

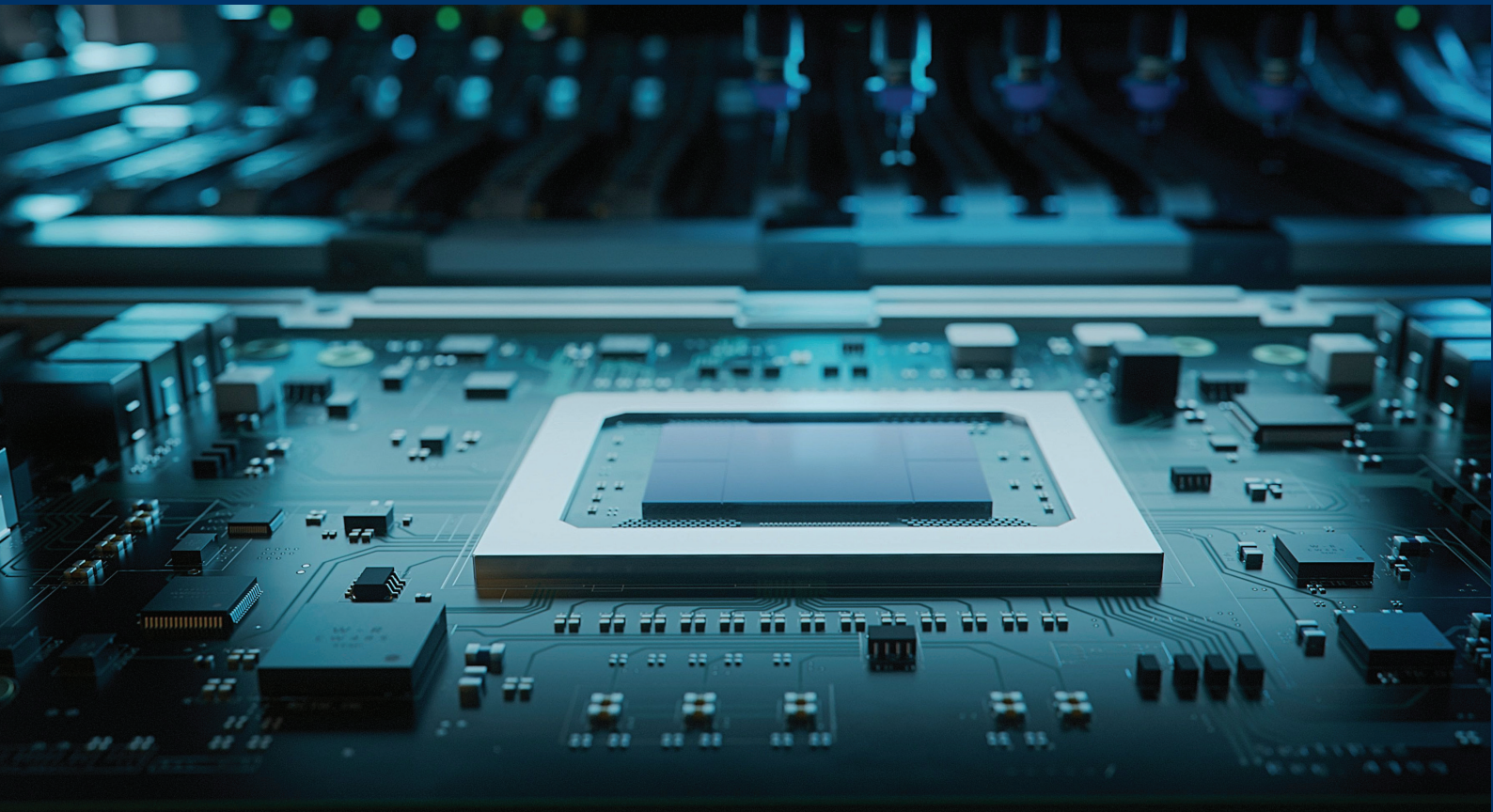


MICRO
MEASUREMENTS
A VPG Brand

MICRO-MEASUREMENTS

PRECISION STRAIN MEASUREMENT
SOLUTIONS

SENSING WHAT MATTERS



Micro-Measurements is part of Vishay Precision Group, Inc. (NYSE: VPG), a global leader in precision measurement and sensing technologies.

