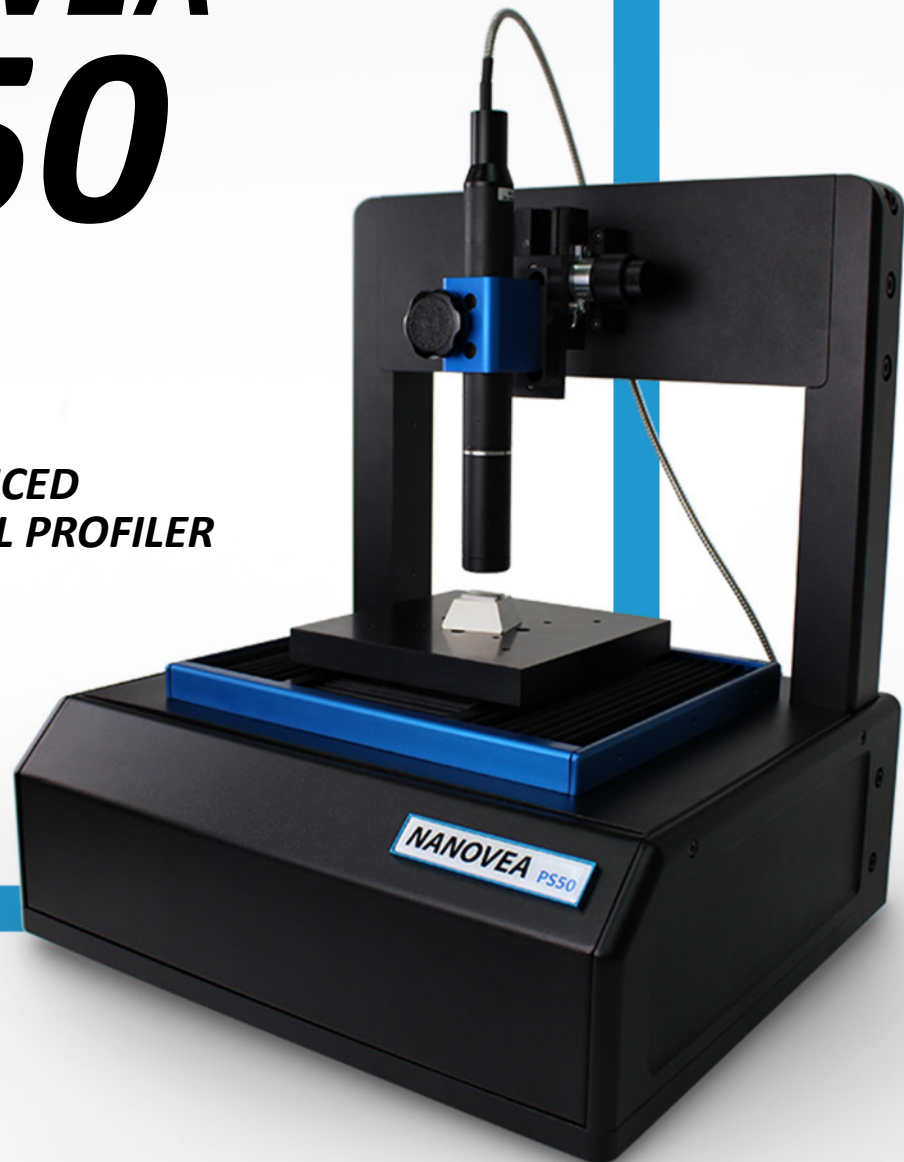


# **NANOVEA PS50**

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**THE MOST ADVANCED  
COMPACT OPTICAL PROFILER**



microworld®

[NANOVEA.COM](http://NANOVEA.COM)

# ULTIMATE MEASURE

*Designed with Chromatic Light technology, the optical profiler measures physical wavelengths and provides the highest accuracy on any surface roughness, form and material.  
Transparent or opaque*

