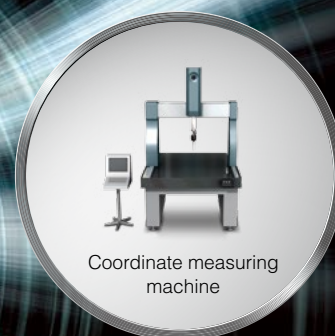


KEYENCE



6-in-1

Six measurement and observation devices in one compact unit

3D Optical Profilometer

VR Series

6-in-1

3D Optical Profilometer

3D Characteristics

collected in
one device

Problems

solved by
one device





Contact profiler

Measurement

High-accuracy but inconsistent measurement results



Laser microscope

Observation

Measurement

High-accuracy but narrow scan area



Measuring microscope

Observation

Measurement

Measure during imaging but difficult to record data



Coordinate measuring machine

Measurement

Multipurpose but difficult to operate



3D scanner

Measurement

Fast but poor measurement resolution



Stereoscope

Observation

Easy-to-use but limited functionality



Contact profiler



Laser microscope



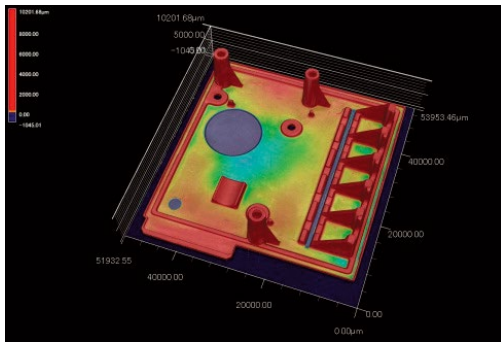
Measuring microscope

Problems

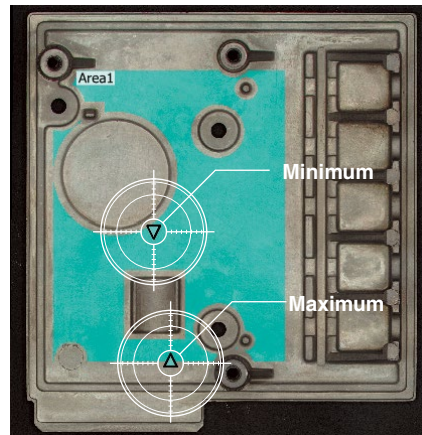
Roughness over the entire surface cannot be measured

6-in-1 measurement system provides solutions

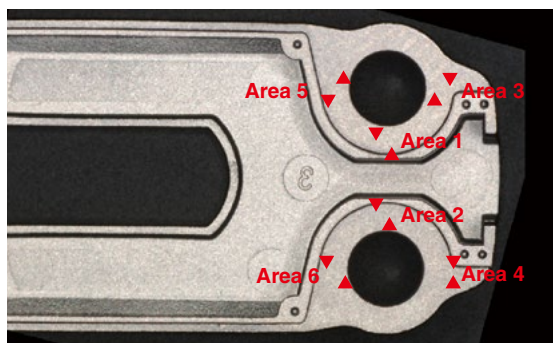
Surface measurements can be performed over a large area, which makes it possible to visualize curvatures and measure maximum and minimum points (flatness).



Measurement area	Average height	Maximum height	Minimum height	Maximum - minimum
Area 1	3.06 μm 0.12 Mil	79.07 μm 3.11 Mil	-40.53 μm -1.60 Mil	119.60 μm 4.71 Mil



The average height of a specified area can be easily measured, allowing for comparative evaluations.



