INFINITEFOCUSSL

AS FAST AND INTUITIVE AS 3D SURFACE MEASUREMENT CAN BE

THE SYSTEM

Traceable 3D measurement with color images

InfiniteFocusSL is a cost efficient optical 3D measurement system for easy, fast and traceable measurement of form and finish on micro structured surfaces. Users are able to measure form and roughness of components with only one system. In addition, color images with high contrast and depth of focus are achieved. The robust frame and the intelligent illumination technology provide fast and high resolution measurement in the laboratory and a production near environment.

THE BENEFITS

Cost efficient, fast and intuitive

InfiniteFocusSL is particularly attractive due to its cost effectiveness, measurement speed and usability. The long working distance of up to 33mm in combination with the above average measurement field of 50mm x 50mm allows a wide range of applications. Measurements are achieved within seconds, and features, such as a coaxial laser for quick and easy focusing, enhance its usability.

THE APPLICATIONS

Robust design for universal use

Applications range from cutting edge measurement in tool industry to quality assurance and surface finish measurement of micro components and features on surfaces. InfiniteFocusSL is used in the automotive, aerospace, mold and medical device industries. Users also measure difficult to access surface positions including steep flanks or the roughness on, for example, the tooth root of a gear.

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GENERAL SPECIFICATIONS

Measurement principle	non-contact, optical, three-dimensional, based on Focus-Variation
Max. number of measurement points in a single measurement	X: 2040, Y: 2040, X x Y: 4.16 million
Max. number of measurement points	X: 62500, Y: 62500, X x Y: 500 million
Positioning volume (X x Y x Z)	50 mm x 50 mm x 155 mm (Z: 25 mm mot., 130 mm man.) = 387500 mm^3
Ring light illumination	white LED high-power ring light, 24 segments
Positioning help	coaxial laser beam
Dimensions (W x D x H)	measurement instrument: 195 mm x 316 mm x 418 mm; ControlServerHP: 190 mm x 500 mm x 450 mm
ControlServerHP	12-Core, 32 GB, 24" Full HD LED Monitor

ACCURACY

Flatness deviation	2 mm x 2 mm with 10x objective	U = 0.1 µm
Max. deviation of a height step measurement	height step 1000 µm height step 100 µm height step 10 µm height step 1 µm	$E_{Uni: St: ODS, MPE}$ = 1 µm, σ = 0.1 µm $E_{Uni: St: ODS, MPE}$ = 0.4 µm, σ = 0.05 µm $E_{Uni: St: ODS, MPE}$ = 0.3 µm, σ = 0.025 µm $E_{Uni: St: ODS, MPE}$ = 0.15 µm, σ = 0.01 µm
Profile roughness	Ra = 0.5 µm	U = 0.04 µm, σ = 0.002 µm
Area roughness	Sa = 0.5 µm	U = 0.03 µm, σ = 0.002 µm
Distance measurement	XY up to 2 mm	$E_{Bi: Tr: ODS, MPE}$ = 0.8 µm
Wedge angle	β = 70-110 °	U = 0.15 °, σ = 0.02 °
Edge radius	R = 5 µm - 20 µm R > 20 µm	U = 1.5 µm, σ = 0.15 µm U = 2 µm, σ = 0.3 µm

$E_{Uni: St: ODS, MPE}$ & $E_{Bi: Tr: ODS, MPE}$ conform to ISO 10360-8

MEASUREMENT OBJECT

Surface texture	surface topography Ra above 0.009 µm with λ_c 2 µm; depending on surface structure
Max. height	155 mm
Max. weight	4 kg; more on request

OBJECTIVE SPECIFIC FEATURES

Objective magnification (*)		**10x**	**20x**	**50x**	**2xSX**	**5xSX**	**10xSX**	**20xSX**	**50xSX**
Numerical aperture		0.3	0.4	0.6	0.055	0.14	0.28	0.42	0.55
Working distance	mm	17.5	13	10.1	34	34	33.5	20	13
Lateral measurement area (X,Y) **(X x Y)**	mm mm^2	2 4	1 1	0.4 0.16	10 100	4 16	2 4	1 1	0.4 0.16
Ext. lat. measurement area (X,Y) **(X x Y)**	mm mm^2	50 2500							
Measurement point distance	µm	1	0.5	0.2	5	2	1	0.5	0.2
Calculated lateral optical limiting resolution	µm	1.09	0.82	0.54	5.93	2.33	1.17	0.78	0.59
Finest lateral topographic resolution	µm	2	1	0.64	10	4	2	1	0.64
Measurement noise	nm	40	20	10	1240	180	45	25	15
Vertical resolution	nm	100	50	20	3500	510	130	70	45
Vertical measurement range	mm	16	12	9	25	25	25	19	12
Measurement speed	≤ 1.7 million measurement points/sec.								

(*) Objectives with longer working distance available upon request

RESOLUTION AND APPLICATION LIMITS

Objective magnification		**10x**	**20x**	**50x**	**2xSX**	**5xSX**	**10xSX**	**20xSX**	**50SX**
Min. measurable height	nm	100	50	20	3500	510	130	70	45
Max. measurable height	mm	16	12	9	25	25	25	19	12
Height step accuracy (1mm)	%	0.5							
Max. measurable area	mm^2	2500							
Max. measurable profile length	mm	50							
Min. measurable roughness (Ra)	µm	0.3	0.15	0.08	n.a.	n.a.	0.45	0.25	0.15
Min. measurable roughness (Sa)	µm	0.15	0.075	0.05	n.a.	n.a	0.25	0.1	0.08
Min. measurable radius	µm	5	3	2	20	10	5	3	2
Min. measurable wedge angle	°	20							
Max. measurable slope angle	°	87							

SOFTWARE

Measurement modules	Standard: 3D data capturing, profile form, profile roughness (Ra, Rq, Rz,...), surface texture (Sa, Sq, Sz,...), volume, 2D, Automation; Alicona Inspect (3D inspection incl. GD&T); Optional: automatic multi measurement; fusion; form/contour/difference; various application specific measurement modules; Edge Measurement Package (edge radius/form/contour, edge break, chipping/roughness, difference measurement, multi edge measurement); Alicona Inspect Professional; flash measurement
Automation	integrated scripting language; LabVIEW framework; .NET remoting interface; Alicona Inspect Professional (enables GD&T measurement)
Database	intuitive, graphical database
Languages	German, English, French, Korean, Japanese, Chinese
Export formats	3D data sets (e.g.: AL3D, STL, G3D, Open GPS, CSV, QDAS); image formats (e.g.: BMP, JPG, PNG)
Import formats	Standard: 3D data sets (e.g.: AL3D, STL, G3D, Open GPS, IGES, STEP); image formats (e.g.: BMP, JPG, PNG); Optional: Alicona Inspect Professional (SolidWorks; CATIA V4, V5, V6; Pro/E)

Initiative Fair Data Sheet

Specifications in blue mark Alicona specific values.