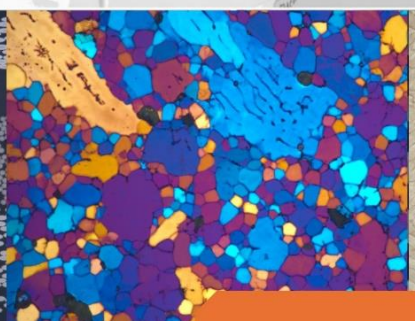
QATM
QUALITY ASSURED

Application lab report

Preparation of PCBs and ceramics with Qmount



QATM-Preparation method

Objective:

Two sorts of materials were sent to QATM to be mounted with UV cold mounting resins, especially with UV 55 which should show less gap formation compared to UV 50. 4 PCB parts as well as 1 ceramic sample were sent to QATM. To compare the gap formation each two PCB parts were mounted in 1 sample and the ceramic sample was mounted separately.

The PCB parts were mounted once with UV 55 and once with UV 50 to compare the gap formation. Because there was just one ceramic sample, this sample was mounted only with UV 55.

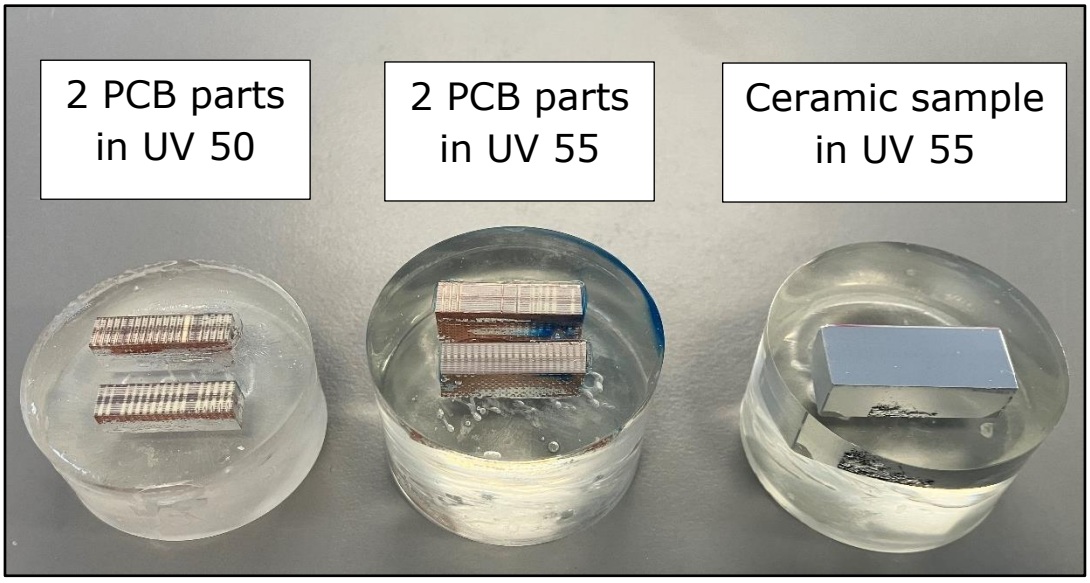


Figure 1: The mounted samples.

QATM-Preparation method

UV mounting

Mounting				
Device	Consumable	Curing time	Mold	Additional equip.
QMOUNT	UV 55 UV 50	10:00 min. 1:30 min.	PP mold Ø 40 mm PP mold Ø 40 mm	- -
Notes				