Measurement area	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Average height	3.94 mm 0.16"	3.95 mm 0.16"	3.89 mm 0.15"	3.98 mm 0.16"	3.93 mm 0.15"	3.96 mm 0.16"



Contact profiler



Laser microscope



Measuring microscope

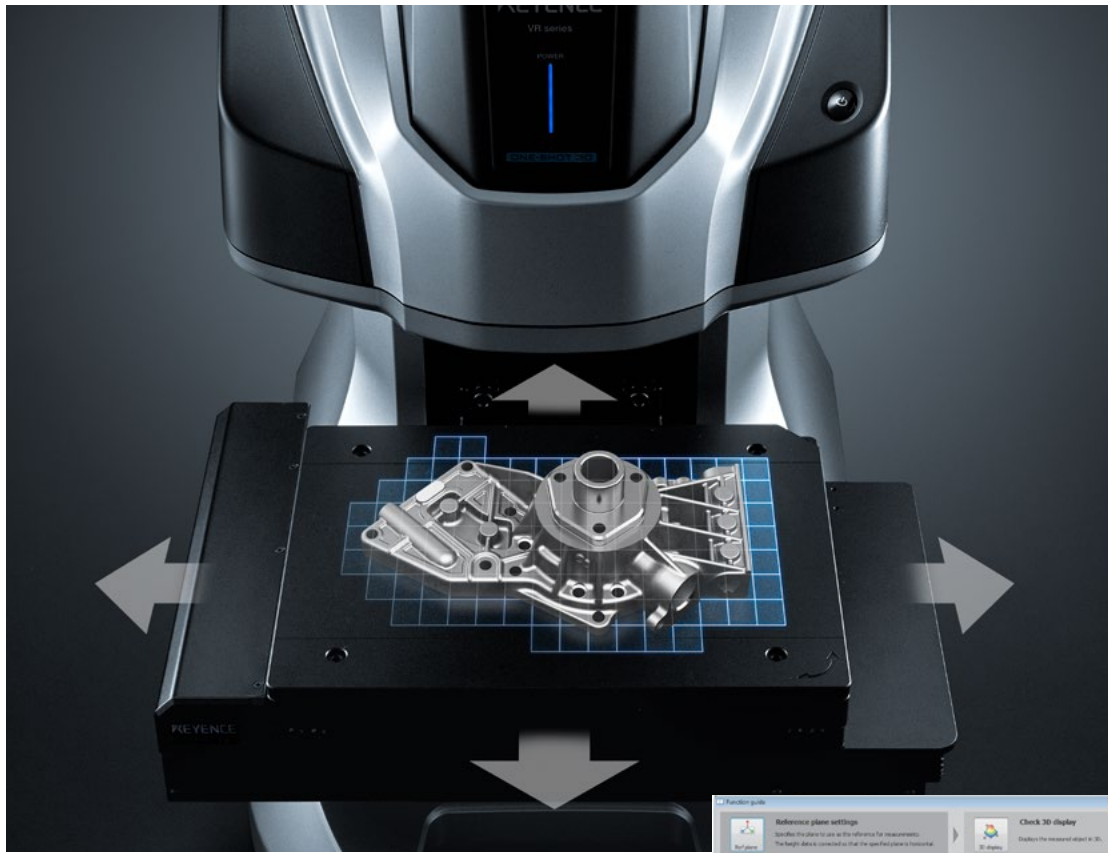
Problems

Only points, lines, and small areas can be measured

6-in-1 measurement system provides solutions

An area of up to 150 mm x 300 mm **5.91" x 11.81"** can be measured with a Z-resolution of 0.1 μm .

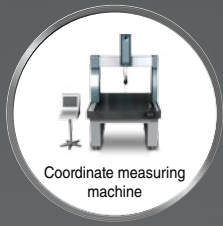
Each 18 mm x 24 mm **0.71" x 0.94"** area contains nearly 800,000 measurement points.



