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FRAME

SAWMILLING OF WOOD

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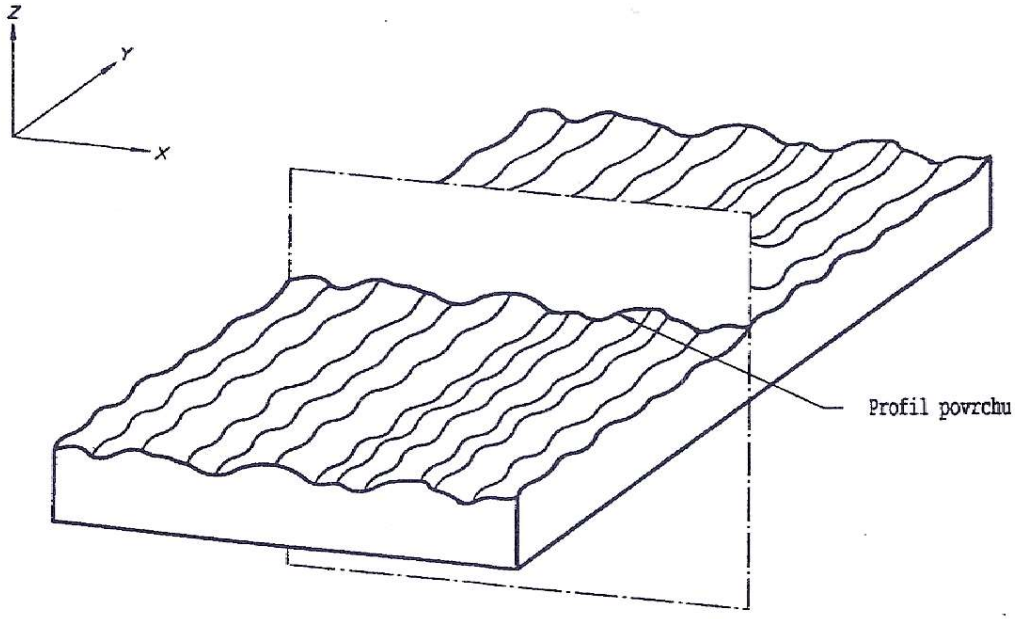
Measurement of surface quality

Possibilities of examining and evaluating the quality of the machined surface:

- comparative
- contact
- contactless



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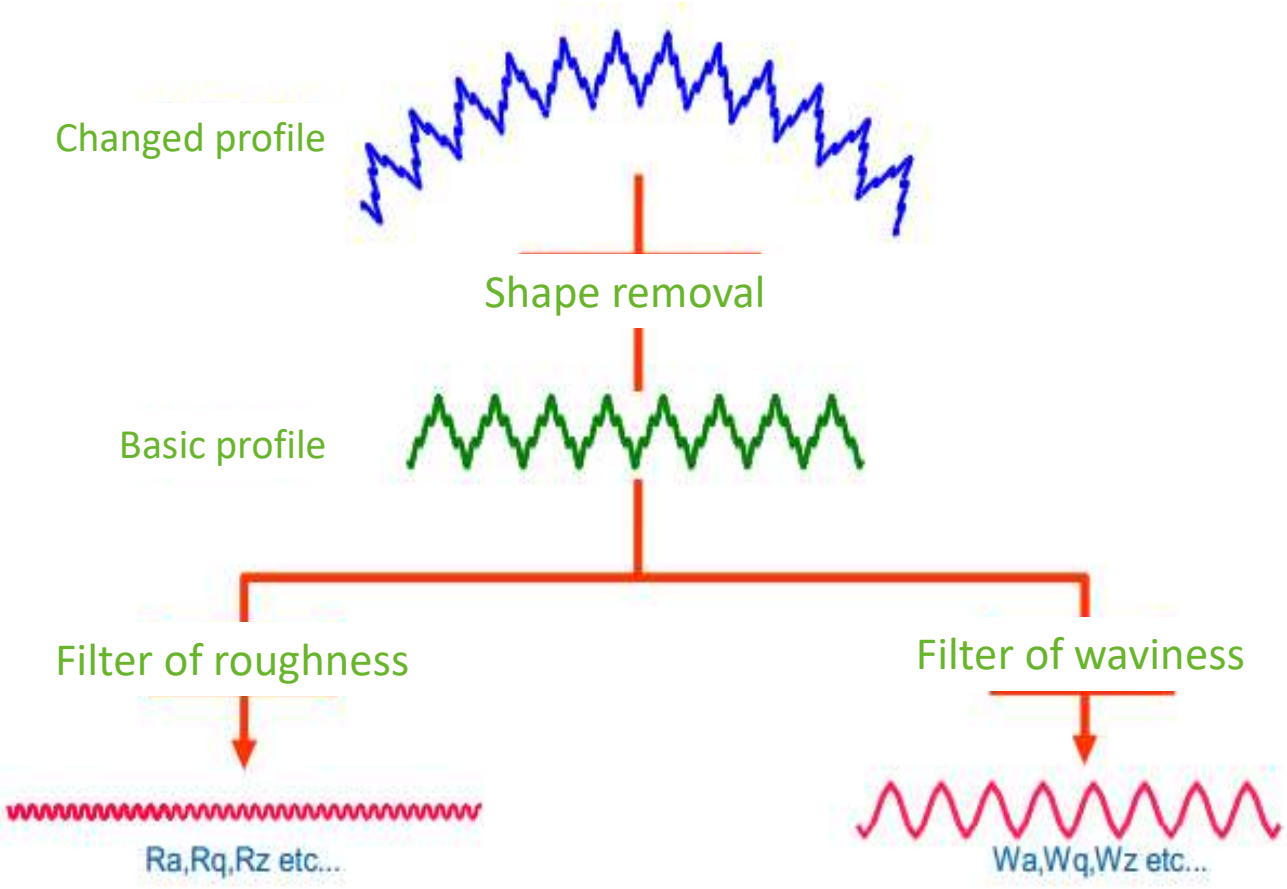
Measurement of surface quality



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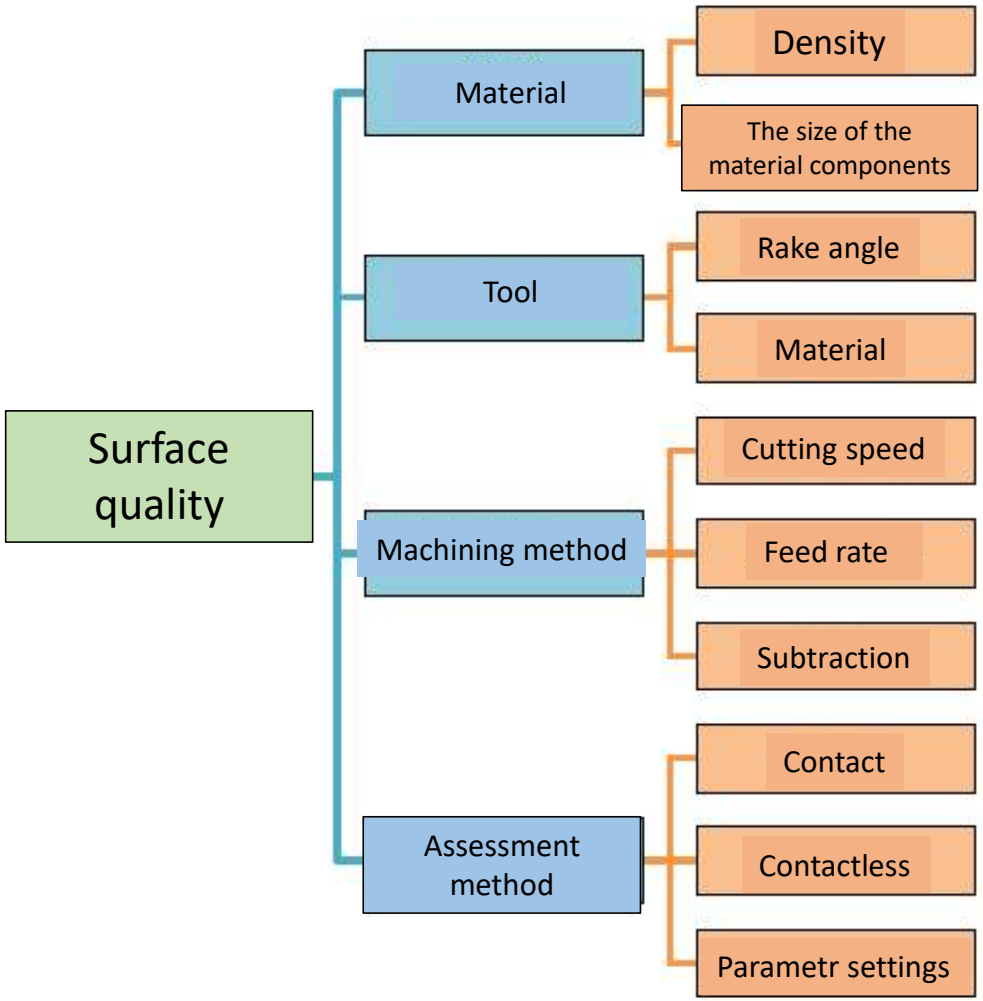
Measurement of surface quality



