

**SVEUČILIŠTE U ZAGREBU
GRAFIČKI FAKULTET ZAGREB**

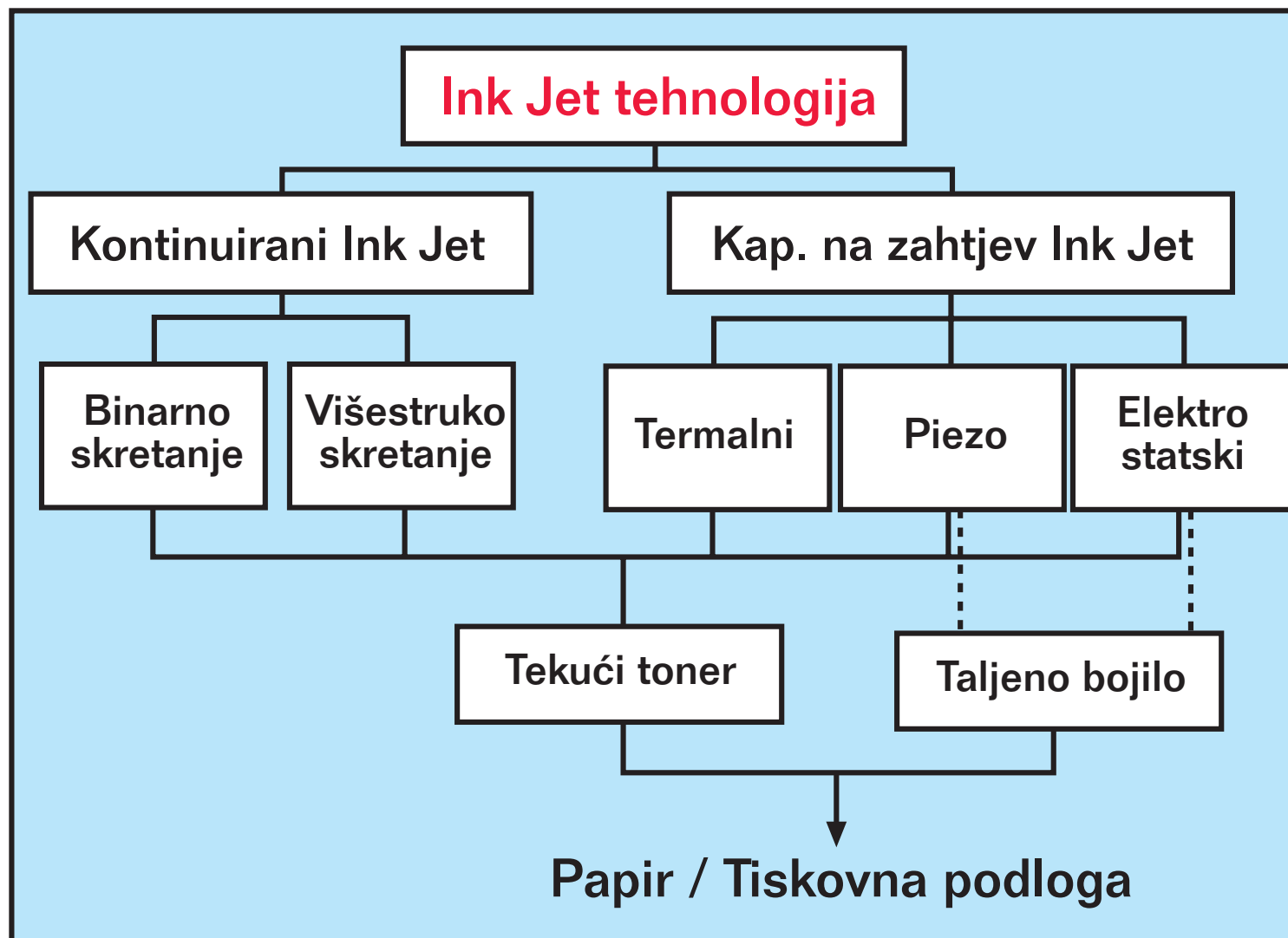
PREDAVANJE

INK JET TEHNOLOGIJA OTISKIVANJA

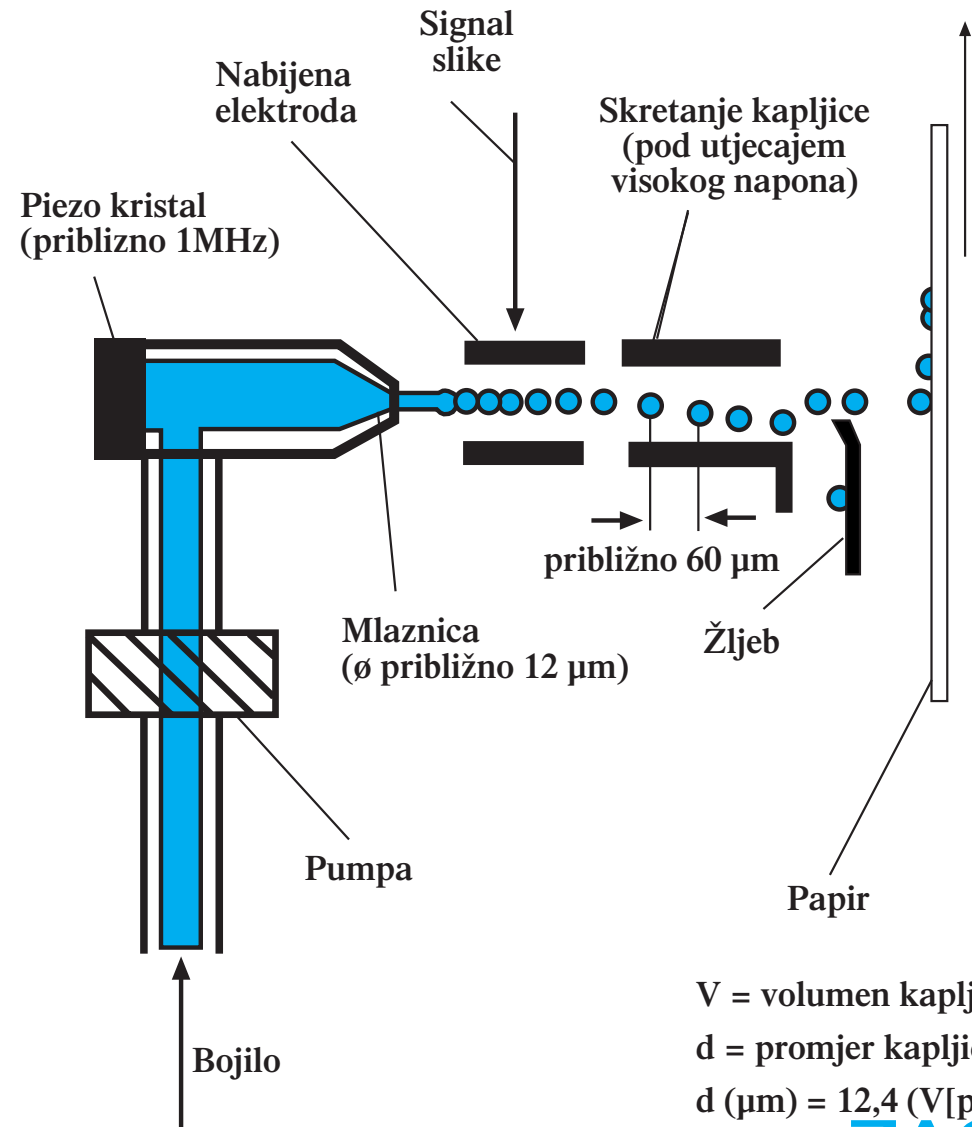
**Predavač: dr. sc. Igor Majnarić,
Grafički fakultet u Zagrebu, Katedra Tisak**

ZAGREB, 31. SVIBNJA 2007.

Podjela INK JET-a



Kontinuirani Ink Jet



Karakteristike:

- Fekvencija kapanja: oko 1 MHz
- Volumen kapljice: oko 4 pl
- Promjer kapljice: oko 20 μm
- Brzina kapljice: oko 40 m/s

