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CMP defects: Influence of CMP slurry, handling and delivery

2020 CMPUG : Advancements in CMP Applications and Research

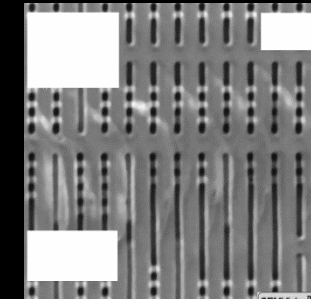
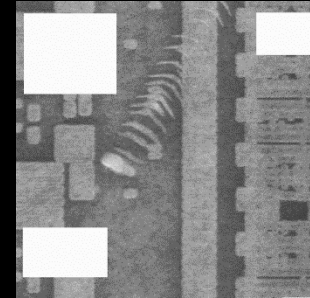
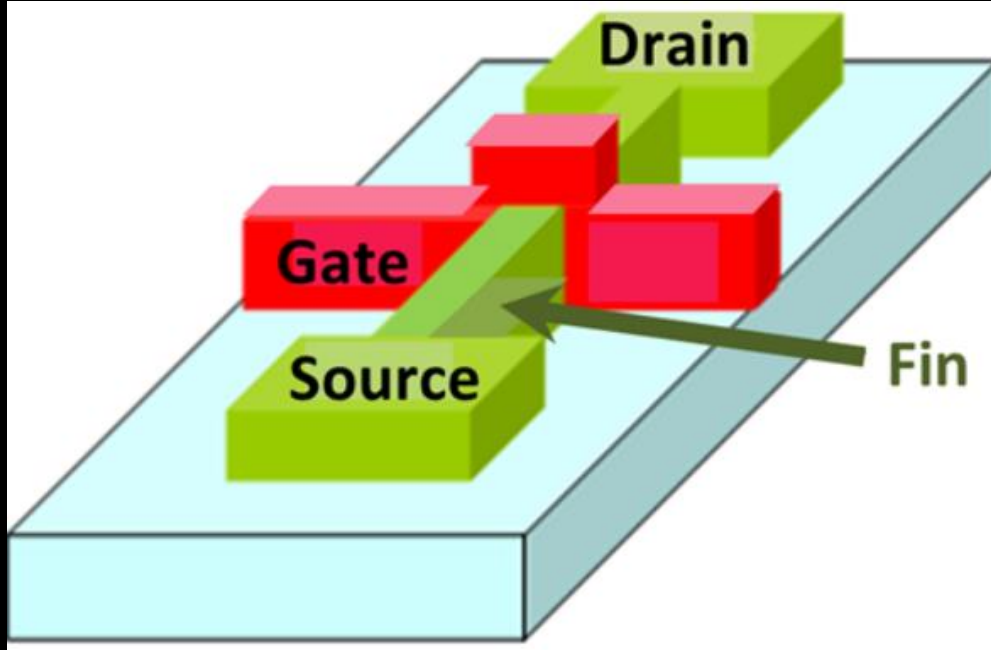
Rahul Trivedi*, Hong Jin Kim, Thayalan Kulasingam, Dinesh Penigalapati, Jainendra Devabhaktuni and Madhav Kalaga

