Press Release

For immediate release

MAGESTIC SYSTEMS
INCORPORATED

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Nikon Metrology and Magestic Systems Inc. Collaborate on New Solution to Increase Production of Right-First-Time Composite Parts

Nikon Metrology and Magestic Systems, Inc. (MSI) jointly introduce an innovative fabrication solution for increasing production of right-first-time composite parts that harnesses the vast capabilities of both Nikon Metrology's Laser Radar technology and MSI's Ply Compensation™ System (PCS™). The benefits of this methodology are twofold: first, manufacturers can overcome the difficult engineering specifications set in place for composite parts; and second, they can achieve success with minimal waste. The synergy between Magestic Systems' PCS™ and Nikon Metrology's Laser Radar offers composite part manufacturers a seamless solution – utilizing metrology, ply nesting and laser projection technologies to produce composite parts within engineering tolerances. By combining Laser Radar and PCS™ technologies, manufacturers put in place an automated Metrology Assisted Production process that delivers parts of predictable quality, while rigorously reducing scrap and maintaining accuracy, scalability, and ease of use.

Despite their generally high cost, composite materials have gained popularity in high-performance products that need to be lightweight, and at the same time strong enough to take harsh loading conditions. Today, composite materials are widely used in aviation components (tails, wings, fuselages, propellers), space vehicles, boat hulls, racecar bodies, storage tanks, turbine blades and even baseball bats.

Composite Part Manufacturers Face Production Issues

Traditional production methods, which have become standards for steel and aluminum industrial production, will not suffice for serial production of composite parts. A variety of factors often prevent manufacturers from keeping geometric deviation within specification, whether it is the nature of combined composites' substrate, resin, and reinforcement materials or even the method by which the parts are molded. Low process repeatability generates lengthy manual rework and an intolerable number of fail components that end up on the scrap pile.

PCS™ –– A Unique Alternative to the Current Machining Process

"As a full-scale enterprise solution, Magestic Systems' Ply Compensation™ System provides a unique alternative to the current machining process for composite part fabrication," says Mike Weber, Magestic V.P. Operations and Business Development. "PCS™ takes parts that have been produced slightly outside of engineering tolerances, and builds them up by single or multiple composite compensation ply layers into finished parts that satisfy all structural and engineering requirements – *the first time through the production process*. This revolutionary method ensures that as-built composite parts adhere to as-designed specifications, while reducing material usage and improving efficiency."

Laser Radar Captures Composites' Nominal Geometry Deviation

The process starts with identifying those surface areas on composite parts that need compensation

ply treatment. “Within a range of 60m, the contactless Laser Radar system from Nikon Metrology captures the surface geometry of composite parts of any shape and size, without requiring SMR or other targets”, explains Francky Demeester, Nikon Metrology V.P. Business Development Large-scale Metrology. “The Laser Radar is fully automatable and programmable, and measures nominal deviation very accurately, both in plane and surface vector intersection modes (PVI and SVI). PVI measurements have shown an order of magnitude improvement in measurement accuracy over other single-point measurement systems, in particular on composite materials. The integration of Laser Radar into innovative manufacturing methods illustrates the impact of Metrology Assisted Production on composite part production quality and throughput.”

Automatic Process to Measure, Nest, Cut, and Lay Up Compensation Plies

Based on the Laser Radar’s geometry data and the resulting nominal deviation of the tool surface, MSI’s Ply Compensation™ System manages the definition and creation of multi-layer compensation plies. After processing this critical step, MSI’s TruNEST™ builds nests of the necessary compensation plies and automatically cuts them out to be laid up. TruLASER™ View kits the compensation plies while still on the cutting table and projects the exact location of where on the deficient part they need to be placed, keeping all grain constraints in mind. Following this, the part is then ready to be re-cured to obtain final geometry. The finished composite part is then measured again with Laser Radar for geometry deviation. By producing composite parts correctly the first time, immediate savings can be noted in the minimization of waste and the maximization of accuracy, part quality, and process efficiency.

A Head Start in Serial Production of Composite Parts

“Our focus with the development of this application was to provide a solution that integrated the unique capabilities of both Nikon Metrology and Magestic Systems to best-fit industry needs,” concludes Mike Weber. “With the current state of the world economy and the rising costs of composite materials, we put a premium on cost efficiency to complement the unique capabilities of this breakthrough solution. All its economic and quality benefits ensure a positive bottom line return on investment for world-class manufacturers around the globe.”

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ABOUT NIKON METROLOGY

Nikon Metrology offers the most complete and innovative metrology product portfolio, including state-of-the-art vision measuring instruments complemented with optical and mechanical 3D metrology solutions. These reliable and innovative metrology solutions respond to the advanced inspection requirements of manufacturers active in consumer, automotive, aerospace, electronics, medical and other industries. Systems are available in both fixed and portable configurations, equipped with a single or multiple sensors.

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ABOUT MAGESTIC SYSTEMS INC.

Magestic Systems, Inc. is a global leader in Enterprise Software Development and specializes in material and process optimization across all CNC Laser Cutting and projection applications. An innovator in the manufacturing industry since 1991, the Magestic Systems Inc. portfolio includes a wide variety of turnkey solutions that assist manufacturers through the entire process of taking a design and turning it into a product.

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