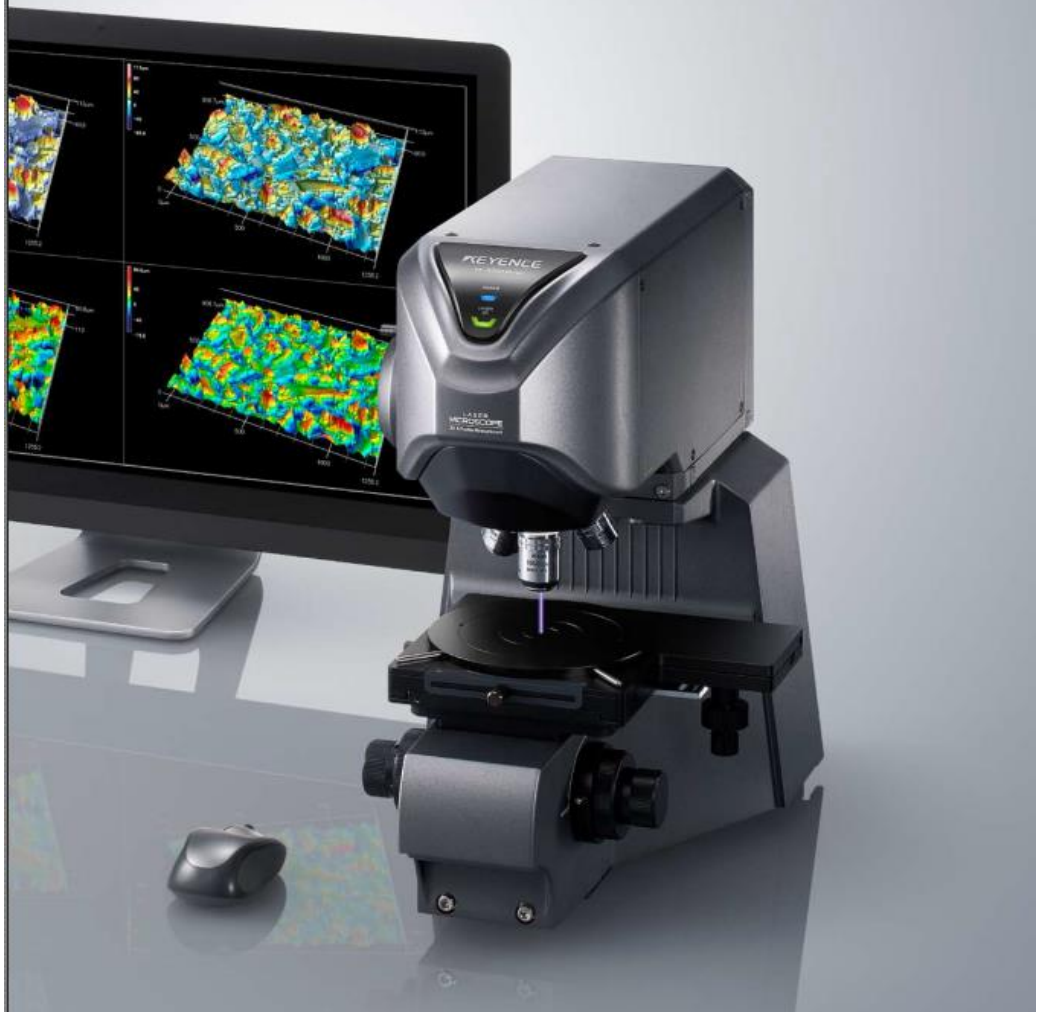
KEYENCE

NEW **Shape Analysis Laser Microscope**
VK-X250/X150/X120



ACCURACY & SIMPLICITY

THAT SHOW THE DIFFERENCES BETWEEN SURFACES

16 BIT

16-BIT
LASER MICROSCOPE OFFERS
MANY ADVANTAGES
OTHERWISE IMPOSSIBLE

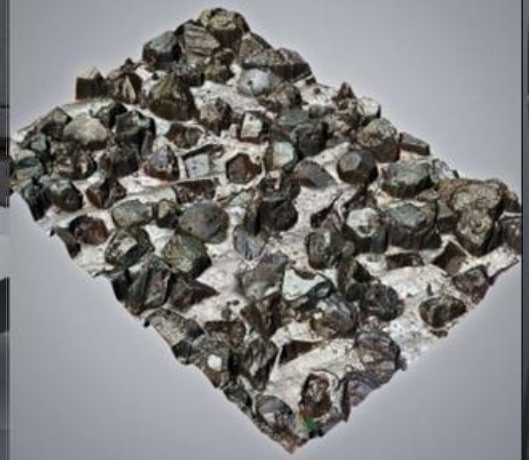
EASY & FAST

HIGH-RESOLUTION COLOR OBSERVATION
WITHOUT PRE-PROCESSING

- 16-bit colour observation
- No pre-processing or vacuuming required
- No restrictions on samples