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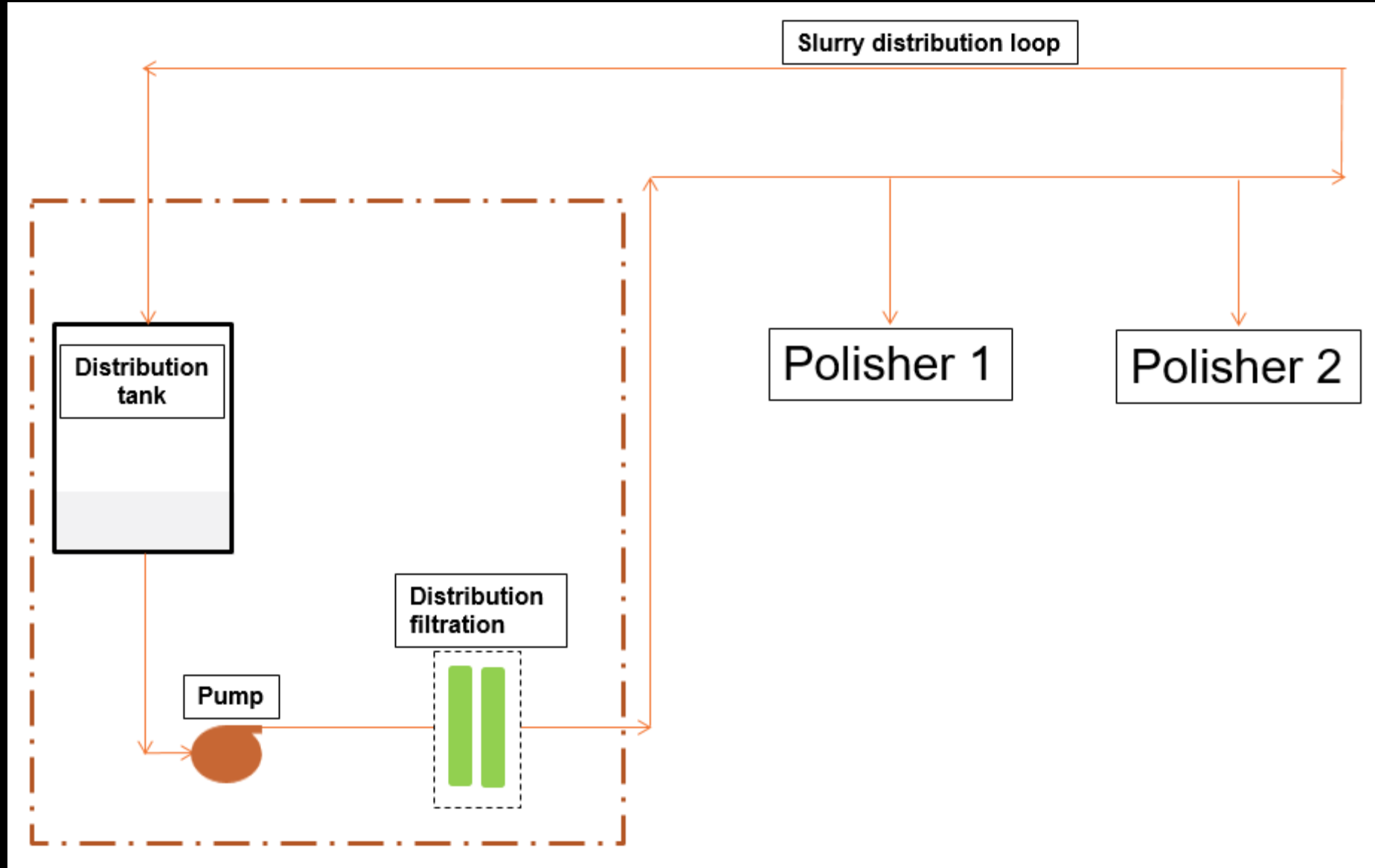


