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**LOWEST COST PER WAFER  
WAFER POLISHING TEMPLATES**

ZeroMicron delivers the wafer polishing template with the lowest cost per wafer in the industry.

- A better than 50% cost reduction based on multiple client results. (See cost comparison on backside of this paper).
- Some reported savings as high as 80%.

And, this low cost polishing template delivers the best results in terms of surface finish, flatness, taper, haze and TTV

Condition	Competition	ZeroMicron
Total Thickness Variation (TTV)	More than 7µm	Less than 2µm
Site Flatness	Wedge surface	Parallel surface
Haze	More than 5%	Less than 1%
Backside Stain	10%	None

Advantages of the ZeroMicron template:

- ✓ Fewer blowouts. Most blowouts only require the replacement of the poromeric insert, not the template. This saves both time and money.
- ✓ Adjustable thickness. An insert is used in the bottom on the polishing pocket to adjust height and is replaceable with a selection of thickness for production. No need to stock multiple templates.
- ✓ Shim Spinning System (S<sup>3</sup>). The removable shim and poromeric insert allows the wafer to spin in the pocket for more even finish and faster removal rate.
- ✓ Faster removal rates. Design allows higher pressures and temperatures with patented S<sup>3</sup> technology for higher removal rates.
- ✓ Rugged design. Template frames are bonded to rigid materials, poromeric materials are replaceable and the wafer is elevated above the base glueline.

ZeroMicron can provide advanced designs for faster processing, improved surface finishes, difficult materials like Silicon Carbide, Sapphire or Germanium.

## Two Examples of Cost Comparisons Based on Client Results:

### Example 1.

Four head polisher, five pocket template (20 wafers per run)

Item	Competitor	ZeroMicron
Average # of runs / template set	100	1000
Cost of template set	\$300.00	\$600.00
Cost of shim and insert set	\$0.00	\$285.00
20,000 wafer run		
Total cost of templates	\$3,000.00	\$600.00
Total cost of shim & insert sets (3 sets)	\$0.00	\$855.00
Total costs	\$3,000.00	\$1,455.00
<b>Cost Per Wafer</b>	<b>\$0.150</b>	<b>\$0.073</b>

Additional benefits cited by the client:

- ✓ Decreased run time from 20 minutes to 15 minutes, 25% thru-put increase.
- ✓ Decreased blowouts from 11 to 2.
- ✓ Each blowout required replacement of the competitor template plus 15 minute replacement time. On ZeroMicro templates, simply replace the insert.
- ✓ Decreased template replacement time.

### Example 2.

Four head polisher, three pocket template (12 wafers per run)

Item	Competitor	ZeroMicron
Average # of runs / template set	130	1250
Cost of template set	\$300.00	\$600.00
Cost of shim and insert set	\$0.00	\$276.72
One month, six day, two shift run (24,960 minutes)		
Run time (Start run to Start run time)	32 min.	27 min.
Total template set run time	4,160 min	33,750 min.
Total template run time	4,160 min	24,960 min.
Total # of runs	780	925
Total # of blowouts	13	2
Cost per blowout	\$75.00	\$20.70
Shim & insert sets (350 runs per set)	0	2.64
Template sets required	6	0.74
Total costs	\$2,775.00	\$1,215.94
Wafers processed	9,360	11,088
<b>Cost Per Wafer</b>	<b>\$0.296</b>	<b>\$0.110</b>

Note: Run time was based on start-to-start time. Downtime and loss for blowouts not included.

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