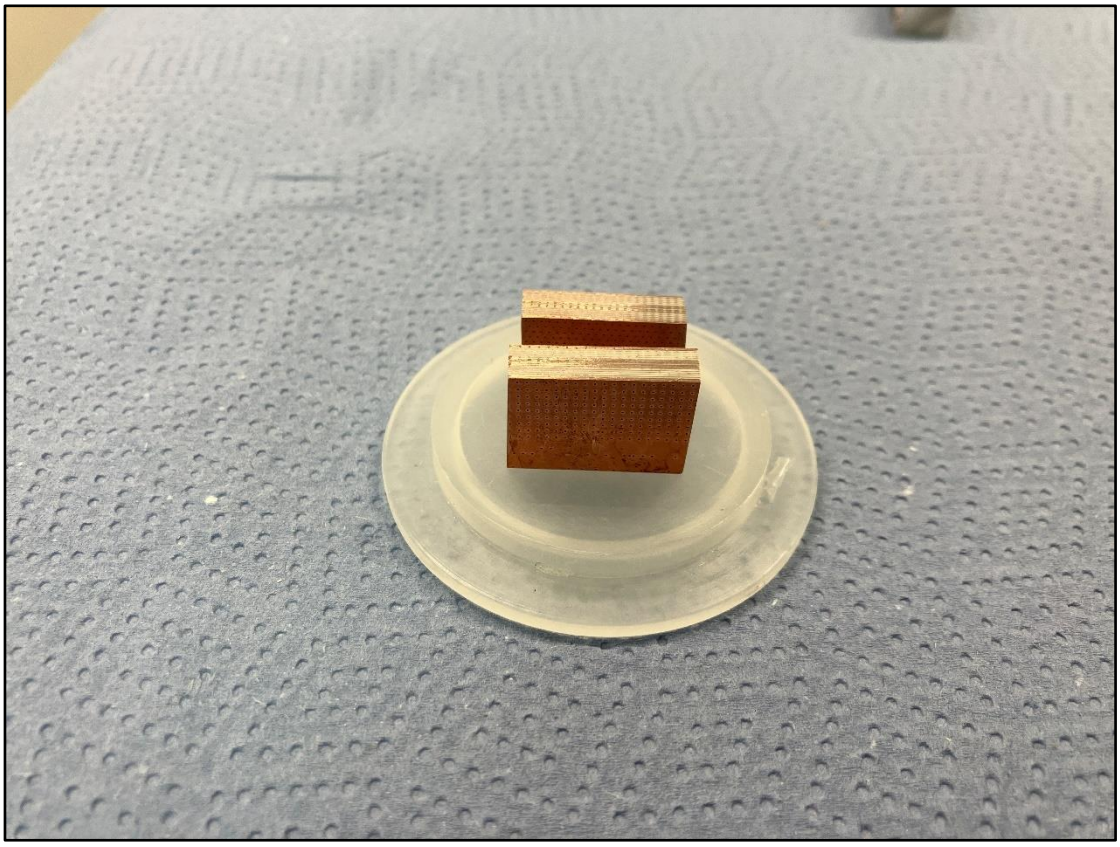


Figure 2: Two PCB parts are on the bottom of the cold mounting mold.

QATM-Preparation method

Grinding/Polishing

Device	Samples holder	Pressure mode				
QPOL 250 A1 Eco	Z5445025	Single				
Step	**MEDIUM**		**RPM**		**N**	**min**
Planar grinding	SiC-Paper/Foil P320	H_2O	200	120 ►►	25	Till flat (ca. 1:00)
Grinding	SiC-Paper/Foil P600	H_2O	200	120 ►►	25	0:45
Grinding	SiC-Paper/Foil P1200	H_2O	200	120 ►►	25	0:45
Polishing	Gamma	Dia. suspension Wb. Poly, 3µm + alc. Lubricant	150	120 ►►	25	5:00
Polishing	ZETA	Dia. suspension Wb. Poly, 1µm + alc. Lubricant	150	120 ►►	22	3:00
Fine polishing	OMEGA	Eposil F 0,1µm	100	80 ►►	20	3:00 (Rinsing time: 30 s)

Notes

- Pre-dosing for 3 µm,1 µm and final polishing suspension: 3 s
  Dosing interval and dosing duration for Dia. Suspension 3µm, 1µm:
  Every 30 s for 1,3 s
- Dosing interval and dosing duration for lubricant:
  Every 60 s for 1,3 s
- Dosing interval and Dosing duration for fine polishing suspension:
  Every 15 s for 1,3 s

