CMP defects: Influence of CMP slurry, handling and delivery

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Introduction
Slurry Distribution System

Slurry distribution loop

Distribution tank

Polisher 1

Polisher 2

Pump

Distribution filtration
Loop Preparation

Reduction in Microscratches because of loop preparation
Slurry Age

% solids in distribution loop Vs slurry age

Attributed to settling and rejection of abrasive particles in container heel
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
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