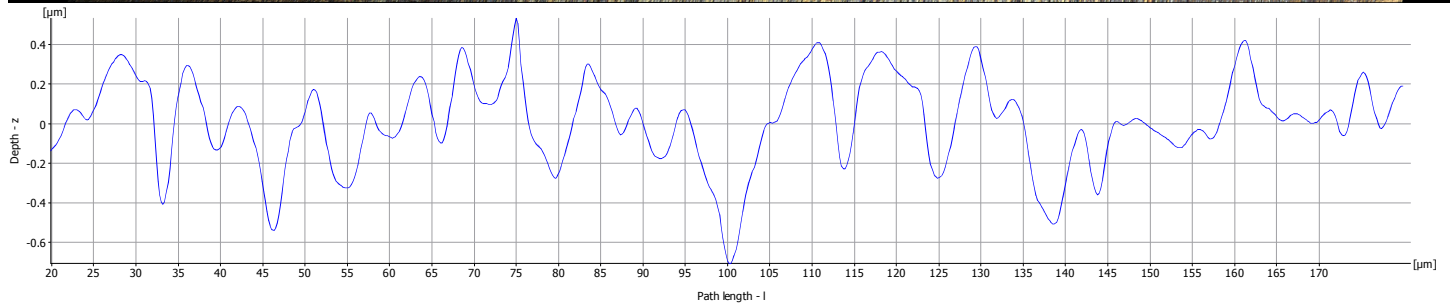
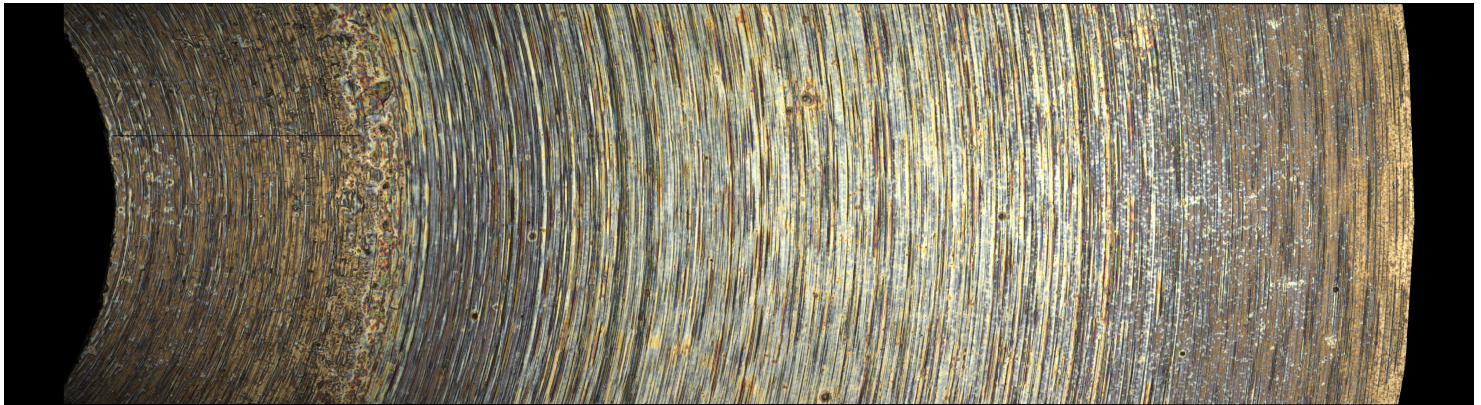


Measurement Report

Profile Measurement

51824_1



Ra: 169nm

Rq: 220nm

Rz: 861nm

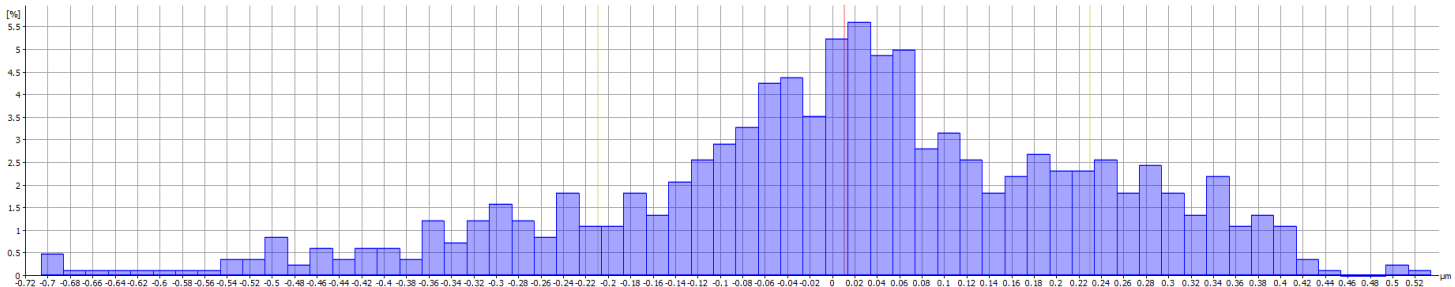
Filter: high pass - roughness profile
Lc:= 80μm

Measurement Report

Profile Roughness Measurement

Parameters of Roughness Profile

51824_1



Histogram Settings

Number of Classes: 62
Minimum Value: $-0.71\mu\text{m}$
Maximum Value: $0.53\mu\text{m}$
Class Width: $0.02\mu\text{m}$

Statistics

Name	Value	[u]
Elements	820	
Classes	62	
Mean Value	0.01	μm
Standard Deviation	0.22	μm

Parameters

Name	Value	[u]	Description
Ra	169	nm	Average roughness of profile
Rq	220	nm	Root-Mean-Square roughness of profile
Rt	1.24	μm	Maximum peak to valley height of roughness profile
Rz	861	nm	Mean peak to valley height of roughness profile
Rmax	1.12	μm	Maximum peak to valley height of roughness profile within a sampling length
Rp	532	nm	Maximum peak height of roughness profile
Rv	706	nm	Maximum valley height of roughness profile
Rc	705	nm	Mean height of profile irregularities of roughness profile

Name	Value	[u]	Description
Rsm	15.1	μm	Mean spacing of profile irregularities of roughness profile
Rsk	-0.355		Skewness of roughness profile
Rku	3.22		Kurtosis of roughness profile
Rdq	0.148		Root-Mean-Square slope of roughness profile
Rt/Rz	1.44		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Advanced Parameters of Roughness Profile

$L_c = 80\mu\text{m}$

51824_1

Mean of Profile Parameters

Name	Value	[u]	Description
mean Ra	171	nm	Average roughness of profile
mean Rq	222	nm	Root-Mean-Square roughness of profile
mean Rt	1.24	μm	Maximum peak to valley height of roughness profile
mean Rz	865	nm	Mean peak to valley height of roughness profile
mean Rmax	1.12	μm	Maximum peak to valley height of roughness profile within a sampling length
mean Rp	536	nm	Maximum peak height of roughness profile
mean Rv	707	nm	Maximum valley height of roughness profile
mean Rc	705	nm	Mean height of profile irregularities of roughness profile
mean Rsm	14.6	μm	Mean spacing of profile irregularities of roughness profile
mean Rsk	-0.342		Skewness of roughness profile
mean Rku	3.23		Kurtosis of roughness profile
mean Rdq	0.152		Root-Mean-Square slope of roughness profile
mean Rt/Rz	1.44		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Standard Deviation of Profile Parameters

