

# 3M™ CMP Pad Conditioner Coatings

## Redefining metal contamination protection

Micron-thick, clear coatings from 3M trap metal ions, preventing them from leaching into the slurry or wafer and helping protect the disk from acidic slurries.

**Up to 99% reduction in metal contamination during long CMP processes<sup>1</sup>**

Metal	Without Coating	With Coating (initial)	With Coating (after 20-hour soaking)
Iron	1410	0.23	0
Manganese	276	0	0
Nickel	15900	0	0
Chromium	262	0	0

<sup>1</sup>3M test results for the U coating in a pH 4.5-5.5 slurry

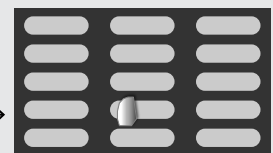
## Understanding metal leaching in CMP

Semiconductor CMP slurries are abrasive. That's their job. But that abrasiveness means that they often leach metals like nickel, manganese or iron out of the pad conditioner. This metal contamination has been shown to reduce yield in both advanced and mature node processes. Harsh slurries like permanganates can even corrode the disk surface itself.

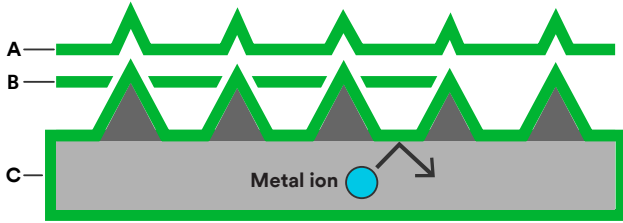


## Metal leaching effects

- Reduced yield
- Substrate corrosion or diamond loss
- Metal residue on IC surface →



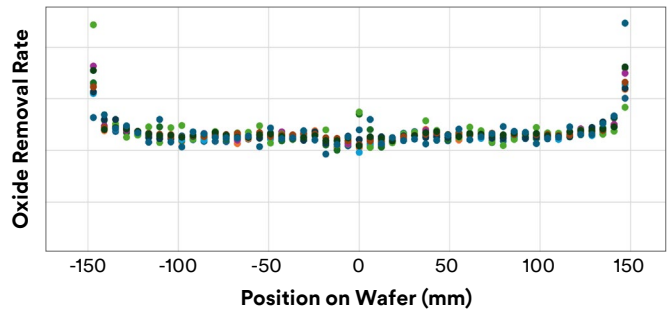
# Performance plus process control, minus metal contamination



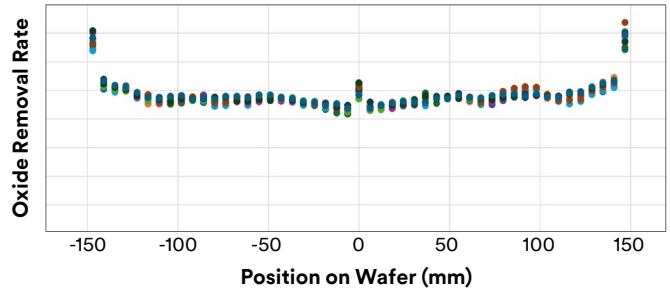
## Surface, selective and full-disk application patterns enable tailored coating solutions for different process needs

- A. Surface coating:** Coat the full contact surface of the disk.
- B. Selective area coating:** Coat specific parts of the disk for targeted protection.
- C. Full disk coating:** For extra-sensitive processes, the whole disk can be coated to comprehensively minimize metal contamination.

Uncoated Conditioner (250 wafers run)



Coated Conditioner (250 wafers run)



**No negative impact on CMP performance, including removal rate and profile**

[View 3M test results](#)

Coating	Color	Metal Leaching Reduction*	Coating Options	Type	Effective Slurry pH range	Compatibility
<b>K Coating</b>	Clear	Up to 75%	Surface	Hydrophobic Hydrophilic	pH 2-12	All 3M pad conditioners
<b>U Coating</b>	Clear	Up to 99%	Surface, Selective area, Full disk	Hydrophobic	pH 2-12	All 3M pad conditioners

\* Per 3M test data

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