With SEMs

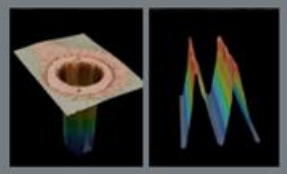
Because vacuuming is required, it takes time before starting observation. While there are restrictions on samples, observation is possible only in monochrome.



NO RESTRICTIONS ON TARGETS

HIGH-ACCURACY MEASUREMENT WITH
PINHOLE CONFOCAL SYSTEM

- Measures even steep shapes with low noise
- Can measure even inclined samples
- High horizontal resolution



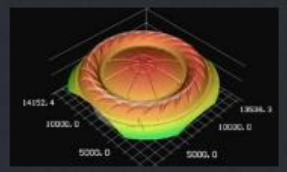
With optical interferometers

Measurement is difficult except for surfaces that reflect light strongly. In addition to this poor angle characteristic, inclination correction is required and the horizontal resolution is the same as with optical microscopes.

NON-CONTACT MEASUREMENT

HIGH-ACCURACY
LASER SCANNING

- No damage to targets
- Instance measurement of desired position
- Laser spot diameter of 0.2 µm



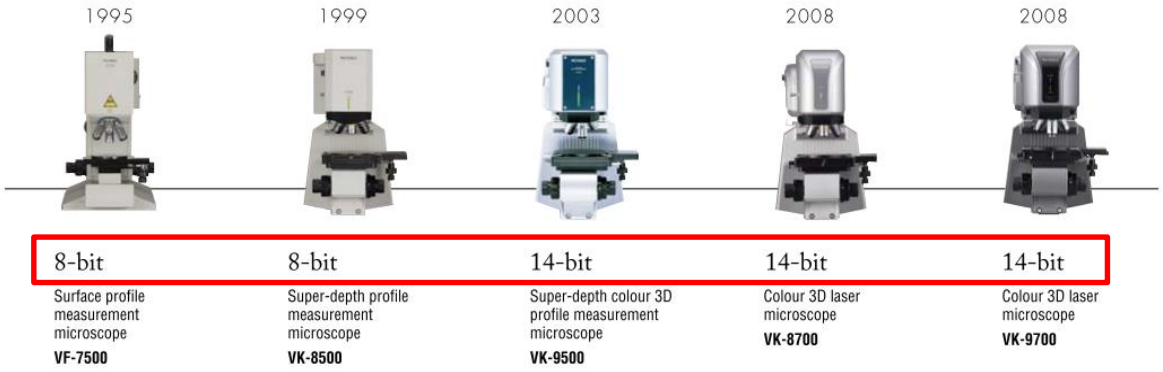
With roughness meters

There are various restrictions and limitations on measurement, including limitations on targets due to the measurement method that brings a needle into contact with the sample surface.

ADVANCED LASER MICROSCOPE

16-bit Shape Analysis Laser Microscope: VK-X260/X160/X130 Series

HISTORY OF LASER SCANNING MICROSCOPES

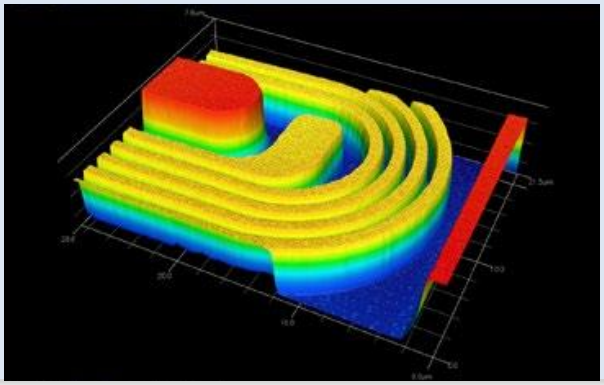


High-resolution/High-Magnification observation

As with color SEMs, high versatility is provided with high-resolution, fully-focused images and X/Y dimension measurement to support traceability.