Name	Value	[u]	Description
sigma Ra	7.22	nm	Average roughness of profile
sigma Rq	8.57	nm	Root-Mean-Square roughness of profile
sigma Rt	80.3	nm	Maximum peak to valley height of roughness profile
sigma Rz	36.9	nm	Mean peak to valley height of roughness profile
sigma Rmax	5.11	nm	Maximum peak to valley height of roughness profile within a sampling length
sigma Rp	94.9	nm	Maximum peak height of roughness profile
sigma Rv	14.8	nm	Maximum valley height of roughness profile
sigma Rc	47	nm	Mean height of profile irregularities of roughness profile
sigma Rsm	566	nm	Mean spacing of profile irregularities of roughness profile
sigma Rsk	0.147		Skewness of roughness profile
sigma Rku	0.189		Kurtosis of roughness profile

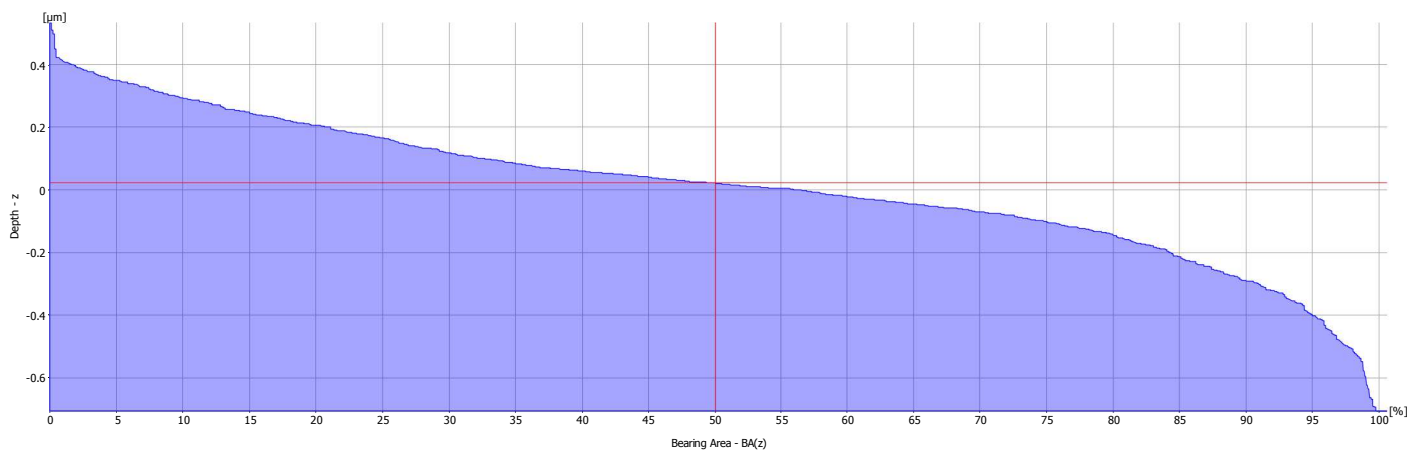
Name	Value	[u]	Description
sigma Rdq	0.00788		Root-Mean-Square slope of roughness profile
sigma Rt/Rz	0.0352		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Bearing Ratio/Firestone-Abbott Curve of Roughness Profile

$L_c = 80\mu\text{m}$
 51824_1



Measurement line

$BA(z) [\%] = 50$

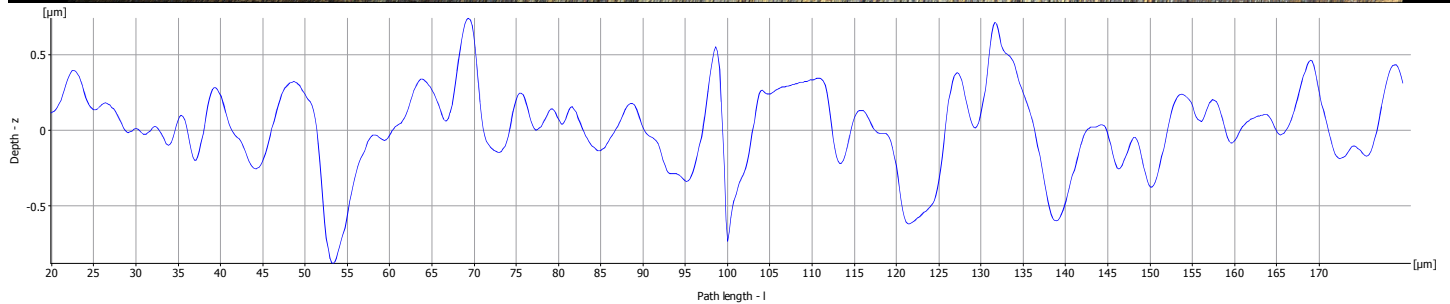
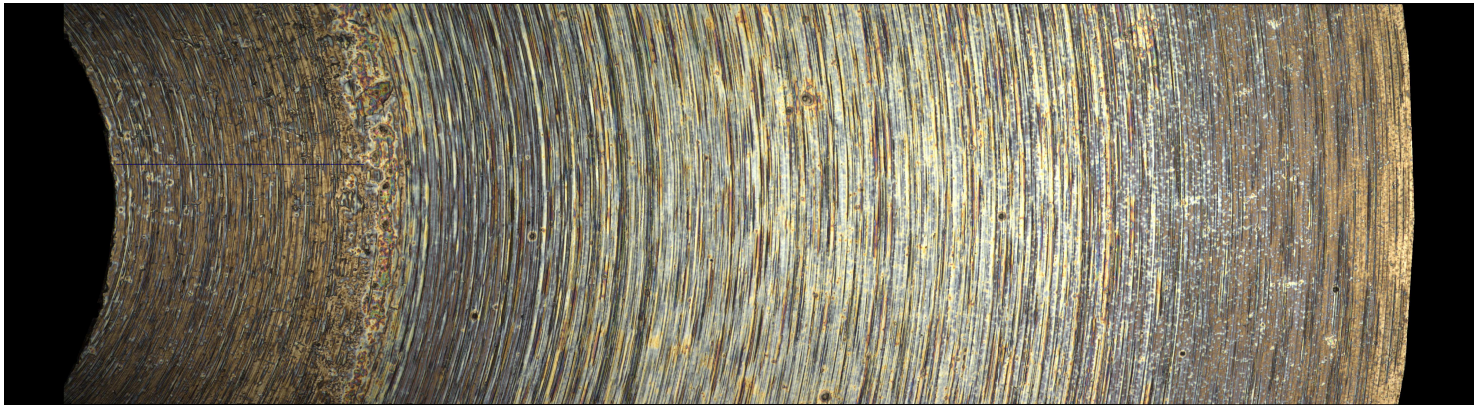
$z = 21.7\text{nm}$

