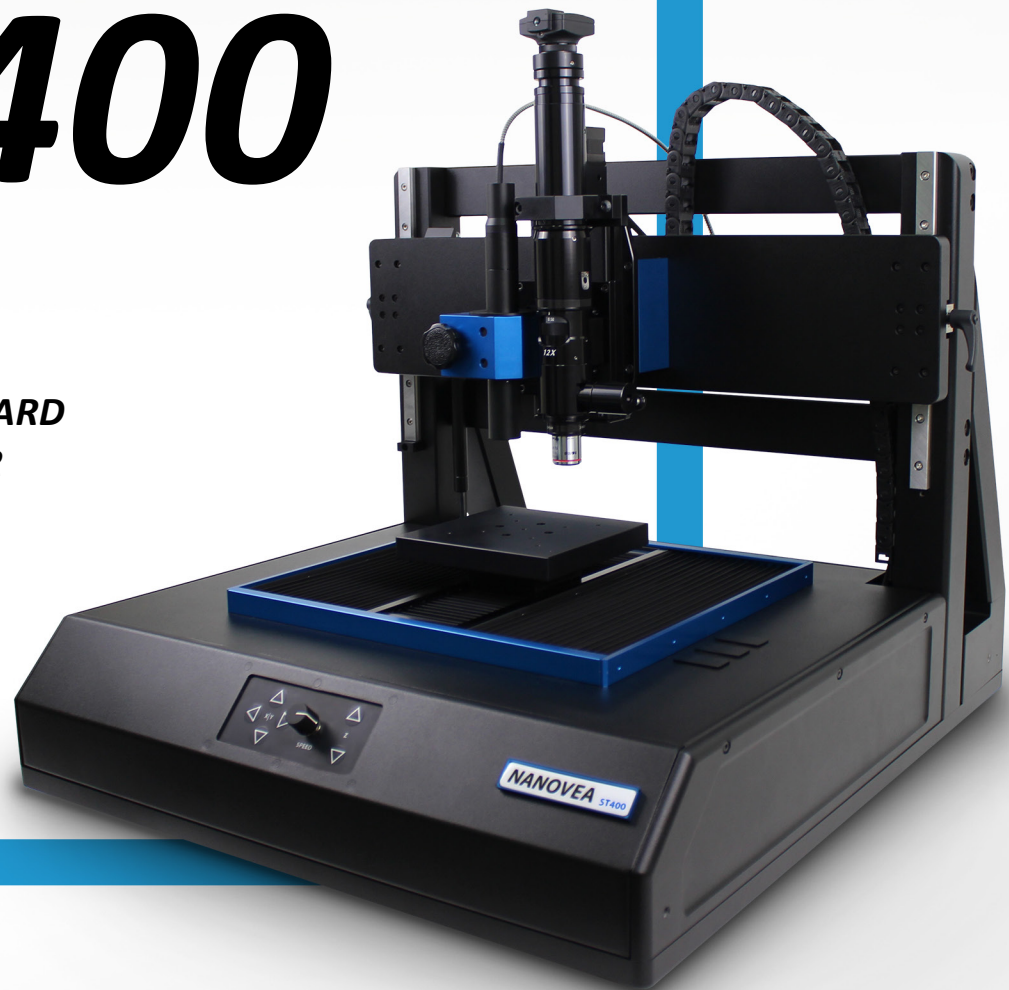


NANOVEA ST400

***MODULAR STANDARD
OPTICAL PROFILER***



SETTING STANDARDS

*Designed with Chromatic Light technology, which measures physical wavelengths, the **NANOVEA ST400** Profilometer provides the highest accuracy on any roughness, form, or material. Transparent or opaque.*