VPG's customers are the innovators and builders of safer aircraft and spacecraft, life-saving medical devices, advanced semiconductor technologies, smarter industrial systems, and next-gen humanoid robots. For engineers who demand accuracy, reliability, and repeatability, VPG is the partner that delivers.



ENGINEERING PRECISION WHERE IT MATTERS MOST

Micro-Measurements delivers precision strain measurement and sensing solutions that empower engineers to validate and improve performance at critical points across their systems.

THE SENSING PARTNER FOR TEST & MEASUREMENT, OEM

For more than six decades, we have been a reliable source of high-performance resistive-foil strain gages, instruments, and accessories for experimental stress analysis and strain measurement. Building on that foundation, we work with OEMs, test engineers, system integrators, and research teams to develop sensing solutions aligned with real-world conditions, system requirements, and integration needs.

As a division of Vishay Precision Group (VPG), Micro-Measurements has a robust manufacturing and R&D infrastructure, with global representation and support.

60+
YEARS OF
INNOVATION

80,000+
STANDARD
GAGE
PATTERNS

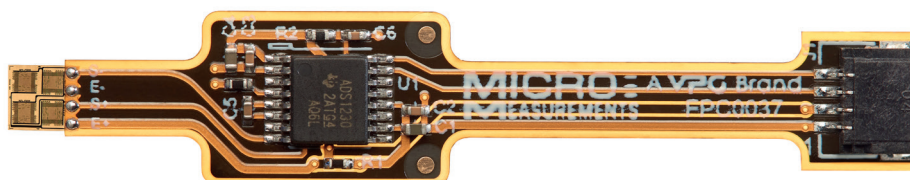
**ISO
9001**
CERTIFIED
QUALITY



WHY ENGINEERS CHOOSE MICRO-MEASUREMENTS

Micro-Measurements stands alone in combining proven measurement expertise with application-focused engineering to meet any need – from traditional strain measurement to advanced sensing for next-gen intelligent machines.

- **Proven, long-lasting performance** – Industry-leading measurement accuracy, stability, and reliability across dynamic, high-load, and long-duration applications.
- **Advanced materials** – Exclusive specialty foil alloys and high-performance backing materials.
- **Complete test and measurement solutions** – Extensive range of standard and custom gages, instrumentation, accessories, and fully integrated sensor assemblies.
- **End-to-end custom OEM solutions** – From prototype to mass production and from gages to full transducers.
- **Application co-design** – Engineering collaboration to meet specific design constraints and system requirements.
- **Expert technical support** – Application expertise, training, and engineering support through global resources and local presence.



SERVING DEMANDING INDUSTRIES & APPLICATIONS

Micro-Measurements solutions are trusted by engineers and researchers across the full spectrum of industries where precision measurement is critical to safety, performance, and innovation.



Humanoid & Industrial Robotics

We provide high-accuracy sensing solutions for force, torque, and motion control in humanoid robots, industrial robots, and co-bots. Strain gages are integrated into actuators, joints, and end-effectors to provide real-time feedback, enabling coordinated movement, responsive control, and safe human-machine interaction in dynamic, multi-axis load conditions.