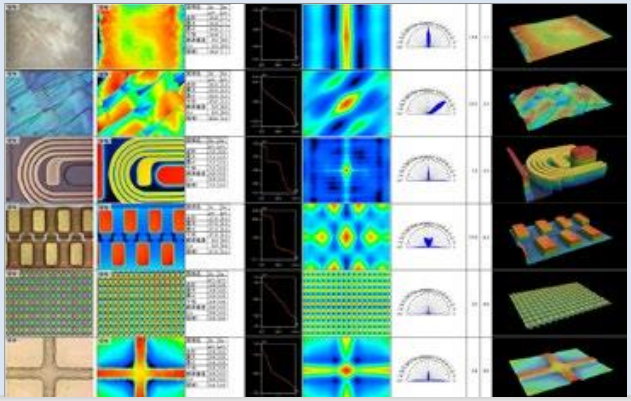
Highest Accuracy in the industry

Our original sensing technologies have improved the laser sensitivity by 16 times over conventional models



Fully-Automatic Measurement

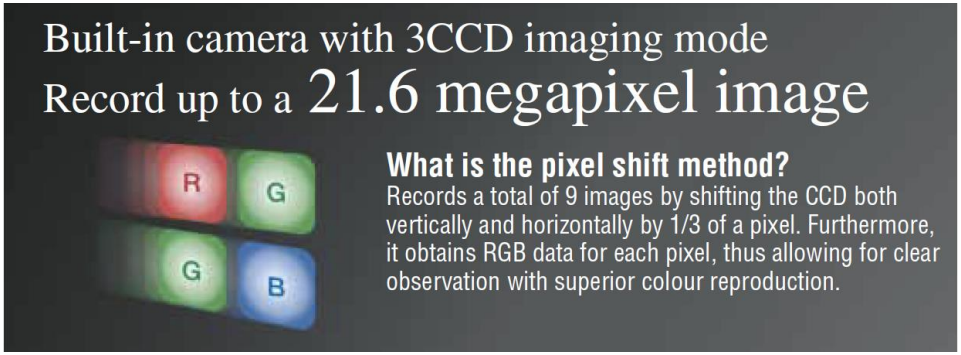
Automatic recognition of the shape and material of a sample produces consistent measurement results.



High-resolution/High-Magnification observation

Super High-resolution Observation and True Color

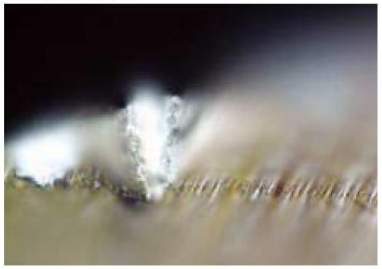
Equipped with a 21.6 megapixel, 3CCD camera



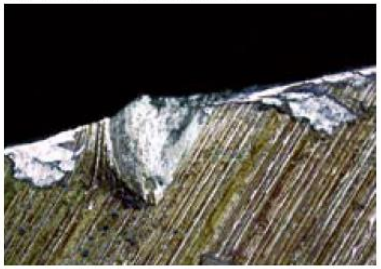
Fully focused images even at high magnification

HIGH-SPEED DEPTH COMPOSITION FUNCTION/ AUTO FOCUS

OPTICAL IMAGE

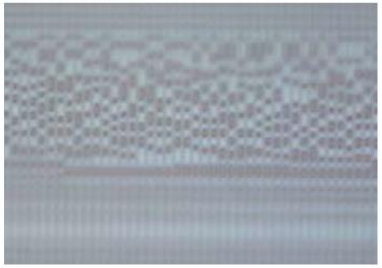


DEPTH COMPOSITION IMAGE

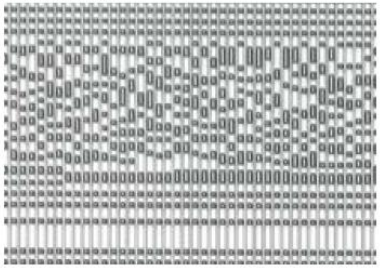


Blade edge (1000×)

