CLAIMS

What is claimed is:

1. A fluid delivery module comprising:

a support structure;

a substrate block mounted to the support structure, the substrate block comprising:

a monolithic body:

a component receiving port formed in the monolithic body;

a first fluid pathway formed in the monolithic body and extending from a first inlet opening to a first outlet opening at the component receiving port;

a second fluid pathway formed in the monolithic body and extending from a second inlet opening at the component receiving port to a second outlet opening;

a filter media positioned within the second fluid pathway that divides the second fluid pathway into a pre-filter section and a post-filter section;

a first active flow component mounted on the monolithic body of the substrate block at the component receiving port and fluidly coupled to each of the first outlet opening and the second inlet opening.

2. The fluid delivery module according to claim 1 wherein a bottom surface of monolithic body of the substrate block is adjacent to and in contact with the top surface of the support structure.

3. The fluid delivery module according to any one of claims 1 to 2 wherein the monolithic body comprises a top surface, the component receiving port and the second outlet opening formed in the top surface.

4. The fluid delivery module according to claim 3 wherein the top surface comprises a first section and a second section vertically offset from but substantially parallel to the first section, the component receiving port located in the first section of the top surface and the second outlet opening located in the second section of the top surface, and comprising an upstanding wall extending between the first and second sections of the top surface.

5. The fluid delivery module according to any one of claims 1 to 4 wherein the component receiving port comprises a basin formed in the monolithic body and having a basin floor, each of the first outlet opening and the second inlet opening located on the basin floor.

6. The fluid delivery module according to any one of claims 1 to 5 wherein the monolithic body comprises a collar portion that forms at least a portion of the component receiving port.

7. The fluid delivery module according to any one of claims 1 to 6 wherein the first inlet opening is located on a first sidewall surface of the monolithic body, and further comprising:

the monolithic body comprising a flange portion protruding horizontally from a bottom of the first sidewall surface; and

one or more fasteners extending through the flange portion and engaging the support structure to secure the substrate block to the support structure.

8. The fluid delivery module according to any one of claims 1 to 7 wherein the second fluid pathway comprises a pre-filter passage, a filter chamber, and post-filter passage; and wherein the pre-filter passage extends from the second inlet opening to the filter chamber, the post-filter passage extends from the filter chamber to the second outlet opening, and the filter media positioned within the filter chamber.

9. The fluid delivery module according to claim 8 wherein the filter media comprises a tubular filter body, an inner surface of the tubular filter body defining a central filter cavity, the filter media supported within the filter chamber to form a post-filter annulus about the outer surface of the tubular filter body; and wherein the pre-filter passage is in fluid communication with the central filter cavity and the post-filter passage is in fluid communication with the post-filter annulus.

10. The fluid delivery module according to claim 8 further comprising:

a first annular gasket positioned within the filter chamber and forming a first seal between a first edge of the tubular filter body and a first end wall of the filter chamber; and

a second gasket positioned within the filter chamber and forming a second seal between a second edge of the tubular filter body and a second end wall of the filter chamber.

11. The fluid delivery module according to claim 8 wherein the filter media comprises a filter body and an annular flange extending from the filter body.

12. The fluid delivery module according to claim 11 wherein the annular flange of the filter media engages a recess formed in the filter chamber.

13. The fluid delivery module according to claim 11 or claim 12 wherein the filter body is cylindrical, the annular flange extending from an outer diameter of the filter body.

14. The fluid delivery module according to any one of claims 1 to 13 wherein the first active component is mounted directly to the first substrate block and supported solely by the first substrate block.

15. The fluid delivery module according to any one of claims 1 to 14 wherein the first active component is a valve.

16. The fluid delivery module according to claim 15 wherein the first active component is a lock out tag out valve.

17. The fluid delivery module according to any one of claims 1 to 16 further comprising:

a second active flow component assembly comprising: a component block, one or more fluid pathways formed in the component block, and one or more active flow components mounted to the component block;

the component block having a first end portion mounted to the substrate block so that the one or more fluid pathways of the second active flow component assembly are fluidly coupled to the second outlet opening of the substrate block.

18. The fluid delivery module according to 17 wherein the component block protrudes horizontally beyond the substrate block and comprises a second end portion mounted to the support structure.

19. A fluid delivery module comprising:

a substrate block comprising:

a monolithic body;

a component receiving port formed in the monolithic body;

a first fluid pathway formed in the monolithic body and extending from a first inlet opening to a first outlet opening at the component receiving port;

a second fluid pathway formed in the monolithic body and extending from a second inlet opening at the component receiving port to a second outlet opening;

a filter media positioned within the second fluid pathway divides the second fluid pathway into a pre-filter section and a post-filter section;

a first active flow component mounted on the monolithic body of the substrate block at the component receiving port and fluidly coupled to each of the first outlet opening and the second inlet opening.

20. A system for processing semiconductor wafers comprising:

a fluid source;

the fluid delivery module according to any one of claims 1 to 25, the first inlet opening of the fluid delivery module fluidly coupled to the fluid source; and

a process chamber fluidly coupled to the fluid delivery module to receive outgoing fluid from the fluid delivery module.