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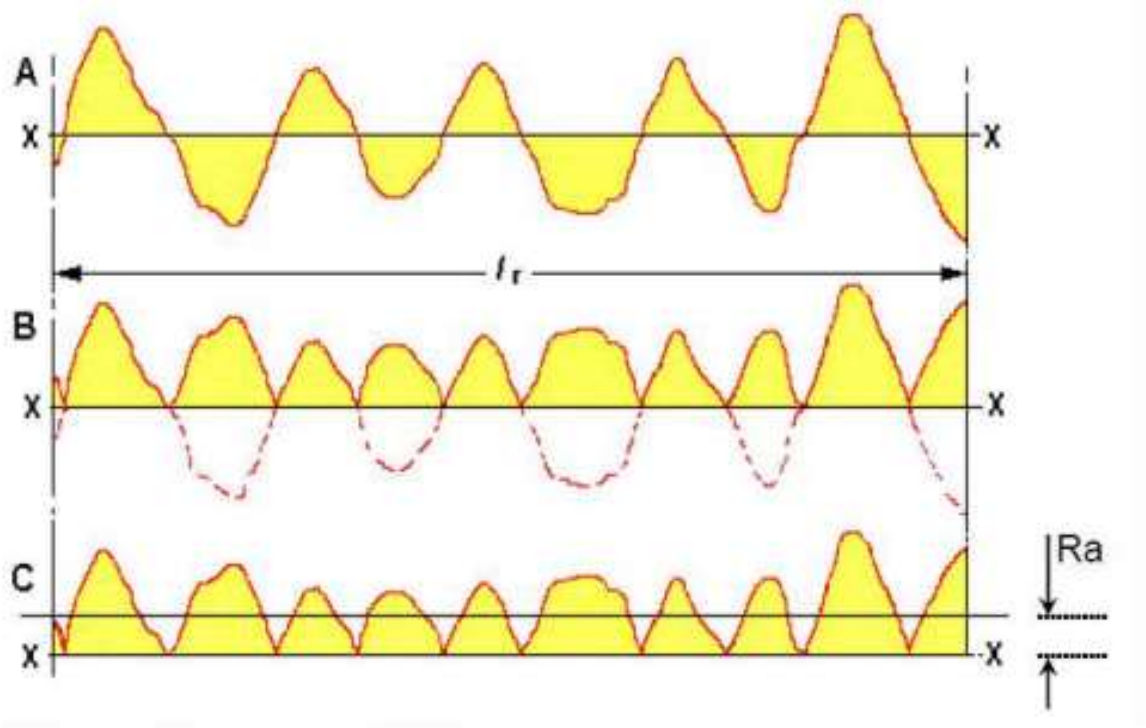
Measurement of surface quality



Ra - average arithmetic deviation of the profile from the center line in the range of the basic length.

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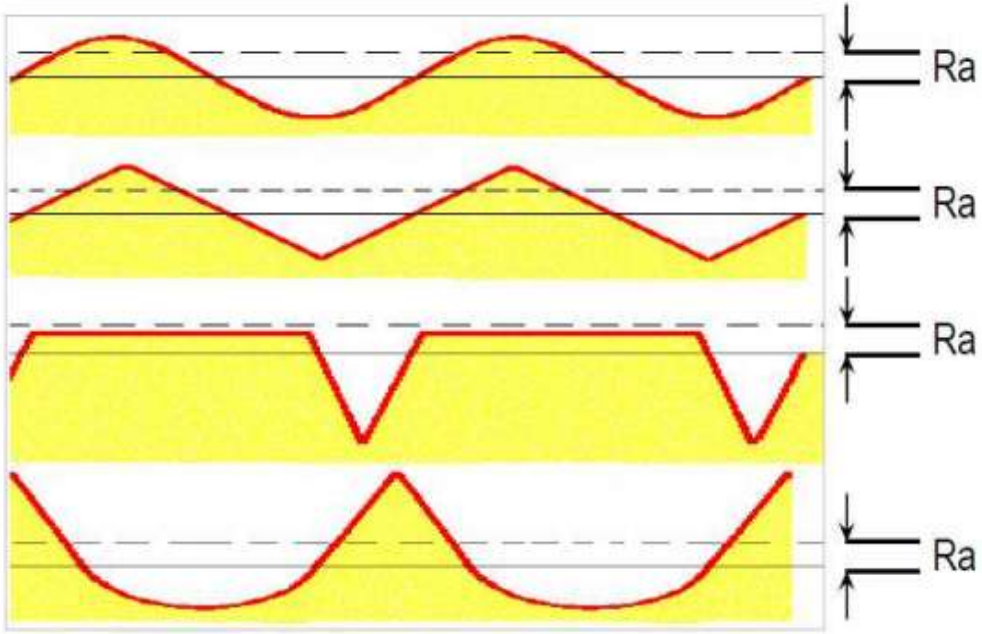
Measurement of surface quality



Ra defects graphically represented: identical Ra size and their different surfaces.

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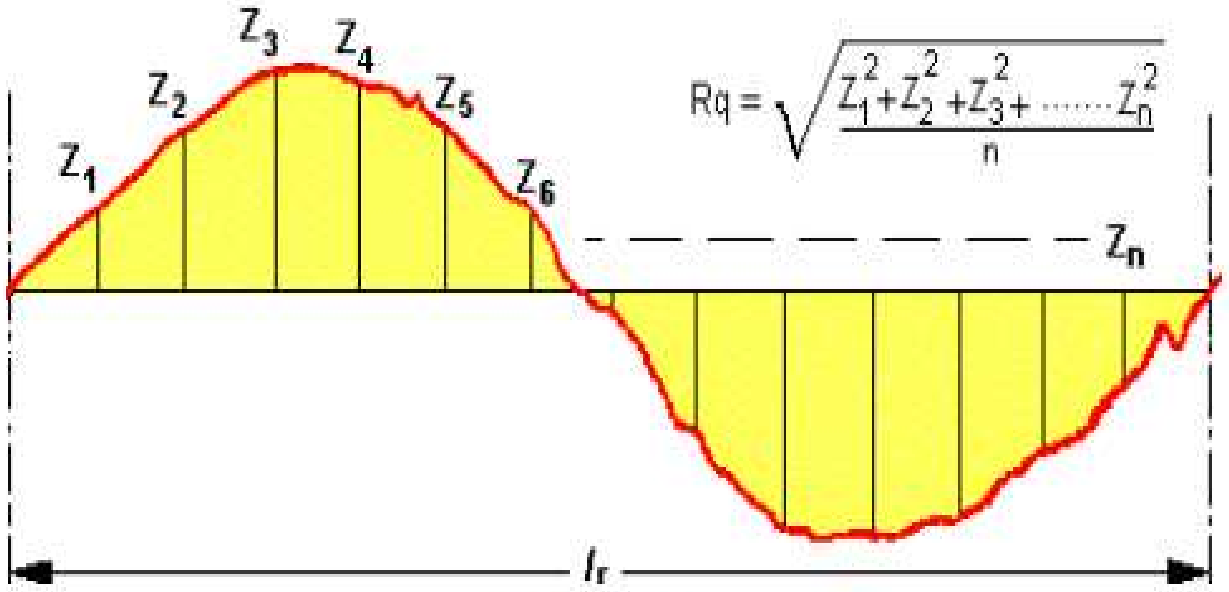
Measurement of surface quality



l_r = basic length

Rq (RMS) - mean square deviation of the profile in the range of the basic length (mean square value of Ra)

