

The Product

Automatic cutting edge measurement

The software package is used to fully automatically measure cutting edges of inserts, micro milling tools, drills, taps etc. Users measure radii, shapes, chipping and roughness regardless of type, size, material or surface finish. It can easily be operated also by non expert users and is applicable for production integrated quality assurance. It enables the measurement of straight and curved edges and edges with and without bevel.

The Benefits

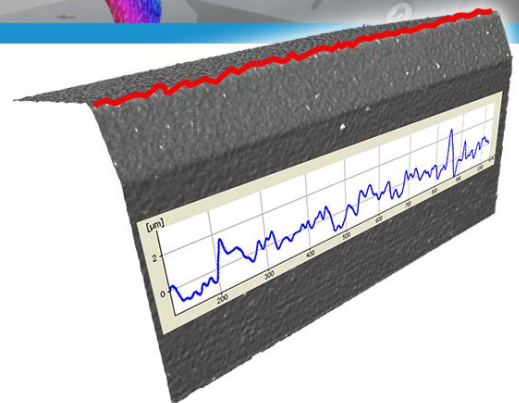
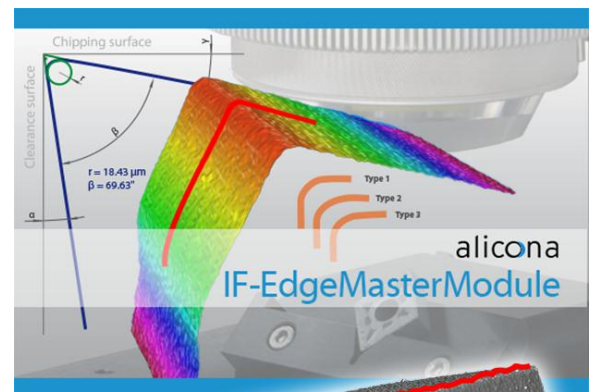
High user-friendliness even at complex shapes

User-friendly operation including a „single button“ solution for a measurement time of down to 15 seconds is provided. High vertical resolution enables chipping measurement of an edge. Also complex geometries and ellipse-like shapes („waterfall“, „trumpet“) are traceably measured. In general, any customer defined shape is measurable. This software enables high speed measurement on devices with compatible hardware.

The Application

Wear analysis, measurement of form deviation and increased process reliability

Typically, the measurement software is used in tool industry for advanced quality assurance, also in production. It is applied for the entire manufacturing process, from the green body to the highly polished component. Measurements with the IF-EdgeMaster module enable manufacturers to deliver tools that have the same geometry and consequently, provide increased process reliability in use. Also, wear analysis and form deviation measurements to the reference geometry or CAD data are performed.