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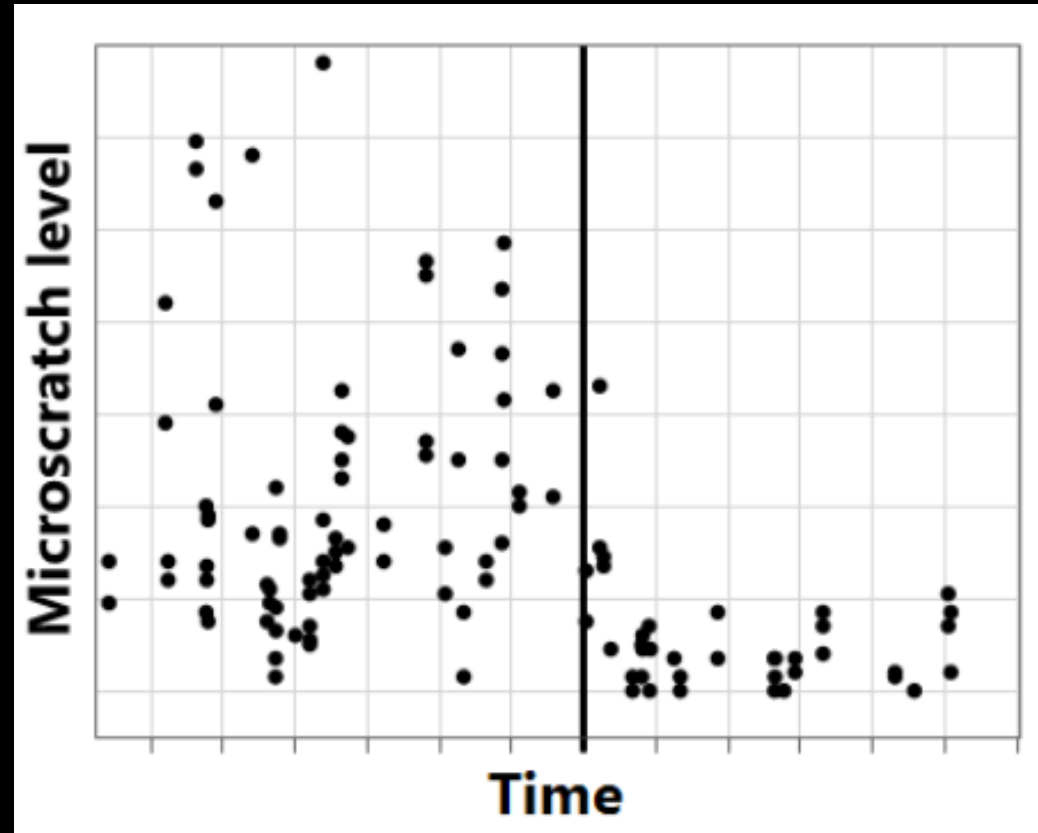
Introduction