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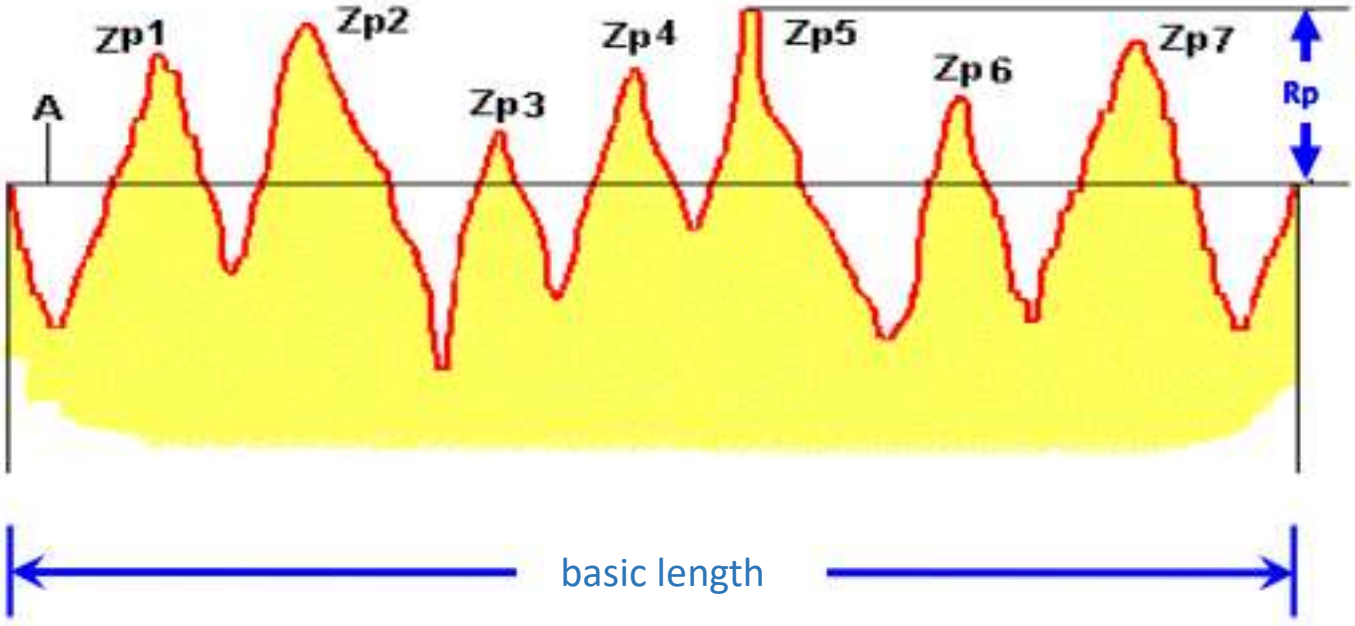
Measurement of surface quality



Rp - the largest height of the peak above the center line in the range of the basic length.

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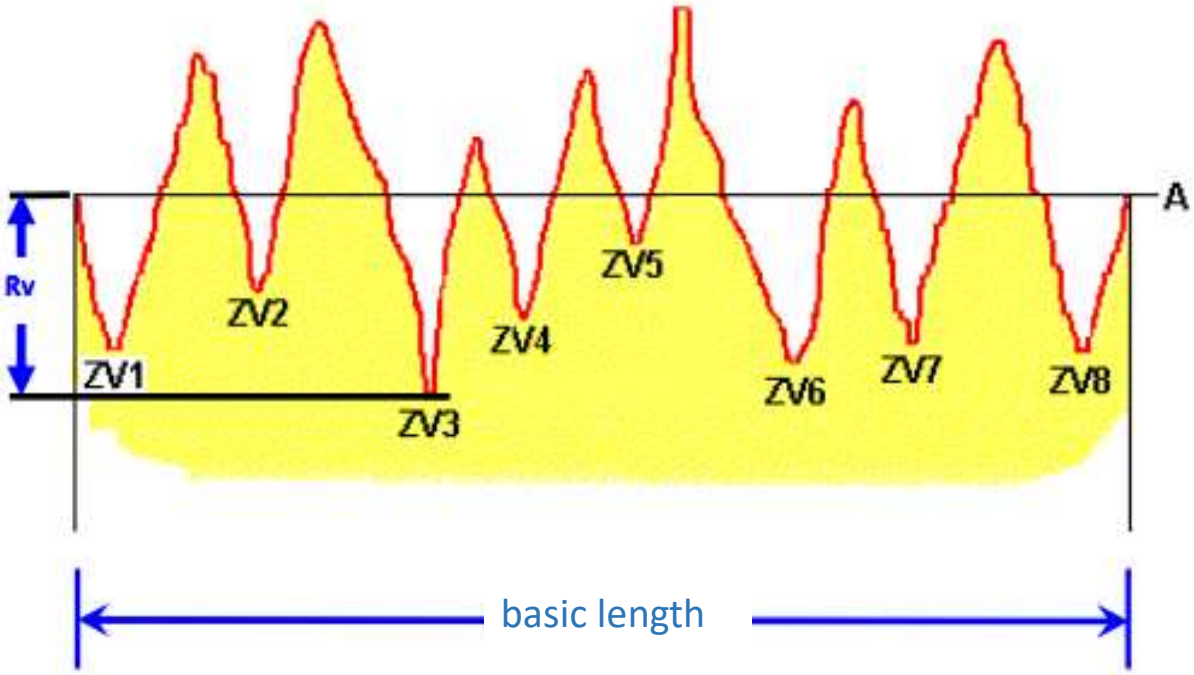
Measurement of surface quality



Rv - the greatest depth of the depression below the center line in the range of the basic length.

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Measurement of surface quality

Nonperiodical profile	Measurement according to the standard ČSN EN ISO 4288 (1998)	
Ra (µm)	λc (mm)	ln (mm)
0,006 < Ra ≤ 0,02	0,08	0,4
0,02 < Ra ≤ 0,1	0,25	1,25
0,1 < Ra ≤ 2	0,8	4
2 < Ra ≤ 10	2,5	12,5
10 < Ra ≤ 80	8	40

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Measurement of surface quality

Periodical profile	Measurement according to the standard ČSN EN ISO 4288 (1998)			
RSm (mm)	λc (mm)	ln (mm)	lt (mm)	r_{tip} (µm)
0,013 < RSm ≤ 0,04	0,08	0,4	0,48	2
0,04 < RSm ≤ 0,13	0,25	1,25	1,5	2
0,13 < RSm ≤ 0,4	0,8	4	4,8	2 or 5
0,4 < RSm ≤ 1,3	2,5	12,5	15	5
1,3 < RSm ≤ 4	8	40	48	10

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Measurement of surface quality

