

# EDGEMASTER

How to measure cutting edges also in production

## THE SYSTEM

### Automatic cutting edge measurement

The 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 > 2µm as well as rake, wedge and clearance angle of cutting edges. Different types, including both waterfall and trumpet, 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

The 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 in addition to traceable roughness measurements at the rake face of edges. 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 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 Tool Construction  
SIMTEK



## 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
Positioning volume (X x Y x Z)	man.: 25 mm x 25 mm x 155 mm (Z: 25 mm mot., 130 mm man.) = 96875 mm <sup>3</sup>
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, ControlServer: 190 mm x 500 mm x 450 mm
ControlServer	6 Core, 8 GB, 24" Full HD LED Monitor
Applications	automated cutting edge measurement; typically applied for inserts

## MEASUREMENT OBJECT

Surface texture	surface topography Ra above 0.009 µm with λ <sub>c</sub> 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
Working distance	mm	17.5	13	10.1	34	34	33.5	20	13
Lateral measurement area (X,Y) (X x Y)	mm mm <sup>2</sup>	2 4	1 1	0.4 0.16	10 100	4 16	2 4	1 1	0.4 0.16
Measurement point distance	µm	1	0.5	0.2	5	2	1	0.5	0.2
Measurement noise	nm	40	20	10	1240	180	45	25	15
Vertical resolution	nm	100	50	20	3500	510	130	70	45
Vertical measurement area	mm	16	12	9	25	25	25	19	12

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

## RESOLUTION AND APPLICATION LIMITS

Objective magnification		10x	20x	50x	2xSX	5xSX	10xSX	20xSX	50xSX	
Min. measurable radius	µm	5	3	2	20	10	5	3	2	
Min. measurable wedge angle	°	20								
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	
Max. bevel length	µm	800	400	160	4000	2000	800	400	160	
Max. measurable slope angle	°	87								

## ACCURACY

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
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

## SOFTWARE

Measurement modules	Standard: automatic edge measurement (edge radius, form, contour, form deviation) Optional: chipping, roughness, edge break
Automation	integrated scripting language; LabVIEW framework; .NET remoting interface
Languages	German, English, French, Korean, Japanese, Chinese
Export formats	3D data sets (e.g.: AL3D, STL, G3D, CSV, QDAS), image formats (e.g.: BMP, JPG, PNG)
Import formats	3D data sets (e.g.: AL3D, STL, G3D), image formats (e.g.: BMP, JPG, PNG)

Initiative Fair Data Sheet  
Specifications in blue mark Alcona specific values.