

IF-EDGEMASTER

HOW TO MEASURE CUTTING EDGES OPTICALLY
AND REPEATABLE ALSO IN PRODUCTION

alicon

THE SYSTEM

Automatic cutting edge measurement

IF-EdgeMaster is an optical 3D measurement device for automatic cutting edge measurement. Edges are measured regardless of type, size, material or surface finish of the tool. Users measure radii $> 2 \mu\text{m}$ as well as rake, wedge and clearance angle of cutting edges. Both waterfall type and trumpet type are precisely measured. The robust technology of Focus-Variation delivers stable and traceable measurements also in a production near environment.

THE BENEFITS

Stable results include traceable roughness measurements

IF-EdgeMaster delivers fully automatic measurements and stable results even with external vibration and external light. The system provides user friendly operation with high measurement speed. High vertical resolution enables chipping measurement and, in addition, traceable roughness measurements at the rake face of an edge. An intelligent illumination technology enables optimized illumination of surfaces with short exposure times, leading to fast measurements.

THE APPLICATION

From the green part to the polished component

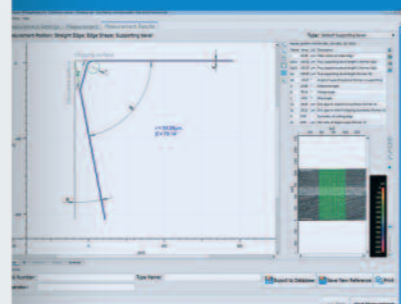
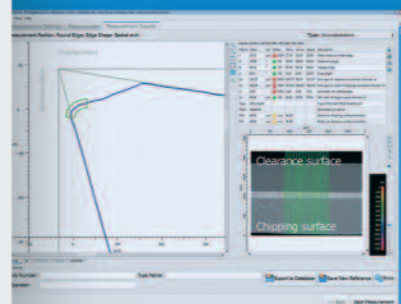
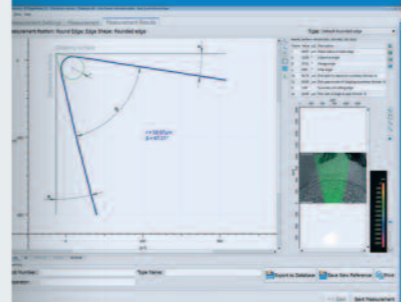
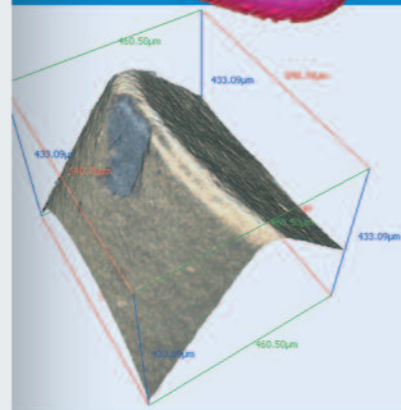
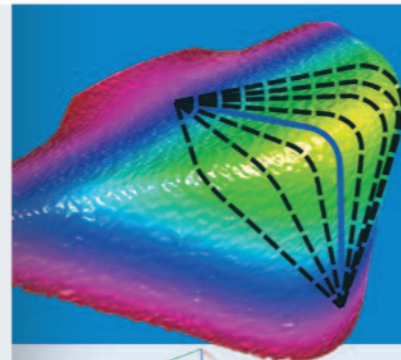
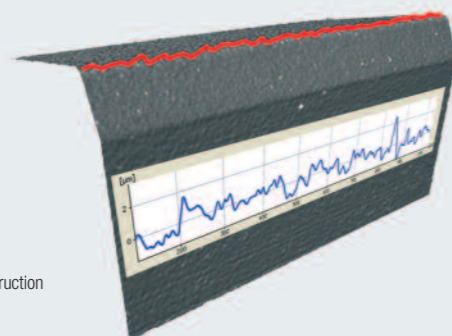
Users benefit from high resolution measurements during the whole manufacturing process. The IF-EdgeMaster is used to measure the green part of a tool as well as the highly polished component in its final stage. Typically, the measurement system is used to measure inserts, drills, millers etc. Advanced visualization including registered color information allows transparent and provable quality assurance.

THE EXPERIENCE

"In addition to the large variety of measurement possibilities, it was the user friendly operation of the system that convinced us in the first place. These characteristics combined with the high measurement accuracy make this device an ideal tool for our production!"



Ulrich Weber
Special Tools Construction
SIMTEK



GENERAL SPECIFICATION

Travel range X/Y	25 mm x 25 mm
Travel range Z	130 mm (26 mm motorized)
Illumination	LED ring light with 24 segments
Weight	12 kg
Dimensions	195 mm x 316 mm x 418 mm (W x D x H)

OBJECTIVES

		10x	20x	50x	2x SX	5x SX	10x SX	20x SX	50x SX
Sampling distance	μm	1	0.5	0.2	5	2	1	0.5	0.2
Min. repeatability (vertical)	nm	40	20	10	1240	180	45	25	15
Max. scan height (approx.)	nm	16	12	9	25	25	25	19	12
Best vertical resolution	nm	100	50	20	3500	510	130	70	45
Working distance	mm	17.5	13	10.1	34	34	33.5	20	13
Measurement field X x Y	mm	2 x 2	1 x 1	0.4 x 0.4	10 x 10	4 x 4	2 x 2	1 x 1	0.4 x 0.4

RANGE OF RESOLUTION AND APPLICATIONS

		10x	20x	50x	2x SX	5x SX	10x SX	20x SX	50x SX
Min. measurable radius	μm	5	3	2	20	10	5	3	2
Min. measurable wedge angle	$^\circ$	20	20	20	20	20	20	20	20
Min. measurable roughness (Ra)	nm	300	150	80	-	-	450	250	150
Min. measurable roughness (Sa)	nm	150	75	50	-	-	250	100	80
Max. level length	μm	800	400	160	4000	2000	800	400	160
Max. measurable slope angle	$^\circ$	up to 87							

ACCURACY

Edge angle	$\beta = 70...110^\circ$	$U = 0.15^\circ, \sigma = 0.02^\circ$
Edge radius	$R = 5 \mu\text{m} - 20 \mu\text{m}$	$U = 1.5 \mu\text{m}, \sigma = 0.15 \mu\text{m}$
	$R > 20 \mu\text{m}$	$U = 2 \mu\text{m}, \sigma = 0.3 \mu\text{m}$

SOFTWARE

Measurement modules	Standard: Automatic edge measurement (edge radius/form/contour; form deviations) Optional: Chipping; roughness, edge break measurement, flash measurement
Automation	Integrated 3D Script Editor, Labview Framework und Remoting
Import/Export	3D data sets (e.g. AL3D, STL, G3D, IGES, STP); common image formats (e.g. BMP, JPG, PNG); simple export of results (CSV, 2D, 3D, QDAS export)
Languages	German, English, French, Japanese, Chinese

MEASUREMENT OBJECT

Surface texture	Surface topography Ra above 9 nm with Lc 2 μm , dependent on surface structure
Max. height	155 mm
Max. weight	4 kg
Sample preparation	none