Slurry Distribution System

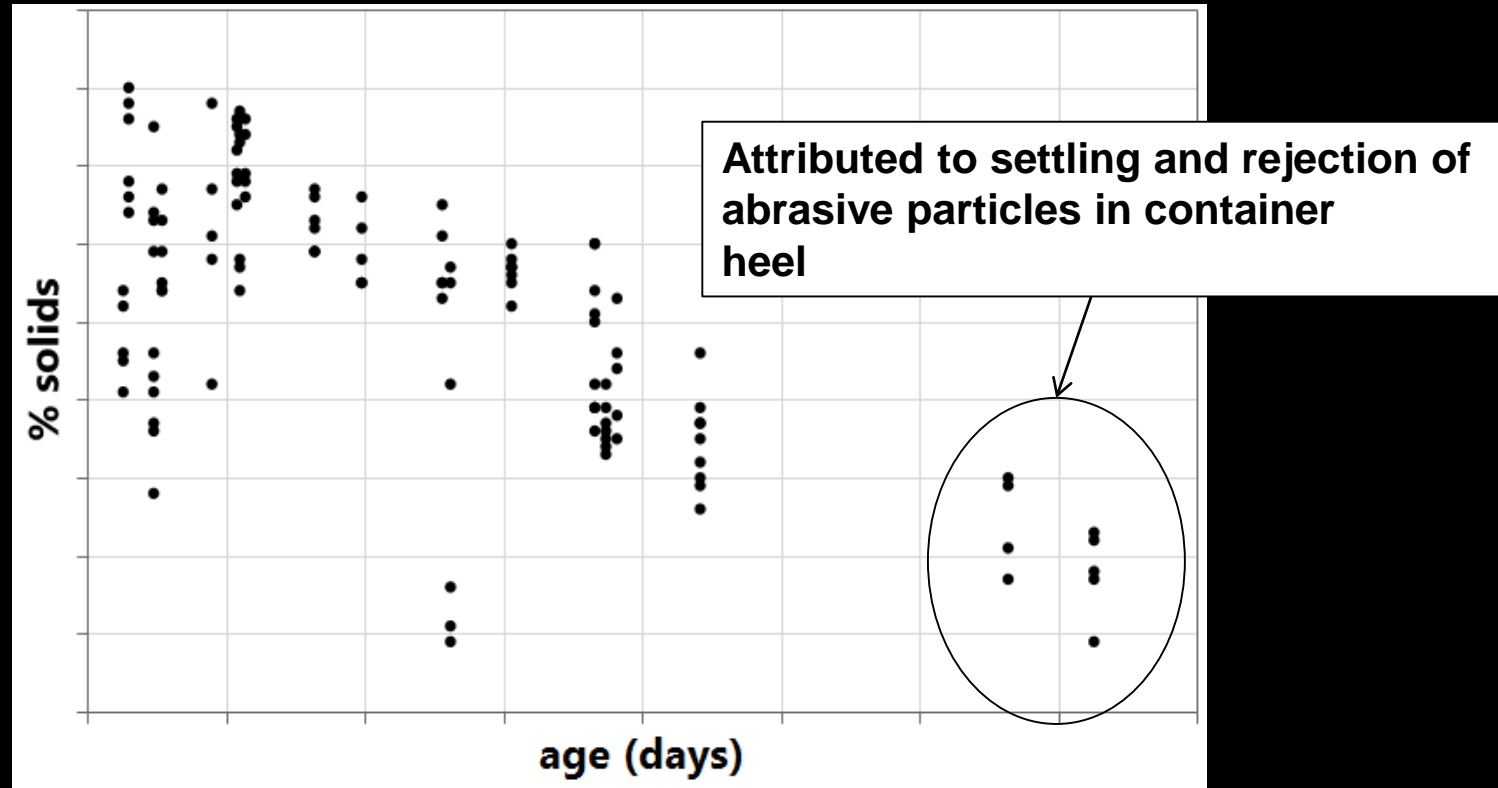


Loop Preparation



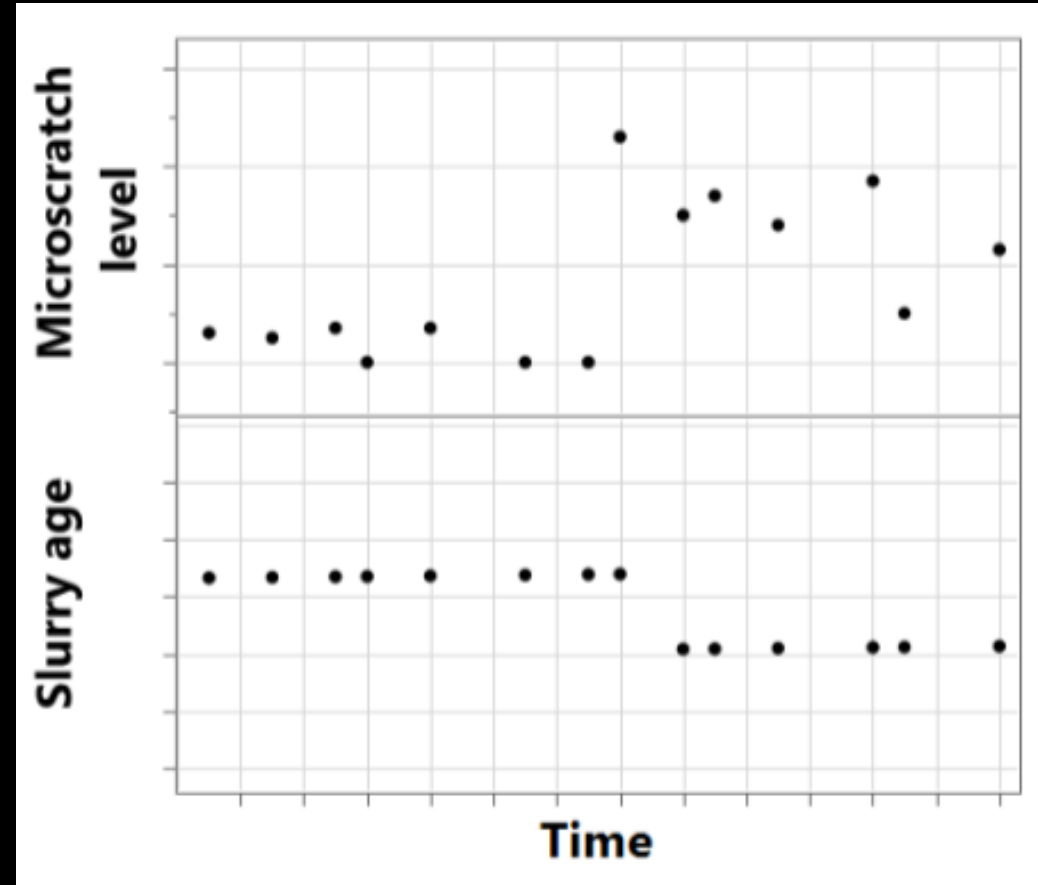
Reduction in Microscratches because of loop preparation