QATM-Preparation method - PCB parts – UV 55

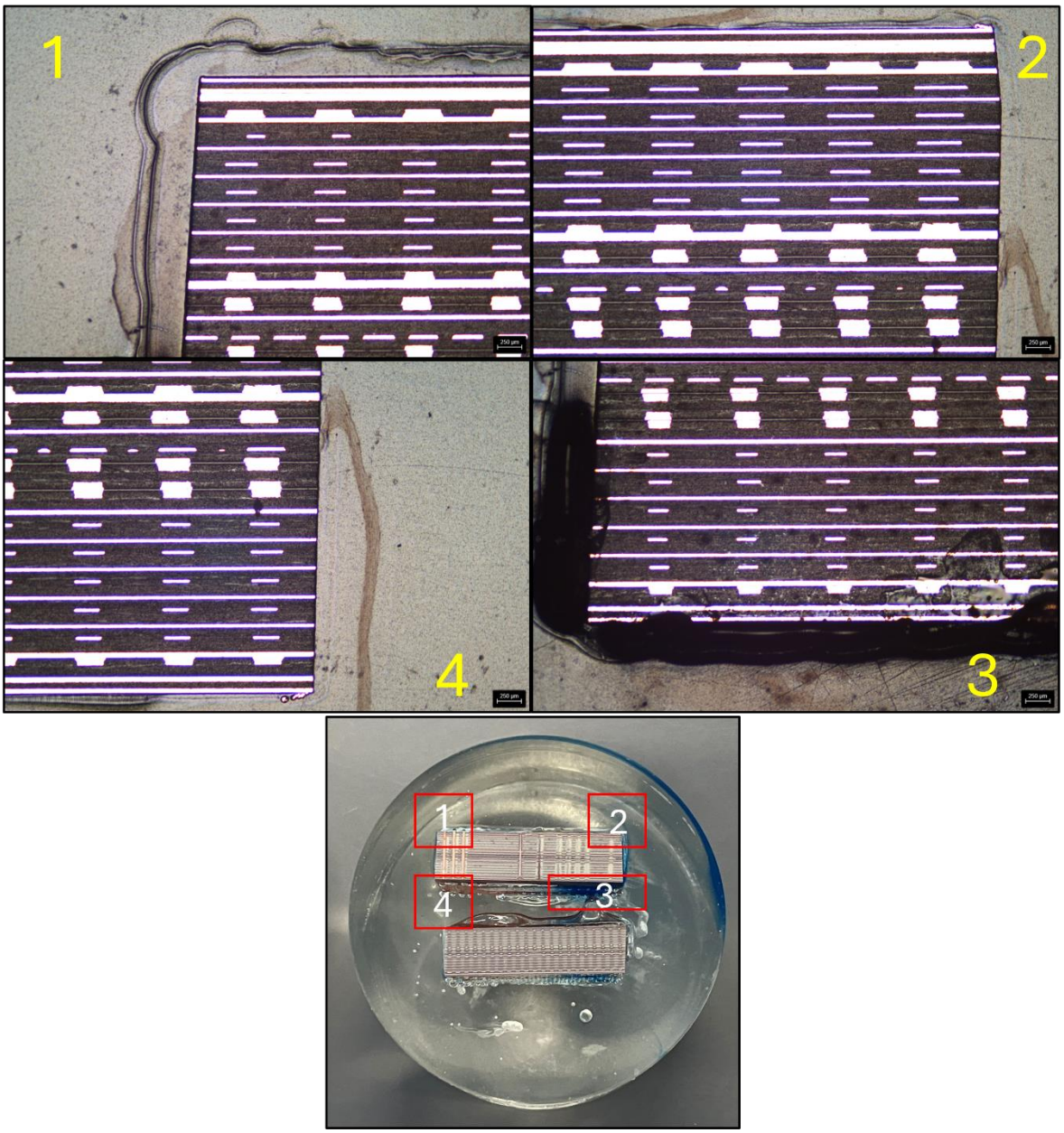


Figure 3: At one corner of both samples there is an area with a large gap of 200 µm. As can be seen in the overview image, there were also some bubbles between two PCB parts in the UV 55 material – 25 x

Note: The samples in all other areas can be prepared without any problem, only in the area with the gap the samples have some scratches.

