

## Pressure booster: Entegris new dispense solution in CMP application

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Over the past years we have observed that a lot of the process improvement in CMP were conducted on slurry dispense.

Peristaltic pump (roller pump) was a default choice on various tools. This dispense system is not suitable for low dispense volume where volume dispensed should be as accurate and repeatable as possible.

In order to achieve consumable cost reduction, the most appropriate factor to work on is slurry flow accuracy. It maximizes volume reduction without affecting process stability (removal rate, planarization...).

Moreover, we have noticed that in multiple cases the pressure of slurry delivery is not sufficient to accept both filtration and dispense solution. In some cases, the pressure at the tool is lower than 10 psi and does not allow either filtration nor dispense solution.

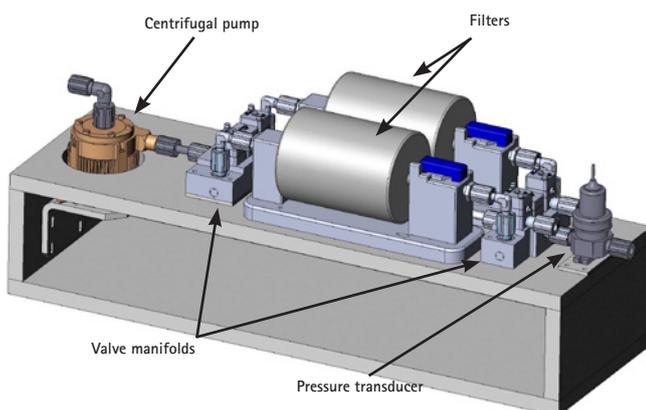
Entegris has developed solution to fit customer expectations. It includes filtration at point of use and point of tool. It is compatible with all variations of tool set, even at low inlet slurry pressure.

### Entegris new development: pressure booster

The pressure booster system has been developed to insure a constant pressure on the tool after filtration. It allows the installation of IFC (Integrated flow controllers) as dispense solution at the POD (Point of dispense).

The pressure booster integrates two filters mounted in parallel to allow filter switching automatically when ever necessary. The system includes also a centrifugal pump in closed loop with a pressure transducer and a combination of valves to direct the fluid to the correct direction.

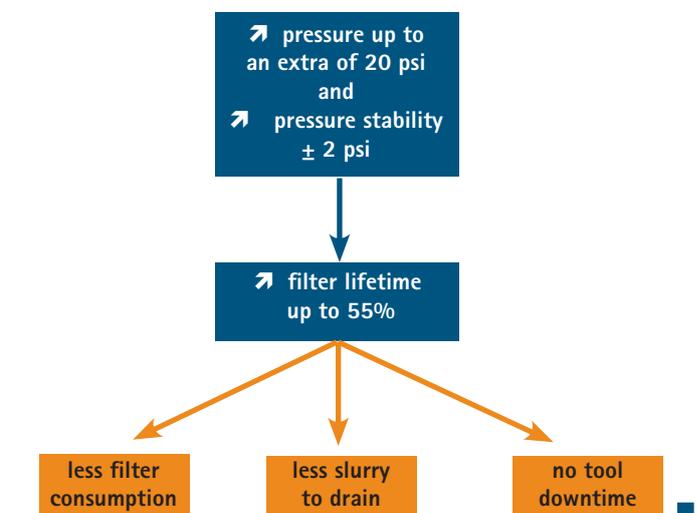
### Pressure booster 3D illustration



- ▶ The Pressure booster has the flexibility to set up the outlet pressure of the system. The centrifugal pump will maintain the required pressure despite inlet pressure variation that can occur on normal process step.
- ▶ The Booster System integrates also a filter clogging alarm detection. It helps to improve filter life time and it determinates the clogging of the filter based on a pressure drop and not on a time base approach. By increasing and stabilizing the pressure the system enables filter life time improvement as well as pressure stability.
- ▶ As the system integrates two filter lines, it automatically primes and switches the flow path when it is necessary to do so. By isolating the flow path, it allows the operator to change the clogged filter without any process disruption. The system is minimizing the tool down time due to filter replacement.
- ▶ APC is mandatory in today's production, and this is one of the factor that we have included in the pressure booster system. Alarming, and start top of the system can be actuated in regard to the tool specifications.

### System benefits

The pressure booster is a system designed to optimize the filter life-time while it maintains a pressure stability at the POT and POD and to minimize tool down time and wastes due to filter change out. With its flexibility it can easily be adapted to various tool of the market. The APC helps in controlling filter life time, monitoring pressure. It optimizes the solution in regards to the specifics of each particular tool.



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