**THE MOST ADVANCED  
COMPACT PROFILER**

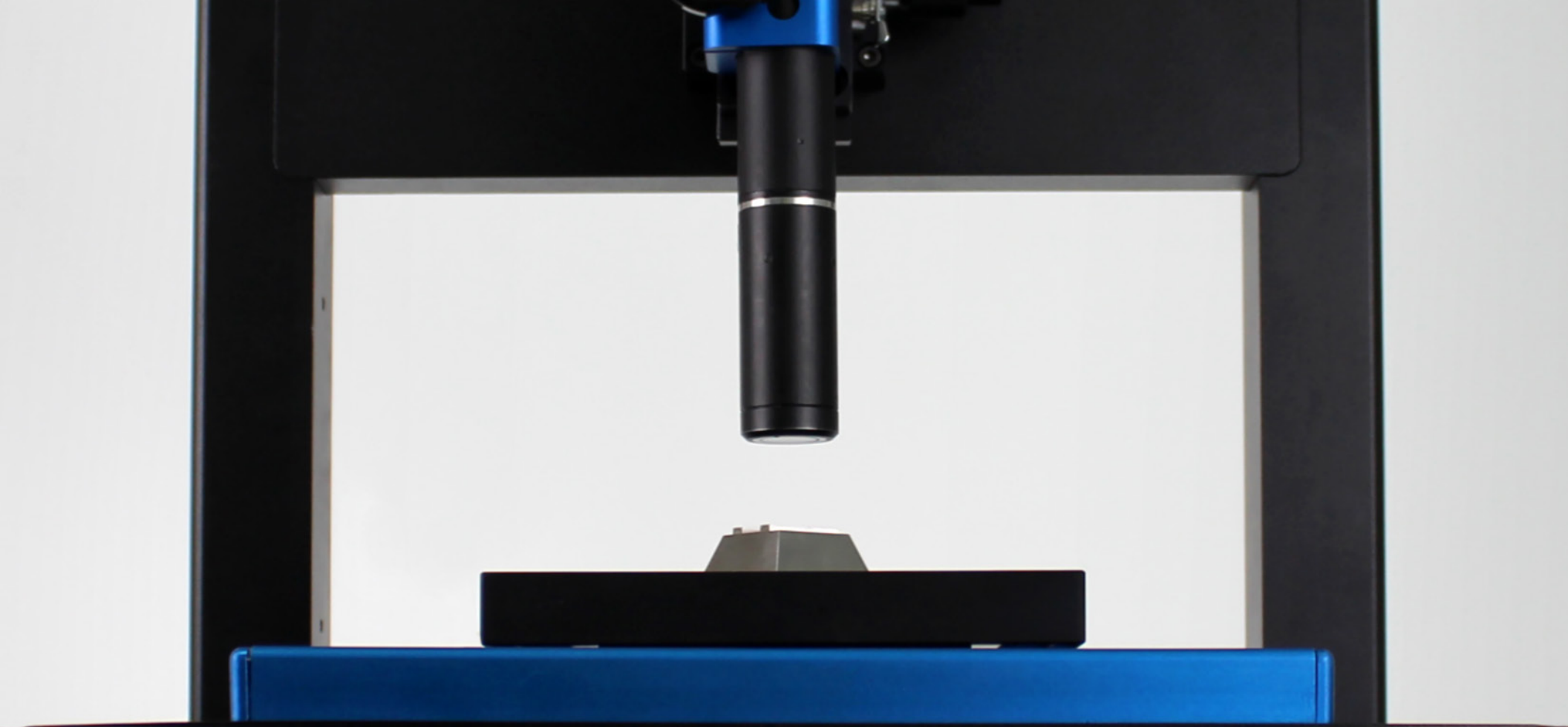
**THE MOST AFFORDABLE  
INVESTMENT**

**UP TO 50 x 50 mm  
OF SCAN AREA**

**SMALL FOOTPRINT  
SMART DESIGN**

A black and blue optical profiler machine. The main body is black, with a prominent blue horizontal bar across the front. A vertical black probe is mounted on a blue bracket that can move along the bar. A thin, braided metal cable is connected to the top of the probe. The machine sits on a black base. A small white label with blue text is on the front right of the base.

**NANOVEA PSS0**



**NANOVEA** PS50

**X-Y**  
*STAGE TRAVEL*  
50 x 50 mm

**Z**  
*AXIS*  
30 mm Manual

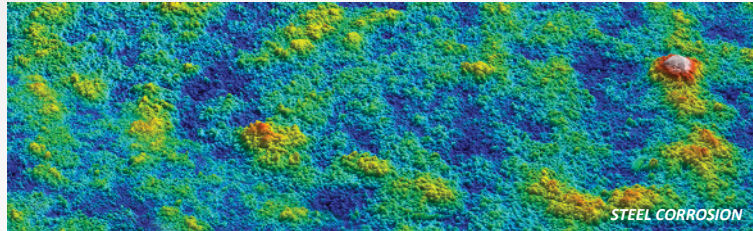
**X-Y**  
*MAX SPEED*  
20 mm/s

# ***THE POWER OF CHROMATIC LIGHT***

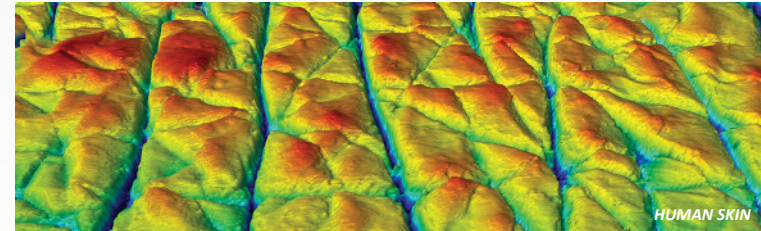
*NANOVEA's Non-Contact Optical Profilers are the ideal upgrade  
from traditional contact stylus and laser profilometers.*



