ESTIMATION OF SURFACES MICROGEOMETRY AND ITS ROLE IN PROVIDING QUALITY OF PRINTED PRODUCTS

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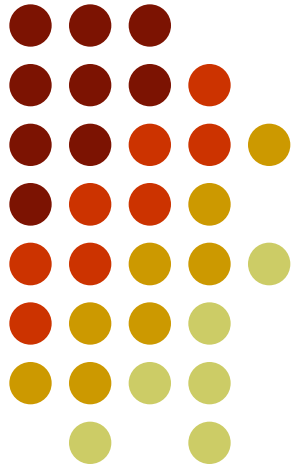
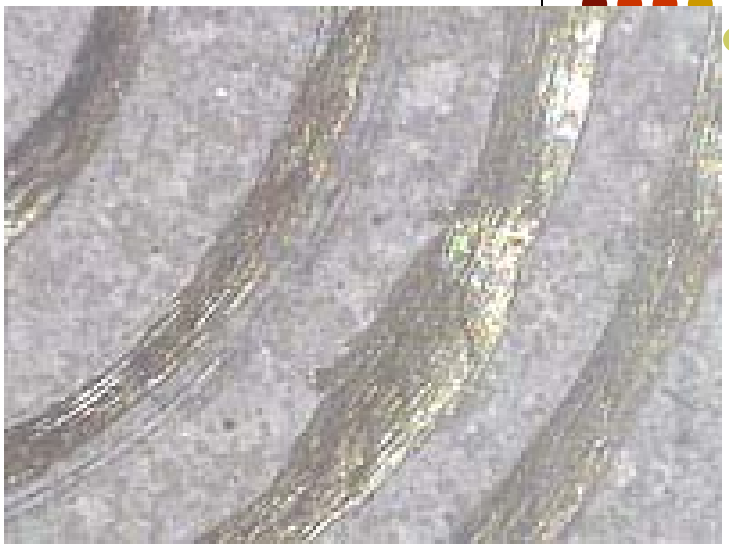


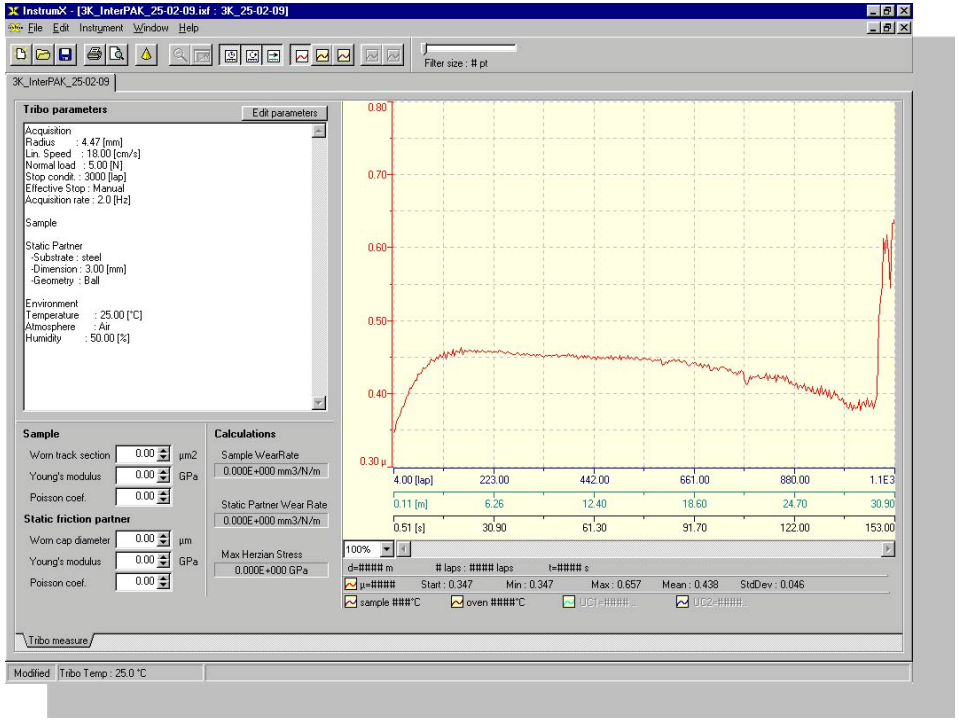
Materials

Sample's number	Mark	Density, g/m^2	Feature material
1	Alaska GC-2	230	cellulose paperboard from primary filaments, two-layer coated face storony, turn - a bleached cellulose of the colour "manilla". Possesses the raised factor of the whiteness face layer
2	Ladoga	220	cellulose paperboards from primary filaments, two-layer coated card face, turn - a bleached cellulose of the colour "manilla"
3	Ladoga	260	cellulose paperboards from primary filaments, a two-layer coated face side, an one-layer coated back side. The High percent of the whiteness face and back
4	Combination material «POLIPAKS «OZLB»	70	aluminum annealed foil GOST 745-2003 / melt PE / moisture and oil resistant paper
5	Combination material «HOUPAK»	70	aluminum annealed foil GOST 745-2003 / polyurethane adhesive / moisture and oil resistant paper
6	Stamp	-	brass embossing stamp
7	Stamp	-	magnesion embossing stamp