Measuring complex edges with the IF-EdgeMasterModule 5.1

Measurement modes	<ul style="list-style-type: none"> » Edge measurement » Difference measurement » Chipping measurement » Edge break measurement
Edge forms	<ul style="list-style-type: none"> » Round edge / Elliptic edge / Arbitrary basket arch » No bevel/ Negative bevel / Supporting bevel » Straight edge / Curved edge » Edge break
Edge parameters	<ul style="list-style-type: none"> » r – Radius » R_{mean} – mean value of the radii of all single profiles » $S\alpha, S\gamma$ - Distance between the apex (intersection of both chain dotted lines) and the end of the clearance or chipping roundness, respectively. » Δr -Shortest distance from the intersection of the chain dotted lines to the fitted circle. » R_{cl} – Ellipse-radius clearance face » R_{ch} - Ellipse-radius chipping face » γ – Chipping surface angle » α – Clearance surface angle » β – Wedge angle » K – Edge symmetry » K_a – Edge symmetry based on areas » W – Edge width » $La1, Lb2, La2, Lb2$- Length of honing width projected to chipping/clearance surface
Additional edge parameters for negative bevel	<ul style="list-style-type: none"> » $bp1\gamma, bp2\gamma, bp3\gamma$ – Projected bevel length » $b\gamma$ – True bevel length » $b_{y_{mean}}$ – Mean value of the $b\gamma$ values of all single profiles » γ_b – Angle of negative bevel
Additional edge parameters for supporting bevel	<ul style="list-style-type: none"> » $bp1\alpha, bp2\alpha, bp3\alpha$ – Projected bevel length » $b\alpha$ – True bevel length » α_b – Angle of supporting bevel
Additional parameters for edge break	<ul style="list-style-type: none"> » B_w – Width of edge break » β_1, β_2– edge break angles » B_1, B_2 – Lengths between fitted lines and edge break points (ISO 13715) » B_{1p}, B_{2p} – projected lengths » $x_1 \text{ neg}, x_2 \text{ neg}$ – normal distances between corridors and exit points » B_d, B_{da} – (Absolute) mean deviation of edge break » B_f - Form parameter » F_c – Indicates whether the shape of the edge is more like a circle or a line
Form deviation parameters	<ul style="list-style-type: none"> » E_{cq} – Form deviation of circle » E_{bq} – Form deviation of basket arch » F_c – see Edge break parameters
Chipping measurement	<ul style="list-style-type: none"> » R_a, R_q, R_z, R_p, R_v...: ISO 4287 conform roughness parameters
Difference measurement	<ul style="list-style-type: none"> » $D_{min}, D_{max}, D_{mean}$: Min. / max. and mean deviation to reference surface » V_p, V_v, V_{dp}, V_{dv}: Volume of peaks / valleys / peak defects / valley defects below / above the reference surface » A_{proj} – Projected area of specimen » A_{dp} – Proj. area of peaks above tolerance » A_{dv} – Proj. area of peaks below tolerance » P_c – Coverage percentage (area within tolerance) » $SIM_{cd}, SIM_{ch}, SIM_t$ – ISO 8785 conform defect parameters

Product info

IF-EdgeMasterModule 5.1

aliconona

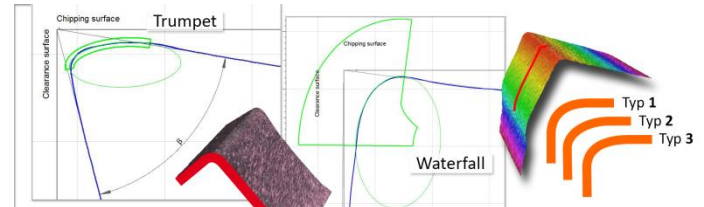
Software compatibility	<ul style="list-style-type: none">» Interface to analysis software IF-MeasureSuite: Users switch between the two Alicona analysis software packages. The IF- MeasureSuite offers additional measurements , e.g. contour or form» Offline measurement: Measurement of existing 3D edge data sets» IF-Remoting Interface Automatisation of edge measurements
Supported Sample Holders	<ul style="list-style-type: none">» IF-InsertGrip ,IF-AdvancedInsertGrip: These sample holders are necessary for several angle measurments (e.g. α, γ, γ_b, α_b)
Supported Alicona 3D measurement devices	<ul style="list-style-type: none">» IF-EdgeMaster G4,» InfiniteFocus SL» IF-SensorR25

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Measurement of basket arch form

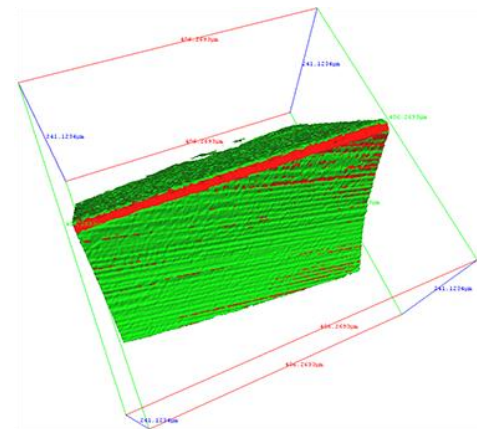
- » Basket arches with both, waterfall and trumpet shape are traceably measurable in high repeatability.
- » A fit of elliptic shapes into the edge region describes the shape by two radial parameters.
- » The edge can also be compared to user-defined basket arch files of arbitrary shape.