Slurry Age



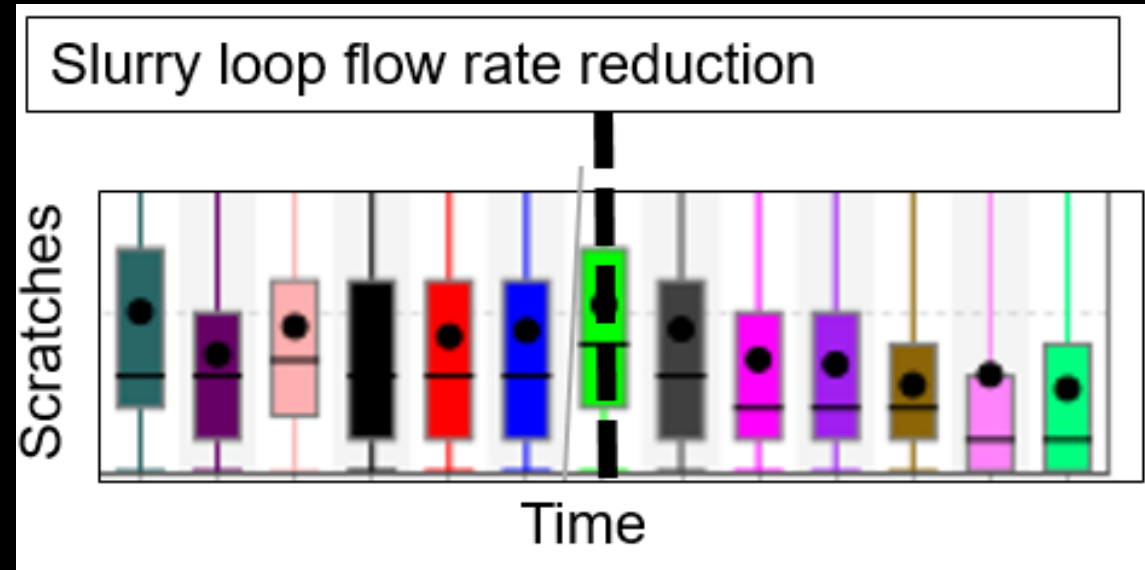
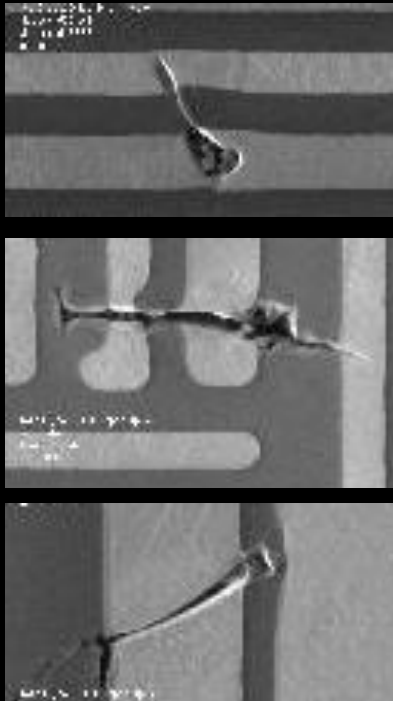
% solids in distribution loop Vs slurry age

