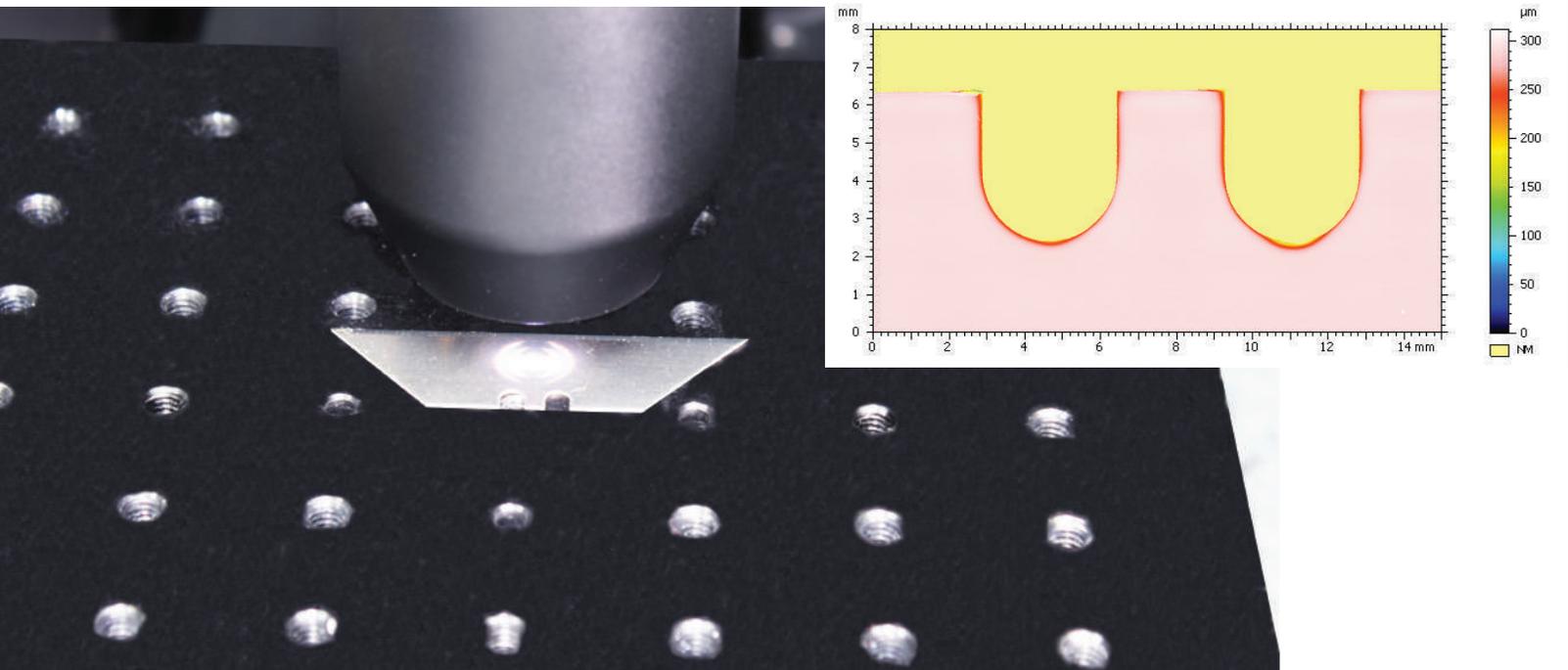


HIGH SPEED SCANNING

— WITH —

NON-CONTACT PROFILOMETRY

LESS THAN 5 SECONDS



Prepared by
Jocelyn Esparza, and Pierre Leroux



Introduction

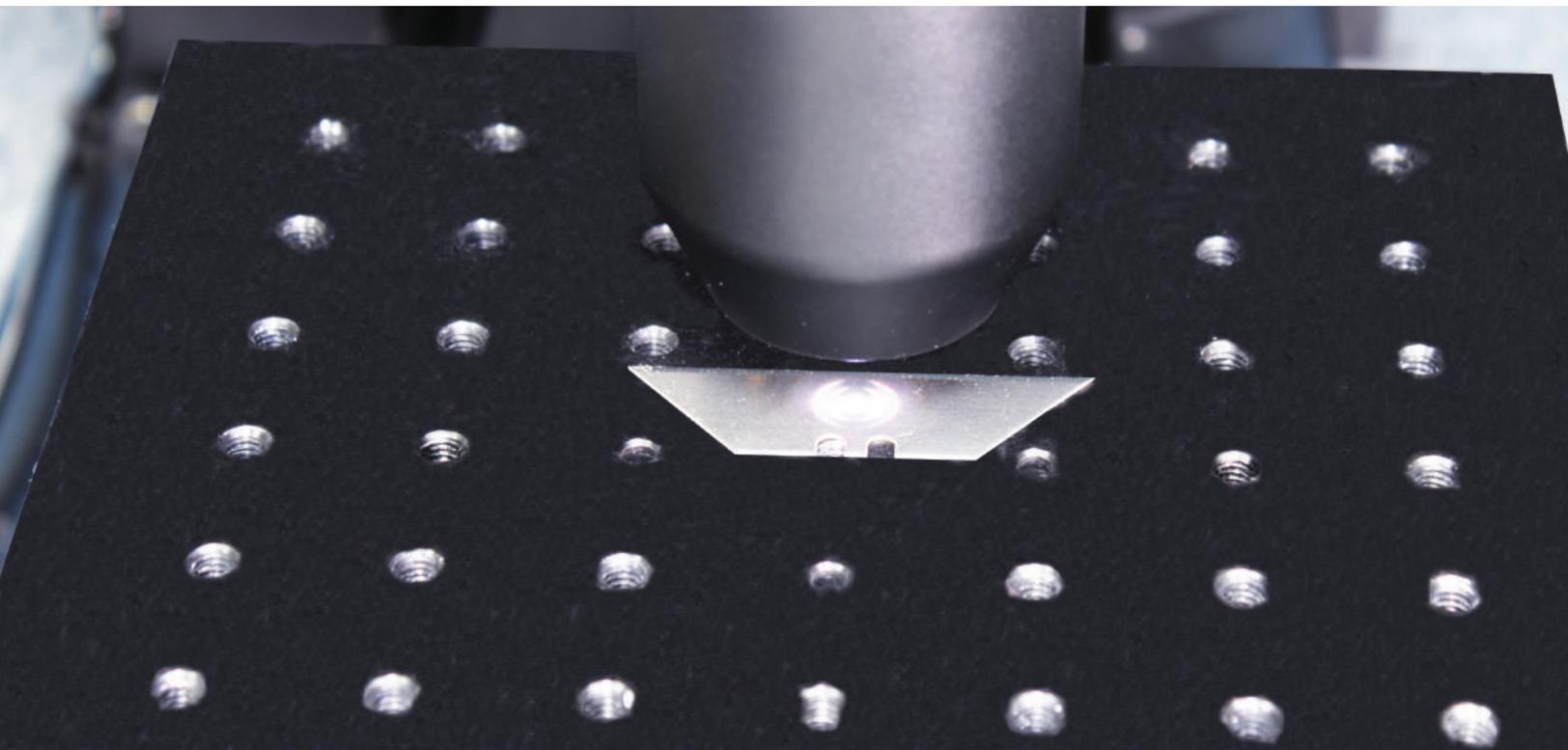
Quick and easy set-up surface measurements save time, effort and are essential for quality control, research and development and production facilities. The Nanovea Non-Contact Profilometer is capable of performing both 3D & 2D surface scans to measure nano to macro scale features on any surface, providing broad range usability.

Importance of Profilometry for Fast 2D Measurement

Unlike other techniques such as touch probes or interferometry, the Non Contact Profilometer, using axial chromatism, can measure nearly any surface, sample sizes can vary widely due to open staging and there is no sample preparation needed. Nano through macro range is obtained during surface measurement with zero influence from sample reflectivity or absorption, has advanced ability to measure high surface angles and there is no software manipulation of results. Easily measure any material: transparent, opaque, specular, diffusive, polished, rough etc. The technique of the Non Contact Profilometer provides an ideal, broad and user friendly capability to maximize surface studies when with the benefits of combined 2D & 3D capability.

MEASUREMENT OBJECTIVES

In this application the Nanovea HS2000 Profilometer is used to measure roughness, step heights and other dimensions on a machined part. All of these calculations are made from a single 2D measurement that takes less than 5 seconds to obtain. This speed and ease of use combined with highly accurate data makes the Nanovea Profilometer a valuable tool for a wide range of applications.