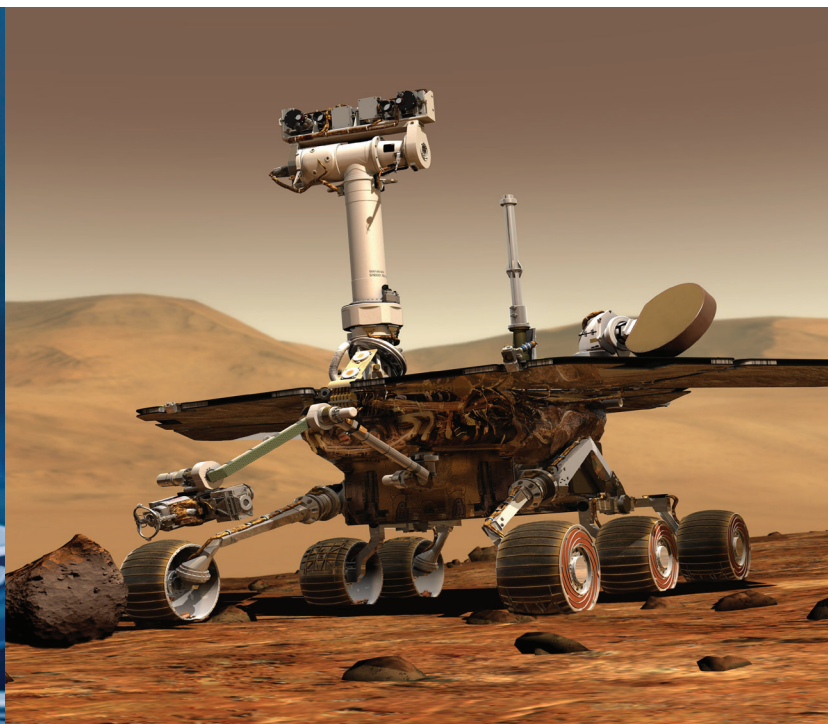
- Closed-loop force and torque feedback for responsive control
- Torque measurement in joints and actuators for coordinated human-like motion and dexterity
- Gripping and tactile force monitoring for delicate handling and interaction
- Ultra-compact, lightweight sensing for seamless system integration in space-constrained robotic systems



Aerospace & Defense

From material testing to flight validation and in-service monitoring, Micro-Measurements enables accurate, reliable strain measurement in varied aerospace and defense applications. Strain gages are applied to aircraft, spacecraft, and critical components to measure stress, load, and fatigue under demanding conditions.

- Fatigue life and structural integrity monitoring under extreme temperature, pressure, and vibration
- Material testing of metals and composites under static and cyclic loading
- Stable measurement in harsh environments, including high-temperature and cryogenic conditions
- Integration with data acquisition systems for real-time analysis





Medical Devices

Our solutions enable precise measurement of force, load, and pressure in varied medical devices, from surgical tools, implants, and prosthetics to laboratory testing and pharmaceutical systems. Strain gages are used to evaluate performance, durability, and consistency where accuracy directly impacts device function and patient safety.

- Force and tactile feedback in surgical instruments, robotic systems, and prosthetics
- High-sensitivity measurement of micro-scale forces in minimally invasive and precision devices
- Monitoring of pressure and load in infusion systems and patient-support devices
- Mechanical testing and durability evaluation under repeated use



Automotive

Micro-Measurements sensing solutions help engineers evaluate the structural performance of vehicle systems, from chassis and suspension to body structures and safety-critical components. Our strain gages measure stress, load, and fatigue during crash testing, durability assessment, and real-world validation.

- Structural testing of chassis, suspension, and body components under static and dynamic loading
- Material evaluation of steel, aluminum, and composites for strength, weight reduction, and impact performance
- Stress distribution analysis in components such as windshields under thermal and impact conditions
- Data acquisition for real-time measurement during vehicle development and testing



SERVING DEMANDING INDUSTRIES & APPLICATIONS



Oil & Gas and Renewable Energy

Micro-Measurements sensing solutions are used across diverse oil and gas operations and renewable energy systems, including wind, hydroelectric, and solar. Strain gages and force sensors measure stress, load, and pressure in pipelines, drilling equipment, turbines, and critical infrastructure.

- Load, fatigue, and pressure monitoring in pipelines, pressure vessels, offshore structures, and process systems
- Force measurement in drilling and high-load equipment, including MWD and subsea applications
- Measurement on high-temperature components without requiring extended system downtime
- Material testing of turbine components, including composite wind turbine blades under cyclic loading



Industrial Manufacturing

Micro-Measurements strain gages enable measurement of load, strain, and pressure in production machinery. Applied to components under high loads and speed, they provide data for process control, quality assurance, and reliable operation.