Name	Value	[u]	Description
Rk	453	nm	Core roughness depth, Height of the core material
Rpk	162	nm	Reduced peak height, mean height of the peaks above the core material
Rvk	314	nm	Reduced valley height, mean depth of the valleys below the core material
Rmr1	15	%	Peak material component, the fraction of the surface which consists of peaks above the core material
Rmr2	84.5	%	Peak material component, the fraction of the surface which will carry the load
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

51824_1



Ra: 208nm

Rq: 273nm

Rz: 1.15μm

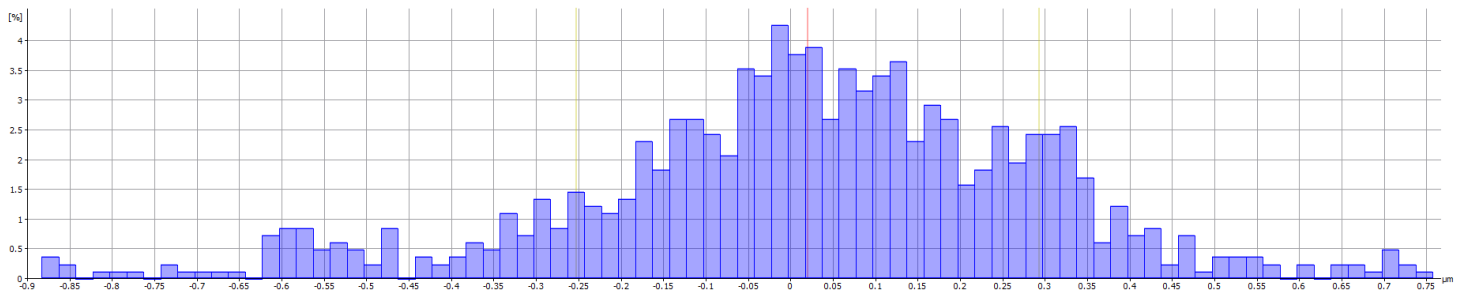
Filter: high pass - roughness profile
Lc:= 80μm

Measurement Report

Profile Roughness Measurement

Parameters of Roughness Profile

51824_1



Histogram Settings

Number of Classes: 82
Minimum Value: $-0.88\mu\text{m}$
Maximum Value: $0.76\mu\text{m}$
Class Width: $0.02\mu\text{m}$

Statistics

Name	Value	[u]
Elements	820	
Classes	82	
Mean Value	0.02	μm
Standard Deviation	0.27	μm

Parameters

Name	Value	[u]	Description
Ra	208	nm	Average roughness of profile
Rq	273	nm	Root-Mean-Square roughness of profile
Rt	1.62	μm	Maximum peak to valley height of roughness profile
Rz	1.15	μm	Mean peak to valley height of roughness profile
Rmax	1.62	μm	Maximum peak to valley height of roughness profile within a sampling length
Rp	741	nm	Maximum peak height of roughness profile
Rv	883	nm	Maximum valley height of roughness profile
Rc	882	nm	Mean height of profile irregularities of roughness profile

Name	Value	[u]	Description
Rsm	16.5	μm	Mean spacing of profile irregularities of roughness profile
Rsk	-0.243		Skewness of roughness profile
Rku	3.59		Kurtosis of roughness profile
Rdq	0.205		Root-Mean-Square slope of roughness profile
Rt/Rz	1.41		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Advanced Parameters of Roughness Profile

$L_c = 80\mu\text{m}$

51824_1

Mean of Profile Parameters

Name	Value	[u]	Description
mean Ra	210	nm	Average roughness of profile
mean Rq	275	nm	Root-Mean-Square roughness of profile
mean Rt	1.65	μm	Maximum peak to valley height of roughness profile
mean Rz	1.16	μm	Mean peak to valley height of roughness profile
mean Rmax	1.62	μm	Maximum peak to valley height of roughness profile within a sampling length
mean Rp	766	nm	Maximum peak height of roughness profile
mean Rv	883	nm	Maximum valley height of roughness profile
mean Rc	893	nm	Mean height of profile irregularities of roughness profile
mean Rsm	16.2	μm	Mean spacing of profile irregularities of roughness profile
mean Rsk	-0.232		Skewness of roughness profile
mean Rku	3.59		Kurtosis of roughness profile
mean Rdq	0.208		Root-Mean-Square slope of roughness profile
mean Rt/Rz	1.43		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Standard Deviation of Profile Parameters

Name	Value	[u]	Description
sigma Ra	1.75	nm	Average roughness of profile
sigma Rq	4.46	nm	Root-Mean-Square roughness of profile
sigma Rt	16.1	nm	Maximum peak to valley height of roughness profile
sigma Rz	42.9	nm	Mean peak to valley height of roughness profile
sigma Rmax	39.7	nm	Maximum peak to valley height of roughness profile within a sampling length
sigma Rp	25.1	nm	Maximum peak height of roughness profile
sigma Rv	22.1	nm	Maximum valley height of roughness profile
sigma Rc	50.1	nm	Mean height of profile irregularities of roughness profile
sigma Rsm	1.66	μm	Mean spacing of profile irregularities of roughness profile
sigma Rsk	0.0397		Skewness of roughness profile
sigma Rku	0.0497		Kurtosis of roughness profile

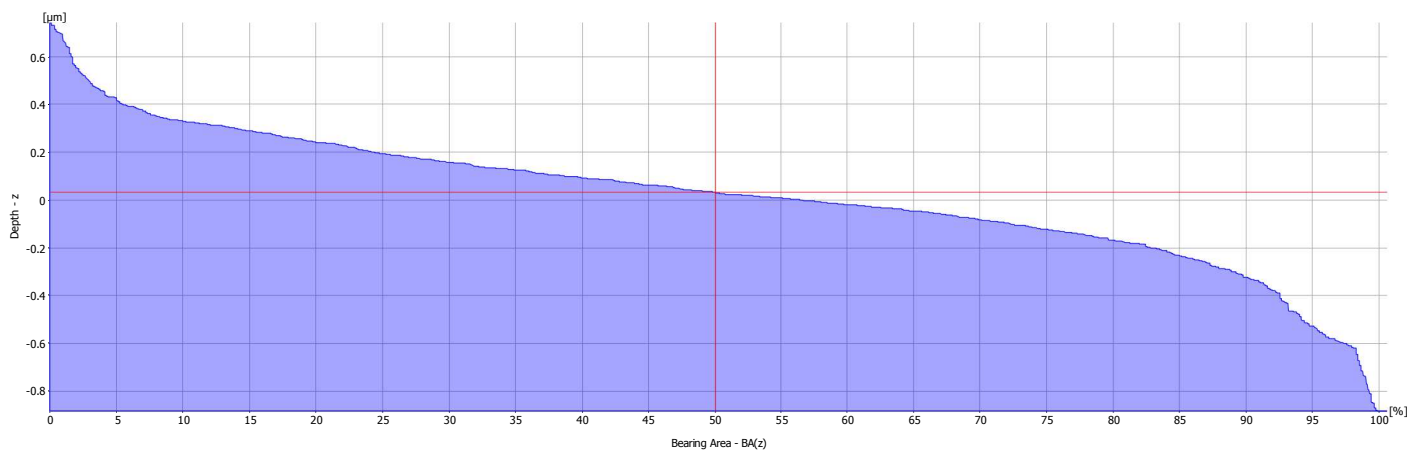
Name	Value	[u]	Description
sigma Rdq	0.0055		Root-Mean-Square slope of roughness profile
sigma Rt/Rz	0.062		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Bearing Ratio/Firestone-Abbott Curve of Roughness Profile

