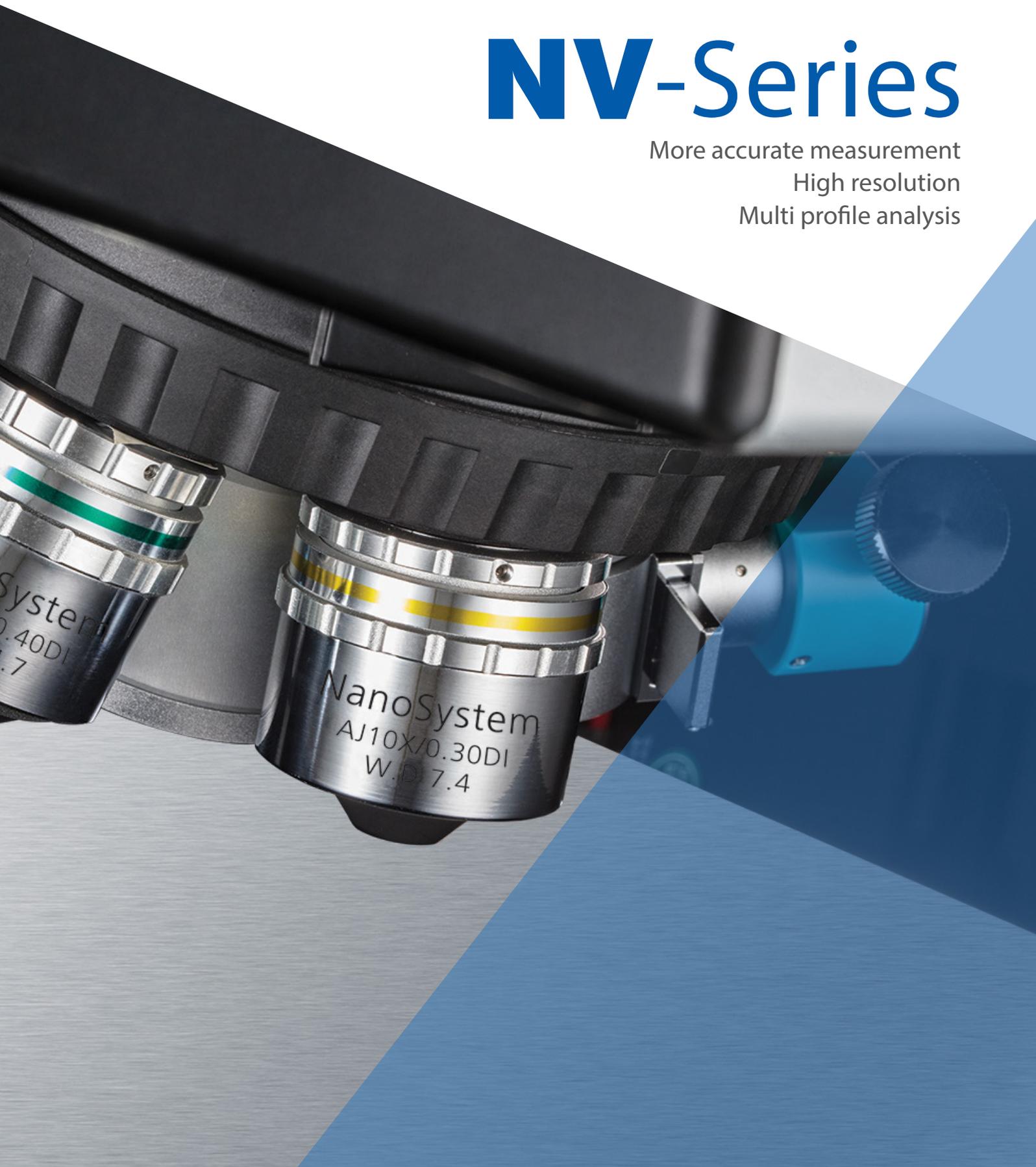


NV-Series

More accurate measurement
High resolution
Multi profile analysis



“ Leading measurement and inspection technology in the world, Global Leader NanoSystem ”

Company Overview

Company Name	NanoSystem Co., Ltd.
C.E.O	Hyung-Seok Lee Ph.D
Establishment	24, April 2003
Business Field	Non-Contact Surface Measurement-Inspection Equipment High Density PCB Measurement Field Semiconductor, FPD Display Measurement · Inspection Field Automotive Industry Field
Product	Non-Contact 3D Surface Profiler
Head Office	90, Techno 2-ro, Yuseong-gu, Daejeon 34014, KOREA
China Office	Room PD5015, Hao Yun Lai Building, Xi-xiang Street, Baoan District, Shenzhen, CHINA

- NanoSystem is a high-tech company that manufactures optical 3D surface measuring instruments and provides effective and easy-to-use 3D image and measurement values in micro and nano unit areas.
- Headquartered in South Korea, Daejeon has partners in Asia, Europe and China to provide services that actively respond to customer needs.
- We are developing and producing innovative products for shape and roughness measurement of ultra-precision field by supplying NV, NVM series and measurement solution, which are non-contact optical measuring instruments to Korean, Japanese, Chinese and European customers.

"Leading measurement and inspection technology in the world, Global Leader NanoSystem"



Company History

2006
2003-2006

- Company Establishment of NanoSystem Co., Ltd
- Registration of Venture
- Get Grand Prize in The 5th National Contest of Business Incubator Center (SMBA)
- Acquire Certificate of Superior Technology Company (Korea Technology Credit Guarantee Fund)
- Be Selected as Demonstration Business of Development in Technology (Industrial Bank of Korea)
- First business with Samsung Electro-mechanics (Daejeon)
- Nano View, Excellent and Exemplary product selected by the sponsor of Daejeon megalopolis
- Acquire ISO9001:2000 (Certification Number : K-QA-Q041816)
- Nidec Read Company(JAPAN) Business partnership contracting & export
- Head Office Transfer (1695-2 Sinil-dong, Daeduk-gu, Daejeon, Korea)

2012
2007-2012

- Export great promise midsize business selection (Small & Medium Business Administration)
- Acquire Promising Small & Medium Business (Daejeon Megalopolis)
- CE certification acquisition (Model : NVE-1000 Certification Number : K1491/E06)
- CE Certification acquisition (Model : NVM-4151P/NVM-5161P Certification Number : K1492/E06)
- INNO-BIZ Selection (Small & Medium Business Administration)
- An office building completion & Head office transfer (Gwanpyoung-dong, Yuseong-Gu, Daejeon, South Korea)
- The Great cooperation of business (Samsung Corning Precision Glass - SCP)

Present
2013-Present

- Opened Chongqing office in China
- Selected as a company that wants to get a job in 2013(Innobiz Association)
- Won the prize of million dollar export(Korea International Trade Association)
- Selected Korea's best industrial technology achievement in 2014
- Certified as promising small and medium-sized business(Daejeon City)
- Designated as a human resource development type small and medium-sized business(Small and Medium Business Administration)

