

IF-EDGEMASTER

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AUTOMATIC
CUTTING EDGE MEASUREMENT

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The system

Automatic cutting edge measurement

The IF-EdgeMaster is an optical 3D measurement device for fully automatic measurement of indexable inserts. Users measure form, roundness and chipping irrespective of type, dimensions, material and surface finish.

The function

Form plus basket arch, chipping plus roughness

Measurement of clearance, wedge and chipping angle plus the basket arch form of an edge. Both "waterfall" and "trumpet" types are accurately measured. In addition the user benefits from traceable roughness measurement. Even in a production environment robust results with high resolution are achieved.

The benefits

Extreme stability and user friendly operation

Reduced user influence by fully automatic measurements. The system delivers stable measurements irrespective of local vibrations and/or external light. Also, users benefit from its high user-friendliness. The visualization, including registered color information, results in clear and provable quality assurance.





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How to measure cutting edges
contactless and repeatable
also in production

The applications

**From the green part
to the polished tool**

Measurement of inserts in all production steps from the green part to the polished tool. The illumination concept of the system provides robust measurements – independent of the material and its reflection properties.

The technology

**Focus-Variation in research
and production**

Focus-Variation uses the small depth of focus of an optic. The EN ISO certified technology delivers traceable measurements with a high level of repeatability. Focus-Variation is used for high resolution area based quality assurance in research and production.

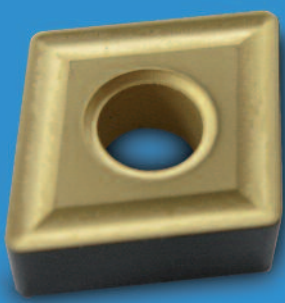
The practice

Ideal in production

„In addition to the comprehensive measurement options the user friendly handling has convinced us. The IF-EdgeMaster has an extremely intuitive user interface and is very easy to use. These qualities, in combination with the high measurement accuracy, make this device ideal for use in our production.“

Ulrich Weber, tool construction

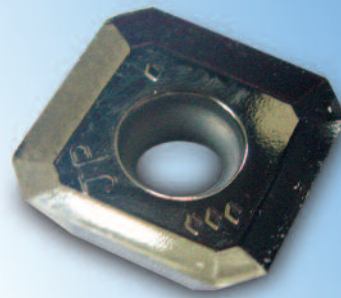
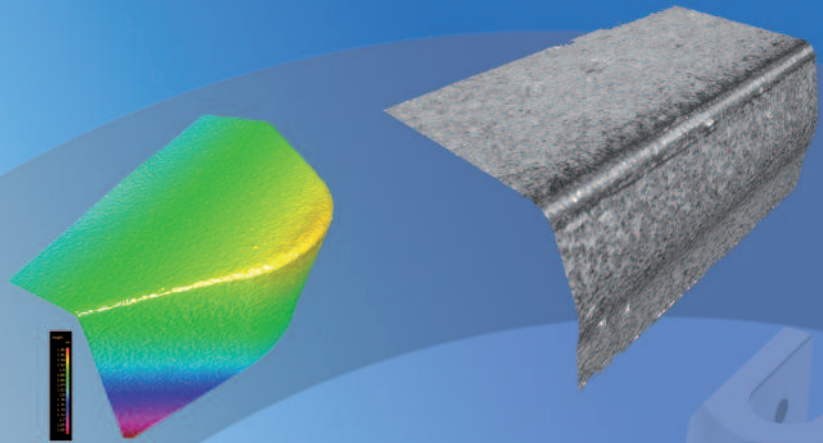
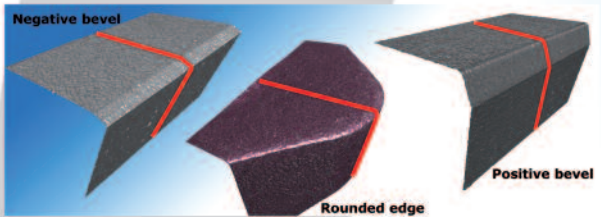
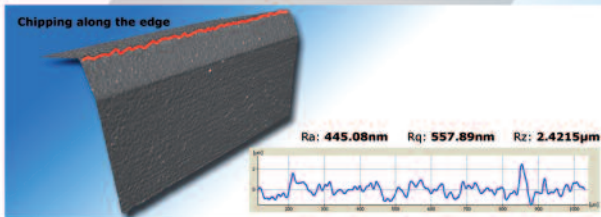
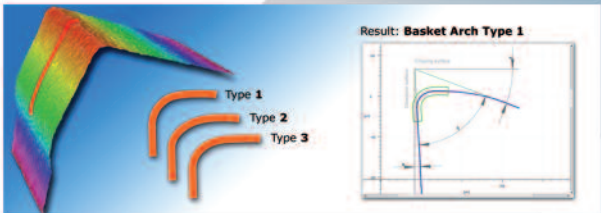
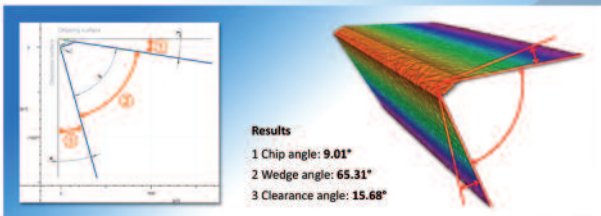
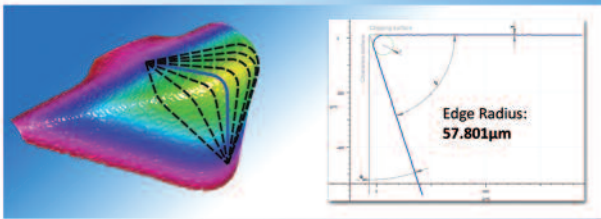
SIMTEK



