

Still Planar

After All These Years

Techcet CMP Consumables 2008 Market Update

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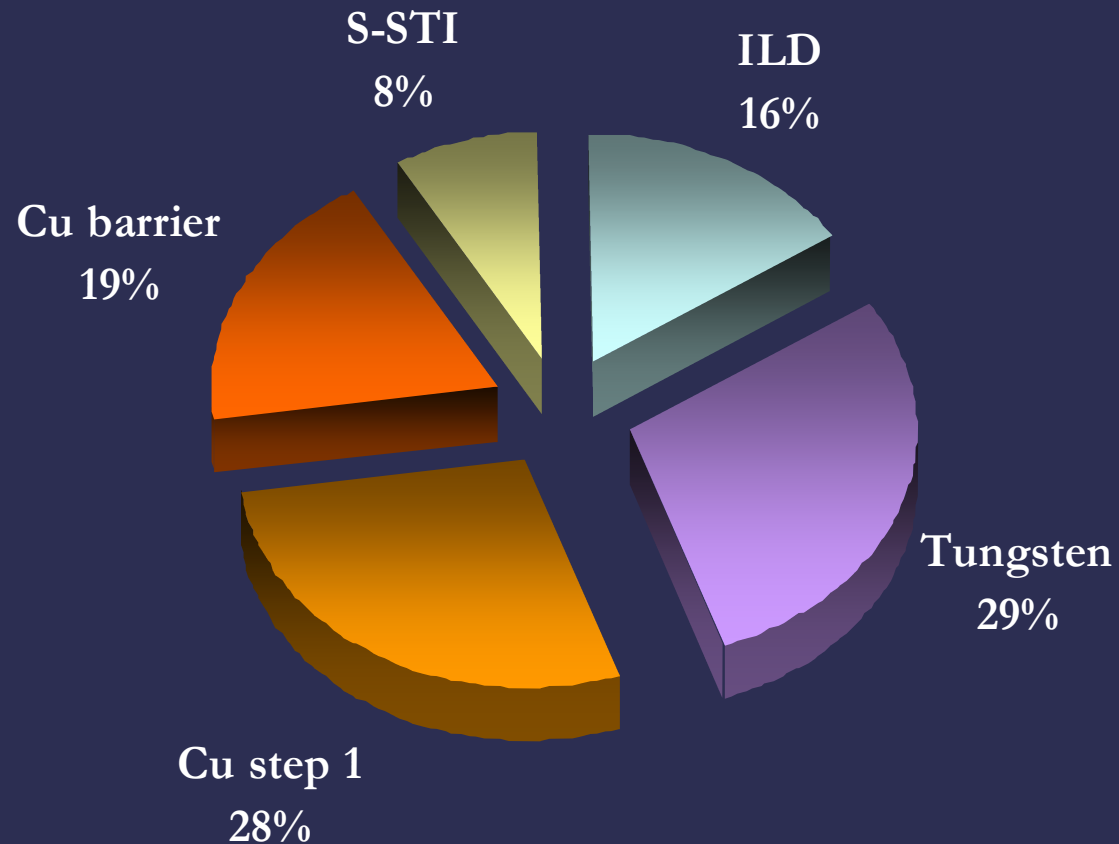
Outline

- The Business
- The Players
- The Buzz
- The End

The Business of CMP

- Slurries \$1.0B
 - 3 year CAGR 0–20%
 - *Worth discussing some more?*
- Pads \$600M
 - 3 year CAGR 9–18%
- CMP Ancillaries \$300M
 - Pad Conditioners, Cu PCMP Cleaners, PVA Brushes (excludes filters & retaining rings)

Slurry Revenue Sources



How Might Slurries Stagnate?

3 year CAGR 0-20% ?