Sample tested on the NANOVEA HS2000

RESULTS AND DISCUSSION

The roughness, step height and contour were used to calculate various dimensions from a single line profile measurement.

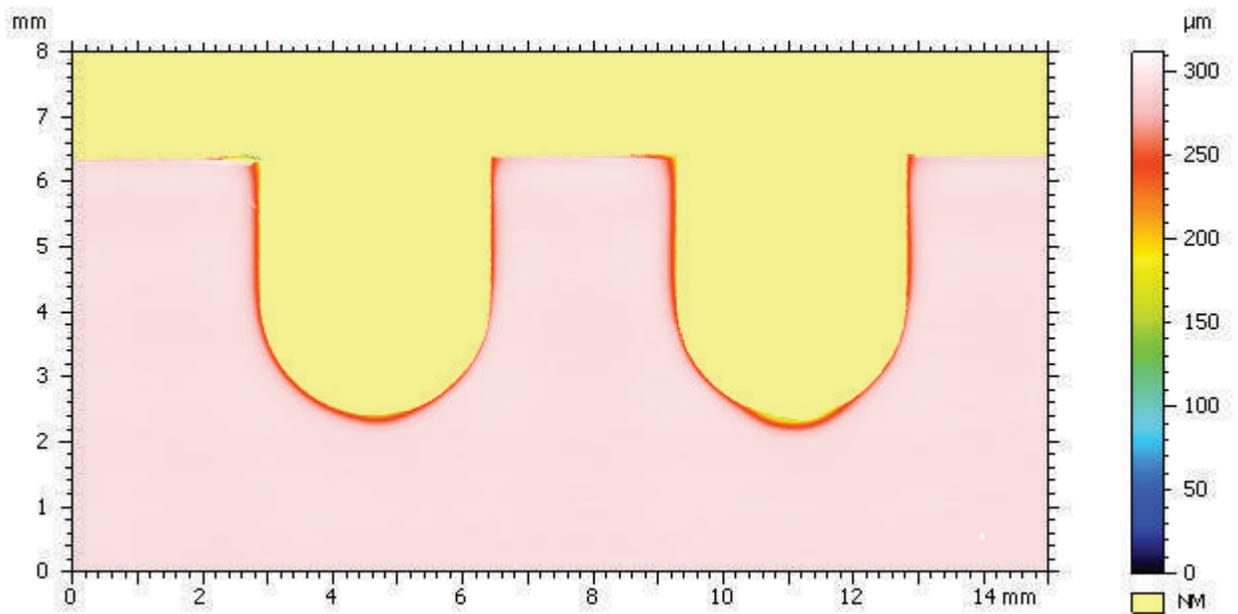


