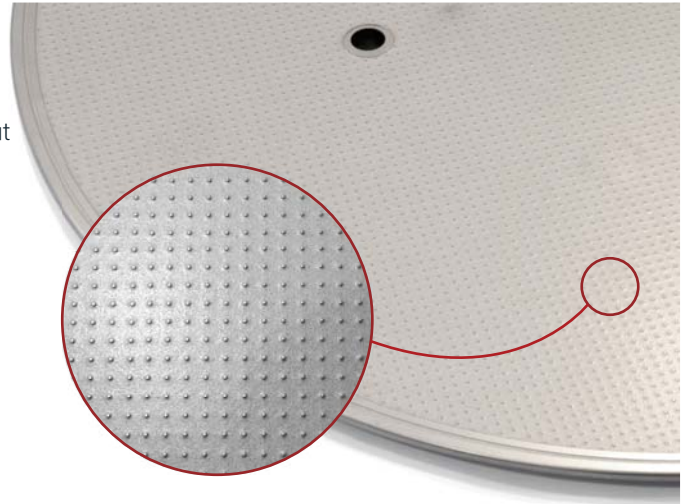




SEMICONDUCTOR WAFER CHUCKS BACK END APPLICATIONS

M Cubed Technologies, a subsidiary of II-VI Incorporated, is a leading provider of advanced metal matrix composites (MMCs) and reaction bonded ceramics (RB SiC) to the semiconductor equipment, LCD equipment, wear, refractory, optics, defense, and thermal management markets. Development and manufacturing facilities are located in Connecticut and Delaware, with sales offices are located in the US, Europe, Korea, and Japan.

M Cubed Technologies is a world leader in wafer chuck products for front end semiconductor applications, supporting the Market with products that enable enhanced precision, increased throughput and lower cost of ownership. Our portfolio of advanced materials, applications expertise and manufacturing technologies enable our customers to pursue their Market driven Technology Roadmaps.



Back End of Line (BEOL) Wafer Processing



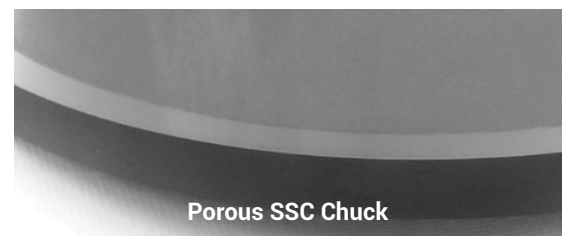
Wafer Packaging, Inspection, Singulation

Recent technology and advanced precision requirements imposed on back end of line processes are driving a need for more advanced equipment and products. M Cubed has addressed these technology challenges by expanding our customized wafer chuck product line to include applications in

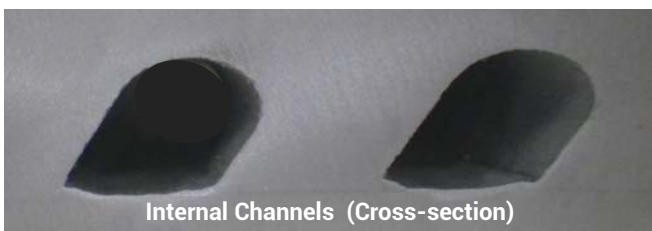
- Advanced wafer packaging
- Mid and BEOL inspection
- Advanced singulation and wafer thinning

We provide wafer chucks with an array of customized contact surface configurations and materials to meet the challenges of advanced BEOL wafer processing and equipment.

- Porous SiC
- Vacuum thru hole
- Continuous contact surfaces.



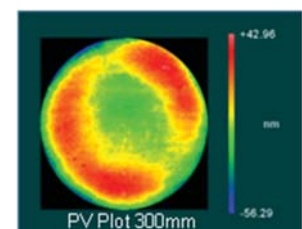
Porous SSC Chuck



Internal Channels (Cross-section)

These new products continue our standard of providing leading edge performance in applications where the following characteristics are critical to our customers continued success.

