D4.4 – Feasibility and accuracy of the high-speed DoD inkjet printing of known ceramic inks onto SOC interconnects

PROJECT INFORMATION

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DELIVERABLE INFORMATION

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WP LEADER	DTU
CONTRIBUTING PARTNERS	TI
NATURE	Public
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DISSEMINATION LEVEL

PU	Public	x
PP	Restricted to other programme participants (incl. Commission Services)	
RE	Restricted to a group specified by the consortium (incl. Commission Services)	
CO	Confidential, only for the members of the consortium (incl. Commission Services)	

1 First trials of ink deposition with a piezoelectric ink jet printer on SOLIDpower interconnects

1.1 Rheology of the inks employed

Table 1 Inks data

Sample	Viscosity (cP):	Surface tension (dyne):	Density (g/L)
Commercial ink for inkjet application	10-11	30-32 dyne	1200
Note:	Solvent based inks were used for testing		

1.2 Process parameters of the printer

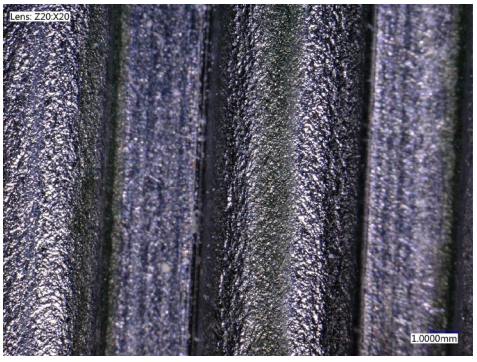
Table 2 Process parameters of the printer

Velocity drop (m/s):	Drop volume (pL):	Resolution (dpi)	Line speed (m/min)	Discharge in single pass for square meter (g/m^2)	Number of passes	Total weight (g/m^2)
7	165	360x360	10	50	2	100

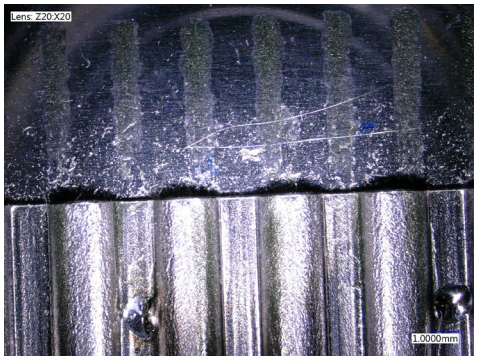
1.3 Thermal treatment post-inkjet deposition

After the ink jet deposition, the samples were dried at 100°C for 20 minutes

1.4 Results



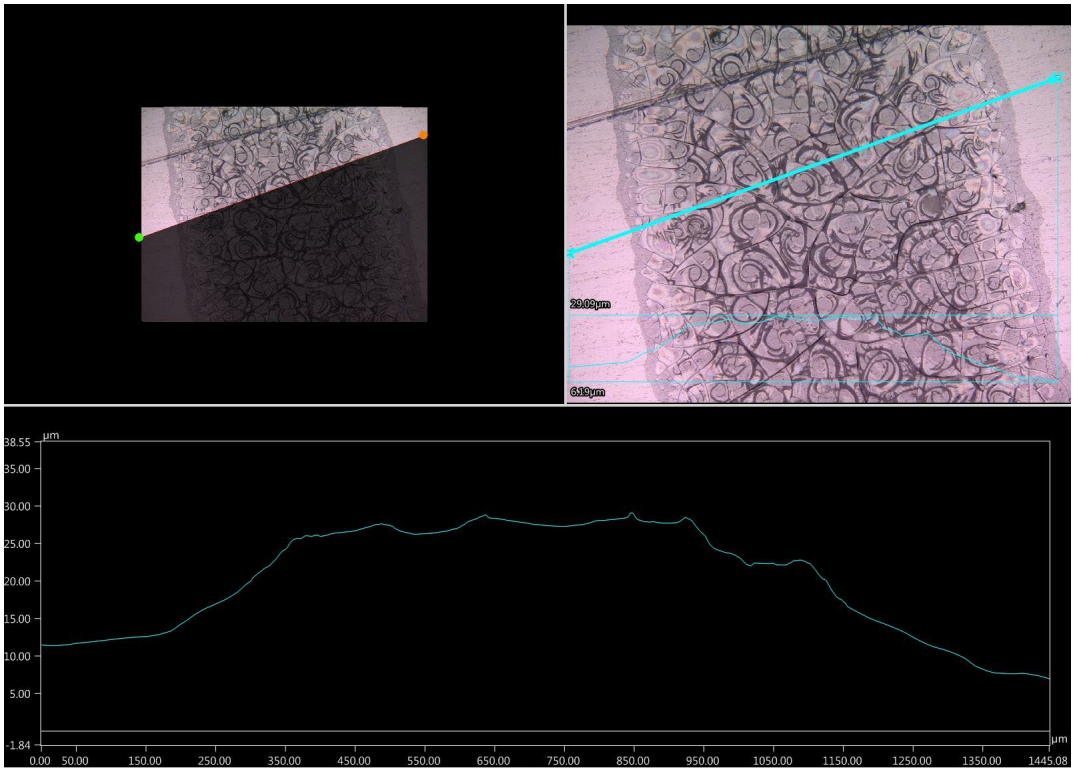
a)



