

Weathering the Downturn

Techcet CMP Consumables 2009 Market Update

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Outline

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



Source: The New Yorker, 2009

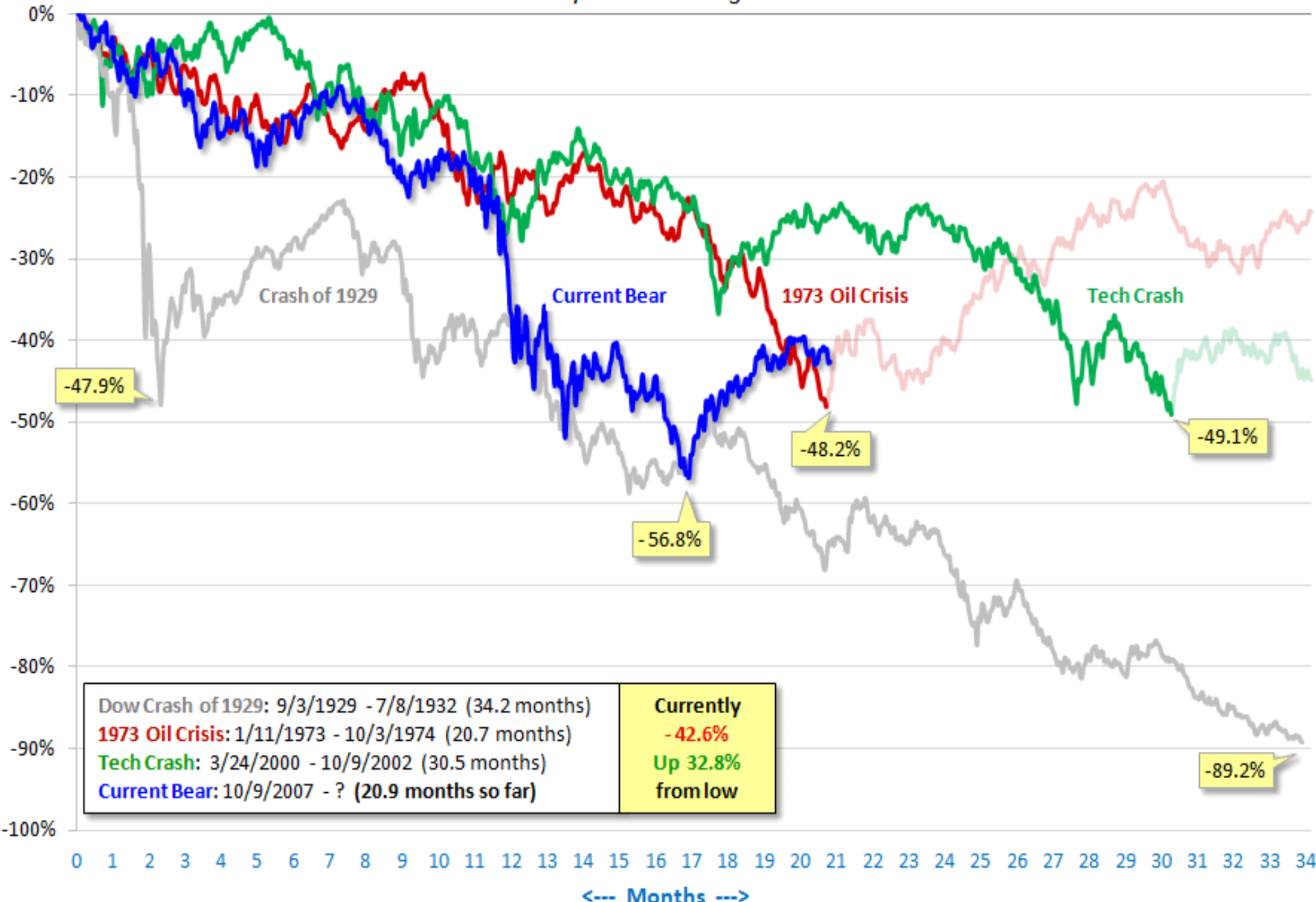
The Business of Business

Company	Forecast
Semico	11%
IC Insights	9%
VLSI Research	8%
iSuppli	8%
SIA	8%
Gartner Dataquest	6%
Average	8%