QATM-Preparation method - PCB parts – UV 55

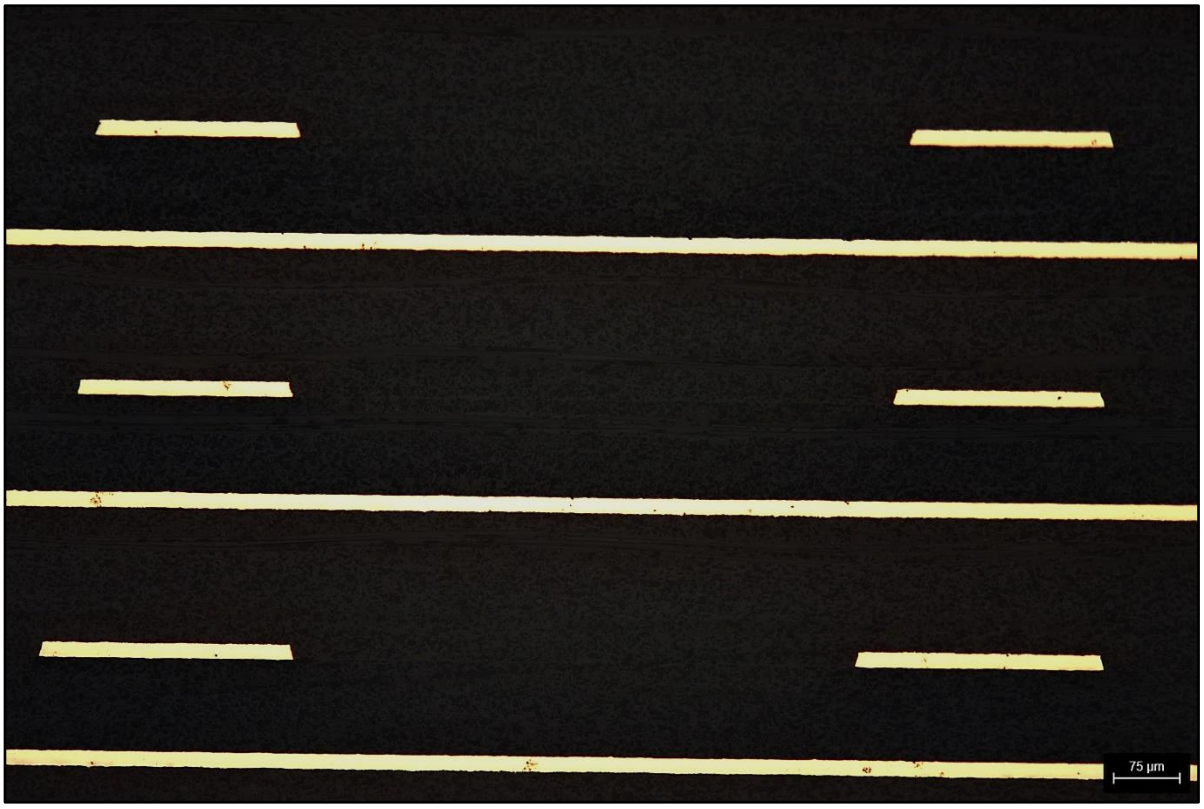


Figure 4: The microstructure of the UV 55 sample. As can be seen in the regions that was no gap, the results are excellent - 100 x