$L_c = 80\mu\text{m}$
 51824_1



Measurement line

$BA(z) [\%] = 50$

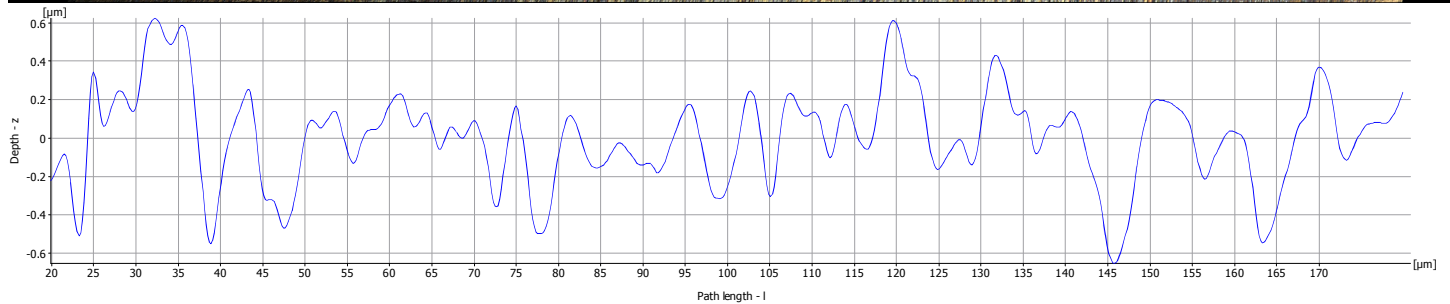
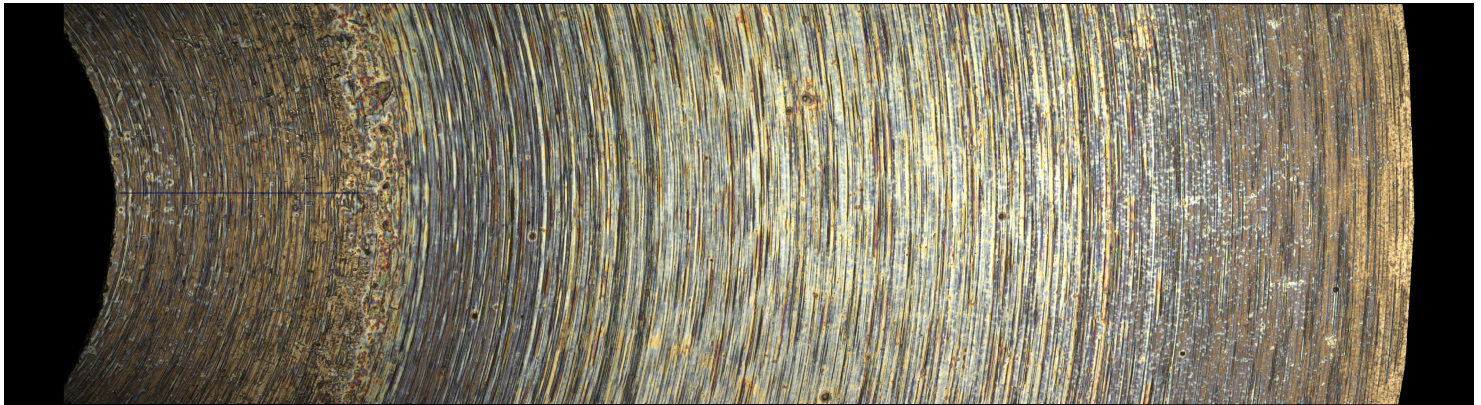
$z = 31.8\text{nm}$

Name	Value	[u]	Description
Rk	586	nm	Core roughness depth, Height of the core material
Rpk	265	nm	Reduced peak height, mean height of the peaks above the core material
Rvk	423	nm	Reduced valley height, mean depth of the valleys below the core material
Rmr1	9.39	%	Peak material component, the fraction of the surface which consists of peaks above the core material
Rmr2	86.2	%	Peak material component, the fraction of the surface which will carry the load
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

51824_1



Ra: 185nm

Rq: 243nm

Rz: 928nm

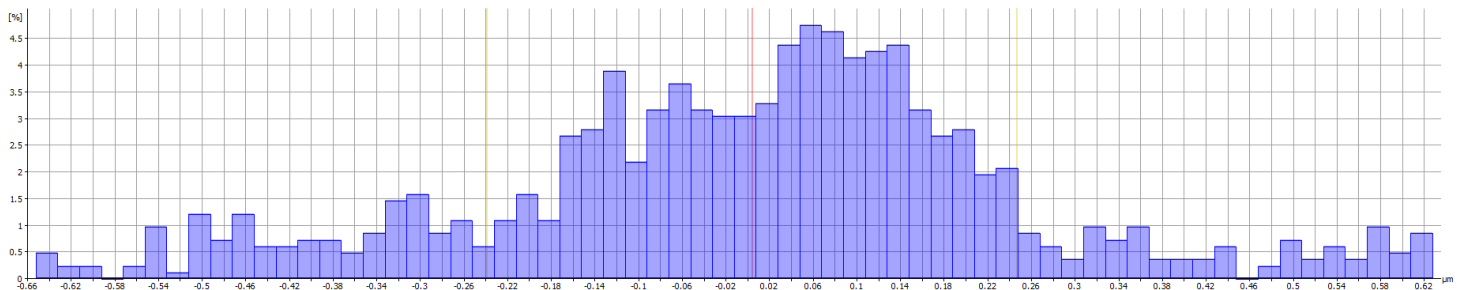
Filter: high pass - roughness profile
Lc:= 80μm

Measurement Report

Profile Roughness Measurement

Parameters of Roughness Profile

51824_1



Histogram Histogram Settings

Number of Classes: 64
Minimum Value: -0.65 μm
Maximum Value: 0.63 μm
Class Width: 0.02 μm

Statistics

Name	Value	[u]
Elements	820	
Classes	64	
Mean Value	0	μm
Standard Deviation	0.24	μm

Parameters

Name	Value	[u]	Description
Ra	185	nm	Average roughness of profile
Rq	243	nm	Root-Mean-Square roughness of profile
Rt	1.27	μm	Maximum peak to valley height of roughness profile
Rz	928	nm	Mean peak to valley height of roughness profile
Rmax	1.26	μm	Maximum peak to valley height of roughness profile within a sampling length
Rp	623	nm	Maximum peak height of roughness profile
Rv	652	nm	Maximum valley height of roughness profile
Rc	671	nm	Mean height of profile irregularities of roughness profile