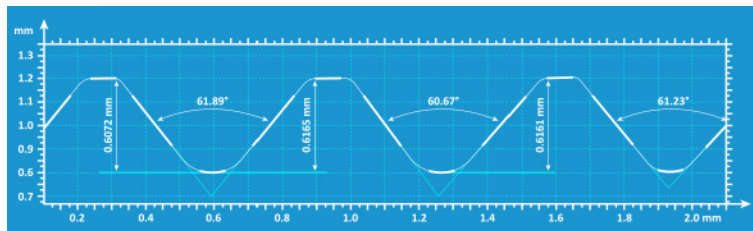
# 2D & 3D NON-CONTACT SURFACE MEASUREMENTS



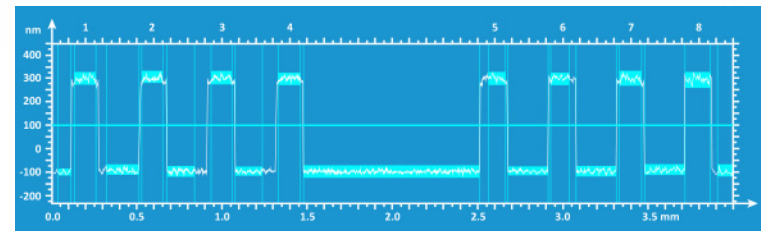
**ROUGHNESS & FINISH**



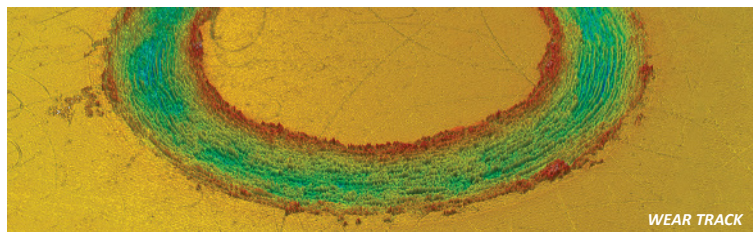
**TEXTURE**



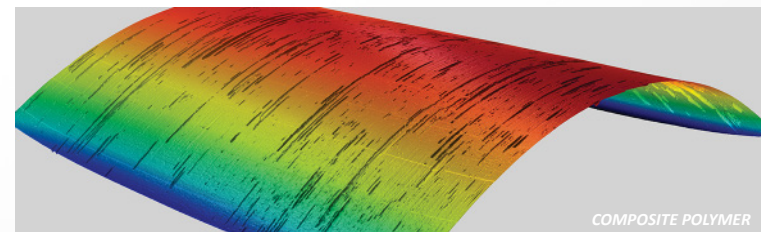
**GEOMETRY & SHAPE**



**STEP HEIGHT & THICKNESS**



**VOLUME & AREA**



**FLATNESS & WARPAGE**

# ANY MATERIAL. TRANSPARENT, REFLECTIVE OR DARK



## STANDARD SENSOR SINGLE POINT

	PS1	PS2	PS3	PS4	PS5	PS6
<b>MAX HEIGHT RANGE</b>	110µm	300µm	1.1mm	3.5mm	10mm	24mm
<b>WORKING DISTANCE</b>	3.35mm	10.8mm	12.0mm	16.2mm	25.9mm	20mm
<b>LATERAL X-Y ACCURACY</b>	0.9µm	1.2µm	2.0µm	3.0µm	7.0µm	8.0µm
<b>HEIGHT REPEATABILITY*</b>	1.2nm	2.2nm	3.4nm	17nm	31nm	41nm

