

## CLAIMS

1. A method for processing a workpiece, the method comprising:  
supporting a workpiece on a workpiece support, the workpiece having a photoresist layer, the workpiece having one or more fluorine residuals on a surface of the workpiece;  
performing a defluorination process on the workpiece at least in part using a plasma generated from a first process gas, the first process gas comprising a hydrogen gas;  
subsequent to performing the defluorination process, performing a plasma strip process on the workpiece to at least partially remove the photoresist layer from the workpiece;  
wherein the workpiece comprises a metal layer.
2. The method of claim 1, wherein performing the defluorination process comprises:  
generating one or more hydrogen radicals in a plasma chamber from the first process gas using a plasma source;  
filtering ions generated using the plasma with a separation grid separating the plasma chamber from a processing chamber;  
exposing the workpiece to the hydrogen radicals in the processing chamber.
3. The method of claim 1, wherein the first process gas further comprises a carrier gas, wherein the carrier gas comprises nitrogen or an inert gas.
4. The method of claim 1, wherein the plasma strip process comprises:  
generating one or more species in a plasma chamber from a second process gas using a plasma source;  
filtering ions using a separation grid separating the plasma chamber from a processing chamber to allow the passage of one or more neutral radicals;  
exposing the workpiece to one or more neutral radicals in the processing chamber;  
wherein the second process gas comprises oxygen.
5. The method of claim 1, wherein the defluorination process is implemented for a treatment time, the treatment time being in the range of about 5 seconds to about 60 seconds.

6. The method of claim 1, wherein the defluorination process is conducted at a process pressure in the processing chamber, the process pressure being in the range of about 300 mT to about 4000 mT.
7. The method of claim 1, wherein the defluorination process is conducted at a source power, the source power being in the range of about 600 W to about 5000 W.
8. The method of claim 1, wherein the defluorination process is conducted with the workpiece at a process temperature, the process temperature being in the range of about 90° C. to about 400° C.
9. The method of claim 1, wherein a ratio of hydrogen gas to one or more carrier gases in the first process gas is about 2 to about 100.
10. The method of claim 1, wherein the metal layer comprises tungsten.
11. The method of claim 1, wherein the fluorine residuals result from an etch process.
12. The method of claim 2, wherein the hydrogen radicals react with the one or more fluorine residuals to generate an HF gas.
13. The method of claim 12, further comprising pumping the HF gas from the processing chamber prior to performing the plasma strip process.
14. The method of claim 4, wherein the second process gas comprises oxygen and nitrogen.
15. A method for implementing a defluorination process on a workpiece, the workpiece comprising a photoresist layer, the workpiece having one or more fluorine residuals on the workpiece, the method comprising:
  - supporting the workpiece on a workpiece support in a processing chamber;
  - generating one or more hydrogen radicals;

exposing the one or more hydrogen radicals to the workpiece to react the hydrogen radicals with the one or more fluorine residuals and generate an HF gas;  
evacuating the HF gas from the processing chamber,  
wherein the one or more hydrogen radicals are generated using a tungsten filament.

16. The method of claim 15, wherein the one or more hydrogen radicals are generated from a process gas using an inductively coupled plasma source.

17. The method of claim 16, wherein the one or more hydrogen radicals are generated by mixing a hydrogen gas with one or more excited inert gas molecules downstream of a plasma source.

18. The method of claim 17, wherein the processing chamber is separated from the plasma source by a separation grid, the hydrogen gas being mixed with one or more excited inert gas molecules at or below the separation grid.