What is claimed:

1. A method ~~for cleaning a component for use in an ultra-high vacuum~~, the method comprising the steps of:

   a) placing ~~the~~ an ultra-high vacuum component ~~to be cleaned~~ in a vacuum furnace chamber;

   b) plasma cleaning the ultra-high vacuum component at a temperature ~~greater than about~~from 80 ºC, ~~preferably from about 80 ºC~~ to ~~about~~ 125 ºC; and at a pressure greater than 10E-06 mbar to remove hydrocarbons from the ultra-high vacuum component, wherein during plasma cleaning, the temperature is prevented from exceeding 125ºC; and

   c) ceasing plasma cleaning and then evacuating the vacuum furnace chamber to reduce a pressure ~~of~~ in the vacuum furnace chamber to less than ~~about 10E-5 mbar, preferably less than about~~ 10E-06 mbar to cause the ultra-high vacuum component to outgas, wherein during evacuating, the temperature is prevented from exceeding 125ºC.

2. The method according to claim 1, further comprising ~~the step of~~ evacuating the vacuum furnace chamber to a pressure of less than ~~about 10E-5 mbar, preferably less than about~~ 10E-6 mbar, after step a) but before step b).

3. The method according to claim 1, further comprising ~~the step of~~ repeating steps b) to c), ~~preferably~~ from ~~about~~ 2 to ~~about~~ 12 times.

4. The method according to claim 1 wherein ~~the~~ gas for forming the plasma is selected from the group consisting of oxygen, air, nitrogen, helium and argon.

5. The method according to claim 4 wherein the gas is oxygen.

6. The method according to claim 1 wherein ~~the~~ a gas for forming the plasma is introduced to a pressure of from ~~about~~ 0.1E+00mbar to ~~about~~ 1E+00mbar, and/or at flow rate ~~of less than about 50 sccm, preferably~~ from ~~about~~ 5 sccm to ~~about~~ 20 sccm.

7. The method according to claim 1 wherein the vacuum furnace chamber has a volume of ~~greater than 200 litres, preferably~~ from ~~about 200 litres to about 1000 litres, preferably from about~~ 250 litres to ~~about~~ 350 litres.

8. The method according to claim 1 wherein following step c) the component is cooled and nitrogen is introduced into the vacuum furnace chamber.

9. The method according to claim 1 wherein a plasma generator is used with a voltage frequency ~~typically of~~ from ~~about~~ 20 kHz to ~~about~~ 40 kHz~~, preferably about 35 kHz~~.

10. The method according to claim 1 wherein step b) lasts ~~less than about 1 hour, preferably less than about 45 minutes, more preferably~~ from ~~about~~ 15 minutes to ~~about 35 minutes, for instance 30~~35 minutes.

11. The method according to claim 1 wherein ~~the cleaning method~~steps a), b) and c) together lasts ~~less than about 1 hour, preferably less than about 45 minutes, more preferably~~ from ~~about~~ 15 minutes to ~~about~~ 40 minutes.

12. The method according to claim 1 wherein step c) lasts ~~more than about one hour, preferably~~ from about 2 to about 4 hours.

13. The method according to claim 1 wherein the component is cleaned with a solvent before it is placed in the vacuum furnace chamber.

~~14. A vacuum furnace for cleaning a component for use in an ultra high vacuum, the vacuum furnace comprising a vacuum furnace chamber, a vacuum pump configured to maintain a pressure of less than about 10E-5 mbar, preferably less than about 10E-6 mbar, in said vacuum furnace chamber, and a plasma generator, and wherein the vacuum furnace is configured to maintain the component to be cleaned at a temperature of greater than about 80°C, preferably from about 80°C to about 125°C, whilst exposing the component to a plasma, wherein the vacuum furnace chamber contains an oxygen, air, nitrogen, helium or argon plasma, preferably an oxygen plasma.~~

~~15. The vacuum furnace according to claim 14 wherein the vacuum furnace chamber has a volume of greater than 200 litres, preferably from about 200 litres to about 1000 litres, preferably from about 250 litres to about 350 litres.~~

~~16. Use of a plasma to clean a component of a vacuum in a vacuum furnace at a~~

temperature of greater than about 80ºC , preferably from about 80 ºC to about 125 ºC .

17. The use according to claim 16 wherein the plasma is an oxygen plasma.

18. An ultra-high vacuum assembly wherein upon its first use the assembly's ultimate pressure is achieved in less than 48 hours.

19. The assembly of claim 18 wherein the assembly has an ultimate pressure of from about 10E-7 mbar to about 10E-11 mbar.

20. An ultra-high vacuum assembly wherein upon its first use the partial pressure of C_4H_7 is less than 1.00E-11 Torr after less than 30 minutes.

21. An ultra-high vacuum pump according to claim 20 wherein upon its first use the partial pressure of C_4H_7 at 2 hours is less than about 1.00E-12 Torr.

22. An ultra-high vacuum pump wherein upon its first use the partial pressure of C_4H_7 at 4 hours is less than about 1.00E-13 Torr, preferably 1.00E-14 Torr or less.