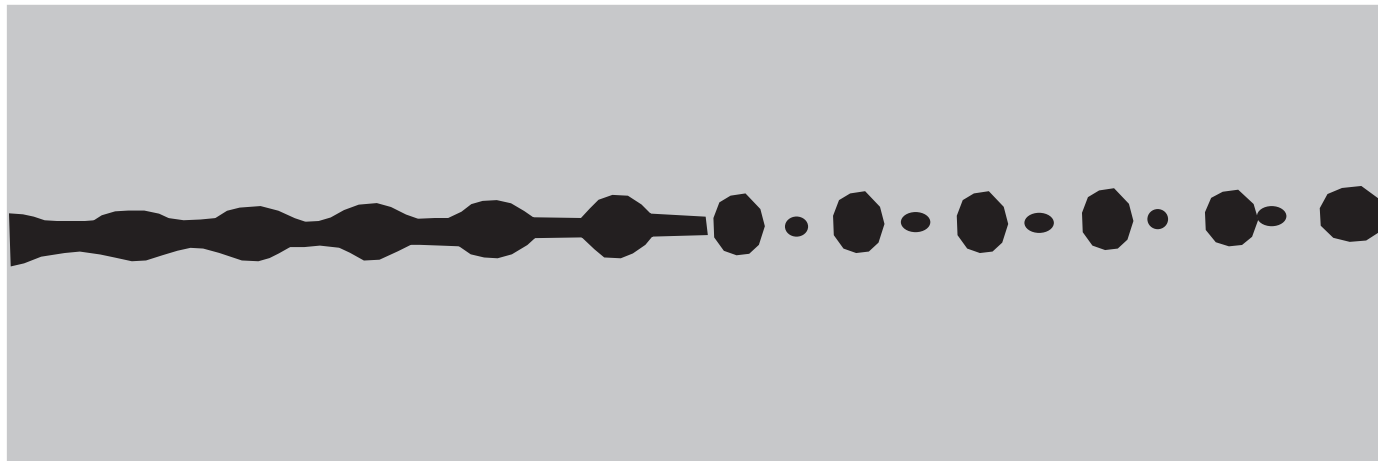
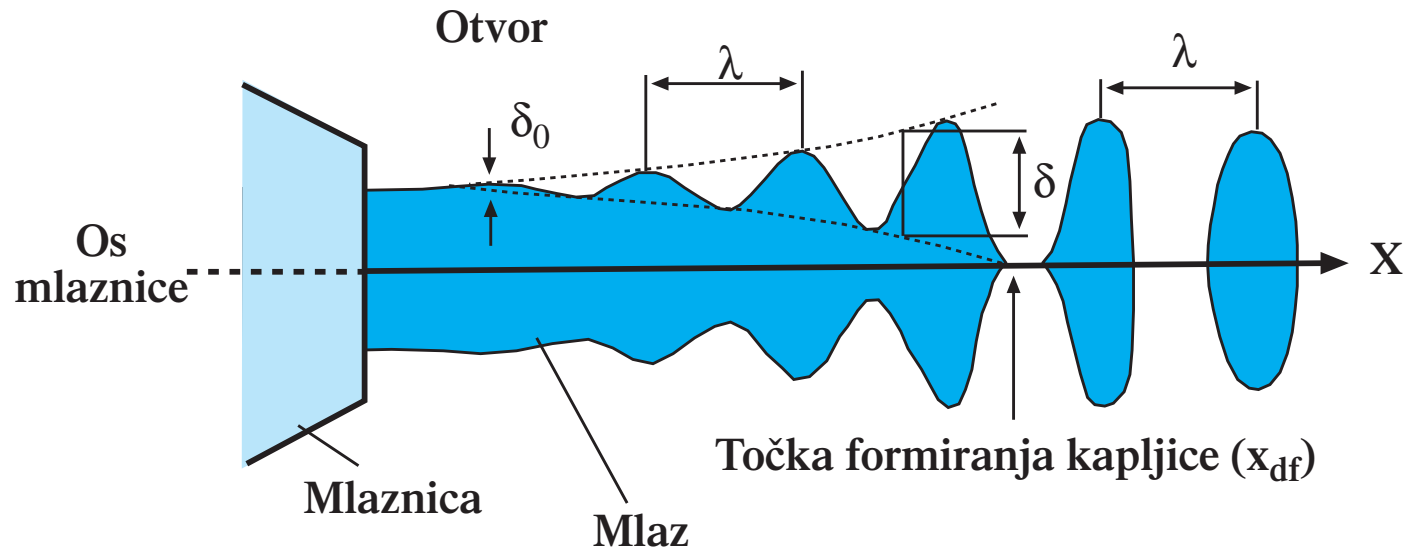
V = volumen kapljice

d = promjer kapljice

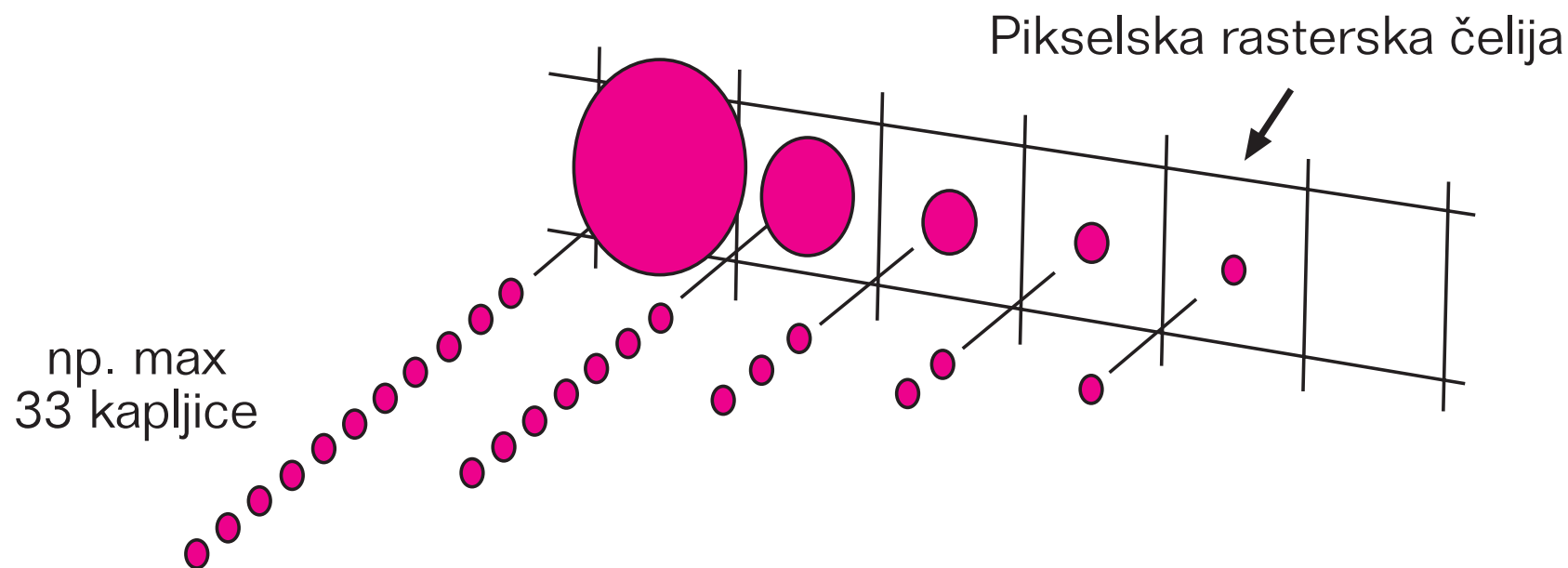
$$d (\mu\text{m}) = 12,4 (V[\text{pl}])^{1/3}$$