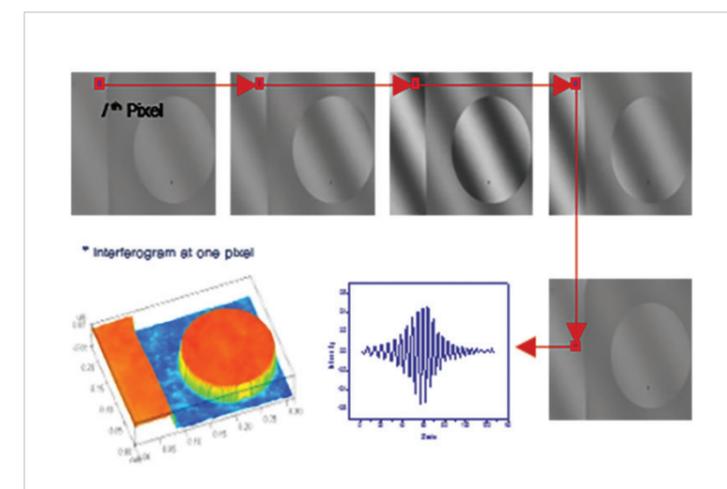
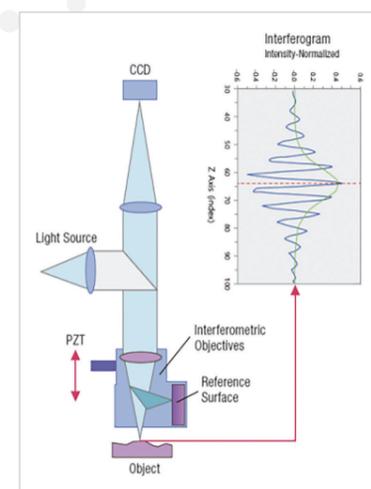
Advanced Measuring Technology

» White Light Scanning Interferometry

A condenser lens collimates the light from the broadband light source. A beam splitter separates the light into reference and measurement beams.

The reference beam is reflected by the reference mirror, while the measurement beam is reflected or scattered from the test surface.

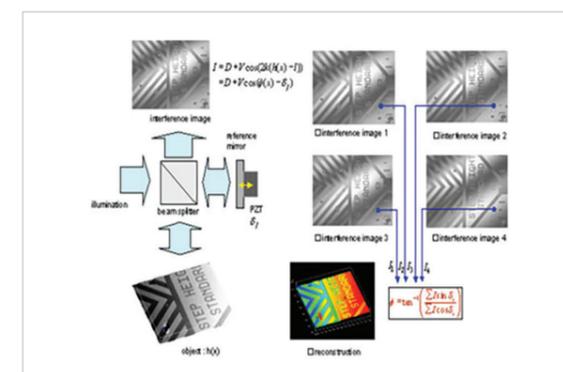
The returning beams are relayed by the beam splitter to the CCD image sensor, and form an interference pattern of the test surface topography that is spatially sampled by the individual CCD pixels.



» Phase Shifting Interferometry

Phase shifting interferometry is a well established technique for areal surface characterization that relies on digitization of interference data acquired during a controlled phase shift, most often introduced by controlled mechanical oscillation of an interference objective.

It provides full 3D images with typical height measurement repeatability of less than 1 nm independent of field size.



General Model NV Series

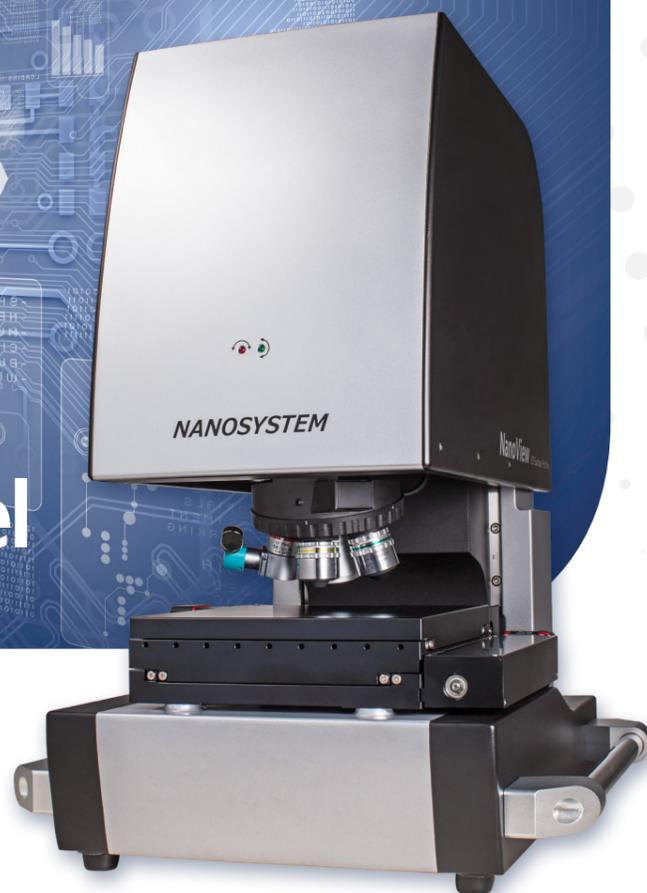
Create A New Solution for Precise Measuring of Surface

» We are participating in the standardization of ISO, ASEM, DIN, JIS, etc.

The NV-Series have high scan speed with sub-nm vertical resolution(0.1nm), regardless of magnification. Using probe tip/tilt function, NV-Series are able to measure even highly sloped surface. NanoSystem's own patented hardware and software for NV-Series are greatly intuitive to use and having user friendly interface.

Also, NV-Series can virtually measure any surface and show vivid 3D images immediately such as texture on rough, transparent samples and more. NV-Series perform 2D and 3D multi functional results.

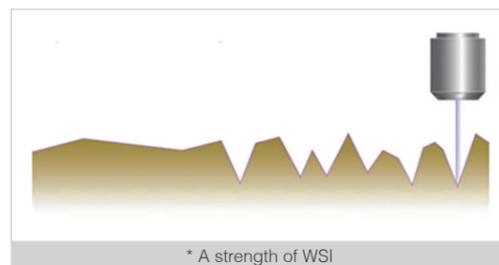
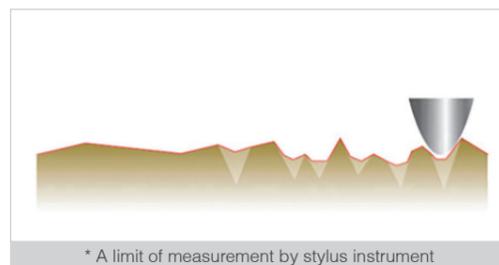
NV-Series is high performance optical measurement solution that is recognized in the laboratory as well as in the production process.