Viewing area (wide-field mode)	With stitching	300 mm x 150 mm 11.81" x 5.91"
	One-shot measurement	24 mm x 18 mm 0.94" x 0.71"
Display resolution	Height measurement	0.1 μm 0.004 Mil
Repeatability (σ)	Width measurement	0.5 μm 0.02 Mil



Contact profiler



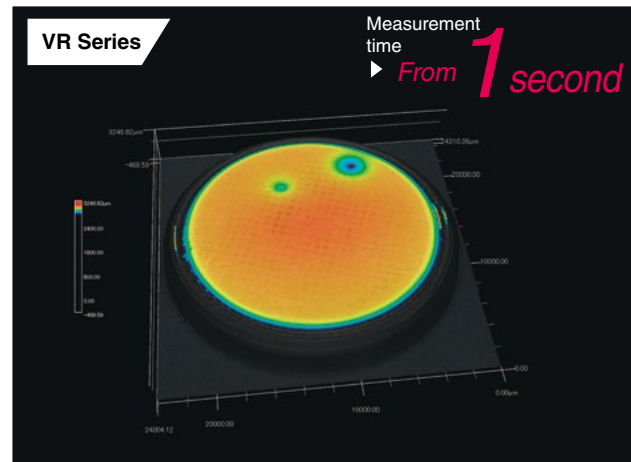
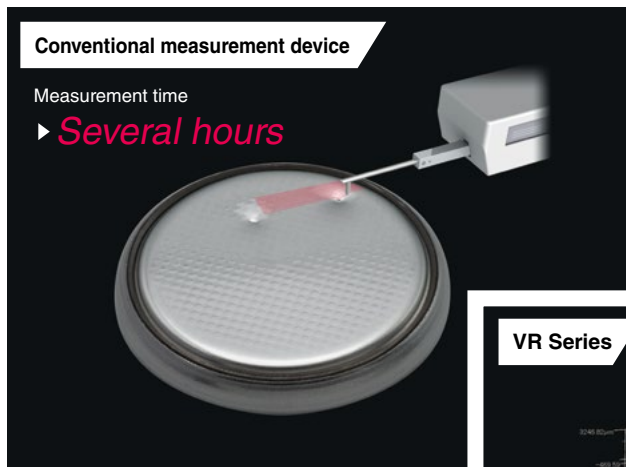
Coordinate measuring machine

Problems

Measuring the correct location is difficult

6-in-1 measurement system provides solutions

With conventional measurement systems that utilize a stylus or probe to measure a surface, setting the correct location can be very time-consuming and challenging. Usually, multiple measurements need to be done in order to locate the highest or lowest point.

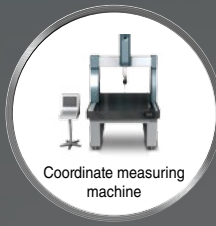


Since data is captured across an entire area, the proper location can be measured the first time

With the VR Series, surfaces can be measured in as little as 1 second. Finding the highest or lowest point can be done quickly, and an exact measurement through that location can be obtained by anyone.



Contact profiler



Coordinate measuring machine



3D scanner

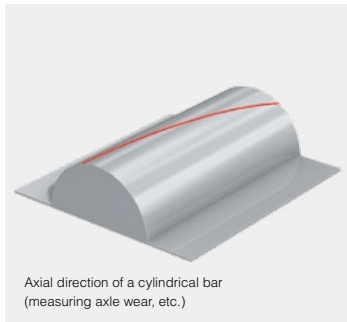
Problems

Measurements are user-dependent

6-in-1 measurement system provides solutions

Conventional measurement systems depend on users to set the stylus or probe location, which can lead to inconsistent results.

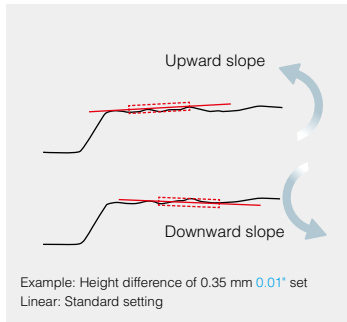
With normal measurement devices, settings such as the measurement location, baseline, and measurement speed are extremely difficult to configure, which means that only specialists can use the equipment.



Axial direction of a cylindrical bar (measuring axle wear, etc.)

The probe does not scan the targeted location.

