CLAIMS

1. A vacuum pump (10) for mounting to a semiconductor processing chamber (5) to evacuate said chamber to pressures between 1 mbar and 5 $X10^{-2}$ mbar, said vacuum pump comprising:

a rotor (35) rotatably mounted within a stator;

said rotor comprising a plurality of angled blades (30) arranged along a helical path from an inlet (16) to an outlet (18);

said stator comprising a plurality of perforated elements (14) arranged to intersect said helical path, said perforations allowing gas molecules travelling along said helical path to pass through said perforated elements;

said rotor being mounted on a magnetically levitated bearing (45); and

said perforated elements located towards the inlet of said vacuum pump comprise a transparency of more than 40% and said perforated elements located towards the outlet of said vacuum pump comprise a transparency of more than 30%,

wherein the transparency of said plurality of perforated elements reduces towards said outlet.

2. A vacuum pump according to claim 1, wherein said perforated elements located towards an inlet of said vacuum pump comprise a transparency of more than 50% and said perforated elements located towards an outlet of said vacuum pump comprise a transparency of more than 40%.

3. A vacuum pump according to claim 1, wherein said rotor and stator are formed of at least one of stainless steel and aluminium.

4. A vacuum pump according to claim 3, wherein said rotor is formed of stainless steel and said perforated elements of aluminium.

5. A vacuum pump according to any preceding claim, wherein at least one of said rotor and stator comprise a coating of a high emissivity.

6. A vacuum pump according to any preceding claim, said vacuum pump being configured to operate at a volumetric speed of between 300 and 1200 litres per second.

7. A vacuum pump according to any preceding claim, said vacuum pump comprising an inlet conduit (12) extending from an inlet of said vacuum pump and configured to connect to said semiconductor processing chamber, said inlet conduit having a length of less than 2m, preferably less than 1 m.

8. A vacuum pump according to any preceding claim, said blades of said rotor at an inlet stage of said pump being wider than said blades of said rotor in other stages of said pump.

9. A vacuum pump according to any preceding claim, said stator further comprising a cylindrical inner surface formed by a stack of rings (40) each having a cylindrical inner surface, said plurality of perforated elements being mounted on respective rings, such that said plurality of perforated elements form a plurality of perforated discs intersecting said helical path at different axial positions.

10. A set of vacuum pumps for evacuating a semiconductor processing chamber, comprising a vacuum pump according to any preceding claim and a roots blower and primary vacuum pump arranged as a backing pump combination for said vacuum pump.

11. A set of vacuum pumps according to claim 10, further comprising a conduit of less than 2m long, preferably less than 1m for connecting said vacuum pump to said semiconductor processing chamber and a longer conduit for connecting said vacuum pump to said roots blower and primary pump such that said roots blower and primary pump are located remotely from said semiconductor processing chamber.

12. A method of evacuating a semiconductor processing chamber said method comprising:

locating a vacuum pump according to any of claims 1 to 9 within a semiconductor fab and attaching said vacuum pump to a semiconductor processing chamber by a conduit of less than 2m length;

locating a roots blower and primary pump in a position remote from the semiconductor fab and attaching an outlet of said vacuum pump to an inlet of said roots blower pump via a longer conduit;

operating said vacuum pumps to evacuate said semiconductor processing chamber to a vacuum of between 1 mbar and 5 $X10^{-2}$ mbar.