Four Bad Bear Markets

Dow in 1929-1932; S&P 500 in 1973-74, 2000-02, 2007-09

nominal price excluding dividends



Dow Crash of 1929: 9/3/1929 - 7/8/1932 (34.2 months)	Currently -42.6% Up 32.8% from low
1973 Oil Crisis: 1/11/1973 - 10/3/1974 (20.7 months)	
Tech Crash: 3/24/2000 - 10/9/2002 (30.5 months)	
Current Bear: 10/9/2007 - ? (20.9 months so far)	

<--- Months --->

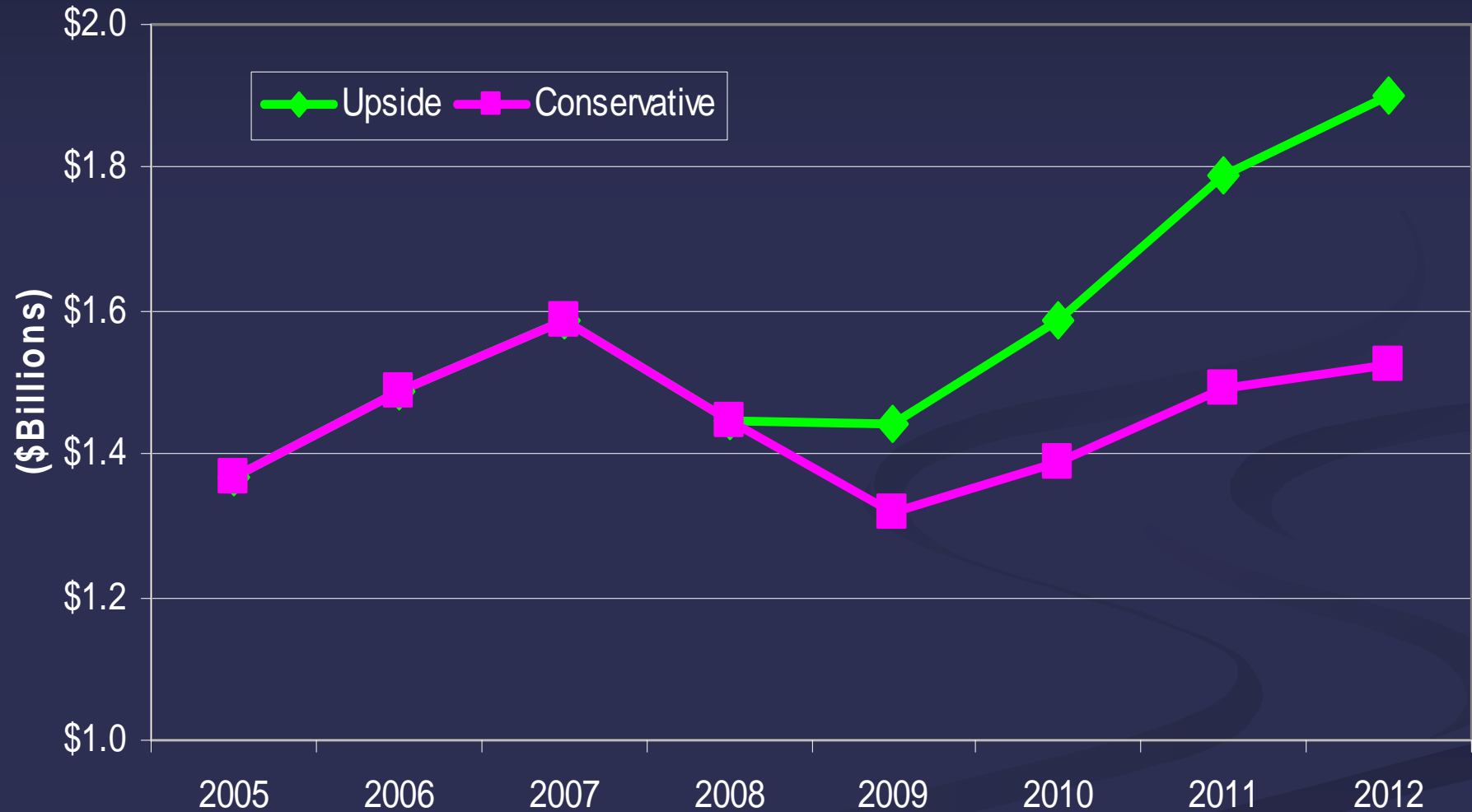


The Business of Business