HIGHLY CUSTOMIZABLE

WIDE RANGE OF ADD-ONS

ROTATIONAL OPTIONS

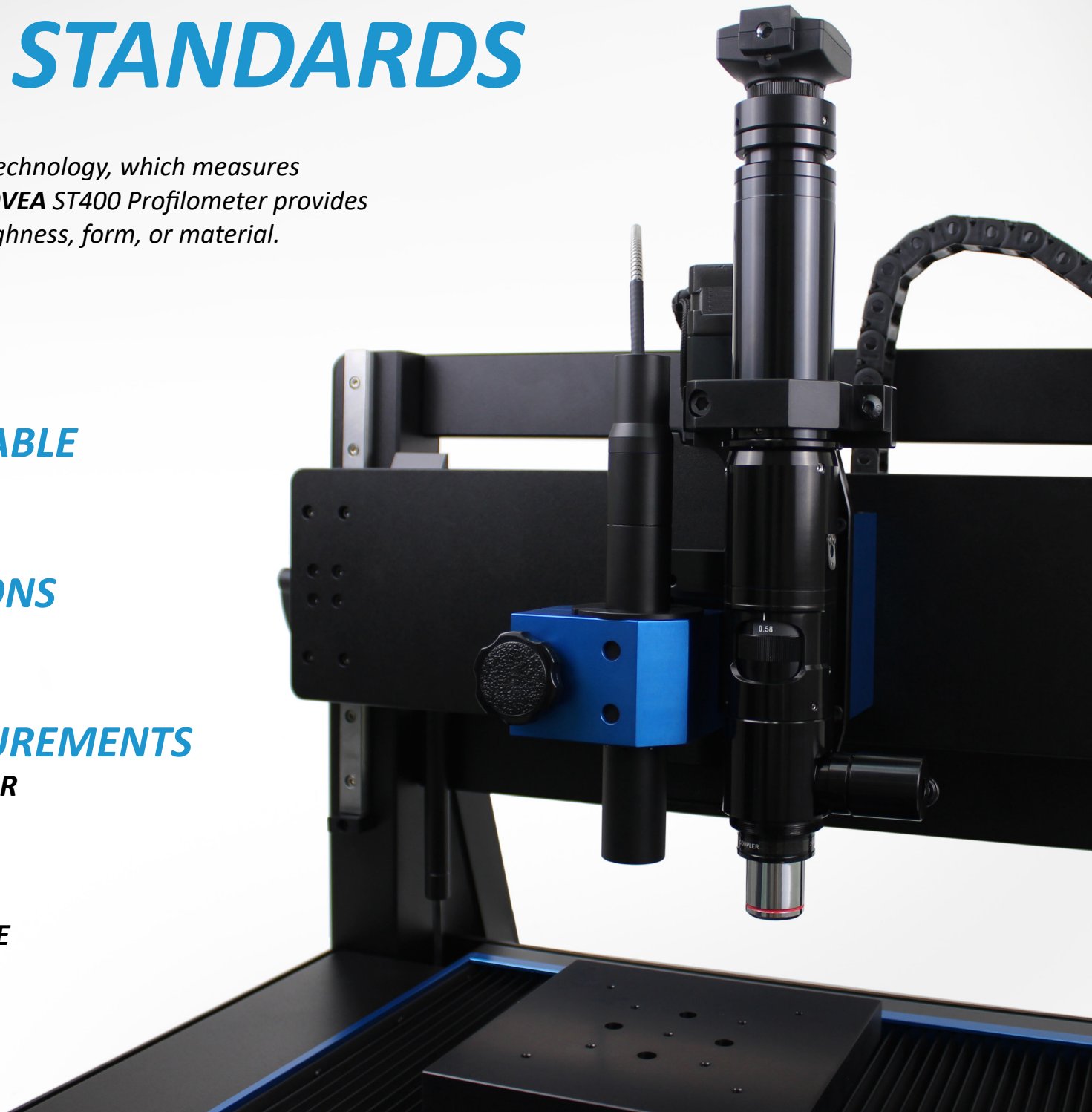
STAGE OR CYLINDER

ULTRA-FAST MEASUREMENTS

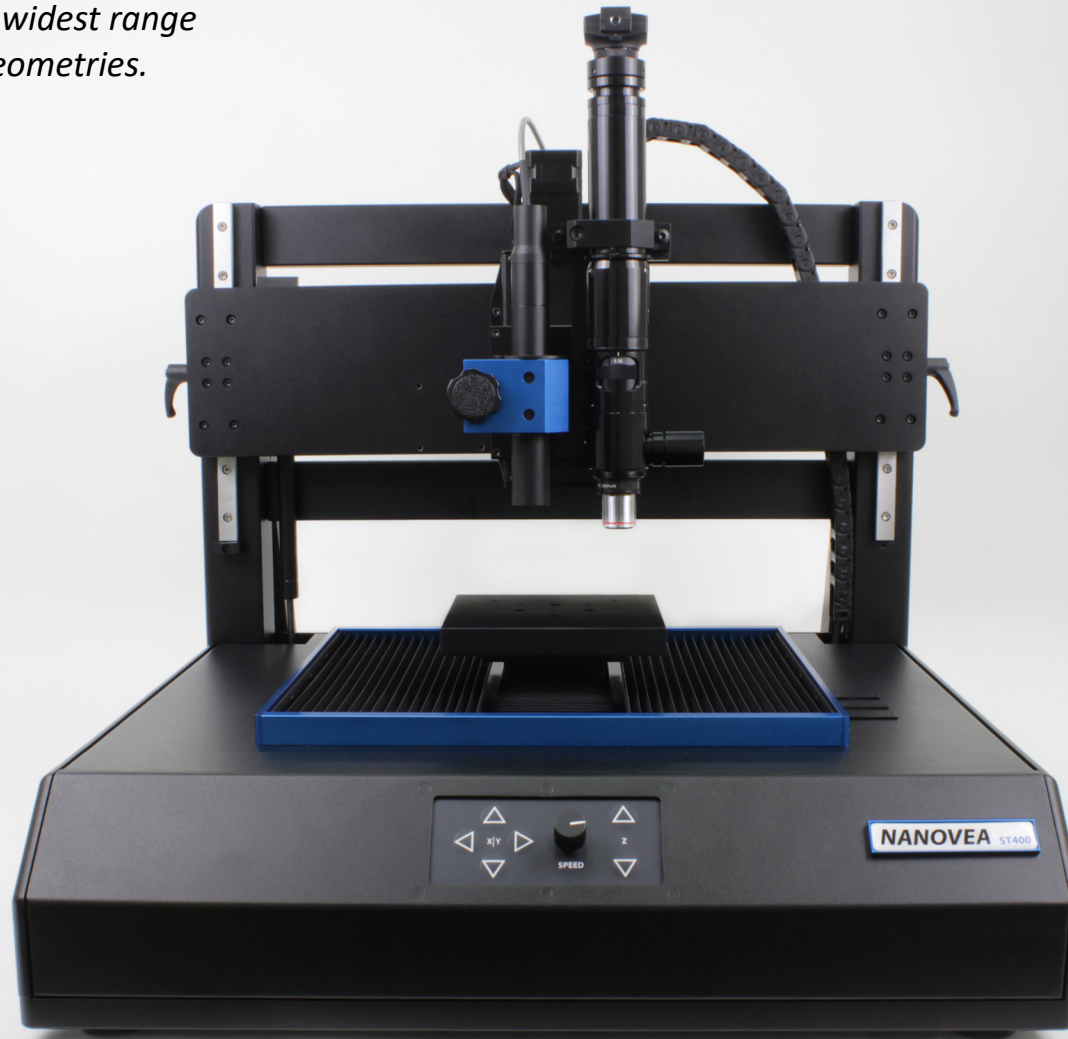
w/ HIGH-SPEED LINE SENSOR

up to 190 mm

HEIGHT SAMPLE CLEARANCE



With larger X-Y stages, 360° rotational stages & many other custom configurations available, the ST400 is ideal for the widest range of samples with varied geometries.