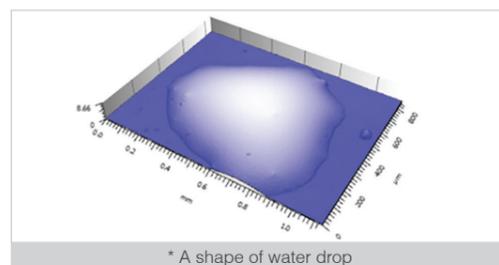
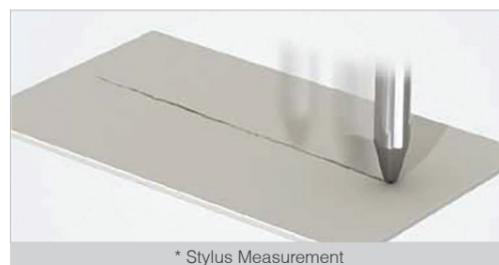
Advantages of White Light Scanning Interferometry

» Non-Contact, Non-Destructive, Fast Measurement

Stylus instruments cannot measure micro asperities less than the stylus tip diameter. The white light interferometry can measure the surface roughness of micro geometries at a considerably higher resolution due to a minute light spot size.



The stylus is made of hard material such as sapphire or diamond. Therefore, the surface of the object may be scratched. On the other hand, White Light Scanning Interferometry can measure in a non-contact method and does not damage the surface of the object.

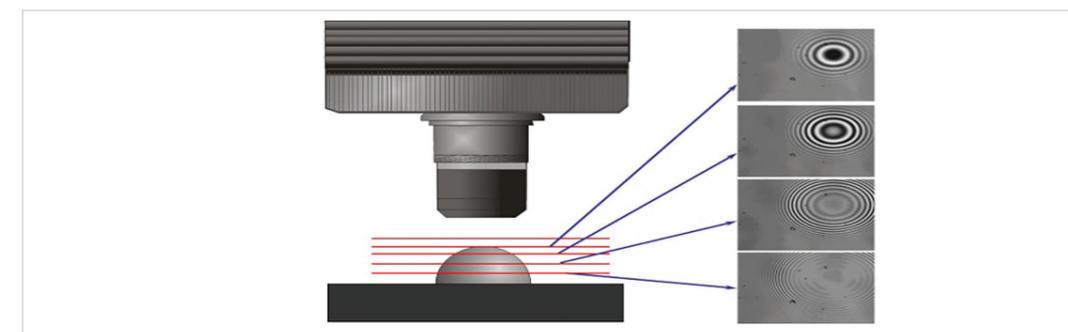


» Greater Reduction of Measurement Time



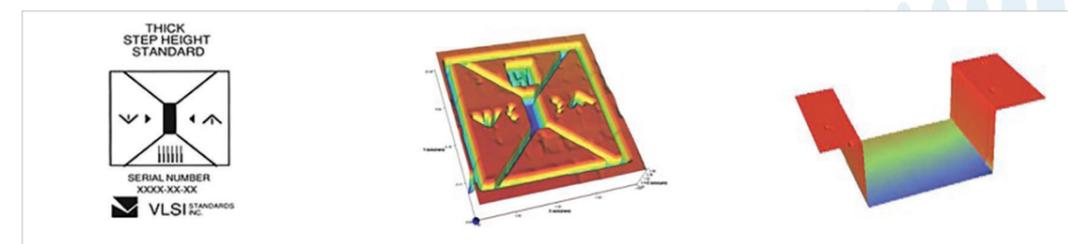
» Strength of area scanning measurement method

Unlike the method of scanning every point in the field of view, WSI has the advantage of reducing the measurement time by measuring the area scanning.



High Traceability and Repeatability

NV Series is calibrated by an VLSI Step Height Standards sample, certified by the NIST. Achieves extremely high accuracy and repeatability as a height measurement system.



85.8 nm VLSI STEP HEIGHT STANDARD Repeatability / PSI Mode

7.75 μm VLSI STEP HEIGHT STANDARD Repeatability / WSI Mode

No.	STEP HEIGHT (Unit: nm)
1	85.879
2	85.891
3	85.883
4	85.904
5	85.895
6	85.895
7	85.902
8	85.907
9	85.924
10	85.922
11	85.881
12	85.921
13	85.918
14	85.880
15	85.903
16	85.880
17	85.883
18	85.893
19	85.927
20	85.884
21	85.902
22	85.918
23	85.921
24	85.924
25	85.900
26	85.934
27	85.884
28	85.893
29	85.871
30	85.881
Avg	85.894
STD	0.0021

Model Number : SHS_880 OC
Serial Number : 4761_74_06

PSI Standard Deviation : 0.00230 nm

No.	Step Height (Unit: μm)
1	7.75224
2	7.75011
3	7.75459
4	7.74956
5	7.75383
6	7.75012
7	7.74795
8	7.75127
9	7.75110
10	7.75149
11	7.75087
12	7.74958
13	7.75050
14	7.75087
15	7.75048
16	7.75315
17	7.75087
18	7.75088
19	7.74801
20	7.74852
21	7.74806
22	7.75081
23	7.75173
24	7.74819
25	7.74795
26	7.74811
27	7.75076
28	7.75332
29	7.74828
30	7.74808
Avg	7.75003
STD	0.0021

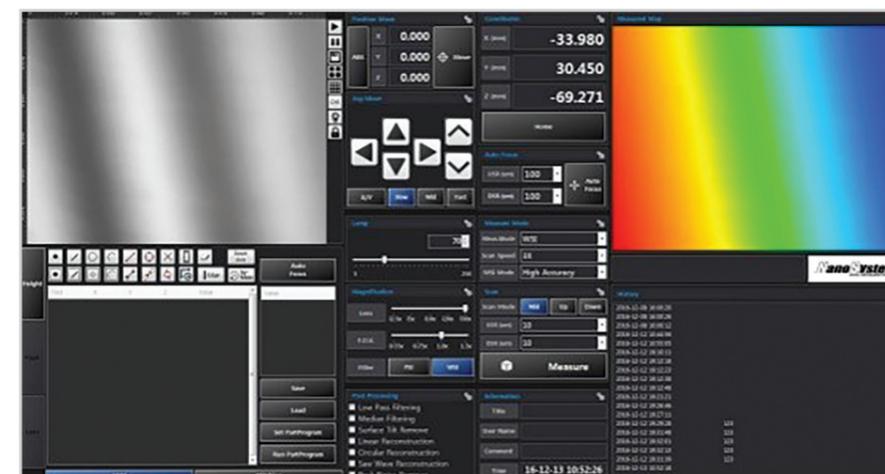
Model Number : SHS_8 OC
Serial Number : 5233_74_06

WSI Standard Deviation : 0.0021 μm

Advanced Operating and Analysis Software

» NanoView : Operating Program

The Operating Program based on a user-friendly GUI configuration is easy and simple to use. And because of its excellent reproducibility, everyone can get the same measurement value.



With GFM function, it is possible to measure 2D size easily by tracing the required areas on screen(Diameter, Width, Pitch, Distance, etc). This is convenient when the sample to be observed has an irregular shape.



Circle Shape



Straight Line

Main Feature and Benefits

» Tip-Tilt Probe

The rotation center of the probe is on the focal point of objectives. So, it is easy to control the tilt of a surface to adjust interference fringe.

