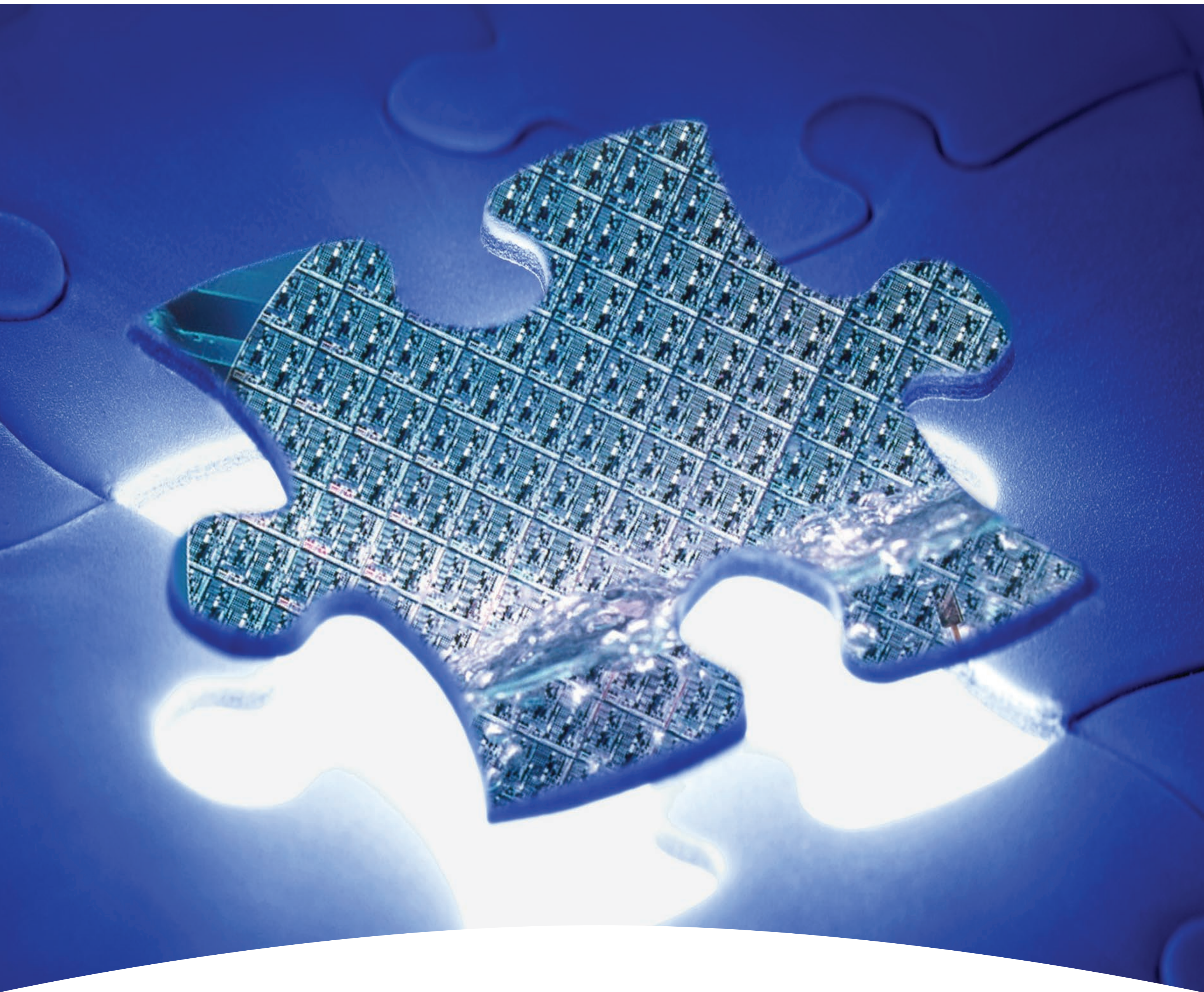
Electronic Chemicals

Honeywell



Honeywell Bulk Etch for Wafer Thinning

Honeywell Bulk Etch

WAFER THINNING MATERIALS

APPLICATIONS

- For rapid and uniform removal of all remnants of induced back grind damage
- Complete wafer thinning back grind capabilities; typical etch depth will be 0.001 inch (25.4μm)
- Increases die strength and reduces warpage