Contact profilometer FORM TALYSURF 50 Intra

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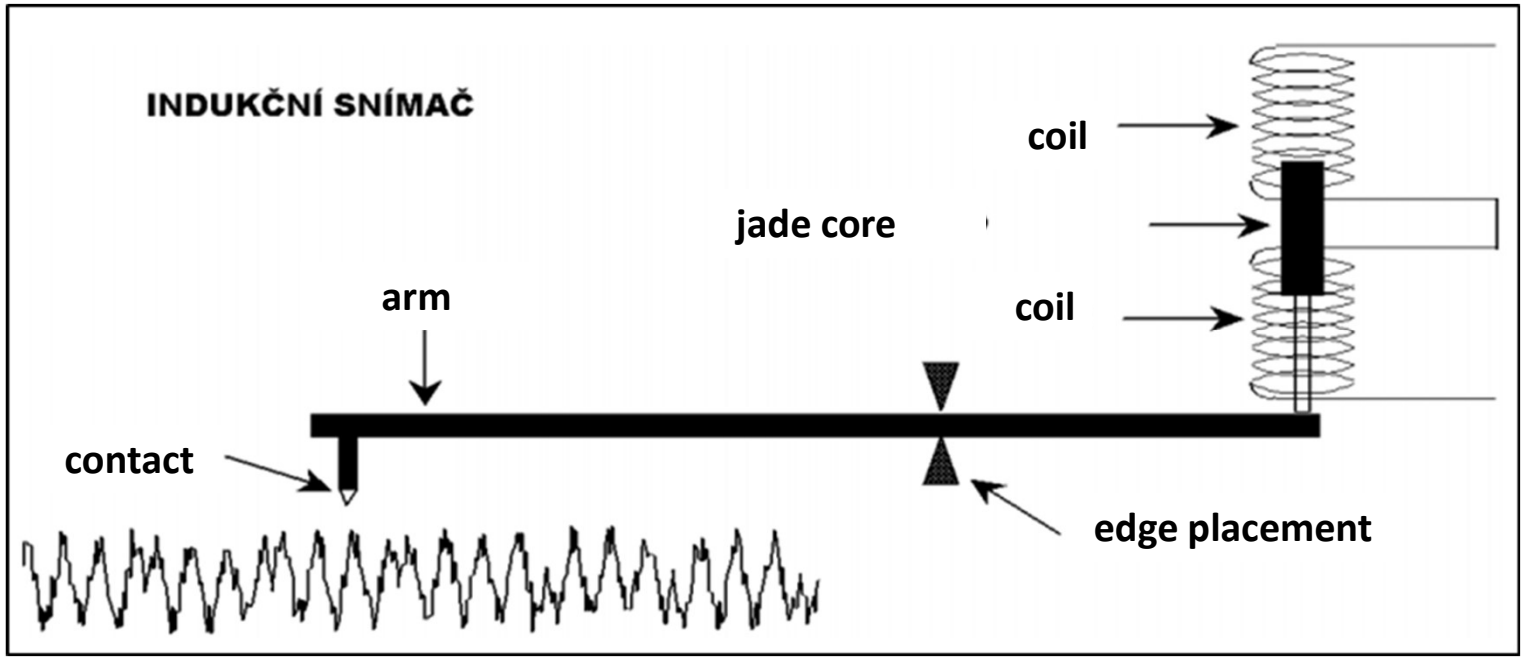
Measurement of surface quality



The contact of the tip is transmitted via the arms to the coil, where the signal is processed by software.

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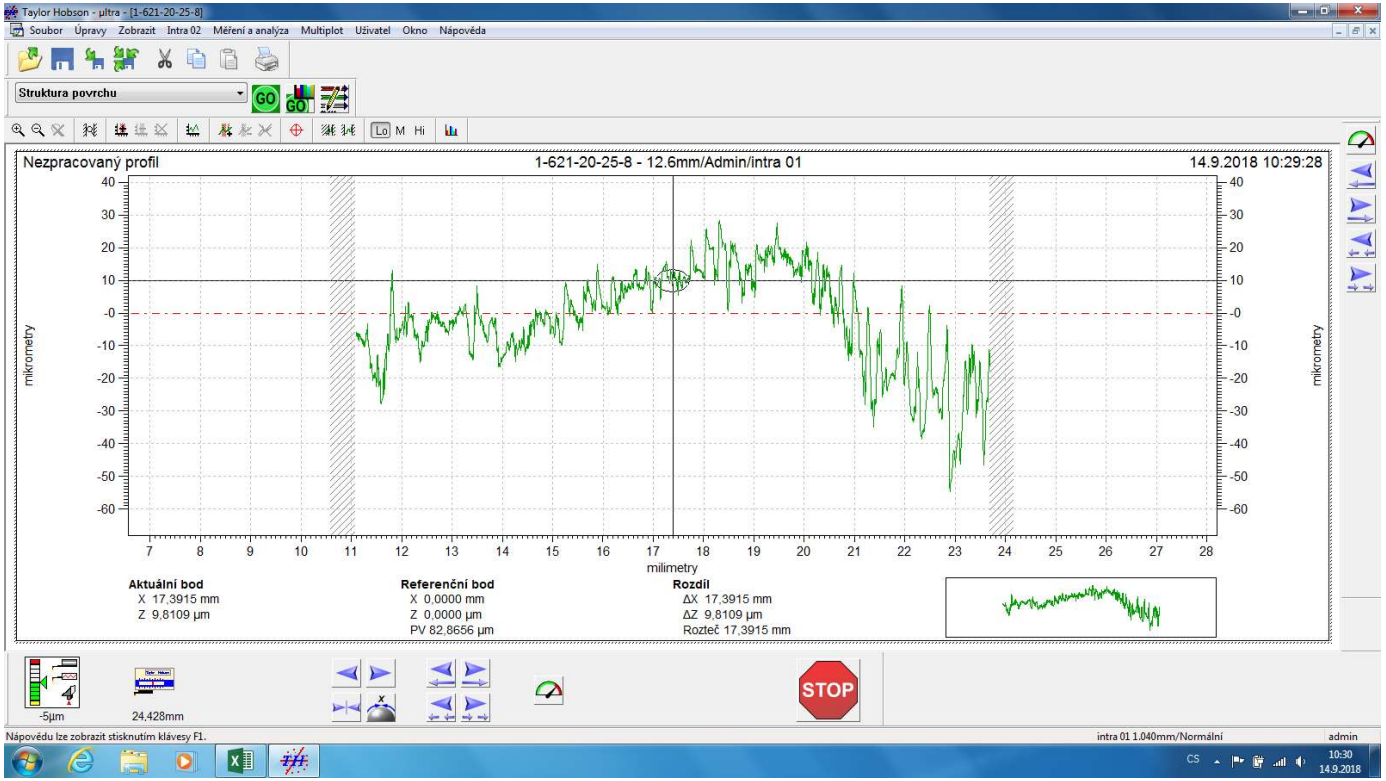
Measurement of surface quality