» Long Measuring Range

270um Long PZT scanning range can cover most of the measuring needs up to 10mm. (option)

» Selectable F.O.V & Objective lens

You can select a variety of F.O.V lens 0.55x, 0.75x, 1.0x, 2.0x and interferometric objectives 2.5x, 5x, 10x, 20x, 50x. Super long working distance objectives are also available.

» Large Travel XY Stage

Motorized 100x100mm travel XY stage help you to measure large size workpieces. For large area(Stitching function is available) & Back-light illumination are available. (Option)

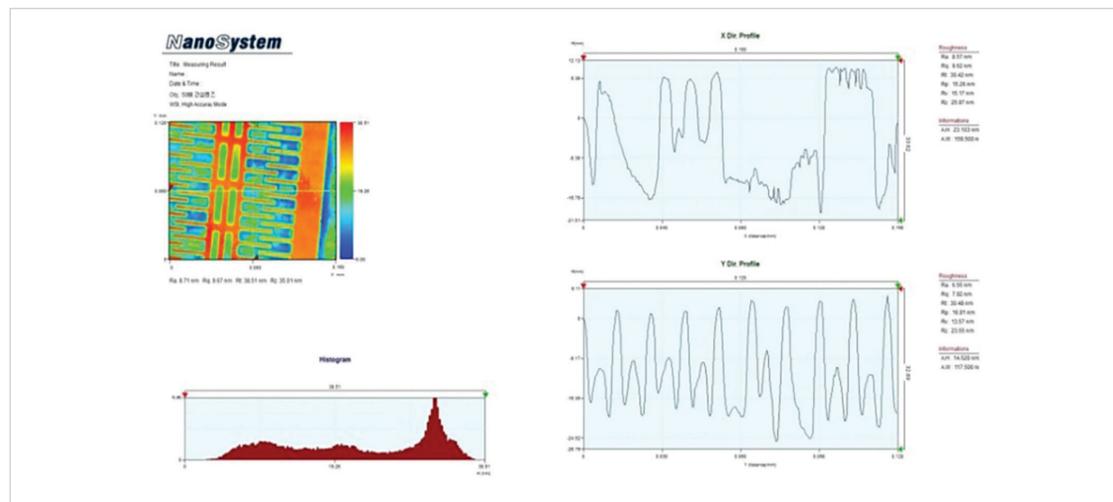
» Powerful Software

Cutting edge real time 3D imaging of surface topography. Automate analysis and publish results easily. The latest ISO25178 standards and national standard.



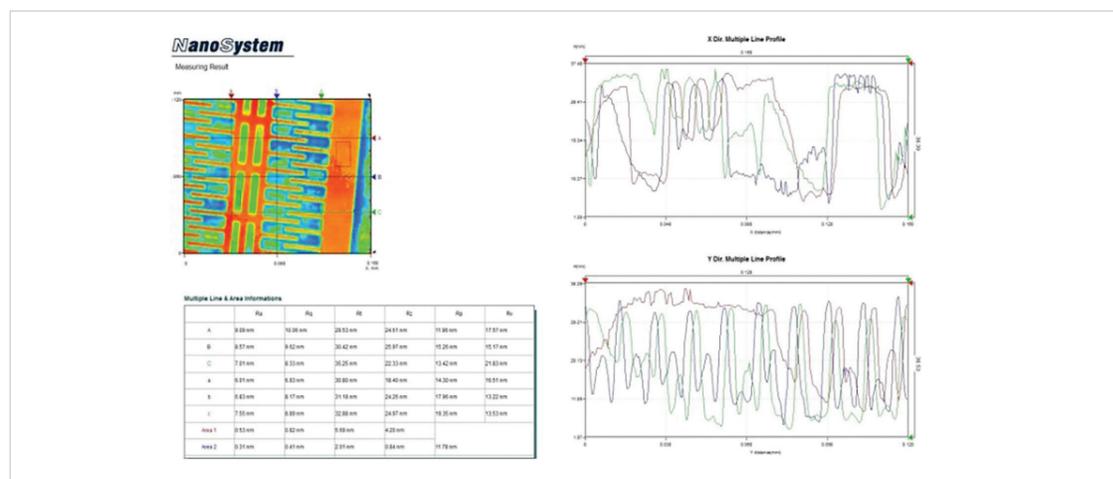
» NanoMap : Analysis Program

NanoMap intuitively displays the measurement results and can obtain the desired level of fine step, roughness, and 3D analysis data through 2D analysis, Multi analysis, 3D analysis.



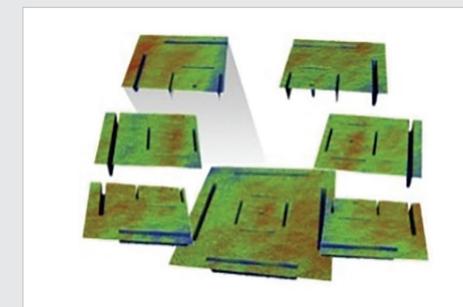
» Multi Analysis

Multi analysis function allows user to compare profiles, roughness information and step information at a glance.



» Stitching Function

Stitching is a process organizing a map by stitching several unit measurement results. It allows analyzing all the patterns in large area, while surveying or measuring the detailed pattern using necessary magnification.

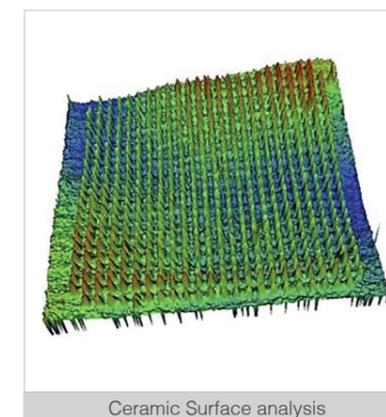
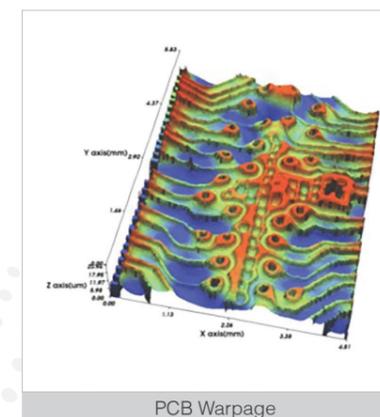


By using the Stitching function, it is possible to measure large areas beyond the existing lens magnification.



» Applications using Stitching Function

By using Stitching function, it is possible to measure up to several tens of mm.



NanoMap Alpha: Advanced Analysis Program



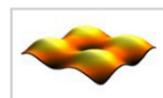
» Acquire ISO9001:2000 (Certification Number : K-QA-Q041816)

Compliance with the ISO and national standards : Analysis of surface texture, roughness, waviness, flatness, grains etc. NanoSystem has surface analysis and filtering technologies and it's NanoMap Alpha. NanoMap Alpha® integrates parameters defined by the latest ISO standards, ASME B46.1 (USA) standards and many other international standards .

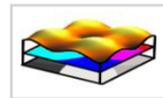
» Various types of surface information can be analyzed.