X-Y
STAGE TRAVEL

200 x 150 mm Motorized

Z
AXIS

*50 mm Motorized
+ 140 mm w/ Manual Slide*

X-Y
MAX SPEED

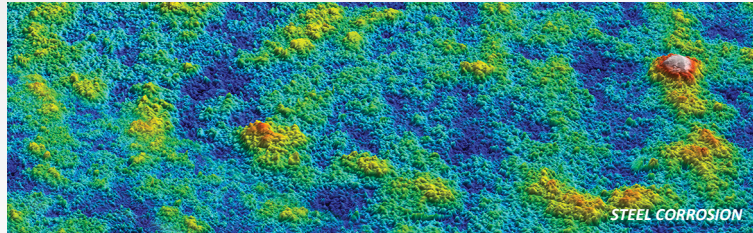
40 mm/s

THE POWER OF CHROMATIC LIGHT

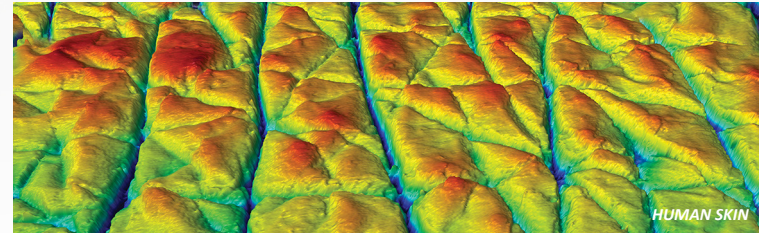
*NANOVEA Non-Contact Optical Profilers are the ideal upgrade
from traditional contact stylus and laser profilometers.*