Figure 2: False color view

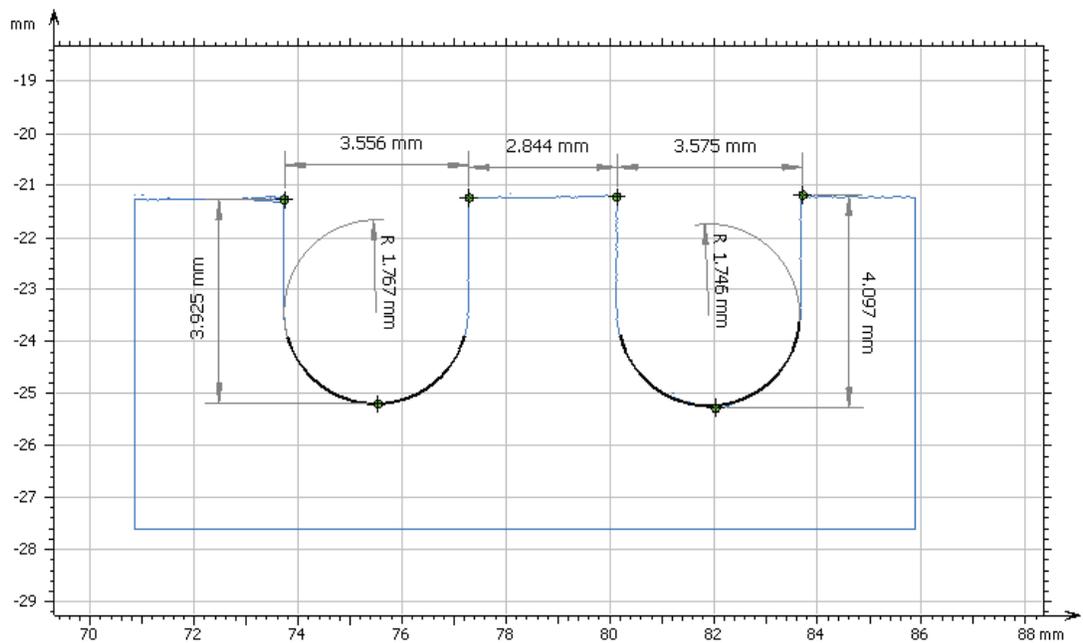


Figure 3: Dimensional analysis

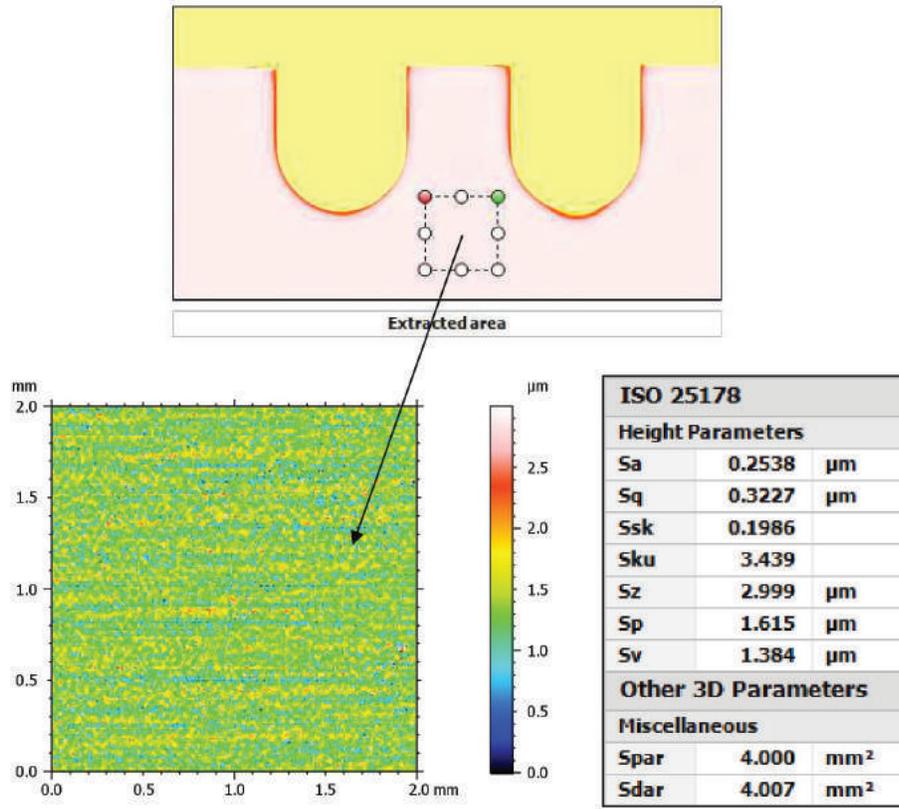


Figure 4: False color view of extracted area and height parameters for surface roughness