OPTICAL IMAGE



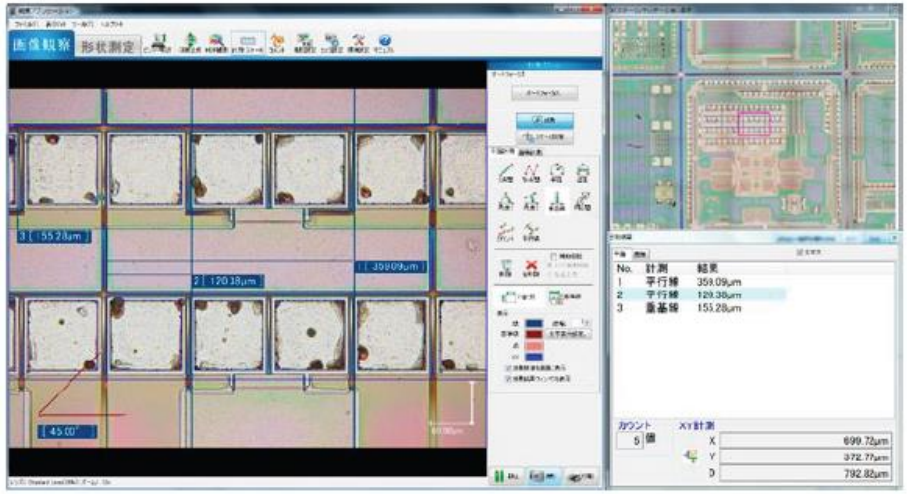
LASER IMAGE



Disk pits (6000×)

Real-time measurement on screen

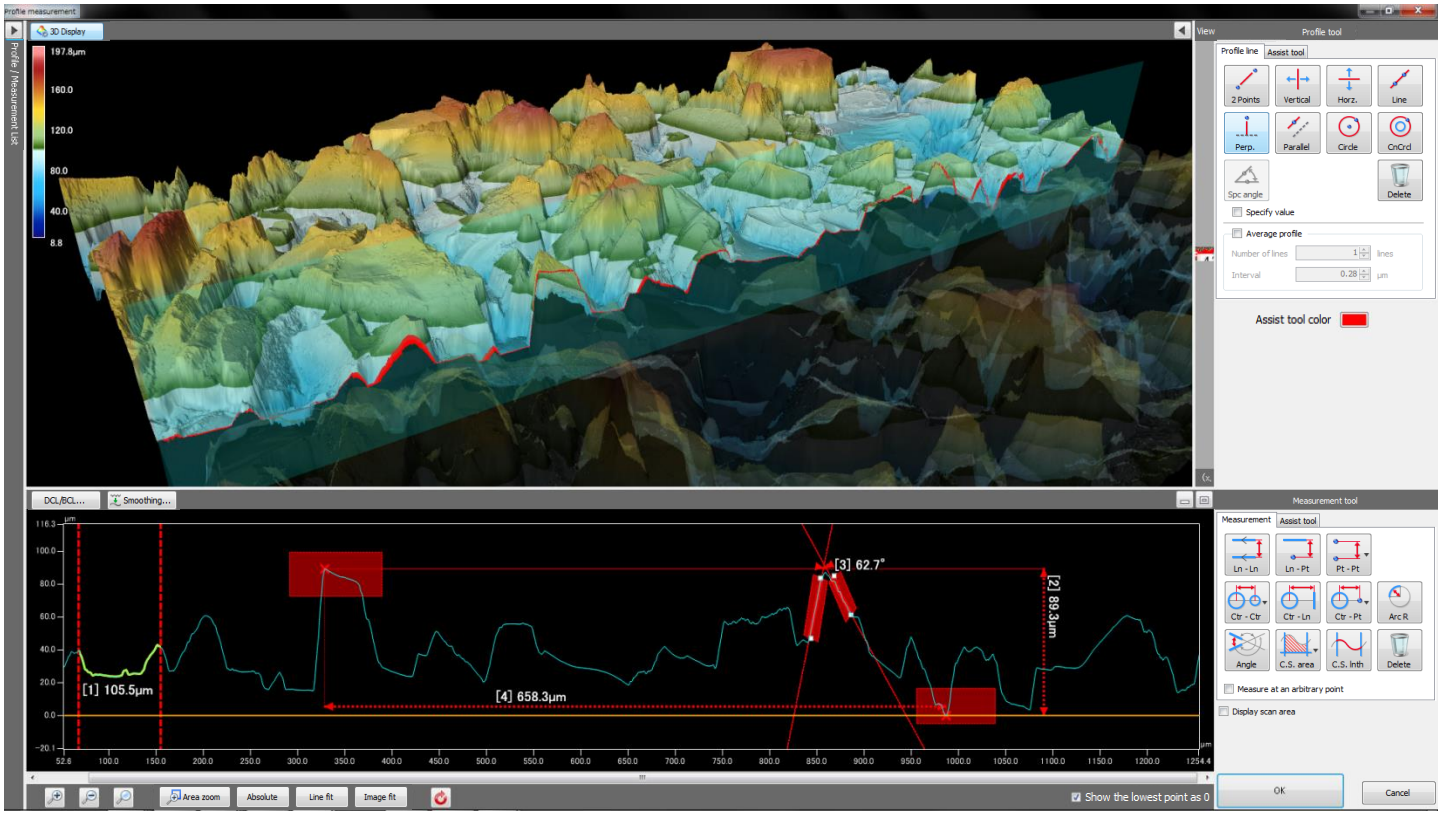
X/Y DIMENSION MEASUREMENT (TRACEABILITY SUPPORT)



