

# InfiniteFocusSL

As fast and intuitive as 3D surface measurement can be

InfiniteFocusSL is a cost efficient optical 3D measurement system for easy, fast and traceable measurement of form and finish on micro structured surfaces. Users measure both form and roughness of components with only one system. In addition, color images with high contrast and depth of focus are achieved. The long working distance of up to 33mm in combination with its measurement field of 50mm x 50mm allows a wide range of applications. Measurements are achieved in seconds and features, such as a coaxial laser for quick and easy focusing, further increase usability. With an automation interface, InfiniteFocusSL is also applied for fully automatic measurement in production.



Real3D Rotation Unit G2



AdvancedInsertGrip



InsertGrip G2



ToolGrip



## GENERAL SPECIFICATIONS

<b>Positioning volume (X x Y x Z)</b>	RL objectives: mot.: 50 mm x 50 mm x 155 mm (Z: 25 mm mot., 130 mm man.) = 387500 mm <sup>3</sup> SXRL/AXRL objectives: mot.: 50 mm x 50 mm x 120 mm (Z: 25 mm mot., 95 mm man.) = 300000 mm <sup>3</sup>
<b>Max. specimen weight</b>	4 kg, more on request

## OBJECTIVE SPECIFIC FEATURES

Objective magnification (*)		10x	20x	50x	2xSX	5xAX	10xAX	20xAX	50xSX
<b>Numerical aperture</b>		0.3	0.4	0.6	0.055	0.14	0.28	0.42	0.55
<b>Working distance</b>	mm	17.5	16	10.1	34	34	33.5	20	13
<b>Lateral measurement area (X,Y) (X x Y)</b>	mm mm <sup>2</sup>	2 4	1 1	0.4 0.16	10 100	3.61 13.03	2 4	1 1	0.4 0.16
<b>Ext. lat. measurement area (X,Y) (X x Y)</b>	mm mm <sup>2</sup>	50 2500							
<b>Measurement point distance</b>	µm	1	0.5	0.2	5	2	1	0.5	0.2
<b>Calculated lateral optical limiting resolution</b>	µm	1.09	0.82	0.54	5.93	2.33	1.17	0.78	0.59
<b>Finest lateral topographic resolution</b>	µm	2	1	0.64	10	4	2	1	0.64
<b>Measurement noise</b>	nm	40	20	10	1240	165	45	25	15
<b>Vertical resolution</b>	nm	100	50	20	3500	460	130	70	45
<b>Vertical measurement range</b>	mm	16	15	9	25	25	25	19	12
<b>Measurement speed</b>		≤ 1.7 million measurement points/sec.							
<b>Accessibility</b>	°	31	29	19	40	51	51	39	26

(\*) Objectives with longer working distance available upon request

## RESOLUTION AND APPLICATION SPECIFICATIONS

Objective magnification		10x	20x	50x	2xSX	5xAX	10xAX	20xAX	50xSX
<b>Min. measurable height</b>	nm	100	50	20	3500	460	130	70	45
<b>Max. measurable height</b>	mm	16	15	9	25	25	25	19	12
<b>Height step accuracy (1 mm)</b>	%	0.1							
<b>Max. measurable area</b>	mm <sup>2</sup>	2500							
<b>Max. measurable profile length</b>	mm	50							
<b>Min. measurable roughness (Ra)</b>	µm	0.3	0.15	0.08	n.a.	n.a.	0.45	0.25	0.15
<b>Min. measurable roughness (Sa)</b>	µm	0.15	0.075	0.05	n.a.	n.a.	0.25	0.1	0.08
<b>Min. measurable radius</b>	µm	5	3	2	20	10	5	3	2
<b>Min. measurable wedge angle</b>	°	20							
<b>Max. measurable slope angle</b>	°	87							

## ACCURACY

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

E<sub>Uni: St: ODS, MPE</sub> & E<sub>Bi: Tr: ODS, MPE</sub> conform to ISO 10360-8