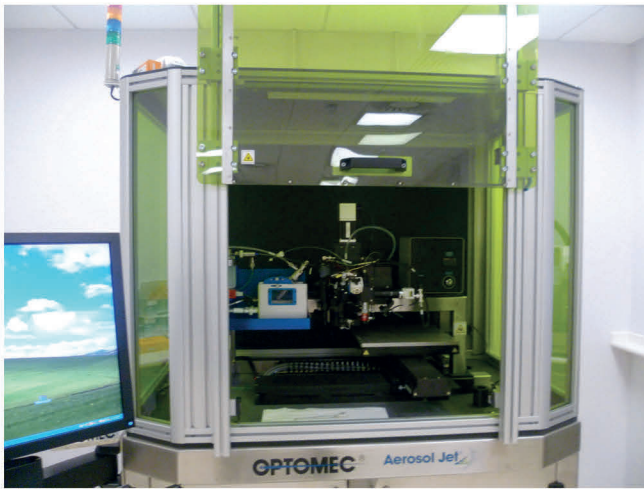


# AEROSOL JET DEPOSITION SYSTEM



The Optomec Aerosol Jet Deposition System generates a mist of material using ultrasonic or pneumatic atomisers. This is then focused into a highly collimated stream (as fine as 10 microns) which is directed onto the substrate. Patterning is achieved by moving the substrate under this stream using an accurately controlled platen. This print can be thermally cured/dried by heating the platen or can be selectively and precisely laser treated to avoid substrate damage. The system works with practically any material than can be dispersed in liquid and is ideal for prototyping.

## SPECIFICATIONS

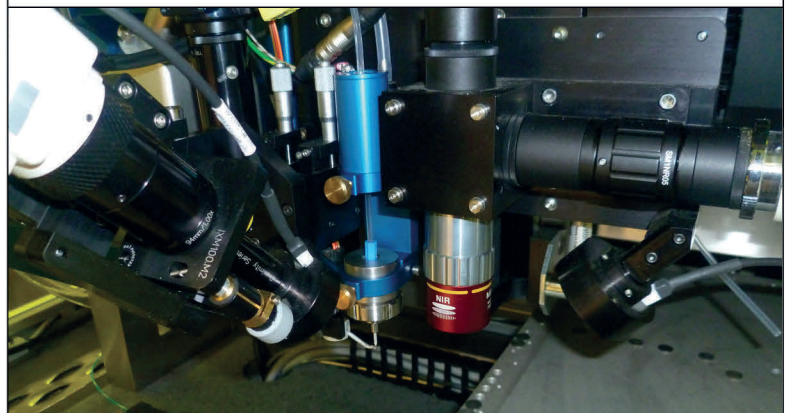
- Feature sizes down to 10 microns.
- Thin layer deposits from 10nm.
- Material viscosities from 1-1000cP.
- Print line widths 10 $\mu$ m-150 $\mu$ m.

## BENEFITS

- Can be used on a wide range of materials.
- Rapid prototyping and design alterations.
- Minimal material waste.
- Reduced costs as no masks or tooling required.

## FEATURES

- Liquid raw material is atomised and deposited as a focused aerosol.
- Materials used include metals, alloys, dielectrics, polymers and biomaterials.
- Nanomaterial Deposition Capability.
- Non-planar substrates can be used.
- Low Temperature Processing.
- Vector tool paths from AutoCAD.



## CASE STUDY

### MICRO ELECTRONICS

The Aerosol jet system was used to deposit 20 micron wide lines of insulating polymer onto silicon wafer. Combinations of conductive, insulating and semi-conductor materials can be used to produce micro-scale electronic devices directly from a CAD design. The aerosol jet is an additive process so there is no need for the costly masks or tooling used in conventional methods of manufacture. This allows rapid prototyping and alterations in the design. The aerosol jet has been used for thin-film transistors, displays, antennas and solar cells.

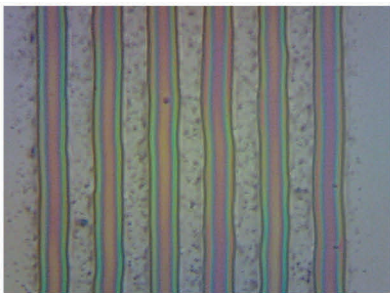


Fig 1. 20µm lines of insulating polymer deposited on silicon wafer using the Optomec system

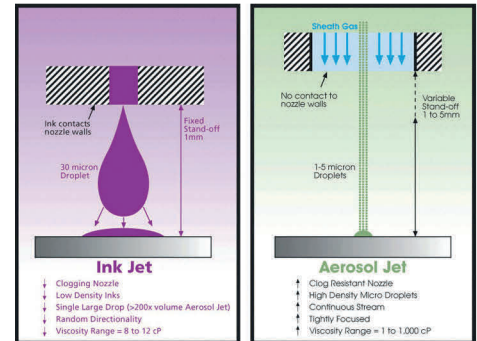


Fig 2: Benefits of using Optomec System over InkJet

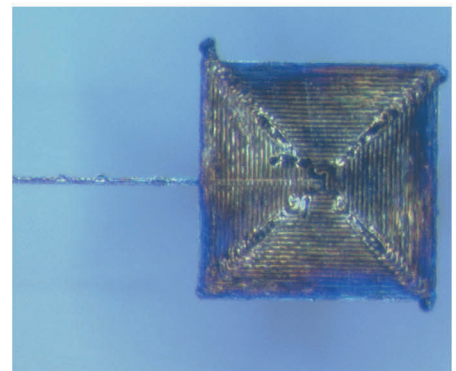


Fig 3: A print of silver nanoparticle ink on glass with 10 micron wide lines and a contact pad constructed from a square spiral fill pattern

## APPLICATIONS

AREA OF INTEREST	APPLICATIONS
LIFE SCIENCE	<ul style="list-style-type: none"> <li>• Bio and chemical sensor architecture.</li> <li>• Microarrays.</li> <li>• Protein, DNA, cell and enzyme deposition and patterning.</li> </ul>
ELECTRONICS	<ul style="list-style-type: none"> <li>• Microelectronics - transistors, antennas.</li> <li>• Displays.</li> <li>• Photovoltaics.</li> <li>• Interconnects.</li> </ul>
OTHERS	<ul style="list-style-type: none"> <li>• Packaging &amp; Assembly.</li> <li>• Hybrid manufacture.</li> </ul>