Instantaneous scanning of shapes with laser

Laser x 16 bits =

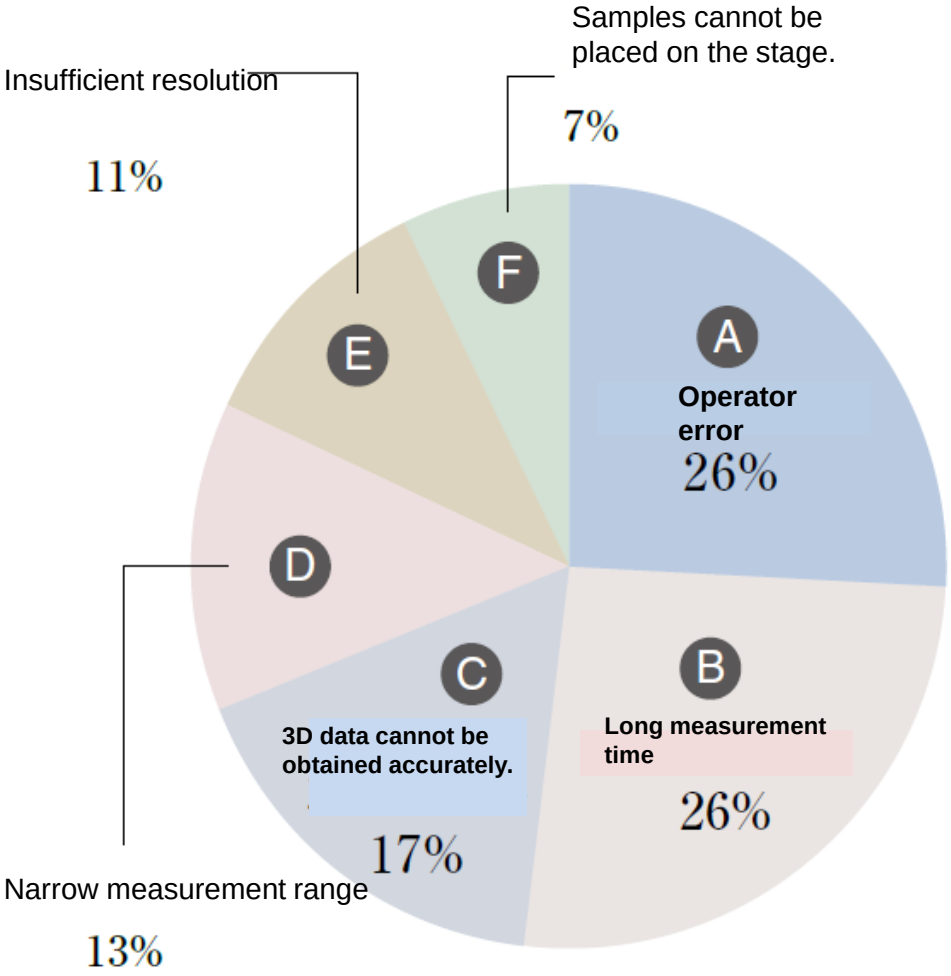
HIGH-ACCURACY 3D MEASUREMENT



High-resolution/High-Magnification observation

〈 **Problems of measuring instrument users**

〉 Investigatio performed by KEYENCE



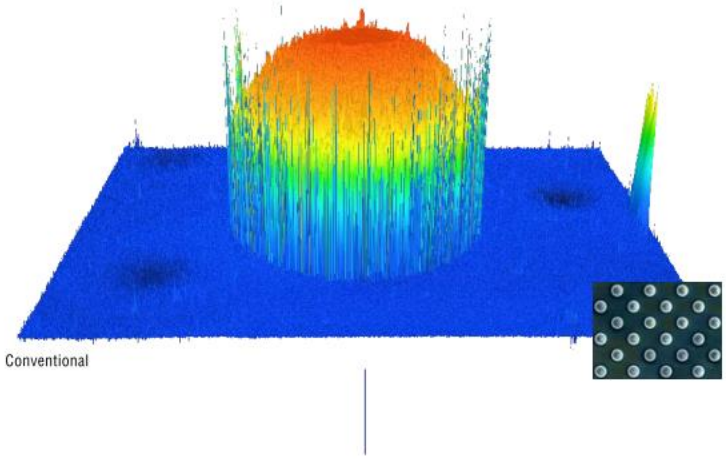
World's first

FULLY-AUTOMATIC MEASUREMENT AI-SCAN