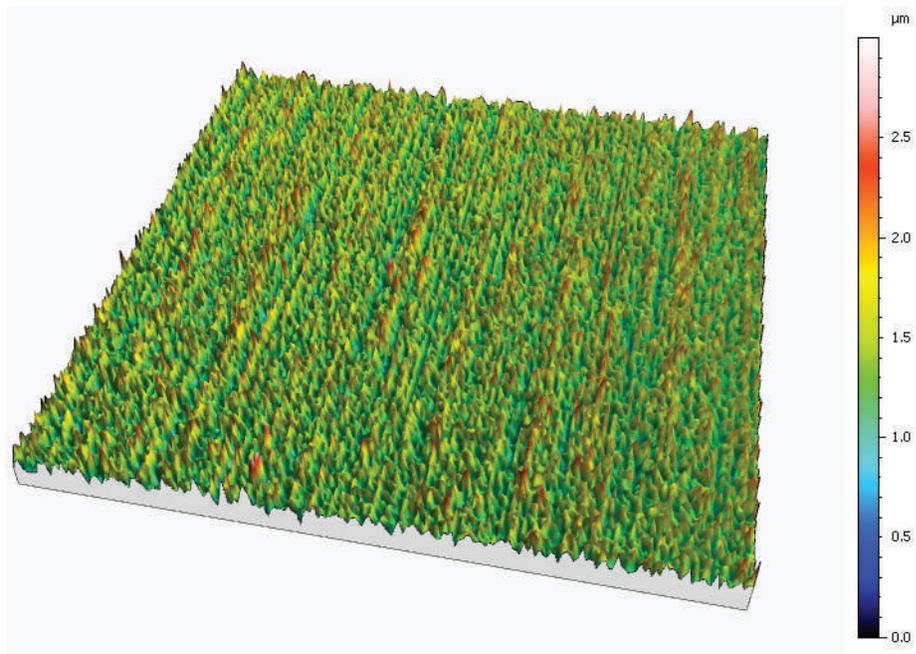
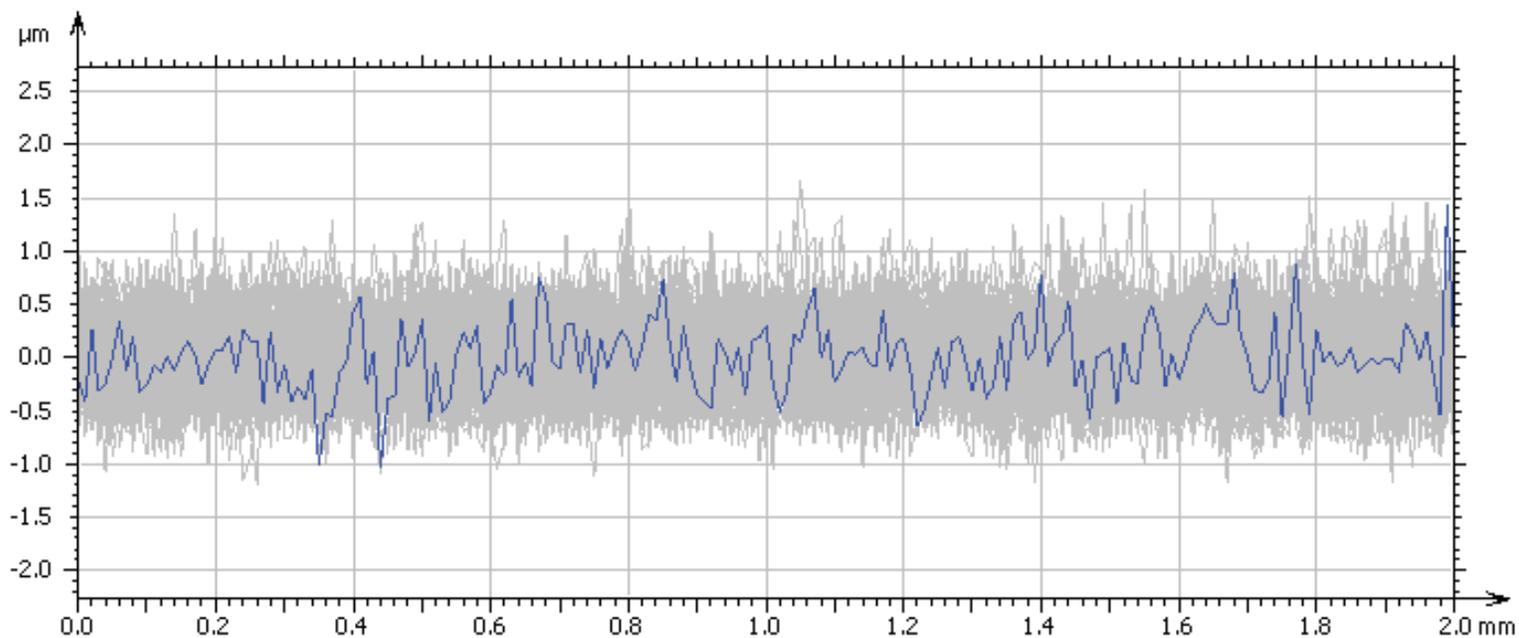