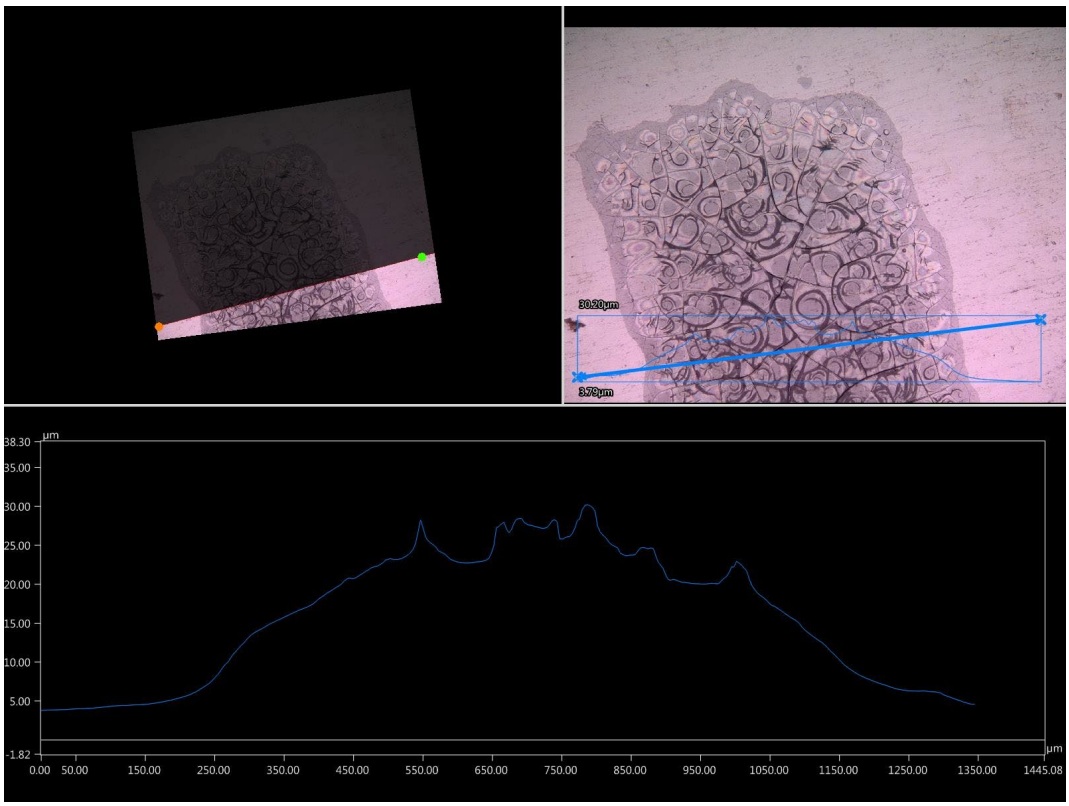
b)

Figure 1a): Ink deposited on the crests. Two passages X50, b) picture at x20

a)



b)



Figures 2 a) and b): Thicknesses of the deposed layer in two different reginos for two passages at X250

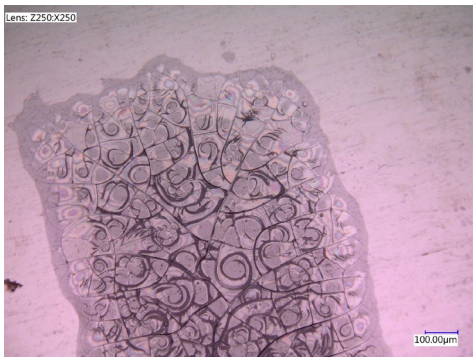


Figure 3: picture of the deposed layer. Two passages X250

Conclusions

There are no apparently any critical issues to apply the inks, bearing in mind that the step in patterns must be a multiple of 1 mm with the current used inkjet printer.

Two passages in the printer permit to do approximately 35 microns thick layers.

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