Tribology Method

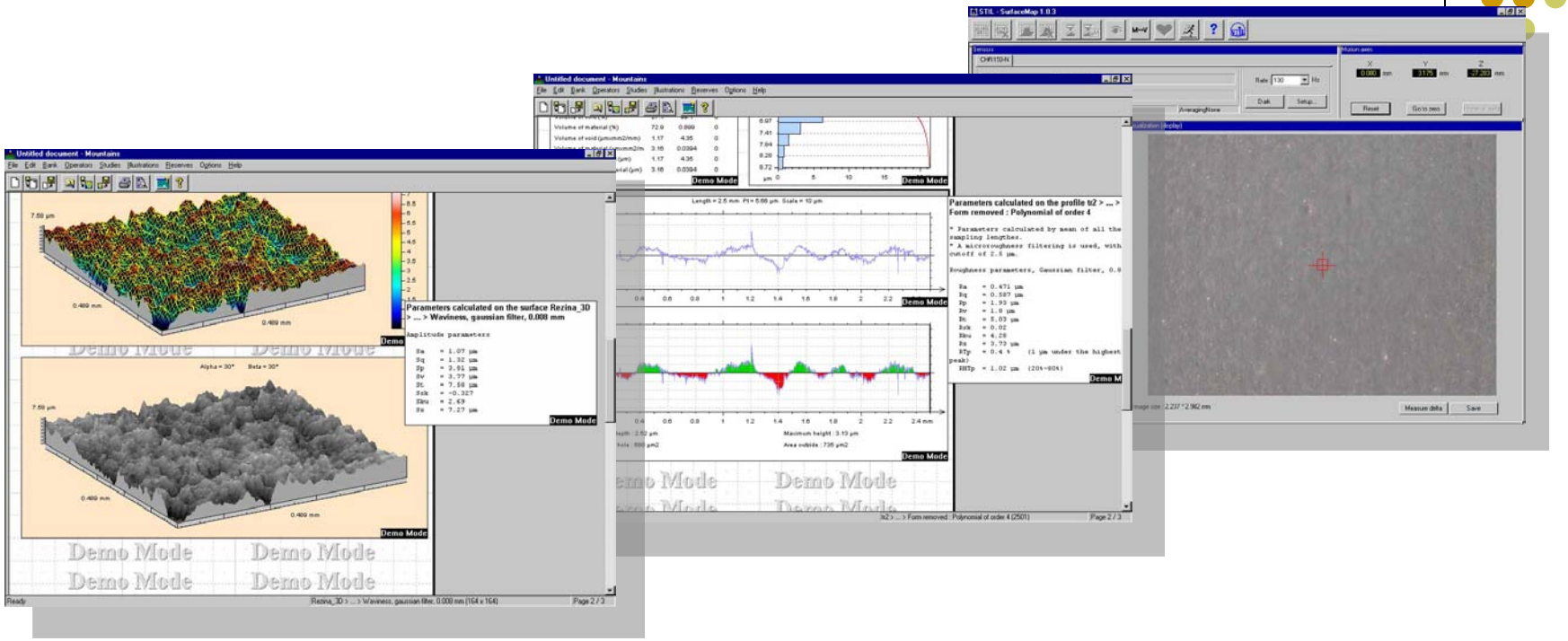
PC-Operated High Temperature Tribometer
THT-S-AX0000





Max temperature of sample	800°C
Loading on indentor	(1-60) H
Loading resolution	10 mH
Frictional force	to 10 H
Frequency of rotation	1-1500 circle/min
Diameter of disk	r=55 mm, h=10 mm

Method 3D noncontact profilometry



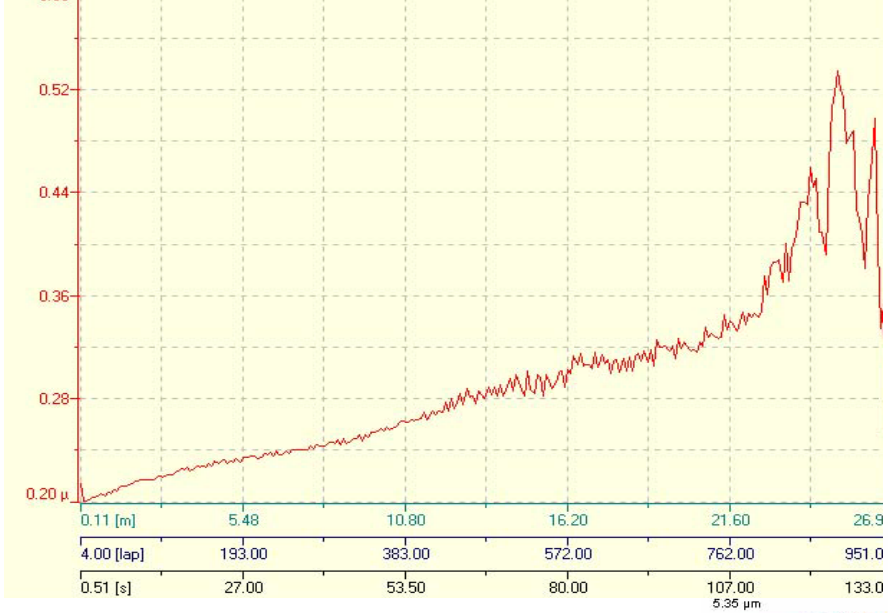
3D- polygraph STIL's Micro Measure 3D Station

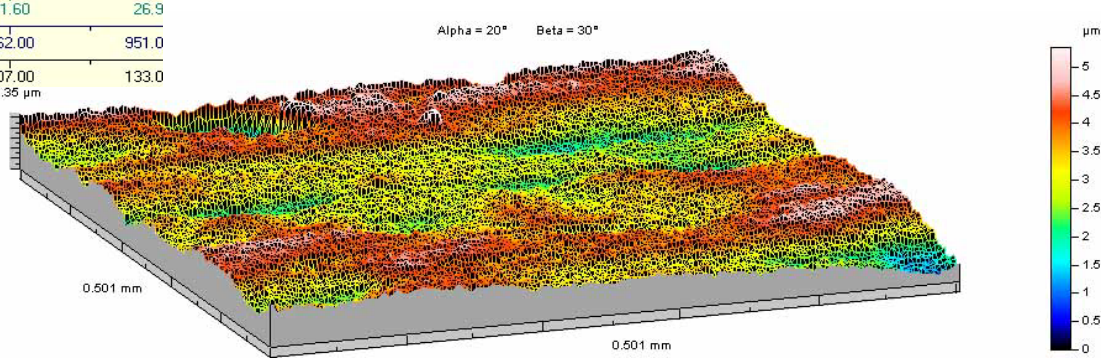
Resolution on axis Z	0,01 μm
Max measuring value on axis Z	300 μm
Resolution on axises X и Y	0,1 μm
Scanning square of sample surface	100 mm^2