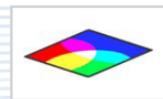
> Profile analysis : profiles, series of profiles, contour etc.



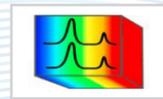
> Surface analysis : surface topography, series of topographies etc.



> Multi-physics : topography + color + intensity etc.

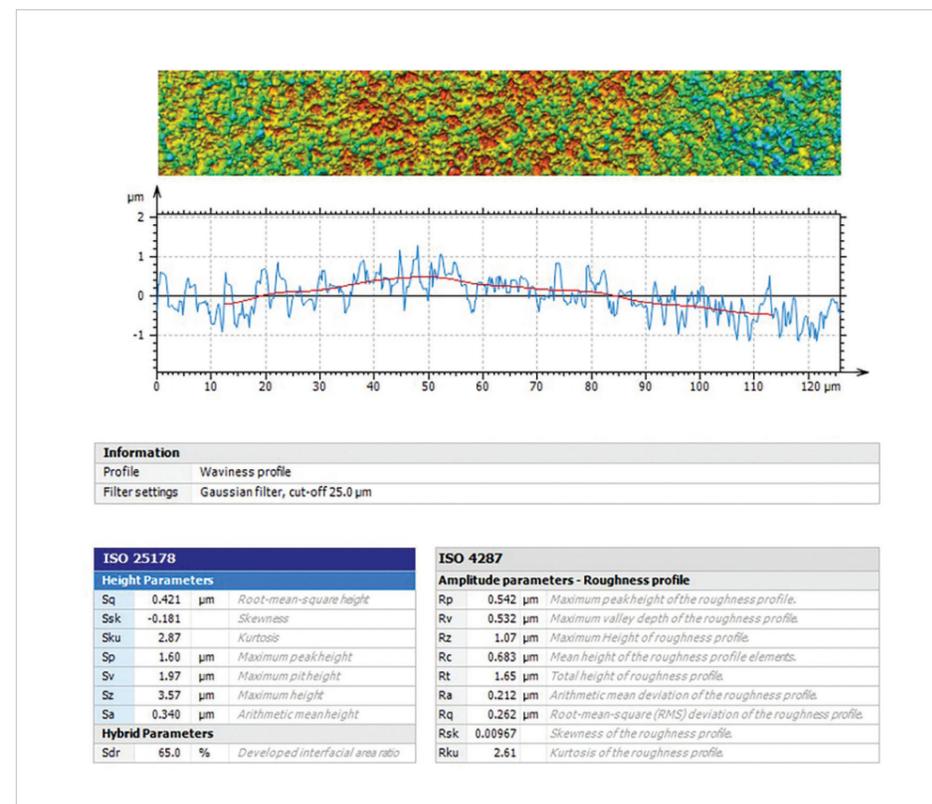


> Image analysis : binary image, grayscale image, color image, series of images.

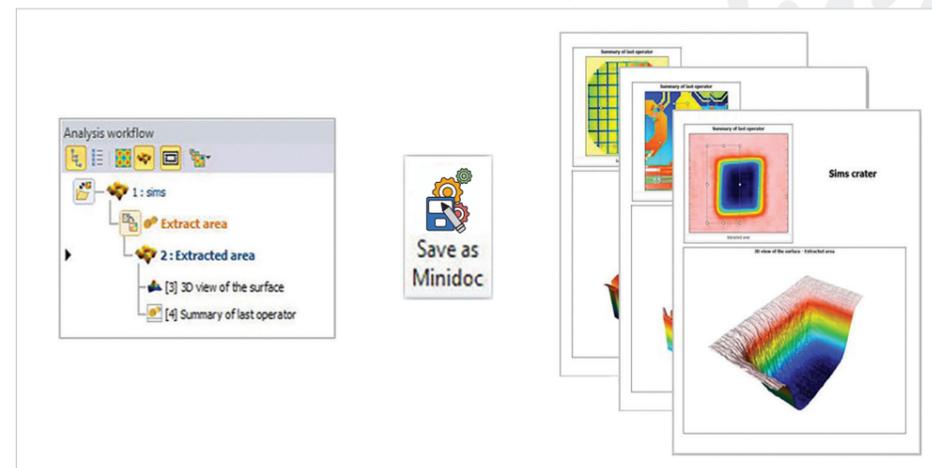


> Hyper-spectral analysis : spectrum, series of spectra, hyperspectral cube etc.

» 2D/3D Surface Roughness Analysis



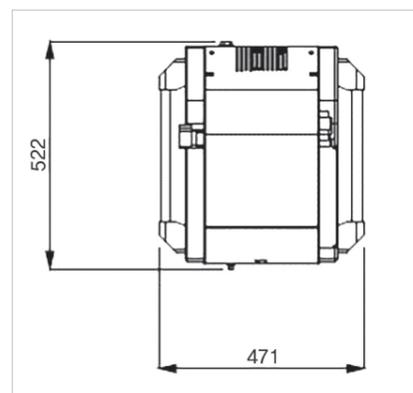
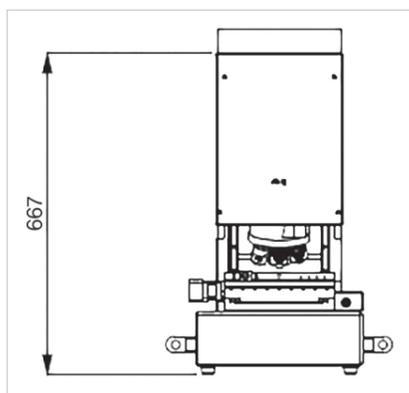
» Save common sequences of analysis steps as Minidoc & apply them at any time with a single click.



Specifications

Model	NV-1800	NV-2400	NV-2700	NV-3200
Production / Measurement Method	White Light Scanning Interferometry / Phase Shift Interferometry			
F.O.V Lens	1.0x (Default)		4 Position Motorized Turret Addition F.O.V Available (Option)	
Interferometric Objectives	Single Lens Available	5Lens Available (Manual Turret)	5Lens Available (Motorized Turret)	
Illumination	White Light LED Illumination			
Scanning Range	≤ 270um (PZT Scanning)			
Scanning Velocity	7. 2um/sec (1x~3x user selectable)	12um/sec (1x~5x user selectable)		
Tip / Tilt	±3° (Stage Tip/Tilt)	Probe Tip/Tilt ±6° (Manual)	Probe Tip/Tilt ±6° (Motorized)	
Vertical Resolution	WSI : 0.5nm / PSI : 0.1nm			
Lateral Resolution	0.2 ~ 4um (Objectives / FOV Lens Dependent)			
Step Height Repeatability	0.2% @1σ	0.1% @1σ(Standard 8um Step sample)		
X, Y Stroke	70x50mm (Manual)	100x100mm (Motorized)	300x300mm (Motorized)	
Z Stroke	30mm (Manual)	100mm (Manual)	100mm (Motorized)	
Stage Size	90x90mm	230x230mm	445x445mm	
Option				
F.O.V Lens	0.5x, 0.75x, 1x, 1.5x, 2x (Selectable)			
Interferometric Objectives	2.5x, 5x, 10x, 20x, 50x, 100x (Selectable)			
Vacuum Stage	Option			
Scanning Range	Max 10mm available (Motor Scanning Option)			