$$d = \left(\frac{6 \cdot V}{\pi} \right)^{1/3}$$

Kontinuirani Ink Jet

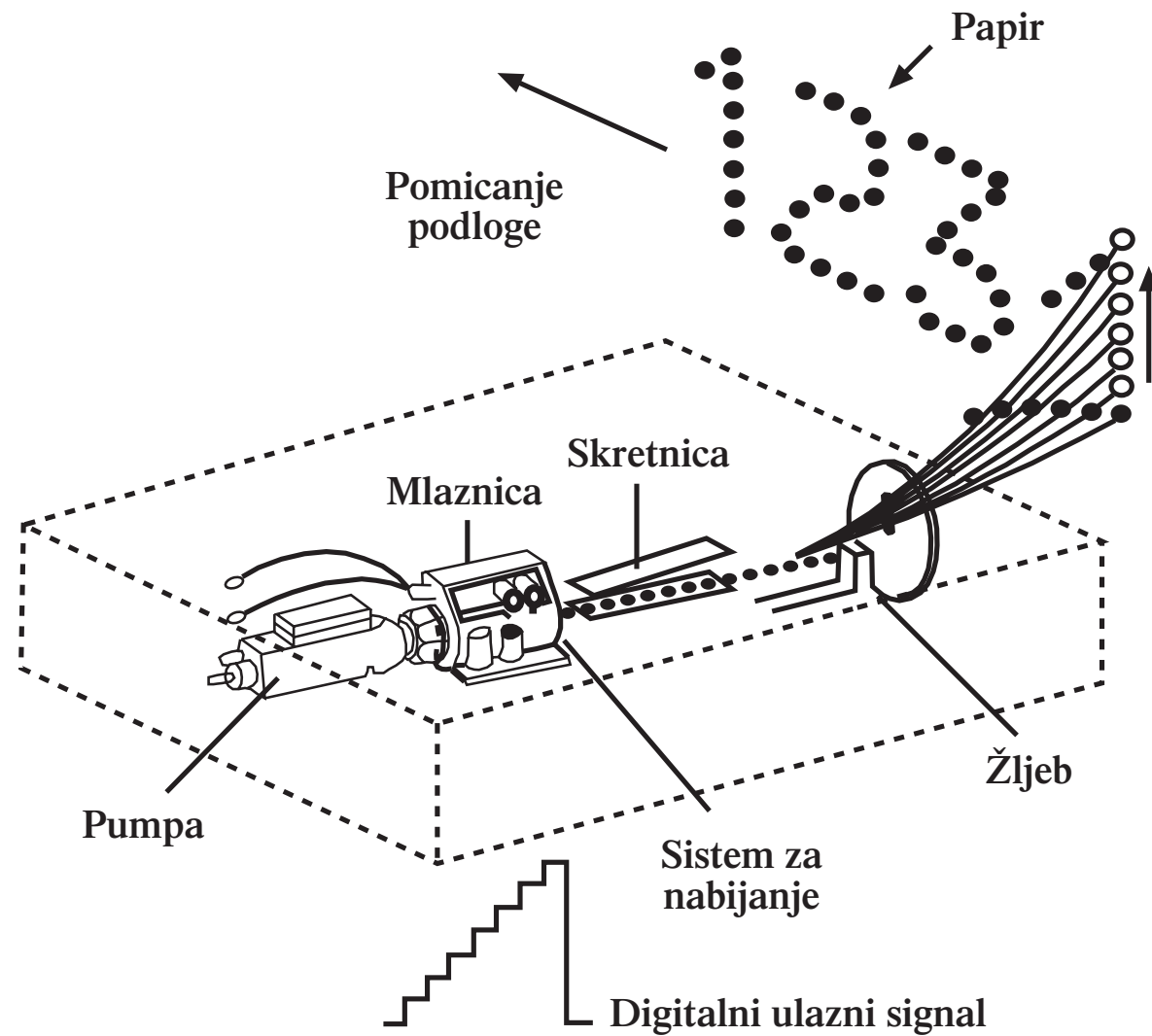


Kontinuirani Ink Jet

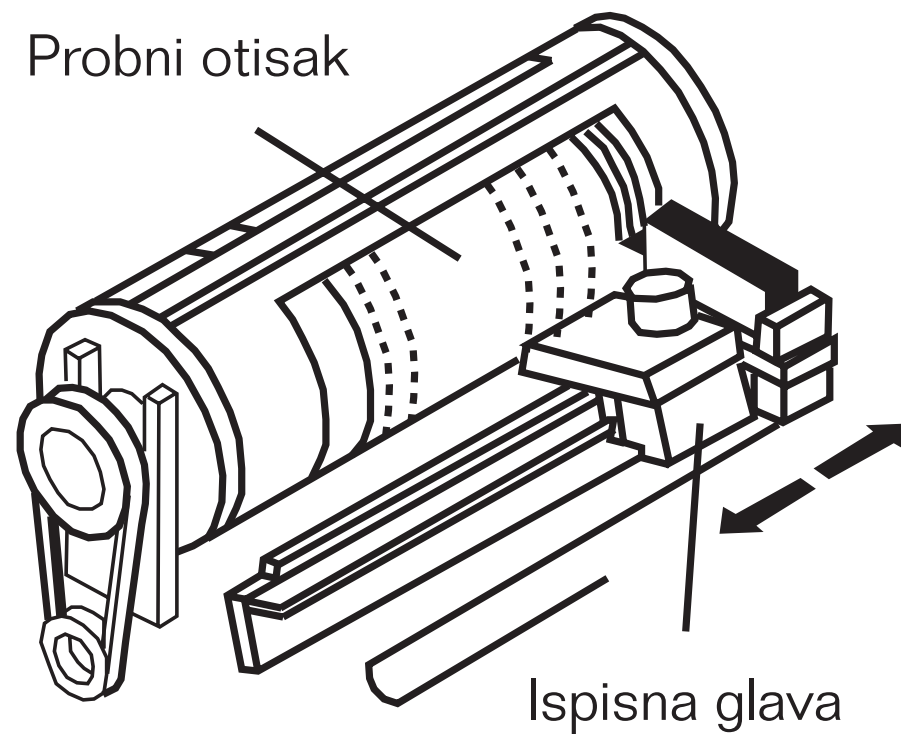


Kontinuirani Ink Jet

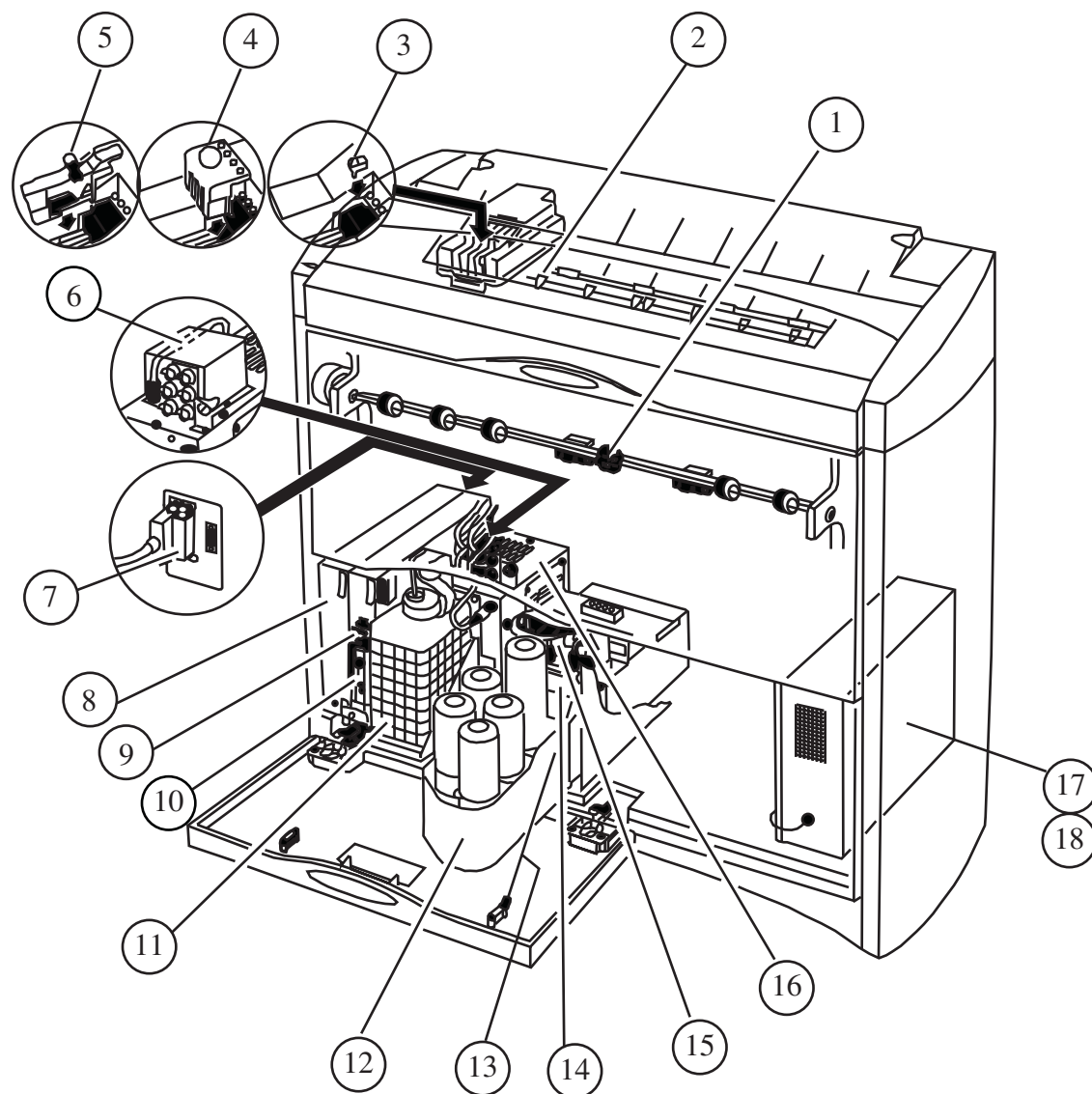
VIŠESTRUKO
SKRETANJE



Kontinuirani Ink Jet IRIS (SCITEX)

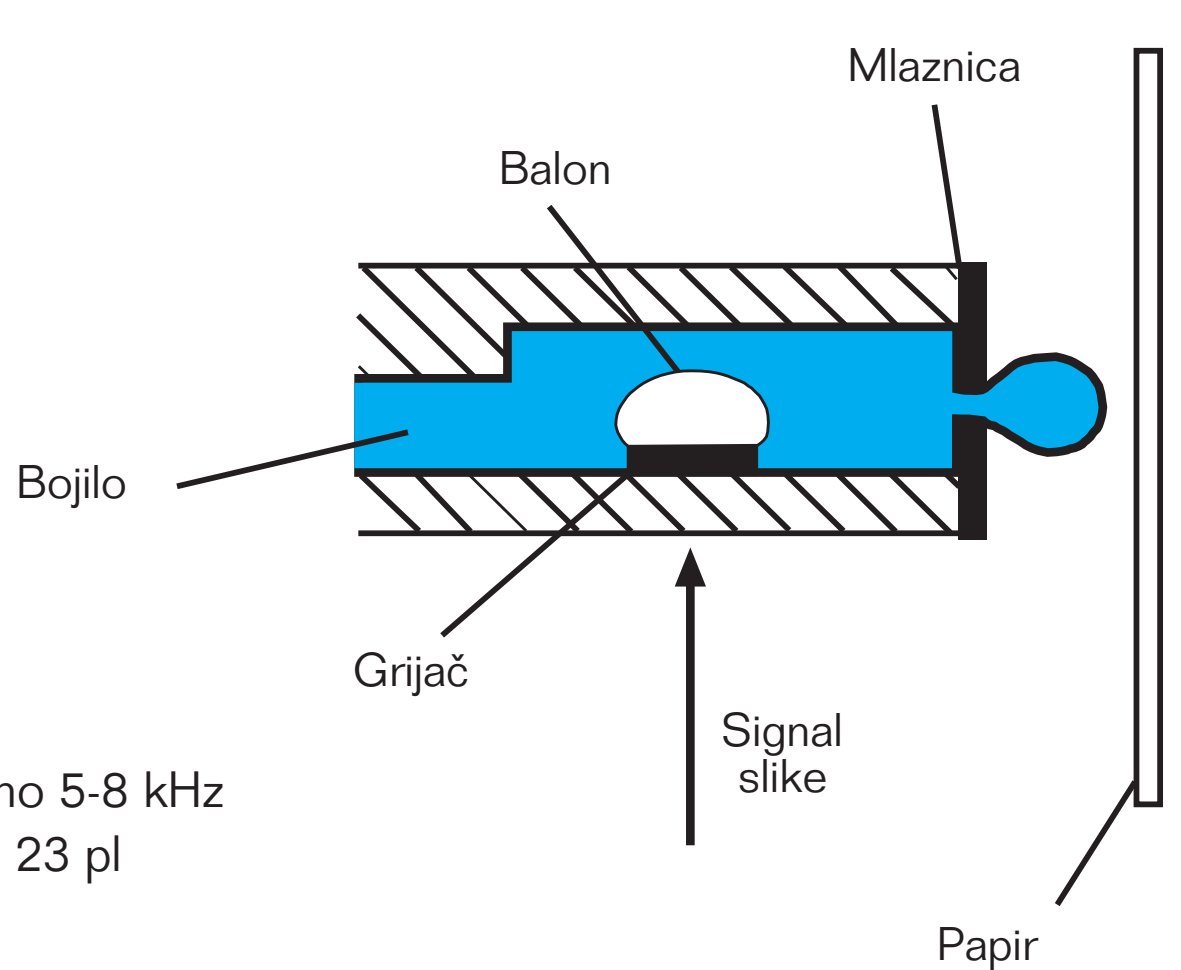


Kontinuirani Ink Jet IRIS (SCITEX)