Profile

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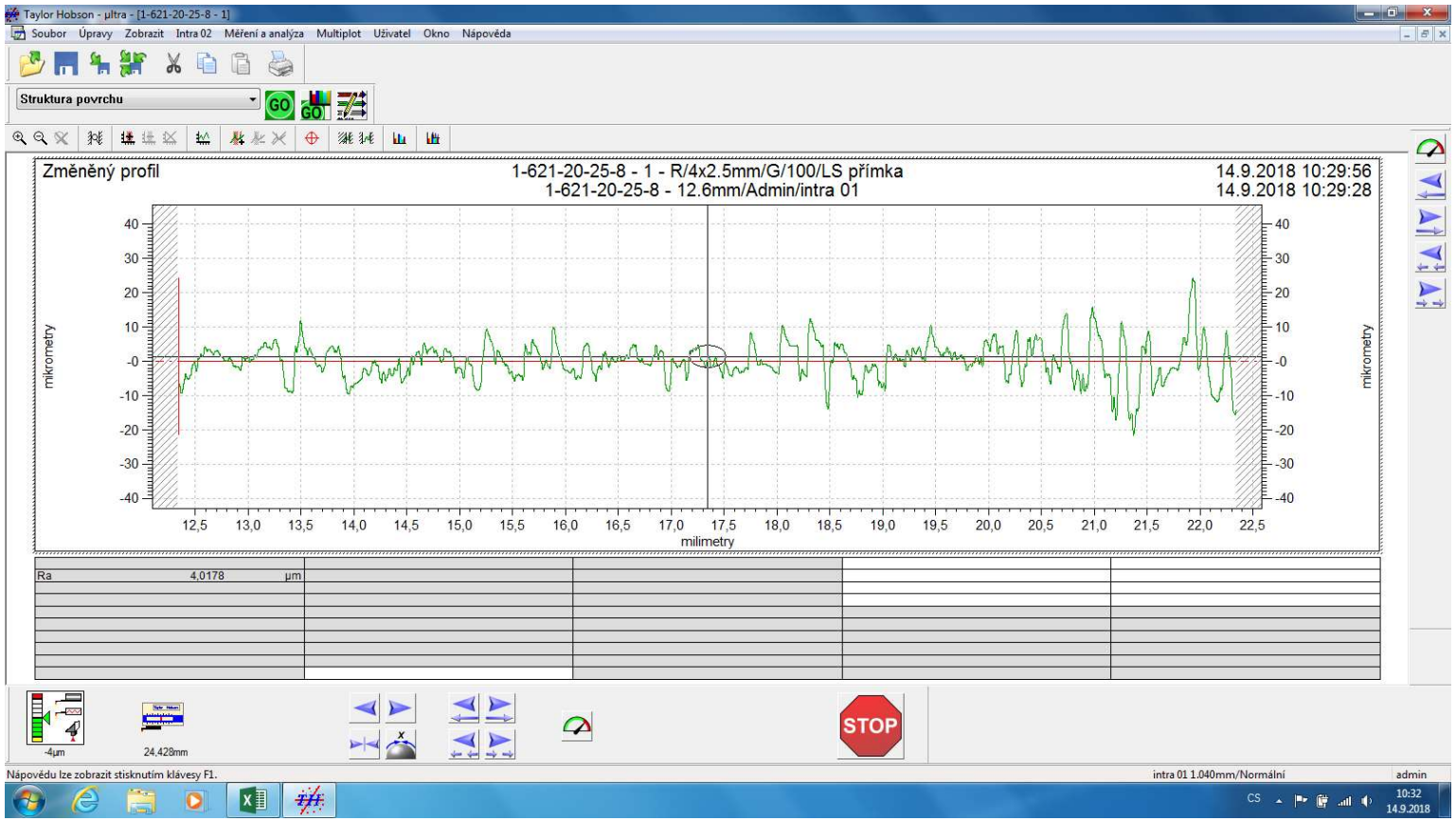
Measurement of surface quality



Roughness

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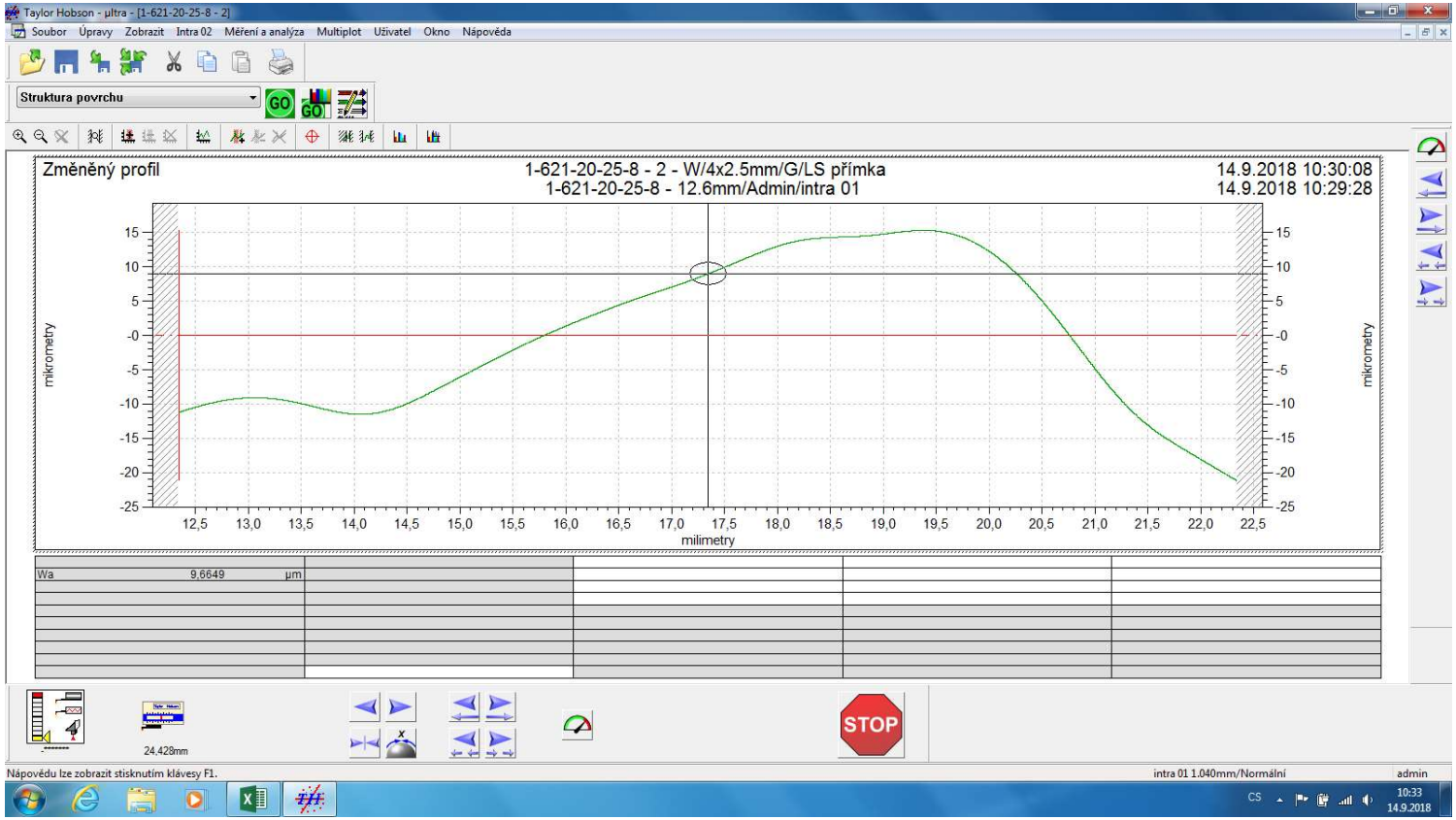
Measurement of surface quality



Waviness

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Measurement of surface quality

Contactless profilometer LEXT 3D OLS4100

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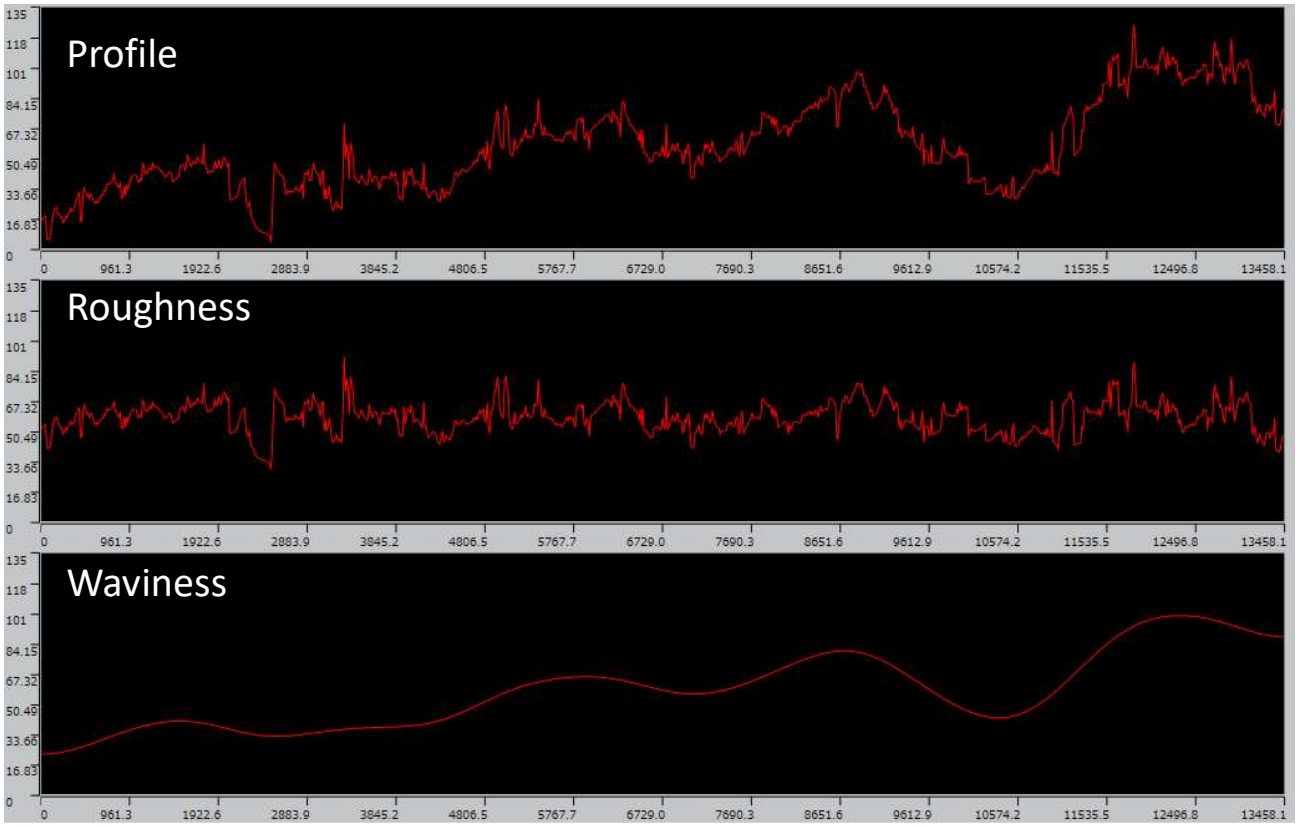
Measurement of surface quality