OVERVIEW

Honeywell's wafer thinning materials are part of three new product lines (wafer thinning materials, performance cleans, selective etchants) being introduced from its state-of-the-art electronic chemicals manufacturing sites in Chandler, Arizona and Seelze, Germany.

Honeywell's electronic chemicals manufacturing site in Chandler, Arizona.

These customized, application specific offerings provide improved cost of ownership (CoO), increased yield and ease-of-use. Our application expertise maximizes customer wafer thinning processes with application development support and troubleshooting know-how while our consistent drum-to-drum and bottle-to-bottle wafer etching characteristics provide unsurpassed batch-to-batch product uniformity. A robust manufacturing infrastructure and application expertise further enable Honeywell to deliver flexible end products, custom-matched to the best chemistry formulations for customer processes and specifications.

RESEARCH AND DEVELOPMENT

Honeywell and SEZ developed and performed an extensive design of experiment (DOE) to identify the critical chemical and operating parameters necessary to maximize silicon removal, etch uniformity and surface morphology of a bulk silicon removal process (utilizing a SEZ single wafer processing tool).

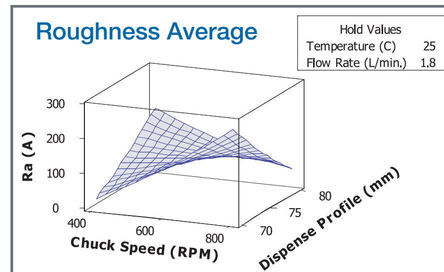
ETCHER PARAMETER	SETTING		
	High	Middle	Low
Temperature (˚C)	28	25	22
Chuck Speed (RPM)	800	600	400
Flow Rate (L/min.)	2.0	1.8	1.6
Dispense Profile (mm)	80	75	70

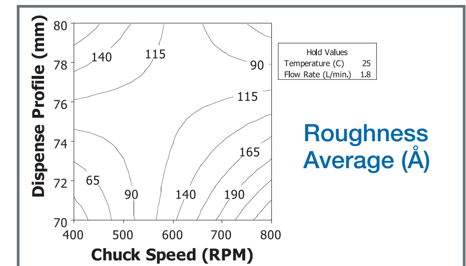
A stable etch process and consistent etchant are needed to ensure a stable wafer backside etching process

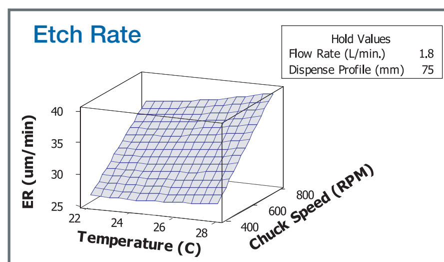
Conclusions of this work indicate:

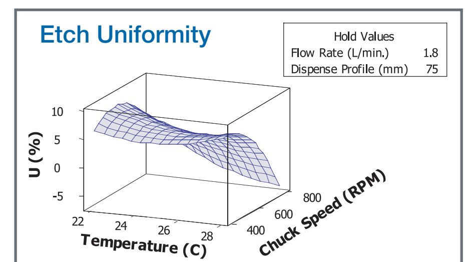
- The silicon **etch rate** and **etch uniformity** are primarily functions of the **chuck rotational speed**
- The silicon **etch rate increases and the etch uniformity decreases** (i.e., the etch becomes more uniform) with increasing chuck speed
- **Post etch surface roughness** is a function of the chuck speed and dispense profile

(See Roughness and Etch Rate data below.)









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