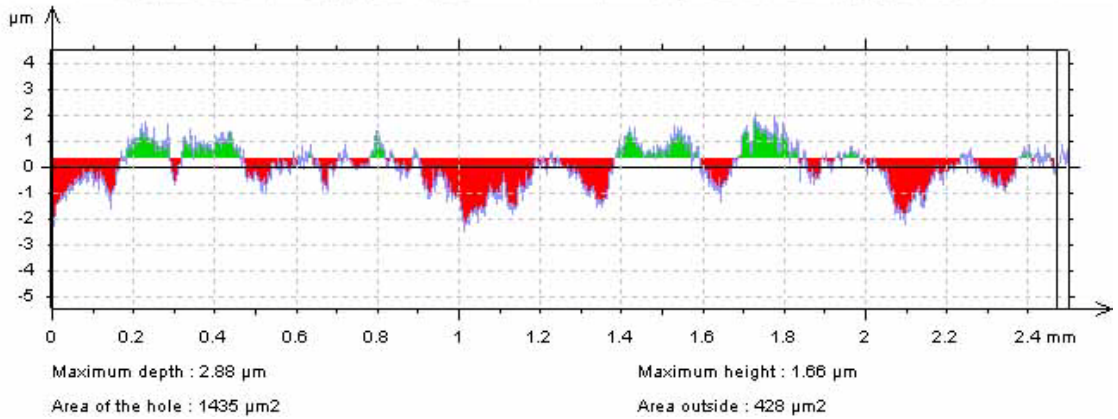
Results

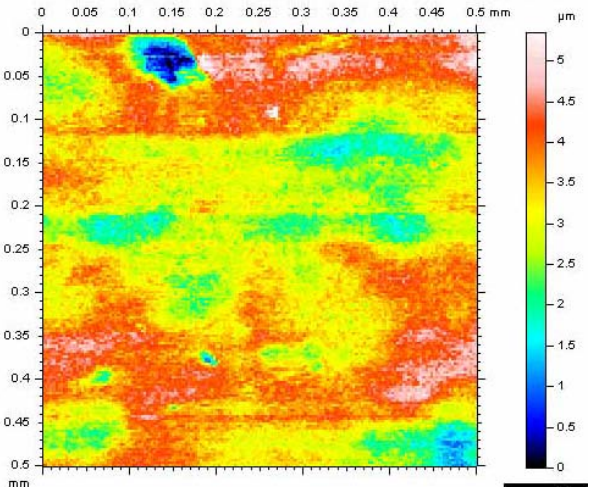
Sample's number	Mark	Density g/m^2	Characteristics of the surface microrelief										Characteristics abrasion resistance			
			Ra, µm	Rq, µm	Rp, µm	Rv, µm	Rt, µm	Rsk, µm	Rku	Rz, µm	RTp, %	RHTp, µm	Friction coefficient	Number of Tracks	The length of the path to destruction, м	Time, c
1	Alaska GC-2	230	0,411	0,512	1,29	1,36	2,75	-0,02	2,6	2,64	23,4	0,85	0,39	54	1,53	7,5
2	Ladoga	220	5,110	6,86	10,8	28,7	43,6	-1,89	7,70	39,5	1,2	9,64	0,21	35	0,99	5,0
3	Ladoga	260	4,010	4,89	8,42	12,7	23,7	-0,60	2,66	21,2	0,9	8,75	0,23	46	1,3	6,5
4	Combination material of company "POLYPAKS "OZLB"	70	0,709	0,885	2,49	2,28	5,22	-0,06	2,9	4,77	1,7	1,37	0,24	135	3,8	34
5	Combination material of company "HOUPAK"	70	0,474	0,596	1,28	1,65	3,48	-0,42	3,7	2,93	10,8	0,93	0,23	253	7,2	64
6	Brass stamp	-	0,637	0,808	2,31	2,14	5,91	-0,19	3,3	4,45	1,31	1,25				
7	Magnesium stamp	-	0,258	0,330	1,1	0,79	3,45	0,08	3,3	1,90	0,6	0,55				