- Thermal control
- High specific stiffness
- Advanced flatness



SEMICONDUCTOR WAFER CHUCKS BACK END APPLICATIONS

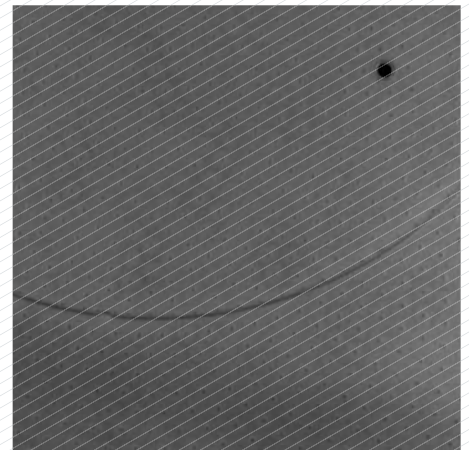
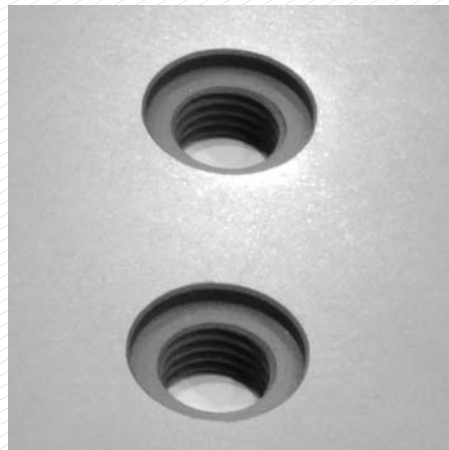
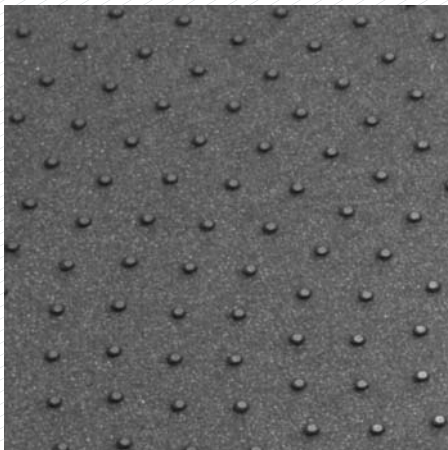


M Cubed Technologies has developed a technology solution enabling custom flatness and surface finish requirements for a broad range of wafer handling components. MESA™ provides functional advantages for precise overlay and focus applications as well as detailed defect detection for advanced semiconductor equipment applications.

| Materials Property | Aluminum Metal Matrix Composites | | | Reaction Bonded SiC | | | Specialty Reaction Bonded Ceramics | | | |
|--------------------------------|----------------------------------|-------------------------|-------------------------|---------------------|---------------------|---------------------|------------------------------------|------------------------|-----------------------|---------------------------------------|
| | ASC-301 (Al/SiC-30p) | ASC-401 (Al/SiC-40p) | MMC-S55 (Al/SiC-55p) | SSC-702 (Si/SiC) | SSC-802 (Si/SiC) | SSC-902 (Si/SiC) | SSC-FG (Fine Grained SiC) | HSC-702 (Si/SiC+Al) | TSC-15 (Si/SiC+Ti) | RBBC-751 (B ₂ C/SiC/Si) |
| Density (g/cc)[β] | 2.78 | 2.87 | 2.96 | 2.95 | 3.00 | 3.12 | 2.94 | 3.01 | 3.13 | 2.56 |
| Young's Modulus - GPa (E) | 125 | 150 | 200 | 350 | 380 | 410 | 330 | 330 | 390 | 400 |
| CTE avg 20-100°C(ppm/k) [α] | 14 | 12 | 11 | 2.9 | 2.9 | 2.7 | 3.0 | 4.4 | 3.0 | 4.8 |
| Thermal Conductivity (W/mK)[k] | 160 | 160 | 160 | 170 | 180 | 190 | 150 | 220 | 210 | 52 |
| Specific Stiffness(E/β) | 45 | 52 | 68 | 119 | 127 | 131 | 112 | 109 | 125 | 156 |
| Thermal Stability(k/α) | 11 | 13 | 14 | 59 | 62 | 70 | 50 | 45 | 70 | 11 |

Call or write today!

Materials, **M**achining, **M**otion



REV 101515

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