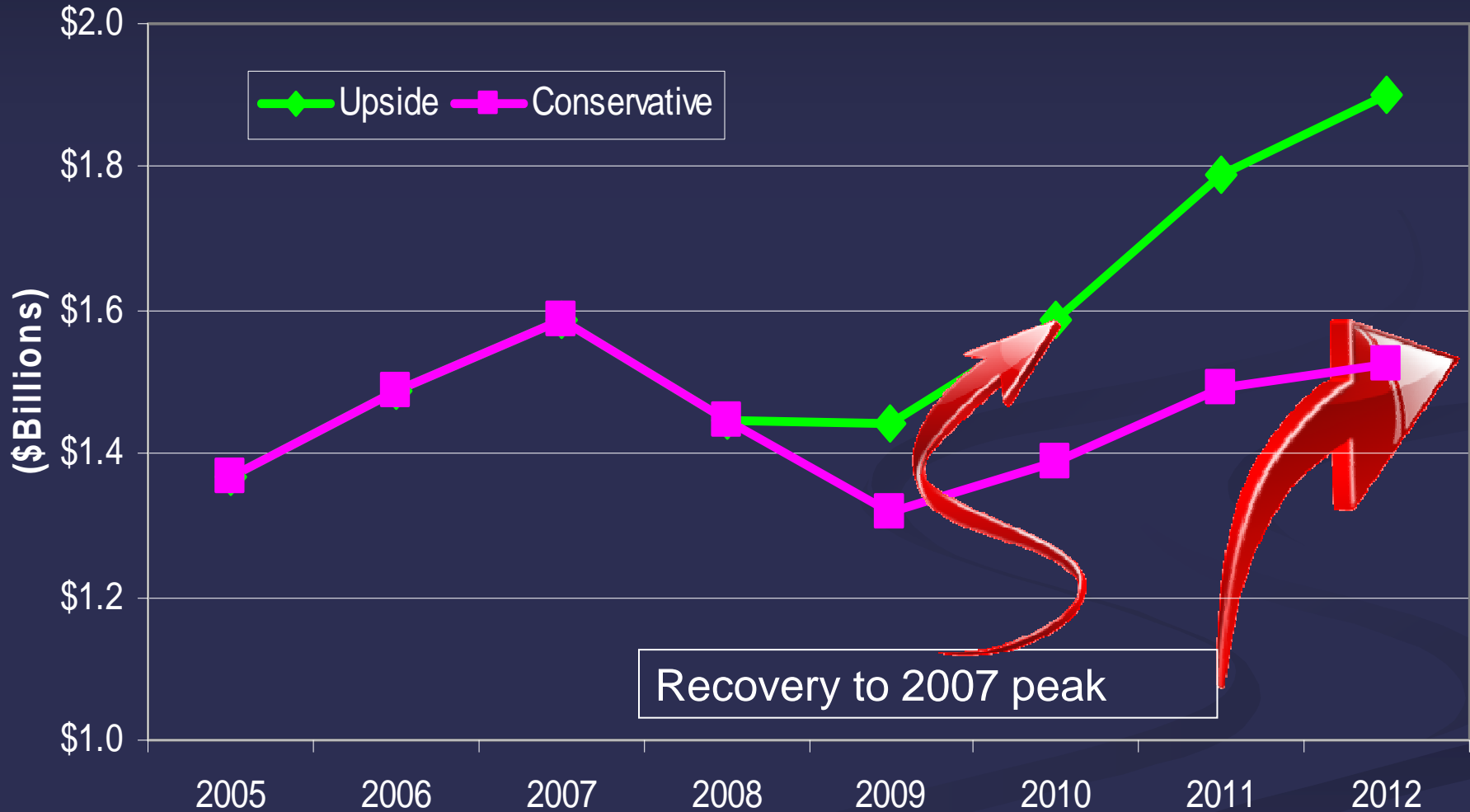
The Business of CMP

CMP Slurry & Pad Revenue



The Business of CMP

CMP Slurry & Pad Revenue



The Business of CMP

- * Slurries – *patience!*
 - ✦ *K Holland presentation later today*
- * Pad market ~\$625M
 - ✦ 3 year CAGR 5.5%
 - ✦ Outlook last year was 9–18%
- * CMP Ancillaries down 5%–10% from 2008 estimate of \$300M
 - ✦ Pad Conditioners, Cu PCMP Cleaners, PVA Brushes (excludes filters & retaining rings)

