CLAIMS

1. Device for drying a photomask comprising:
   - a sealed chamber (2) containing at least one photomask (13),
   - a pumping unit (3) to set up and maintain vacuum within said chamber (2),
   - a support (12) for the photomask (13) placed within said chamber (2),
   - infrared radiation means (6) placed within said chamber (2),
   - a system (10) for injecting gas into said chamber (2),

   characterized in that the infrared radiation means comprise a plurality of infrared radiation sources (6) distributed in a plane parallel to the plane of the photomask (13) in such a way that the distance from the photomask (13) to the IR radiation means is given by the relationship:

$$D = 1.5 \times d$$

   wherein D is the distance between the plane containing the infrared radiation sources and the photomask and d is the distance between the center points of two neighboring infrared radiation sources (6),
   and in that the gas-injection system (10) comprises a plurality of gas injectors (30) distributed in a plane parallel to the plane of the photomask (13) in such a way that the injectors (30) follow a 90° rotational invariance about the center point of the photomask (13).

2. Drying device according to claim 1, wherein the infrared radiation sources (6) are placed so as to send infrared radiation perpendicularly to the active surface of the photomask (13).

3. Drying device according to one of the claims 1 and 2, comprising at least three infrared radiation sources (6) aligned so that two IR radiation sources (6) are placed respectively on either side of the photomask (13) and one infrared radiation source (6) at least is placed at the center of the photomask (13).

4. Drying device according to claim 3, wherein the diameter of the gas-injection orifice, placed so as to be facing the center of the photomask, is greater than the diameter of the other orifices.

5. Drying device according to one of the claims 1 to 4, comprising temperature-measuring means (9) provided with pyrometers, placed so as to measure the temperature on the edge of the photomask (13).

6. Drying device according to one of the above claims, comprising a support (12) of the photomask (13) comprising means for receiving and positioning the photomask, comprising a pierced frame (40) suspended inside said chamber (2).

7. Drying device according to one of the above claims, comprising remote ultrasonic sensors (8).

8. Drying device according to one of the above claims, comprising means for measuring pressure (7), temperature (9) and distance (8) and a control and command device capable of receiving information from the means for measuring pressure (7), temperature (9) and distance (8) and capable of making the infrared radiation means (6) and the gas-injection system (10, 30) operate as a function of the information received.

9. Method for drying a photomask by means of a drying device according to one of the above claims, comprising the following steps:
   - the photomask (13) is positioned in a sealed chamber (2) at atmospheric pressure,
   - the photomask (13) is heated to a fixed temperature equal at most to 60°C,
   - a low pressure is set up in the sealed chamber (2) by the pumping out of the gases that it contains,
   - the chamber (2) is kept at low pressure and at the fixed temperature for a fixed duration,
   - the heating of the photomask (13) is stopped,
   - atmospheric pressure is restored in the chamber (2) by injection of a neutral gas, and
   - it is ascertained that the temperature of the photomask (13) is about 30°-35°C before the photomask (13) is extracted from the chamber (2).

10. Method according to claim 9, wherein the positioning of the photomask is verified by means of at least three remote ultrasonic sensors (8).

The invention claimed is:

1. A device for drying a photomask, the device comprising:

a sealed chamber having a size and shape configured to receive at least one photomask,

a pumping unit to set up and maintain vacuum within said chamber,

a support for the photomask placed within said chamber,

infrared radiation means placed within said chamber,

a system for injecting gas into said chamber,

characterized in that the infrared radiation means comprises a plurality of infrared radiation sources distributed in a plane parallel to the plane of the photomask in such a way that the distance from the photomask to the infrared radiation means is given by the relationship:

$$D=1.5\times d$$

wherein:

D is the distance between a plane containing the infrared radiation sources and the photomask; and

d is a distance between the center points of two neighboring infrared radiation sources, and

the gas-injection system comprises a plurality of gas injectors distributed in a plane parallel to the plane of the photomask in such a way that the injectors follow a 90° rotational invariance about the center point of the photomask.

2. The drying device according to claim 1, wherein the infrared radiation sources are placed so as to send infrared radiation in a direction which is perpendicular to an active surface of the photomask.

3. The drying device according to claim 1, further comprising at least three infrared radiation sources aligned so that two infrared radiation sources are placed respectively on either side of the photomask and one infrared radiation source at least is placed at the center of the photomask.

4. The drying device according to claim 3, wherein the diameter of the gas-injection orifice, placed so as to be facing the center of the photomask, is greater than the diameter of the other orifices.

5. The drying device according to claim 1, further comprising temperature measuring means provided with pyrometers, placed so as to measure the temperature on the edge of the photomask.

6. The drying device according to claim 1 wherein the support for the photomask comprises means for receiving and positioning the photomask, said means comprising a pierced frame suspended inside said chamber.

7. The drying device according to claim 1 further comprising remote ultrasonic sensors.

8. The drying device according to claim 1 further comprising means for measuring pressure, temperature and distance and a control and command device capable of receiving information from the means for measuring pressure, temperature and distance and capable of making the infrared radiation means and the gas-injection system operate as a function of the information received.

9. A method for drying a photomask, the method comprising:

positioning a photomask in a sealed chamber having a size and shape configured to receive at least one photomask, wherein the photomask is disposed on a support placed within the chamber at atmospheric pressure;

establishing a vacuum within the sealed chamber using a pumping unit to set up and maintain the vacuum within the sealed chamber wherein establishing a vacuum is accomplished by establishing a low pressure in the sealed chamber by pumping out gases contained in the chamber using the pumping unit;

injecting gas into the sealed chamber using a system for injecting gas, wherein the gas-injection system includes a plurality of gas injectors distributed in a plane parallel to the plane of the photomask in such a way that the injectors follow a 90° rotational invariance about the center point of the photomask; and

heating the photomask to a fixed temperature equal at most to 60°C. using infrared radiation means placed within the sealed chamber, characterized in that the infrared radiation means comprises a plurality of infrared radiation sources distributed in a plane parallel to the plane of the photomask in such a way that the distance from the photomask to the infrared radiation means is given by the relationship:

$$D=1.5\times d$$

wherein:

D is the distance between a plane containing the infrared radiation sources and the photomask; and

d is a distance between the center points of two neighboring infrared radiation sources; and

maintaining the chamber at low pressure and at the fixed temperature for a fixed duration of time;

stopping the heating of the photomask;

restoring atmospheric pressure in the sealed chamber by injection of a neutral gas; and

ascertaining that the temperature of the photomask is about 30°-35°C. before extracting the photomask from the sealed chamber.

10. The method according to claim 9 further comprising verifying the positioning of the photomask by means of at least three remote ultrasonic sensors.