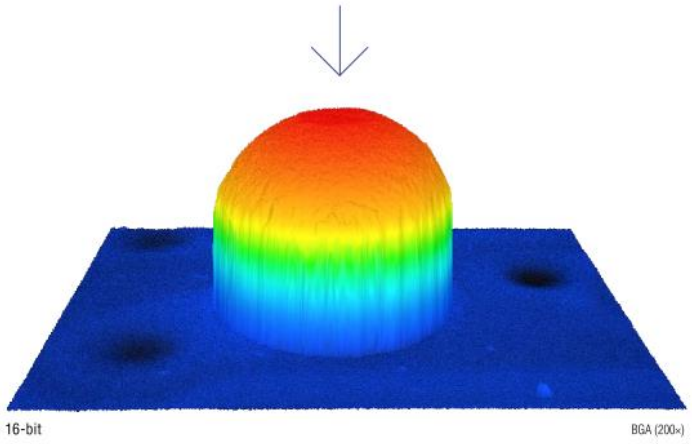
Simple clicking achieves the same measurement as experienced operators

Highest Accuracy in the Industry

16-BIT SENSING

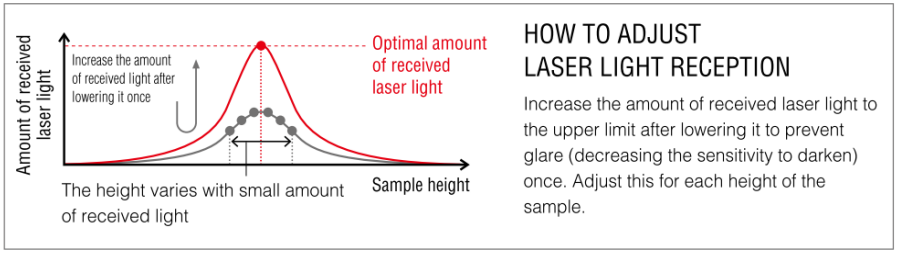


CAN MEASURE WHAT USED TO BE IMPOSSIBLE



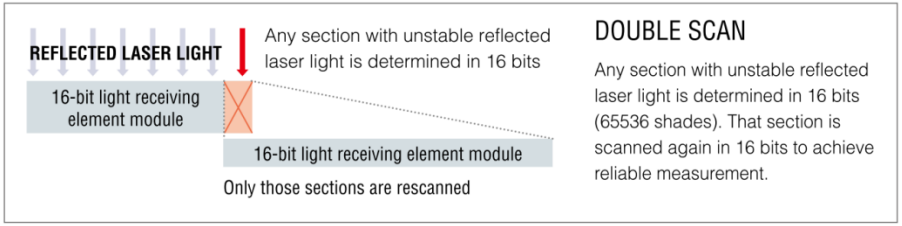
Optimally adjusts laser light intensity (AI-Scan support function 1)

AAGII FUNCTION (AAG = ADVANCED AUTO GAIN)