The Players - Pads

- * Emeritus: Dow, TWI, 3M
- * Relative newcomers
 - ✦ 4 with measurable share
 - ✦ JSR, Fujibo, Praxair, Cabot
 - ✦ Others continue to aspire
 - ✦ innoPad, IVT Tech, KPC, Mipox, NexPlanar, Planar Labs, SemiQuest, SKC, Toray, Toyo
- * One noteworthy departure
 - ✦ PPG exits pad market abruptly

The Players - Pads

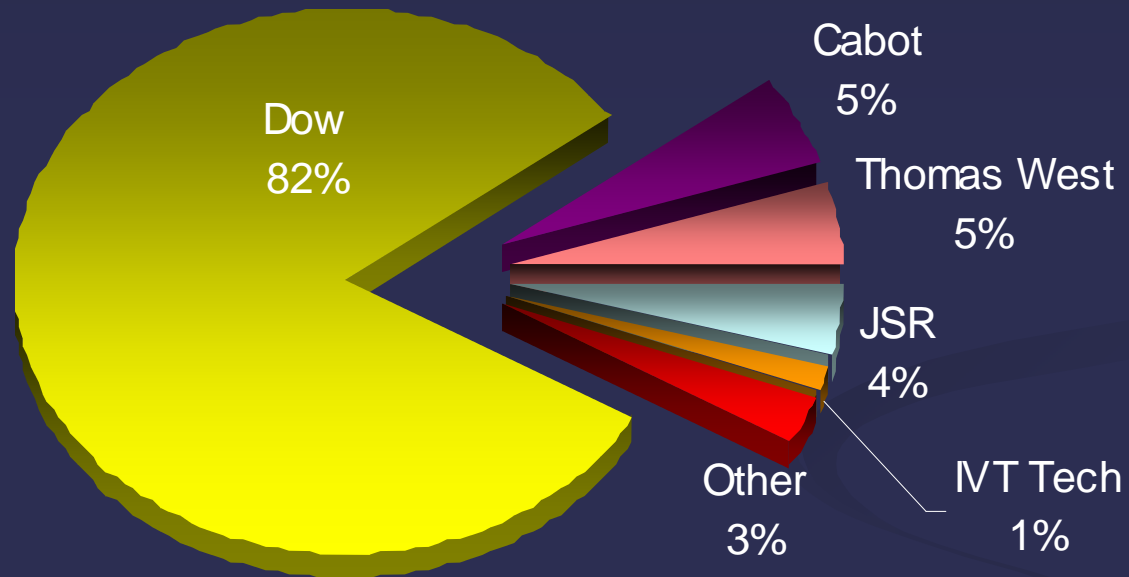
* Geologic Shift in Pad Share

- ✦ JSR: 20% Cu Step 1 on AMAT
- ✦ Fujibo: 10% Cu Step 2
- ✦ Praxair: 10% ILD on AMAT
- ✦ CCMP: 5% Cu Step 1 on Ebara
- ✦ CCMP: 5% W
- ✦ innoPad: ?% W in Pac Rim

Shift in Pad Size

- * 300mm pads now ~40% of revenue
 - ✦ Accelerated by 200mm fab closures
 - ✦ >45% anticipated by 2012
 - ✦ Cu & STI drive 300mm growth
- * Fixed abrasive pad rolls
 - ✦ 100% implementation on AMAT platform