- Load and strain measurement in presses, die-cast machines, and production equipment under static and dynamic conditions
- Fatigue monitoring in steel components to assess life expectancy and prevent failure
- In-process measurement of force, strain, and pressure for quality control, dimensional accuracy, and process optimization
- High-speed data acquisition for real-time monitoring, including weighing systems and material handling





Electronics and Semiconductor

Micro-Measurements sensing and measurement solutions are used to evaluate mechanical strain in PCBs, semiconductor packages, and electronic assemblies. Applied during assembly, validation, and reliability testing, they provide precise, localized data on deformation and stress in miniaturized, high-density designs.

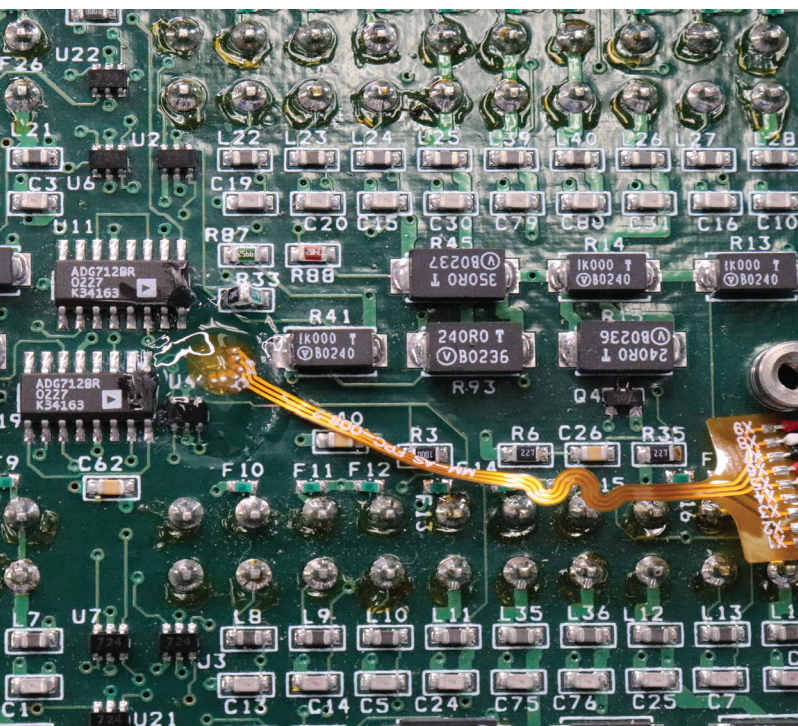
- Measurement of assembly-induced strain to assess solder joint integrity and component reliability
- Evaluation of thermomechanical strain in semiconductor packages and interconnects under operating conditions
- Shock, drop, and transport simulation to assess durability and board-level reliability
- Compact, pre-cabled sensing solutions for accurate measurement in confined, fragile assemblies



Civil Engineering and Infrastructure

Micro-Measurements sensing solutions deliver real-time strain data for structural health monitoring of civil infrastructure. Designed for field installation in challenging conditions, our strain gage solutions enable accurate load evaluation and condition assessment for long-term reliability.

- Continuous strain monitoring in concrete, steel, and composite structures to assess load distribution and structural response
- Embedded and weldable gages for installation on coated or contaminated surfaces in harsh, hard-to-access environments
- Monitoring of bridges, tunnels, dams, and foundations under traffic, environmental, and load stresses
- Geotechnical and structural assessment of stability, settlement, and performance





TEST AND MEASUREMENT SOLUTIONS

Stress Analysis Strain Gages

Micro-Measurements offers the broadest range of high-performance strain gages designed for experimental stress analysis and failure analysis. From research to testing structural integrity in diverse operating environments, our strain gages deliver accurate, reliable measurement under variable loads and forces.