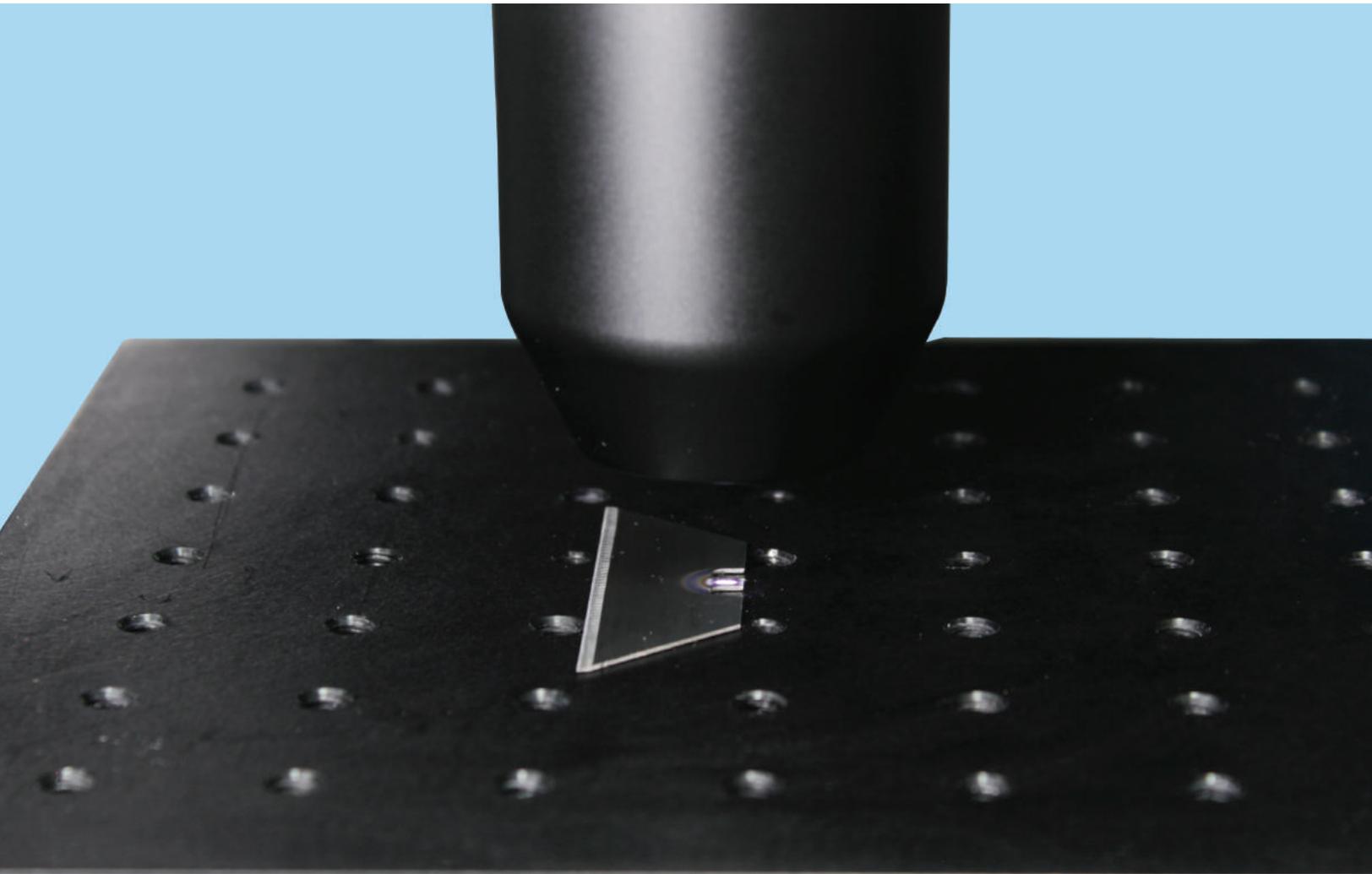