1. ULAGAČI VALJAK
2. SKIDAJUĆI PRSTI
- 3, 6 POGO PIN-ova ASSY
4. ISPISNA OLOVKA (GLAVA)
- 5 OLOVKA
6. NISKO PRITISNI FILTER
7. TERMINATOR (UNIŠTIVAČ)
8. MODUL KONTROLE NAPAJANJA
9. CPU MODULARNE KARTICE
10. UGRAĐENI SOFTWER 3.0.1.
11. BOCA ZA OTPATKE
12. LADICA SA DISPENZIRANOM BOJOM
13. KABAL ZA ZAUSTAVLJANJE VRATA
14. MODUL ZA PUMPANJE BOJE
15. FILTER ZA BOJU KOJA JE POD VISOKIM PRITISKOM
16. MODUL ZA SMEĆE
17. NAPAJANJE
18. KABAL ZA NAPAJANJE

Termalni Ink Jet

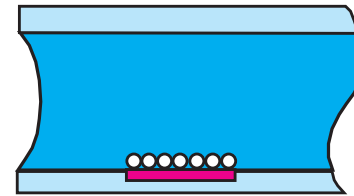


Karakteristike:

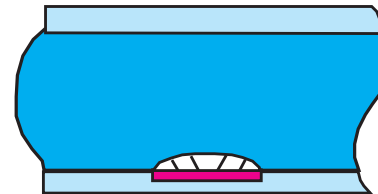
- Fekvencija kapanja: približno 5-8 kHz
- Volumen kapljica: približno 23 pl
- Diametar kapljice: 35 μm

Signal slike

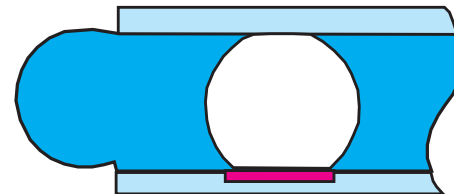
Termalni Ink Jet



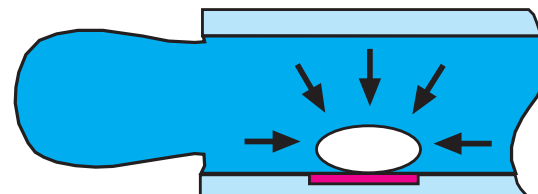
Poslije aktivacije
grijačeg elementa
temperatura se naglo
povećava do 300° C



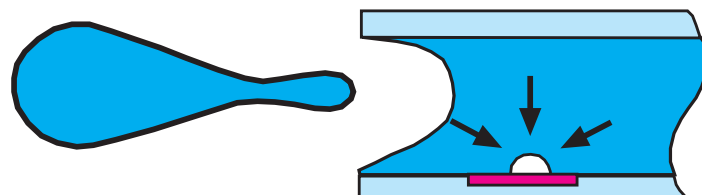
Bojilo isparava i
formira se mjehur



Mjehurić formira
kapljicu bojila i
izgurava je iz mlaznice



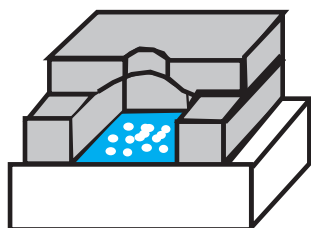
Zagrijavanje kapljice
i mjehura prestaje



Kapljica puca;
kapilarna sila usisava
novo bojilo u mlaznicu

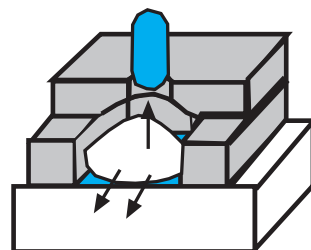
Termalni Ink Jet

Jezgra
mgehura
<3 μ s



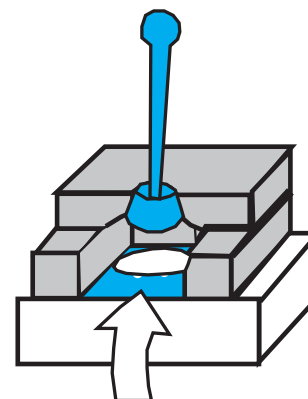
Naglo zagrijavanje
100° C/ μ s
rezultira maglastom
eksplozijom u bojilu

Mgehur
raste
3-10 μ s



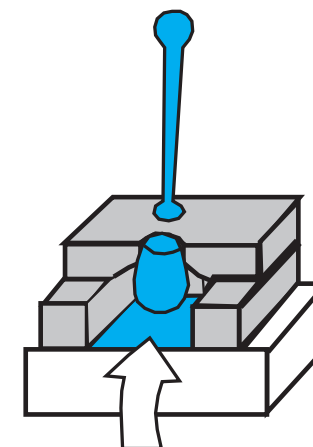
Formiranje
kapljice

Prekid formiranja
mgehura i oslobađanje
kapljice 10 - 20 μ s



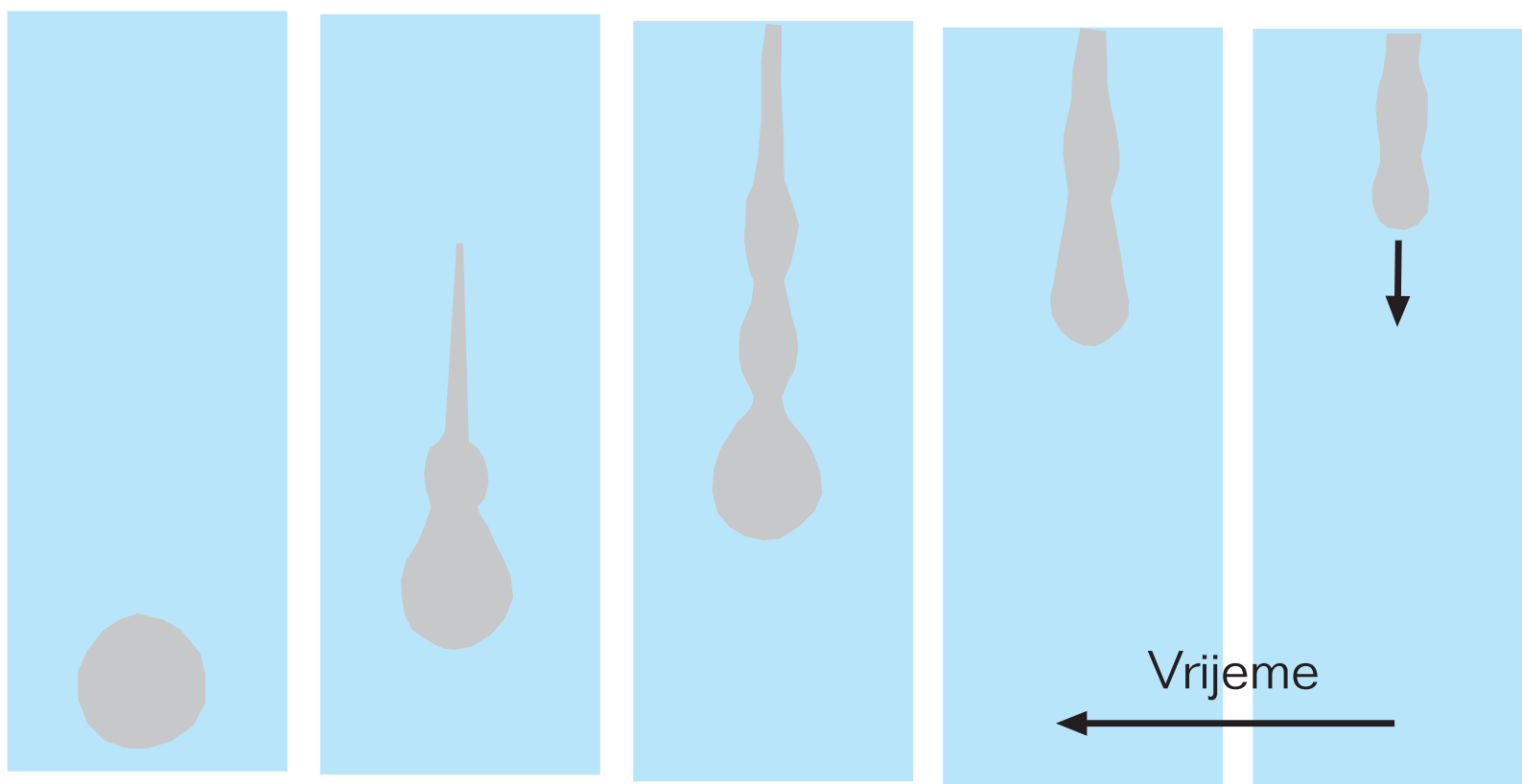
Završetak mgehura
i početak ponovnog
punjenja

