PRECISION IS OUR PROFESSION

Catalog No. E11017(2)

Introduction to Precision Measuring Instrument Solutions

— Bearing Industry Measurements —

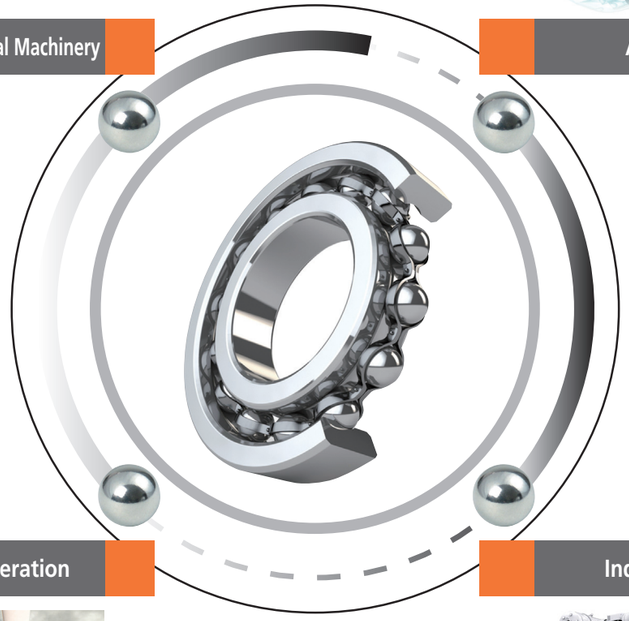
Mitutoyo

Mitutoyo provides the best measuring solutions for managing the quality of bearings

As essential components for supporting sophisticated technologies, bearings are used in a wide range of fields, such as machine tools, robots, home appliances, machines, automobiles, trains, gages, power generators, and ships. Bearings support the rotating parts of machines and reduce friction during rotation to minimize loss of power in the drive train while ensuring maximum service life and rotational integrity. Since the accuracy required of bearing rolling elements is now on the level of nanometers (nm), needs for technologies to measure rolling elements are ever increasing. Mitutoyo has outstanding solutions that meet the needs for high-accuracy measurement of bearings. This catalog gives an introduction to high-accuracy measuring machines for the bearing industry from a lineup of more than 5,500 precision measuring machines by Mitutoyo.

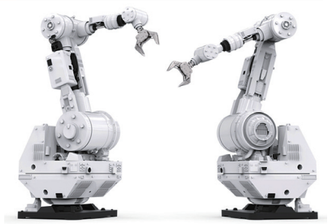
Machine Tools / Industrial Machinery

Automobiles

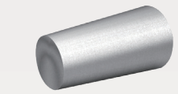


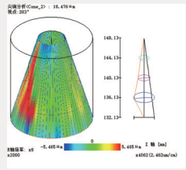
Wind Power Generation

Industrial Robots

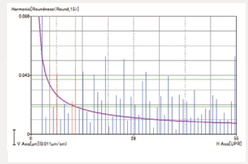


Rolling Element (Balls / Cylindrical rollers / Tapered rollers)

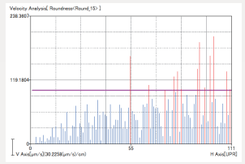




Harmonic tolerance verification

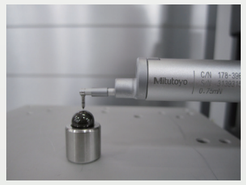


Velocity analysis



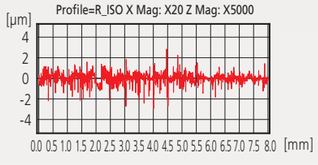
Roundness / Cylindricity Measurement Roundtest:
RA-2200 PLUS

This Roundness / Cylindricity Measurement Roundtest allows for high-accuracy analysis, such as roundness of rolling elements, harmonic analysis, tapered surface assessment, etc. Harmonic tolerance verification and velocity analysis are also carried out to assess the bearings. Furthermore, with a surface roughness detector (optional accessory), it can also accurately measure roughness in the direction of rotation and the Z-axis direction.



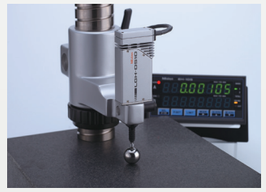
Surface Roughness Measuring Instrument: **FTA-S3000**
Portable Surface Roughness Measurement Surftest: **SJ-410 Series**

Machines for measuring the surface roughness of rolling elements are compliant with JIS B 0651, and the method and procedure for assessment are compliant with JIS B 0633. A combination of the SJ-410 Series and auto-set unit can lead to increased work efficiency by automatically completing a full measurement cycle of stylus contact, measurement, stylus retraction and detector auto return from just one button push.