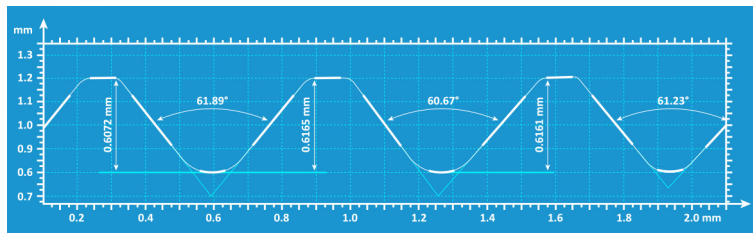
2D & 3D NON-CONTACT SURFACE MEASUREMENTS



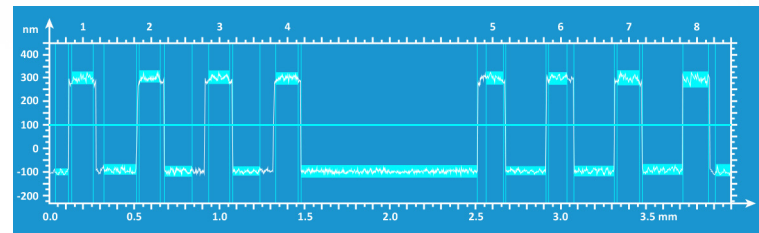
ROUGHNESS & FINISH



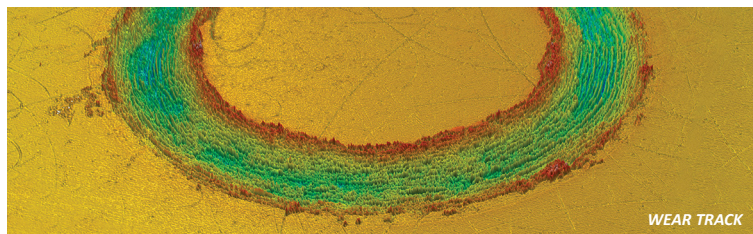
TEXTURE & GRAIN



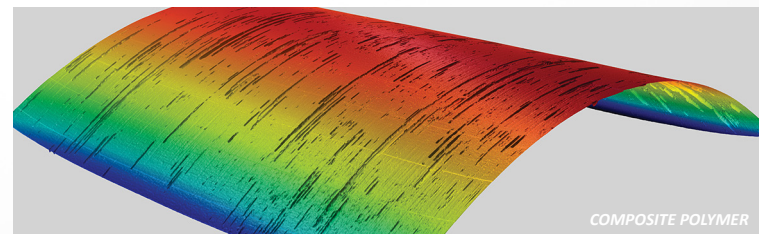
GEOMETRY & SHAPE



STEP HEIGHT & THICKNESS



VOLUME & AREA



FLATNESS & WARPAGE

ANY MATERIAL.

TRANSPARENT, REFLECTIVE OR DARK

1 nm MAX VERTICAL RESOLUTION

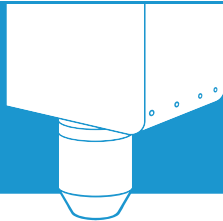
up to 87° MAX SURFACE ANGLE



STANDARD SENSOR

SINGLE POINT

	PS1	PS2	PS3	PS4	PS5	PS6
MAX HEIGHT RANGE	110 μm	300 μm	1.1 mm	3.5 mm	10 mm	24 mm
WORKING DISTANCE	3.3 mm	10.8 mm	12.2 mm	16.5 mm	26.6 mm	20 mm
LATERAL X-Y ACCURACY	0.8 μm	1.7 μm	2.6 μm	4.6 μm	11.0 μm	11.0 μm
HEIGHT REPEATABILITY*	1.9 nm	5.4 nm	15.8 nm	31.6 nm	117.0 nm	237.2 nm