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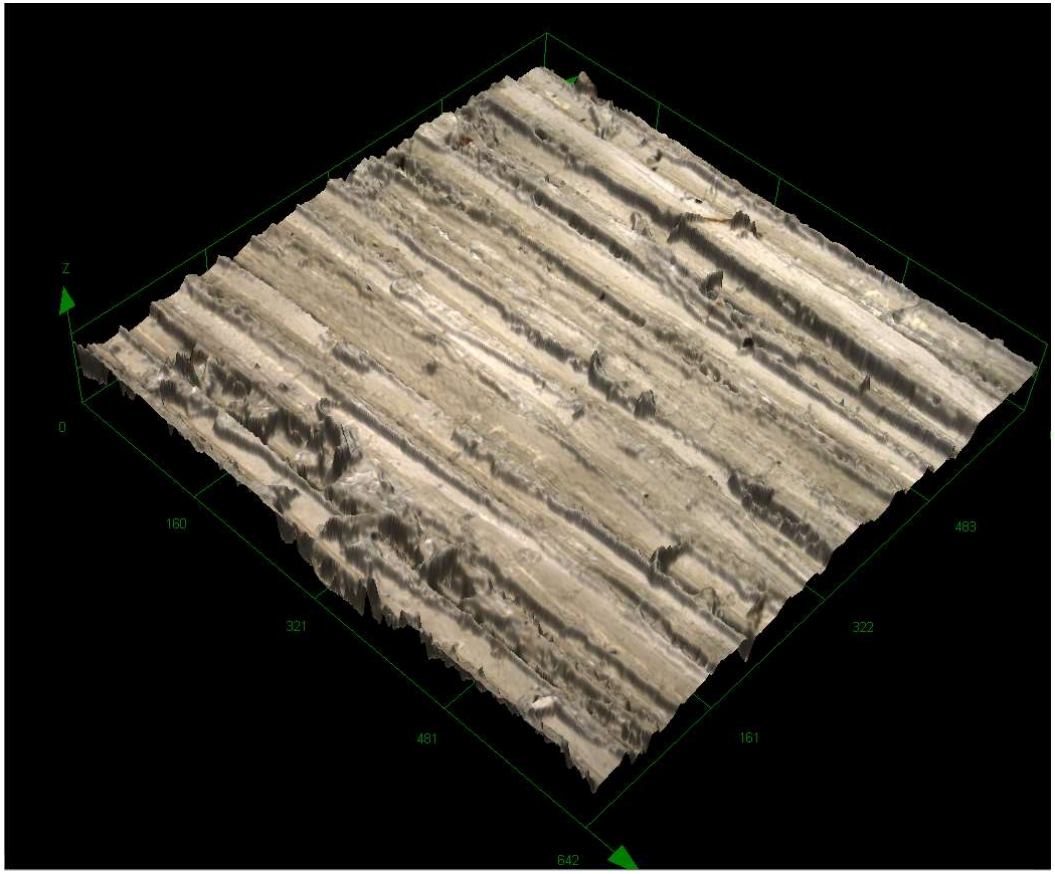
Measurement of surface quality



Profile after milling

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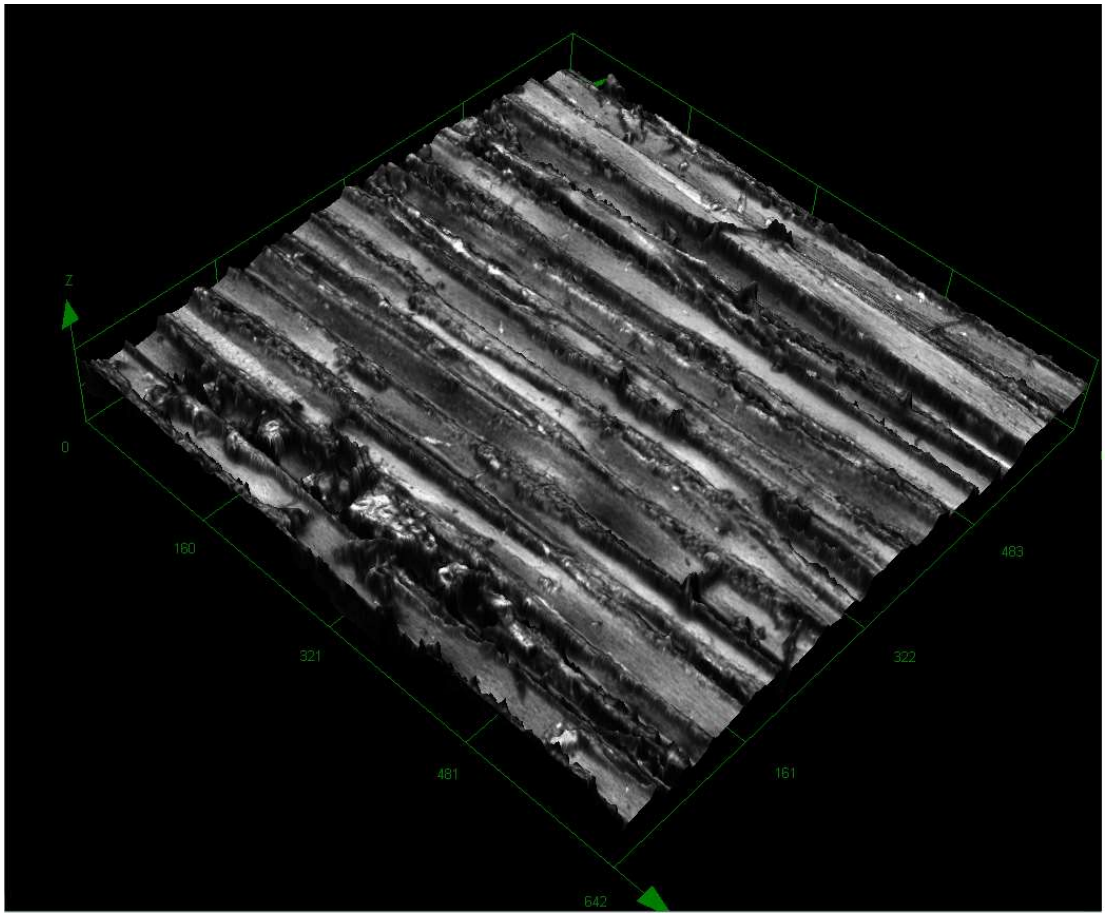
Measurement of surface quality