Improved work piece quality
and enhanced tool life

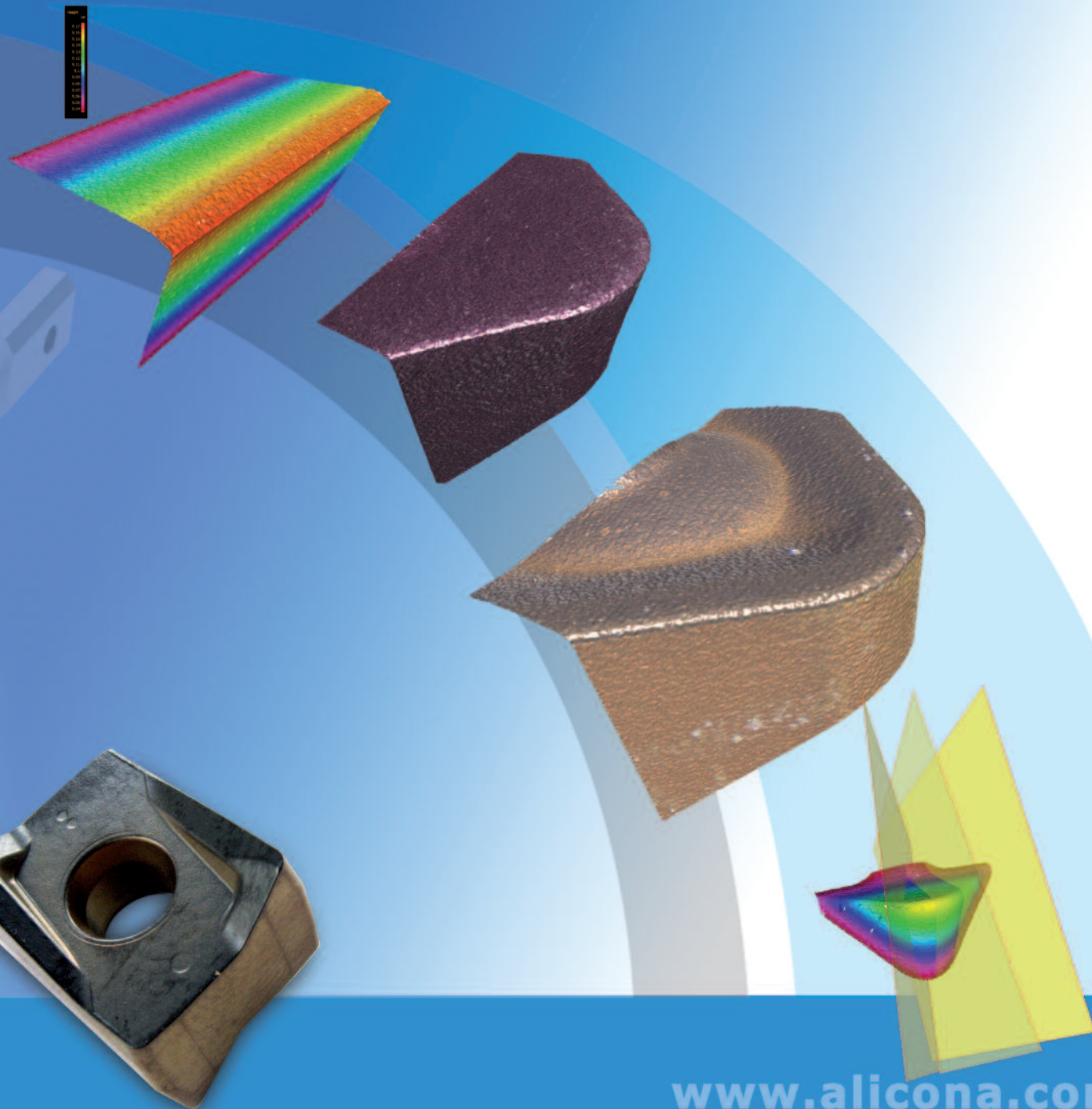


Optical cutting edge measurement also in production

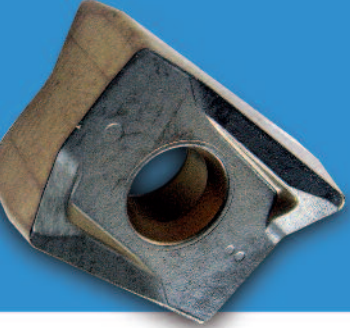


Fewer rejects at
higher process reliability

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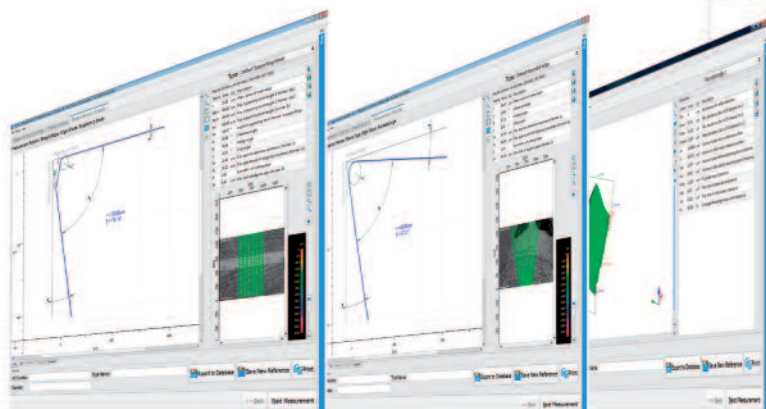
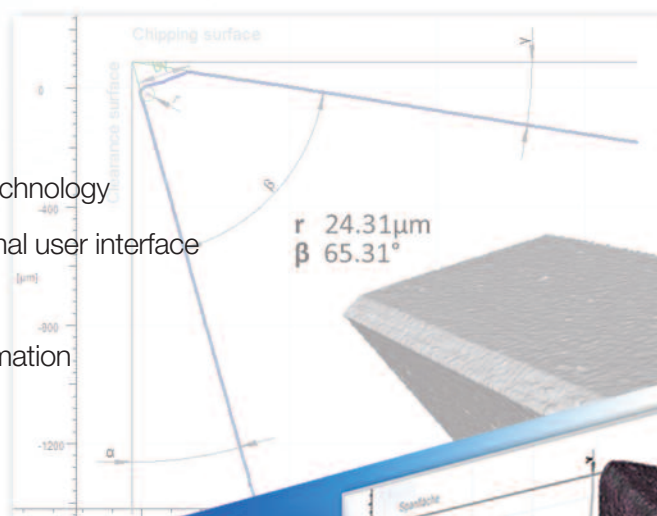