Our stress analysis strain gage offering includes:

- Linear Patterns
- Shear Patterns
- Tee Rosette Patterns
- Rectangular Rosette Patterns

Key Features

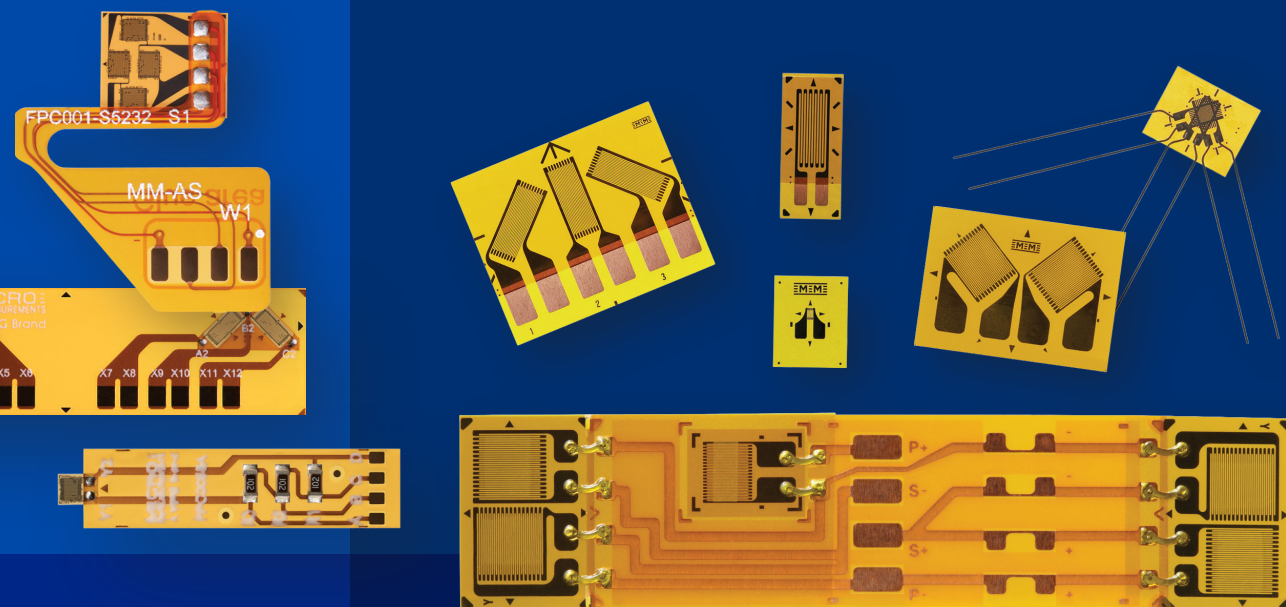
- Engineered for reliability under extreme temperatures, humidity, and mechanical stress
- Compatible with metals, composites, and varied test materials
- Integrate with most data acquisition systems and workflows
- Custom solutions available for complex and application-specific measurement requirements

High-Temperature Strain Gages

Our high-temperature strain gage solutions are engineered for precise, reliable measurement in environments where conventional gages fail. Free-filament and wire designs enable accurate strain data at elevated temperatures, ensuring data integrity in demanding applications beyond standard operating limits.

Key Features

- High-precision measurement for safety-critical applications in extreme thermal conditions
- Accurate operation in temperatures up to 1150°C (2100°F)
- Free-filament design minimizes thermal strain errors in fluctuating temperatures
- Durable wire gages ensure performance under sustained thermal stress
- Compatible with existing data acquisition systems for easy integration



Instruments

Micro-Measurements' advanced instrument solutions deliver precise and reliable data for stress analysis, enabling engineers and researchers to perform both static and dynamic testing with unmatched accuracy.

