



TIPS FOR DESIGNING FOR ELECTROUV3D PRINTING

- **Preferred file types:** Gerber files converted to PDFs.
- **Minimum trace width:** 100 microns.
- **Minimum spacing:** 200 microns, edge to edge.
- **Pay close attention** to spacing not only between traces, but also between traces and drill holes/vias.
 - **Recommended spacing:** ~200 microns, edge of trace to wall of via.
 - Traces too close to vias can potentially cause shorting between layers as the conductive ink may unintentionally fall through.
- **Drill holes** are printed within insulating layers, essentially printing an inverse image of a standard drill hole file, leaving voids in the layer to serve as vias.
 - **Minimum via size:** 200 micron diameter.
- **Soldermasks** can be printed using the same dielectric material as the insulating layers.
- **External fiducials** are extremely useful for alignment purposes.
 - **At least 1 external fiducial** that is consistent throughout all layers is strongly recommended for easier layer-to-layer alignment within the software as well as throughout the actual build.
- **Hatched ground planes** are an option, if possible, to reduce silver ink consumption.
- **For pads in which a component will be attached:**
 - It is recommended to **print additional silver layers** to provide a solid foundation to solder to.
 - For these repeat pad build-up layers, a **separate file is recommended**, containing only the pads that will be soldered to with the **pads being shrunk by ~20%** to account for any spread that may occur during build-up.
- **For power traces:**
 - Same concept as pads for component attachment, where a **separate file** containing only power traces can be **repeat printed** as necessary to meet design specs.
- **General substrate recommendations:**
 - Most common: Kapton/polyimide, FR4 board, PET (Polyethylene terephthalate).
 - **Any planar surface**, rigid or flexible.
 - If adhesion is an issue, either print a dielectric base layer or use our wipe-on primer to enhance adhesion.
- **Basic file/design manipulations** can be done using features in the front-end printer software, allowing quick alterations to design aspects such as:
 - Expand/shrink vias.
 - Thicken/thin traces.
 - Add/remove basic details.



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ChemCubed Jettable Solutions™

ElectroJet™

MULTI-LAYER, MULTI-MATERIAL ADDITIVELY PRINTED SOLUTIONS FOR TOMORROW'S ELECTRONICS

Silver Conductive Inks

- Highest conductivity @ near bulk silver

Resistivity in range of 10^{-8} Ohm*M

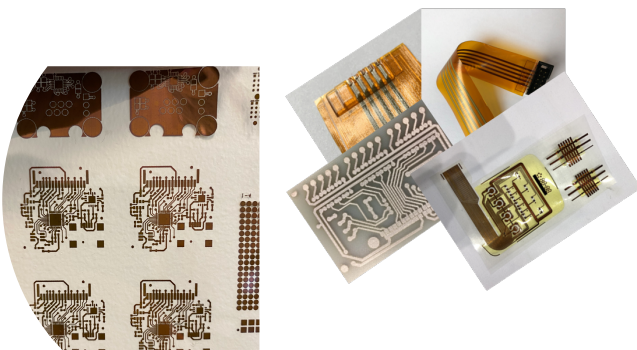
- Lowest sintering temperature
- Particle-free based formulation for long-term jetting performance

No clogged heads

- Compatible with ElectroJet brand printer and other jettable technologies

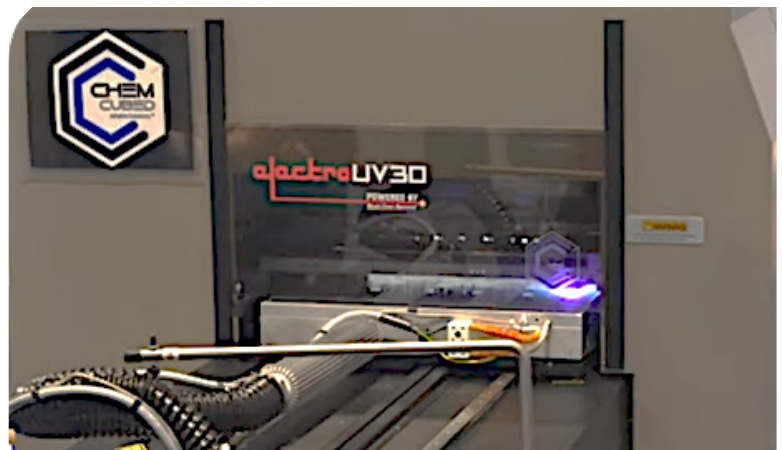
E.g. piezo, aerosol

- Flexible and non-brittle
- Excellent elongation



Dielectric Insulating Inks

- Fully compatible with silver inks for optimized adhesion, print resolution and insulation between conductive trace layers
- UV curable technology suitable for building 3D printed structures
- Compatible with ElectroJet™ brand printer and other UV LED inkjet technologies
- Multiple dielectric formulations for numerous applications





ChemCubed Jettable Solutions™

ElectroJet™ Product Reference Specifications

CONDUCTIVE, DIELECTRIC, PRIMER, AND SECURITY MARKING MATERIALS

Product Name	Description	Key Features	Resistivity	Sintering Temperature
C3-Ag-1037-2	Ethanol-based silver conductive Ink	Low sintering temperature particle-free silver conductive material formulated for piezo inkjet heads	Range 10^{-8} $\Omega \cdot M$	80
C3-DI-7	Dielectric Insulating Ink (UV Curable)	Insulation/building material with excellent adhesion promotion for substrates and compatibility with silver conductive material	3.3×10^{13} $\Omega \cdot cm$	UV
C3-DI-8	Dielectric Insulating Ink (UV Curable)	Insulation/building material for interlayer insulation optimized for flexible circuitry and compatibility with silver conductive material	3.3×10^{13} $\Omega \cdot cm$	UV
C3-OPT-7	Dielectric Insulating Ink (UV Curable)	Transparent insulating/building material with excellent insulating properties for higher voltage and compatibility with silver conductive material	3.3×10^{13} $\Omega \cdot cm$	UV
C3-SMR-7	Solder Mask Ink (UV Curable)	Colored solder mask ink material with excellent adhesion properties for wave solder process (Red color, other colors optional)	N/A	UV
C3-SEC-7	Security Marking Ink (UV Curable)	Transparent ink material for invisible image printing when used in conjunction with DI-8 or OPT-7 insulating inks, UV detection	N/A	UV
C3-PR-3	Substrate Primer	Specialized primer solution for wiping pre-treatment of high surface energy substrates to optimize adhesion of direct print silver conductive ink	N/A	N/A
C3-HPD-3	High Performance dielectric used in conjunction with C3-DI-7	Makes DI-7 three times stronger, withstand much higher temperature, dramatically small Coefficient of thermal expansion (CTE) with a lower dielectric constant	N/A	UV

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