

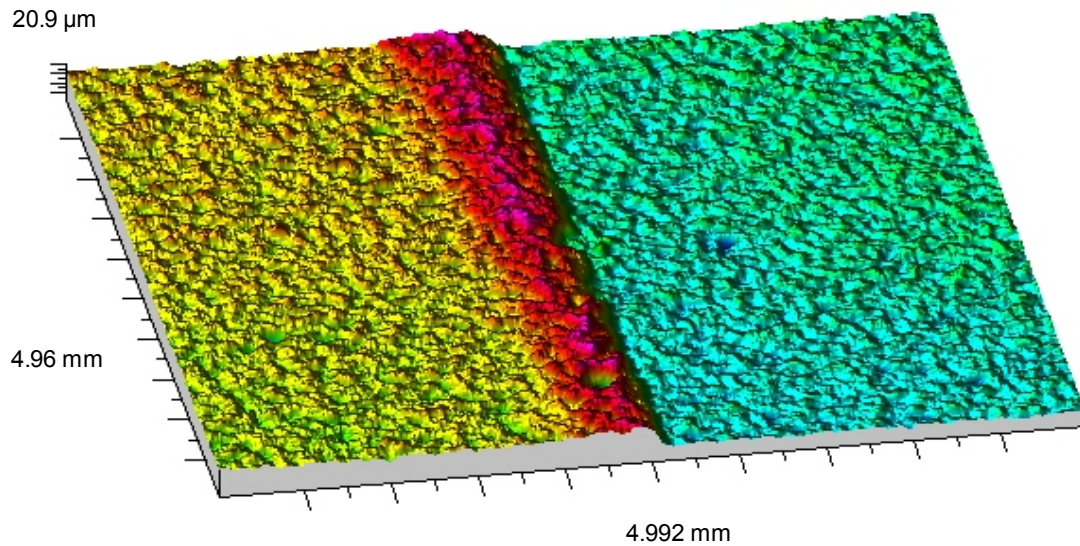
Sample:

Piezo Actuator Disk 4A
Metallisation Thickness

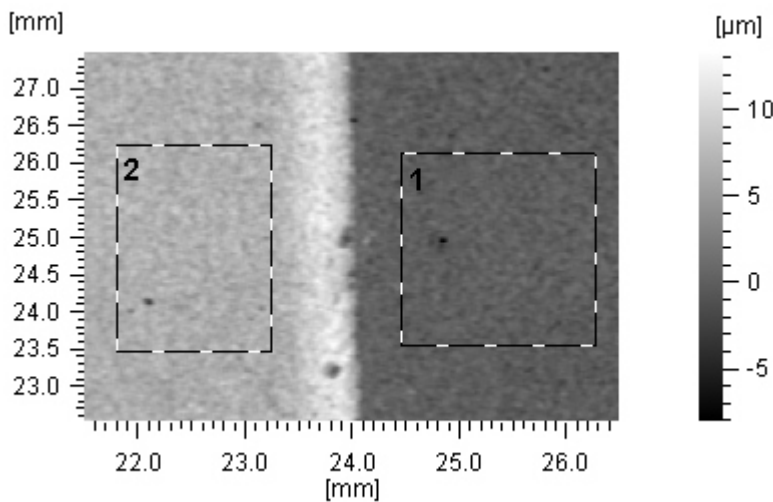


Optische Präzisionsmesstechnik

isometric view

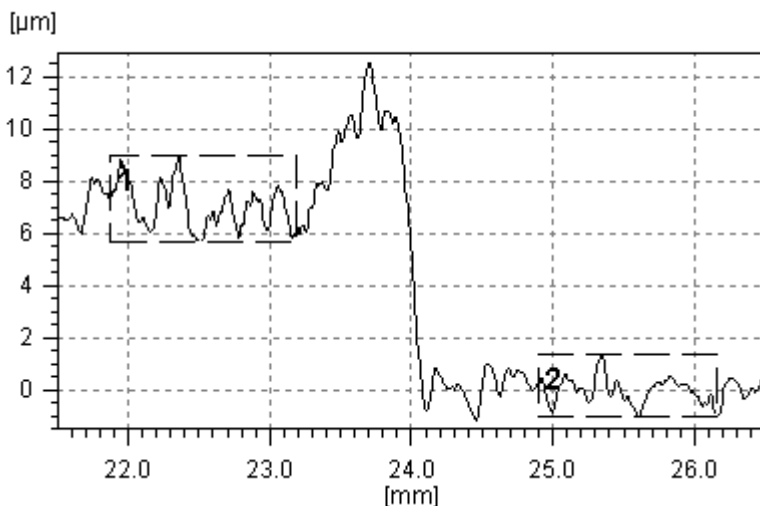


Three ways to determine metallisation thickness



1) using average profile value (area)

	Zone 1	Zone 2
X1	24.46mm	21.80mm
X2	26.27mm	23.24mm
ΔX	1.81mm	1.44mm
Y1	23.54mm	23.46mm
Y2	26.12mm	26.24mm
ΔY	2.58mm	2.78mm
avg(Z)	-0.03 μm	6.73 μm
ΔZ		-6.76μm



2) using average profile value (line)

	Zone 1	Zone 2
X1	21.88mm	24.90mm
X2	23.19mm	26.16mm
ΔX	1.32mm	1.26mm
avg(Z)	7.03 μm	-0.02 μm
ΔZ		7.06μm
min(Z)	5.66 μm	-1.02 μm
max(Z)	9.01 μm	1.38 μm
$\sigma(Z)$	0.82 μm	0.48 μm

Sample:

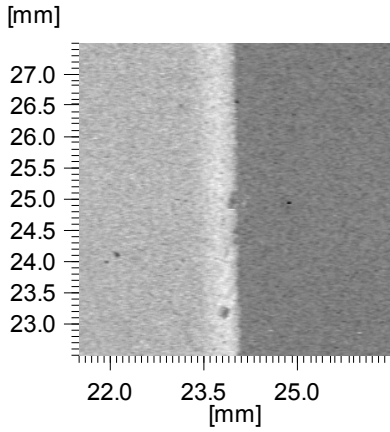
Piezo Actuator Disk 4A
Metallisation Thickness