Name	Value	[u]	Description
Rsm	12.3	μm	Mean spacing of profile irregularities of roughness profile
Rsk	-0.0534		Skewness of roughness profile
Rku	3.36		Kurtosis of roughness profile
Rdq	0.176		Root-Mean-Square slope of roughness profile
Rt/Rz	1.37		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Advanced Parameters of Roughness Profile

$L_c = 80\mu\text{m}$

51824_1

Mean of Profile Parameters

Name	Value	[u]	Description
mean Ra	188	nm	Average roughness of profile
mean Rq	247	nm	Root-Mean-Square roughness of profile
mean Rt	1.29	μm	Maximum peak to valley height of roughness profile
mean Rz	957	nm	Mean peak to valley height of roughness profile
mean Rmax	1.27	μm	Maximum peak to valley height of roughness profile within a sampling length
mean Rp	634	nm	Maximum peak height of roughness profile
mean Rv	656	nm	Maximum valley height of roughness profile
mean Rc	684	nm	Mean height of profile irregularities of roughness profile
mean Rsm	12.6	μm	Mean spacing of profile irregularities of roughness profile
mean Rsk	-0.0676		Skewness of roughness profile
mean Rku	3.34		Kurtosis of roughness profile
mean Rdq	0.18		Root-Mean-Square slope of roughness profile
mean Rt/Rz	1.35		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Standard Deviation of Profile Parameters

Name	Value	[u]	Description
sigma Ra	2.95	nm	Average roughness of profile
sigma Rq	3.41	nm	Root-Mean-Square roughness of profile
sigma Rt	31.3	nm	Maximum peak to valley height of roughness profile
sigma Rz	20.3	nm	Mean peak to valley height of roughness profile
sigma Rmax	17.6	nm	Maximum peak to valley height of roughness profile within a sampling length
sigma Rp	10.2	nm	Maximum peak height of roughness profile
sigma Rv	26.9	nm	Maximum valley height of roughness profile
sigma Rc	18	nm	Mean height of profile irregularities of roughness profile
sigma Rsm	479	nm	Mean spacing of profile irregularities of roughness profile
sigma Rsk	0.0254		Skewness of roughness profile
sigma Rku	0.0734		Kurtosis of roughness profile
sigma Rdq	0.00168		Root-Mean-Square slope of roughness profile

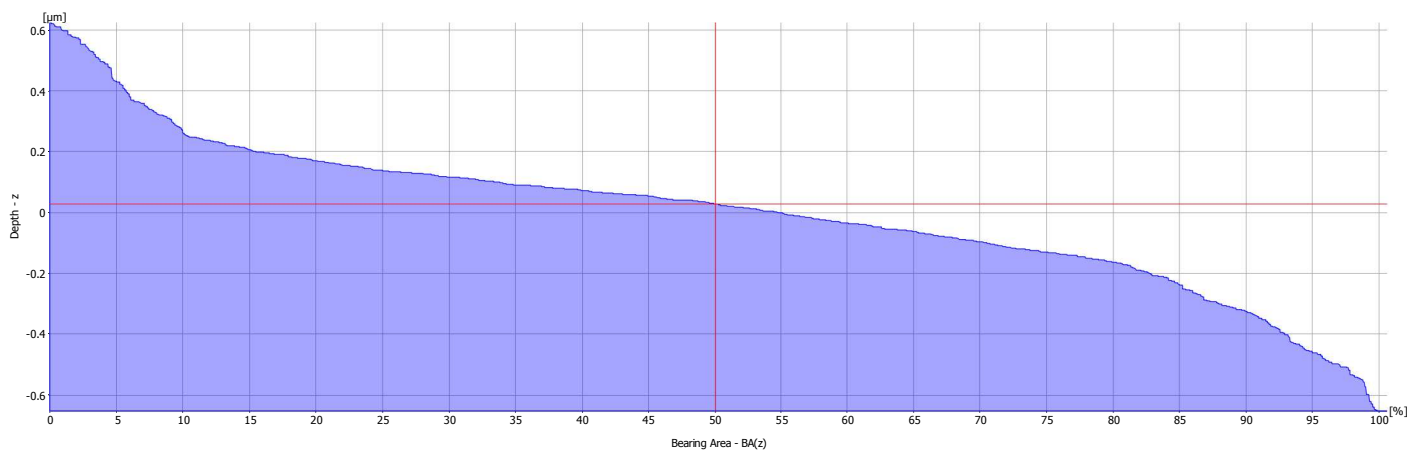
Name	Value	[u]	Description
sigma Rt/Rz	0.0213		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Bearing Ratio/Firestone-Abbott Curve of Roughness Profile

$L_c = 80\mu\text{m}$
51824_1



Measurement line

$BA(z) [\%] = 50$

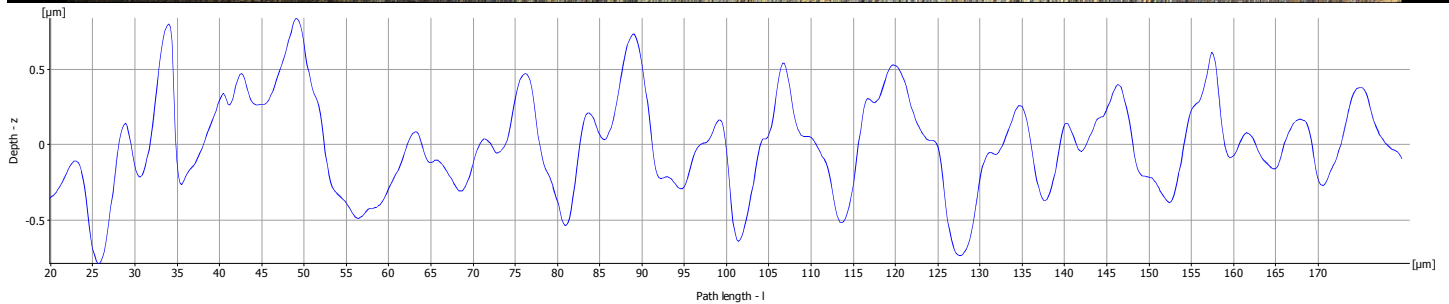
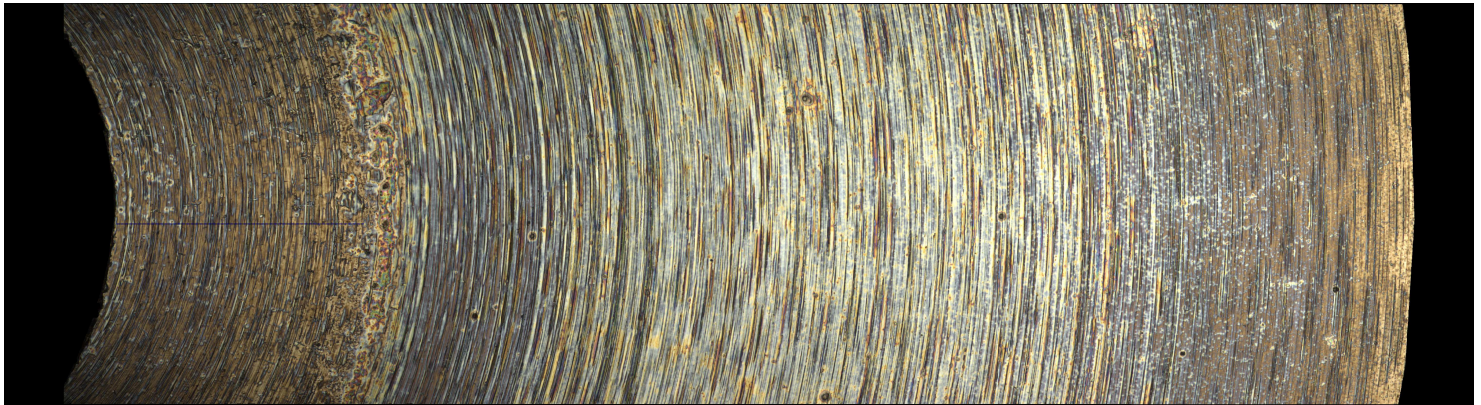
$z = 29\text{nm}$