» Product Dimension (NV-2700 Model)



Advanced Measuring Technology



NV-3200

- Premium Model
- Motorized Turret
- Motorized Stage(XY) : 300 X 300mm
- Auto focus
- F.O.V lens selectable
- Stitching function



NV-2700

- Advanced Model
- Motorized Turret
- Motorized Stage(XY) : 100 X 100mm
- Auto Focus
- F.O.V lens selectable
- Stitching function



NV-2400

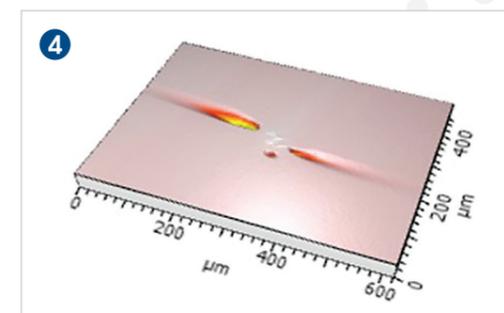
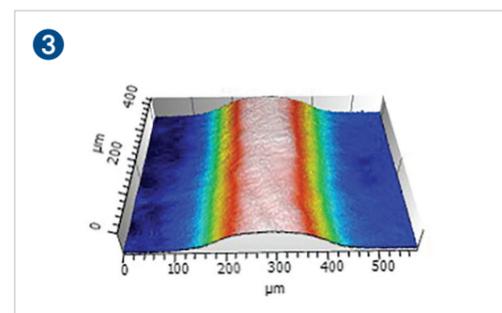
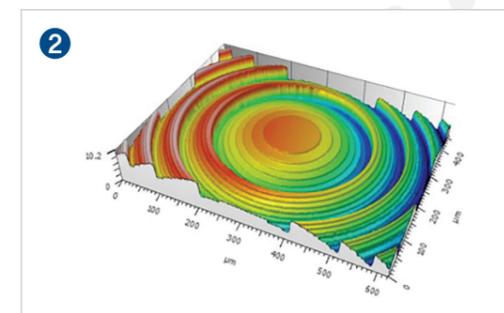
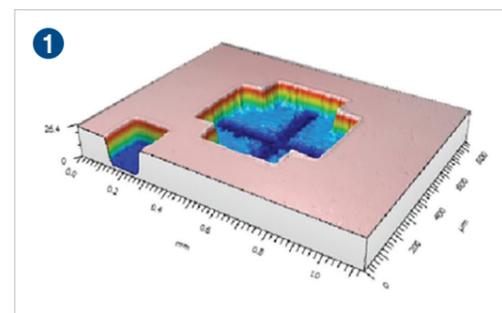
- Economic Model
- 5 objective lens Select able (Manual)
- Motorized Stage(XY) : 100 x 100mm
- Stitching function



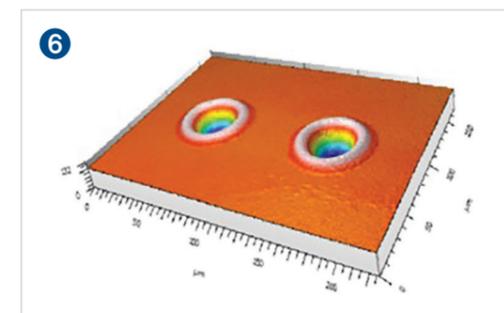
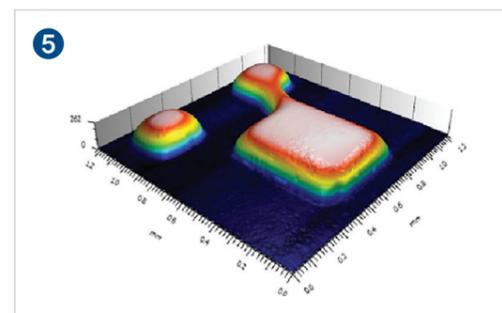
NV-1800

- Compact model
- Single lens type
- Manual Stage(XY) : 70 x 50mm
- Excellent measuring accuracy