Slurry Age



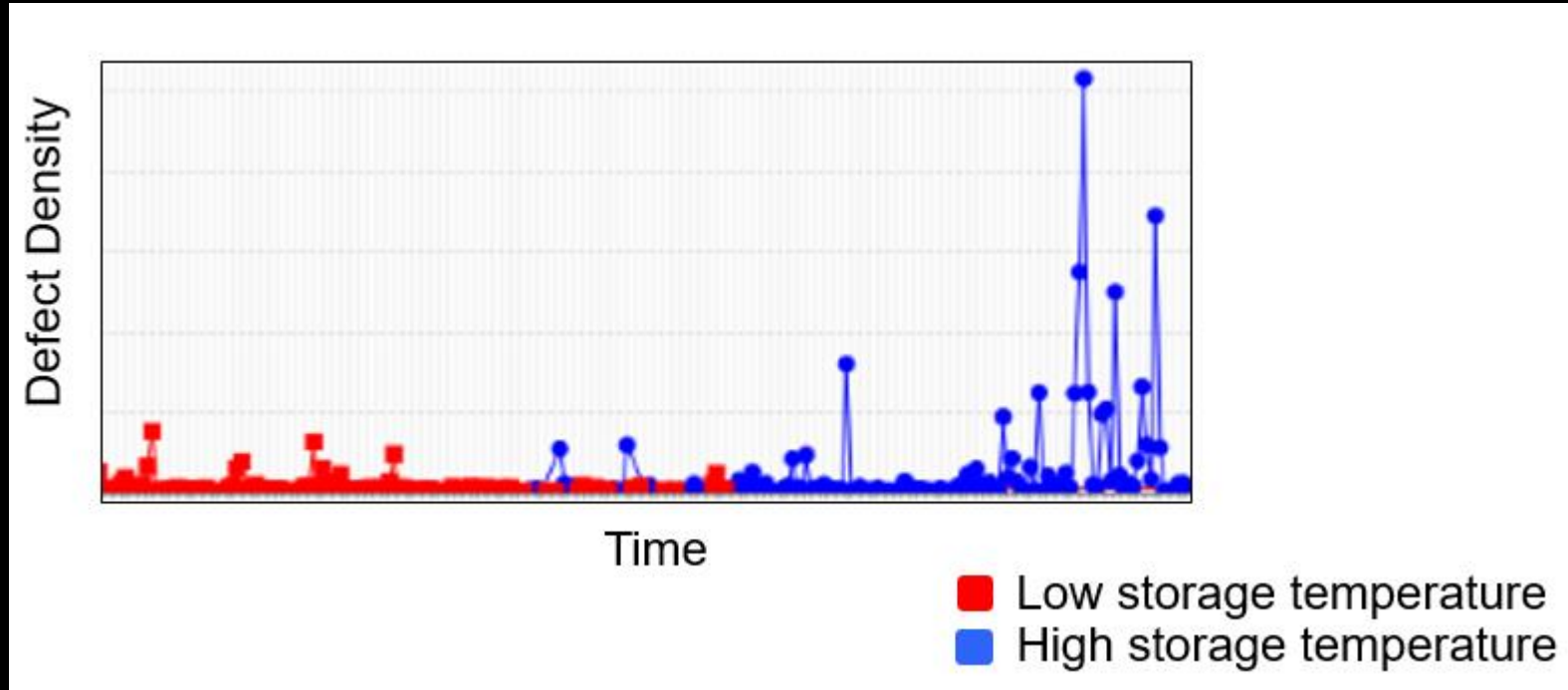
Correlation between slurry age and Microscratch level

