

# AEROSOL JET<sup>®</sup> MATERIAL STARTER RECIPES

Aerosol Jet Material Starter Recipes enable customers to save time and speed development of new printed electronic processes and applications. Developed by Optomec applications engineers working in our Aerosol Jet Advanced Applications Lab, each recipe provides detailed print and cure instructions covering specialized material handling, equipment set-up, process settings, and in-situ or post processing curing procedures. Expected print results are given for a particular nozzle type and print speed. If applicable, expected electrical and environmental performance data is provided.

**Ink Information:**

Manufacturer: Clariant  
Material: EXPT Prelect TPS 50G2  
Viscosity: 15 cP  
Solvents: Water, Ethylene glycol  
(Cas# 107-21-1)

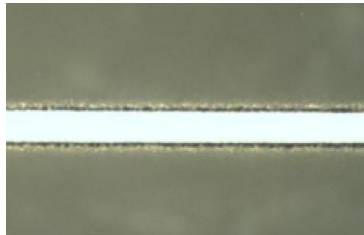


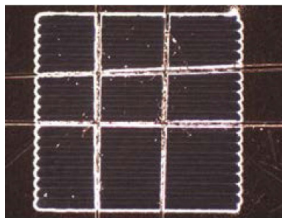
Figure 1 - 100 micron printed Ag feature

**Ink Information:**

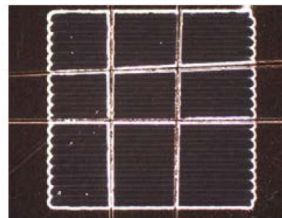
Manufacturer: MicroChem  
Material: XP PriElex SU-8  
Viscosity: 12 cP  
Solvents: PGMEA  
(Cas# 108-65-6)



Figure 2 - 200 micron printed SU-8 feature



Pad 1 - Before



Pad 1 - After

Figure 3 - Clariant TPS 50 Ag ink Printed on PC/ABS Substrate Using ASTM D3359-09 Adhesion Testing

THICKNESS microns	POST EXPOSURE BAKE TIME minutes @ 95°C
0.5 -2	1 -2
3-5	2-3
6-15	3-4
16-25	4-5
26-40	5-6

Table 1 - Optimal MicroChem SU8 Performance Matrix

## KEY FEATURES

- ▶ Developed by Optomec Experts – save weeks of trial and error
- ▶ Commercially Available Inks and Materials – repeatable results
- ▶ Process Specifics – speed R&D and application development
- ▶ Post Processing Details – optimized material performance
- ▶ Customer Tested – use with confidence

# EXAMPLE AEROSOL JET® STARTER RECIPES

**Sprint Ink St**  
**Part Number:**

**Ink Information**  
 Manufacturer: Cla  
 Material: EXPT Pre  
 Viscosity: 15 cP  
 Solvents: Water, Et

**Setup:**  
 Atomizer: Ultrason  
 Dilution: 1:1, Ink: D  
 Bath Temperature:  
 Platen/Substrate T  
 Bubbler: DI Water  
 Print Head: Fine Fe  
 Tip Size: 300µm  
 Stand-Off Distance  
 Test Substrate: Gla

**Print Parameter**  
 Sheath Flow Rate:  
 Atomizer Current:  
 Atomizer Flow Rate  
 Speed: 5mm/s

**Expected Result**  
 Line Width: 100µm  
 Line Thickness: 2.0  
 Resistivity: 3.2x10<sup>4</sup>  
 Post-Processing Co

**Notes and Tips:**  
 -Sintering this ink f  
 especially at low te  
 but drops to 5x aft

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**Tips:**

**No or Low Atomizat**

- Pneumatic
  - ✓ Check jet bottom of volume ja
  - ✓ Observe p it can be d print nozz
  - ✓ Leak chee seated or
- Ultrasonic
  - ✓ Consider cing to th
  - ✓ Leak chee seated or
- Dilution
  - ✓ Reduce vi
  - ✓ Volatile v solvent d
  - ✓ If ink still then addi
  - ✓ Consider

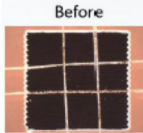
**Altering/Tailoring D**

- Deposition too d
  - ✓ Increase r
  - ✓ Switch tu
  - ✓ Add low-v
  - ✓ Sheath bu
- Deposition too w
  - ✓ Decrease
  - ✓ Heat subs
- Output Fluctuati
  - ✓ Monitor p
  - ✓ Reconside
  - ✓ Implemen

**Adhesion Testing Results:**

**Polycarbonate: 5B**

Before



After



**Glass: 0B**

Before



After

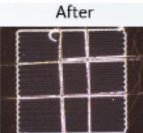


**PC-ABS: 5B**

Before



After

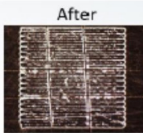


**Nylon 12: 5B**

Before



After

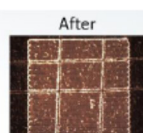


**Polyamide: 5B**

Before



After



**Kapton: 0B**

Before



After



ASTM Test Designation: D 3359 – 09  
Tape Used: 3M #396

*Refer to material vendor SDS for additional details*

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## ABOUT OPTOMECC

Optomec® is a privately-held, rapidly growing supplier of Additive Manufacturing systems. Optomec's patented Aerosol Jet Systems for printed electronics and LENS 3D Printers for metal components are used by industry to reduce product cost and improve performance. Together, these unique printing solutions work with the broadest spectrum of functional materials, ranging from electronic inks to structural metals and even biological matter. Optomec has more than 300 marquee customers around the world, targeting production applications in the Electronics, Energy, Life Sciences and Aerospace industries. For more information about Optomec, visit <http://www.optomec.com>.