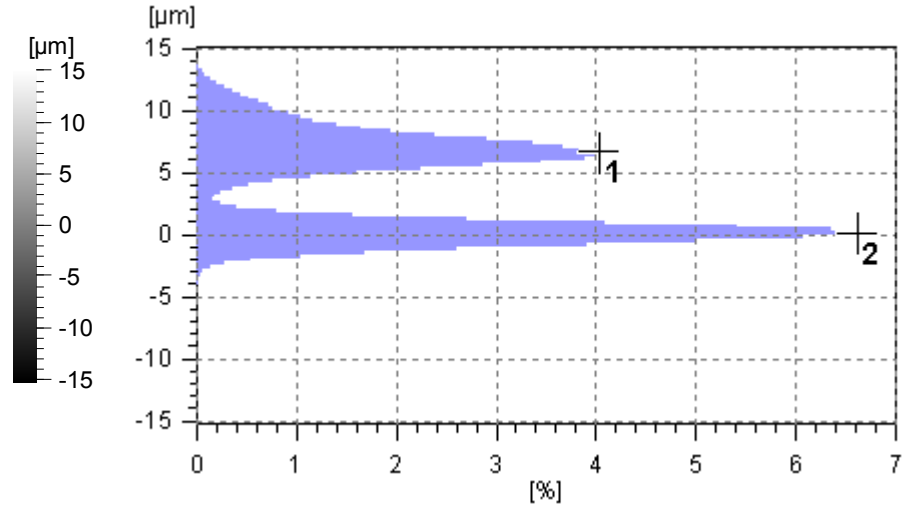
Optische Präzisionsmesstechnik

3) using amplitude distribution

convert surface



to amplitude distribution



	Marker 1	Marker 2
X	4.03%	6.61%
ΔX		-2.58%
Z	6.67 μm	0.13 μm
ΔZ		6.53μm

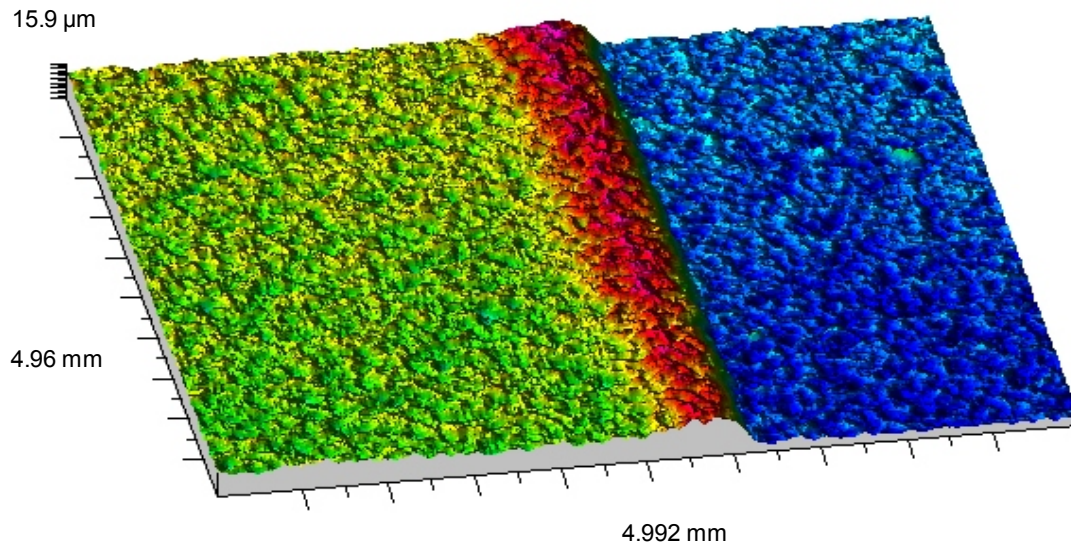
Sample:

Piezo Actuator Disk 4B
Metallisation Thickness

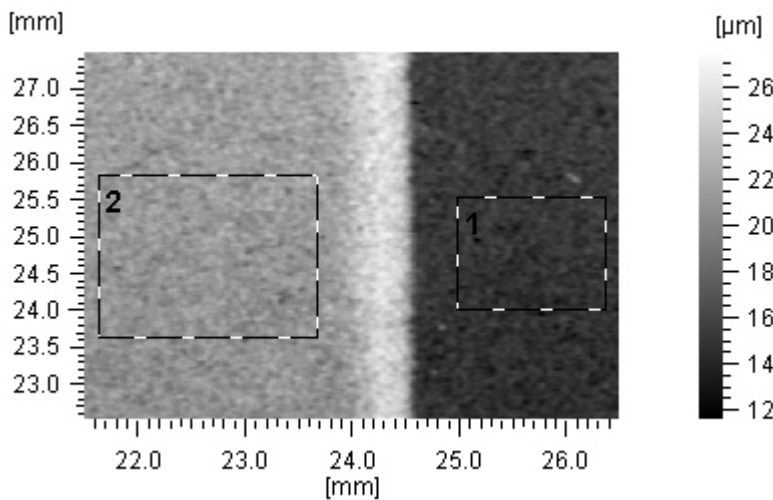


Optische Präzisionsmesstechnik

isometric view

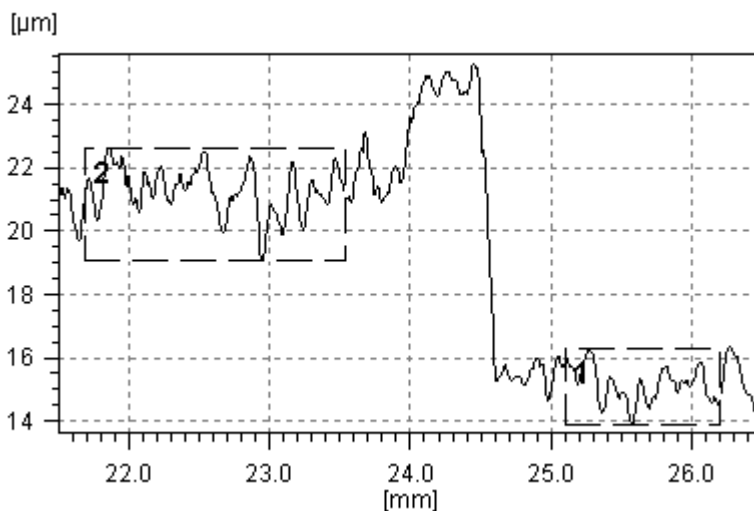


Three ways to determine metallisation thickness



1) using average profile value (area)

	Zone 1	Zone 2
X1	24.98mm	21.63mm
X2	26.37mm	23.67mm
ΔX	1.39mm	2.04mm
Y1	24.00mm	23.62mm
Y2	25.52mm	25.82mm
ΔY	1.52mm	2.20mm
avg(Z)	14.92µm	20.98µm
ΔZ	-6.07µm	



2) using average profile value (line)

	Zone 1	Zone 2
X1	25.10mm	21.70mm
X2	26.20mm	23.54mm
ΔX	1.10mm	1.84mm
avg(Z)	15.15µm	21.27µm
ΔZ	-6.13µm	
min(Z)	13.90µm	19.07µm
max(Z)	16.30µm	22.63µm
$\sigma(Z)$	0.54µm	0.72µm

Sample:

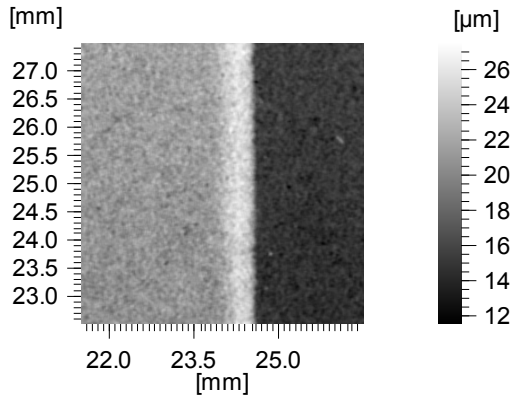
Piezo Actuator Disk 4B
Metallisation Thickness



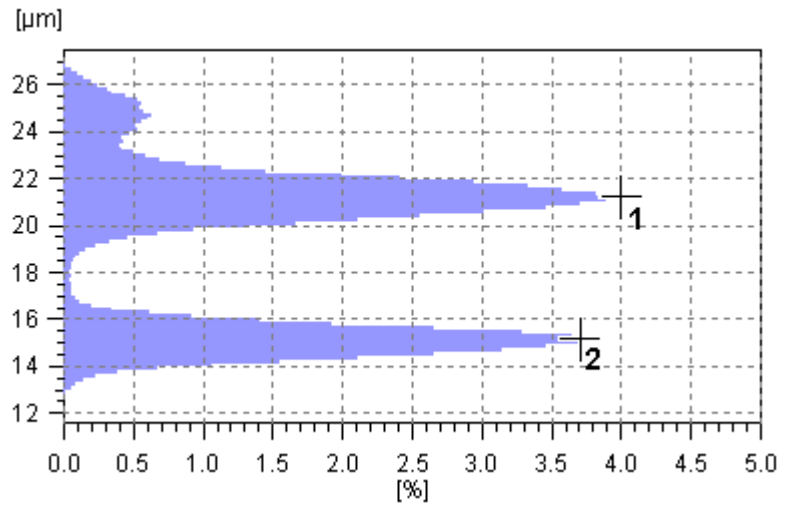
Optische Präzisionsmesstechnik

3) using amplitude distribution

convert surface



to amplitude distribution



	Marker 1	Marker 2
X	4.00%	3.70%
ΔX		0.30%
Z	21.22 μm	15.16 μm
ΔZ		6.06μm