the cavity (5) of the inner container (30) on the one or more first leg members (4) at the predetermined distance above the substrate (20) such that a growth surface of the substrate (20) is entirely exposed to the source material (10);

- arranging the inner container (30) within an insulation container (50);

- arranging the insulation container (50) and the inner container (30) in an outer container (60);

- providing heating means (70) outside the outer container (60) to heat the cavity (5);

- evacuating (S101) the cavity (5) to a predetermined low pressure;

- introducing (S102) an inert gas into the cavity (5);

- raising (S103) the temperature in the cavity (5) to a predetermined growth temperature by the heating means (70);

- maintaining (S104) the predetermined growth temperature in the cavity (5) until a predetermined thickness of the epitaxial monocrystalline layer on the substrate (20) has been achieved; and

- cooling (S105) the substrate (20).