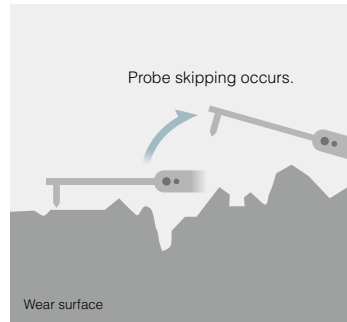
It can be challenging to set up the probe to scan along a curved area or a very specific location.



Example: Height difference of 0.35 mm 0.01^* set Linear: Standard setting

Improper baseline settings cause errors.

Creating a baseline to correct for any tilt that the object has can be difficult when just using a single line.



Probe skipping occurs.

Probe skipping occurs depending on the measurement speed.

If the measurement speed is set too high, the stylus tip may skip across the surface and fail to measure subtle shapes.

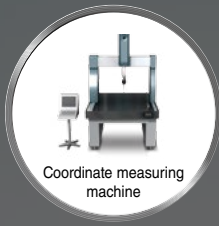
Simply press the measurement button.

VR Series measurements are performed simply by placing the sample on the stage and clicking a single button. Anyone can obtain all the desired X, Y, and Z data of the sample to measure.





Contact profiler



Coordinate measuring machine



3D scanner

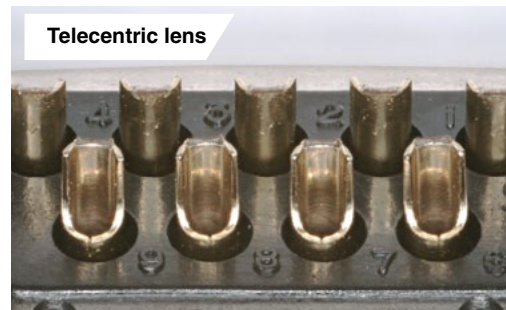
Problems

No imaging capability

6-in-1 measurement system provides solutions

Telecentric lenses with a large depth-of-field

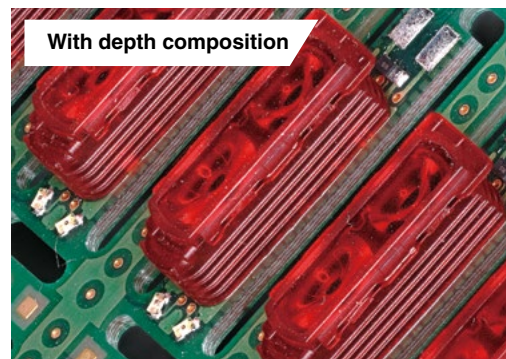
The VR Series is designed with unique telecentric lenses created with advanced optical technology developed through 20 years of optical design experience. These high-quality lenses make observation possible with high resolution, minimal distortion, and a large depth-of-field.



Connector 12x

Extended depth-of-field function

Telecentric lenses combined with the KEYENCE Depth Composition function allow for sharp focus of an entire surface without the need for any manual manipulation of the part. This function produces fully-focused images of samples, even when working at high magnification, where depth-of-field is limited.



PCB 12x



Stereoscope



Laser microscope



Measuring microscope

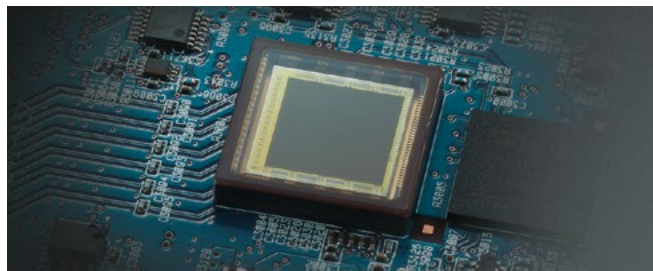
Problems

Limited imaging quality and contrast

6-in-1 measurement system provides solutions

High-definition imaging

The VR Series is equipped with a high-resolution camera that can capture images at up to 4 megapixels at magnifications from 12x to 160x.