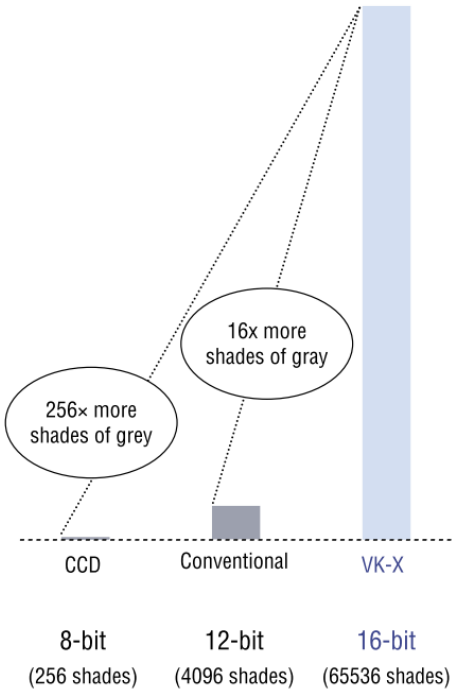
Reliable measurement with double scan (AI-Scan support function 2)

DOUBLE SCAN FUNCTION



Highest Accuracy in the industry

PERFORMANCE DIFFERENCES AMONG LIGHT RECEIVING ELEMENTS



CAN MEASURE FROM A DISTANCE

Takes further advantage of 16 bits

EXTENSIVE LENS LINEUP

Fluorite having low refraction and colour aberration used as the lens material

Comprehensive lineup including lenses with long working distances for setting samples at a safe distance

Examples of lenses with long working distances	Monitor magnification	Working distance
Standard 5× lens	100×	22.5 mm
Ultra-long range 20× lens	400×	20.5 mm
Ultra-long range 50× lens	1000×	13.8 mm
Ultra-long range 100× lens	2000×	4.7 mm

TRACEABILITY SYSTEM

Z	X-Y
National Standard	**National Standard**
National Institute of Advanced Industrial Science and Technology (AIST)	National Institute of Standards and Technology (NIST)
JCSS accreditation body	
Step measurement device	Coordinate measurement device
Standard step	Standard scale