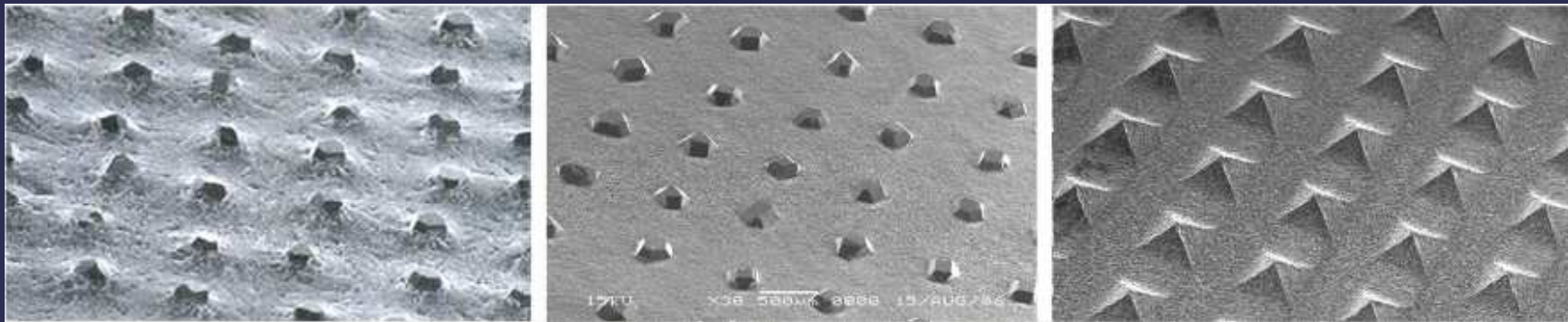
The Players - Pads



Techcet estimates of market share

The Players – Pad Conditioners

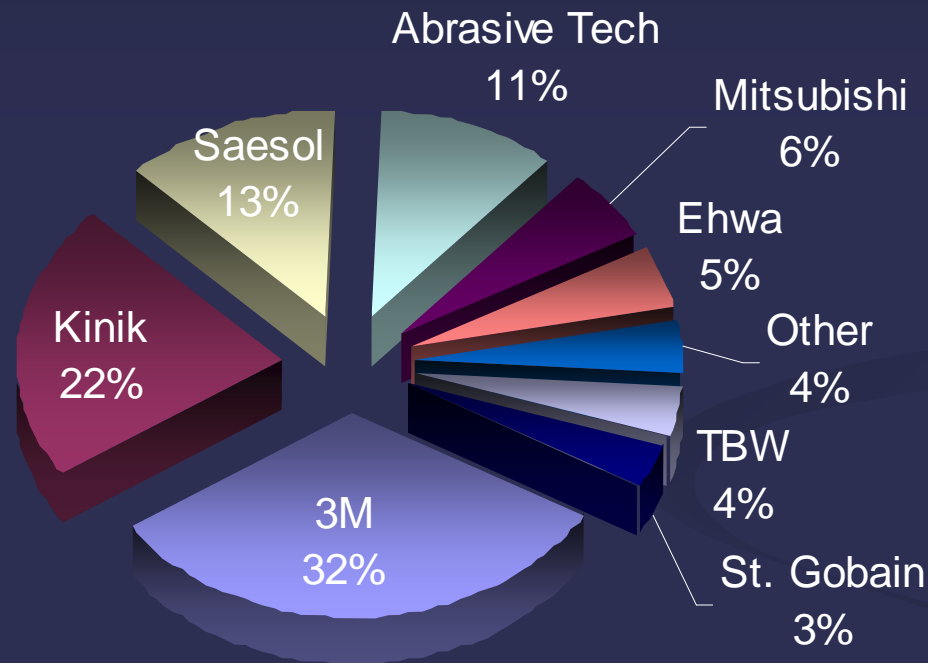
- * Market size ~\$200M
- * Microreplication demonstrating its value



▲ Source: M. Sung, NCCAUS CMPUG, May, 2009

- * Pad conditioning system paradigm
 - ✦ Startup: Confluense LLC; *see D. Peters tomorrow*
 - ✦ Regime change – slurry dilution → replacement
 - ✦ 50% reduction in slurry & pad usage