**1 nm**

max vertical resolution



**up to 87°**

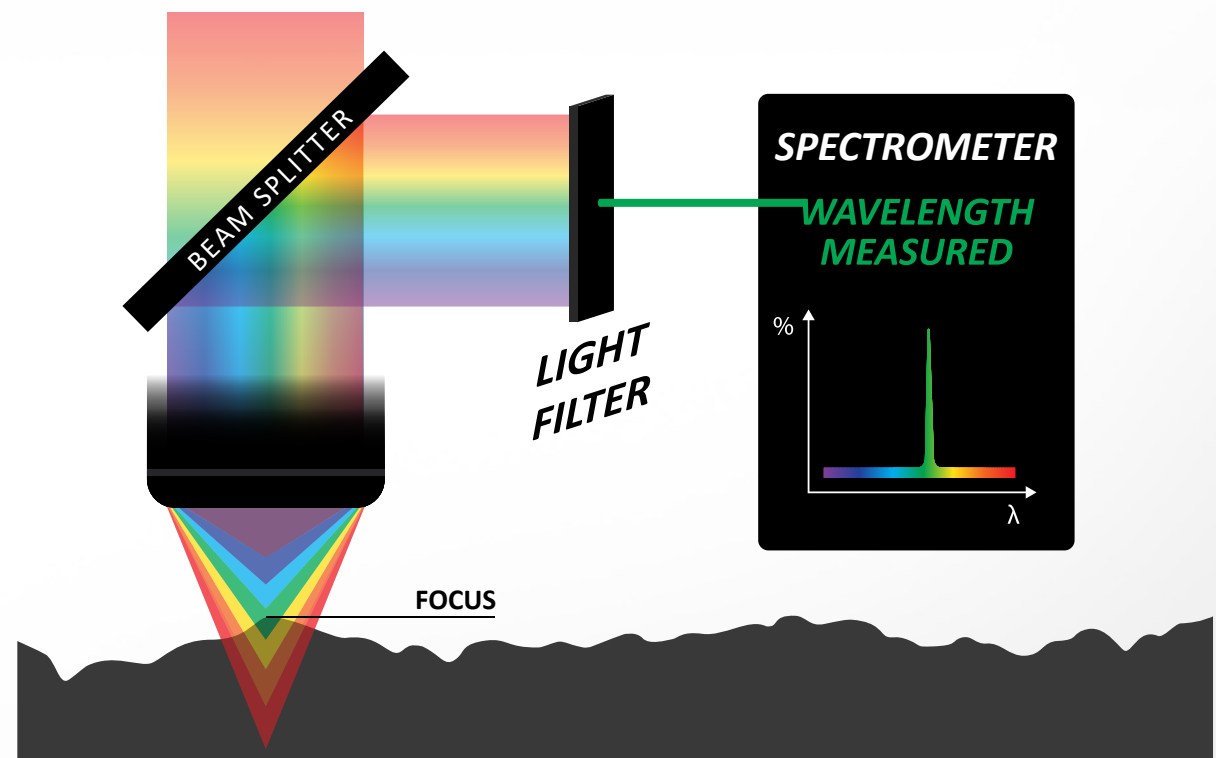
max surface angle

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

# HOW IT WORKS

Chromatic Light Technology operates via a process that utilizes white light and a series of spherochromatic lenses. The spherochromatic lenses split the white light into individual wavelengths with unique vertical focal points (vertical distance from surface or height). All wavelengths and their corresponding heights make up the height range measurement scale of a sensor.

The wavelength with the highest intensity will be detected by the spectrometer which processes the wavelength's associated height. During a full raster scan, this process takes a fraction of a second and produces an accurate height map of the surface of interest.



**NO COMPLEX ALGORITHMS**

**NO DATA STITCHING WITHIN X-Y STAGE TRAVEL**

# THE PROBLEM WITH OTHER TECHNIQUES

## LATERAL RESOLUTION vs LATERAL ACCURACY



**THEM**

**Camera Pixel Size** or **Display Resolution** is often defined as **lateral resolution** to impress clients. Instruments that use camera pixel-based technology require complex algorithms to determine the focal point of the instrument which is problematic for complex surfaces.

**US**

**Chromatic Light** provides **lateral accuracy** which is determined by 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

## LATERAL ACCURACY

For 50x objective (370 x 277  $\mu\text{m}$ )

$\pm 2\%$  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  $\mu\text{m}$  range

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

**16x BETTER HEIGHT ACCURACY**

## AREA TESTED

### STITCHING REQUIRED

# scans (25 x 25 mm)

25 000  $\mu\text{m}$  / 370  $\mu\text{m}$  x 25 000  $\mu\text{m}$  / 277  $\mu\text{m}$

68 x 91

= **6188 scans**



### NO STITCHING

Consistent accuracy across any measurement size

**1 SCAN**

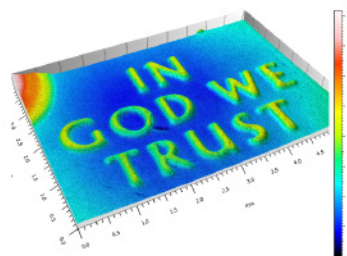
## TEST TIME

6 sec per scan

+ 4 sec displacement & stitching

= 10 sec/scan x 6188 scans

= **61860 seconds** ( $\approx 17$  hours)



Scan time (25 x 25 mm)

= **29.6 seconds**

**2090x FASTER**

# NANOVEA

# PS50

## OPTICAL PROFILER



microworld®

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[www.microworld.eu](http://www.microworld.eu)

Also available in other configurations



PORTABLE



HIGH SPEED



STANDARD



LARGE AREA



ZERO NOISE