Both, waterfall and trumpet shape are traceably measurable in high repeatability

Wear measurement

- » The software automatically compares the measured cutting tool to a previously imported CAD data set or reference geometry.
- » Differences to a measured „golden“ standard are clearly visible. This is achieved throughout advanced pseudo color visualization: all points that lie within the tolerance remain green whereas all others are shown in red.



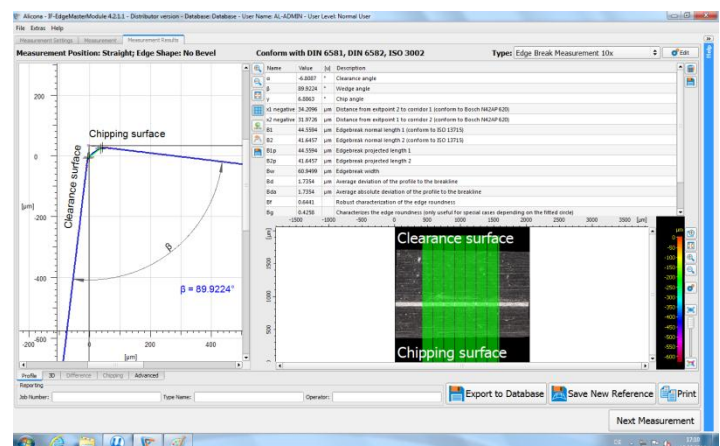
3D measurements are automatically compared to CAD data

Mean and single profile measurement

- » Cutting edges are usually verified throughout the measurement of the mean profile.
- » The IF-EdgeMaster module additionally offers the measurement of up to 100 edge profiles within the measurement area.
- » This enables the detailed analysis of the selected measurement area. Users easily detect variances along the edge to deeply analyze its homogeneity.

Chamfer Measurement

- » With the IF-EdgeBreakMeasurement module users measure the shape, length... of a chamfer.
- » Measurements include chamfer width, various angles and other ISO 13715 conform parameters. As it is with edge measurement, also chamfer measurement is designed as a one button solution to be applied in production.
- » Applications and fields of use reach from tool manufacturing to machining industry and micro-precision engineering.



Chamfer measurement includes chamfer width, various angles and other ISO 13715 conform parameters.

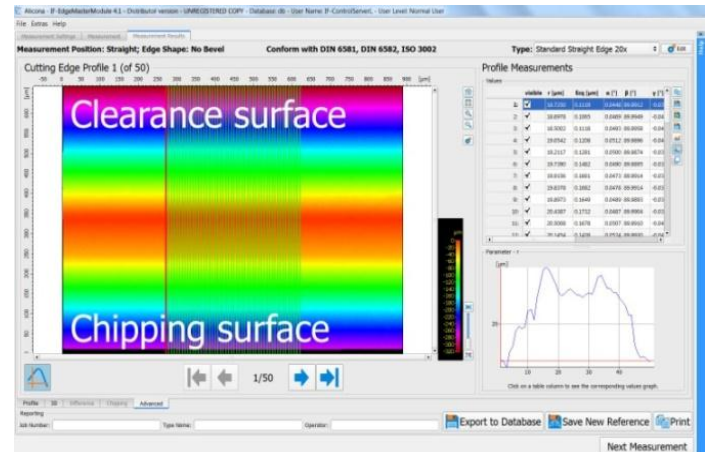
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Automated measurement

- » Measurements with the IF-EdgeMaster module can be performed fully automatically as a „single button“ solution.
- » The user only chooses a reference type from either a selection of pre-defined edge types or by using a barcode reader.
- » Parameter settings only have to be defined once at an administrator level.

Quality Assurance and Reporting

- » All measurements are automatically saved and can be imported in Microsoft Excel for statistical evaluation.
- » For each measurement reports can be generated and printed.
- » All measurements can be archived in a database for quality assurance



Up to 100 edge profiles enable to analyze the homogeneity of a cutting edge

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