- Slurry volumes grow with chip volumes
 - as expected
- Slurry costs are under a lot of pressure
 - as expected
- Fab engineers can do more about slurry costs than about other CMP consumable costs

Fab Engineers

Those Magnificent Men (and Women) in their Polishing Machines

- POU slurry dilution
 - 2:1 to 10:1
- Lower slurry flow rates
 - Remember the *Photoresist Alamo!*

Pads Holding Their Own

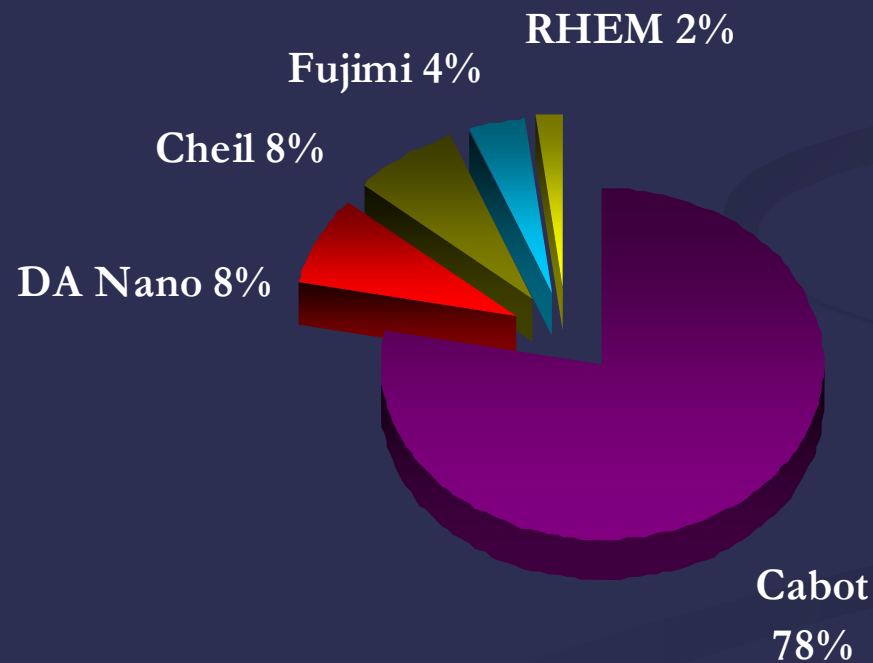
- Not as much specialization by CMP application
 - Diffuses focus
- Pad longevity increasing with kinder, gentler conditioning – or none at all
 - Defuses cost pressure
- Public opinion poll: same old same old

CMP Ancillaries

- Pad conditioners are the hotbed
 - New materials, new designs, new research
- Cu PCMP is still a growth market
 - W PCMP niches will grow below 45nm
 - S-STI PCMP showing signs of life
- PVA brushes – new names, new designs
- Filters – the quiet companies
- Retaining rings – new materials