Ponovno
punjenje
< 80 μ s

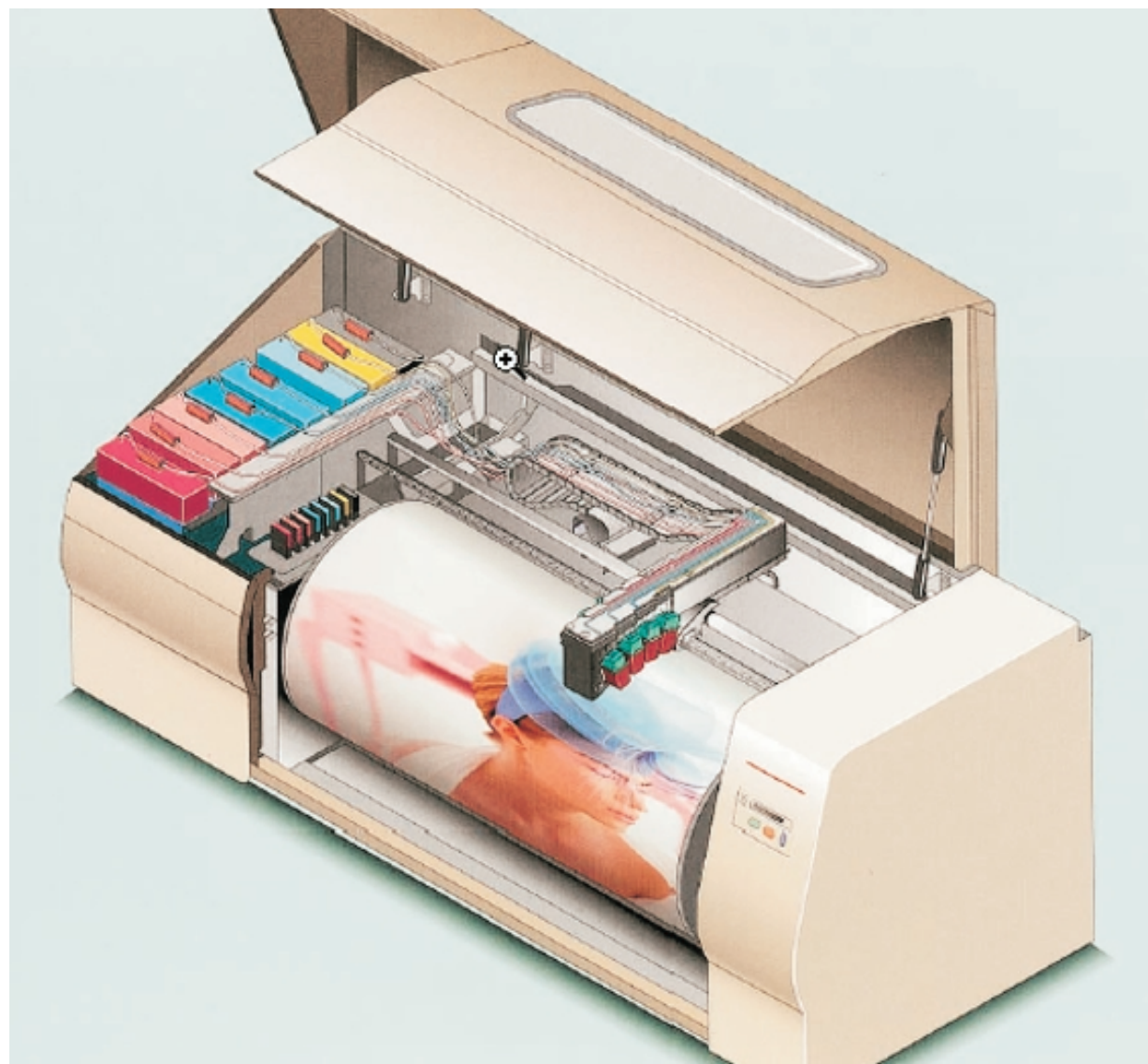


Otvor meniska je
potpuno ispunjen

Termalni Ink Jet

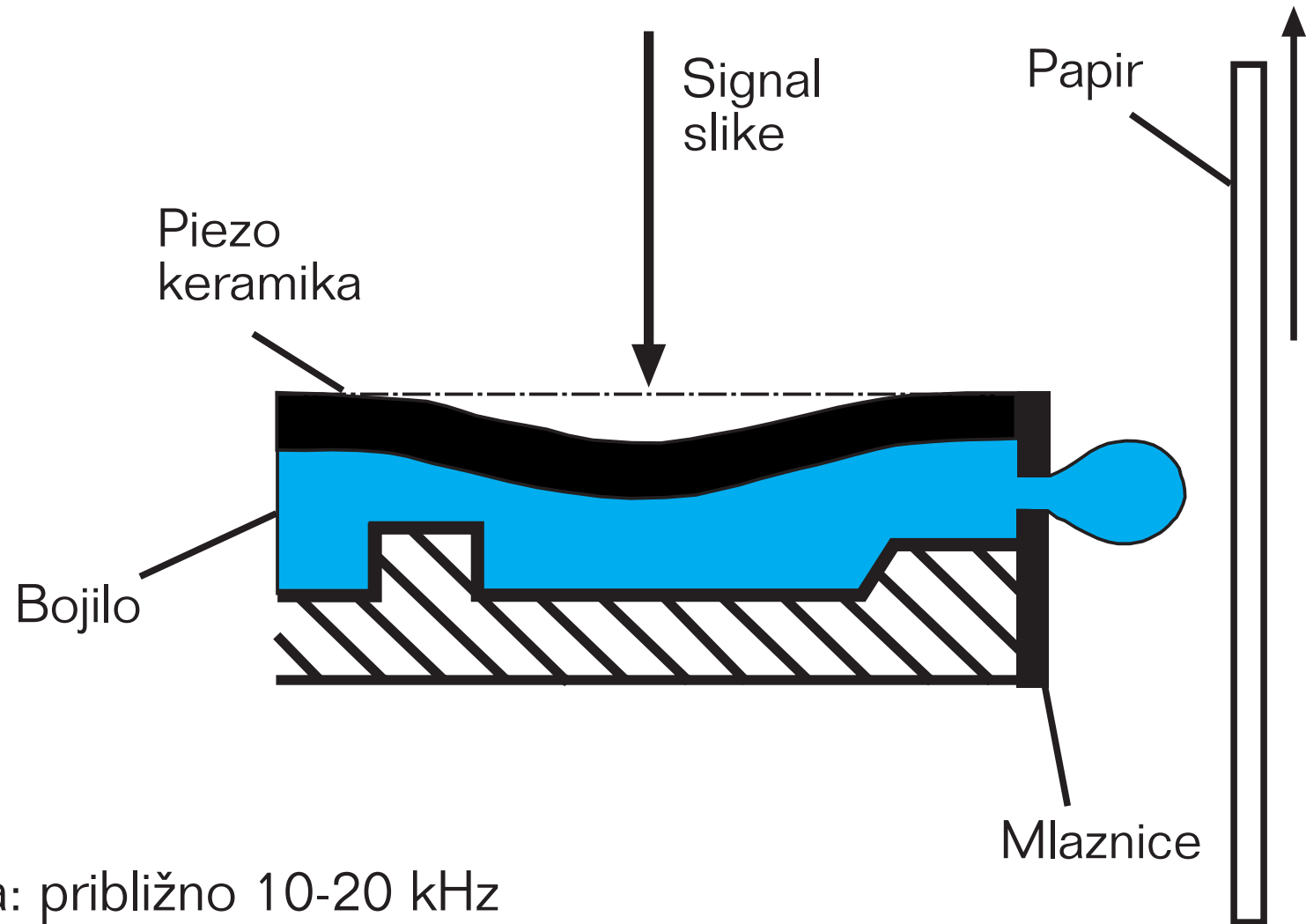


Termalni Ink Jet AGFA a1 (probno otiskivanje)



ZAGREB
2007.

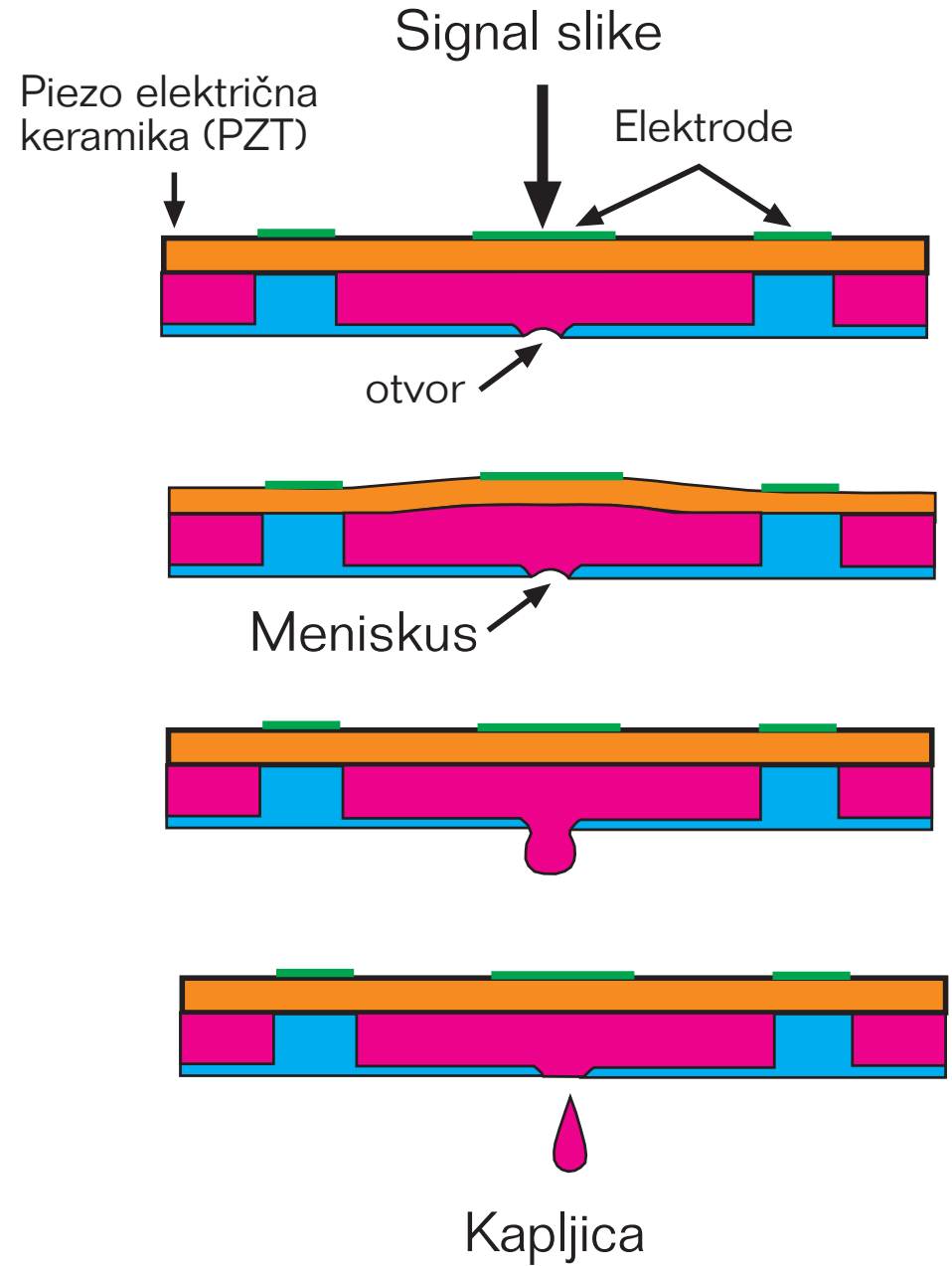
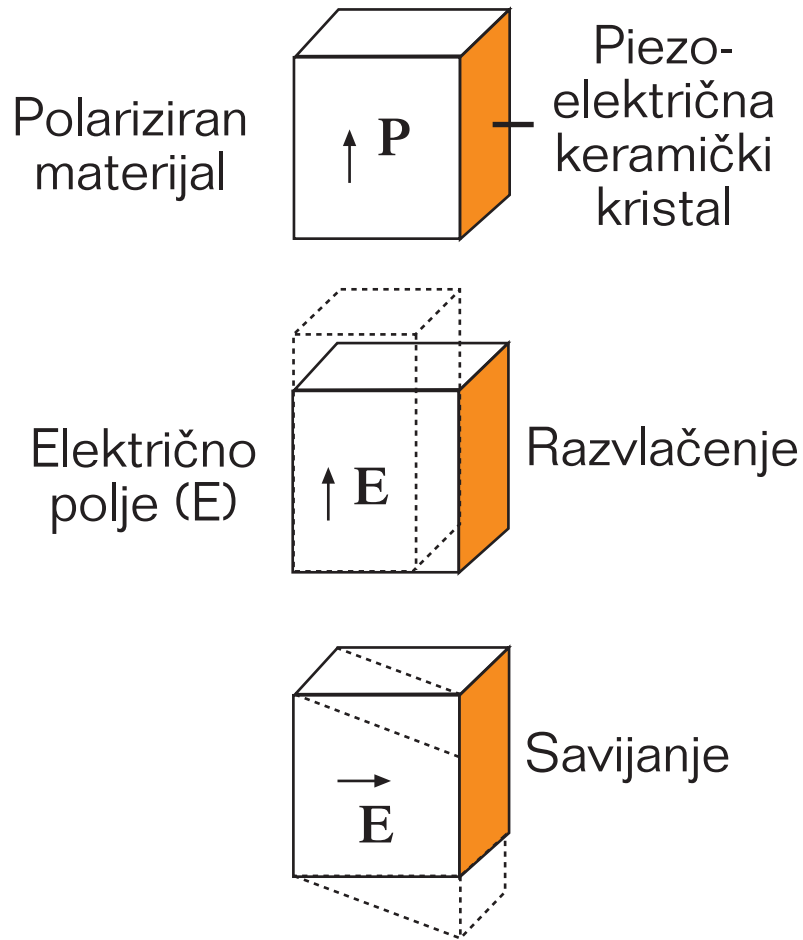
Piezo Ink Jet