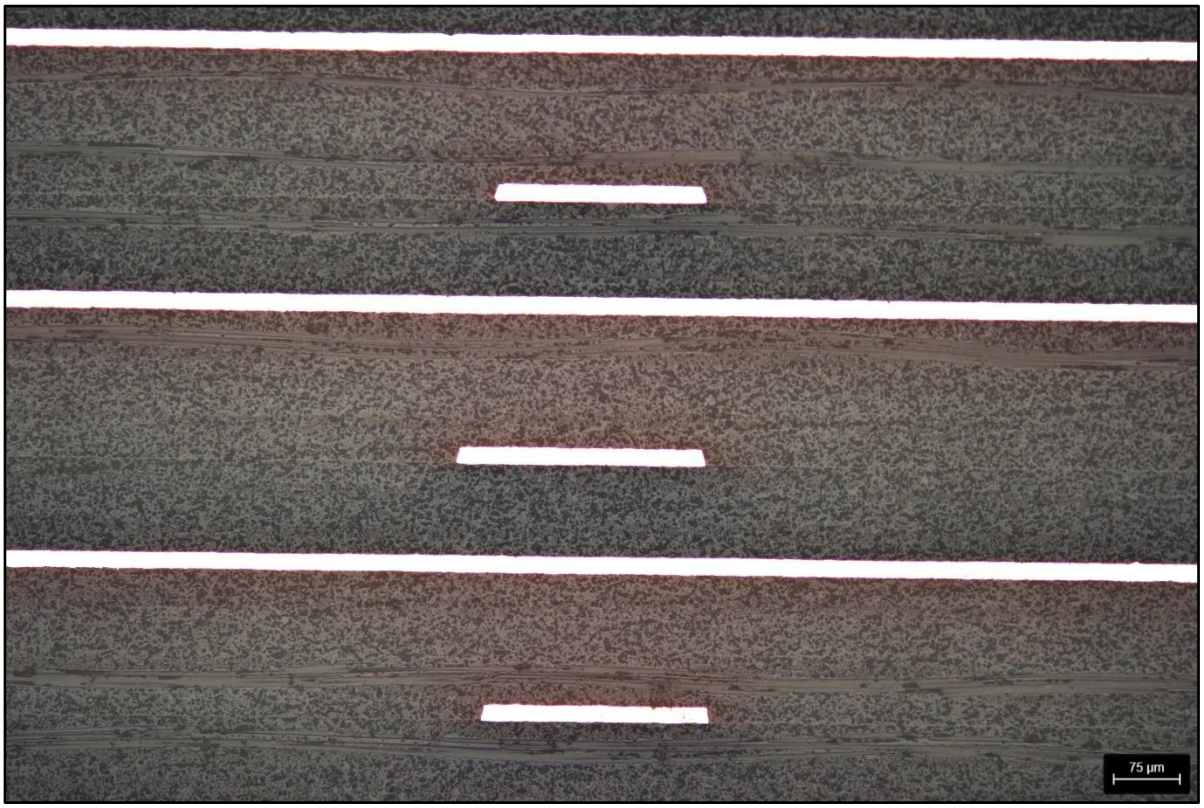


Figure 5: The CFRP polymers in the PCB part – 100 x

QATM-Preparation method - PCB parts – UV 50

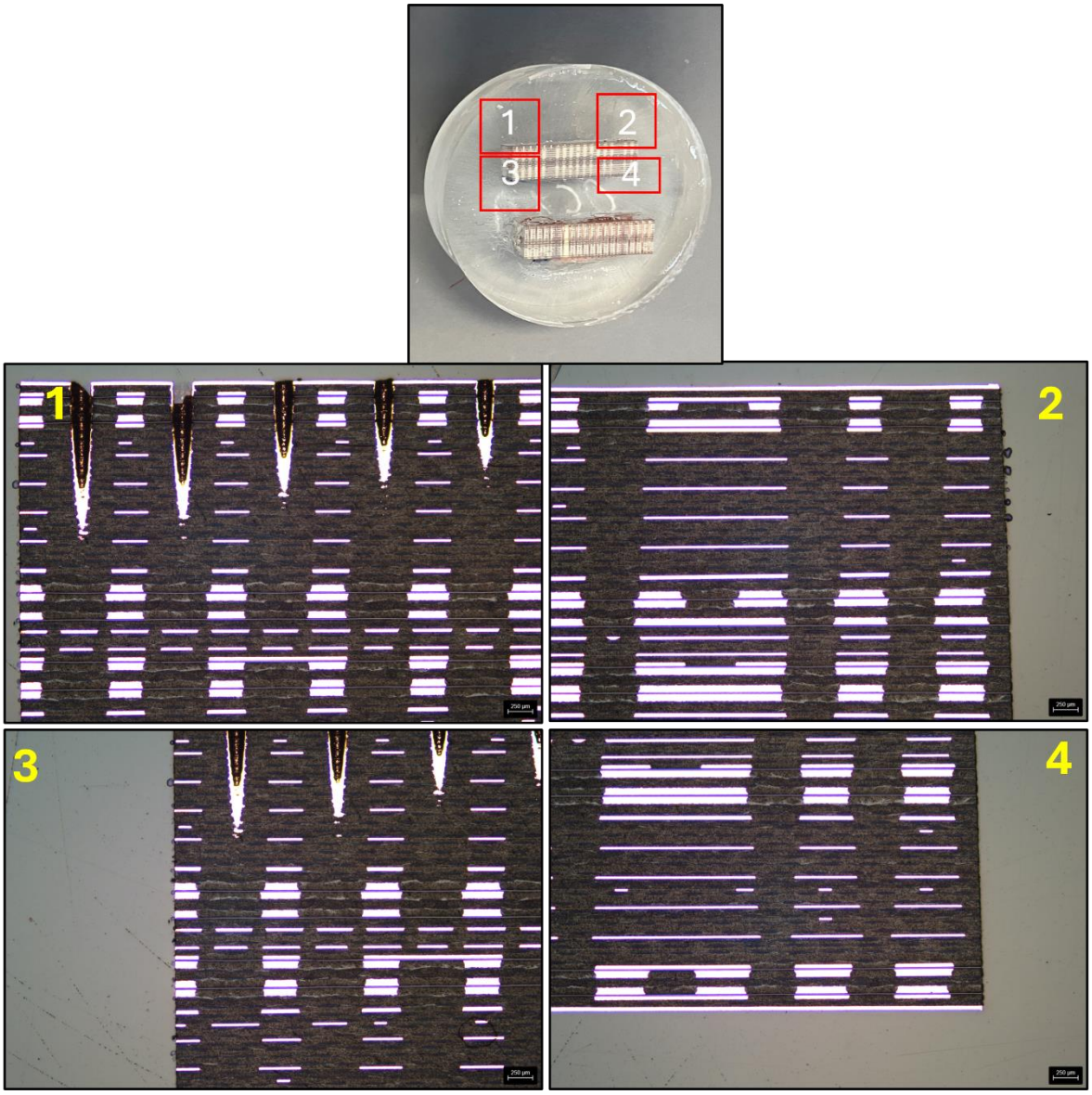


Figure 6: After mounting with UV 50 no significant gap has been detected and the quality of the preparation after polishing is better than the sample with UV 55 – 25 x