ANALYSIS AUTOMATION TOOL AI-ANALYSER

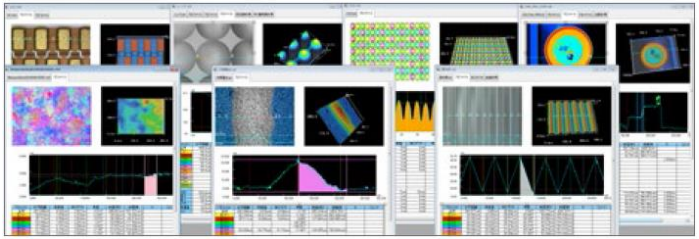
SHOWS THE DIFFERENCES YOU NEED TO KNOW

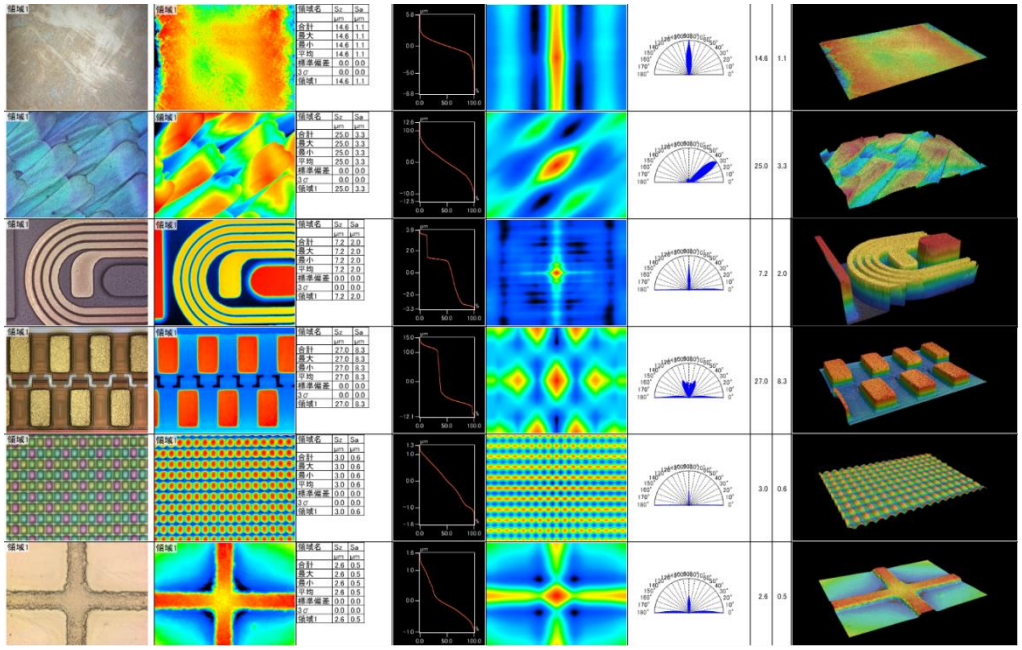
Fully-Automatic Measurement

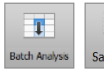
ARRANGES AND SHOWS MULTIPLE FILES

MULTI-FILE VIEW

Separate result outputs require longer analysis time and hinder understanding.
Their summarization in Excel also takes time.



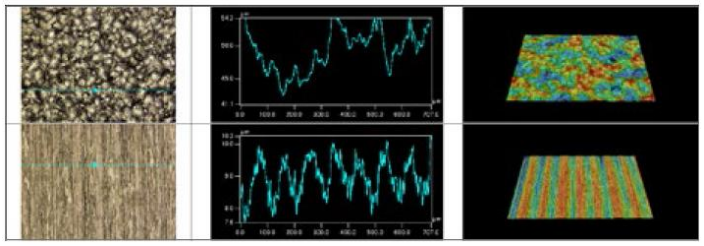


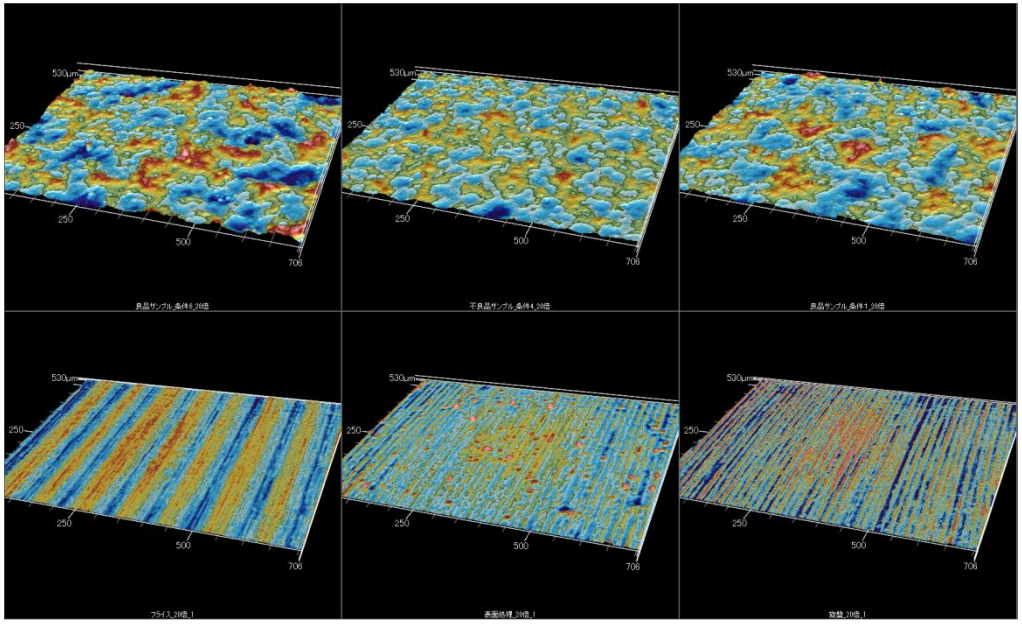


COLLECTIVE ANALYSIS OF MULTIPLE FILES

AUTO ARRANGE

Due to an unaligned height range, it cannot tell visually which projections and depressions are greater. Measurement positions differ between two files.





Fully-Automatic Measurement

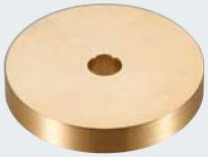
Recommendation

EASY TO UNDERSTAND SAMPLE ROUGHNESS VARIANCE INDICES

ROUGHNESS PARAMETER SUGGEST

OK sample: Ra = 1.8

NG sample: Ra = 1.8



For different appearance and touch, it cannot be determined which roughness parameters to use for evaluation. Neither Ra nor Rz reveals differences.