Karakteristike:

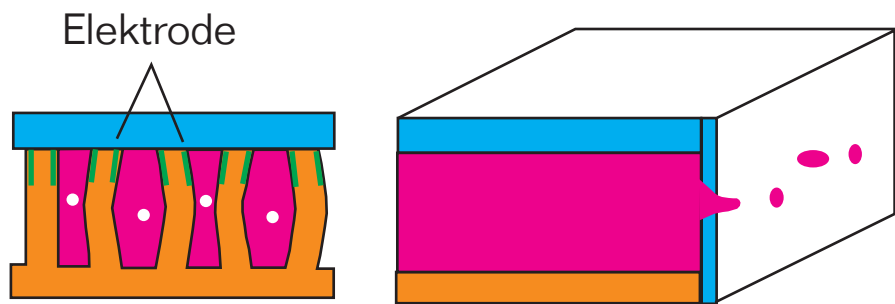
- Fekvencija kapanja: približno 10-20 kHz
- Volumen kapljica: približno 14 pl
- Diametar kapljice: 30 μm

Piezo Ink Jet

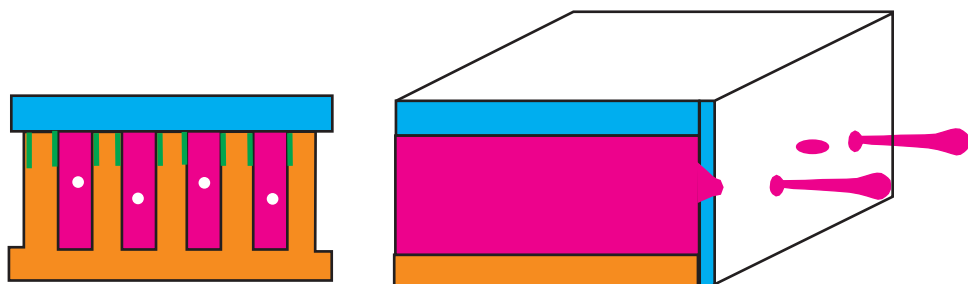


Piezo Ink Jet

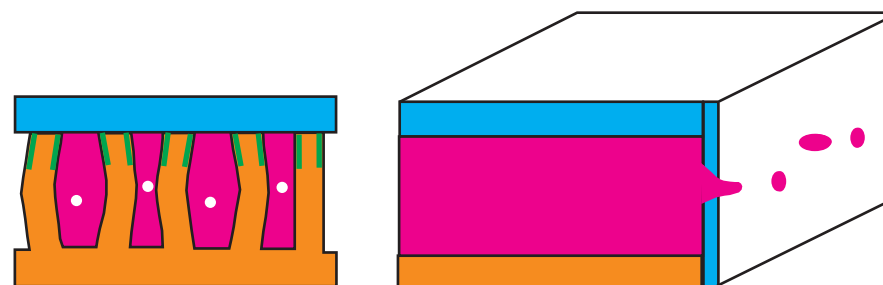
1)



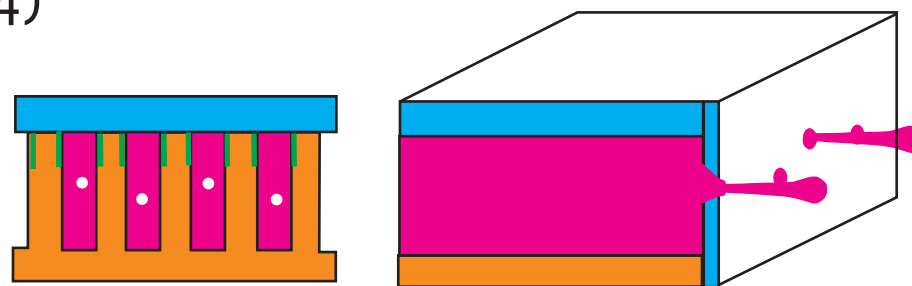
2)



3)



4)



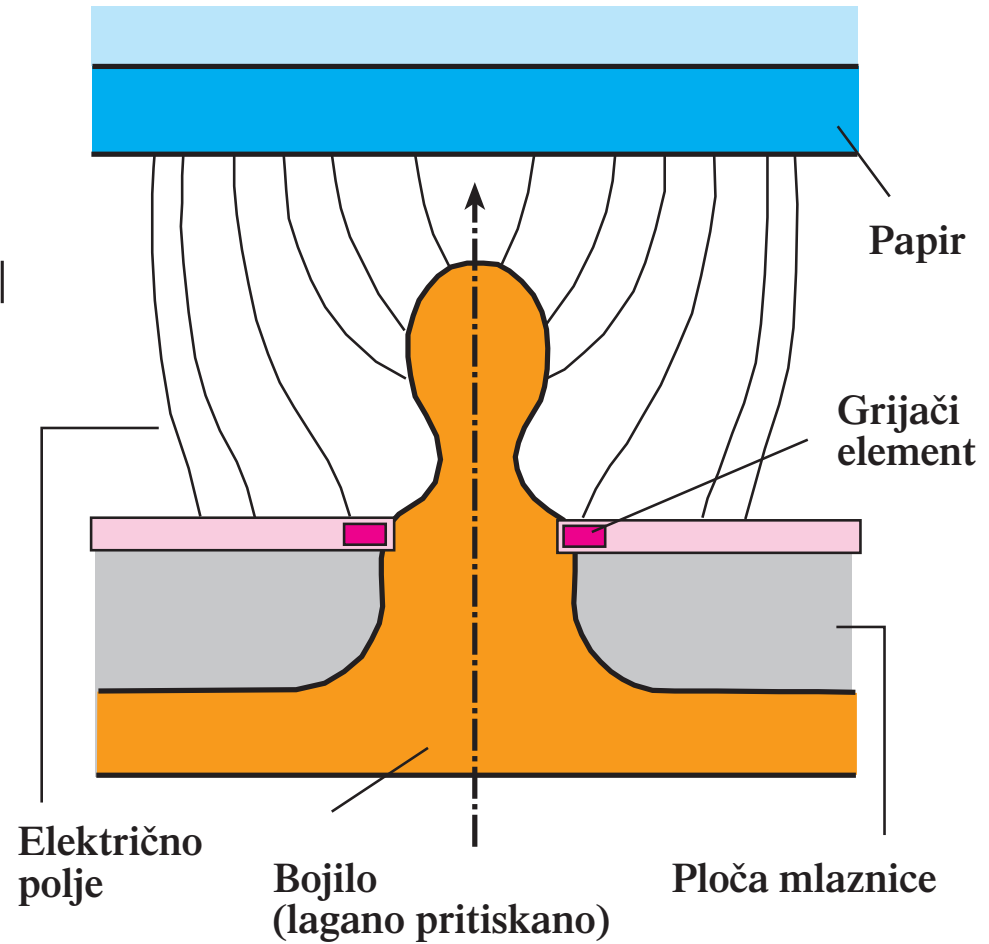
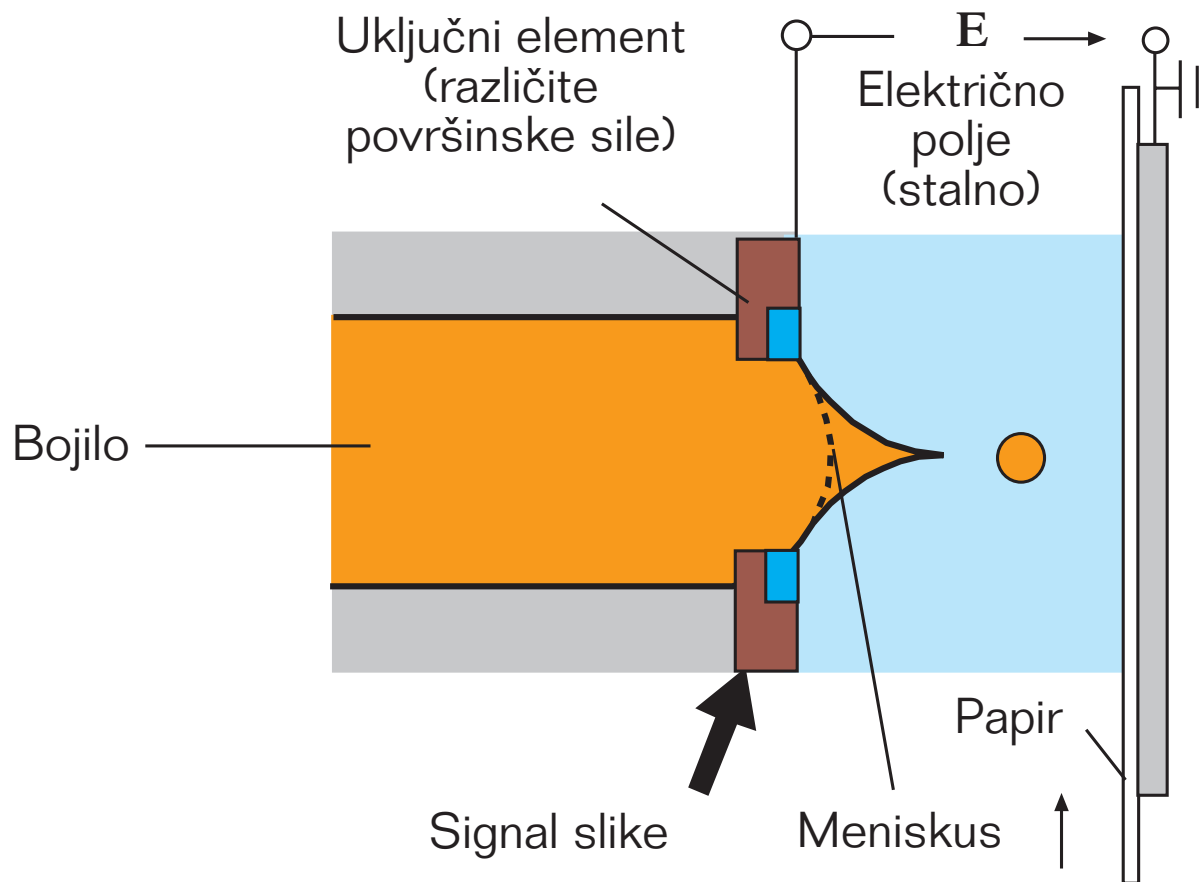
Piezo Ink Jet