Name	Value	[u]	Description
Rk	495	nm	Core roughness depth, Height of the core material
Rpk	367	nm	Reduced peak height, mean height of the peaks above the core material
Rvk	335	nm	Reduced valley height, mean depth of the valleys below the core material
Rmr1	10.1	%	Peak material component, the fraction of the surface which consists of peaks above the core material
Rmr2	85	%	Peak material component, the fraction of the surface which will carry the load
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

51824_1



Ra: 252nm

Rq: 319nm

Rz: 1.26μm

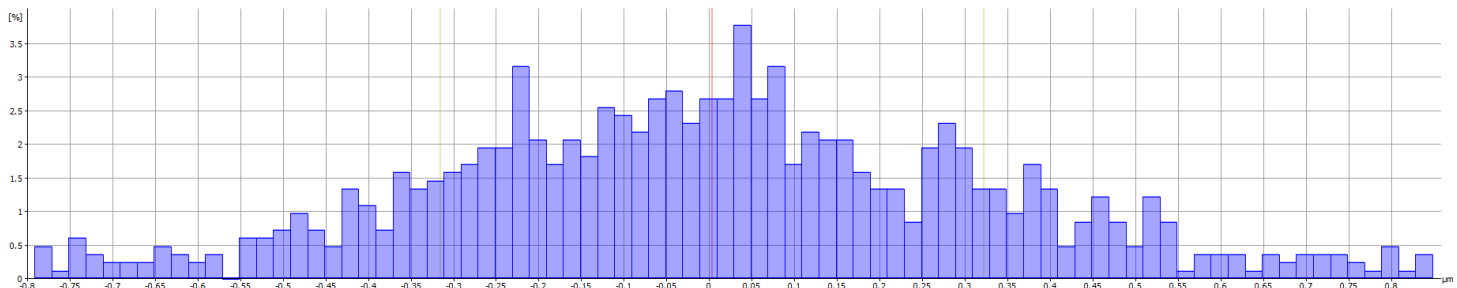
Filter: high pass - roughness profile
Lc:= 80μm

Measurement Report

Profile Roughness Measurement

Parameters of Roughness Profile

51824_1



Histogram Histogram Settings

Number of Classes: 82
Minimum Value: $-0.79\mu\text{m}$
Maximum Value: $0.85\mu\text{m}$
Class Width: $0.02\mu\text{m}$

Statistics

Name	Value	[u]
Elements	820	
Classes	82	
Mean Value	0	μm
Standard Deviation	0.32	μm

Parameters

Name	Value	[u]	Description
Ra	252	nm	Average roughness of profile
Rq	319	nm	Root-Mean-Square roughness of profile
Rt	1.63	μm	Maximum peak to valley height of roughness profile
Rz	1.26	μm	Mean peak to valley height of roughness profile
Rmax	1.63	μm	Maximum peak to valley height of roughness profile within a sampling length
Rp	844	nm	Maximum peak height of roughness profile
Rv	791	nm	Maximum valley height of roughness profile
Rc	935	nm	Mean height of profile irregularities of roughness profile

Name	Value	[u]	Description
Rsm	13.1	μm	Mean spacing of profile irregularities of roughness profile
Rsk	0.133		Skewness of roughness profile
Rku	2.88		Kurtosis of roughness profile
Rdq	0.223		Root-Mean-Square slope of roughness profile
Rt/Rz	1.3		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Advanced Parameters of Roughness Profile

$L_c = 80\mu\text{m}$

51824_1

Mean of Profile Parameters

Name	Value	[u]	Description
mean Ra	253	nm	Average roughness of profile
mean Rq	322	nm	Root-Mean-Square roughness of profile
mean Rt	1.64	μm	Maximum peak to valley height of roughness profile
mean Rz	1.28	μm	Mean peak to valley height of roughness profile
mean Rmax	1.64	μm	Maximum peak to valley height of roughness profile within a sampling length
mean Rp	848	nm	Maximum peak height of roughness profile
mean Rv	792	nm	Maximum valley height of roughness profile
mean Rc	946	nm	Mean height of profile irregularities of roughness profile
mean Rsm	13.1	μm	Mean spacing of profile irregularities of roughness profile
mean Rsk	0.109		Skewness of roughness profile
mean Rku	2.91		Kurtosis of roughness profile
mean Rdq	0.227		Root-Mean-Square slope of roughness profile
mean Rt/Rz	1.28		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Standard Deviation of Profile Parameters

Name	Value	[u]	Description
sigma Ra	1.98	nm	Average roughness of profile
sigma Rq	7.9	nm	Root-Mean-Square roughness of profile
sigma Rt	88.1	nm	Maximum peak to valley height of roughness profile
sigma Rz	77.5	nm	Mean peak to valley height of roughness profile
sigma Rmax	88.1	nm	Maximum peak to valley height of roughness profile within a sampling length
sigma Rp	48.3	nm	Maximum peak height of roughness profile
sigma Rv	39.8	nm	Maximum valley height of roughness profile
sigma Rc	38.3	nm	Mean height of profile irregularities of roughness profile
sigma Rsm	404	nm	Mean spacing of profile irregularities of roughness profile
sigma Rsk	0.0232		Skewness of roughness profile
sigma Rku	0.219		Kurtosis of roughness profile

