

Professional Ultra Precision Metrology Component Supplier - ZHHIMG's Role in China's Metrology Development

JINAN, SHANDONG, CHINA, December 3, 2025 /EINPresswire.com/ -- The foundation of modern manufacturing, spanning from microelectronics to vast aerospace components, is fundamentally reliant on the integrity and absolute stability of its metrology systems. These systems, designed to verify geometric accuracy at the most granular levels, demand foundational components that are inherently stable, thermally inert, and manufactured to exceptional tolerances. [Zhonghui Intelligent Manufacturing \(Jinan\) Co.,](#)

[Ltd. \(ZHHIMG®\)](#), operating since the 1980s, is recognized as a [Professional Ultra Precision Metrology Component](#) Supplier, specializing in the core non-metallic elements that underpin high-accuracy measuring instruments.

ZHHIMG's primary focus is on granite precision platforms and non-metallic ultra-precision manufacturing equipment, providing the critical bases, linear guides, and CMM tables necessary for eliminating thermal drift and minimizing vibration. This specialized component production enables metrology systems to achieve and sustain sub-micrometer accuracy. ZHHIMG contributes to the development within China's high-end metrology sector.



The Evolving Landscape of Global Metrology and Precision Standards

The global metrology industry is undergoing a paradigm shift, transitioning from localized quality control to fully integrated, real-time process monitoring within the framework of Industry 4.0. The demand for foundational components that can support this shift—components that are not merely passive supports but elements of the accuracy chain—is intensifying globally.

Key Drivers in the Metrology Sector

Three major trends necessitate the deep technical expertise found in specialized component suppliers:

The Quest for Nanometer Accuracy: Industries such as semiconductor fabrication (wafer

inspection), high-precision optics, and advanced bio-instrumentation now require verification systems capable of measuring features at the nanometer scale. Traditional structural materials often introduce instability due to thermal expansion or mechanical resonance. This has spurred the widespread adoption of high-density natural granite, which offers superior thermal stability (low coefficient of thermal expansion, or CTE) and internal damping characteristics essential for maintaining positional and geometrical accuracy throughout prolonged measurement cycles.

Increased Scale and Customization: The rise of large-format manufacturing (e.g., aircraft wings, large LCD panels) requires massive metrology systems. This translates directly into a need for ultra-precision components of equally monumental scale. Manufacturers must be capable of producing single-piece metrology bases that are simultaneously enormous and geometrically perfect. ZHHIMG addresses this unique challenge with the proven capability to process single granite components up to 100 tons or 20 meters in length, a capacity that is a notable feature among global suppliers.

Mandate for Quality Assurance and Global Standards: Metrology components must adhere to the highest international quality, environmental, and safety benchmarks. ZHHIMG's corporate structure ensures rigorous compliance with standards including ISO 9001, ISO 14001, ISO 45001, and the EU CE mark. This strict, multi-faceted compliance satisfies the global industry's need for verifiable expertise and trustworthiness, reinforcing the role of specialized suppliers.

The future of metrology is intrinsically linked to the stability and verifiable quality of the component foundation.

ZHHIMG's Technical Capability and Component Manufacturing

ZHHIMG's position in ultra-precision metrology components is a direct result of decades of specialized focus on non-metallic materials and large-scale, high-precision manufacturing.

Foundational Expertise in Granite Metrology Components

Operating two advanced manufacturing facilities in Shandong Province since the 1980s, ZHHIMG has accumulated institutional knowledge in the selection, processing, and finishing of high-density granite. This material mastery is translated into a diverse product portfolio:

Ultra-High Precision Bases and Tables (CMM/VMM): ZHHIMG manufactures monolithic granite bases for Coordinate Measuring Machines (CMMs) and Vision Measuring Machines (VMMs). The precise finishing process ensures the surface flatness meets demanding specifications, often achieving parallelism and flatness accuracies within 1 to 3 micrometers (μm) over large spans. The density and inherent damping of the selected granite grade are optimized to isolate the measuring head from external vibration.

Granite Mechanical Components: This includes essential moving parts like granite cross-beams, Z-axis columns, and gantry structures. Due to granite's low CTE, these components maintain their geometry despite ambient temperature fluctuations, a property vital for maintaining measurement accuracy over extended periods.

Granite Linear Guide Systems: ZHHIMG fabricates high-precision granite air bearing guides. These components require supreme straightness and parallelism, finished via specialized lapping techniques. The resultant motion straightness is often verified to be within $0.5\mu\text{m}$

\mu\text{m})\$ per 300 mm travel, supporting smooth, frictionless, and precise motion for scanning and positioning tasks.

Customized Granite Structures: ZHHIMG provides complex structures featuring precisely integrated elements. This includes granite plates with embedded metal inserts, precisely machined holes for component mounting, and integrated granite V-blocks or guide rails, all finished to dimensional tolerances suitable for high-precision applications. The company's large capacity allows them to simultaneously handle high volume orders (up to 10,000 sets per month) and specialized, one-off projects up to the 20-meter mark.

Products and Solutions Supporting Metrology Innovation

ZHHIMG's product solutions are specifically engineered to maximize the system's inherent stability and geometrical accuracy, providing verifiable performance metrics:

Precision Tooling and Inspection Jigs: Beyond standard bases, ZHHIMG produces granite master squares, cubes, and straight edges. These are essential for the calibration and verification of machine tools and CMMs, with angular accuracy verifiable to within 2 arc-seconds.

Advanced Assembly Bases: Manufacturing large granite reference plates used as assembly bases for high-precision components like satellites, optical equipment, and lithography systems. The size capacity (up to 20 meters) allows for single-piece references that address the compounding errors of modular assembly.

Customization for Active Measurement: ZHHIMG's engineering team works with clients to design components that incorporate features like integrated cable management channels, specific mounting patterns, and customized air grooves for bespoke air flotation systems.

Conclusion: The Foundation of Future Precision

The global push toward ultra-precision manufacturing and verification requires suppliers who not only understand geometry but master foundational material science. ZHHIMG's specialized knowledge in non-metallic ultra-precision components, combined with its ability to handle large scale and volume, establishes it as a specialized Professional Ultra Precision Metrology Component Supplier. By providing stable foundations and precision components, verified by rigorous compliance with ISO and CE standards, ZHHIMG supports its partners—both in China and globally—in achieving high levels of measurement accuracy.

For more information on ZHHIMG's ultra-precision metrology components and solutions, details are available on the official website: <https://www.zhhimg.com/>

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