



BEAMS AND STRUCTURES

M Cubed Technologies, a subsidiary of II-VI Incorporated, is a leading provider of advanced metal matrix composite (MMC) and ceramic products to the semiconductor equipment, LCD equipment, wear, refractory, optics, and armor markets. Corporate offices are located in Newtown, CT, with development and manufacturing facilities in Monroe, CT and Newark, DE. M Cubed provides its customers with optimized turnkey solutions starting with product design and analysis support, followed by material selection, fabrication, and final finishing.

M Cubed offers a broad range of high performance engineered MMC and ceramic material solutions that enable higher throughput and precision at a lower cost of ownership. Our broad product portfolio provides system designers with multiple options for enhanced system performance of stages, gantries, metrology systems, and air bearings. Key attributes include high mechanical and thermal stability, damping, and large size/complex shape capability.



Aluminum Metal Matrix Composites (MMC's)

Silicon carbide particle reinforced aluminum (Al) metal matrix composites (Al/SiC MMCs) provide distinct performance advantages as compared to traditional materials, such as aluminum and granite. In addition, these materials can provide significant cost and toughness improvements relative to ceramic-based structural solutions. Typical applications consist of wafer handling and robotic components, machine bases, gantry beams, stage structures, and optical housings and structures. Key advantages include:



- Net and near-net shape fabrication via investment and sand casting
- Fully machinable including direct threading
- Casting capability in excess of 2m x 3m and 1000 kg
- Greatly enhanced mechanical and thermal stability relative to traditional metals and granite
- High damping capacity
- High toughness relative to ceramics (Al₂O₃ and SiC)
- Multiple formulations available (e.g., 30 and 55% SiC particles) to meet application requirement

Reaction Bonded Silicon Carbide (Si/SiC)

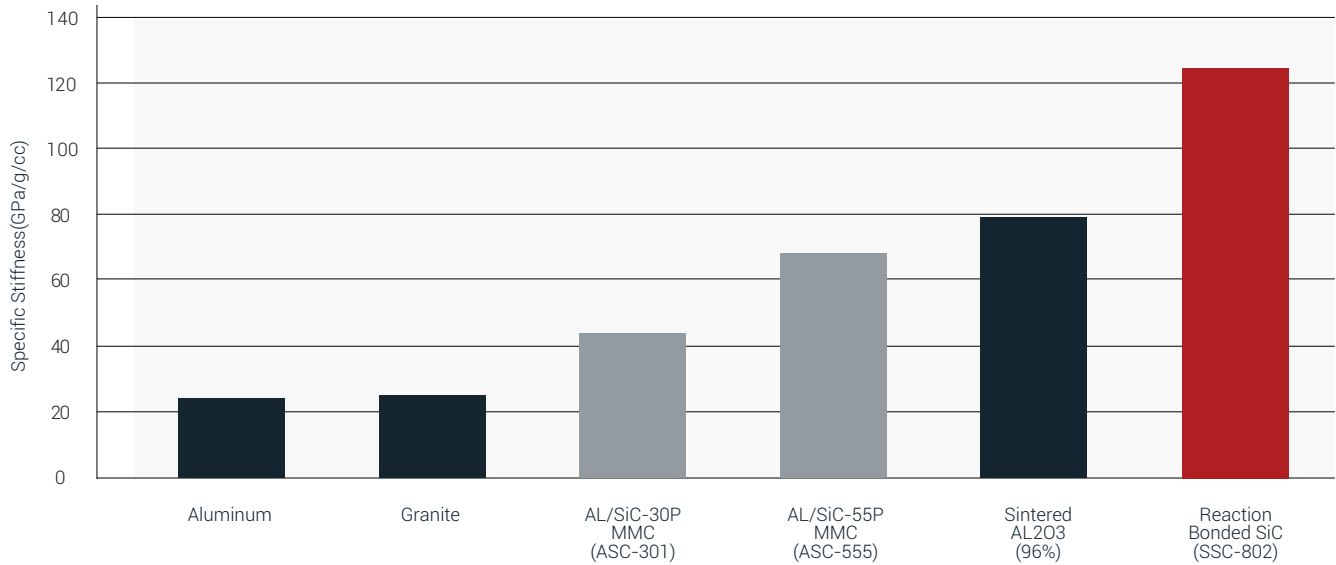
M Cubed provides reaction bonded SiC structural elements in a broad range of applications where very high stability is required (high specific stiffness, high natural frequency, low CTE, and high thermal conductivity). Products consist of gantry and air bearing beams, stage structures, housings, machine bases, and precision mounting structures. Key attributes include:

- Net and near-net shape fabrication – near zero process shrinkage
- Complex shape capability with preform casting, green machining and/or preform joining
- Ceramic firing up to 1.7m x 2.4m
- In-house finishing and metrology capabilities for air bearing surfaces and optical mounting structures
- Very high mechanical and thermal stability

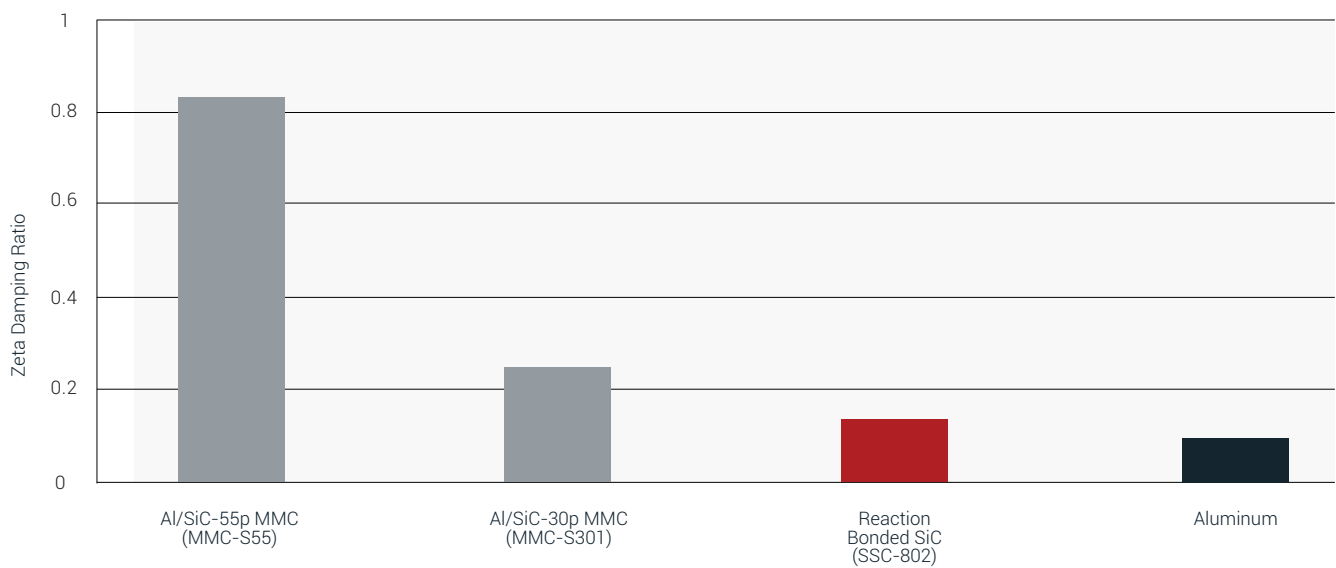


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Specific Stiffness Comparison



Damping Comparison



REV 102414

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