Alaska GC-2
230 g/m²



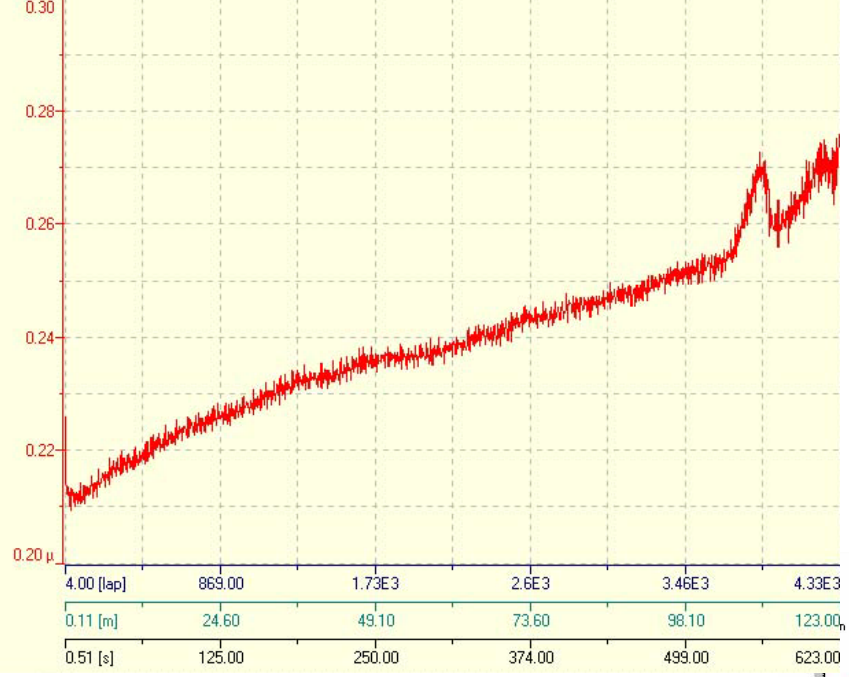


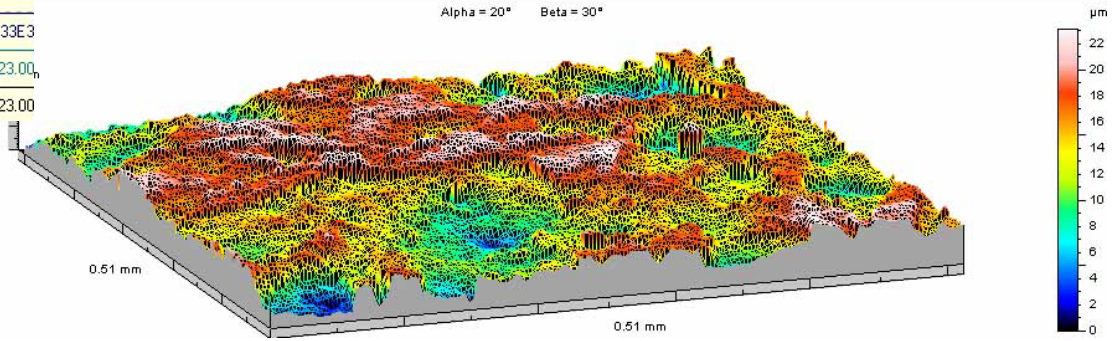


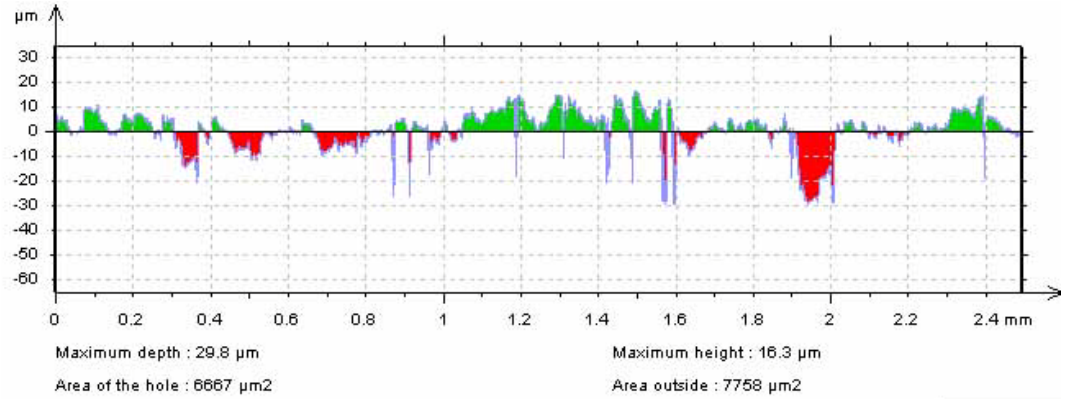


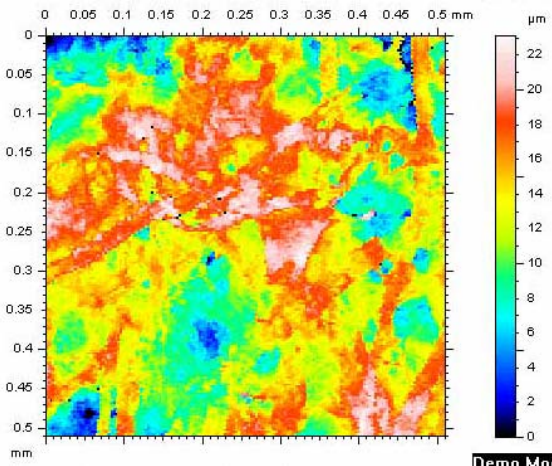
Ladoga