Our instrument offering includes:

Data Acquisition Systems

- Multi-channel data acquisition for static and dynamic strain measurement
- High-speed data loggers for transient event capture
- Embedded analog-to-digital converters for high-resolution, precision digitization
- Inputs for strain gages and other commonly used sensors
- Seamless integration with StrainSmart® software

Signal Conditioners

- Amplify and filter strain signals for accurate, low-noise measurement
- Built-in support for quarter, half, and full Wheatstone bridge configurations
- High-bandwidth models for dynamic and fatigue testing
- Eliminate the need for external bridge completion circuitry
- Portable and rack-mount configurations available

StrainSmart® Software

- Intuitive interface for data collection, visualization, and analysis
- Real-time insights with live data display during testing
- Easy integration with existing systems and export formats
- Simplifies configuration and control of multi-channel test systems
- Used across aerospace, automotive, and civil engineering applications

Specialty Instruments

- Model 700B Portable Welder — Lightweight, rechargeable-battery-powered
- RS-200 Milling Guide for residual stress measurements per ASTM E837
- Precision microscope and micrometer for hole depth control
- Portable strain indicators for field measurements
- Single-channel devices for dedicated monitoring tasks





OEM SOLUTIONS

Transducer Class® Strain Gages

Transducer Class® strain gages are engineered specifically for OEM production of load cells, force transducers, and pressure transducers, delivering consistent, reliable measurement from prototype through volume manufacturing. Tightly controlled materials and manufacturing processes minimize creep and hysteresis, ensuring long-term stability across units.

- High repeatability for consistent output across temperature ranges
- Wide range of creep compensation to offset inherent creep in the spring material
- Modulus compensation with temperature for stability
- Configurable geometries to meet specific OEM design requirements
- Long-term stability, reducing recalibration, and supporting extended service life

Custom Strain Gages

With over 80,000 standard gage configurations, Micro-Measurements offers an industry-leading range of strain gages. When standard products don't meet your requirements, our engineering team develops fully customized solutions.

- Non-standard gage geometry, grid material, or backing configuration
- Specialty resistance values or tolerance requirements
- Unique leadwire and cable configurations for restricted installations
- Tailored Transducer Class® gages for proprietary load cell designs

Flex Assembly

Micro-Measurements' Flex Assembly integrates Transducer Class® strain gages with flexible printed circuit (FPC) technology to deliver a complete sensing solution for OEM designs. It simplifies sensor integration, reduces installation time, and ensures precise, repeatable gage positioning within the transducer architecture.

By embedding electrical pathways and optional components directly into the flex, Flex Assembly eliminates discrete wiring and supports compact, scalable designs optimized for production. This approach improves assembly efficiency, consistency, and overall system reliability.

Assembly configurations:

- Flex with single Transducer Class® gage
- Flex with multiple gages in defined configurations
- Integration of resistors, temperature sensors, connectors, and other components



Pre-Applied Adhesives

Designed to streamline your workflow, Micro-Measurements' Pre-Applied Adhesives feature a precision-thin layer of our premium, strain-conductive adhesive – factory-applied directly to the backing of the strain gage.

Using our Pre-Applied Adhesives eliminates the need for separate adhesive stocking and handling, saves material costs and reduces the labor involved in manual adhesive application. By minimizing variables in the installation process, our Pre-Applied Adhesives also significantly lower the risk of technician error, ensuring consistent, reliable results every time.

The adhesives are dry to the touch, making them clean and easy to handle right out of the packaging.

Gage Installation as a Service

Micro-Measurements provides advanced strain gage bonding services through its StrainBond™ capability, delivering accurate, reliable measurement performance in demanding environments. From laboratory testing to harsh operational conditions, each installation is engineered to ensure long-term stability and data integrity.

The entire Gage Installation as a Service is completed in-house, ensuring full control over quality and performance. Custom gage patterns and sensor designs are developed when standard solutions do not meet application requirements.

The gage bonding and installation process:

1. Define requirements and select materials and gage patterns
2. Surface preparation and cleaning
3. Precision gage positioning and installation
4. Adhesive bonding and curing under controlled conditions
5. Environmental testing and temperature compensation
6. Calibration and final assembly



Full OEM Development

Micro-Measurements partners with OEMs in developing complete sensing systems, translating performance requirements into fully integrated transducer solutions. From early-stage design through production, we work directly with engineering teams to ensure alignment between sensing elements, mechanical design, and manufacturing processes. This approach reduces development risk, improves performance consistency, and supports efficient transition to production.