Loop Flow Rate



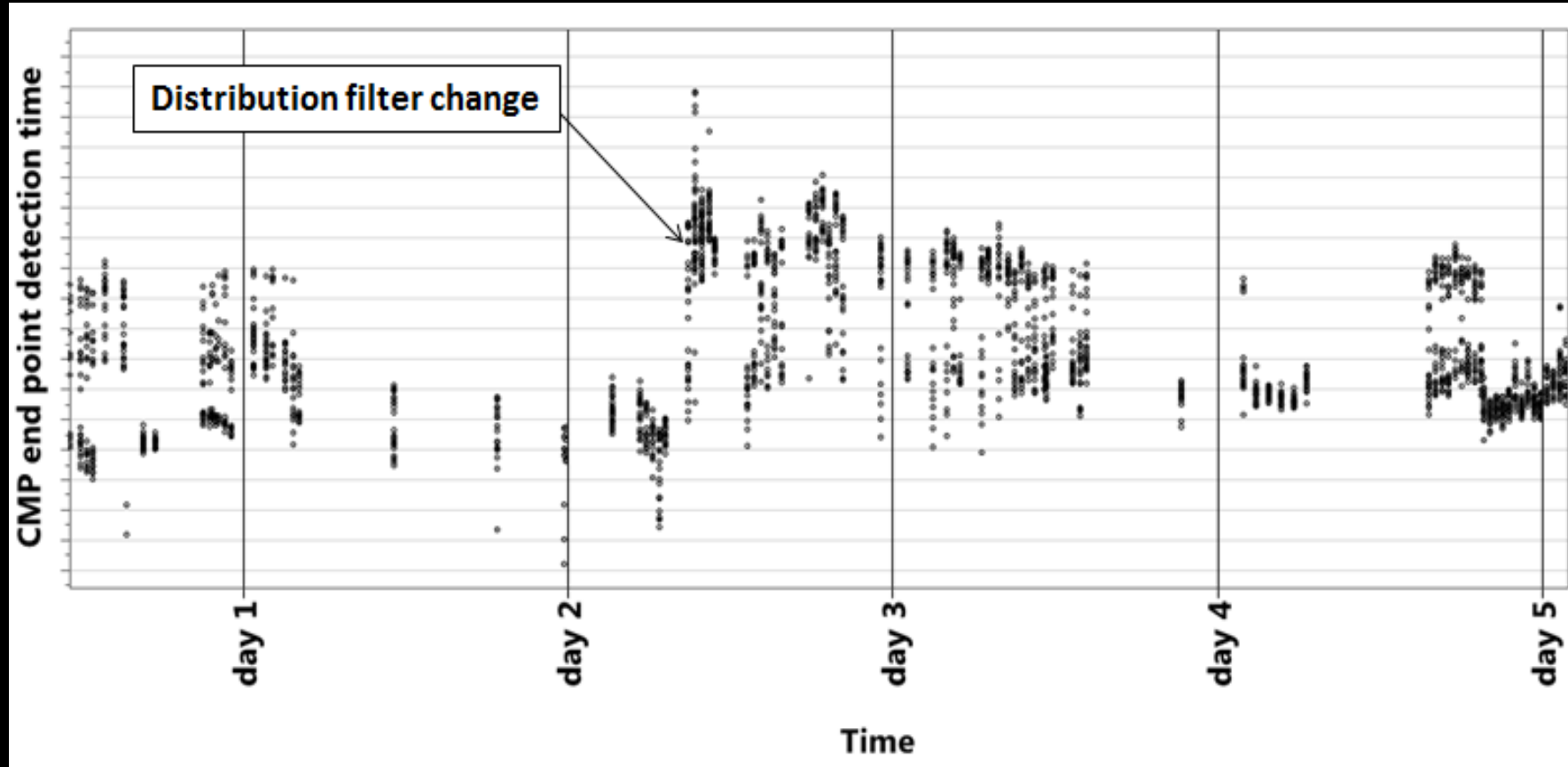
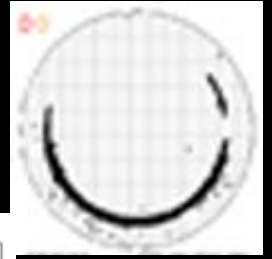
Improvement in Scratches with slurry loop flow rate reduction