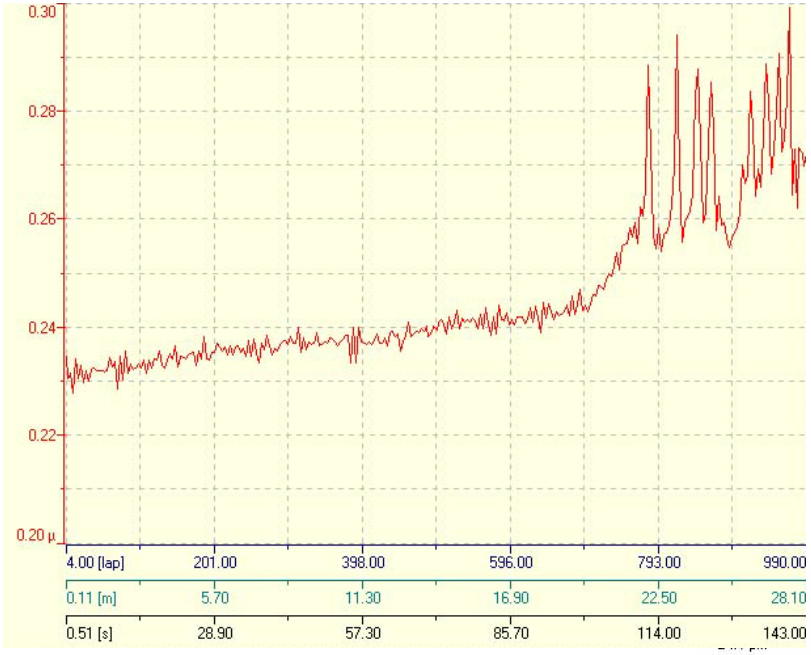
220 g/m²





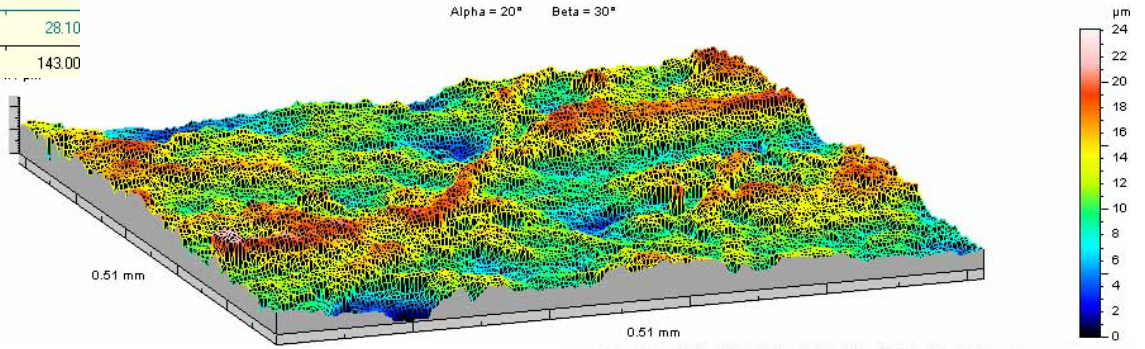


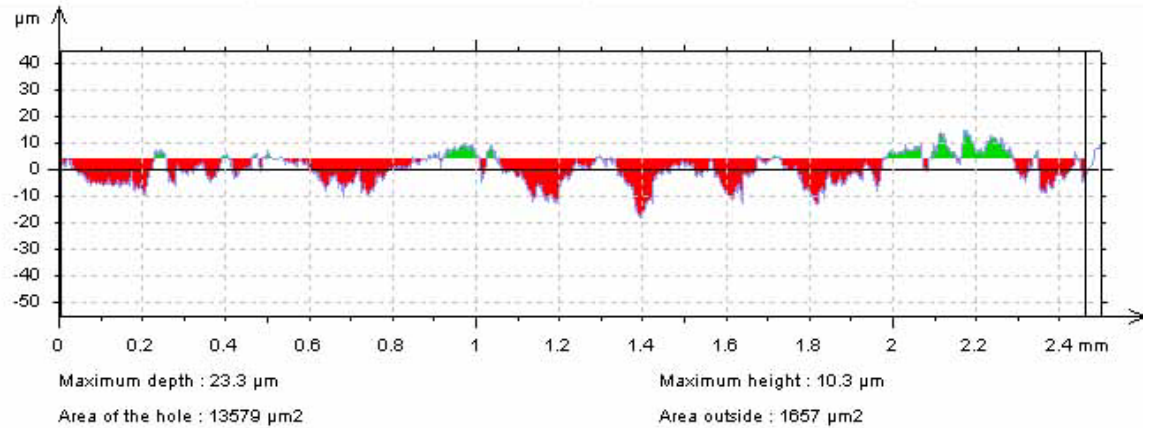


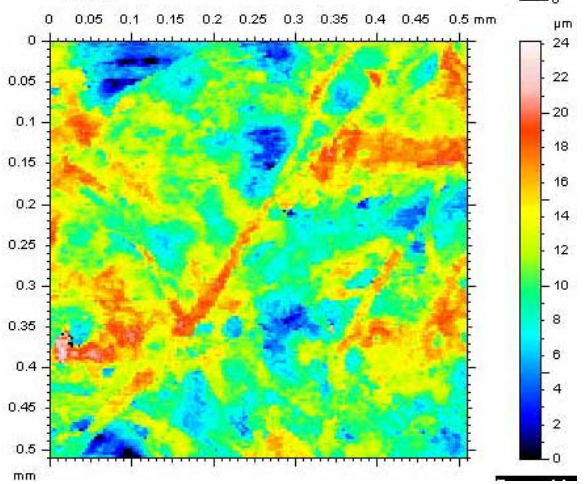


Ladoga