Figure 5: 3D view of surface roughness



		Context	Mean	Std dev	Min	Max
ISO 4287						
Amplitude parameters - Primary profile						
Pa	µm		0.2398	0.02643	0.1809	0.3381
Pz	µm		1.753	0.2750	1.208	2.571
Pq	µm		0.3032	0.0330	0.2304	0.4180
Amplitude parameters - Roughness profile						
Ra	µm	<i>Gaussian filter, 0.8 mm</i>	0.2245	0.02703	0.1555	0.3198
Rz	µm	<i>Gaussian filter, 0.8 mm</i>	1.437	0.2556	0.9034	2.557
Rq	µm	<i>Gaussian filter, 0.8 mm</i>	0.2839	0.0334	0.2023	0.4041

Figure 6: Mean profile and amplitude parameters.

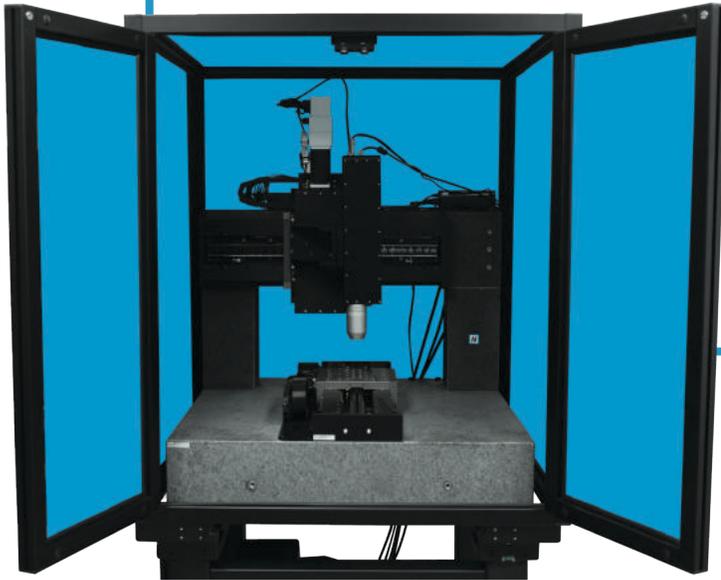


Conclusion

In this application, we have shown how the Nanovea Non-Contact Profilometer can precisely measure roughness, various heights, widths, and other dimensions from a single 3D measurement that takes seconds to obtain. The data shows an average step height of 4.011mm, an average radius of 1.757mm, an average surface roughness of 0.254 μ m as well as other dimensions and height parameters. These measurements are relevant to a huge range of applications, from precision machined parts to biomedical products to electronics. The data shown here represents only a portion of the calculations available in the analysis software.

Learn more about the [Nanovea Proflometers](#) or visit our [application notes library](#).

HS2000 Profiler



High Speed Inspection & Precision Flatness Measurement

Advanced Automation with customizable options

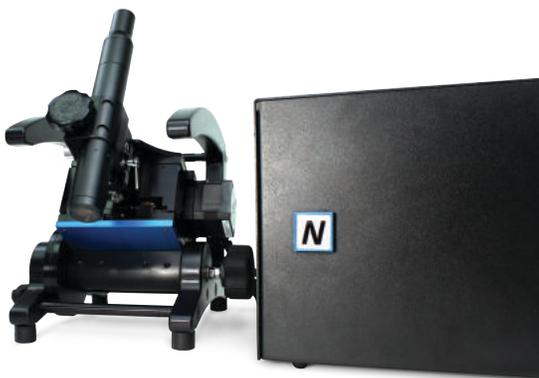
High Speeds up to 384,000 points per second

Designed for large area flatness measurement

Full granite base with integrated anti-vibration table

[Learn More about the HS2000](#)

Jr25 Profiler



High Quality with Portability and Versatility

Full portability with Nanometer Resolution

25mm XY Scan Area

White-light Chromatic Confocal Technology

No Sample Size or Weight Limits

[Learn More about the Jr25](#)

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Call to Schedule a demo today!

If you have any questions please email us at info@nanovea.com

Recommended Reading

Check out our other application note :

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NANOVEA
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www.nanovea.com
info@nanovea.com
euroinfo@nanovea.com
mexinfo@nanovea.com
(949) 461-9292

NANO MECHANICAL CHARACTERIZATION
— OF —
SPRING CONSTANTS



Prepared by
Xavier Herrera-Keehn & Jocelyn Esparza

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