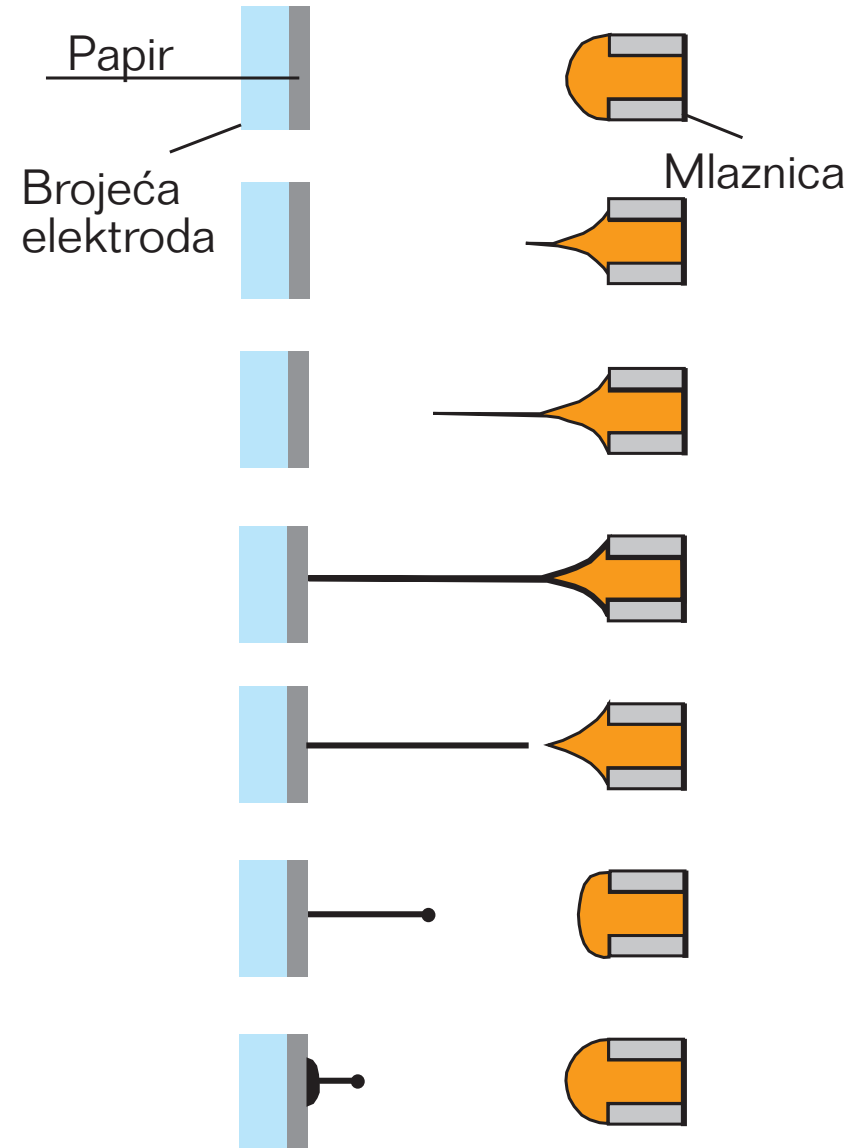
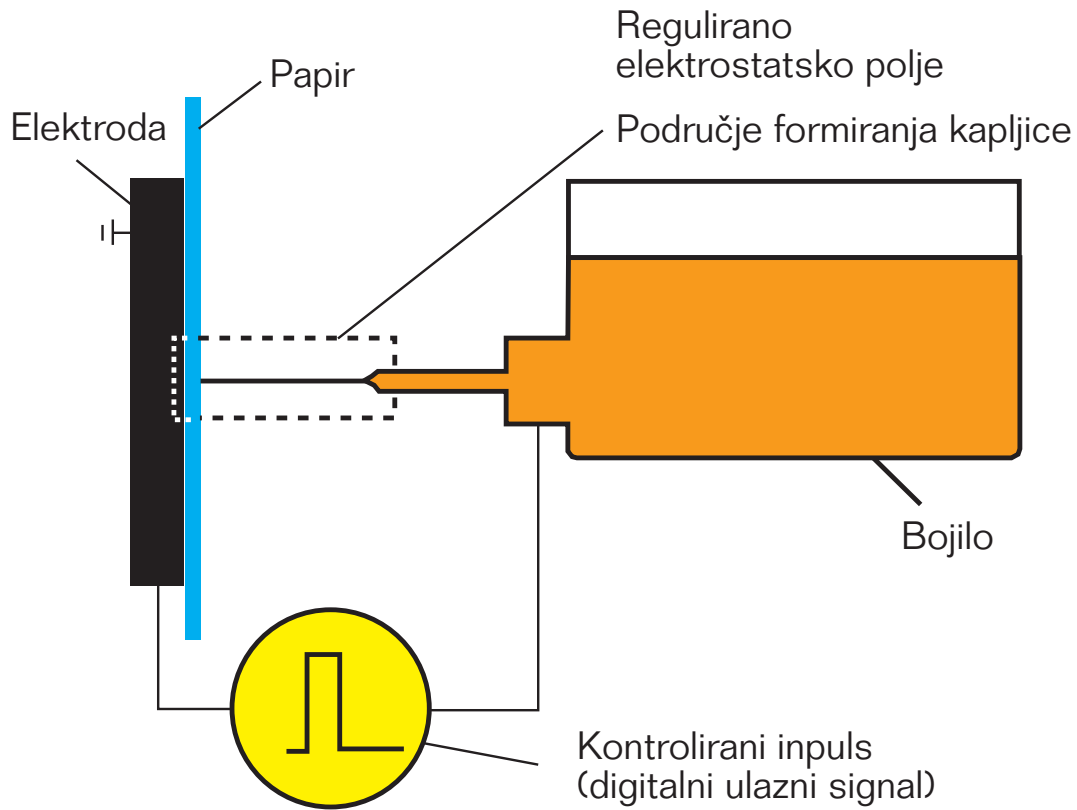
Veličina slike	max. 324 x 476 mm
Veličina papira	max. 330 x 482 mm
Brzina višebojnog otiska	slika 203 x 254 mm = 120 s slika 101 x 2152 mm = 60 s
Rezolucija	1440 x 720 dpi
Kapacitet buffera	128 KB
Printerski jezik	Epson ESC/P2, IBM X24E
Princip rada	kapljanje na zahtjev, piezo tehnologija
Ispisna glava	48 mlaznica x 6 (C, c, M, m, Y, K)
Veličina formirane točkice	6 pl
Dimenzije pisača	579 x 289 x 175 mm
Kapacitet spremnika papira	100 araka papira (80 g/m ²)
Buka	47 dB
Ulazni priključak	USB

