

## Enable filter lifetime monitoring during CMP applications

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Chemical Mechanical Planarization (CMP) slurry dispense systems may utilize gross filtration for filtering large agglomeration, typically larger than 1 micron. These large particles can generate wafer scratches during polishing steps.

Part of the CMP World, Entegris is manufacturing complete filtration systems based on depth filter and pleated membrane, and as well a large product range for measuring and controlling the critical process parameters like pressure, flow, conductivity.

### Your challenges

A plugged or loaded filter reduces the pressure downstream and flow rate of slurry directed to the polishing system. The low pressure or insufficient pressure directed to the polishing pad can lead into damaged wafers.

Measuring the pressure across a filtration system can help to monitor the filter lifetime as the pressure differences increases and the flow coming out from the filter decreases due to the filter loading. Inline and On-line pressure differences measurement allows CMP Engineers to optimize filter life, schedule the maintenance for the filters change out with minimal downtime and therefore, for lower cost of ownership of the tool.

### Our solutions

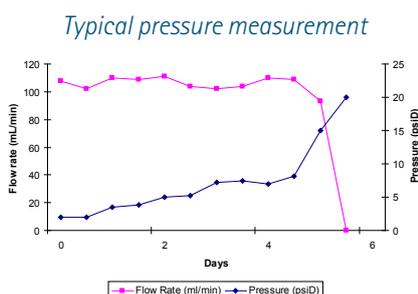
Introducing the Entegris **Filter Delta P Box**. Driven by customer challenges and based on our large product range, Entegris has designed this customer specific solution to support **filter lifetime monitoring** and **consumable cost reduction**.



This filter box is composed by our Chemlock® Housing solution, NT®4210 Pressure transducer and our latest MiniMax®, a multi purpose smart box.

This graph shows how pressure, differential pressure and flow are directly linked to each other during CMP filtration steps.

End of filter lifetime can be marked up at 15psig, where the flow

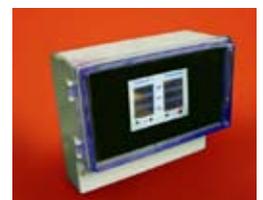


starts decreasing and being a cause of scratched wafers.

Using the Entegris filter box will enable maintenance easily, participate in consumable cost reduction and will by the way minimize the unexpected tool downtime.

Customer Challenges	Features	Benefits
Filters are changed preventively during planned maintenance => CONSUMABLE COST REDUCTION	• Pressure differential Measurement	• Increases filter lifetime with in-real process parameters control
Decrease in system pressure or filter plugging can be seen on the dispense rate => SCRAPPED WAFERS	• Inline Pressure Measurement & Monitoring	• Increases wafer throughput by reducing scrapped wafer
Unexpected tool downtime => OVERALL EQUIPMENT EFFICIENCY	• Easy filter changeout Design	• Eliminates process interruptions

Our solution includes a software/hardware controller that is **custom configurable** to support a wide range of fluid flow, pressure, and control requirements. It accepts up to 22 sensor inputs features 16 control outputs and provides an elegant solution to **control liquid flow controllers, solenoid valves, and similar devices**.



MiniMax™



Pressure control

On top of it, its filter changeout design offers Chemlock **space saving** solution like no other liquid cartridge filter. This revolutionary design allows the filter assembly to be removed as a single unit.

Inline pressure measurement utilizes a flow through design to minimize any dead volume and to reduce the possibility of having slurry settling and drying into agglomerates. This pressure transducer is constructed of chemically compatible and high purity materials such as PTFE.

The NT® flow through pressure transducer meets the requirement for CMP Slurry applications with measurement capabilities up to 100psig. ■

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