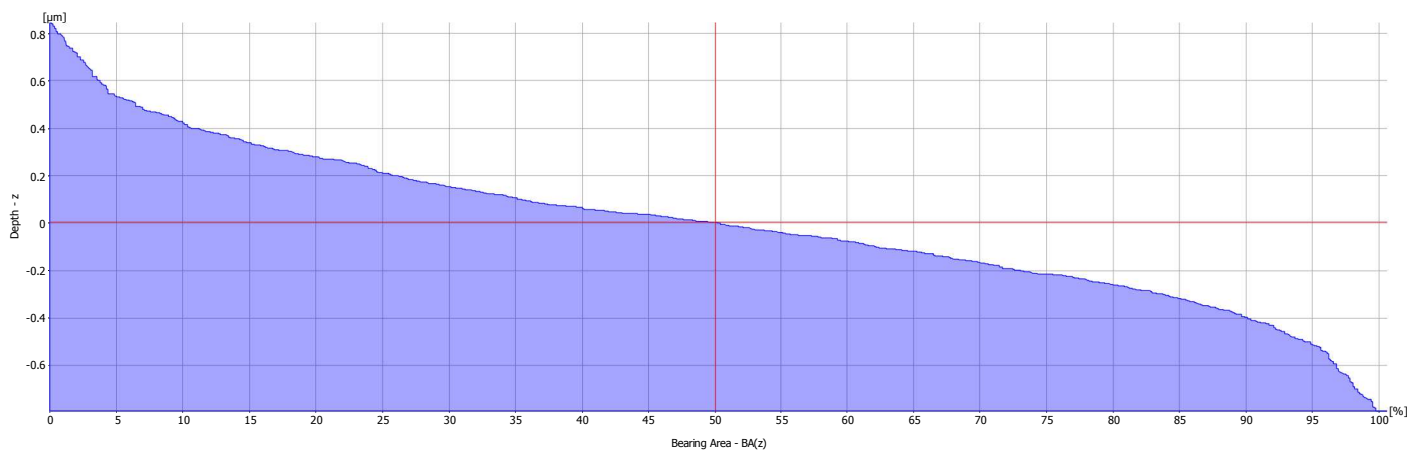
Name	Value	[u]	Description
sigma Rdq	0.00386		Root-Mean-Square slope of roughness profile
sigma Rt/Rz	0.0122		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Bearing Ratio/Firestone-Abbott Curve of Roughness Profile

$L_c = 80\mu\text{m}$
 51824_1



Measurement line

$BA(z) [\%] = 50$

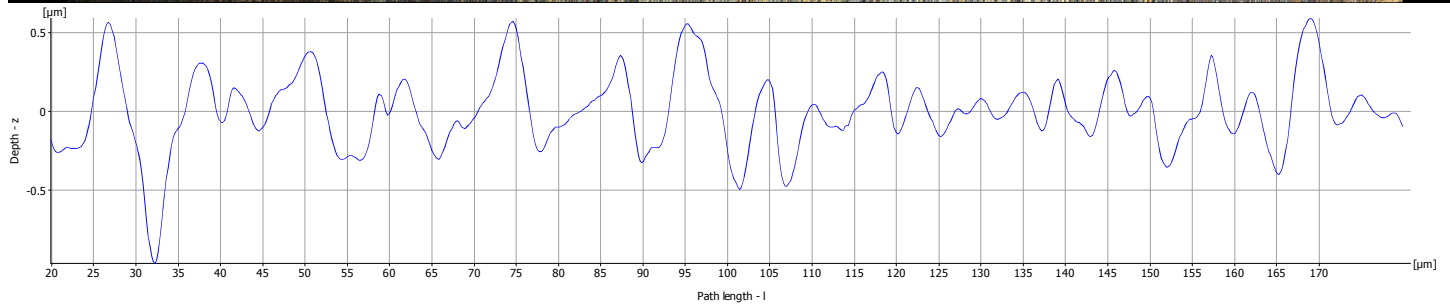
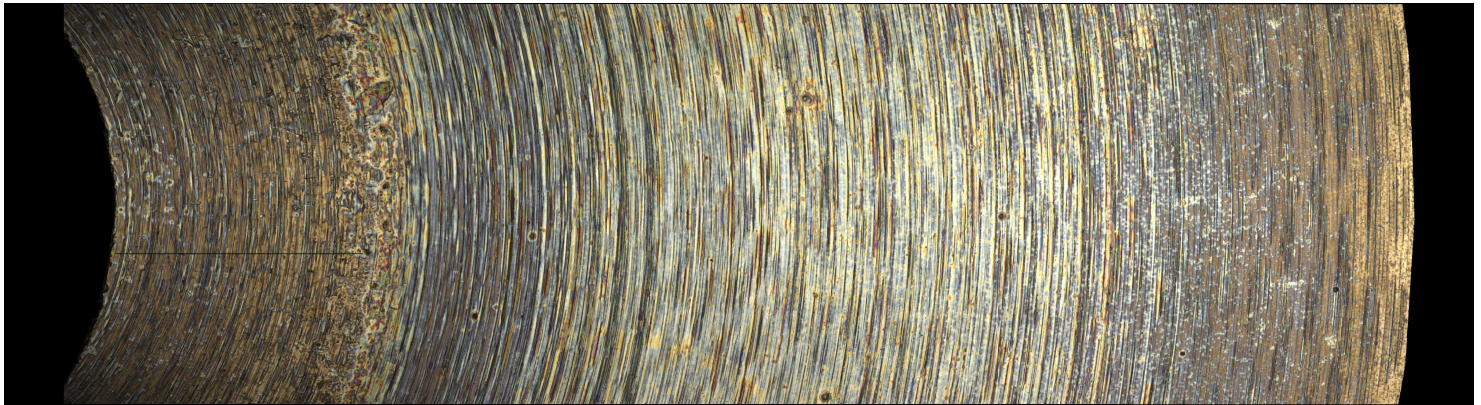
$z = 4.93\text{nm}$

Name	Value	[u]	Description
Rk	773	nm	Core roughness depth, Height of the core material
Rpk	324	nm	Reduced peak height, mean height of the peaks above the core material
Rvk	294	nm	Reduced valley height, mean depth of the valleys below the core material
Rmr1	13.4	%	Peak material component, the fraction of the surface which consists of peaks above the core material
Rmr2	90.1	%	Peak material component, the fraction of the surface which will carry the load
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

51824_1



Ra: 176nm

Rq: 237nm

Rz: 973nm

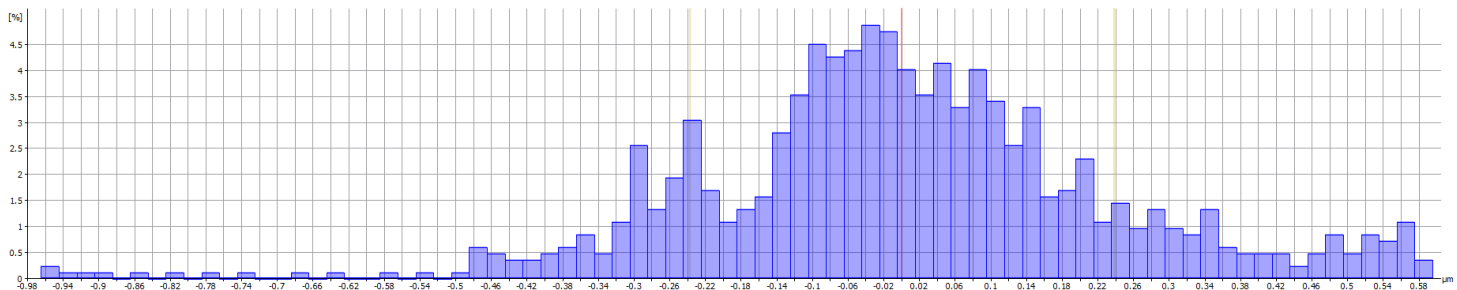
Filter: high pass - roughness profile
Lc:= 80μm