>> Wide Application Field

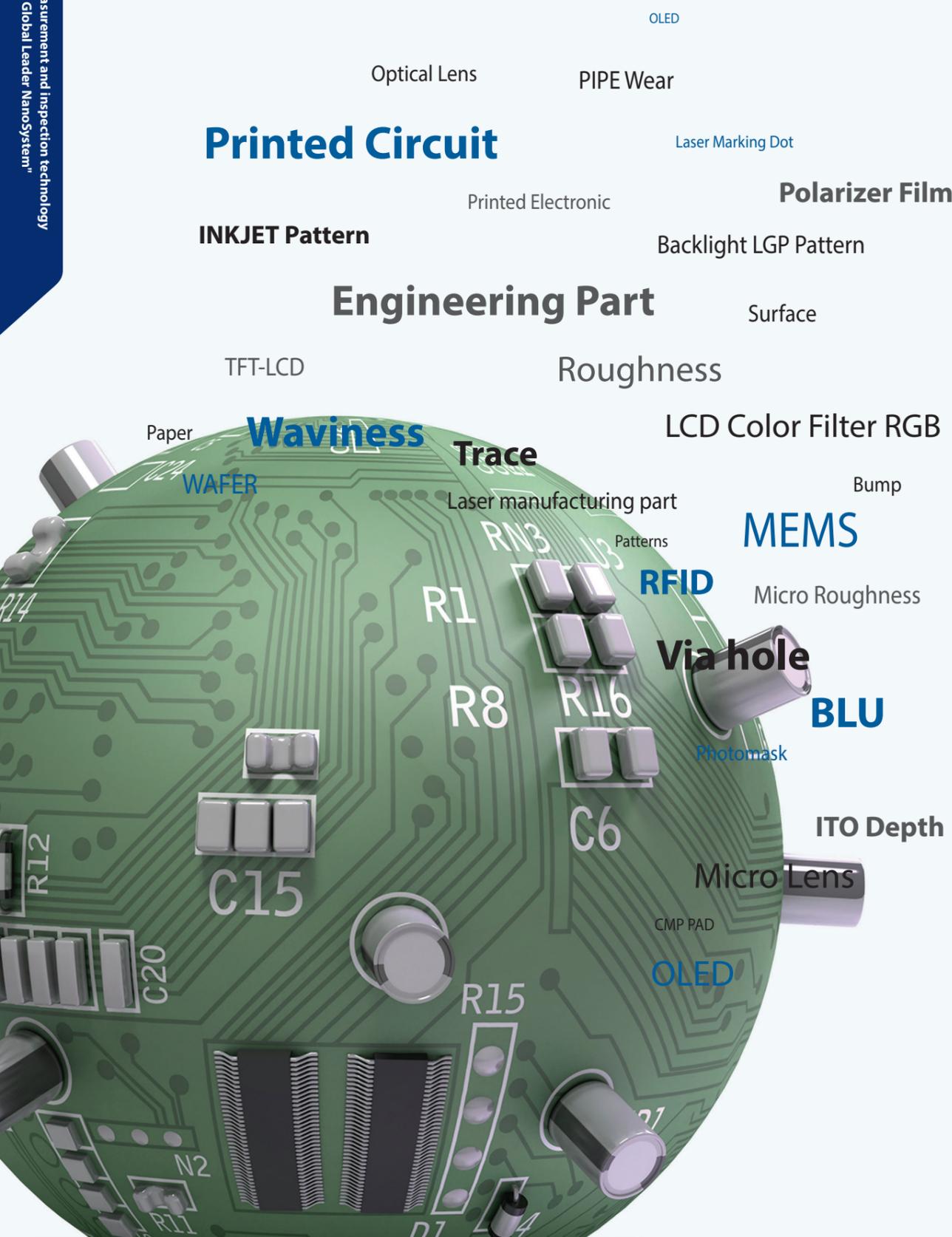


- 1 Overlay(objective lens 10x / optical zoom 1x / scanning area 11 mm x 840μm)
- 2 Optic lens (objective lens 10x / optical zoom 1x / scanning area 620μm x 450μm)
- 3 OLED patterns (objective lens 20x / optical zoom 1x / scanning area 560μm x 420μm)
- 4 Glass defect (objective lens 10x / optical zoom 1x / scanning area 620μm x 460μm)

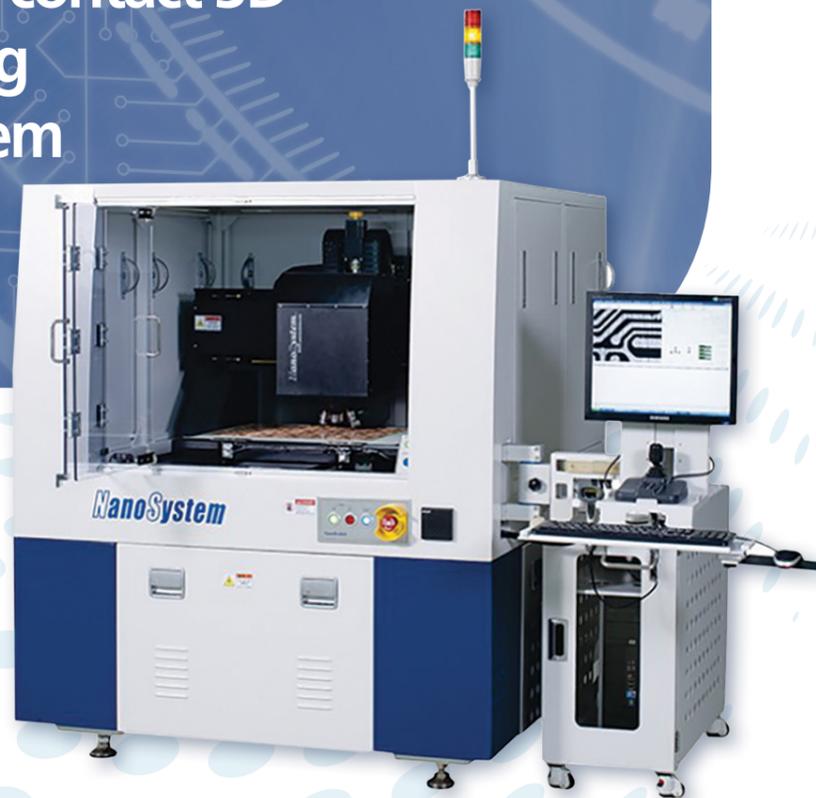


- 5 Resistance (objective lens 5x / optical zoom 1x / scanning area 13mm x 13mm)
- 6 Wafer on laser marking (objective lens 50x / optical zoom 1x / scanning area 250μm x 150μm)

"Leading measurement and inspection technology in the world Global Leader NanoSystem"



NVM Series : Non-contact 3D Surface Measuring Automation System



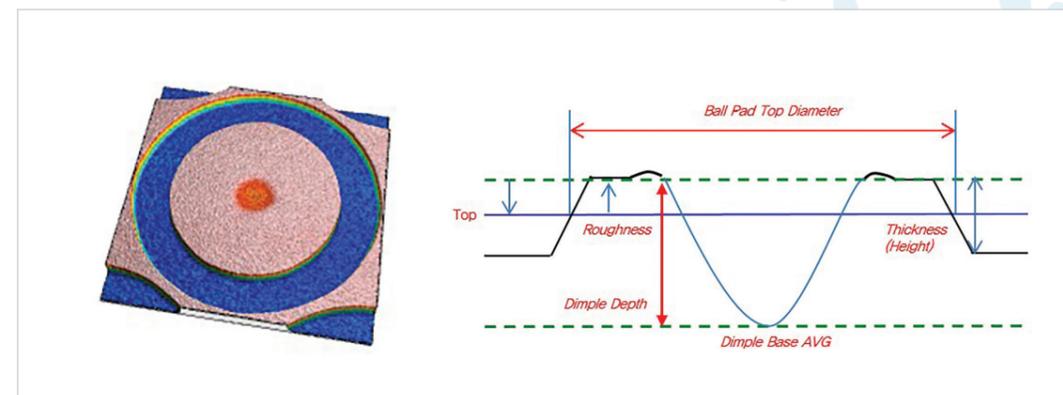
Automated Non-contact Optical Measurement Machine
Surface Profiler has Nano Resolution using Optical Interference
High Resolution CNC Programmable Automatic Optical Coordinate Measurement

NVM - Series is an automatic 3D inspection system for High-end PCB Process Monitoring