QATM-Preparation method - PCB parts – UV 50

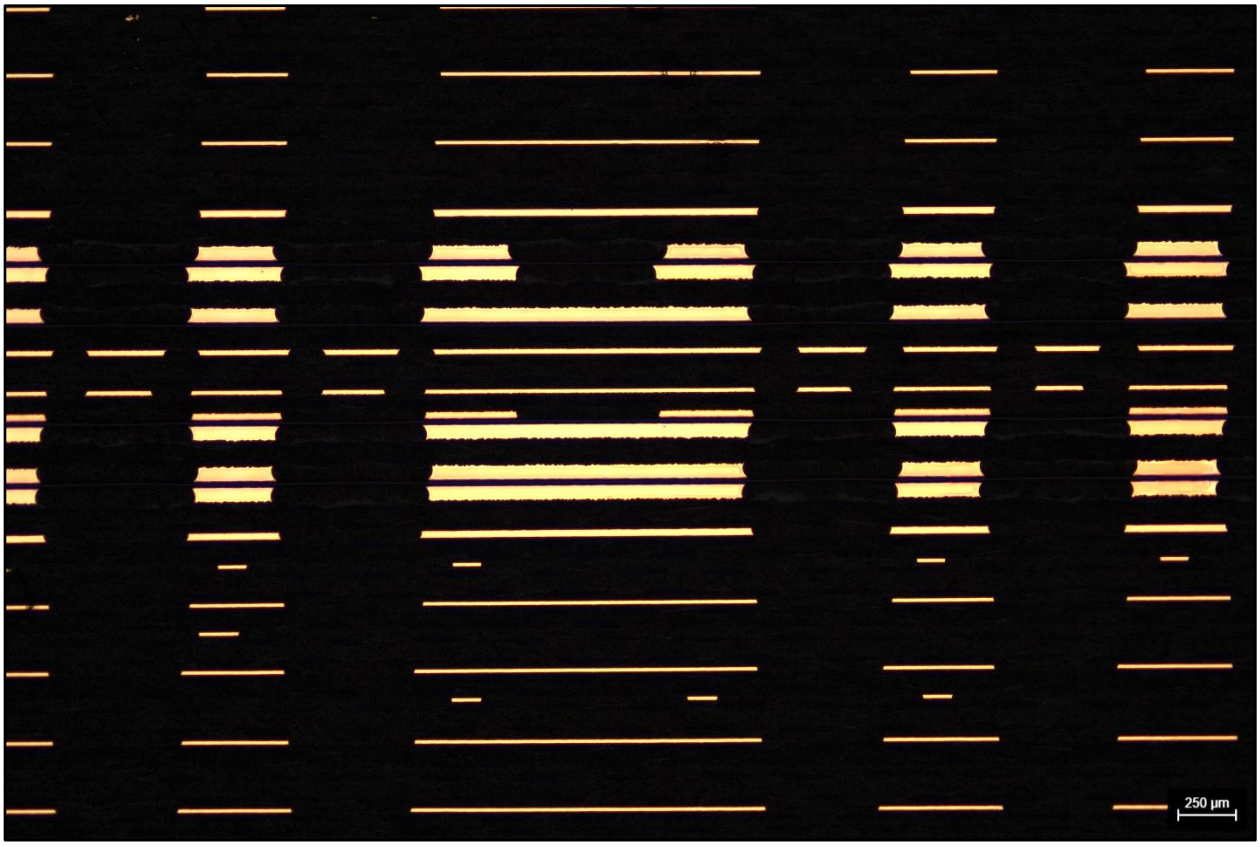


Figure 7: The copper parts after final polishing – 25 x

Figure 8: The CFRP in the PCB part – 100 x

QATM-Preparation method - PCB parts – UV 50

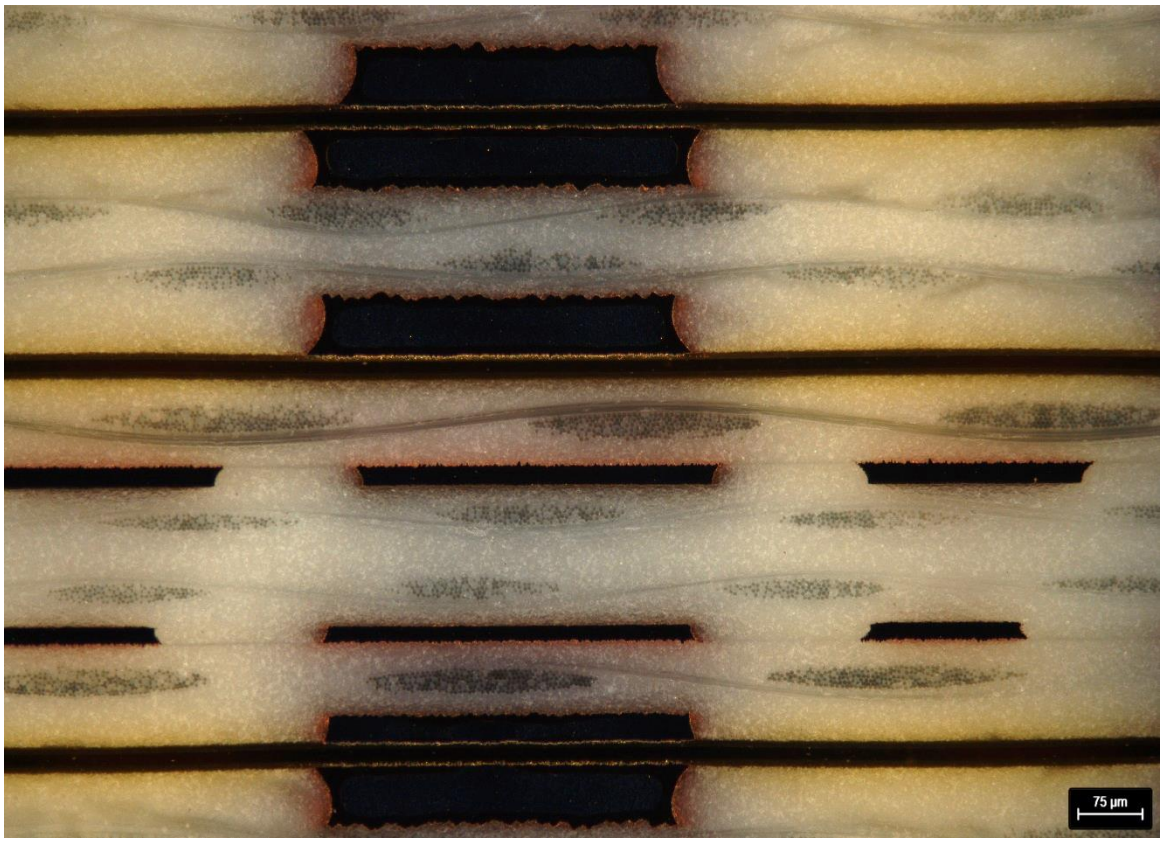