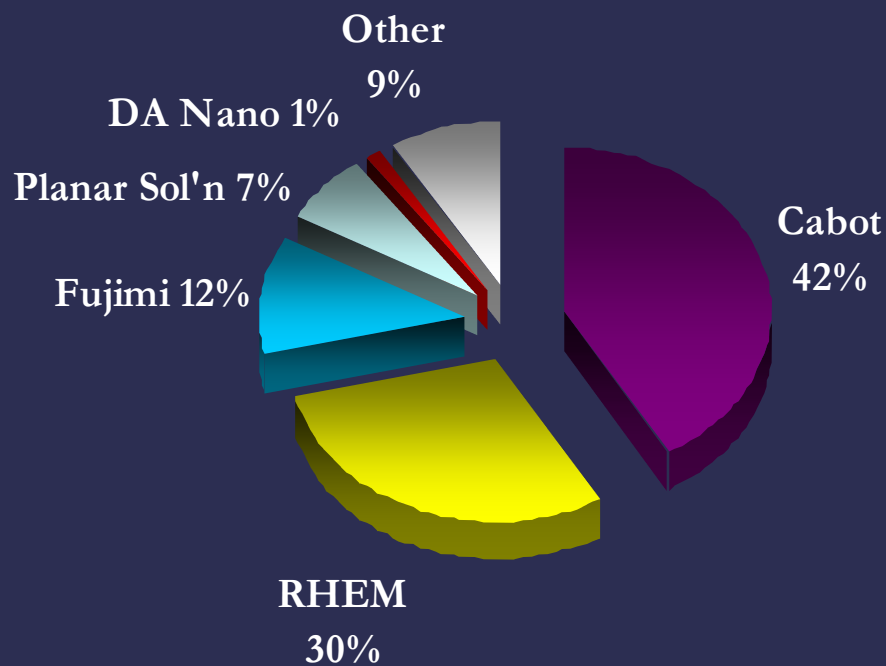
The Players - Slurry

Tungsten

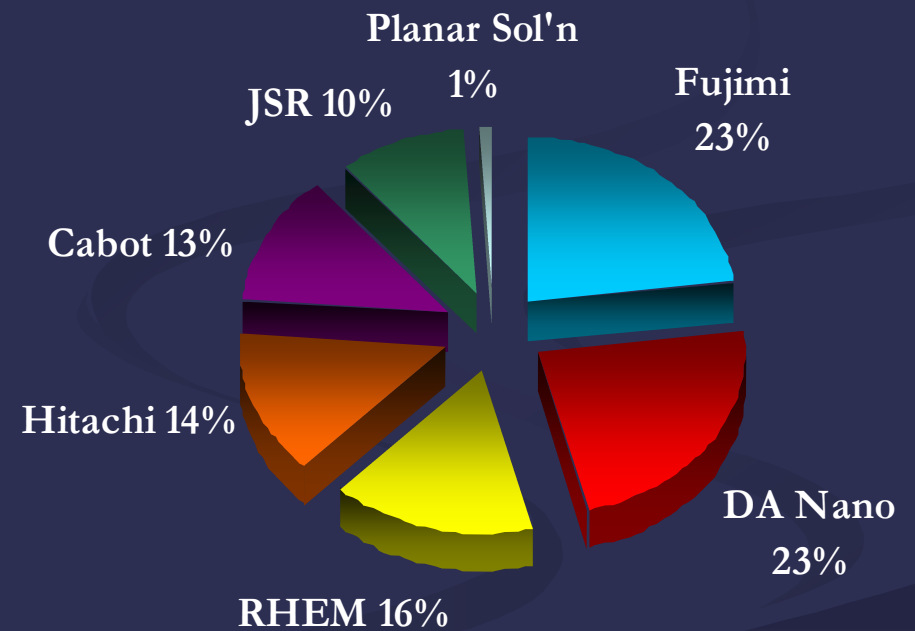


The Players - Slurry

ILD

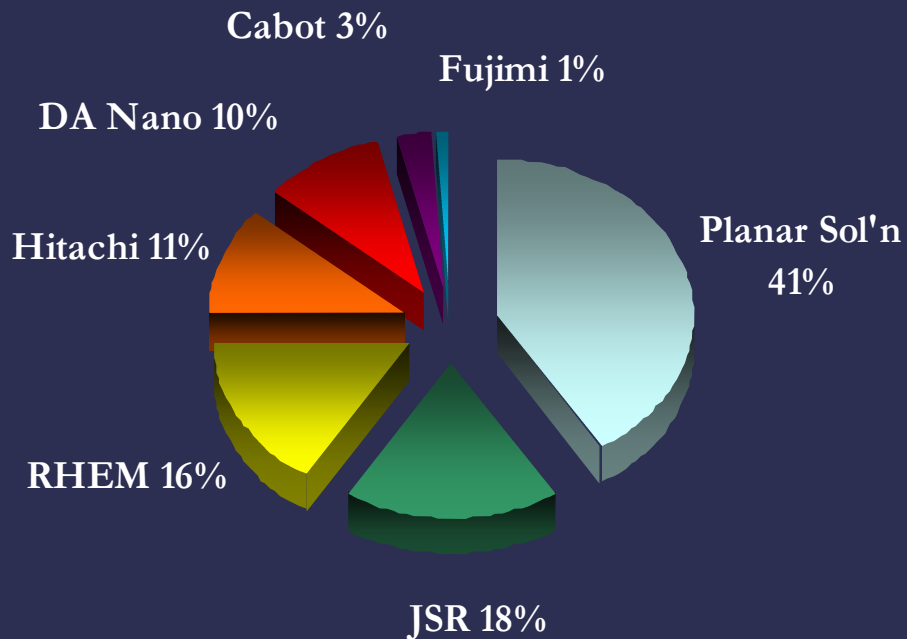


Cu Step 1

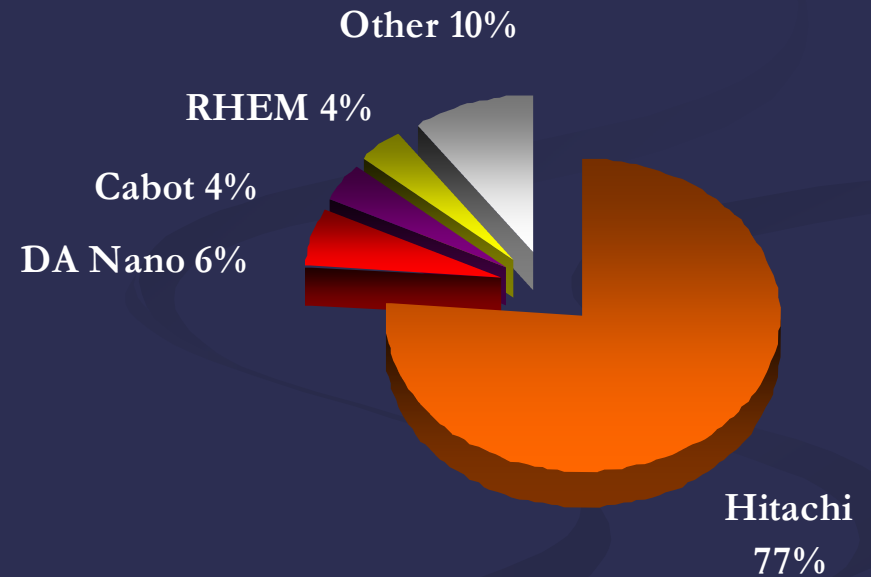


The Players - Slurry

Cu Barrier

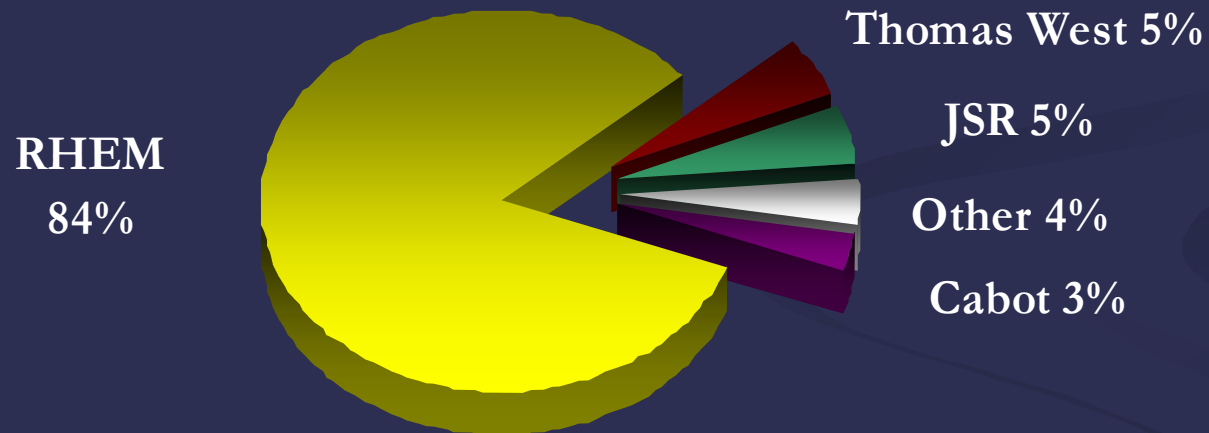


S-STI



The Players - Pads

CMP Pads



The Buzz – Big Biz

- Dow Chemical acquires Rohm & Haas Corporation for \$18.8B July 10, 2008

The Buzz - Slurry

- Hitachi Chemical commands S-STI
- Planar Solutions – breakout leader in Cu barrier
- Five suppliers over 10% share in Cu step 1, two over 20%
- Cabot slurry overall revenue share is down to 35%, even with 78% of the W market

The Buzz - Pads

- Innopad & Cabot pads replacing RHEM for W; TWI share is holding
- JSR Cu step 1 pads used on AMAT
- Cabot Cu step 1 pads find home on Ebara
- Praxair ILD pads gaining as AMAT BKM
- NexPlanar – re-birth on July 10

The Buzz – The Biz

- Proprietary PCMP cleaners are alive and well, and getting better
 - Orphaned EKC & APCI PCMP products need a home
 - Cabot PCMP strategy undefined
- PVA brushes will live well through several more nodes
 - Molded-on-the-core may be the enabler

The Buzz – The Biz

- SEZ into Lam – PCMP in your future?
- Fixed abrasive pads have found a non-threatening niche
- Lam Teres – R.I.P.
- ECMP – R.I.P.
- Novellus CMP – resting in pieces

The End

- CMP growth is keeping pace with the semiconductor industry
 - Evolution, not revolution
- No threats to CMP status quo
- Suppliers and market shares will continue to shift over time, but CMP revenues will soar

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