Increased productivity on all materials

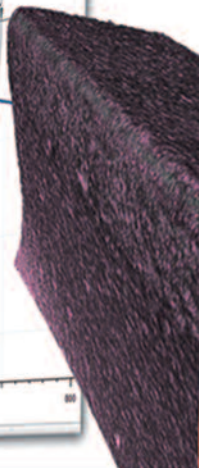
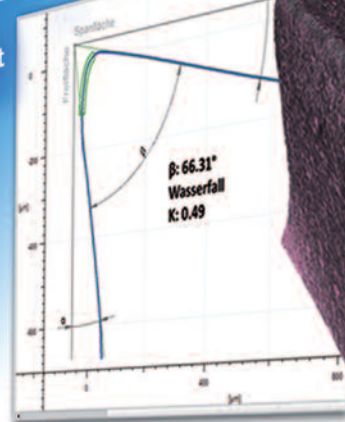
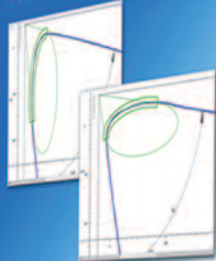
Your benefits

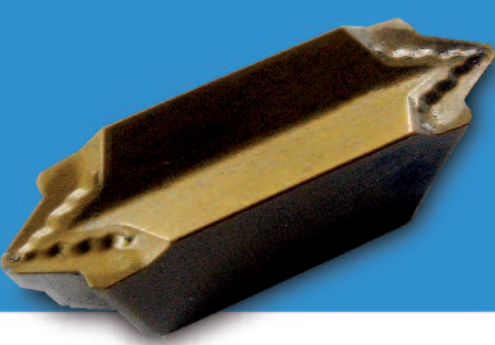
The IF-EdgeMaster meets all requirements of a cost efficient measurement device for quality assurance of cutting edges:

- » it enables repeatable measurements within seconds
- » it provides measurements of cutting edges regardless material and surface finish
- » it measures small radii in highest resolution
- » it allows traceable roughness measurement
- » it measures without any pre-treatment
- » it measures large bevel lengths
- » it provides various export and print functionalities
- » it yields stable measurements through a robust technology
- » it delivers fully automatic measurement with minimal user interface
- » it offers intuitive user guidance
- » it visualizes results with registered true color information
- » it performs wear analysis automatically



Waterfall vs. Trumpet





Technical Specifications

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General Specifications

Measurement principle	<i>non-contact, optical, 3-dimensional, based on Focus-Variation, measurable are cutting edges, material and process independent (unsintered, sintered, polished, PKD, CBN)</i>
Optic	<i>Objectives 10x, 20x</i>
Maintenance	<i>maintenance free</i>
Illumination	<i>LED ring light, high power, electronically controllable, and dual laser beam focus aid</i>
Vertical travel range coarse drive	<i>64mm</i>
Vertical travel range motorized	<i>26mm</i>
Manual x/y-adjustment	<i>25mm x 25mm</i>
Weight measurement system	<i>9.3kg</i>
Size measurement system WxDxH	<i>167mm x 270mm x 388mm</i>
Temperature range	<i>possible: 5°- 40°C, calibrated for: 18°- 22°C</i>
Power supply	<i>900W; 110-230V~; 50-60Hz</i>

Objectives

Objective		10x	20x
Sampling distance	<i>μm</i>	<i>1.1</i>	<i>0.55</i>
Min. repeatability (vertical)	<i>nm</i>	<i>40</i>	<i>25</i>
Max. scan height	<i>mm</i>	<i>16</i>	<i>12</i>
Vertical resolution*	<i>nm</i>	<i>150</i>	<i>100</i>
Max. scan speed	<i>μm/s</i>	<i>100</i>	<i>50</i>
Vertical dynamic		<i>150000</i>	<i>200000</i>
Working distance	<i>mm</i>	<i>17.5</i>	<i>13</i>
Field of view X	<i>μm</i>	<i>1760</i>	<i>880</i>
Field of view Y	<i>μm</i>	<i>1320</i>	<i>660</i>

*) Vertical resolution can be adjusted depending on the application. This also influences the scan speed.

Resolution and Application Range

Objective		10x	20x
Min. measurable radius	<i>μm</i>	<i>6</i>	<i>4</i>
Min. measurable wedge angle	<i>°</i>	<i>20</i>	<i>20</i>
Repeatability of radius straight edge*	<i>μm</i>	<i>0.04-0.3</i>	<i>0.04-0.3</i>
Repeatability of radius round edge*	<i>μm</i>	<i>0.04-0.6</i>	<i>0.04-0.6</i>
Repeatability of angle straight edge*	<i>°</i>	<i>0.01-0.1</i>	<i>0.01-0.1</i>
Repeatability of angle round edge*	<i>°</i>	<i>0.01-0.3</i>	<i>0.01-0.3</i>
Uncertainty of angle	<i>°</i>	<i>0.5</i>	<i>0.5</i>
Max. bevel length	<i>μm</i>	<i>500</i>	<i>250</i>
Measurement duration	<i>sec</i>	<i>20-60</i>	<i>20-60</i>

*) dependent on the quality of the rounded edge

Software

Automatic measurement	<i>fully automatic measurement of radius, clearance angle, wedge angle, chipping angle, S_{ox}, S_{y}, K, Δr, positive and negative bevel, basket arch, chipping along the edge, detection and measurement of edge defects</i>
Additional measurement	<i>ISO conform Profile-Form-Measurement, Profile-Roughness-Measurement (R_a, \dots), Surface-Texture-Measurement (S_a, fractal dimension...), target/actual comparison to CAD or reference data</i>
Database	<i>intuitive, graphical database</i>
Measurement report	<i>automatic measurement report including visualization</i>

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Various grips allow various applications

Insert-Grip

A tool for placing small inserts in an exact 45° position. Also reflections are reduced. This minimizes sources of error and increases repeatability.



Advanced-Insert-Grip

Grip for the measurement of inserts in variable oblique positions. This grip can be adjusted to most cutting tools and can be locked in the desired position. Measurement comfort and repeatability are increased.

Rotation-Grip

Clamping device, for horizontal mounting of components such as drills or milling cutters enabling it to be rotated into the desired position. Also cutting edges can be measured easily.

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