- End-to-end engineering partnership across design, development, and prototyping through volume production
- Co-design of sensing elements and transducer architectures
- Integration of strain gages, electronics, and mechanical components
- Design validation, testing, and performance optimization



ACCESSORIES

Micro-Measurements offers a comprehensive range of accessories for strain gage installation and measurement, helping ensure accurate, reliable results in both laboratory and field environments.

Adhesives

Our M-Bond adhesives line is specifically formulated to meet the unique demands of stress analysis applications, providing consistent bonding quality that ensures accurate strain transfer and repeatable measurement results. With options designed for varying temperatures, test durations, and environmental conditions, our adhesives support both quick installation for short-term testing and high-performance bonding for long-term or high-temperature applications.

Protective Coatings

M-Coat protective coatings shield installed strain gages from environmental factors such as moisture, chemicals, temperature extremes, and mechanical damage. Selection depends on operating conditions, exposure duration, and required level of protection. These coatings help preserve measurement integrity in demanding environments, from laboratory testing to outdoor and industrial applications, ensuring stable, long-term data collection.

Cleaning Agents

Surface cleaning products formulated to create the optimal conditions for bonding strain gages to various materials, for long-lasting and stable performance.

Installation Tools

A range of precision tools tested and validated for strain gage installation, to help users achieve precise placement, repeatability, and consistent results.

Bondable Terminals

Designed specifically to provide secure leadwire attachment while minimizing mechanical stress on the strain gage tabs, improving the durability of electrical connections.

Solders and Related Accessories

Strain-gage-qualified solders and fluxes that ensure strong, stable connections between gages, terminals, and instrumentation, for sustained signal integrity and long-term measurement reliability.

Wires and Cables

Leadwires and cables designed for compatibility with strain gages and measurement systems, offering flexibility and durability for both laboratory and field use.

Precision Resistors

High-stability resistors for shunt calibration and bridge completion of strain-measuring instrumentation, supporting the accuracy and stability of the fixed resistors.

Application Kits

Complete sets of tools and materials required for strain gage installation, for convenient purchase of all needed supplies and efficient setup.

Bridge Completion Modules (BCM)

MR-Series Bridge Completion Modules simplify wiring and enable accurate Wheatstone bridge completion, supporting reliable measurement when instrumentation lacks required circuitry.

EXPERT TECHNICAL SUPPORT AND TRAINING

Micro-Measurements provides unparalleled technical support and educational resources to help engineers maximize the value of their strain measurement programs.

Training Workshops

Micro-Measurements conducts an extensive series of regularly scheduled hands-on technical seminars, workshops, and short courses. These training programs are intended for managers, design and test engineers, technicians, teachers, and anyone involved in stress analysis testing or transducer development and manufacturing.

[Enter to see the upcoming course schedule](#)

Applications Engineering

Expert guidance on gage selection, installation techniques, circuit configuration, and data interpretation from specialists with decades of field experience.

Knowledge Base and Calculators

Extensive online library of technical documents, application notes, calculators, and reference guides covering all aspects of strain gage technology.

Online Tutorials

Vast library of tutorial and instructional videos on strain measurement topics — from basic installation to advanced analysis techniques.

QUALITY ASSURANCE



Micro-Measurements is an ISO 9001 Certified company.

Every product in our catalog, and all our coatings and adhesives, are manufactured to exacting standards, with rigorous quality control at every stage of production. Full process control from design to manufacturing enables lot-to-lot consistency within tight production tolerances, resulting in extremely high reliability and compliance.

ABOUT VISHAY PRECISION GROUP (NYSE: VPG)

VPG sensors, weighing solutions, and measurement systems deliver the highest levels of accuracy and reliability where precision measurement matters. Driven by innovation, our precision measurement sensing technologies provide specialized solutions that help make the world safer, smarter, and more productive. With a global manufacturing and R&D footprint, VPG brings the financial stability, investment capacity, and long-term commitment that complex engineering programs demand.

For Micro-Measurements customers, this means one thing above all: behind every product and every solution stands a corporation with the resources, the reach, and the resolve to support your most critical measurement challenges — today and tomorrow.

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