CLAIMS:

1. A semiconductor processing system comprising:

a vacuum pump having an inlet and an outlet, said inlet of said vacuum pump configured to be in fluid communication with an outlet of a semiconductor reactor, and said vacuum pump configured to output an exhaust of waste gases from the reactor at said outlet of said vacuum pump; and

a water scrubber system at said outlet of said vacuum pump, said water scrubber system having a vertical orientation relative to the pump, said water scrubber system comprises:

a first conduit (18a);

a second conduit (18b) concentrically surrounding and spaced from the first conduit (18a);

a third conduit (18c) concentrically surrounding and spaced from the second conduit (18b);

an inlet and at least one mixing chamber, said inlet in fluid communication with said outlet of said vacuum pump and said mixing chamber said inlet of water scrubber system in fluid communication with said first conduit (18a) to direct the exhaust into said first conduit (18a), and said first conduit (18a) directing the exhaust to said mixing chamber (18);

a supply of heated nitrogen for supplying heated nitrogen in fluid communication with the second conduit (18b), said supply of heated nitrogen is configured to flow the heated nitrogen between said second conduit (18b) and said first conduit (18a) to thereby heat the first conduit (18a) and the exhaust flowing therethrough, to maintain the temperature of exhaust at said output of said pump and while said exhaust is directed to said mixing chamber (18), the first conduit (18a) and the second conduit (18b) are configured to mix the heated nitrogen with the exhaust to form a heated nitrogen diluted mixture after flowing through the first conduit (18a) and the

second conduit (18b) and redirect the heated nitrogen diluted mixture into the mixing chamber (18); and

a water supply configured to inject water into the heated nitrogen diluted mixture to remove water reactive products in the exhaust.

2. The semiconductor processing system according to claim 1, wherein said water scrubber system includes a water recirculating circuit to recirculate water through said mixing chamber.

3. The semiconductor processing system according to claim 2, wherein said water recirculating circuit is configured to maintain a water level in said mixing chamber.

4. The semiconductor processing system according to claim 1, said water scrubber system including a plurality of Raschig rings.

5. The semiconductor processing system according to claim 1, wherein said water scrubber system is configured to redirect the mixture into a larger portion of the mixing chamber to allow the mixture to expand and to inject the water when the mixture is flowed into said larger portion.

6. The semiconductor processing system according to any of claims 1 to 5, wherein said mixing chamber is a first mixing chamber, said water scrubber system including a second mixing chamber, and said first mixing chamber directing the mixture to said second mixing chamber.

7. The semiconductor processing system according to claim 6, wherein said water scrubber system is configured to inject water into the mixture in said first mixing chamber and said second mixing chamber.

8. The semiconductor processing system according to claim 6, wherein said water scrubber system is configured to inject water into the exhaust in said first mixing chamber using a first set of venturi nozzles.

9. The semiconductor processing system according to claim 8, wherein said water scrubber system is configured to inject water into the exhaust in said second mixing chamber using a second set of venturi nozzles wherein said first set of venturi nozzles spray water at a smaller angle than said second set of venturi nozzles.

10. The semiconductor processing system according to claim 9, wherein the first set of venturi nozzles spray the water into the first mixing chamber at angle between about 30 to 60 degrees into chamber, and the second set of venturi nozzles spraying the water into the second mixing chamber at angle between 90 to 150 degrees.

11. An in-line water scrubber system comprising:

a mixing chamber (18);

a first conduit (18a);

a second conduit (18b) concentrically surrounding and spaced from the first conduit (18a);

a third conduit (18c) concentrically surrounding and spaced from the second conduit (18b);

an inlet in fluid communication with an outlet of a vacuum pump and said mixing chamber, said inlet of water scrubber system in fluid communication with said first conduit (18a) to direct the exhaust into said first conduit (18a), and said first conduit (18a) directing the exhaust to said mixing chamber (18);

a supply of heated nitrogen for supplying heated nitrogen in fluid communication with the second conduit (18b), said supply of heated nitrogen is configured to flow the heated nitrogen between said second conduit (18b) and said first conduit (18a) to thereby heat the first conduit (18a) and the exhaust flowing therethrough, to maintain the temperature of exhaust at said output

of said pump and while said exhaust is directed to said mixing chamber (18), the first conduit (18a) and the second conduit (18b) are configured to mix the heated nitrogen with the exhaust to form a heated nitrogen diluted mixture after flowing through the first conduit (18a) and the second conduit (18b) and redirect the heated nitrogen diluted mixture into the mixing chamber (18); and

a water supply configured to inject water into the heated nitrogen diluted mixture to remove water reactive products in the exhaust

12. The in-line water scrubber system according to claim 11, wherein said water scrubber system is configured to redirect the mixture into a larger portion of the mixing chamber to allow the mixture to expand and to inject the water when the mixture is flowed into said larger portion.

13. The in-line water scrubber system according to claim 12, wherein said mixing chamber isa first mixing chamber, further comprising a second mixing chamber, and said first mixing chamber directing the mixture to said second mixing chamber.

14. The in-line water scrubber system according to claim 13, wherein said water supply is configured to inject water into the mixture in said first mixing chamber and said second mixing chamber.

15. The in-line water scrubber system according to claim 14, wherein said water scrubber system is configured to inject water into the exhaust in said first mixing chamber with a first set of venturi nozzles and into said second mixing chamber with a second set of venturi nozzles, wherein said first set of venturi nozzles spray water into said first mixing at a smaller angle than said second set of venturi nozzles.

16. A method of scrubbing semiconductor processing waste gases of a semiconductor processing system using the in-line water scrubber system according to claim 11, the

semiconductor processing system having a reactor, a vacuum pump for pumping waste gases from the reactor, the vacuum pump having an inlet and an outlet, said method comprising:

providing a mixing chamber having an inlet;

vertical orienting the mixing chamber relative to the vacuum pump;

providing fluid communication between the outlet of said vacuum pump and the inlet of the mixing chamber, and said scrubber system configured to maintain the temperature of exhaust at the output of the pump and while the exhaust is directed into said mixing chamber and to direct water into the exhaust thereby removing water reactive products and/or water absorbing products in the exhaust.

17. The method according to claim 16, wherein the outlet of the pump has an elbow with a horizontal component, further comprising locating the inlet to the mixing chamber within 12 inches of the horizontal component of the elbow.

18. The method according to claim 17, wherein said mixing chamber is a first mixing chamber, further comprising a second chamber and directing the water and heated nitrogen diluted mixture into the second chamber.

19. The method according to claim 18, further comprising directing water into the second chamber and thereby removing further water reactive products and/or water absorbing products in the exhaust.

20. The method according to claim 17, wherein said directing water includes injecting the water with venturi nozzles.

21. The method according to any of claims 17-20, wherein said removing water reactive products includes removing a water reactive product selected from the group consisting of

titanium tetrachloride, tungsten hexafluoride, ammonium nitrate, trimethyl aluminum, chlorine trifluoride.