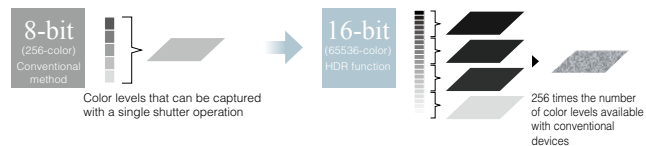


4 megapixel 3 CMOS camera

Red, green, and blue data is obtained for each pixel, which enables clear observation with excellent color reproduction.

Observation that surpasses the limits of optics

Thanks to its evolved high-performance graphics engine, the VR Series obtains 16 bits of red, green, and blue color data for each pixel instead of the conventional 8 bits of observation data. This makes it possible to faithfully reproduce the surface of the target to a level that was not previously possible.



Conventional

- Only a narrow range of brightness can be captured, and any brightness that exceeds this range becomes glare.
- Detailed contrast cannot be expressed due to the limited gradation range.

VR Series

- A wide range of brightness can be captured, so glare does not occur.
- Small changes in contrast can be collected with detailed gradation data.



Without HDR

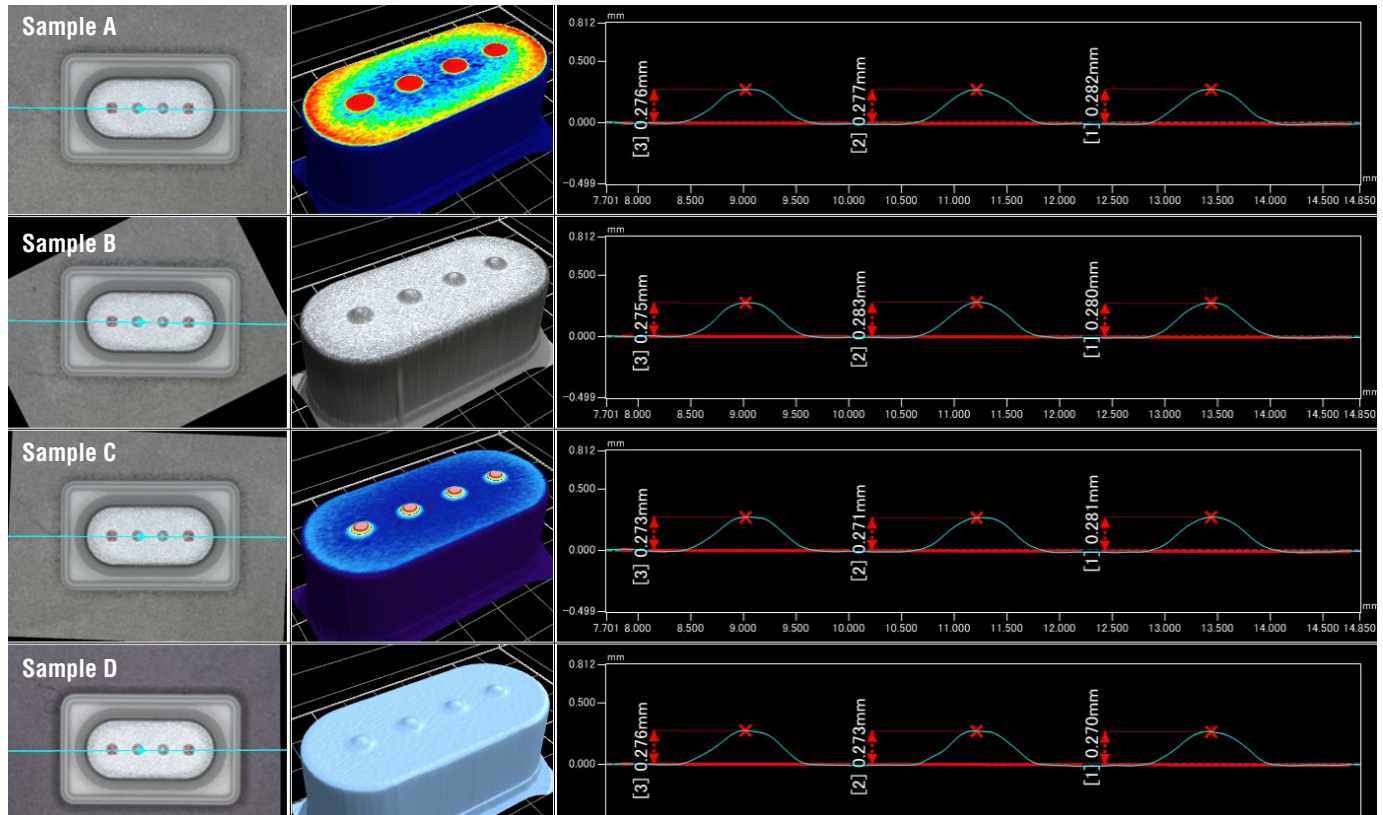


With HDR

Resin surface 12x

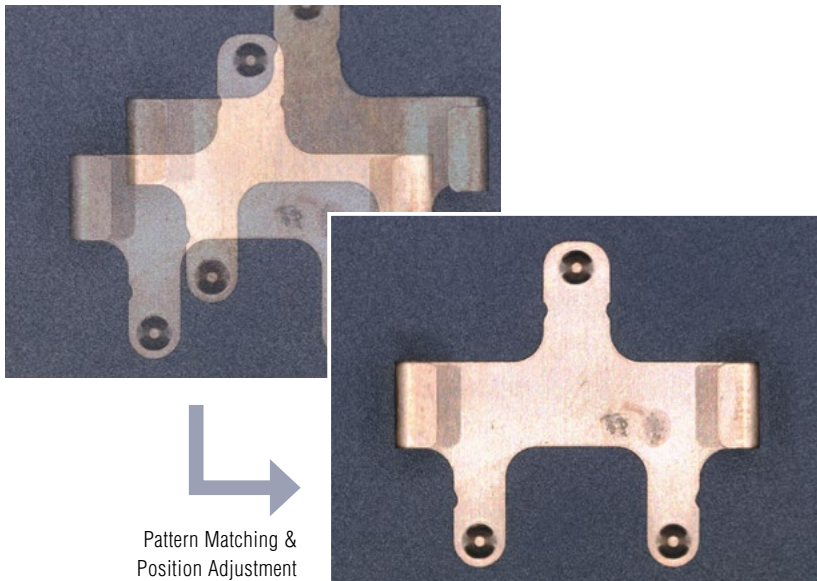
Compare and differentiate between multiple samples simultaneously

NEW Multi-file analysis function



Measurements including cross-section, volume, area, planarity, and roughness can be performed on several files simultaneously and under the same measurement conditions. For example, users are able to see changes in topography or shape between prototypes that were made under different manufacturing conditions or to visualize and measure surface wear over time. This greatly reduces the number of operations and process time required for measurement and prevents mistakes from occurring due to changes in measurement conditions.

