Velocity for Defect Removal: Scrubber Applications and Beyond

NAURA Akrion Single-Wafer “Super Scrubber” Technology

Patented Goldfinger® megasonics
particle removal without damaging sensitive structures (standard feature)

JetStream™ (patents pending)
combines with megasonics for additional cleaning during DIW rinse (optional feature)

Backside megasonics (patents pending)
high efficiency backside particle removal (optional feature)

Industry Need

Advanced sub-50nm process requires more stringent particle control. Manufacturers desire megasonic assisted chemical processing to remove nano-particles. NAURA Akrion is the industry leader in megasonic technology.

Key Benefits

• Sensitive structure cleaning without damage
• Small particle removal, even below 35nm
• No or little chemical etching during particle removal
• Recessed feature cleaning
• Simultaneous frontside and backside cleaning or single side processing
Defect Removal with Goldfinger® Megasonics

Velocity “Super Scrubber” vs. Traditional Scrubbers

<table>
<thead>
<tr>
<th></th>
<th>Goldfinger® Megasonics</th>
<th>Traditional Scrub (Spray)</th>
<th>Traditional Scrub (Brush)</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Damage-free Cleaning</td>
<td></td>
<td></td>
<td>X</td>
<td>Goldfinger meg &gt; 70% PRE for 65nm structures</td>
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<tr>
<td>Frontside PRE</td>
<td></td>
<td></td>
<td></td>
<td>All methods provide excellent PRE, at least for &gt; 90nm particles</td>
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<tr>
<td>Small Particle Removal</td>
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<td></td>
<td>Goldfinger meg &gt; 95% PRE for 45nm particles</td>
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<tr>
<td>Simultaneous Front/Back Clean</td>
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<td></td>
<td>X</td>
<td>Goldfinger meg transmits energy through the wafer for backside cleaning</td>
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Goldfinger megasonic process has demonstrated superior capabilities compared to traditional scrubber tools.

Small Particle Removal (≥ 45nm)

Particle removal efficiency > 95% for particles as small as 45nm with Goldfinger megasonics.

FEOL Sensitive Structure Clean

Defect Level Comparison

Defect reduction was obtained by using a DIW or dSC1 clean with Goldfinger Megasonics. The sensitive structures were not impacted.

Single-Wafer and Batch-Immersion Cleaning

NAURA Akrion also has a complete line of batch immersion products for a variety of cleaning, etching and stripping applications. Our batch immersion and single wafer systems are found in leading edge fabs worldwide.