Figure 9: The dark field image of the copper parts, which shows there is no scratches on these parts – 100 x

QATM-Preparation method – Ceramic part with UV 55

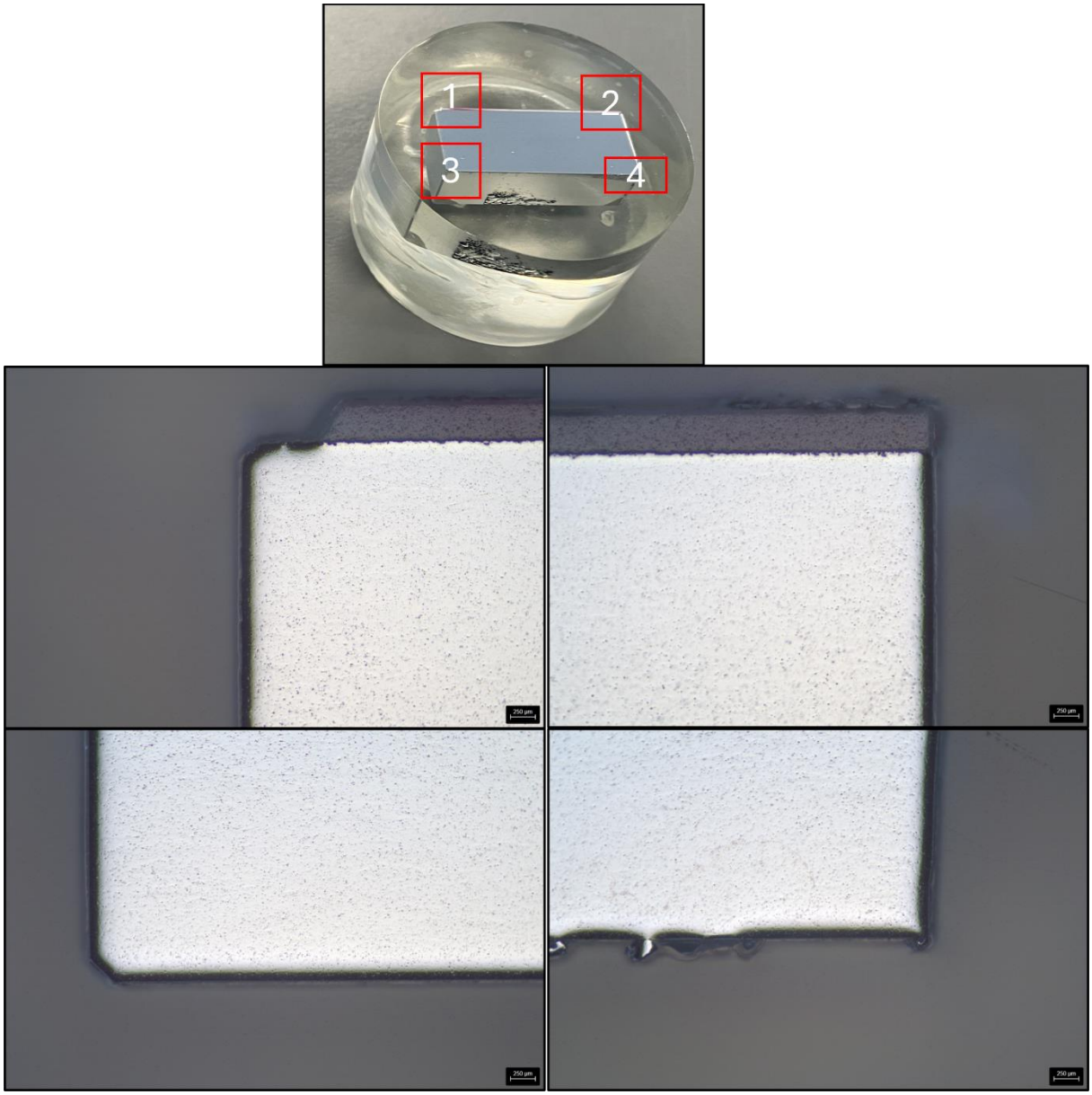


Figure 10: Ceramic sample after mounting with UV 55. No gap has been detected – 25 x