Advanced support functions for improved analysis

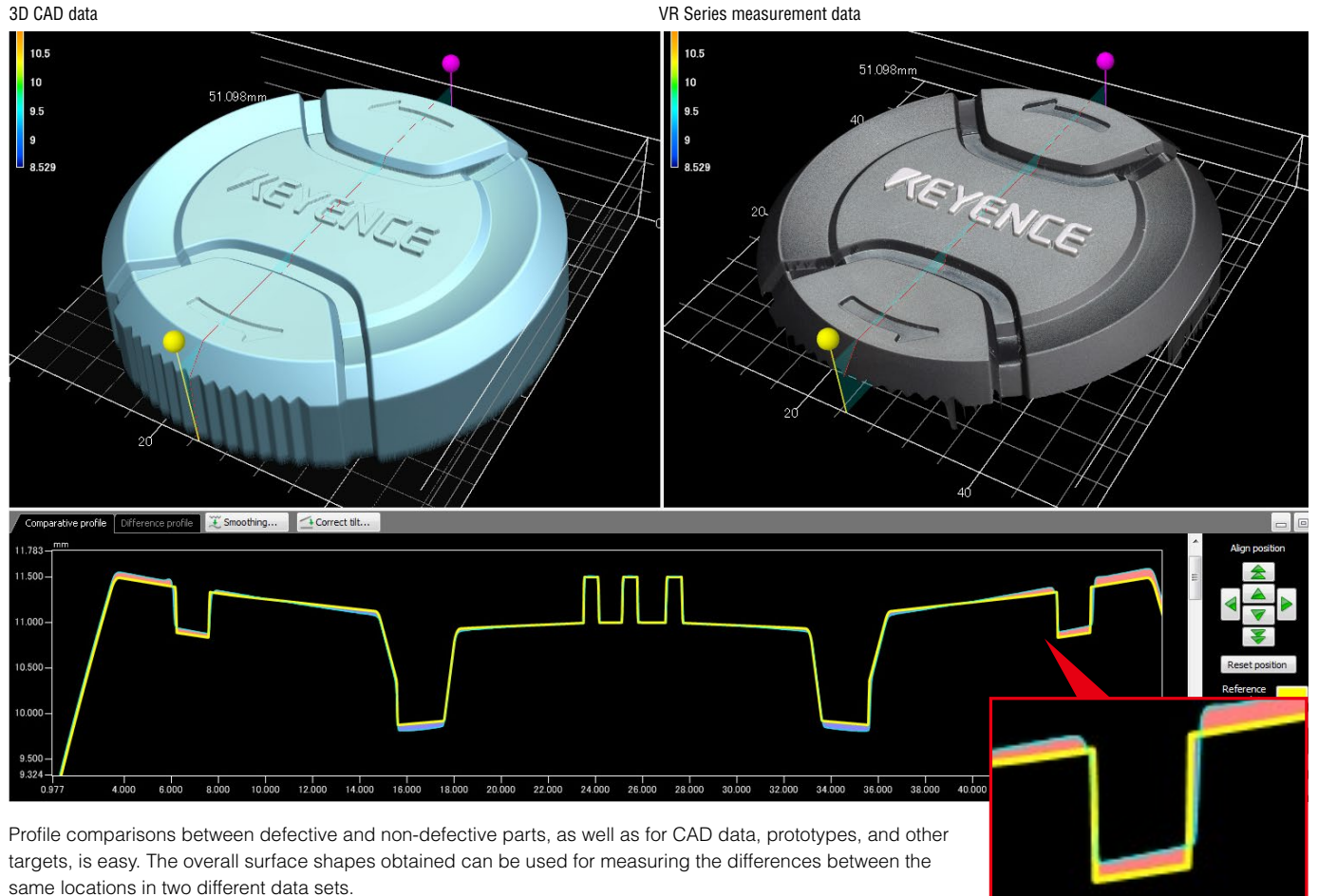


High reproducibility: Position Adjustment & Pattern Matching

A semi-transparent master image is displayed on-screen to be used as a reference for position alignment. Simply place the object near the reference image and click a button to perform automatic positioning. Additionally, small changes in alignment can be corrected through the use of highly-accurate pattern matching.

Visualization and quantification of surface shape differences

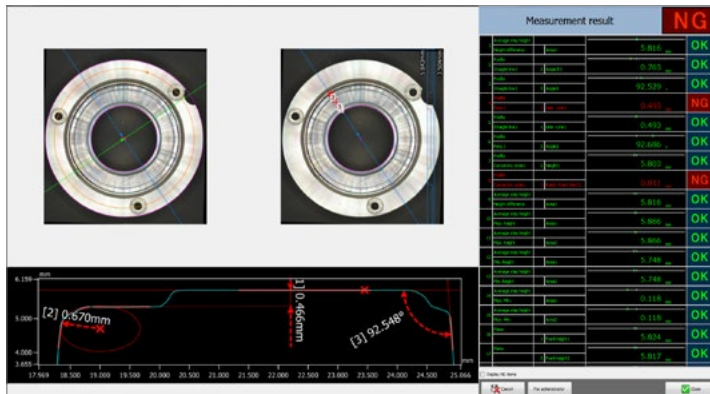
NEW Profile comparison measurement function



Profile comparisons between defective and non-defective parts, as well as for CAD data, prototypes, and other targets, is easy. The overall surface shapes obtained can be used for measuring the differences between the same locations in two different data sets.