Profile after milling

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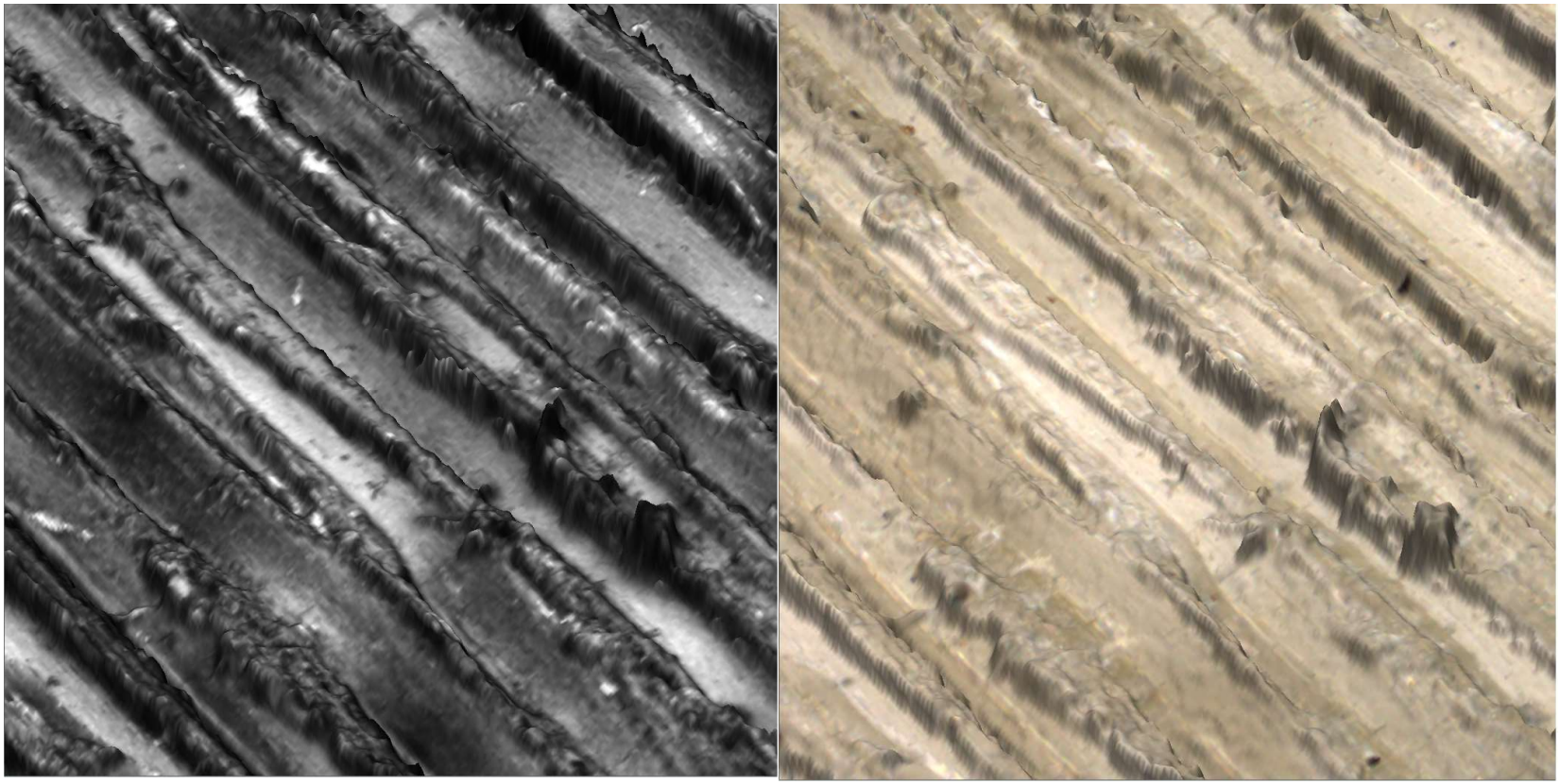
Measurement of surface quality



Spruce – black+white / colorfully

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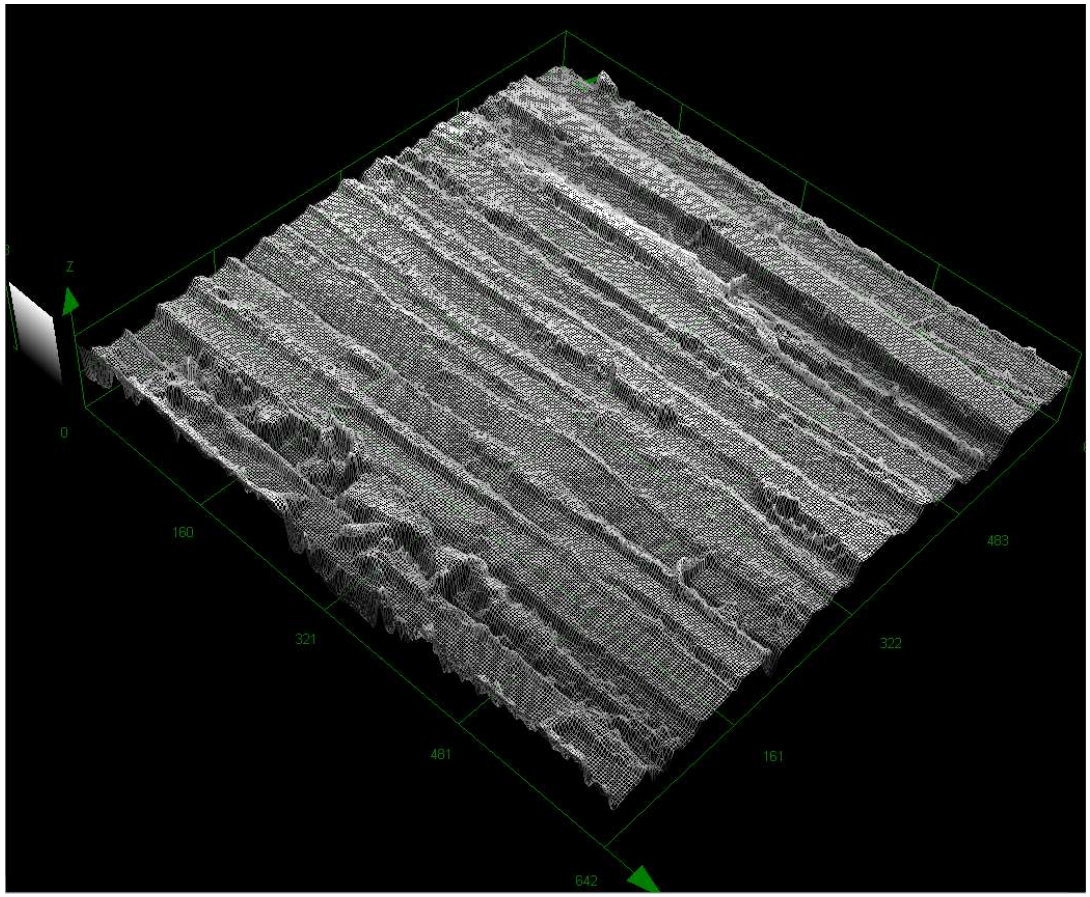
Measurement of surface quality



