SUMMARY OF THE DISCLOSURE

[0006] Embodiments described herein provide systems and methods for controlling the operation of a pump to perform a filter priming cycle. The filter priming cycle can be optimized for a process fluid and filter type. By optimizing the priming routine, the number of dispense cycles needed before a pump is ready to dispense fluid to wafers is minimized. In particular, embodiments described herein can include priming routines optimized for multiple membrane filters. Even more particularly, the priming routines can involve a back pressure stage in which the filter is pressurized from downstream for a period of time and a back flush stage in which the filter is flushed from downstream. Such priming routines have been found to be beneficial for use with multiple membrane filters.

[0007] According to a first aspect of the present invention, there is provided a pump for semiconductor manufacturing comprising: ~~One embodiment described herein can include a dispense system for semiconductor manufacturing that has~~ one or more motors to draw fluid into an inlet of the pump and dispense fluid from an outlet of the pump. The pump can further include a removable filter disposed in a fluid flow path between the pump inlet and the pump outlet and a pump controller. The pump controller can be configured to select a priming routine from a set of priming routines based on a filter type and process fluid. The set of priming routines can include a first priming routine that includes a forward pressurization segment for a first type of removable filter and a second priming routine for that includes a back pressurization segment for a second type of removable filter. The pump controller can control the pump to perform the selected priming routine to prime the removable filter.

[0008] According to one embodiment, the pump controller can select the first priming routine for a first type of removable filter and select the second priming routine for a second type of removable filter. According to one embodiment, the first type of removable filter has a single filter membrane and the second type of removable filter has multiple filter membranes. Controlling the pump to perform the selected priming routine when the second priming routine is selected can include introducing a process fluid to the removable filter and back-pressurizing the removable filter for a predetermined period of time. According to one embodiment, the pump controller can be configured to back pressurize the removable filter for 5-10 minutes at 5-25 psi.

[0009] According to a second aspect of the present invention, there is provided a method for priming a filter in a semiconductor manufacturing pump comprising: ~~Another embodiment can include a method for priming a pump including the steps of~~ connecting a removable filter to the pump, selecting a priming routine for the removable filter based on a filter type and process fluid and operating the pump according to the selected priming routine. Operating the pump according to the selected priming routine can include introducing a process fluid to the removable filter and back-pressurizing the removable filter for a predetermined period of time.

[0010] According to a third aspect of the present invention, there is provided a computer program product comprising a non-transitory storage medium storing a set of computer executable instructions comprising instructions executable to: receive filter information and process fluid information; select a priming routine for the removable filter based on the filter information and process fluid information; *operate a pump according to the selected priming routine, wherein operating the* pump according to the selected priming routine comprises introducing a process fluid to the removable filter and back-pressurizing the removable filter for a predetermined period of time. ~~Yet another embodiment can include a computer program product comprising a non-transitory storage medium storing a set of computer executable instructions. The instructions can be executable to receive filter information (e.g., from a tag reader, storage, user input or otherwise receive the filter information) and process fluid information, select a priming routine for the removable filter based on the filter information and process fluid information and operate a pump according to the selected priming routine. Operating the pump according to the selected priming routine can include introducing a process fluid to the removable filter and back-pressurizing the removable filter for a predetermined period of time.~~

[0011] Another embodiment can include a dispense system having a pump and a pump management system. The pump can include one or more motors to draw fluid into an inlet of the pump and dispense fluid from an outlet of the pump, a removable filter in a fluid flow path between the pump inlet and pump outlet, an electronic tag reader positioned and configured to read the filter information from the electronic tag and a pump controller. The pump controller can be coupled to the electronic tag reader and configured to receive filter information from the electronic tag reader, communicate the filter information over a communications link and control operation of the pump to dispense a fluid. The pump management system can be

configured to receive the filter information from the pump, access a library of operating routines based on the filter information and a process fluid information to select an operating routine for the pump. The pump management system can communicate the selected operating routine to the pump controller. The operating routines can include priming routines that include a back pressure and back flush segments.