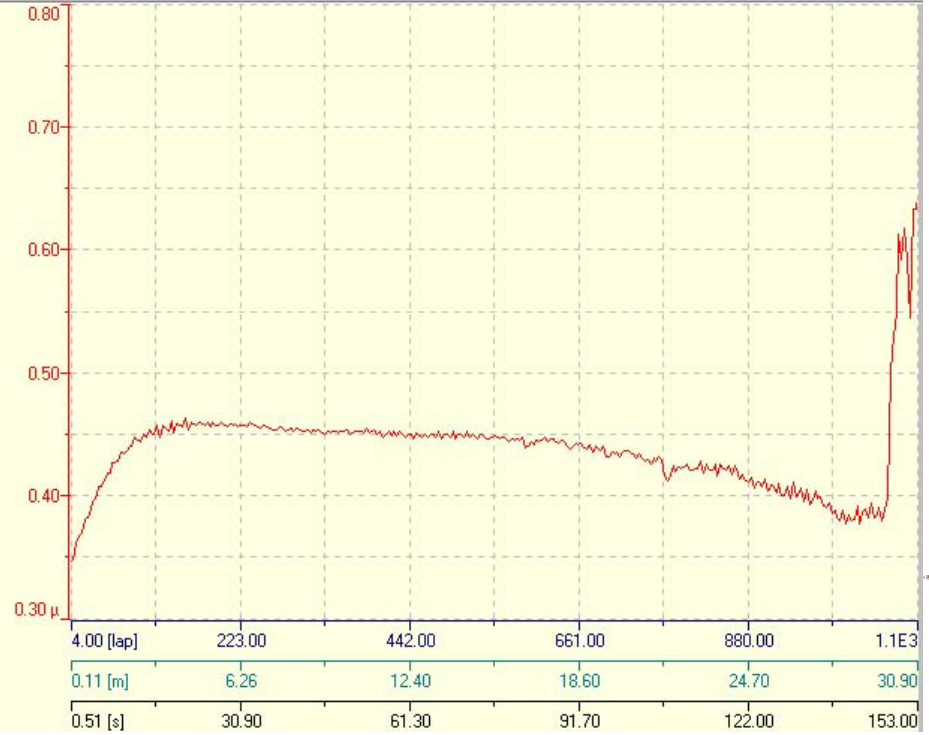
260 g/m²

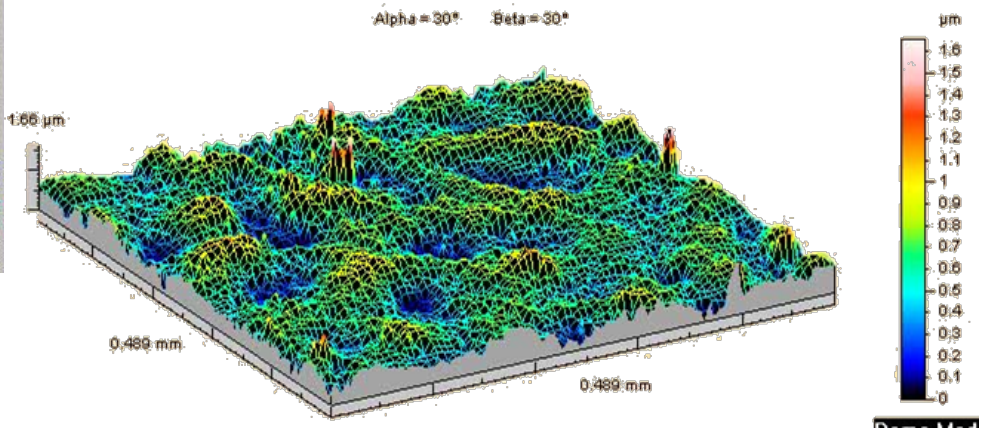


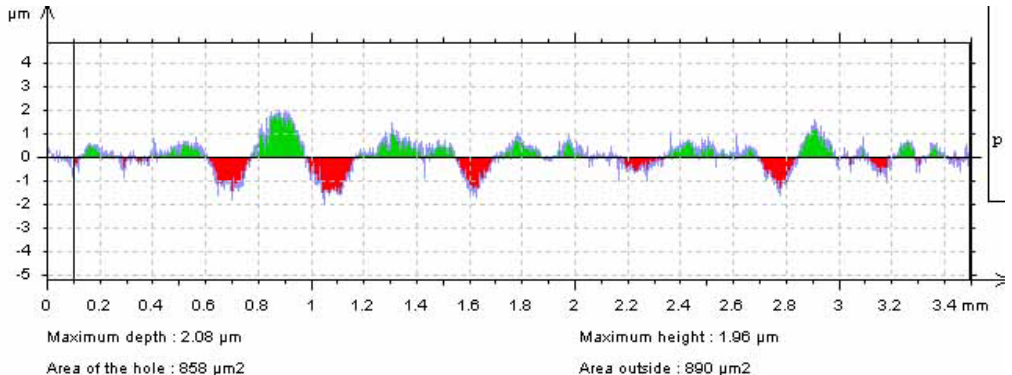


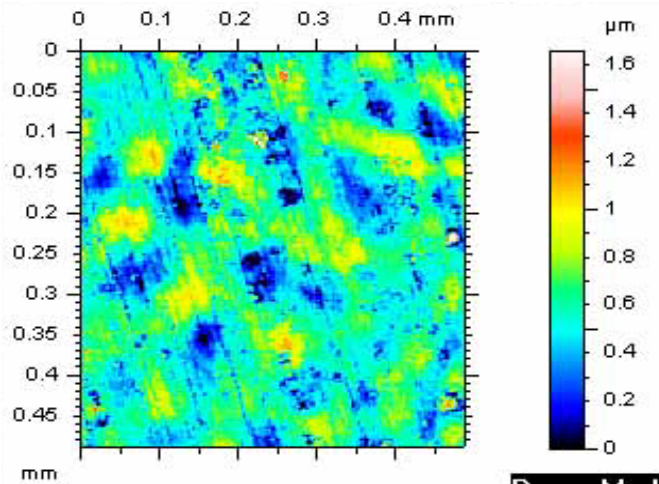


Combination Material “HOUPAK”