The Players – Pad Conditioners

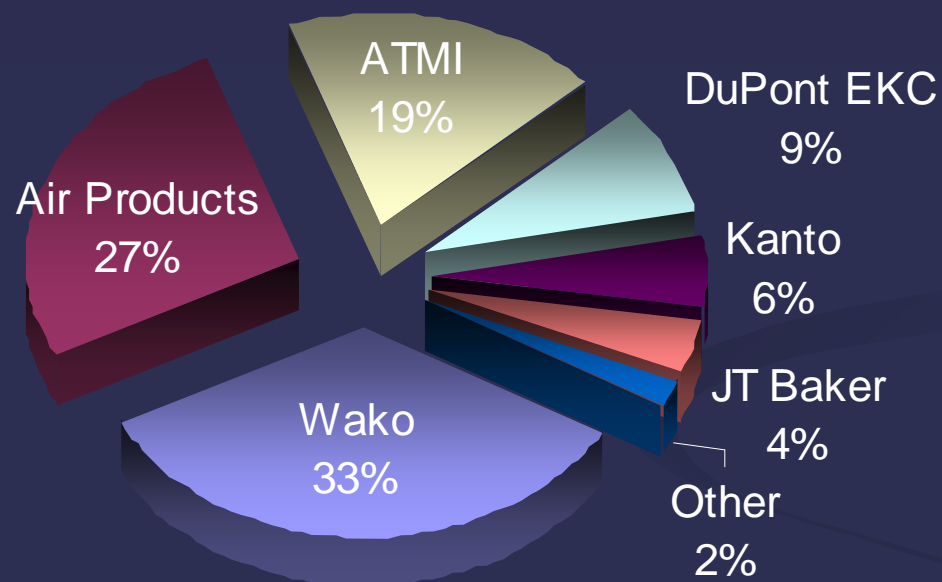


Techcet estimates of market share

The Players – PCMP Clean

- * Market size ~\$100M
- * Market is driven by copper
 - † Wako, Air Products, ATMI dominate
 - † Minor niche markets for W & ceria STI
 - † New markets likely with new device structures
- * Lam Research acquires SEZ
 - † PCMP: if not, why not?

The Players – Cu PCMP Clean

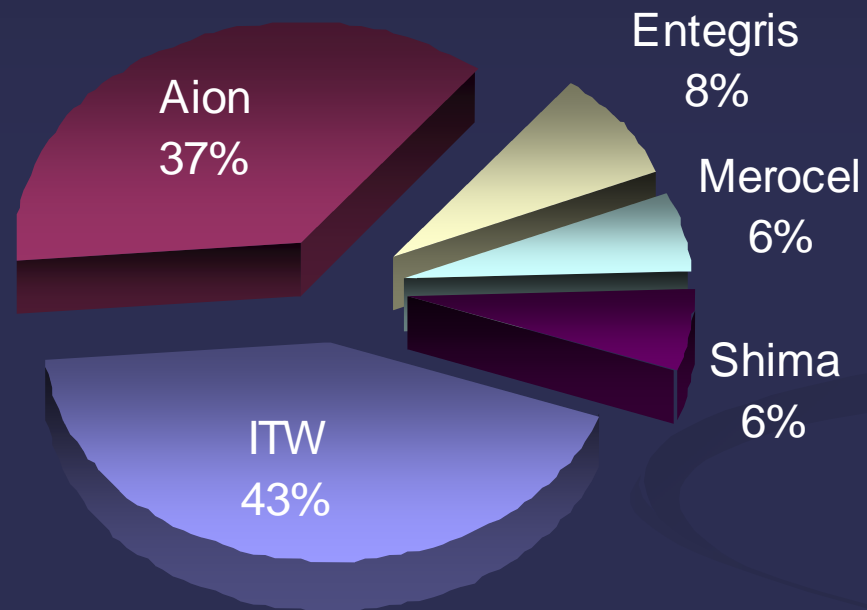


Techcet estimates of market share

The Players – PVA Brushes

- * Market size ~\$40M
- * Consolidation: *do the math*
 - ✦ Kanebo – Rippey → Aion
 - ✦ Rippey + Texwipe → ITW
- * Brush life varies widely
 - ✦ ILD as high as 20,000 wafers
 - ✦ Cu as low as 1,000 wafers
- * Brushless threat from Lam + SEZ

The Players – PVA Brushes



Techcet estimates of market share

The Buzz – The Biz

- * Dow Chemical acquires Rohm & Haas Corporation for \$18.8B
 - ✦ Announced July 10, 2008
 - ✦ Rohm & Haas abandoned at the altar
 - ✦ Lawyers and judges → wedding bells ring

- * PPG abrupt exit from pad business
 - ✦ Impact on other pad startups *tbd*

The End

- * CMP growth is keeping pace with the semiconductor industry – good or bad
 - ✦ A receding tide sinks all boats
- * CMP applications continue to increase along evolutionary trajectories
- * CMP consumables revenue will recover to 2007 peak levels between 2010 and 2014

The Techcet Group, LLC

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The Techcet Group, LLC

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