EPSON 1200 Photo

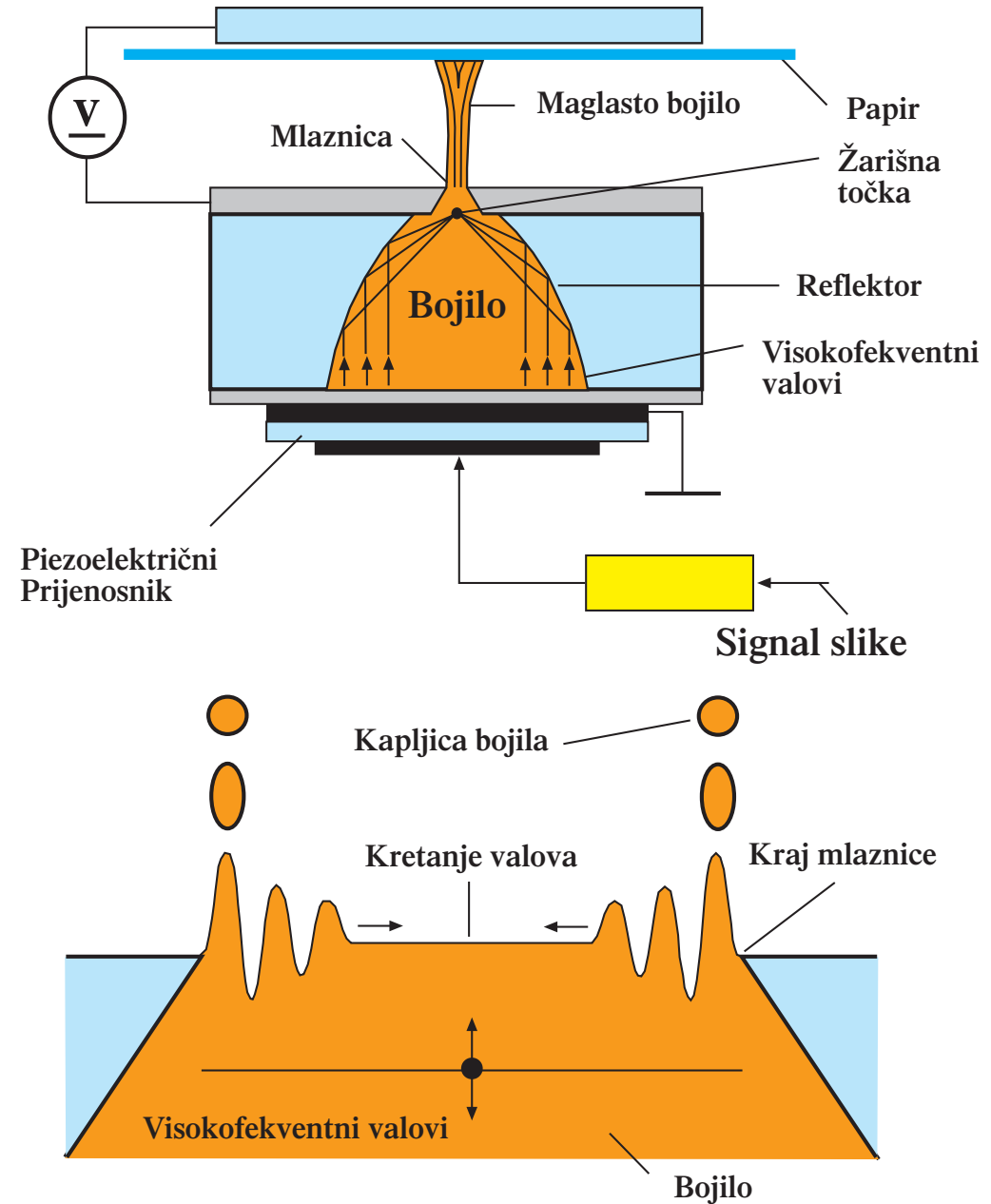
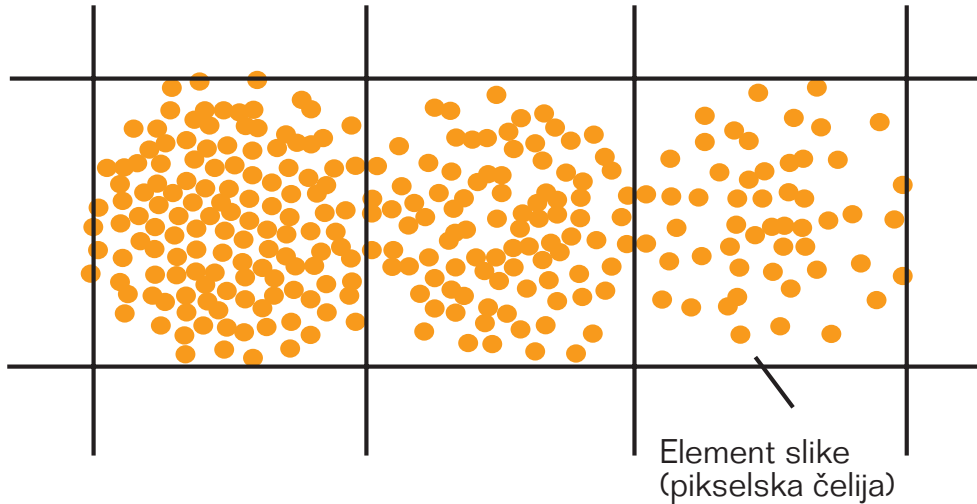
Elektrostatski Ink Jet

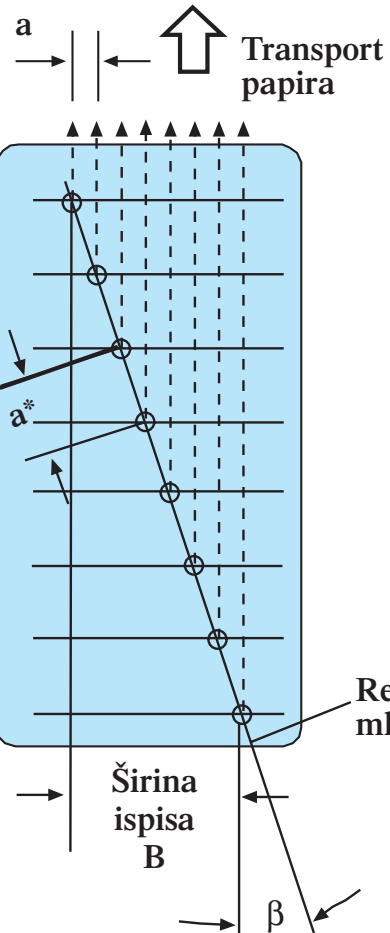
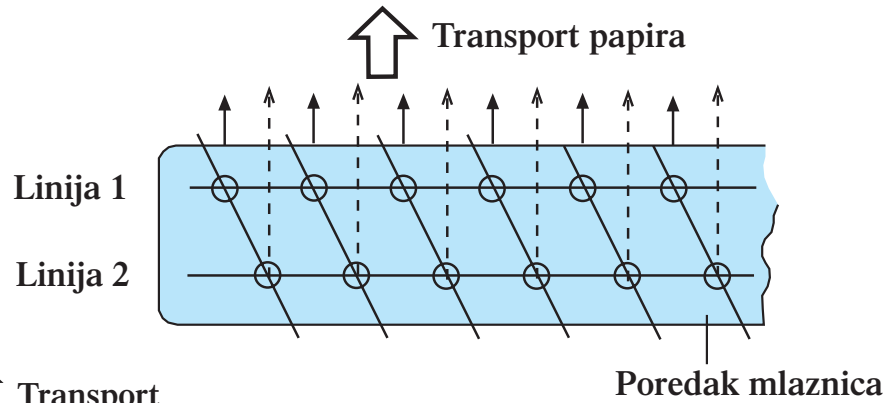


Elektrostatski Ink Jet (Taylor effect)



Elektrostatski Ink Jet (Ultrazvučni)





Rezolucija ispisne glave:

$$A = A^* / \sin \beta = 1 / (a^* \cdot \sin \beta) = 1 / a$$

A^* rezolucija reda

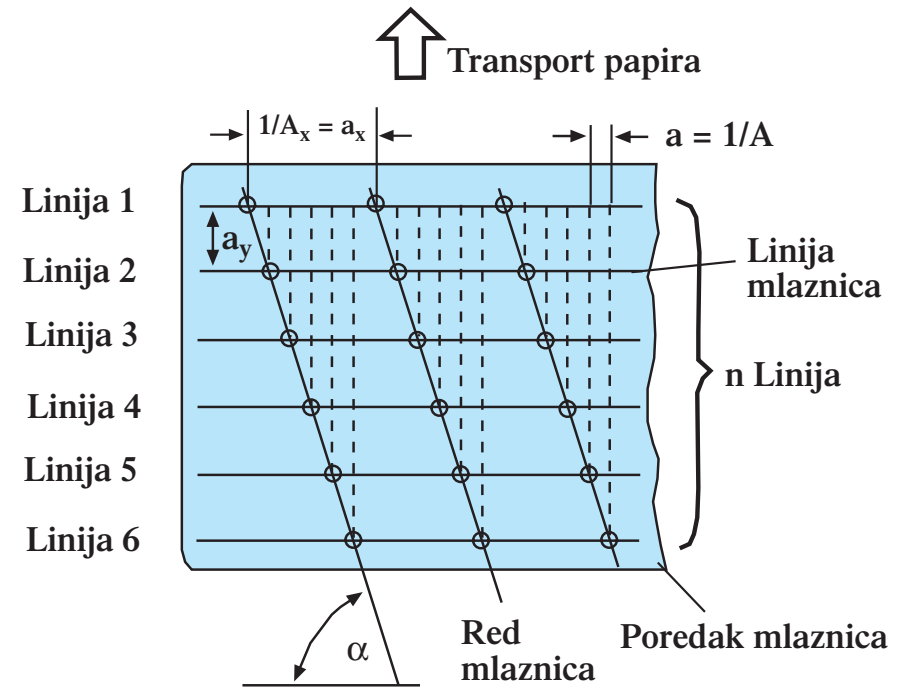
$$\sin \beta = a / a^*$$

NPR: $A^* = 100 \text{ dpi}$
 $A = 600 \text{ dpi}$
 $b = 9,6^\circ$

Širina ispisa:

$$B = (m - 1) \cdot a^* \cdot \sin \beta$$

m broj mlaznica po redu



Rezolucija poretka: $A = A_x \cdot n$ (točno 600 dpi)

$$\tan \alpha = (n-1) \cdot a_y \cdot A_x$$

A_x Rezolucija linije (točno 100 dpi)

n Broj linija (točno 6)

a_y Razmak između linija