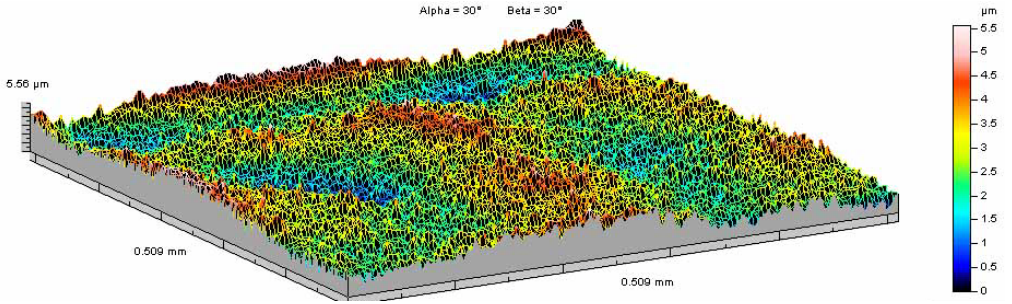


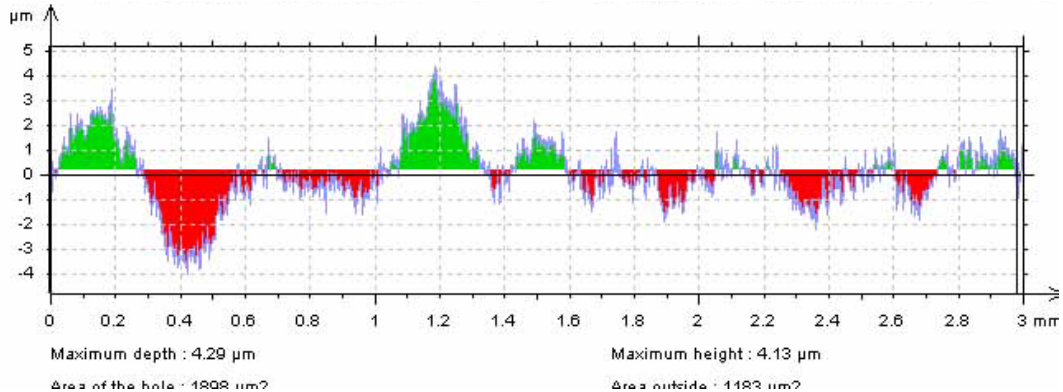


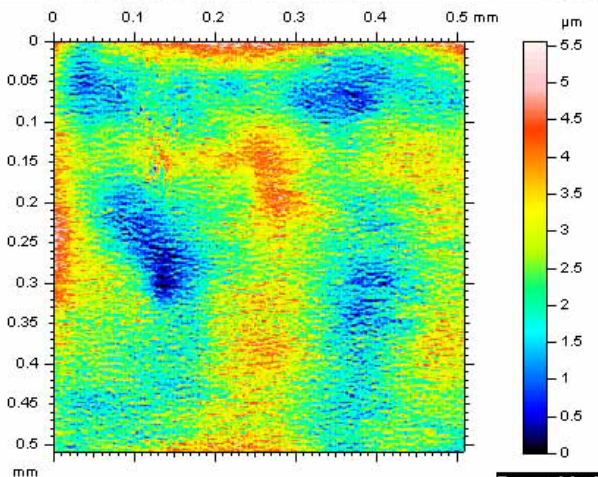




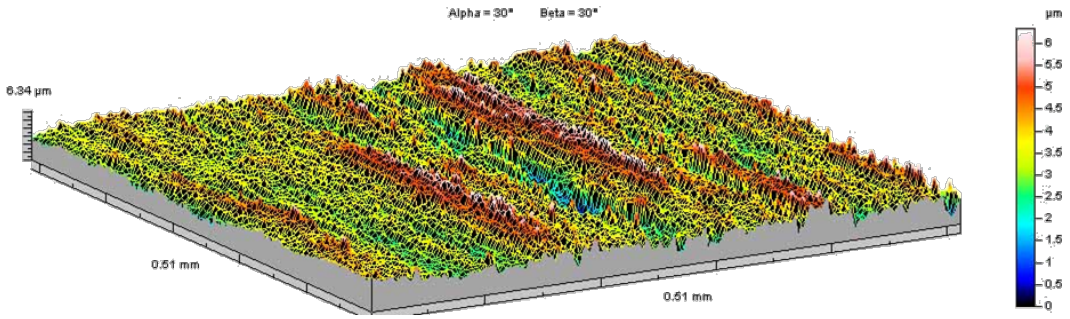
Combination Material "POLYPAKS" OZLB"