Measurement Report

Profile Roughness Measurement

Parameters of Roughness Profile

51824_1



Histogram Histogram Settings

Number of Classes: 78
Minimum Value: $-0.96\mu\text{m}$
Maximum Value: $0.6\mu\text{m}$
Class Width: $0.02\mu\text{m}$

Statistics

Name	Value	[u]
Elements	820	
Classes	78	
Mean Value	0	μm
Standard Deviation	0.24	μm

Parameters

Name	Value	[u]	Description
Ra	176	nm	Average roughness of profile
Rq	237	nm	Root-Mean-Square roughness of profile
Rt	1.56	μm	Maximum peak to valley height of roughness profile
Rz	973	nm	Mean peak to valley height of roughness profile
Rmax	1.53	μm	Maximum peak to valley height of roughness profile within a sampling length
Rp	591	nm	Maximum peak height of roughness profile
Rv	965	nm	Maximum valley height of roughness profile
Rc	736	nm	Mean height of profile irregularities of roughness profile

Name	Value	[u]	Description
Rsm	12.9	μm	Mean spacing of profile irregularities of roughness profile
Rsk	-0.216		Skewness of roughness profile
Rku	4.53		Kurtosis of roughness profile
Rdq	0.181		Root-Mean-Square slope of roughness profile
Rt/Rz	1.6		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Advanced Parameters of Roughness Profile

$L_c = 80\mu\text{m}$

51824_1

Mean of Profile Parameters

Name	Value	[u]	Description
mean Ra	177	nm	Average roughness of profile
mean Rq	239	nm	Root-Mean-Square roughness of profile
mean Rt	1.56	μm	Maximum peak to valley height of roughness profile
mean Rz	994	nm	Mean peak to valley height of roughness profile
mean Rmax	1.53	μm	Maximum peak to valley height of roughness profile within a sampling length
mean Rp	599	nm	Maximum peak height of roughness profile
mean Rv	965	nm	Maximum valley height of roughness profile
mean Rc	749	nm	Mean height of profile irregularities of roughness profile
mean Rsm	12.9	μm	Mean spacing of profile irregularities of roughness profile
mean Rsk	-0.214		Skewness of roughness profile
mean Rku	4.53		Kurtosis of roughness profile
mean Rdq	0.184		Root-Mean-Square slope of roughness profile
mean Rt/Rz	1.57		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Standard Deviation of Profile Parameters

Name	Value	[u]	Description
sigma Ra	2.17	nm	Average roughness of profile
sigma Rq	3.55	nm	Root-Mean-Square roughness of profile
sigma Rt	37	nm	Maximum peak to valley height of roughness profile
sigma Rz	11.4	nm	Mean peak to valley height of roughness profile
sigma Rmax	21.1	nm	Maximum peak to valley height of roughness profile within a sampling length
sigma Rp	16.8	nm	Maximum peak height of roughness profile
sigma Rv	51	nm	Maximum valley height of roughness profile
sigma Rc	22.4	nm	Mean height of profile irregularities of roughness profile
sigma Rsm	799	nm	Mean spacing of profile irregularities of roughness profile
sigma Rsk	0.0871		Skewness of roughness profile
sigma Rku	0.205		Kurtosis of roughness profile

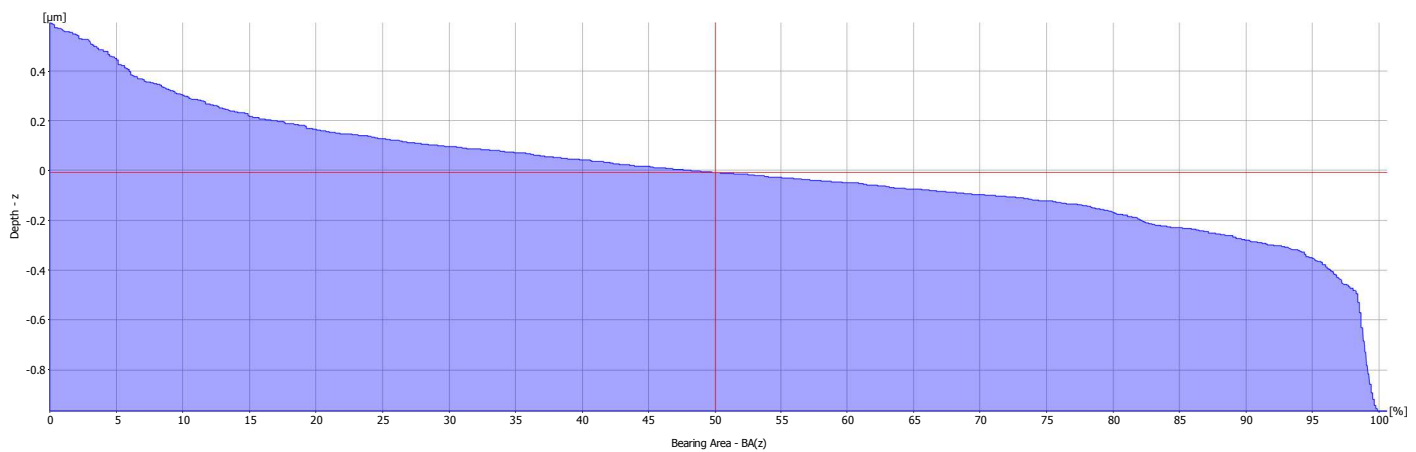
Name	Value	[u]	Description
sigma Rdq	0.00317		Root-Mean-Square slope of roughness profile
sigma Rt/Rz	0.0371		Extreme Scratch/Peak value of roughness profile, (≥ 1), higher values represent larger scratches/peaks
Lc	80	μm	LambdaC: cut off wavelength

Measurement Report

Profile Measurement

Bearing Ratio/Firestone-Abbott Curve of Roughness Profile

$L_c = 80\mu\text{m}$
 51824_1



Measurement line

$BA(z) [\%] = 50$

$z = -8.32\text{nm}$

Name	Value	[u]	Description
Rk	473	nm	Core roughness depth, Height of the core material
Rpk	311	nm	Reduced peak height, mean height of the peaks above the core material
Rvk	279	nm	Reduced valley height, mean depth of the valleys below the core material
Rmr1	13.9	%	Peak material component, the fraction of the surface which consists of peaks above the core material
Rmr2	86.1	%	Peak material component, the fraction of the surface which will carry the load
l	200	μm	Profile Length
Lc	80	μm	LambdaC: cut off wavelength