HIGH-SPEED SENSOR

192 POINTS

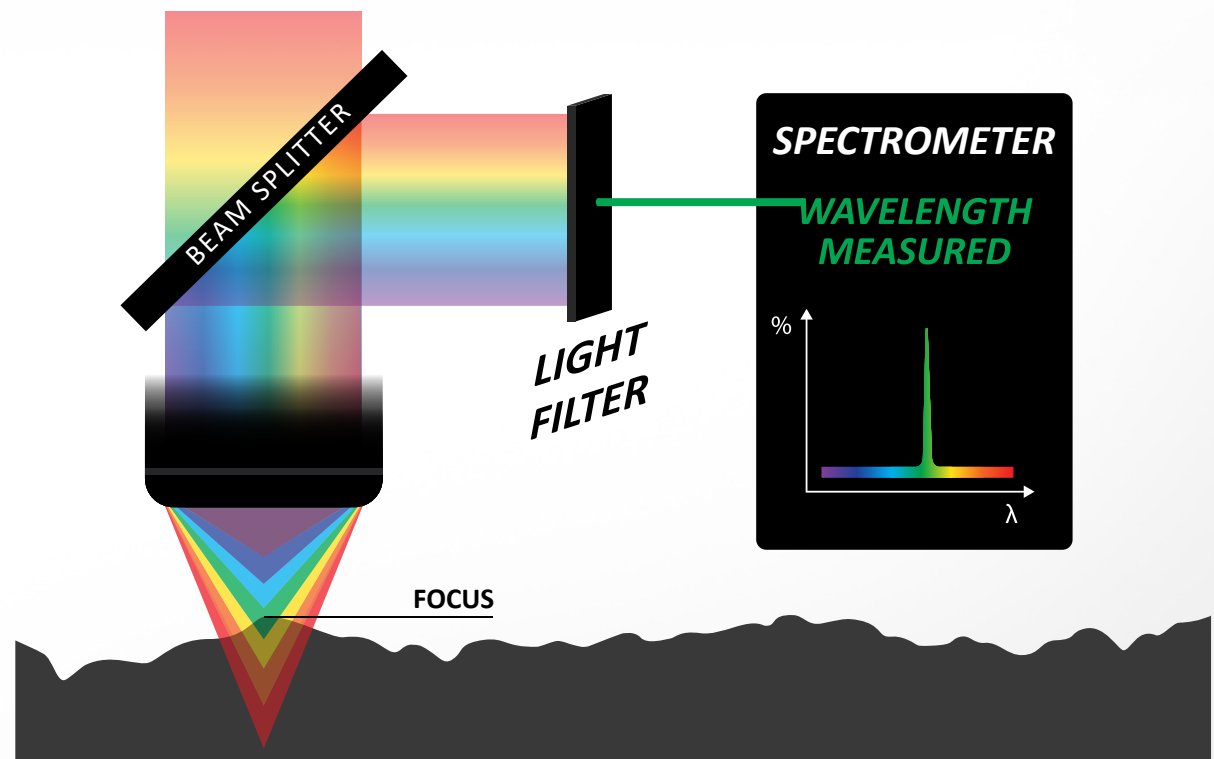
	LS1	LS2	LS3
MAX HEIGHT RANGE	200 μm	0.95 mm	3.9 mm
WORKING DISTANCE	5.3 mm	18.5 mm	41 mm
HEIGHT REPEATABILITY Ra*	14 nm	21 nm	70 nm
LINE WIDTH	0.96 mm	1.91 mm	4.78 mm
PITCH	5 μm	10 μm	25 μm
LATERAL ACCURACY OF EACH POINT	1 μm	2 μm	5 μm
ACQUISITION RATE (points per second)	384 KHz	384 KHz	384 KHz

* Fixed point measurement on glass. Ra average height variation for 1,200 points (100 samplings).

HOW IT WORKS

Chromatic Light Technology works by using white light and a set of sphero-chromatic lenses to split the light into individual wavelengths, each with its unique vertical focal point or height. All wavelengths, with their corresponding heights, make up the height range measurement scale of a sensor.

The spectrometer detects the wavelength with the highest intensity and processes its associated height measurement. During a full raster scan, this process takes only a fraction of a second and produces an accurate height map of the surface of interest.