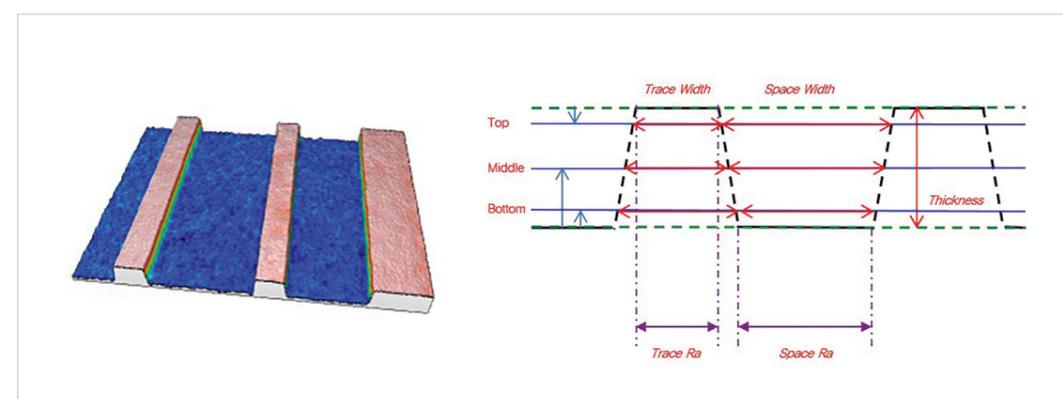
» Characteristics

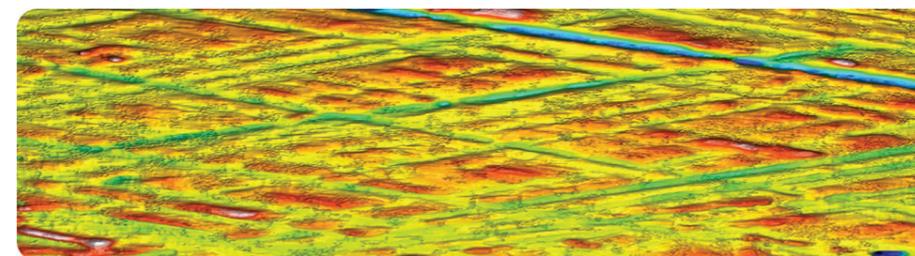
- Excellent Measuring Accuracy
- Fast Measuring Speed
- Easy Manipulation S/W for Measuring
- Reliability and Prompt Support
- 2/3D Multi-functional Performance
- Recipe Function (2/3D all in one function)
- Automatic Measuring Function (2/3D Auto Module Change)
- Auto Focus Function
- Data Feedback Function (Same output)

» 3D Metrology Pad / Land Algorithm



» 3D Metrology Trace Line / Space Width Algorithm





- Texture analysis
- Roughness parameter compliant with DIN EN ISO
- 3D roughness parameters
- Wear analysis
- Defect detection
- Volume parameters

» Non-destructive measurement of cylinder bore surfaces

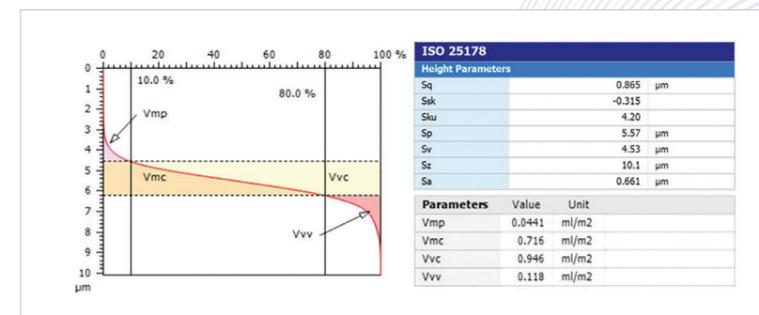
The topography of the cylinder surface is one of the most important factors to control oil consumption, fuel consumption, longevity and wear of engines. In order to enhance surfaces, CylinderScan is a reliable method to characterize them.

The CylinderScan combines exceptional non-destructive profiling performance, operator convenience. Besides evaluating ISO roughness values, employing white light interferometry, this compact system can measure 3D surface topography from nanometer-scale roughness with sub-nanometer resolution and production-level throughput.

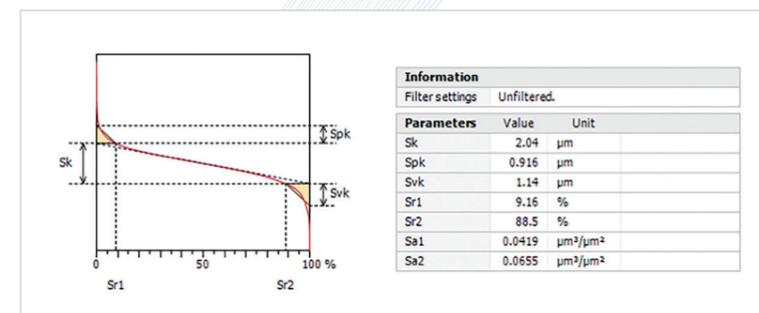
It allows to measure cylinder bores from 70 to 160mm diameter. It is fully automated with handful recipe function(radial, axial).

Tribology, bearing surfaces, functional volume

» Volume parameters
Compliance with ISO 25178



» Sk parameters
Compliance with ISO 13565-2



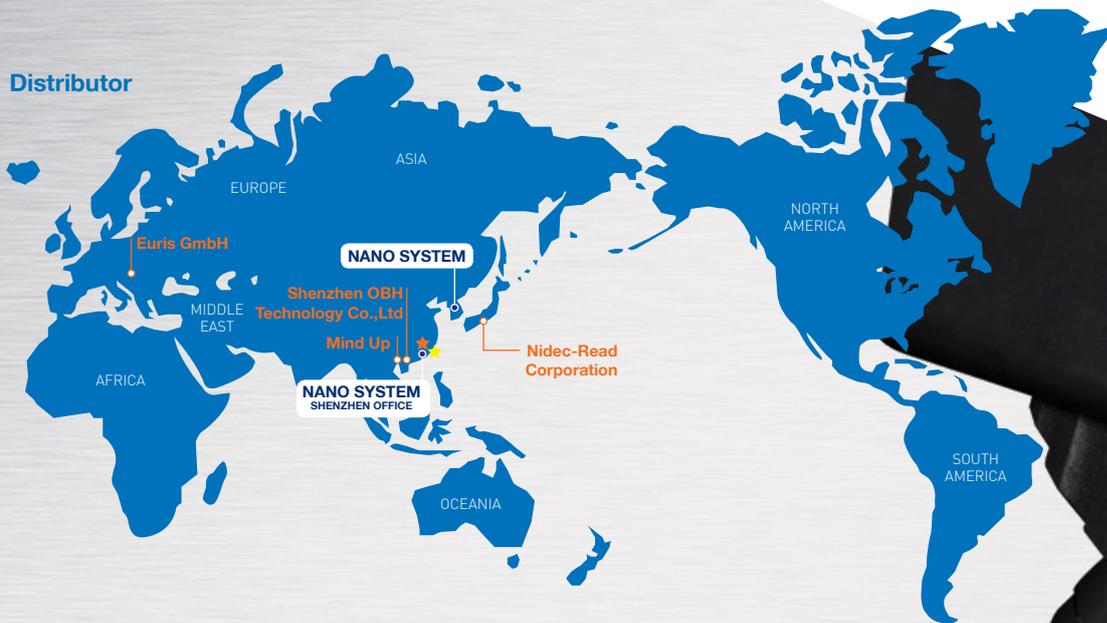
"Leading measurement and inspection technology in the world. Global Leader NanoSystem"

CS2000 : CylinderScan 2000





Distributor



★ Tech Vision Global

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- Fax : +86-21-3221-1381

★ Supergold Enterprise International Ltd.

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- Fax : +852-2947-0621

○ Shenzhen OBH Technology Co.,Ltd.

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○ Nidec-Read Corporation

- 10 Tsutsumisoto-cho, Nishikyogoku, Ukyo-ku, Kyoto 615-0854, Japan
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- Fax : +81-75-315-8011

○ Euris GmbH

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- Tel : +49-(0)89-35095780-0
- Fax : +49-(0)89-3509578-10

○ Mind Up

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NanoSystem
www.nanosystemz.com

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