CNC Surface Roughness / Contour Measurement:
CS-H5000CNC

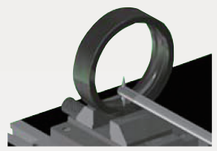
Can acquire the amount of crowning and surface roughness data for cylindrical rollers in a single trace.

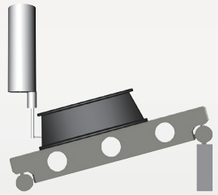


High-accuracy Linear Gage: **LGH**
Laser Scan Micrometer: **LSM**
High-accuracy Digimatic Micrometer: **MDH-25MB**

Combining high-accuracy linear gage **LGH** or laser scan micrometer **LSM** with a dedicated jig makes it possible to efficiently measure the diameter of balls and cylindrical rollers. Moreover, if the high-accuracy digimatic micrometer **MDH-25MB** with a resolution of 0.1 µm is used, this allows high-accuracy measurement with the same operability as conventional micrometers.

Inner / outer ring



Customized Taper Measuring Machine*

A dedicated tapered shape measuring system that measures the shape of the generatrix of the outer ring and inner ring raceway surfaces by tilting the tapered roller bearing to a prescribed angle using a sine bar. Improves the measurement efficiency of tapered roller bearing angle and roughness.

* Customized

CNC Surface Roughness/Contour Measurement: **CS-H5000CNC**

Can acquire roughness and contour data in a single trace, as well as efficiently and highly accurately analyze the contours of inner ring/outer ring grooves.

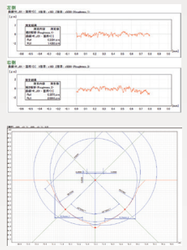


Dedicated jigs

Ultra-large Surface Roughness/ Contour Measuring Instrument: **SV-C**

A custom large-surface roughness and contour measuring system, this boasts a Z-axis measuring range of 1,000 mm. When combined with dedicated jigs, it can measure workpieces of ø30 mm to ø860 mm.

Threaded shaft and nut

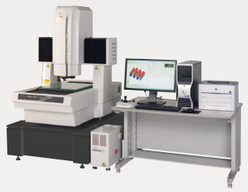
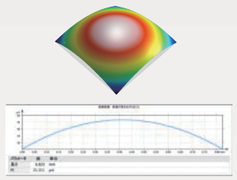

CNC Surface Roughness/ Contour Measuring Instrument: **SV-C4500CNC**

A dual-role CNC measuring machine, this allows the roughness detector to be replaced with the contour detector and vice versa to measure both roughness and contours. In addition, with the optional Y axis and θ axis, it allows continuous top-bottom measurement and accurate analysis of ball-screw groove shapes.

Retainer


CNC Vision Measuring System: **QUICK VISION Pro**

Allows high-accuracy measurement of distance-to-center and angle differences on retainers based on sharp images obtained by its high-performance optical and illumination systems.

Non-contact 3D Measuring System: **Hyper QV WLI**

The white light interferometer (**WLI**) allows non-contact, 3D shape and roughness measurement of spherical surfaces.

Constant-velocity joint (CVJ)

High Accuracy CNC Coordinate Measuring Machine: STRATO-Apex+Scanning probe **MPP-310Q**

Measures outer race and inner race ball grooves using a stylus with the same diameter as that of the balls. Can assess each P.C.D. angle with high accuracy based on centripetal point measurement by the ultra-high accuracy scanning probe **MPP-310Q**. In addition, it can also measure the ball center locus.

Rockwell Hardness Testing Machine: **HR-530**

HR-530, with a nose-type indenter shaft mechanism, can test the hardness of the inner surface of round workpieces. With 15 supported languages, the 5.7-inch color touch-screen display unit provides usability and understandability.

Large bearing

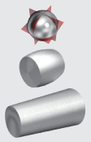
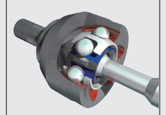
Large Bridge and Gantry CNC Coordinate Measuring Machine: **STRATO-Apex Gantry type**

Large bearings for wind power generation systems or construction equipment require large coordinate measuring machines to measure the positional tolerance of positioning holes. The **STRATO-Apex Gantry type** can easily handle large workpieces thanks to its large stroke supporting up to 4,000 mm in the X-axis, high accuracy, its moving bridge and solid foundation architecture.

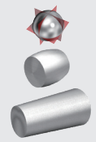
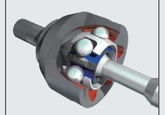
Moving-column Roundness/ Cylindricity Measuring System: Customized **RA-2200***

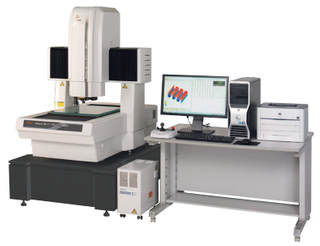
Allows efficient probing diameter change (max. ø1,500 mm) as well as efficient loading/unloading of large bearings since the column is designed to move from side to side for measurement.