NO COMPLEX ALGORITHMS ♦ **NO LEVELING REQUIRED** ♦ **NO X-Y DATA STITCHING**

THE PROBLEM WITH OTHER TECHNIQUES

LATERAL RESOLUTION vs LATERAL ACCURACY



THEM

To impress clients, companies often choose to define **Display Resolution** or **Camera Pixel Size** as lateral resolution. However, instruments that rely on camera pixel-based technology require complex algorithms to determine the focal point, which is problematic for analyzing complex surfaces.

US

Chromatic Light provides lateral **accuracy** which is determined by the physics and is directly related to the spot size of the chromatic light source of the optical sensor.

LASER SCANNING CONFOCAL MICROSCOPE



LASER RADIATION

HEALTH HAZARD

Exposure to laser light reflectivity

INCONSISTENT LASER LIGHT WAVELENGTH

Inconsistencies in wavelength during scanning
affect accuracy of results

DECEPTIVE 'DISPLAY RESOLUTION'

Lateral & height accuracy are fixed by the objective lens
making 'Display Resolution' insignificant

COMPLEX ALGORITHMS

Alpha blending algorithms stitch collected data
layer by layer, grounding accuracy on complex calculations

STITCHING REQUIRED

Objective lenses have limited fixed fields of view
Stitching of larger areas compromises accuracy of the scan

50x SLOWER

Data acquisition speed up to 7.9 KHz

VS

CHROMATIC LIGHT OPTICAL SENSOR

SAFE WHITE LIGHT

No need for protective wear

UNIFORM & BROAD WHITE LIGHT SPECTRUM

Changes in wavelength are the data being collected

INDEPENDENT LATERAL & HEIGHT ACCURACY

Lateral & height accuracy can be mixed and matched
to meet a broad range of scanning requirements

NO ALGORITHMS

Physical wavelength reflected from the surface
is measured directly for an accurate representative height map

NO STITCHING

Data points are collected continuously providing
the same level of accuracy for both small and large areas

50x FASTER

Data acquisition speed up to 384 KHz

LASER MICROSCOPE

OPTICAL SENSOR

LATERAL ACCURACY

For 50x objective (370 x 277 μm)

$\pm 2\%$ of measuring value

$\pm 2\% \times 370 \mu\text{m}$

$\approx 15 \mu\text{m}$

w/ stitching algorithms $\gg 15 \mu\text{m}$



Step size:

$= 5 \mu\text{m}$

3x BETTER LATERAL ACCURACY

HEIGHT ACCURACY

$\approx 0.2 + L/100 \mu\text{m}$

$\approx 0.2 + 950/100 \mu\text{m}$

$\approx 9.7 \mu\text{m}$



950 μm range

$\approx 0.6 \mu\text{m}$

16x BETTER HEIGHT ACCURACY

AREA TESTED

STITCHING REQUIRED

scans (25 x 25 mm)

25 000 μm / 370 μm x 25 000 μm / 277 μm

68 x 91

$= 6188$ scans



NO STITCHING

Consistent accuracy across any measurement size

1 SCAN

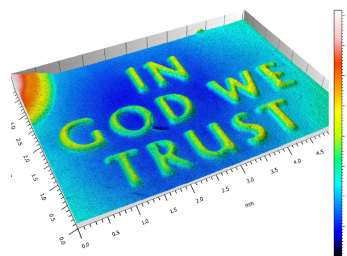
TEST TIME

6 sec per scan

+ 4 sec displacement & stitching

$= 10 \text{ sec/scan} \times 6188 \text{ scans}$

$= 61860 \text{ seconds}$ ($\approx 17 \text{ hours}$)



Scan time (25 x 25 mm)

$= 29.6 \text{ seconds}$

2090x FASTER

MICROSCOPE VIDEO IMAGING



up to 50x
objective magnification

1200 x 1600
color video camera

FLAWLESS LARGE AREA
stitching & focus stacking

NANOVEA

ST400

OPTICAL PROFILER

For pricing information,
please contact sales@nanovea.com

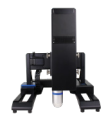
Also available in other configurations



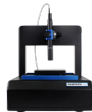
**PORTABLE
COMPACT**



**PORTABLE
STANDARD**



**PORTABLE
HIGH-SPEED**



**COMPACT
STANDARD**



**MODULAR
LARGE AREA**

NANOVEA.COM