Profile after milling - net

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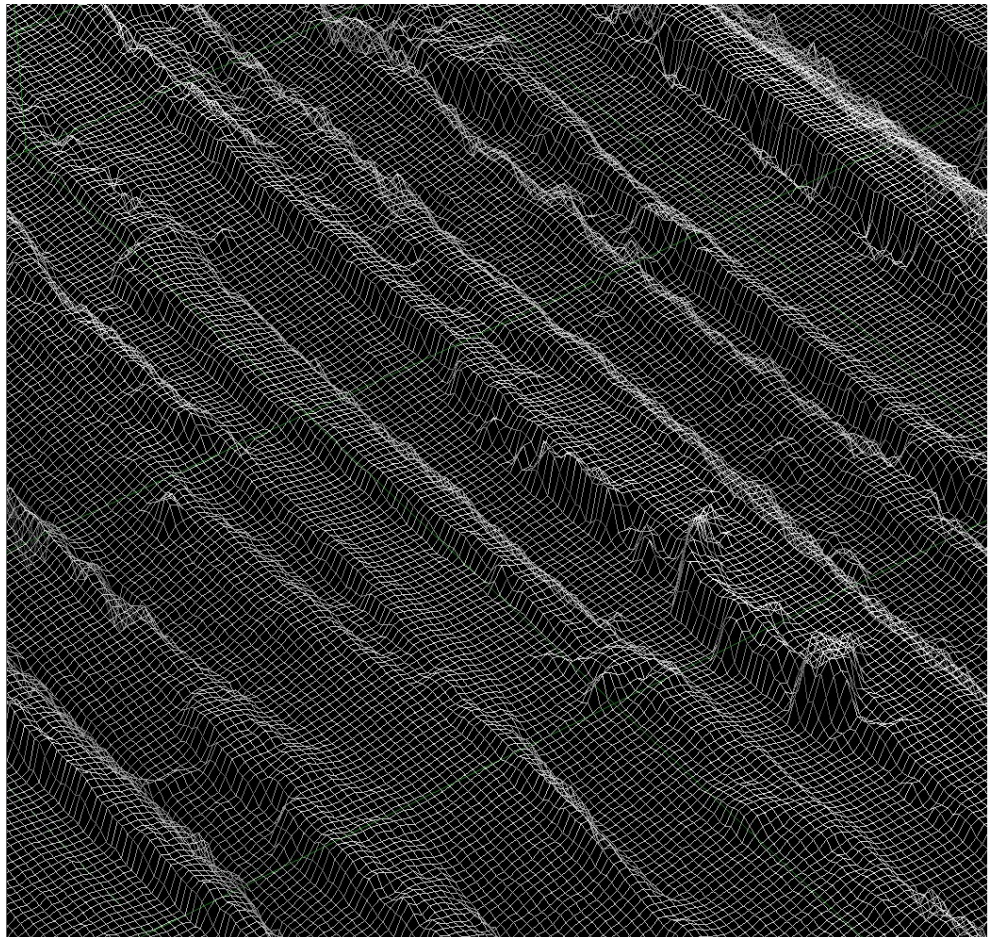
Measurement of surface quality



Profile after milling - net

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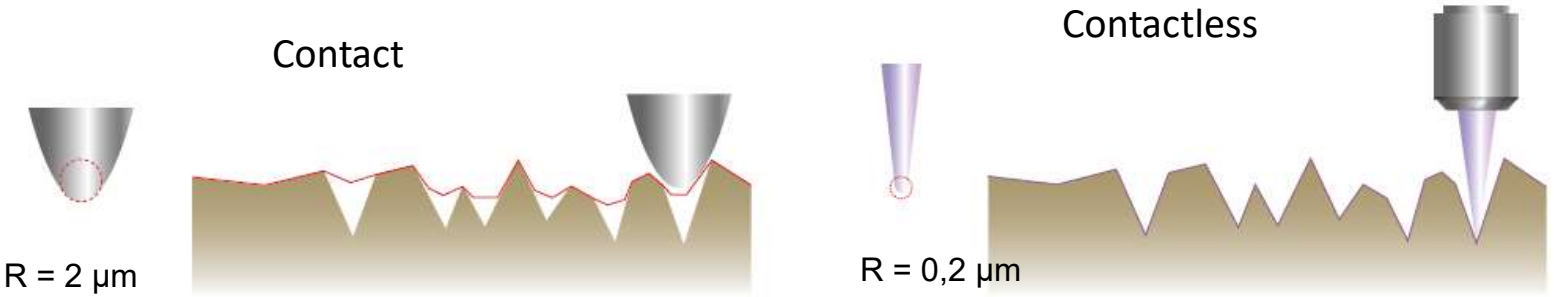
Measurement of surface quality



difference in radius

There is a significant difference between contact and contactless methods

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Measurement of surface quality

CONTACTLESS	CONTACT
Higher acquisition costs and more expensive maintenance.	Lower acquisition and subsequent maintenance costs.
The measured sample cannot be damaged.	The measured sample can be damaged.
Greater accuracy in roughness = better statistical evaluation of the results.	Sufficient for practical use.
No clear dependence was shown for waviness.	
With a longer evaluated length, it is more time-consuming.	Simpler control, but more complicated evaluation of individual quantities.

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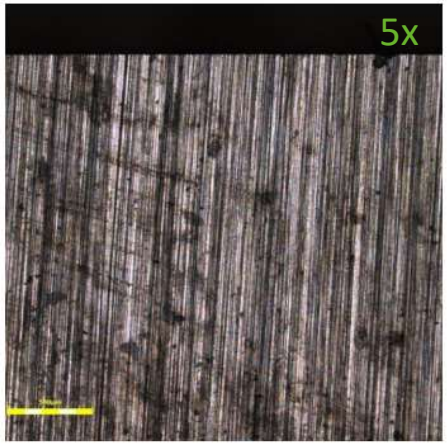

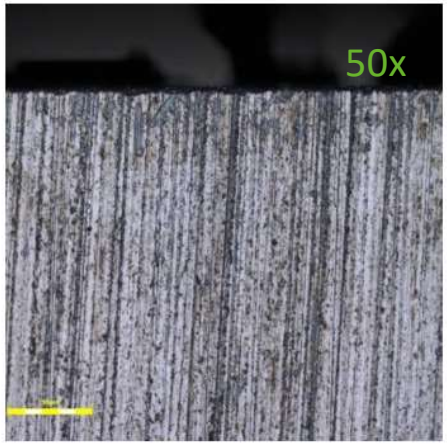

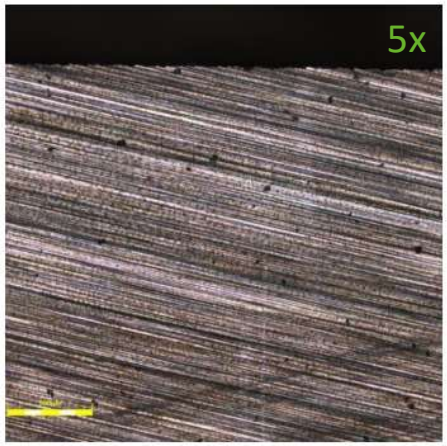

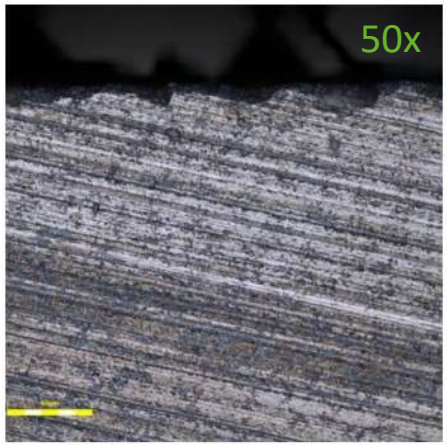

Measurement of surface quality

Two types of knifes

- High speed steel (HSS)
- High speed steel for wood-based materials

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Measurement of surface quality

Comparative method – two ways

- evaluation by touch and sight
- we do not evaluate roughness and waviness, but overall quality.

I.

1. creation of an evaluation scale
2. creation of samples
3. evaluation

II.

1. creation of samples
2. sorting samples
3. evaluation

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Measurement of surface quality

Comparative method – two ways

I.

1. It is good to have a scale for evaluation established by a contact or non-contact method. Usually 10 samples are created, with which the products are then compared.

2. Samples or products we want to evaluate. It is then assigned to a given quality class.

3. Evaluation. Class 10 has the worst quality, which no longer meets the desired quality.

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Measurement of surface quality

Comparative method – two ways

II.

1. Samples or products we want to evaluate. They must be identical.
2. Ranking samples by quality from best to worst.
3. Evaluation. The exclusion of the sample determines its use.

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THANKS FOR YOUR ATTENTION