* Customized

	Rolling Element (Balls / Cylindrical rollers / Tapered rollers)	Inner / outer ring	Retainer	Threaded shaft and nut	Constant-velocity joint (CVJ)	Large bearing
						
CNC Surface Roughness/ Contour Measurement **CS-H5000CNC**	Contour analysis Crowning amount Pt value Surface roughness	Groove radius Angle Shape deviation Pt value Groove roughness		Groove form and Parameter Point-contact angle Groove radius Thread pitch Groove roughness		
CNC Surface Roughness/ Contour Measuring Instrument **SV-C4500CNC**		Groove radius Angle Shape deviation (Profile of line) Groove diameter (PCD) Groove roughness		Groove form and Parameter Point-contact angle Groove radius Thread pitch Pitch circle diameter (PCD) Groove roughness		
Contour Measuring Instrument **CV-4500**		Groove radius Angle Shape deviation (Profile of line) Groove diameter (PCD)		Groove form and Parameter Point-contact angle Radius Thread pitch Pitch circle diameter (PCD)		
Surface Roughness Measuring Instrument **FTA-S3000**	Surface roughness Spherical roughness Roughness depth	Groove roughness		Groove roughness	Groove roughness	
Portable Surface Roughness Measurement Surftest **SJ-410 Series**	Surface roughness					Surface roughness
Customized Taper Measuring Machine	Taper angle Surface roughness	Taper angle Surface roughness				
Moving-column Roundness/ Cylindricity Measuring System Customized **RA-2200**						Inner/outer ring roundness
Roundness/Cylindricity Measurement Roundtest **RA-2200 PLUS**	Harmonic analysis Roundness Tapered surface assessment Flatness Generatrixl roughness	Harmonic analysis Roundness Tapered surface assessment Flatness Perpendicularity Radial runout/Total runout Generatrixl roughness				
Compact Roundness Measuring **RA-120P**	Harmonic analysis Roundness	Harmonic analysis Roundness Flatness Parallelism Perpendicularity Radial runout				




	Rolling Element (Balls / Cylindrical rollers / Tapered rollers)	Inner / outer ring	Retainer	Threaded shaft and nut	Constant-velocity joint (CVJ)	Large bearing
						
Rockwell Hardness Testing Machine **HR-530**	Hardness	Hardness		Hardness	Hardness	Hardness
High Accuracy CNC Coordinate Measuring Machine **STRATO-Apex**		Perpendicularity Parallelism Concentricity Radial runout/Total runout Flatness Diameter	True position Concentricity Diameter		Inner/outer race • Pitch circle diameter (PCD) • Angle pitch • Ball center locus	
Large Bridge and Gantry CNC Coordinate Measuring Machine **STRATO-Apex Gantry type**						Inner/outer ring, Retainer True position End face runout Perpendicularity Concentricity Parallelism
Minute-form Measuring System **UMAP Vision System** **MiSCAN Vision System**			Flat retainer Angle pitch Pitch circle diameter (PCD) Concentricity True position	Ultra-small R angle Micro contour analysis		
Non-contact 3D Measuring System **Hyper QV WLI**	Spherical form/ 3D roughness (Depends on the grade)		Flat retainer Angle pitch Pitch circle diameter (PCD) Concentricity True position			
CNC Vision Measuring System **QUICK VISION Pro**			Angle pitch Pitch circle diameter (PCD) Concentricity True position			
High-accuracy Linear Gage **LGH**	External diameter of balls and rollers					
Laser Scan Micrometer **LSM**	External diameter of balls and rollers					
High-accuracy Digimatic Micrometer **MDH-25MB**	External diameter of balls and rollers					
Dial Indicator **2046S**	External diameter of balls and rollers					

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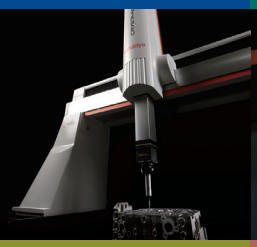
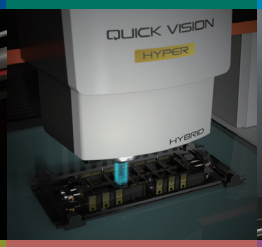
Coordinate Measuring Machines



Vision Measuring Systems

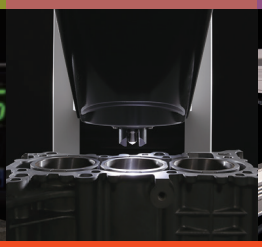


Form Measurement

Optical Measuring

Sensor Systems

Test Equipment



Digital Scale and DRO Systems

Small Tool Instruments and Data Management

Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Find additional product literature and our product catalogue

https://www.mitutoyo.co.jp/global.html

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If the purchased product is exported, even though it is not a regulated item (Catch-All controls item), the customer service available for that product may be affected. If you have any questions, please consult your local Mitutoyo sales office.

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