QATM-Preparation method – Ceramic part with UV 55

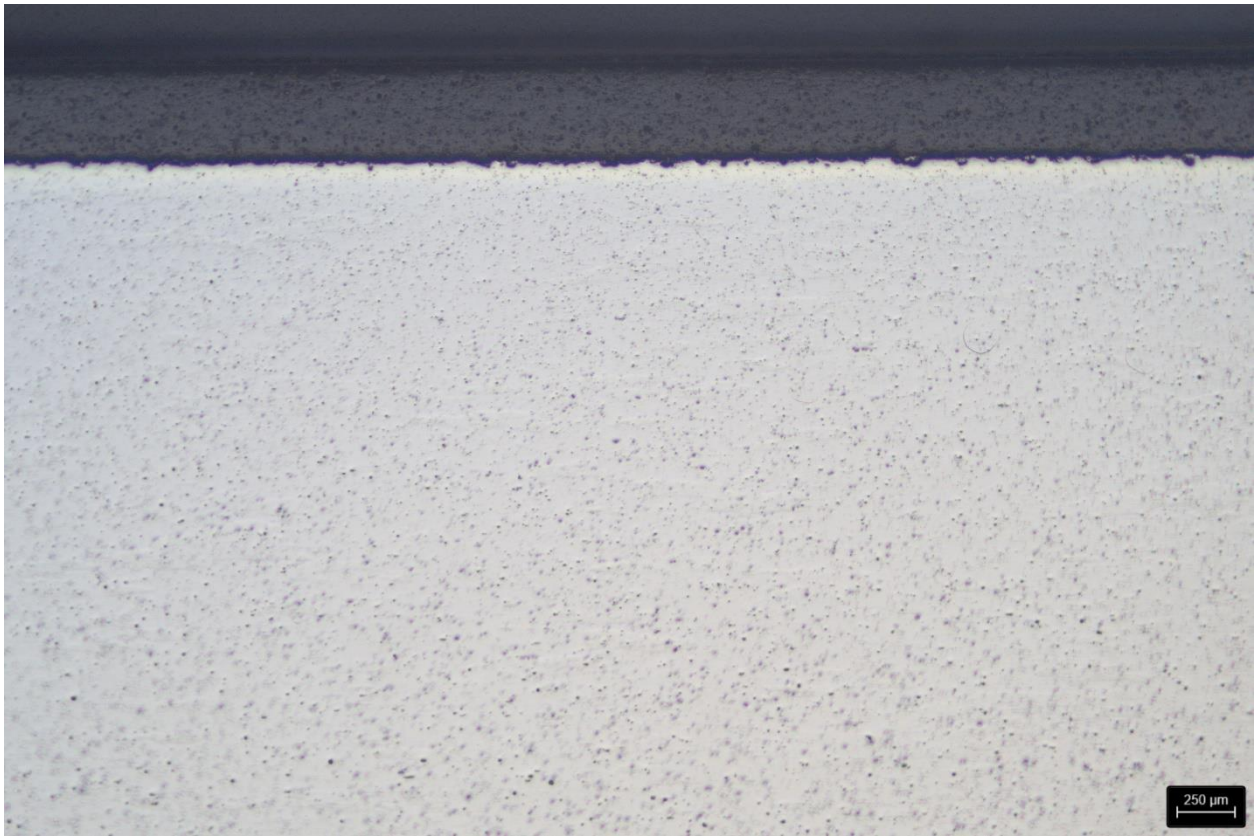


Figure 11: Ceramic sample after mounting with UV 55. No gap has been detected – 25 x

Note: The darker part on top of the coating is not a gap, it is some rounding on the mounting material due to the final polishing step and does not affect the quality of the preparation.

QATM-Preparation method

Conclusion:

1. The UV mounting with Qprep UV 55 is not to recommend. For mounting PCB samples, we recommend using Qprep UV 50 as UV-mounting resin or KEM 20 as MMA-based cold mounting resin.
2. The preparation method for the PCB parts gave excellent results. The microstructures are clearly visible (CFRP- and Cu-parts) and the samples were polished without any scratches or deformation.
3. The ceramic sample has been mounted with UV 55. No gap has been detected between the sample and the mounting material, which is why we can recommend this method for mounting the ceramic samples. The preparation is also suitable.