Slurry Storage Temperature



Modulation in defect density with raw slurry storage temperature

Filtration



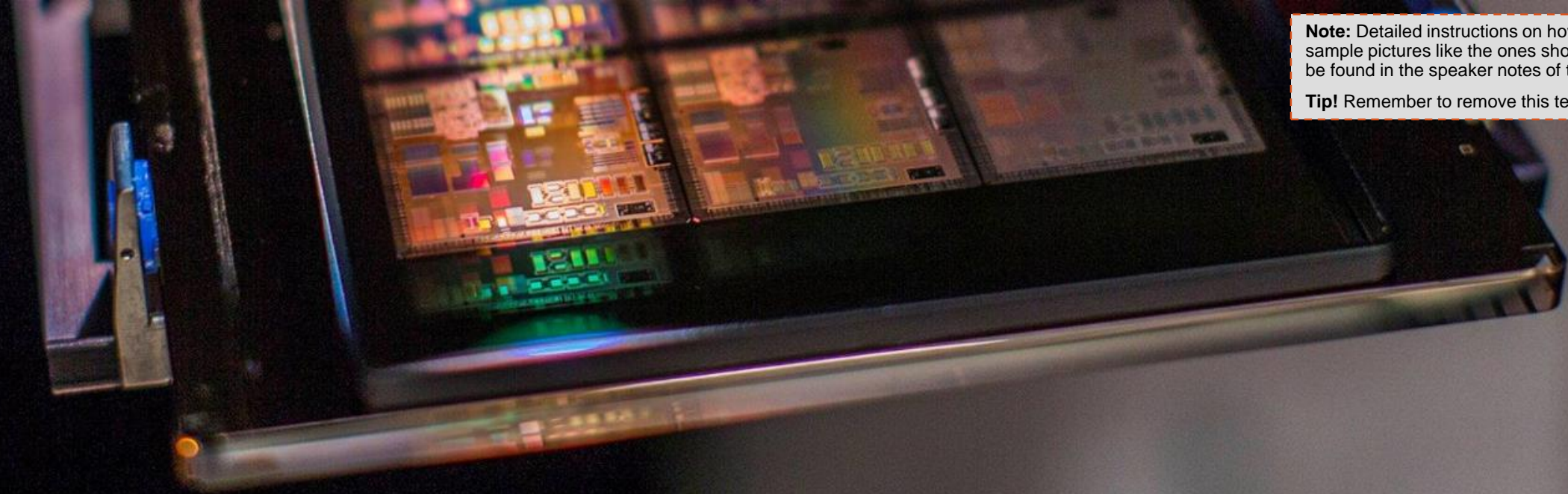
FEOL oxide CMP end point detection time trend

Conclusion

- As device geometries shrink, CMP slurry, handling & delivery play an important role in modulating defects
- Slurry parameters present an important opportunity in defect reduction

Acknowledgements

Rob Rhoads, Jason Kiernan, Chem Ops and CMP team members.



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