Quick and easy 3D shape inspection

NEW Pass/Fail judgment function



Based on registered tolerances, pass/fail (OK/NG) judgment can be made as soon as measurements are taken. This saves inspection time in various quality and analysis applications such as setting prototype conditions or performing acceptance inspections.



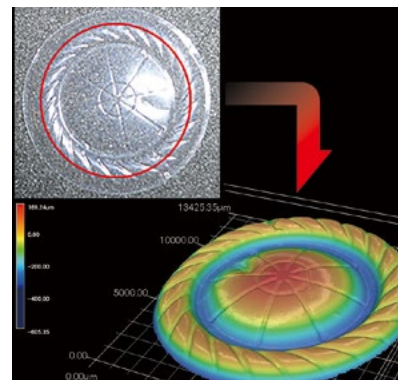
ELECTRICAL/ELECTRONIC INDUSTRY **MEASURING THE SHAPE OF DIAPHRAGMS**

CURRENT EQUIPMENT **CONTACT PROFILERS AND LASER DISPLACEMENT SENSORS**

It takes 1 to 2 hours to measure a line using a contact profilometer or laser displacement sensor. Since users have to position the object and measurement location for each part, results can vary and be incredibly difficult to reproduce.

VR Series

The overall shape of an object can be measured in as little as four seconds, without having to make contact with the part. Measurements that are difficult to make with other systems - curvature lines, etc. - can be done repeatably between users. Having 3D data over an entire surface also provides operators with a better understanding of their parts and helps to improve management of prototypes and manufactured products.



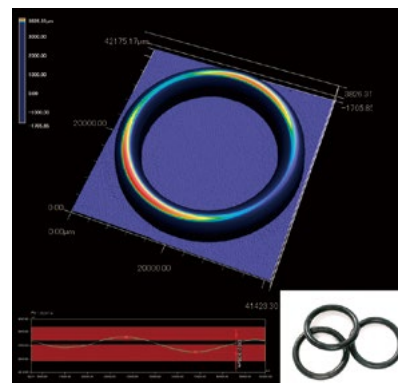
CHEMICAL MATERIAL INDUSTRY **EVALUATION OF O-RING SEAL CAPABILITY**

CURRENT EQUIPMENT **CONTACT PROFILERS**

With contact measurement devices, the probe catches on the rubber, which leads to probe skipping. Data can be acquired by performing measurements at a very slow speed, but this requires a large amount of time. The overall trends cannot be understood with a single measurement, so measurements must be performed multiple times, which is very inefficient.


VR Series

The entire ring shape can be measured in approximately 1 second, which greatly improves efficiency. Because a non-contact measuring method is used, there is no need to worry about the probe getting caught on the ring. There is no need to perform multiple measurements because the entire surface is captured in a single operation. This makes it possible to quickly determine the location that is the cause of the fluid leak.



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www.keyence.com

SAFETY INFORMATION
 Please read the instruction manual carefully in order to safely operate any KEYENCE product.

CONTACT YOUR NEAREST OFFICE FOR RELEASE STATUS

KEYENCE CORPORATION OF AMERICA

500 Park Boulevard, Suite 200, Itasca, IL 60143, U.S.A. **PHONE:** +1-201-930-0100 **E-mail:** keyence@keyence.com

KEYENCE CANADA INC.

E-mail: keyencecanada@keyence.com

KEYENCE MEXICO S.A. DE C.V.

E-mail: keyencemexico@keyence.com