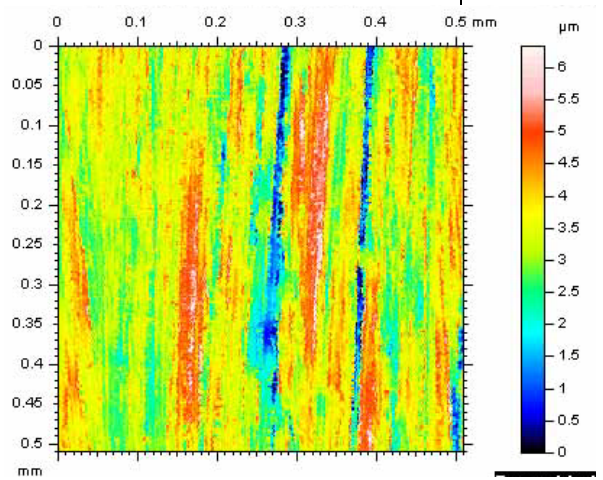


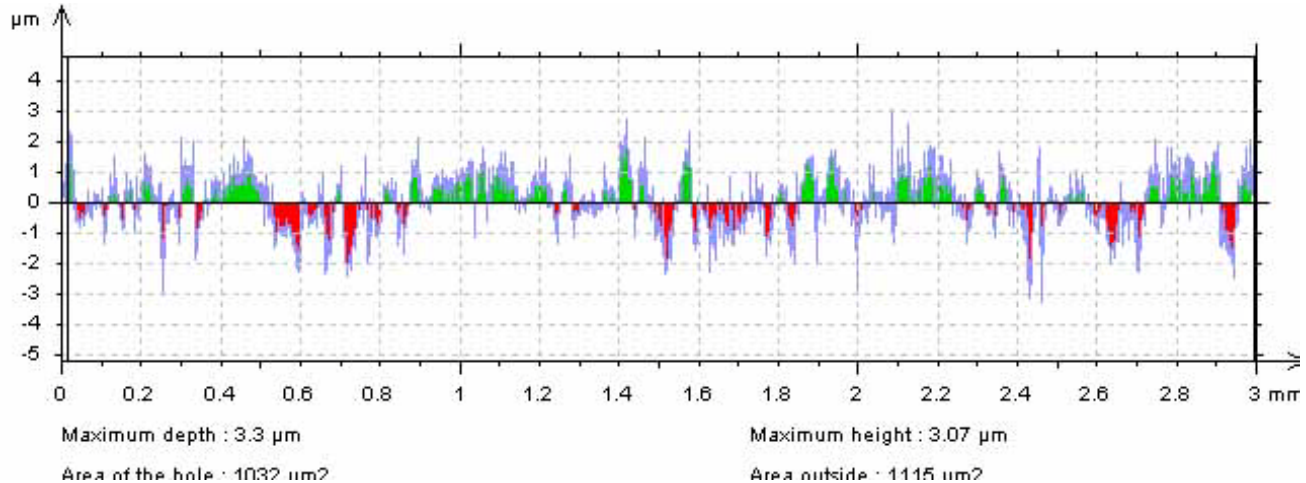




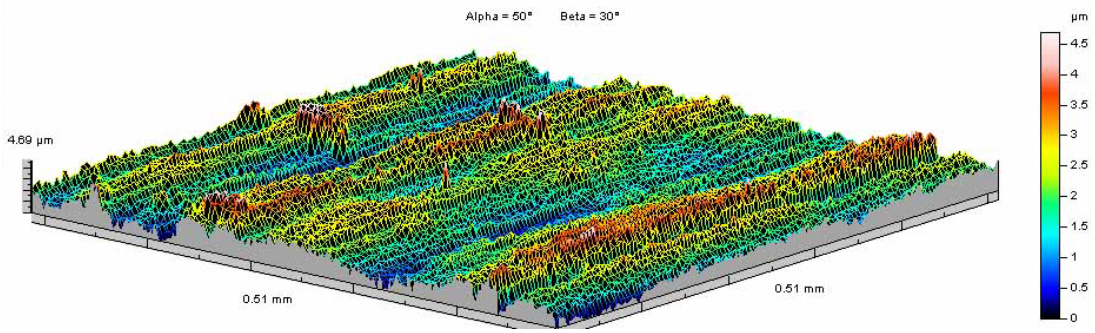
Brass Stamp

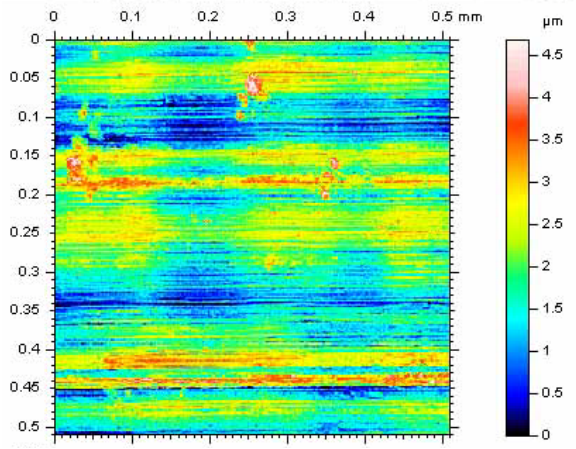

Alpha = 30°
Beta = 30°
6.34 µm
0.51 mm
0.51 mm
µm
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0

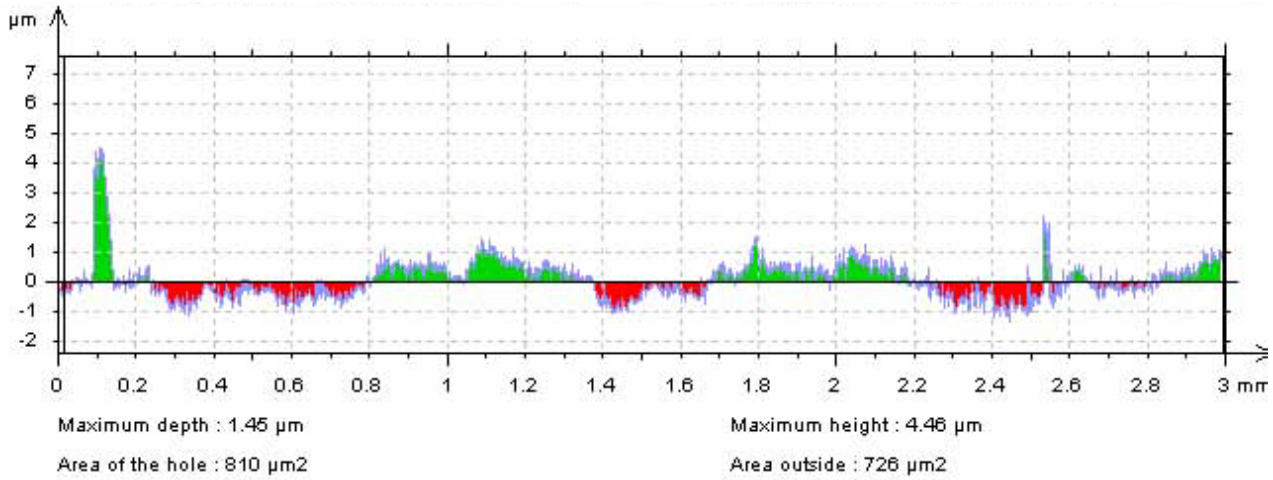

0
0.1
0.2
0.3
0.4
0.5 mm
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
mm
µm
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0


µm
4
3
2
1
0
-1
-2
-3
-4
-5
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3 mm
Maximum depth : 3.3 µm
Area of the hole : 1032 µm2
Maximum height : 3.07 µm
Area outside : 1115 µm2

Magnesium Stamp







Conclusions

- The surface microgeometry estimation method has been developed. With this method it is possible to represent surface heterogeneity and accurately register microgeometry parameters.

- The polygraphic material surface of abrasion resistance estimation method has been developed and the surface destruction process graphics have been presented.

Conclusions

- There are showed connection between fluctuation strength of inking layers of printed products and options of surface microrelief. The less surface's inhomogeneity of printed products, the more strength of inking layer.

- The kaschiered aluminum foil substrate microgeometry dependence on the received complex material strength has been detected. The lower substrate roughness, the smoother surface material and the higher binding adhesion strength.

THANK YOU FOR YOUR ATTENTION